Pharmacologic, Physical, and Cognitive Pain Alleviation for Musculoskeletal Extremity/Pelvis Surgery

Appropriate Use Criteria

Adapted by:
The American Academy of Orthopaedic Surgeons Board of Directors
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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.

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FDA Clearance
Some drugs or medical devices referenced or described in this document may not have been cleared by the Food and Drug Administration (FDA) or may have been cleared for a specific use only. The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or device he or she wishes to use in clinical practice.

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For a more user-friendly version of this AUC, or to view additional AUCs, please visit the AAOS AUC web-based app at:

www.OrthoGuidelines.org/auc

To view the clinical practice guideline for this topic, please visit
http://www.orthoguidelines.org/go/auc/

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I. INTRODUCTION

OVERVIEW

The AAOS has developed this Appropriate Use Criteria (AUC) to determine appropriateness of Perioperative pain management in patients with adult orthopaedic trauma.

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 voting panel with the AAOS/METRC Clinical Practice Guideline on Pharmacologic, Physical, and Cognitive Pain Alleviation for Musculoskeletal Extremity/Pelvis Surgery, which can be accessed via the following link: http://www.orthoguidelines.org

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 general and other qualified physicians managing patients with high energy lower extremity trauma. 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.

INTERETTING 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.

INCIDENCE AND PREVALENCE

Studies suggest that 60% of patients experience moderate to severe postoperative pain, and there are many negative implications associated with this including prolonged hospital stay, delayed convalescence, reduced patient satisfaction, and delayed ambulation.[3]

ETIOLOGY

Acute postoperative pain in a manifestation of inflammation due to tissue injury, or never injury or both.[5] A primary goal following surgery is to reduce pain during rest and mobilization, and, if relevant, to reduce opioid consumption and any opioid-related adverse effects.[4]

POTENTIAL BENEFITS, HARMS, AND CONTRAINDICATIONS

Benefits of perioperative pain management is providing levels of pain relief and decreasing adverse events. A problem is that no single analgesic provides good levels of pain relief in everyone and increasing the dose of an analgesic is likely to increase the problems of adverse events.[5]

II. METHODS

This AUC for Pharmacology, Physical, and Cognitive Pain Alleviation for Musculoskeletal Extremity/Pelvis Surgery is based on a review of the available literature and a list of clinical scenarios (i.e. criteria) constructed and voted on by experts in orthopaedic surgery and other relevant medical fields. This section describes the methods adapted from RAM[1]. This section also includes the activities and compositions of the various panels that developed, defined, reviewed, and voted on the criteria.

Two panels participated in the development of the AUC, a writing panel and a voting 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 voting panel participated in two rounds of voting. During the first round, the voting 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 voting panel rates for appropriateness is described in more detailed below. After the first round of voting/appropriateness ratings were submitted, AAOS staff calculated the median ratings for each patient scenario and specific treatment. A voting panel meeting was held via teleconference on Wednesday, July 8, 2020. During this meeting voting panel members addressed the scenarios/treatments which resulted in disagreement from round one voting. The voting 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 voting 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 Council on Research and Quality, and the AAOS Board of Directors sequentially approve all AAOS AUC.

DEVELOPING CRITERIA

Panel members of the Pharmacology, Physical, and Cognitive Pain Alleviation for Musculoskeletal Extremity/Pelvis Surgery 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 voting items (i.e. # of patient scenarios x # of treatments) should be practical for the voting panel. Target number of total voting items = 2000-6000. This means that not all patient indications and treatments can be assessed within one AUC.

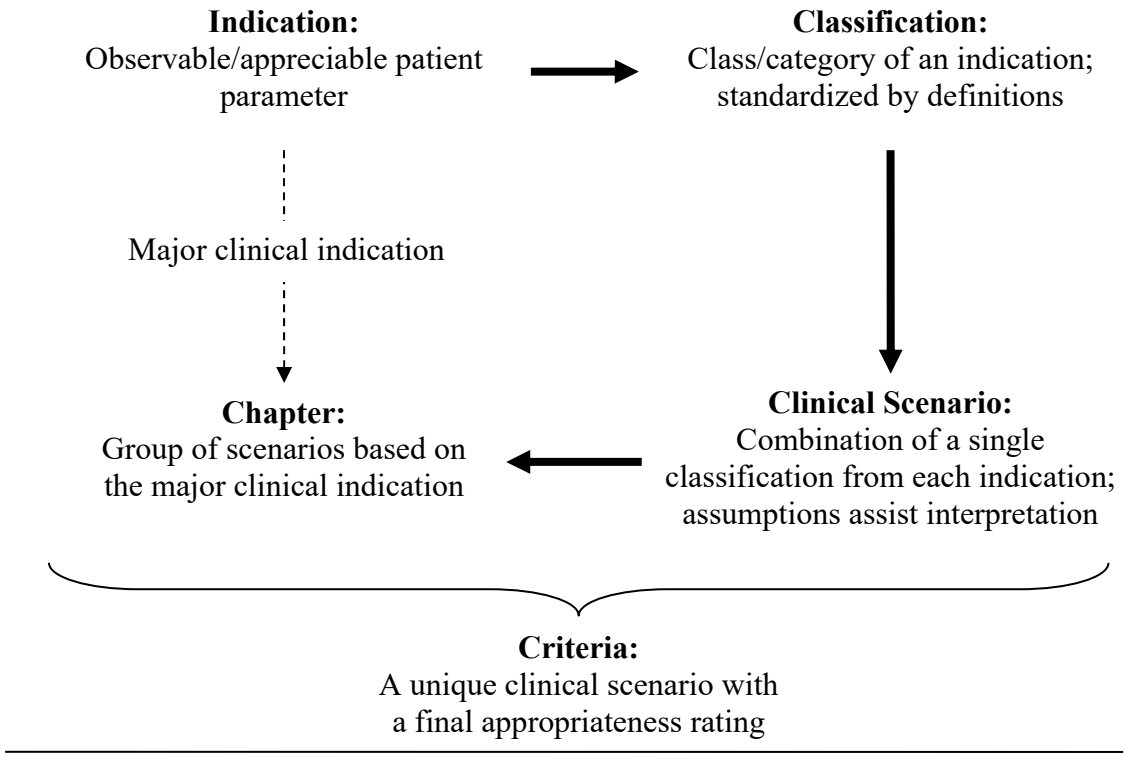
The writing panel developed the scenarios by categorizing patients in terms of indications evident during the clinical decision-making process. These scenarios relied upon definitions and general assumptions, mutually agreed upon by the writing panel during the development of the

