



AMERICAN ACADEMY OF
ORTHOPAEDIC SURGEONS

Treatment of Mid-Shaft Clavicle Fractures

Appropriate Use Criteria

Adopted by:

The American Academy of Orthopaedic Surgeons Board of Directors
November 18, 2025

Endorsed by:



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Disclaimer

Volunteer physicians from multiple medical specialties created and categorized these Appropriate Use Criteria. These Appropriate Use Criteria are not intended to be comprehensive or a fixed protocol, as some patients may require more or less treatment or different means of diagnosis. These Appropriate Use Criteria represent patients and situations that clinicians treating or diagnosing musculoskeletal conditions are most likely to encounter. The clinician's independent medical judgment, given the individual patient's clinical circumstances, should always determine patient care and treatment.

Disclosure Requirement

In accordance with American Academy of Orthopaedic Surgeons (AAOS) policy, all individuals whose names appear as authors or contributors to this document filed a disclosure statement as part of the submission process. All authors provided full disclosure of potential conflicts of interest prior to participation in the development of these Appropriate Use Criteria. Disclosure information for all panel members can be found in Appendix B.

Funding Source

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FDA Clearance

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To view the clinical practice guideline for this topic, please visit <https://www.orthoguidelines.org/topic?id=1043>

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INTRODUCTION

AUC OVERVIEW

AAOS have developed this Appropriate Use Criteria (AUC) to determine the appropriateness of surgical and non-surgical treatment in patients who have suffered a mid-shaft clavicle fracture.

An “appropriate” healthcare service is one for which the expected health benefits exceed the expected negative consequences by a sufficiently wide margin.¹ Evidence-based information, in conjunction with the clinical expertise of physicians from multiple medical specialties, was used to develop the criteria in order to improve patient care and obtain the best outcomes while considering the subtleties and distinctions necessary in making clinical decisions. To provide the evidence foundation for this AUC, the AAOS Department of Clinical Quality and Value provided the writing panel and rating panel with the AAOS Clinical Practice Guideline on The Treatment of Clavicle Fracture, which can be accessed via the following link:

<http://www.orthoguidelines.org/topic?id=1050>².

The purpose of this AUC is to help determine the appropriateness of clinical practice guideline recommendations for the heterogeneous patient population routinely seen in practice. The best available scientific evidence is synthesized with collective expert opinion on topics where gold standard randomized clinical trials are not available or are inadequately detailed for identifying distinct patient types. When there is evidence corroborated by consensus that expected benefits substantially outweigh potential risks, exclusive of cost, a procedure is determined to be appropriate. The AAOS uses the RAND/UCLA Appropriateness Method (RAM)¹ to assess the appropriateness of a particular treatment. This process includes reviewing the results of the evidence analysis, compiling a list of clinical vignettes, and having an expert panel comprised of representatives from multiple medical specialties to determine the

appropriateness of each of the clinical indications for treatment as “Appropriate,” “May be Appropriate,” or “Rarely Appropriate.” To access a more user-friendly version of the appropriate use criteria for this topic online, please visit our AUC web-based application at www.orthoguidelines.org/auc or download the OrthoGuidelines app from Google Play or Apple Store.

These criteria should not be construed as including all indications or excluding indications reasonably directed to obtaining the same results. The criteria intend to address the most common clinical scenarios facing qualified physicians managing patients with a mid-shaft clavicle fracture. The ultimate judgment regarding any specific criteria should address all circumstances presented by the patient and the needs and resources particular to the locality or institution. It is also important to state that these criteria are not meant to supersede clinician expertise and experience, or patient preference.

INTERPRETING THE APPROPRIATENESS RATING

To prevent misuse of these criteria, it is extremely important that the user of this document understands how to interpret the appropriateness ratings. The appropriateness rating scale ranges from one to nine and there are three main range categories that determine how the median rating is defined (i.e., 1-3 = “Rarely Appropriate”, 4-6 = “May Be Appropriate”, and 7-9 = “Appropriate”). Before these AUCs are consulted, the user should read through and understand all contents of this document.

INJURY OVERVIEW

ETIOLOGY

Clavicle fractures typically occur because of a direct blow to the shoulder. This can be due to a lower energy mechanism like a fall, or due to a higher energy event like a bicycle crash or motor vehicle collision.

INCIDENCE AND PREVALENCE

Clavicle fractures make up about 3-5% of all adult fractures. The incidence of clavicle fractures has been reported to be between 29 and 64 per 100,000 person-years in the last two decades, with higher incidences reported more recently.^{3,4,5} Clavicle fractures occur in a bimodal age distribution with the first peak in incidence occurring during the second and third decades of life, making up nearly 1/3 of all clavicle fractures. A second peak of incidence occurs in the elderly population. A 2019 US private insurance claims database study reported that the rate of surgical intervention for clavicle fractures was 15.2%.⁴

BURDEN OF DISEASE

Clavicle fractures impact men more often than women. They are common among contact athletes but occur after non-sports-related trauma as well. With regard to economic burden of clavicle fractures, a systematic review of the literature has found that the mean overall cost per person of operative treatment of a clavicle fracture is around \$10,000, while the cost for nonoperative treatment averages closer to \$8,000 USD.⁶ The mean absence from work ranges from 8-193 days for patients receiving operative intervention and 24-69 days for those receiving non-operative treatment.⁶ Data demonstrates that the cost-effectiveness of clavicle fracture treatment is largely driven by costs of operative treatment and lengths of absence from work.

EMOTIONAL AND PHYSICAL IMPACT

Clavicle fractures can result in long term negative functional consequences for the shoulder - particularly in the setting of fracture

nonunion and malunion. Optimizing the treatment of clavicle fractures can reduce the negative physical and emotional impacts of the injury. It is the goal of the clinical practice guidelines and appropriate use criteria to help healthcare professionals to determine the ideal treatment for patients and counsel them appropriately.

