

Non-Arthroplasty Treatment of Osteoarthritis of the Knee

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These appropriate use criteria were approved by the American Academy of Orthopaedic Surgeons on December 6, 2013.

The complete *Appropriate Use Criteria for Non-Arthroplasty Treatment of Osteoarthritis of the Knee* includes all tables, figures, and appendices, and is available at http://www.aaos.org/research/Appropriate_Use/oakaucfull.pdf. The OAK AUC content is also available in a web-based mobile app and can be accessed at the following address: www.aaos.org/aucapp.

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Abstract

The American Academy of Orthopaedic Surgeons has developed an Appropriate Use Criteria (AUC) on the Non-Arthroplasty Treatment of Osteoarthritis of the Knee (OAK). Evidence-based information, in conjunction with clinical expertise of physicians, was used to develop the criteria to improve patient care and obtain best outcomes while considering the subtleties and distinctions necessary in making clinical decisions. The OAK AUC clinical scenarios were derived from patient indications that generally accompany OAK as well as from the current evidence-based clinical practice guidelines and its supporting literature. The 576 patient scenarios and 10 treatments were developed by the Writing Panel, a group of clinicians who are specialists in this AUC topic. Next, the Review Panel, a separate group of volunteer physicians, independently reviewed these materials to ensure that they were representative of patient scenarios clinicians are likely to encounter in daily practice. Finally, the multidisciplinary Voting Panel (made up of specialists and nonspecialists) rated the appropriateness of treatment of each patient scenario using a 9-point scale to designate a treatment as Appropriate (median rating, 7 to 9), May Be Appropriate (median rating, 4 to 6), or Rarely Appropriate (median rating, 1 to 3). The final appropriateness ratings assigned by the voting panel can be accessed online via the AAOS OAK AUC web-based mobile application at: www.aaos.org/aucapp.

Overview and Rationale

This Appropriate Use Criteria (AUC) was approved by the American Academy of Orthopaedic Surgeons (AAOS) Board of Directors on December 6, 2013. The purpose of the AUC is to help determine the appropriateness of treatments of the heterogeneous patient population routinely seen in practice. The best available scientific evidence is synthesized with collective expert opinion on topics for which gold standard randomized clinical trials are not available or are inadequately detailed for identifying distinct patient types. AAOS staff convened

three independent volunteer clinician panels that developed this AUC.

Musculoskeletal care is provided in many settings by different providers. AAOS created this AUC as an educational tool to guide qualified physicians through a series of treatment decisions in an effort to improve the quality and efficiency of care. 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 all appropriately trained surgeons and all qualified physicians managing patients under

Table 1

Indications and Classifications

Indications	Classifications
Function-limiting pain	Function-limiting pain at moderate to long distances: walking moderate to long distances greater than one-quarter mile Function-limiting pain at short distances: limiting activity to two city blocks, the equivalent of walking the length of a shopping mall Pain at rest or at night
Range of motion extension/flexion	Full range of extension/flexion Lack of full extension (>5° flexion contracture) and/or flexion <110°
Ligamentous instability (not to include antalgic giving way)	No ligamentous instability Ligamentous instability
Pattern of arthritic involvement (medial tibiofemoral, lateral tibiofemoral, or patellofemoral)	Predominantly one compartment More than one compartment
Imaging (joint space in most involved compartment)	Mild to moderate: joint space narrowing visible on imaging without complete loss of joint space Severe: complete loss of joint space
Limb alignment	Normal Varus/valgus and/or patellofemoral malalignment
Mechanical symptoms	Yes No
Age	Young Middle-aged Elderly

consideration for managing osteoarthritis of the knee (OAK). 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. The Non-Arthroplasty Treatment of Osteoarthritis of the Knee developed appropriateness treatment ratings for 576 patient scenarios. The OAK AUC can be accessed via a web-based mobile application at www.aaos.org/aucapp.