scenarios. These definitions and assumptions were necessary to provide consistency in the interpretation of the clinical scenarios among experts voting 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 with high energy lower extremity trauma in clinical practice. Indications are most often parameters observable by the clinician, including symptoms or results of diagnostic tests. Additionally, "human factors" (e.g. activity level) or demographic variables can be considered.

FIGURE 1. DEVELOPING CRITERIA



Indications identified in clinical trials, derived from patient selection criteria, and/or included in AAOS Clinical Practice Guidelines[2] (https://www.orthoguidelines.org) 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 writing panel was given the opportunity to remove any scenarios that rarely occur in clinical practice but agreed that all scenarios were clinically

relevant. The major clinical decision-making indications chosen by the writing panel divided the matrix of clinical scenarios into chapters, as follows: extremity, bone injury, muscle injury, joint injury, soft tissue injury, contamination, and advanced/end stage comorbidities.

CREATING DEFINITIONS AND ASSUMPTIONS

The 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 the final list appears below in the "Patient Indications and Treatments" section of this document.

LITERATURE REVIEW

The Clinical Practice Guideline on Pharmacology, Physical, and Cognitive Pain Alleviation for Musculoskeletal Extremity/Pelvis Surgery, was used as the evidence base for this AUC (see here: http://www.orthoguidelines.org/guidelines). This guideline helped to inform the decisions of the writing panel and voting panel where available and necessary.

VOTING PANEL MODIFICATIONS TO WRITING PANEL DOCUMENT

At the start of the in-person voting panel meeting, the voting panel was reminded that they can amend the original writing panel materials if the amendments resulted in more clinically relevant and practical criteria. To amend the original materials, instructed voting 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 voting panel members voted "yes" to amend the original materials, the amendments were accepted.

DETERMINING APPROPRIATENESS

VOTING PANEL

As mentioned above, a multidisciplinary panel of clinicians was assembled to determine the appropriateness of treatments for the AUC. A non-voting moderator, who is an orthopaedic surgeon, but is not a specialist in the diagnosis or management of pain alleviation, moderated the

voting panel. The moderator was familiar with the methods and procedures of AAOS Appropriate Use Criteria and led the panel (as a non-voter) in discussions. Additionally, no member of the voting panel was involved in the development, i.e. writing panel, of the scenarios.

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

RATING APPROPRIATENESS

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

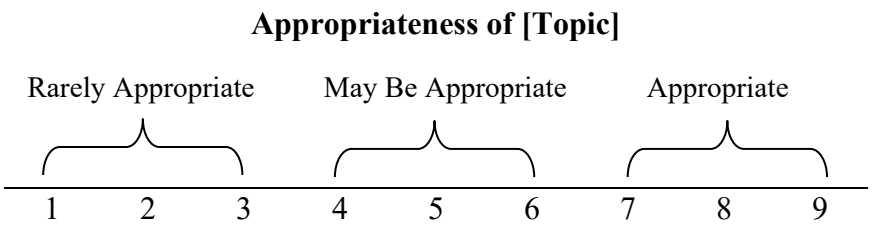
> "An appropriate procedural step for a patient with high energy lower extremity trauma is one for which the procedure **is** generally acceptable, i**s** a reasonable approach for the indication, and i**s** likely to improve the patient's health outcomes or survival."

The voting 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).

Each panelist uses the scale below to record their response for each scenario:



ROUND ONE VOTING

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

The second round of voting occurred after the voting panel meeting on Friday, September 11, 2020. Prior to the in-person meeting, each voting 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 voting. These personalized documents served as the basis for discussions of scenarios which resulted in disagreement.

During the discussion, the voting panel members were allowed to add or edit the assumptions list, patient indications, and/or treatments if clarification was needed. Voting 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 voting 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 Manual[1], for a panel of 8-10 voting members (see Figure 3 below). The 8-10 panel member disagreement cutoff was used for this voting 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). If there is still disagreement in the voting panel ratings after the last round of voting, that voting item is labeled as "5" regardless of median score. Agreement is defined as ≤ 2 panelists rated outside of the 3-point range containing the median.

FIGURE 3. DEFINING AGREEMENT AND DISAGREEMENT FOR APPROPRIATENESS RATINGS

	Disagreement	**Agreement**
Panel Size	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

Adapted from RAM[1]

The classifications in the table below determined final levels of appropriateness.

FIGURE 4. INTERPRETING FINAL RATINGS OF CRITERIA

Level of Appropriateness	**Description**
Appropriate	• Median panel rating between 7-9 and no disagreement
May Be Appropriate	• Median panel rating between 4-6 or • Median panel rating 1-9 with disagreement
Rarely Appropriate	• Median panel rating between 1-3 and no disagreement

REVISION PLANS

These criteria represent a cross-sectional view of current methods for management of high energy lower extremity trauma and may become outdated as new evidence becomes available or clinical decision-making indicators are improved. In accordance with the standards of the National Guideline Clearinghouse, 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 [http://www.aaos.org/auc]. 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 the *AAOS Now* and the Journal of the American Academy of Orthopaedic Surgeons (JAAOS). In addition, the Academy's Annual Meeting showcases the AUCs on Academy Row and at Scientific Exhibits.