POTENTIAL BENEFITS, HARM, AND CONTRAINDICATIONS

Clavicle fractures may be treated either nonoperatively or operatively, with differing potential benefits and harms (depending on patient characteristics, such as age and occupation, as well as fracture characteristics, such as displacement). Non-operative treatment of clavicle fractures has the benefit of avoiding surgical intervention and the associated risks of surgery. Nonoperative treatment can allow for fracture healing and a return of function. However, while the harms of non-invasive treatments are typically lower than those associated with operative treatments, risks of non-operative treatment include delays in healing, time lost from work and wages, and nonunion or malunion, potentially impacting long term function. Non-operative treatment is rarely contraindicated, but situations such as open fractures and an unstable shoulder girdle often necessitate surgical intervention. Furthermore, certain clavicle fractures, particularly those with substantial shortening or displacement, may carry higher risk for future problems after nonoperative treatment. Operative treatment of clavicle fractures allows for anatomic reduction of the bone to expedite healing, reducing the risk of nonunion and allows for long term improvement in function, particularly with displaced, comminuted, and shortened clavicle fractures. Operative treatment of clavicle fractures comes with risks inherent to surgical intervention including but not limited to bleeding, infection, and damage to nerves and blood vessels. While nonunion and malunion can be risks associated with operative

intervention, they occur at rates lower than those seen after non-operative intervention. A substantial risk of operative treatment is re-operation, often for the removal of painful implants. Operative treatment is not indicated in minimally displaced fractures and may also be contraindicated by overall patient health and medical comorbidities.

METHODS

This AUC on the Treatment of Mid-Shaft Clavicle Fracture is based on a review of the available literature and a list of clinical scenarios (i.e., criteria) constructed and rated by experts in orthopaedic surgery and other relevant medical fields. This section describes the methods adapted from RAM¹. This section also includes the activities and compositions of the various panels that developed, defined, reviewed, and rated the criteria.

Two panels participated in the development of the Mid-Shaft Clavicle Fracture AUC, a writing panel and a rating panel. Members of the writing panel developed a list of patient scenarios and relevant treatment options. Additional detail on how the writing panel developed the patient scenarios and treatments is below. The rating panel participated in two rounds of rating. During the first round, the rating panel was given approximately one month to independently rate the appropriateness of each the provided treatments for each of the relevant patient scenarios as 'Appropriate', 'May Be Appropriate', or 'Rarely Appropriate' via an electronic ballot. How the rating panel rates for appropriateness is described in more detailed below. After the first round of appropriateness ratings were submitted, AAOS staff calculated the median ratings for each patient scenario and specific treatment. A virtual rating panel meeting was held on Wednesday, September 17, 2025. During this meeting rating panel members addressed the scenarios/treatments which resulted in disagreement from round one rating. The rating panel members discussed the list of assumptions, patient indications, and treatments to identify areas that needed to be clarified/edited. After the discussion and subsequent changes, the group was asked to rerate their first-round ratings during the rating panel meeting, only if they were persuaded to do so by the discussion and available evidence. There was no attempt to obtain consensus about appropriateness.

The AAOS Committee on Evidence Based Quality and Value, the AAOS Research and Quality Council, and the AAOS Board of Directors sequentially approve all AAOS AUC.

DEVELOPING CRITERIA

Panel members of the Mid-Shaft Clavicle Fracture AUC developed patient scenarios using the following guiding principles:

1. **Comprehensive** – Covers a wide range of patients.
2. **Mutually Exclusive** - There should be no overlap between patient scenarios/indications.
3. **Homogenous** – The final ratings should result in equal application within each of the patient scenarios.
4. **Manageable** – Number of total rating items (i.e., # of patient scenarios x # of treatments) should be practical for the rating panel. Target number of total rating items should be >1500. This means that not all patient indications and treatments can be assessed within one AUC.

The writing panel developed the scenarios by categorizing patients in terms of indications evident during the clinical decision-making process. These scenarios relied upon definitions and general assumptions, mutually agreed upon by the writing panel during the development of the scenarios. These definitions and assumptions were necessary to provide consistency in the interpretation of the clinical scenarios among experts rating on the scenarios, and readers using the final criteria.