Potential Harms and Contraindications

Individuals with OAK often report joint pain, stiffness, and difficulty with purposeful movement. The aim of treatment is to provide pain relief and improve the patient's functioning. Most interventions are associated with some potential for adverse outcomes, especially if invasive or operative. Contraindications

vary widely by procedure. Reducing risks improves treatment efficacy and is accomplished through collaboration between patient and physician.¹

Methods

The AAOS uses the RAND/UCLA Appropriateness Method² to develop AUCs. The process includes the following steps:

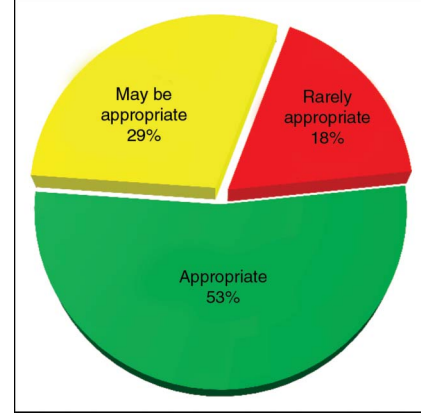
Non-Arthroplasty Treatment of Osteoarthritis of the Knee AUC Writing Panel: David F. Dalury, MD, Craig J. Della Valle, MD, Mark I. Ellen, MD, Eric P. Gall, MD, MACP, MACR, Brian J. McGrory, MD, Jennifer Stevens-Lapsley, PT, PhD, and AJ Yates, Jr, MD. *Review Panel:* Miguel A. Ayerza, MD, PhD, Santiago de Solo, MD, Robin Dore, MD, G. Kelley Fitzgerald, PT, PhD, FAPTA, E. Robert Harris, MD, Richard Haynes, MD, William M. Jones, MD, Jeffrey Katz, MD, Kent Kwok, MD, Amanda Nelson, MD, Lee Rosenzweig, PT, DPT, CHT, James A. Shaw, MD, Jasvinder Singh, MD, Mark Spangehl, MD, Audrey Tsao, MD, and Joseph Zeni, PT, PhD. *Voting Panel:* Joel Block, MD, Pablo Castaneda, MD, Dennis Chin, MD, T. Derek V. Cooke, MA, MB, BChir, FRCS(C), Charles M. Davis III, MD, PhD, Yvonne Golightly, PT, MS, PhD, T. David Hayes, MD, Kenneth Jaffe, MD, Nancy E. Lane, MD, Brian McCardel, MD, Arvind D. Nana, MD, MBA, Harold W. Rees, MD, Peter F. Sharkey, MD, Terence W. Starz, MD, Kimberly Templeton, MD, and Kevin R. Vincent, MD, PhD. *Moderators:* James O. Sanders, MD, and Michael Heggeness, MD. *AAOS Staff:* Deborah S. Cummins, PhD, Jayson Murray, MA, Ryan Pezold, MA, Patrick Donnelly, MA, Anne Woznica, MLS, Leeaht Gross, MPH, and Yasseline Martinez.

Table 2

Appropriate Non-Arthroplasty Treatments of Osteoarthritis of the Knee

- Self-management programs, including lower extremity and core strengthening, low-impact aerobic exercises, and engaging in physical activity consistent with national guidelines, along with patient education about activity modification and the variable progression of the disease
- Prescribed physical therapy, which may include range-of-motion, strengthening, and aerobic exercise programs; appropriate use of ambulatory aids; neuromuscular education; and other common modalities
- Hinged knee brace and/or unloading brace (varus or valgus)
- Nonsteroidal anti-inflammatory drugs (oral or topical)
- Narcotic medicine for refractory pain (oral or transcutaneous opioids): monitored, intermittent, or low dose in conjunction with other therapies
- Tramadol
- Acetaminophen
- Intra-articular corticosteroids
- Arthroscopic partial meniscectomy or loose body removal
- Realignment osteotomy

Figure 1



Summary of appropriateness ratings of the Non-Arthroplasty Treatment of Osteoarthritis of the Knee Appropriate Use Criteria.

1. Constructing a writing panel consisting of 6 to 10 clinicians who are experts in the topic under study to create a list of patient indications, assumptions, and treatments based on an evidence-based systematic review of the literature conducted by AAOS staff research analysts;
2. Constructing a review panel consisting of 10 to 30 clinicians to review the writing panel's materials and provide any suggestions for improvement;
3. Constructing a multidisciplinary voting panel who uses a review of the most current and relevant literature along with their expert clinical judgment to rate the appropriateness of treatment of various patient scenarios.

General assumptions were developed by the OAK AUC panel members to clarify the interpretation of the patient scenarios and provide standardization for the parameters used to rate the appropriateness of treatment. This AUC was approved by the Appropriate Use Criteria Section of the Committee on Evidence-Based Quality and Value, the Council

on Research and Quality, and the AAOS Board of Directors. All tables, figures, and appendices, as well as the details of the methods used to prepare this AUC, are detailed in the full AUC, which is available at www.aaos.org/auc.

OAK AUC Patient Indications and Classifications

Table 1 provides the list of patient indications and classifications developed by the OAK AUC Writing Panel. Definitions of the patient indication classifications are indicated below.