The dissemination efforts of AUC include web-based mobile applications, webinars, and online modules for the Orthopaedic Knowledge Online website, radio media tours, and media briefings. In addition, AUCs are also promoted in relevant Continuing Medical Education (CME) courses and distributed at the AAOS Resource Center.

Other dissemination efforts outside of the AAOS include submitting AUCs to the National Guideline Clearinghouse and to other medical specialty societies' meetings.

PATIENT ASSUMPTION AND EXLUSIONS

Assumptions:

1. Adult patients (>17) with musculoskeletal injuries to the extremity and/or pelvis
   As necessary, clinicians can and should consult with the appropriate specialty teams for medical treatment or procedural intervention.

Exclusions:

1. Pathologic, musculoskeletal tumors fracture
2. Patients with hands, spine, rib, toes and forefoot injuries
3. Patients taking daily opioids regularly (as prescribed and/or illicit) for more than 3 mos.- CDC
   Long-term opioid therapy is defined as use of opioids on most days for >3 months.
4. Patients with a history of substance use disorder.

Definitions:

Pain is the unpleasant thoughts, emotions, and behaviors that can accompany nociception.
"Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage"- International Association for the Study of Pain (IASP)

Substance use disorder- The persistent use of drugs (including alcohol) despite substantial adverse consequences

INDICATIONS

PATIENT INDICATIONS

Body Location

1. Upper Extremity
2. Lower Extremity/Pelvis

Injury Severity/Type

1. Minor/Moderate (hover examples: ACL reconstruction, rotator cuff surgery, knee arthroscopy, metacarpal injury, etc.)
2. Major (hover examples: femur shaft fracture, tibia shaft, limb threatening injuries, polytrauma etc.)

Pain Intensity

1. None/Mild
2. Moderate
3. Severe

Magnitude of Limitation

1. Minor/Moderate (patients independent/advance in exercise)
2. Major (patients slow to mobilize)

Degree of Energy/Polytrauma

1. Low Energy (ex. fragility pubic ramus fracture)

High Energy (ex. patients in MVC with multiple fractures)

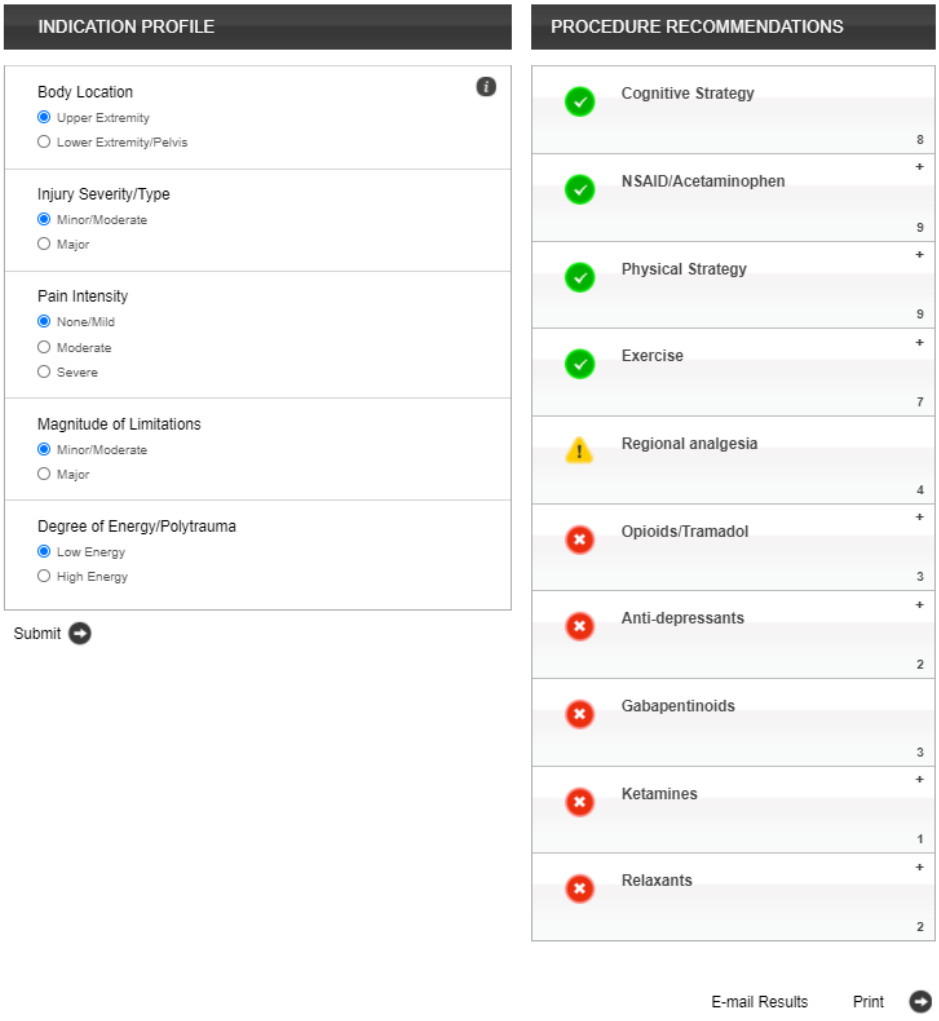
NEXT STEPS (APPROPRIATE, MAYBE APPROPRIATE, OR RARELY APPROPRIATE):

1. Cognitive Strategy (Virtual reality, mirror therapy, music, aromatherapy, meditation, education, etc.)
2. Opioids/Tramadol
3. Anti-depressants
4. NSAID/Acetaminophen
5. Gabapentinoids
6. Ketamine
7. Relaxants (Diazepam, Baclofen, etc.)
8. Physical Strategy (Cryotherapy (topical, compression, etc.) ice, heat, TENS, acupuncture, message, etc.)
9. Regional analgesia (Field block, peripheral nerve/plexus blocks, single injection, catheter, etc.)
10. Exercise (e.g. guided exercise, independent exercise, physical therapy, occupational therapy)

III. RESULTS OF 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



RESULTS:

The following Appropriate Use Criteria tables contain the final appropriateness ratings assigned by the members of the voting panel. Patient characteristics are found under the column titled "Scenario". 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 voting panel, respectively.