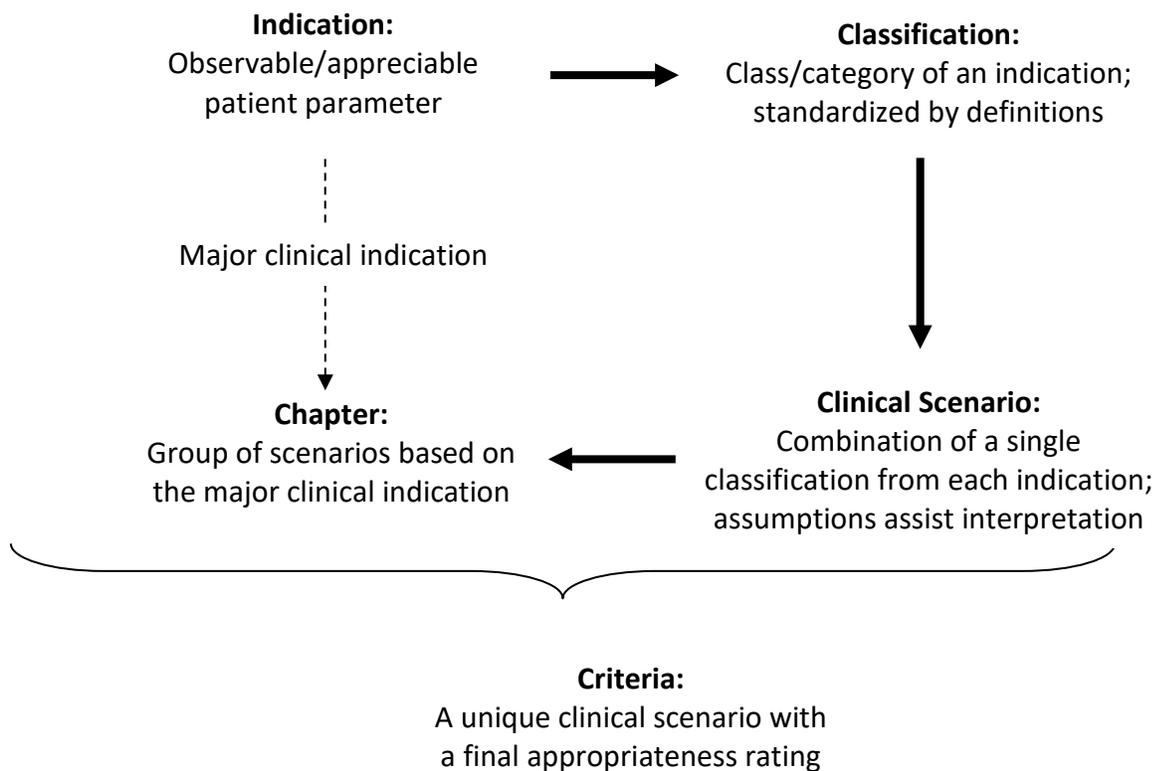
FORMULATING INDICATIONS AND SCENARIOS

The AUC writing panel began the development of the scenarios by identifying clinical indications typical of patients who have

suffered a mid-shaft clavicle fracture. Indications are most often parameters observable by the clinician, including symptoms or results of diagnostic tests.

Additionally, “human factor” (e.g., activity level) or demographic variables can be considered.

FIGURE 1. DEVELOPING CRITERIA



Indications identified in clinical trials, derived from patient selection criteria, included in AAOS Clinical Practice Guidelines (<https://www.orthoguidelines.org/topic?id=1043>) served as a starting point for the writing panel, as well as ensured that these AUCs referenced the evidence base for this topic. The writing panel considered this initial list and other indications based on their clinical

expertise and selected the most clinically relevant indications. The writing panel then defined distinct classes for each indication to stratify/categorize the indication.

The writing panel organized these indications into a matrix of clinical scenarios that addressed all combinations of the classifications. The panel has the ability to remove any scenarios that rarely occur in clinical practice however all

scenarios were retained for this AUC. The major clinical decision-making indications chosen by the writing panel divided the matrix of clinical scenarios into chapters, as follows: Fracture Type, Comminution, Age, Identifiable Factors that Negatively Affect Healing or Outcomes, and Pre-Injury Activity Level of the Patient.

CREATING DEFINITIONS AND ASSUMPTIONS

The Mid-Shaft Clavicle Fracture AUC writing panel constructed concise and explicit definitions for the indications and classifications. This standardization helps ensure that the way the writing panel defined the patient indications is consistent among those reading the clinical scenario matrix or the final criteria. Definitions create explicit boundaries when possible and are based on standard medical practice or existing literature.

Additionally, the writing panel formulated a list of general assumptions in order to provide more consistent interpretations of a scenario. These assumptions differed from definitions in that they identified circumstances that exist outside of the control of the clinical decision-making process. Assumptions also address the use of existing published literature regarding the effectiveness of treatment and/or the procedural skill level of physicians. Assumptions also highlight intrinsic methods described in this document such as the role of cost considerations in rating appropriateness, or the validity of the definition of appropriateness. The main goal of assumptions is to focus scenarios so that they apply to the average patient presenting to an average physician at an average facility.

The definitions and assumptions should provide all readers with a common starting point in interpreting the clinical scenarios. The list of definitions and assumptions accompanied the matrix of clinical scenarios in all stages of AUC development and appears in the Writing Panel section of this document.

LITERATURE REVIEW

The Clinical Practice Guideline on the Treatment of Clavicle Fractures, was used as the evidence base for this AUC³ (see here: <https://www.orthoguidelines.org/topic?id=1043>). This guideline helped to inform the decisions of the writing panel and rating panel where available and necessary.

RATING PANEL MODIFICATIONS TO WRITING PANEL DOCUMENT

At the start of the rating panel meeting, the rating panel was reminded that they could amend the original writing panel materials if the amendments resulted in more clinically relevant and practical criteria. To amend the original materials, a rating panel member must make a motion to amend, and another member must “second” that motion, after which a vote is conducted. If the majority of rating panel members voted “yes” to amend the original materials, the amendments were accepted.

DETERMINING APPROPRIATENESS

RATING PANEL

As mentioned above, a multidisciplinary panel of clinicians was assembled to determine the appropriateness of treatments for the Mid-Shaft Clavicle Fracture AUC. A non-rating moderator, who is an orthopaedic surgeon, moderated the rating panel. The moderator was familiar with the methods and procedures of AAOS Appropriate Use Criteria and led the panel (as a non-rater) in discussions. Additionally, no member of the rating panel was involved in the development (i.e., writing panel), of the scenarios.

The rating panel used a modified Delphi procedure to determine appropriateness ratings. The rating panel participated in two rounds of rating while considering evidence-based information provided in the literature review.

RATING APPROPRIATENESS

When rating the appropriateness of a scenario, the rating panel considered the following definition:

“An appropriate procedural step for a patient seeking care is one for which the procedure is generally acceptable, is a reasonable approach

for the indication, and is likely to improve the patient’s health outcomes or survival.”

The rating panel rated each scenario using their best clinical judgment, taking into consideration the available evidence, for an average patient presenting to an average physician at an average facility as follows:

FIGURE 2. INTERPRETING THE 9-POINT APPROPRIATENESS SCALE

| Rating | Explanation |
|--------|---|
| 7-9 | Appropriate: Appropriate for the indication provided, meaning treatment is generally acceptable and is a reasonable approach for the indication and is likely to improve the patient’s health outcomes or survival. |
| 4-6 | May Be Appropriate: Uncertain for the indication provided, meaning treatment may be acceptable and may be a reasonable approach for the indication, but with uncertainty implying that more research and/or patient information is needed to further classify the indication. |
| 1-3 | Rarely Appropriate: Rarely an appropriate option for management of patients in this population due to the lack of a clear benefit/risk advantage; rarely an effective option for individual care plans; exceptions should have documentation of the clinical reasons for proceeding with this care option (i.e., procedure is not generally acceptable and is not generally reasonable for the indication). |

ROUND ONE RATING

The first round of rating occurred after approval of the final indications, scenarios, and assumptions by the writing panel. The rating panel rated the scenarios electronically using the AAOS AUC Electronic Ballot Tool, a personalized ballot created by AAOS staff. There was no interaction between rating panel members while completing the first round of rating. Panelists considered the following materials:

- The instructions for rating appropriateness
- The completed literature review, that is appropriately referenced when evidence is available for a scenario

- The list of indications, definitions, and assumptions, to ensure consistency in the interpretation of the clinical scenarios

ROUND TWO RATING

The second round of rating occurred after the virtual rating panel meeting on April 1, 2025. Prior to the meeting, each rating panelist received a personalized document that included his/her first-round ratings along with summarized results of the first-round ratings that resulted in disagreement. These results indicated the frequency of ratings for a scenario for all panelists. The document contained no identifying information for other

panelists' ratings. The moderator also used a document that summarized the results of the panelists' first round rating. These personalized documents served as the basis for discussions of scenarios which resulted in disagreement.