OAK AUC Covered Treatments

Table 2 provides treatments rated for appropriateness in the non-arthroplasty management of OAK.

Results of Appropriateness Ratings

Out of 5,760 total voting items (ie, 576 patient scenarios and 10 treatments), 1,021 voting items (18%) were rated

as Rarely Appropriate, 1,698 voting items (29%) were rated as May Be Appropriate, and 3,041 voting items (53%) were rated as Appropriate (Figure 1). Additionally, the voting panel members were in agreement on 2,048 voting items (36%) and were in disagreement on 184 voting items (3%). There were three treatments about which the voting panel had at least one disagreement: Hinged Knee Brace and/or Unloading Brace (73/576 within treatment voting items with disagreement), Arthroscopic Partial Meniscectomy or Loose Body Removal (95/576 within treatment voting items with disagreement), and Realignment Osteotomy (16/576 within treatment voting items with disagreement). The final appropriateness ratings assigned by the voting panel can be accessed online via the AAOS OAK AUC web-based mobile application at: www.aaos.org/aucapp.

AUC Mobile Application

As part of the dissemination efforts for the OAK AUC, a web-based mobile application has been developed to provide physicians with immediate access to information to assist them

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Figure 2

Indication Profile	Treatment Recommendations
Function-Limiting Pain i <input checked="" type="radio"/> Function-Limiting Pain at Moderate to Long Distances <input type="radio"/> Function-Limiting Pain at Short Distances <input type="radio"/> Pain at Rest or Night	<input checked="" type="checkbox"/> + Self-Management Programs 9
Range of Motion Extension/Flexion <input checked="" type="radio"/> Full Range of Extension/ Flexion <input type="radio"/> Lack of Full Extension (> 5 degree flexion contracture) and/or Flexion (< 110 degrees)	<input checked="" type="checkbox"/> + Prescribed Physical Therapy 7
Ligamentous Instability (not to include antalgic giving way) <input checked="" type="radio"/> No Ligamentous Instability <input type="radio"/> Ligamentous Instability	<input checked="" type="checkbox"/> + Nonsteroidal anti-inflammatory drugs 8
Pattern of Arthritic Involvement <input type="radio"/> Arthritic Involvement Predominantly in One Compartment <input checked="" type="radio"/> Arthritic Involvement in More than One Compartment	<input checked="" type="checkbox"/> Acetaminophen 7
Imaging (joint space most involved compartment) <input type="radio"/> Mild to Moderate Joint Space Narrowing <input checked="" type="radio"/> Severe Joint Space Narrowing	<input type="checkbox"/> Hinged Knee Brace and/or Unloading Brace 5
Limb Alignment <input type="radio"/> Limb Alignment - No Varus/Valgus/Patellofemoral Deformity <input checked="" type="radio"/> Limb Alignment - Varus/Valgus and/or Patellofemoral mal-alignment	<input type="checkbox"/> Intraarticular Corticosteroids 6
Mechanical Symptoms Compatible with Meniscal Tear or Loose Body? <input checked="" type="radio"/> Mechanical Symptoms Present <input type="radio"/> Mechanical Symptoms Absent	<input type="checkbox"/> Arthroscopic Partial Meniscectomy or Loose Body Removal 5
Age <input checked="" type="radio"/> Young <input type="radio"/> Middle-Aged <input type="radio"/> Elderly	<input checked="" type="checkbox"/> Realignment Osteotomy 3
Submit ➔	Print ➔

Screen shot of the Appropriate Use Criteria mobile app for Non-Arthroplasty Treatment of Osteoarthritis of the Knee.

with providing evidence-based patient care. The mobile application includes the list of patient indications and treatment recommendations. Once the clinician enters in a patient indi-

cation profile, a list of treatment recommendations is provided. For the selected patient profile, green circled checkmarks reflect appropriate treatments, yellow caution symbols reflect

treatments that may be appropriate, and red circled X's reflect treatments that are rarely appropriate (Figure 2). The app also includes a demonstration ("tour"), definitions, background

information, assumptions, a literature review, and a list of contributors. The AAOS OAK AUC web-based mobile application is available at www.aaos.org/aucapp.

References

1. American Academy of Orthopaedic Surgeons: *The Burden of Musculoskeletal Diseases in the United States*. Rosemont, IL, American Academy of Orthopaedic Surgeons, 2008.
2. Fitch K, Bernstein SJ, Aguilar MD, et al: *The RAND/UCLA Appropriateness Method User's Manual*. Santa Monica, CA, RAND Corporation, 2001.