Out of 480 total voting items, 253 (53%) voting items were rated as "Appropriate", 146 (30%) voting items were rated as "May Be Appropriate", and 81 (17%) voting items were rated as "Rarely Appropriate" (Figure 5). Additionally, the voting panel members were in statistical agreement on 250 (52%) voting items with no statistical disagreement on any voting items (Figure 6).

FIGURE 5. BREAKDOWN OF APPROPRIATENESS RATINGS

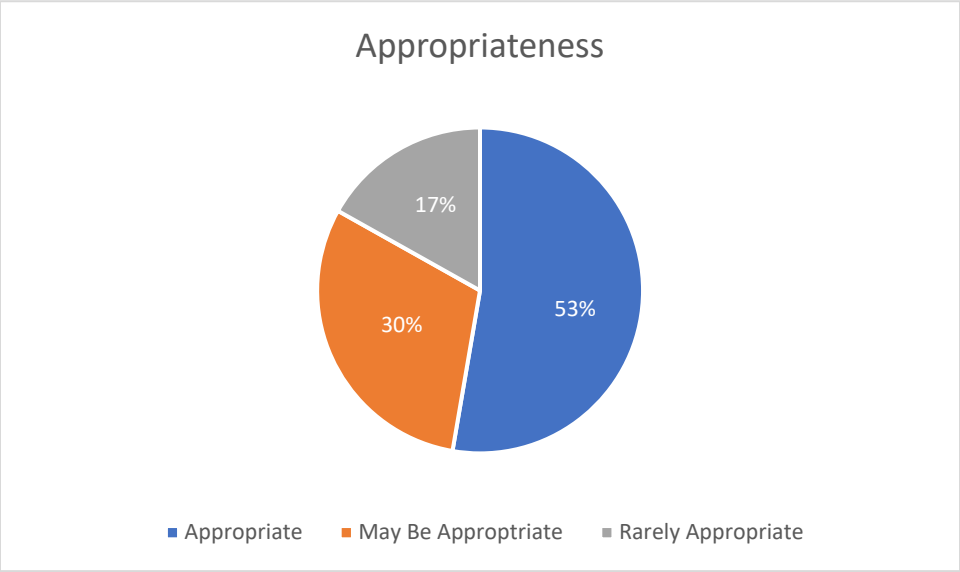


FIGURE 6. BREAKDOWN OF AGREEMENT AMONGST VOTING PANEL

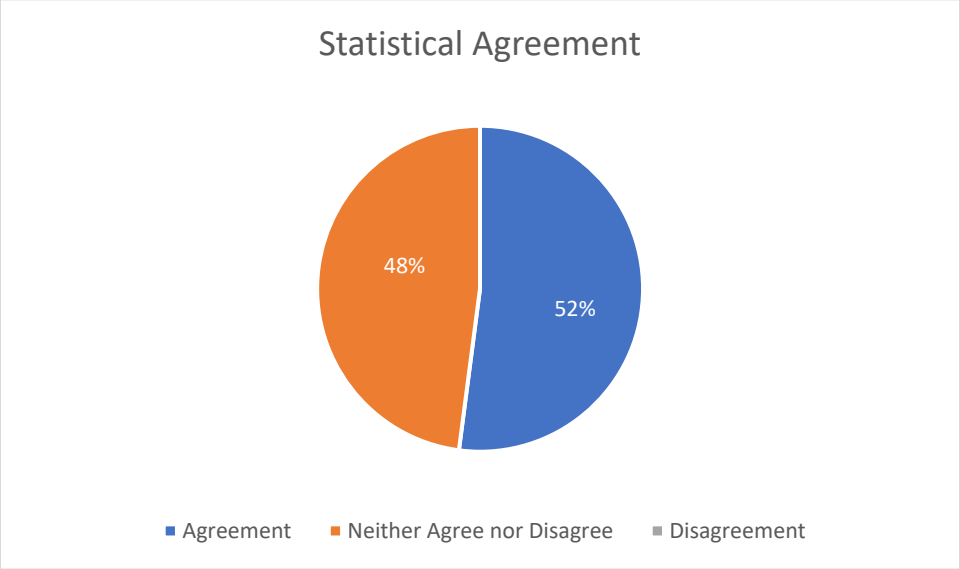
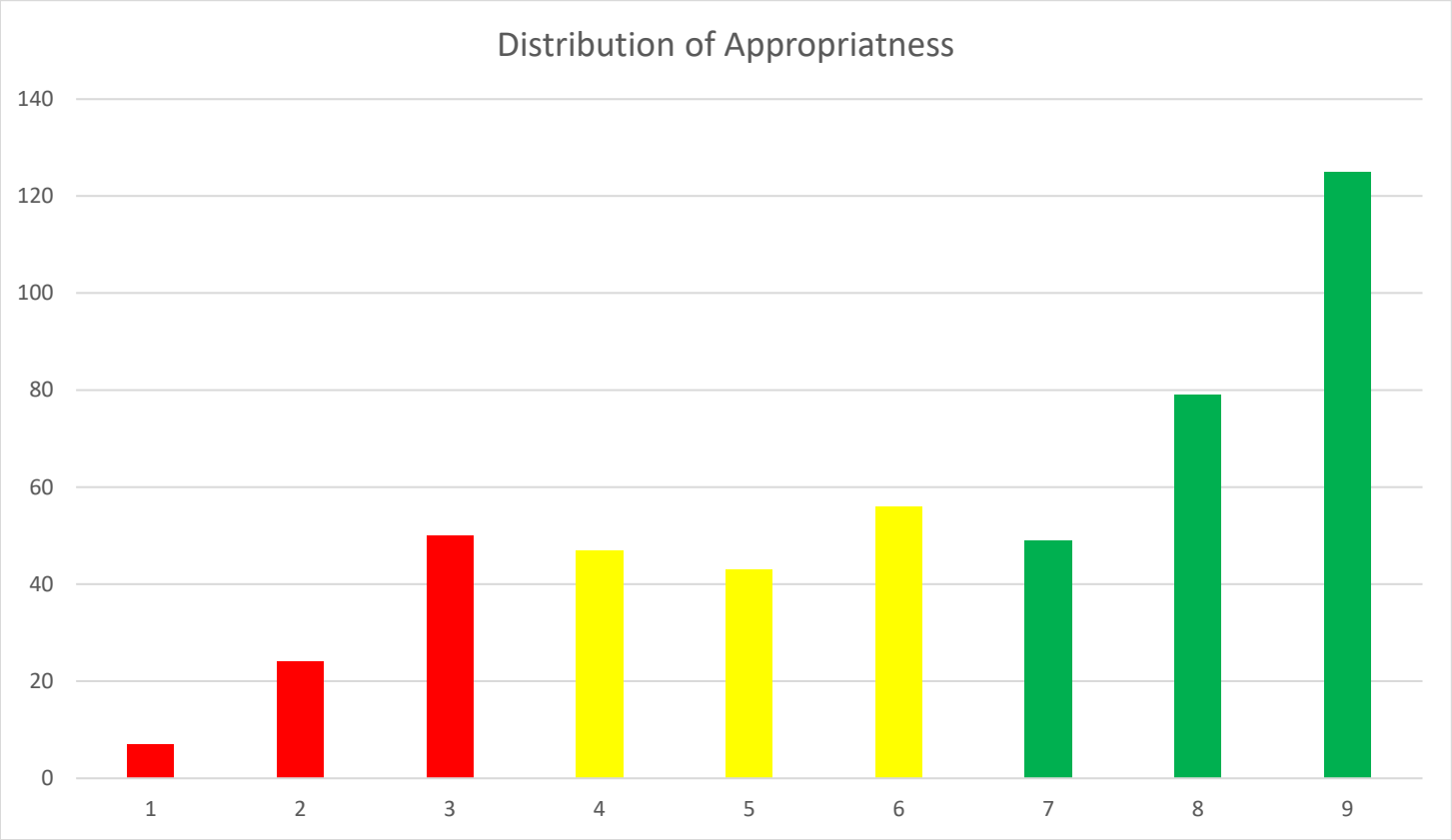