During the discussion, the rating panel members were allowed to add or edit the assumptions list, patient indications, and/or treatments if clarification was needed. Rating panel members were also able to record a new rating for any scenarios/treatments, if they were persuaded to do so by the discussion and/or the evidence. There was no attempt to obtain consensus among the panel members. After the final ratings were submitted, AAOS staff used the AAOS AUC Electronic Ballot Tool to export the median values and level of agreement for all rating items.

FINAL RATINGS

Using the median value of the second-round ratings, AAOS staff determined the final levels of appropriateness. Disagreement among raters can affect the final rating. Agreement and disagreement were determined using the BIOMED definitions of Agreement and Disagreement, as reported in the RAND/UCLA Appropriate Method User's Manual¹, for a panel of 8-10 rating members (Figure 3). The 8-10 panel member disagreement cutoff was used for this rating panel. For this panel size, disagreement is defined as when ≥ 3 members' appropriateness ratings fell within the appropriate (7-9) and rarely appropriate (1-3) ranges for any scenario (i.e., ≥ 3 members' ratings fell between 1-3 and ≥ 3 members' ratings fell between 7-9 on any given scenario and its treatment). Agreement is defined as ≤ 2 panelists rating outside of the 3-point range containing the median. If there is disagreement in the rating panel ratings after the last round of rating, that rating item is labeled as "5" regardless of median score. The classifications presented in figure 4 determined final levels of appropriateness.

FIGURE 3. DEFINING AGREEMENT AND DISAGREEMENT FOR APPROPRIATENESS RATINGS

| Panel Size | <u>Disagreement</u> | <u>Agreement</u> |
|------------|--|---|
| | Number of panelists rating in each extreme (1-3 and 7-9) | Number of panelists rating outside the 3-point region containing the median (1-3, 4-6, 7-9) |
| 8,9,10 | ≥ 3 | ≤ 2 |
| 11,12,13 | ≥ 4 | ≤ 3 |
| 14,15,16 | ≥ 5 | ≤ 4 |
| 17,18,19 | ≥ 6 | ≤ 5 |

Adapted from RAND/UCLA Appropriate Method User's Manual¹

FIGURE 4. INTERPRETING FINAL RATINGS OF CRITERIA

| Level of Appropriateness | Description |
|---------------------------------|--|
| Appropriate | <ul style="list-style-type: none">• Median panel rating between 7-9 and no disagreement |
| May Be Appropriate | <ul style="list-style-type: none">• Median panel rating between 4-6 or• Median panel rating 1-9 with disagreement |
| Rarely Appropriate | <ul style="list-style-type: none">• Median panel rating between 1-3 and no disagreement |

REVISION PLANS

These criteria represent a cross-sectional view of current methods of care for patients with a mid-shaft clavicle fracture and may become outdated as new evidence becomes available or clinical decision-making indicators are improved. In accordance with guideline and appropriate use criteria standards, AAOS will update or withdraw these criteria in five years. AAOS will issue updates in accordance with new evidence, changing practice, rapidly emerging treatment options, and new technology.

DISSEMINATING APPROPRIATE USE CRITERIA



All AAOS AUCs can be accessed via a user-friendly app that is available via the OrthoGuidelines website (www.orthoguidelines.org/auc) or as a native app via the Apple and Google Play stores.

Publication of the AUC document is on the AAOS website at <https://www.aaos.org/quality/quality-programs/>. This document provides interested readers with full documentation about the development of Appropriate Use Criteria and further details of the criteria ratings.

AUCs are first announced by an Academy press release and then published on the AAOS website. AUC summaries are published in *AAOS Now* and the *Journal of the American Academy of Orthopaedic Surgeons (JAAOS)*. AUCs may also be promoted via JAAOS' Unplugged podcast. In addition, most appropriate use criteria are promoted at the AAOS Annual Meeting in the Resource Center.

The dissemination efforts of AUCs may include the AAOS Learning Management Systems (LMS), AAOS' Education by Specialty Area pages, webinars, and media briefings. In addition, AUCs are also promoted in relevant Continuing Medical Education (CME) courses. Specialty Societies that participated in the development of the AUC are invited to endorse the AUC and share the links to the online tool and full AUC pdf to their membership via their websites.

Other dissemination efforts outside of the AAOS include submitting AUCs to the Guidelines International Network and to other medical specialty societies' meetings.

ASSUMPTIONS, PATIENT INDICATIONS AND TREATMENTS

ASSUMPTIONS LIST AND DISCLAIMER

Assumptions

- The scope of this AUC does not include pre-pubescent or peri-pubescent patients.
- This AUC is not pertinent to a delayed union (>6 mos)

Before these appropriate use criteria are consulted, it is assumed that:

- Patient was appropriately evaluated with complete history and physical and had appropriate radiographic workup
- The patient has been optimized and risk stratified, and deemed an appropriate candidate for surgical intervention when necessary
- The fracture is isolated and the patient has no polytrauma or associated neurovascular injury
- The fracture is neither open nor impending open
- The surgery, when indicated, will be performed in a timely fashion to allow ideal treatment of the fracture.
- The patient is still having clinical symptoms associated with the acute clavicle fracture

Disclaimer

Volunteer physicians and dentists from multiple medical and dental specialties created and categorized these Appropriate Use Criteria. These Appropriate Use Criteria are not intended to be comprehensive or a fixed protocol, as some patients may require more or less treatment or different means of diagnosis. These Appropriate Use Criteria represent patients and situations that clinicians treating or diagnosing musculoskeletal conditions are most likely to encounter. The clinician's independent medical judgment, given the individual patient's clinical circumstances, should always determine patient care and treatment.