FIGURE 7. DISTRIBUTION OF APPROPRIATENESS ON 9-POINT RATING SCALE



APPROPRIATENESS RATINGS BY PATIENT SCENARIO

Interpreting the AUC tables:

- Each procedure contains the appropriateness (i.e. appropriate, may be appropriate, or rarely appropriate) for each patient scenario, followed by the median panel rating, and the panel's agreement represented by "+", in parentheses.

Scenario 1:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, None/Mild, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8)
	Opioids/Tramadol	Rarely Appropriate (3, +)
	Anti-depressants	Rarely Appropriate (2, +)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Rarely Appropriate (3)
	Ketamine	Rarely Appropriate (1, +)
	Relaxants	Rarely Appropriate (2, +)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (4)
	Exercise	Appropriate (7, +)
Scenario 2:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, None/Mild, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	Rarely Appropriate (2, +)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Rarely Appropriate (3)
	Ketamine	Rarely Appropriate (2, +)
	Relaxants	Rarely Appropriate (2, +)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (4)
	Exercise	Appropriate (7, +)
Scenario 3:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, None/Mild, Major, Low Energy	Cognitive Strategy	Appropriate (9, +)
	Opioids/Tramadol	Rarely Appropriate (3, +)
	Anti-depressants	Rarely Appropriate (3, +)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Rarely Appropriate (3, +)
	Ketamine	Rarely Appropriate (1, +)
	Relaxants	Rarely Appropriate (2, +)
	Physical Strategy	Appropriate (9, +)

	Regional anesthesia	May Be Appropriate (4)
	Exercise	Appropriate (7, +)
Scenario 4:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, None/Mild, Major, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	Rarely Appropriate (3)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (5)
	Ketamine	Rarely Appropriate (2, +)
	Relaxants	Rarely Appropriate (2)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (6)
	Exercise	Appropriate (7)
Scenario 5:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, Moderate, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (5)
	Anti-depressants	Rarely Appropriate (3)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (5)
	Ketamine	Rarely Appropriate (2, +)
	Relaxants	Rarely Appropriate (3, +)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (5)
	Exercise	Appropriate (8, +)
Scenario 6:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, Moderate, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (5)
	Anti-depressants	May Be Appropriate (4)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (6)
	Ketamine	Rarely Appropriate (3)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (5)
	Exercise	Appropriate (8, +)
Scenario 7:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, Moderate, Major, Low Energy	Cognitive Strategy	Appropriate (8, +)

	Opioids/Tramadol	May Be Appropriate (5)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (6)
	Ketamine	May Be Appropriate (4)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (6)
	Exercise	Appropriate (8, +)
Scenario 8:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, Moderate, Major, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (5)
	Anti-depressants	May Be Appropriate (4)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (6)
	Ketamine	May Be Appropriate (4)
	Relaxants	Rarely Appropriate (3)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (7)
	Exercise	Appropriate (8)
Scenario 9:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, Severe, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (5)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (7, +)
	Exercise	Appropriate (8, +)
Scenario 10:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, Severe, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (8, +)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	May Be Appropriate (6)

	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8)
	Exercise	Appropriate (8, +)
Scenario 11:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, Severe, Major, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	May Be Appropriate (6)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (7, +)
	Exercise	Appropriate (9, +)
Scenario 12:	**Treatment**	**Appropriate Rating**
Upper Extremity, Minor/Moderate, Severe, Major, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (8, +)
	Anti-depressants	Appropriate (7)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (7, +)
	Exercise	Appropriate (9, +)
Scenario 13:	**Treatment**	**Appropriate Rating**
Upper Extremity, Major, None/Mild, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	Rarely Appropriate (3)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (4)
	Ketamine	Rarely Appropriate (2, +)
	Relaxants	Rarely Appropriate (2)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (4)
	Exercise	Appropriate (8, +)
Scenario 14:	**Treatment**	**Appropriate Rating**

Upper Extremity, Major, None/Mild, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	Rarely Appropriate (3)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (4)
	Ketamine	Rarely Appropriate (2)
	Relaxants	Rarely Appropriate (2)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (5)
	Exercise	Appropriate (9, +)
Scenario 15:	**Treatment**	**Appropriate Rating**
Upper Extremity, Major, None/Mild, Major, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	May Be Appropriate (4)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Rarely Appropriate (3)
	Ketamine	Rarely Appropriate (2, +)
	Relaxants	Rarely Appropriate (2)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (5)
	Exercise	Appropriate (9, +)
Scenario 16:	**Treatment**	**Appropriate Rating**
Upper Extremity, Major, None/Mild, Major, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	May Be Appropriate (4)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (5)
	Ketamine	Rarely Appropriate (2)
	Relaxants	Rarely Appropriate (3, +)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (4)
	Exercise	Appropriate (8, +)
Scenario 17:	**Treatment**	**Appropriate Rating**
Upper Extremity, Major, Moderate, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (6)
	Anti-depressants	Rarely Appropriate (3)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (5)

	Ketamine	May Be Appropriate (4)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (6)
	Exercise	Appropriate (8, +)
Scenario 18:	**Treatment**	**Appropriate Rating**
Upper Extremity, Major, Moderate, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (9, +)
	Opioids/Tramadol	May Be Appropriate (6)
	Anti-depressants	May Be Appropriate (5, +)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (5)
	Ketamine	Rarely Appropriate (3)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (6)
	Exercise	Appropriate (8, +)
Scenario 19:	**Treatment**	**Appropriate Rating**
Upper Extremity, Major, Moderate, Major, Low Energy	Cognitive Strategy	Appropriate (9, +)
	Opioids/Tramadol	May Be Appropriate (6)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (5)
	Ketamine	Rarely Appropriate (3)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (7)
	Exercise	Appropriate (8)
Scenario 20:	**Treatment**	**Appropriate Rating**
Upper Extremity, Major, Moderate, Major, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (6)
	Ketamine	May Be Appropriate (4)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (7)
	Exercise	Appropriate (9, +)
Scenario 21:	**Treatment**	**Appropriate Rating**

Upper Extremity, Major, Severe, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7, +)
	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8, +)
	Exercise	Appropriate (9, +)
Scenario 22:	**Treatment**	**Appropriate Rating**
Upper Extremity, Major, Severe, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (8, +)
	Anti-depressants	May Be Appropriate (6)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8, +)
	Exercise	Appropriate (9, +)
Scenario 23:	**Treatment**	**Appropriate Rating**
Upper Extremity, Major, Severe, Major, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	May Be Appropriate (6)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	Appropriate (7)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8, +)
	Exercise	Appropriate (9, +)
Scenario 24:	**Treatment**	**Appropriate Rating**
Upper Extremity, Major, Severe, Major, High Energy	Cognitive Strategy	Appropriate (9, +)
	Opioids/Tramadol	Appropriate (8, +)
	Anti-depressants	Appropriate (7)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7, +)

	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8, +)
	Exercise	Appropriate (9, +)
Scenario 25:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, None/Mild, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	Rarely Appropriate (3)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Rarely Appropriate (3)
	Ketamine	Rarely Appropriate (1, +)
	Relaxants	Rarely Appropriate (2)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Rarely Appropriate (3)
	Exercise	Appropriate (9, +)
Scenario 26:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, None/Mild, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	Rarely Appropriate (3, +)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Rarely Appropriate (3, +)
	Ketamine	Rarely Appropriate (1, +)
	Relaxants	Rarely Appropriate (2, +)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (4)
	Exercise	Appropriate (9, +)
Scenario 27:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, None/Mild, Major, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	Rarely Appropriate (3)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Rarely Appropriate (3)
	Ketamine	Rarely Appropriate (1, +)
	Relaxants	Rarely Appropriate (2, +)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Rarely Appropriate (3)

	Exercise	Appropriate (9, +)
Scenario 28:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, None/Mild, Major, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	May Be Appropriate (4)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (4)
	Ketamine	Rarely Appropriate (2)
	Relaxants	Rarely Appropriate (3)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (6)
	Exercise	Appropriate (9, +)
Scenario 29:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, Moderate, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (6)
	Anti-depressants	Rarely Appropriate (3)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (4)
	Ketamine	Rarely Appropriate (3)
	Relaxants	Rarely Appropriate (3)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (7)
	Exercise	Appropriate (8, +)
Scenario 30:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, Moderate, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (6)
	Anti-depressants	May Be Appropriate (4)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (5)
	Ketamine	May Be Appropriate (4)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (6)
	Exercise	Appropriate (9, +)
Scenario 31:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, Moderate, Major, Low Energy	Cognitive Strategy	Appropriate (8, +)

	Opioids/Tramadol	May Be Appropriate (6)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (5)
	Ketamine	May Be Appropriate (4)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (7)
	Exercise	Appropriate (8, +)
Scenario 32:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, Moderate, Major, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (6)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (6, +)
	Ketamine	Rarely Appropriate (3)
	Relaxants	Rarely Appropriate (3)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (5)
	Exercise	Appropriate (9, +)
Scenario 33:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, Severe, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (5)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (7)
	Exercise	Appropriate (8, +)
Scenario 34:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, Severe, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	Appropriate (7)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)