INDICATIONS

Fracture Type

- Displaced (more than 100%) – Shortened (2cm or more)
- Displaced (more than 100%) – Not Shortened
- Non-displaced
- Angulation greater than 10degrees (medial segment related to lateral segment)

Comminution

- Yes
- No

Age

- Adolescent (post-pubescent) (≤ 18 yrs old)
- Adult (> 18 yrs old)

Identifiable Factors that Negatively Affect Healing or Outcomes

- Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.)
- No Identifiable Factors That Negatively Affect Healing or Outcomes

Pre-Injury Activity Level of the Patient

- High (Patients experiencing substantial stress/strain on their shoulder on regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.)
- Moderate (General Recreational Activities)
- Low (Low activity, Regular Activities of Daily Living)

TREATMENTS

- Non-operative Treatment
- Operative Treatment (including internal fixation)

FINAL APPROPRIATENESS RATINGS

For a user-friendly version of these appropriate use criteria, please access our AUC web-based application at www.orthoguidelines.org/auc. The OrthoGuidelines native app can also be downloaded via the Apple or Google Play stores.

Web-Based AUC Application Screenshot

| INDICATION PROFILE | PROCEDURE RECOMMENDATIONS | | | | | | |
|--|--|--------|--|--------|--|--------------------------------|---|
| <p>Fracture Type i</p> <p><input checked="" type="radio"/> Displaced (more than 100%) - Shortened (2cm or more)</p> <p><input type="radio"/> Displaced (more than 100%) - Not Shortened</p> <p><input type="radio"/> Non-Displaced</p> <p><input type="radio"/> Angulation greater than 10 degrees (medial segment related to lateral segment)</p> | <table border="1"><tr><td data-bbox="906 625 1010 730"></td><td data-bbox="1019 625 1448 730">Operative Treatment (including internal fixation)</td><td data-bbox="1458 625 1474 730">+ 8</td></tr><tr><td data-bbox="906 751 1010 856"></td><td data-bbox="1019 751 1448 856">Non-Operative Treatment</td><td data-bbox="1458 751 1474 856">4</td></tr></table> | | Operative Treatment (including internal fixation) | + 8 | | Non-Operative Treatment | 4 |
| | Operative Treatment (including internal fixation) | + 8 | | | | | |
| | Non-Operative Treatment | 4 | | | | | |
| <p>Comminution</p> <p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p> | <p>E-mail Results Print <input type="button" value="Copy"/></p> | | | | | | |
| <p>Age</p> <p><input type="radio"/> Adolescent (post-pubescent) (<18yrs old)</p> <p><input checked="" type="radio"/> Adult (>18yrs old)</p> | | | | | | | |
| <p>Identifiable Factors That Negatively Affect Healing or Outcomes</p> <p><input type="radio"/> Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.)</p> <p><input checked="" type="radio"/> No Identifiable Factors That Negatively Affect Healing or Outcomes</p> | | | | | | | |
| <p>Pre-Injury Activity Level of the Patient</p> <p><input type="radio"/> High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.)</p> <p><input checked="" type="radio"/> Moderate (General Recreational Activities)</p> <p><input type="radio"/> Low (Low activity, Regular Activities of Daily Living)</p> | | | | | | | |
| <p>Submit </p> | | | | | | | |

RESULTS

The following Appropriate Use Criteria tables contain the final appropriateness ratings assigned by the members of the rating panel. Patient characteristics are found under the column titled “Patient Indications”. The Appropriate Use Criteria for each patient scenario can be found within each of the treatment rows. These criteria are formatted by appropriateness, median rating, and + or - indicating agreement or disagreement amongst the rating panel, respectively.

Out of 192 total rating items, 89 (46.4%) rating items were rated as “Appropriate”, 83 (43.2%) rating items were rated as “May Be Appropriate”, and 20 (10.4%) rating items were rated as “Rarely Appropriate” (Figure 5). Additionally, the rating panel members were in statistical agreement on 89 (46.4%) rating items and statistical disagreement on 0 (0%) rating items (Figure 6). 103 (53.6%) items did not reach agreement nor disagreement. The distribution of appropriateness ratings on the 9-point scale can be seen in Figure 7.

FIGURE 5. BREAKDOWN OF APPROPRIATENESS RATINGS

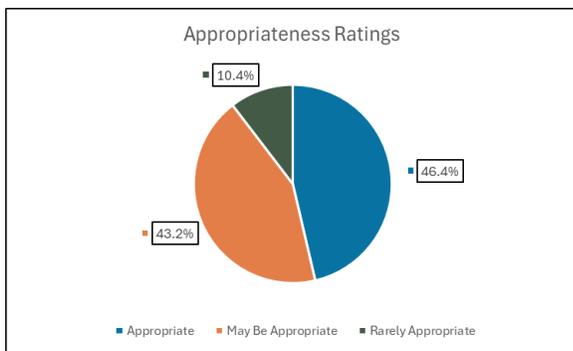


FIGURE 6. BREAKDOWN OF AGREEMENT AMONGST RATING PANEL

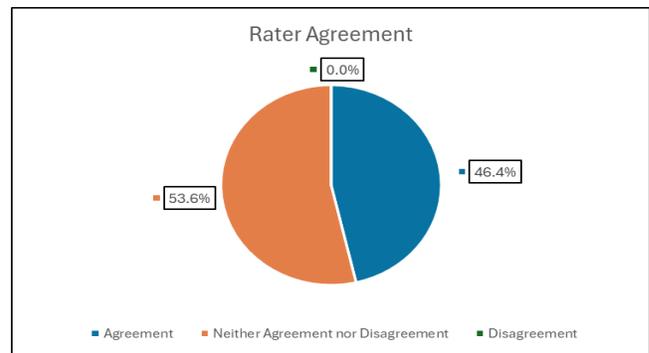
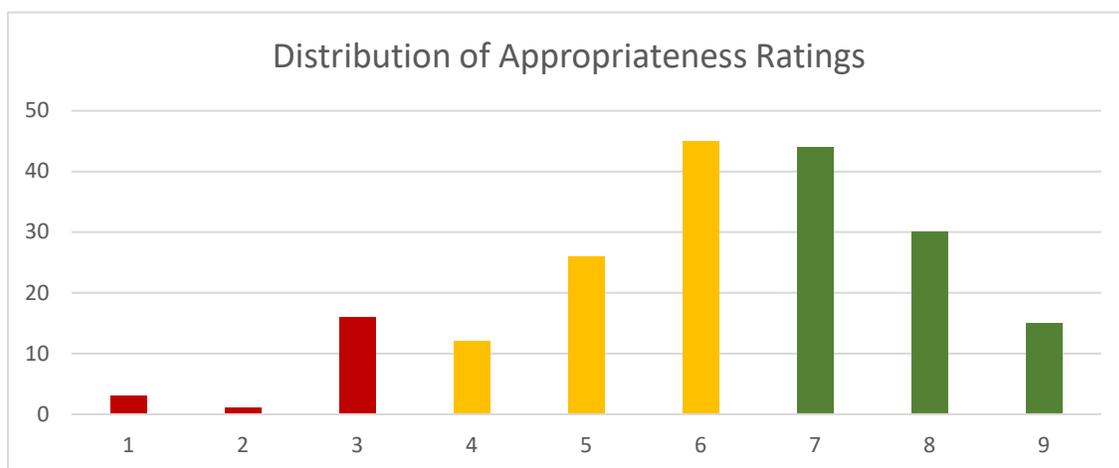


FIGURE 7. DISTRIBUTION OF APPROPRIATENESS ON 9-POINT RATING SCALE



APPROPRIATENESS RATINGS BY PATIENT SCENARIO

Interpreting the AUC tables:

- The appropriateness rating (i.e., appropriate, may be appropriate, or rarely appropriate) for the respective treatment option is reported next to the associated patient scenario, followed by the median panel rating, and the panel’s agreement, indicated by a plus sign for agreement, a minus sign for disagreement or no icon for neither agreement nor disagreement, in parentheses.

| Scenario 1: | Treatment | Appropriateness Rating |
|--|---|------------------------|
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 2: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 3: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 4: | Treatment | Appropriateness Rating |

| | | |
|--|---|------------------------|
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] (+) |
| Scenario 5: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 6: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 7: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 8: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. | Non-Operative Treatment | May Be Appropriate [6] |

| | | |
|--|---|----------------------------|
| poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 9: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 10: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Rarely Appropriate [3] (+) |
| | Operative Treatment (including internal fixation) | Appropriate [9] (+) |
| Scenario 11: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [4] |
| | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 12: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |

| Scenario 13: | Treatment | Appropriateness Rating |
|---|---|------------------------|
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] (+) |
| Scenario 14: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 15: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 16: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 17: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution | Non-Operative Treatment | May Be Appropriate [6] |

| | | |
|---|---|------------------------|
| Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | | |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 18: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 19: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 20: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 21: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. | Non-Operative Treatment | May Be Appropriate [5] |

| | | |
|--|---|------------------------|
| poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 22: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [4] |
| | Operative Treatment (including internal fixation) | Appropriate [9] (+) |
| Scenario 23: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [4] |
| | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 24: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Shortened (2cm or more) No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [4] |
| | Operative Treatment (including internal fixation) | Appropriate [7] (+) |
| Scenario 25: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 26: | Treatment | Appropriateness Rating |

| | | |
|--|---|-------------------------------|
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 27: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] (+) |
| Scenario 28: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 29: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 30: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adolescent (post-pubescent) (<18yrs old) | Non-Operative Treatment | May Be Appropriate [6] |

| | | |
|--|---|----------------------------|
| No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | | |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 31: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] (+) |
| | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 32: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [5] (+) |
| | Operative Treatment (including internal fixation) | Appropriate [7] (+) |
| Scenario 33: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [6] (+) |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 34: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a | Non-Operative Treatment | May Be Appropriate [5] |

| | | |
|---|---|----------------------------|
| regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 35: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [5] (+) |
| | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 36: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [5] (+) |
| | Operative Treatment (including internal fixation) | Appropriate [7] (+) |
| Scenario 37: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] (+) |
| | Operative Treatment (including internal fixation) | Appropriate [7] (+) |
| Scenario 38: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [6] (+) |

| | | |
|---|---|----------------------------|
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 39: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 40: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] (+) |
| | Operative Treatment (including internal fixation) | Appropriate [7] (+) |
| Scenario 41: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 42: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | Appropriate [7] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 43: | Treatment | Appropriateness Rating |

| | | |
|---|---|----------------------------|
| Displaced (more than 100%) - Not Shortened No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | Appropriate [7] (+) |
| Scenario 44: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [6] (+) |
| | Operative Treatment (including internal fixation) | Appropriate [7] (+) |
| Scenario 45: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 46: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [4] |
| | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 47: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution | Non-Operative Treatment | May Be Appropriate [4] |

| | | |
|---|---|----------------------------|
| Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | | |
| | Operative Treatment (including internal fixation) | Appropriate [8] (+) |
| Scenario 48: | Treatment | Appropriateness Rating |
| Displaced (more than 100%) - Not Shortened No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [5] |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 49: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [4] |
| Scenario 50: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] (+) |
| Scenario 51: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. | Non-Operative Treatment | Appropriate [9] (+) |

| | | |
|---|---|------------------------|
| poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Operative Treatment (including internal fixation) | Rarely Appropriate [2] |
| Scenario 52: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [4] |
| Scenario 53: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] |
| Scenario 54: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [2] |
| Scenario 55: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] |
| Scenario 56: | Treatment | Appropriateness Rating |