	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (5)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8, +)
	Exercise	Appropriate (9, +)
Scenario 35:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, Severe, Major, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	May Be Appropriate (6)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8, +)
	Exercise	Appropriate (9, +)
Scenario 36:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Minor/Moderate, Severe, Major, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	Appropriate (7)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	May Be Appropriate (6)
	Relaxants	Appropriate (7)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (7, +)
	Exercise	Appropriate (9, +)
Scenario 37:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, None/Mild, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	Rarely Appropriate (3)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (4)
	Ketamine	Rarely Appropriate (2, +)
	Relaxants	Rarely Appropriate (2)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (4)

	Exercise	Appropriate (8, +)
Scenario 38:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, None/Mild, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	Rarely Appropriate (3)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (4)
	Ketamine	Rarely Appropriate (2, +)
	Relaxants	Rarely Appropriate (2)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (5)
	Exercise	Appropriate (9, +)
Scenario 39:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, None/Mild, Major, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (5)
	Anti-depressants	May Be Appropriate (4)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (4)
	Ketamine	Rarely Appropriate (1)
	Relaxants	Rarely Appropriate (3, +)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (5)
	Exercise	Appropriate (8, +)
Scenario 40:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, None/Mild, Major, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Rarely Appropriate (3)
	Anti-depressants	May Be Appropriate (4)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (4)
	Ketamine	Rarely Appropriate (1)
	Relaxants	Rarely Appropriate (3)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (4)
	Exercise	Appropriate (9, +)
Scenario 41:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, Moderate, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (5)

	Anti-depressants	May Be Appropriate (4)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (4)
	Ketamine	Rarely Appropriate (3)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (5)
	Exercise	Appropriate (8, +)
Scenario 42:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, Moderate, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (6)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (5)
	Ketamine	May Be Appropriate (4)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (6)
	Exercise	Appropriate (9, +)
Scenario 43:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, Moderate, Major, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	May Be Appropriate (6)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (5)
	Ketamine	May Be Appropriate (4)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	May Be Appropriate (6)
	Exercise	Appropriate (8, +)
Scenario 44:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, Moderate, Major, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	May Be Appropriate (6)
	Ketamine	May Be Appropriate (4)
	Relaxants	May Be Appropriate (4)
	Physical Strategy	Appropriate (9, +)

	Regional anesthesia	May Be Appropriate (6)
	Exercise	Appropriate (8, +)
Scenario 45:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, Severe, Minor/Moderate, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	May Be Appropriate (5)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8)
	Exercise	Appropriate (9, +)
Scenario 46:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, Severe, Minor/Moderate, High Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	May Be Appropriate (5)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7, +)
	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8, +)
	Exercise	Appropriate (9, +)
Scenario 47:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, Severe, Major, Low Energy	Cognitive Strategy	Appropriate (8, +)
	Opioids/Tramadol	Appropriate (7, +)
	Anti-depressants	May Be Appropriate (6)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7)
	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8, +)
	Exercise	Appropriate (9, +)
Scenario 48:	**Treatment**	**Appropriate Rating**
Lower Extremity/Pelvis, Major, Severe, Major, High Energy	Cognitive Strategy	Appropriate (8, +)

	Opioids/Tramadol	Appropriate (8, +)
	Anti-depressants	May Be Appropriate (6)
	NSAID/Acetaminophen	Appropriate (9, +)
	Gabapentinoids	Appropriate (7, +)
	Ketamine	May Be Appropriate (6)
	Relaxants	May Be Appropriate (6)
	Physical Strategy	Appropriate (9, +)
	Regional anesthesia	Appropriate (8, +)
	Exercise	Appropriate (9, +)

IV. APPENDICES

APPENDIX A. DOCUMENTATION OF APPROVAL

AAOS BODIES THAT APPROVED THIS APPROPRIATE USE CRITERIA

Committee on Evidence-Based Quality and Value: Approved on April 17, 2021
The AAOS Committee on Evidence Based Quality and Value consists of 20 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 on April 30, 2021
To enhance the mission of the AAOS, the Council on Research and Quality 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 on July 19, 2021
The 16 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

Joseph R. Hsu, MD, FAAOS
Submitted on: 04/29/2019
Smith & Nephew: Paid presenter or speaker ($30,000) Number of Presentations: 3 Speaker bureau (Self)

David Ring, MD, FAAOS
Submitted on: 04/10/2019
AAOS: Board or committee member ($0) Chair, Patient Safety Committee (Self)
Clinical Orthopaedics and Related Research: Editorial or governing board ($5,000) (Self)
Journal of Orthopaedic Trauma: Editorial or governing board ($0) (Self)
Orthopaedic Trauma Association: Board or committee member ($0) Research Committee (Self)
Skeletal Dynamics: IP royalties ($10,000) Royalties for Elbow Device (Self)
Wright Medical Technology, Inc.: IP royalties ($5,000) Royalties for Elbow Plates (Self)

Renan C. Castillo, MD
Submitted on: 05/31/2019
(This individual reported nothing to disclose)

Anna Miller, MD
Submitted on: 04/30/2019
American College of Surgeons: Board or committee member ($0) Committee on Trauma (Self)
AONA: Other financial or material support ($2,000) course instructor (Self)
Association for the Advancement of Automotive Medicine: Board or committee member ($0) Board Member (Self)
Bonesupport: Research support ($0) Fortify study research support (Self)
Journal of Bone and Joint Surgery - American: Editorial or governing board ($0) Editorial Board (Self)
Journal of Orthopaedic Trauma: Editorial or governing board ($0) Editorial Board (Self)
Orthopaedic Trauma Association: Board or committee member; Board or committee member ($0) Research
Committee (Self)
Smith & Nephew: Other financial or material support ($500) N/A(Self)
Stryker: Other financial or material support ($500) N/A(Self)

Jeanne Patzkowski, MD
Submitted on: 05/03/2019
Arthroscopy Association of North America: Board or committee member ($0) Bylaws committee member (Self)
Society of Military Orthopaedic Surgeons: Board or committee member ($0)

Sandra Kopp, MD
Submitted on: 07/24/2019
(This individual reported nothing to disclose)

Michael Patzkowski, MD
Submitted on: 01/19/2019
(This individual reported nothing to disclose)

Kimberly Templeton, MD, FAAOS
Submitted on: 05/07/2019
Journal of Bone and Joint Surgery - American: Editorial or governing board ($0) Case Connector (Self)
USBJI: Board or committee member ($0) AAOS representative (Self)

Thomas Myers, MD, FAAOS
Submitted on: 05/13/2019
Journal of Arthroplasty: Editorial or governing board ($0) editorial board (Self)

VOTING PANEL MEMBER DISCLOSURES

Wilford Gibson, MD, FAAOS
Submitted on: 10/04/2019
AAOS: Board or committee member; Board or committee member ($0) PAC executive committee (Self)
AAOS Now: Editorial or governing board ($0) Ex officio editorial board member (Self)

Nicholas Brown, MD
Submitted on: 01/17/2020
DePuy, A Johnson & Johnson Company: Other financial or material support ($9,000) Teaching (Self)

Deanna Boyette, MD, FAAOS
Submitted on: 02/10/2020
(This individual reported nothing to disclose)

Asokumar Buvanendran, MD
Submitted on: 01/26/2020
American Society of Regional Anesthesia and Pain Medicine: Board or committee member ($0)
Anesthesia & Analgesia Regional Anesthesia and Pain Medicine: Editorial or governing board ($0)

Nabil Elkassabany, MD
Submitted on: 03/19/2020
American Society of Regional Anesthesia and Pain Medicine: Board or committee member ($0)
Foundry Therapeutics: Paid consultant ($0)

Jason Strelzow, MD
Submitted on: 02/10/2020
Acumed, LLC: Paid presenter or speaker ($1,500) Number of Presentations: 3 N/A(Self)
Acumed, LLC: Paid consultant ($3,500) N/A(Self)
American Society for Surgery of the Hand: Board or committee member ($0) N/A(Self)
Journal of Hand Surgery - American: Editorial or governing board ($0) N/A(Self)
Orthopaedic Trauma Association: Board or committee member ($0) N/A(Self)
Stryker: Other financial or material support ($300) N/A(Self)
Synthes: Paid consultant ($3,500) N/A(Self)

Ryan Harrison, MD, FAAOS
Submitted on: 01/16/2020
AAOS: Board or committee member ($0)
Orthopaedic Trauma Association: Board or committee member ($0)

Lucas McDonald, MD, MPH, FAAOS
Submitted on: 01/31/2020
AAOS: Board or committee member ($0) Sports Medicine Evaluation Committee Member (Self)
Arthroscopy: Editorial or governing board ($0) Editorial Board Member (Self)
Arthroscopy Association of North America: Board or committee member ($0) Membership Committee Member (Self)
Eli Lilly: Stock or stock Options Number of Shares: 200 Stock (Self)
Johnson & Johnson: Stock or stock Options Number of Shares: 400 Stock (Self)
Norvartis: Stock or stock Options Number of Shares: 400 Stock (Family)
Nycomed: Stock or stock Options Number of Shares: 200 Stock (Self)

Society of Military Orthopaedic Surgeons: Board or committee member ($0) Education Committee Member (Self)
Zimmer: Stock or stock Options Number of Shares: 200 Stock (Self)

Daniel G Kang, MD, FAAOS
Submitted on: 10/05/2019
American Orthopaedic Association: Board or committee member ($0)
Scoliosis Research Society: Board or committee member ($0)
The Spine Journal: Editorial or governing board ($0)

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. Clinical Practice Guideline on Pharmacologic, Physical, and cognitive Pain Alleviation for Musculoskeletal Extremity/Pelvis Surgery. https://www.aaos.org/metrcdod/. Publication Pending

3. Sardana, V., Burzynski, J. M., Scuderi, G. R. Adductor Canal Block or Local Infiltrate Analgesia for Pain Control After Total Knee Arthroplasty? A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *J Arthroplasty* 2019; 1: 183-189

4. Hojer Karlsen, A. P., Geisler, A., Petersen, P. L., Mathiesen, O., Dahl, J. B. Postoperative pain treatment after total hip arthroplasty: a systematic review. *Pain* 2015; 1: 8-30

5. Derry, S., Cooper, T. E., Phillips, T. Single fixed-dose oral dexketoprofen plus tramadol for acute postoperative pain in adults. *Cochrane Database Syst Rev* 2016; 0: Cd012232

LETTERS OF ENDORSEMENT FROM ORGANIZATIONS

SOMOS
Society of Military Orthopaedic Surgeons

August 3, 2021

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

Dear Ms. Sevarino,

The Society of Military Orthopaedic Surgeons endorses the AAOS Appropriate Use Criteria for Pharmacologic, Physical, and Cognitive Pain Alleviation for Musculoskeletal Extremity/Pelvis Surgery. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this appropriate use criteria and reprint our logo in the introductory section of the appropriate use criteria review document.

Sincerely,

Jonathan F. Dickens

Jonathan F. Dickens, MD
President
Society of Military Orthopaedic Surgeons

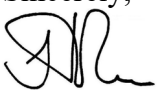
Orthopaedic Trauma Association
Education ▪ Research ▪ Advocacy
9400 W. Higgins Road, Suite 305, Rosemont, IL 60018-4975
Phone: (847) 698-1631 ▪ www.ota.org ▪ OTA@ota.org

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

Dear Ms. Sevarino,

The OTA has voted to endorse the AAOS Clinical Practice Guideline for Pharmacologic, Physical, and Cognitive Pain Alleviation for Musculoskeletal Extremity/Pelvis Surgery. This endorsement implies permission for the AAOS to officially list our organization as an endorser of this appropriate use criteria and reprint our logo in the introductory section of the appropriate use criteria review document.

Sincerely,



Heather A. Vallier, MD
OTS President