| | | |
|---|---|----------------------------|
| Non-Displaced Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] (+) |
| Scenario 57: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] (+) |
| Scenario 58: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [5] |
| Scenario 59: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] (+) |
| Scenario 60: | Treatment | Appropriateness Rating |
| Non-Displaced Yes - Comminution Adult (>18yrs old) | Non-Operative Treatment | Appropriate [9] (+) |

| | | |
|--|---|----------------------------|
| No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | | |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [2] (+) |
| Scenario 61: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] |
| Scenario 62: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] (+) |
| Scenario 63: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [1] (+) |
| Scenario 64: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [4] |

| Scenario 65: | Treatment | Appropriateness Rating |
|--|---|----------------------------|
| Non-Displaced No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] (+) |
| Scenario 66: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [1] (+) |
| Scenario 67: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] |
| Scenario 68: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] (+) |
| Scenario 69: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution | Non-Operative Treatment | Appropriate [9] (+) |

| | | |
|--|---|----------------------------|
| Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | | |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [1] (+) |
| Scenario 70: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [4] |
| Scenario 71: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] (+) |
| Scenario 72: | Treatment | Appropriateness Rating |
| Non-Displaced No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | Appropriate [9] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [1] (+) |
| Scenario 73: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) | Non-Operative Treatment | Appropriate [8] |

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|--|---|----------------------------|
| High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Operative Treatment (including internal fixation) | May Be Appropriate [4] |
| Scenario 74: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [4] |
| Scenario 75: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] (+) |
| Scenario 76: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Appropriate [8] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [4] |
| Scenario 77: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [8] (+) |

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|--|---|----------------------------|
| | Operative Treatment (including internal fixation) | May Be Appropriate [4] |
| Scenario 78: | Treatment | Appropriateness Rating |
| <p>Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living)</p> | Non-Operative Treatment | Appropriate [8] (+) |
| | Operative Treatment (including internal fixation) | Rarely Appropriate [3] (+) |
| Scenario 79: | Treatment | Appropriateness Rating |
| <p>Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.)</p> | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 80: | Treatment | Appropriateness Rating |
| <p>Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities)</p> | Non-Operative Treatment | Appropriate [7] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [5] (+) |
| Scenario 81: | Treatment | Appropriateness Rating |
| <p>Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g.</p> | Non-Operative Treatment | Appropriate [7] |

| | | |
|--|---|----------------------------|
| poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Operative Treatment (including internal fixation) | May Be Appropriate [5] |
| Scenario 82: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [6] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 83: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [5] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [5] (+) |
| Scenario 84: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) Yes - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [5] (+) |
| Scenario 85: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) | Non-Operative Treatment | Appropriate [7] |

| | | |
|---|---|------------------------|
| High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Operative Treatment (including internal fixation) | May Be Appropriate [5] |
| Scenario 86: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [7] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [5] |
| Scenario 87: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adolescent (post-pubescent) (<18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | Appropriate [7] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [4] |
| Scenario 88: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | Appropriate [7] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [5] |
| Scenario 89: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | Appropriate [7] (+) |

| | | |
|---|---|------------------------|
| | Operative Treatment (including internal fixation) | May Be Appropriate [5] |
| Scenario 90: | Treatment | Appropriateness Rating |
| <p>Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adolescent (post-pubescent) (<18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living)</p> | Non-Operative Treatment | Appropriate [7] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [4] |
| Scenario 91: | Treatment | Appropriateness Rating |
| <p>Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.)</p> | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 92: | Treatment | Appropriateness Rating |
| <p>Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g. poorly controlled diabetes, smoking, etc.) Moderate (General Recreational Activities)</p> | Non-Operative Treatment | May Be Appropriate [6] |
| | Operative Treatment (including internal fixation) | May Be Appropriate [5] |
| Scenario 93: | Treatment | Appropriateness Rating |
| <p>Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adult (>18yrs old) Identifiable Factors That Negatively Affect Healing or Outcomes Present (e.g.</p> | Non-Operative Treatment | May Be Appropriate [6] |

| | | |
|---|---|----------------------------|
| poorly controlled diabetes, smoking, etc.) Low (Low activity, Regular Activities of Daily Living) | Operative Treatment (including internal fixation) | May Be Appropriate [5] |
| Scenario 94: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes High (Patients experiencing substantial stress/strain on their shoulder on a regular basis; Contact Sports, Heavy Labor Jobs/Activities, Overhead Labor Activities, etc.) | Non-Operative Treatment | May Be Appropriate [5] (+) |
| | Operative Treatment (including internal fixation) | Appropriate [7] |
| Scenario 95: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Moderate (General Recreational Activities) | Non-Operative Treatment | May Be Appropriate [5] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] |
| Scenario 96: | Treatment | Appropriateness Rating |
| Angulation greater than 10 degrees (medial segment related to lateral segment) No - Comminution Adult (>18yrs old) No Identifiable Factors That Negatively Affect Healing or Outcomes Low (Low activity, Regular Activities of Daily Living) | Non-Operative Treatment | May Be Appropriate [6] (+) |
| | Operative Treatment (including internal fixation) | May Be Appropriate [6] (+) |

APPENDICES

APPENDIX A. DOCUMENTATION OF APPROVAL

AAOS BODIES THAT APPROVED THIS APPROPRIATE USE CRITERIA:

Evidence-Based Quality and Value Committee: Approved on October 20, 2025

The AAOS Committee on Evidence Based Quality and Value consists of 16 AAOS members. The overall purpose of this committee is to plan, organize, direct, and evaluate initiatives related to Clinical Practice Guidelines, Appropriate Use Criteria, and Quality Measures.

Research and Quality Council: Approved October 17, 2025

To enhance the mission of the AAOS, the Research and Quality Council promotes the most ethically and scientifically sound basic, clinical, and translational research possible to ensure the future care for patients with musculoskeletal disorders. The Council also serves as the primary resource to educate its members, the public, and public policy makers regarding evidenced-based medical practice, orthopaedic devices and biologics regulatory pathways and standards development, patient safety, and other related areas of importance.

Board of Directors: Approved November 18, 2025

The 17 member AAOS Board of Directors manages the affairs of the AAOS, sets policy, and determines and continually reassesses the Strategic Plan.

APPENDIX B. DISCLOSURE INFORMATION

WRITING PANEL MEMBER DISCLOSURES

Abdulaziz F. Ahmed, MD

Submitted on: 09/13/2024

American Orthopaedic Society for Sports Medicine: Board or committee member

American Shoulder and Elbow Surgeons: Board or committee member

DJ Orthopaedics: Paid presenter or speaker

Gregory John Della Rocca, MD, PhD, MBA, FAAOS, FACS

Submitted on: 07/20/2024

AAOS: Board or committee member

American College of Surgeons: Board or committee member

American Orthopaedic Association: Board or committee member

Association of Bone and Joint Surgeons: Board or committee member

BioPoly: Unpaid consultant

Geriatric Orthopaedic Surgery and Rehabilitation: Editorial or governing board

Invibio: Unpaid consultant

Journal of Orthopaedic Trauma: Editorial or governing board

Orthopaedic Trauma Association: Board or committee member

Stryker: IP royalties

Ryan Harrison, MD, FAAOS

Submitted on: 07/22/2024

AAOS: Board or committee member

Orthopaedic Trauma Association: Board or committee member

Christopher Klifto, MD, FAAOS

Submitted on: 09/17/2024

Acumed, LLC: Paid consultant

GE Healthcare: Stock or stock Options

Johnson & Johnson: Stock or stock Options

Merck: Stock or stock Options

Pfizer: Stock or stock Options

Restore3d: Paid consultant

Smith & Nephew: Paid consultant

Stryker: Paid consultant

Robert Manske, MD

Submitted on: 01/29/2025

Human Kinetics

Elsevier

Corey J Schiffman, MD

Submitted on: 06/02/2024

This individual reported nothing to disclose

Aaron D Sciascia, PhD, ATC

Submitted on: 09/12/2024

Alyve Medical, Inc: Paid consultant

Springer: Publishing royalties, financial or material support

RATING PANEL MEMBER DISCLOSURES

Omkar Baxi, MD

Submitted on 4/16/2025

This Individual reported nothing to disclose

Jonathan R Dubin, MD, FAAOS

Submitted on: 07/29/2024

(This individual reported nothing to disclose)

Jacquelyn A Dunahoe

Submitted on: 10/10/2024

This individual reported nothing to disclose.

Joseph R Kearns, DPT

Submitted on: 09/13/2024

This individual reported nothing to disclose

William Lack, MD, FAAOS

Submitted on: 1/29/2025

This individual reported nothing to disclose.

Joseph D Lamplot, MD, FAAOS

Submitted on: 09/10/2024

American Orthopaedic Society for Sports Medicine: Board or committee member

Arthroscopy: Editorial or governing board

Vericel: Paid consultant

Kevin Magone

Submitted on: 10/25/2024

This individual reported nothing to disclose.

Mariano E Menendez Furrer, MD

Submitted on: 06/10/2024

American Shoulder and Elbow Surgeons: Board or committee member

Noah Matthew Raizman, MD, FAAOS

Submitted on: 09/04/2024

American Society for Peripheral Nerve: Board or committee member

American Society for Surgery of the Hand: Board or committee member

Skeletal Dynamics: Paid consultant

Matthew J Zens, DPT, MS, ATC

Submitted on: 09/12/2024

This individual reported nothing to disclose

APPENDIX C. REFERENCES

1. Fitch K, Bernstein SJ, Aguilar MD et al. The RAND/UCLA Appropriateness Method User's Manual. Santa Monica, CA: RAND Corporation; 2001.
2. American Academy of Orthopaedic Surgeons/American Association of Hip and Knee Surgeons Prevention of Orthopaedic Implant Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guidelines. www.aaos.org/dentalppxcpg Published 11/18/2024 - Approved by the American Association of Hip and Knee Surgeons on 11/07/2024
3. Huttunen, Tuomas T. MD, PhD^{1,2,a}; Launonen, Antti P. MD, PhD¹; Berg, Hans E. MD, PhD^{3,4}; Lepola, Vesa MD, PhD¹; Felländer-Tsai, Li MD, PhD^{3,4}; Mattila, Ville M. MD, PhD^{1,2,3,4}. Trends in the Incidence of Clavicle Fractures and Surgical Repair in Sweden: 2001-2012. *The Journal of Bone and Joint Surgery*: November 2, 2016 - Volume 98 - Issue 21 - p 1837-1842 doi: 10.2106/JBJS.15.01284
4. Putnam M, Vanderkarr M, Nandwani P, Holy CE, Chitnis AS. Surgical treatment, complications, and reimbursement among patients with clavicle fracture and acromioclavicular dislocations: a US retrospective claims database analysis. *J Med Econ*. 2019;22(9):901–8.
5. Wolf, S., Chitnis, A.S., Manoranjith, A. et al. Surgical treatment, complications, reoperations, and healthcare costs among patients with clavicle fracture in England. *BMC Musculoskelet Disord* 23, 135 (2022). <https://doi.org/10.1186/s12891-022-05075-5>
6. Kask G, Raittio L, Mattila VM, Launonen AP. Cost-Effectiveness of Operative Versus Non-Operative Treatment for Clavicle Fracture: a Systematic Literature Review. *Curr Rev Musculoskelet Med*. 2020 Aug;13(4):391-399. doi: 10.1007/s12178-020-09640-0. PMID: 32383036; PMCID: PMC7340703.

External Endorsements



American Shoulder and Elbow Surgeons

January 15, 2026

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Kaitlyn S. Sevarino, MBA, CAE
Director
Department of Clinical Quality and Value
AAOS

Dear Ms. Sevarino:

The American Shoulder and Elbow Surgeons (ASES) Presidential Line has voted to endorse the *AAOS Appropriate Use Criteria for the Treatment of Mid-Shaft Clavicle Fractures*.

This endorsement implies permission for the AAOS to officially list our organization as an endorser of this Appropriate Use Criteria and placement of our logo in the introductory section of the Appropriate Use Criteria review document.

Sincerely,

Anna Quintanilla, MA, CAE
Executive Director

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