Management of Osteoarthritis of the Hip: Evidence-Based Clinical Practice Guideline

Adopted by the American Academy of Orthopaedic Surgeons (AAOS) Board of Directors
March 13, 2017
The American Academy of Orthopaedic Surgeons
2017 Clinical Practice Guideline
on the Management of Osteoarthritis of the Hip

Greg Polkowski, MD; Norman Johanson, MD; Mark Barba, MD; John C. Grady-Benson, MD; Theodore Toan Le, MD; Harold Rees, MD; Ralph T. Salvagno, MD; Richard Schultz, MD; James Browne, MD; Courtland G. Lewis, MD; Albert Song, MD; Joseph A. Zeni, PT, PhD; David Podewszwa, MD; Ira Zaltz, MD; Robert H Quinn, MD; Atul F. Kamath, MD; Greg McComis, MD. AAOS Staff: William O. Shaffer, MD; Deborah Cummins, PhD; Jayson N. Murray, MA; Nilay Patel, MA; Patrick Donnelly, MA; Nicole Nelson, MPH; Mary DeMars; Yasseline Martinez; Kaitlyn Sevarino, MBA; Anne Woznica, MLIS, AHIP; Peter Shores, MPH; Yupei Chen
WHAT IS A CLINICAL PRACTICE GUIDELINE?

Clinical Practice Guideline

A clinical practice guideline is a series of recommendations created to inform clinicians of best practices, based on best available evidence.

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GOALS AND RATIONALE OF A CLINICAL PRACTICE GUIDELINE

- Improve treatment based on current best evidence
- Guides qualified physicians through treatment decisions to improve quality and efficiency of care
- Identify areas for future research

CPG recommendations are not meant to be fixed protocols; patients’ needs, local resources, and clinician independent medical judgement must be considered for any specific procedure or treatment.
Evidence-Based Medicine is a combination of:

- *Individual Clinical Experience*
- *Best External Evidence*
- *Patient Values and Expectations*
WHAT IS EVIDENCE-BASED MEDICINE?

Evidence-Based Medicine

Evidence-based medicine is the conscientious, explicit, and judicious use of current best evidence from clinical care research in the management of individual patients

Haynes, Sackett et al, 1996 Transferring evidence from research into practice
Sacket et al, 1996, BMJ EBM: what it is and isn’t
IOM STANDARDS FOR DEVELOPING TRUSTWORTHY GUIDELINES

- Establish Transparency
- Management of Conflict of Interest
- Guideline Development Group Composition
- Clinical Practice Guideline-Systematic Review Intersection
- Establish Evidence of Foundations for and Rating Strength of Recommendations
- Articulation of Recommendations
- External Review
- Updating
**CLINICAL PRACTICE GUIDELINE PROCESS FLOWCHART**

1. **Select CPG Topic**
2. **Assemble Work Group Members (WG)**
3. **WG formulates PICO questions, set inclusion criteria at Introductory Meeting**
4. **Literature Review and Appraisal**
   AAOS staff methodologists, in conjunction with work group (WG) members, review and appraise literature
5. **Final Meeting**
   WG meets in-person to:
   - Review quality appraisals and evidence tables
   - Assign grade/rating for each recommendation based on evidence
   - Develop final recommendations
   - Construct risk/harms statements
   - Define future research needs
6. **Review Periods**
   Peer Review and Public Comment review periods
7. **Approval Process**
8. **Communication, Dissemination, and Implementation**
FORMULATING PICOs

“P” = Patient Population

“I” = Intervention or variable of Interest

“C” = Comparison

“O” = Outcome
INCLUSION/EXCLUSION CRITERIA

**Standard inclusion criteria include:**
- Must study humans
- Must be published in English
- Must be published in or after 1966
- Can not be performed on cadavers

Work group members define additional exclusion criteria based on PICO question
LITERATURE SEARCHES

- Databases used:
  - PubMed
  - EMBASE (Excerpta Medica database)
  - CINAHL (Cumulative Index of Nursing and Allied Health Literature)
  - Cochrane Central Register of Controlled Trials

- Search using key terms from work group’s PICO questions and inclusion criteria

- Secondary manual search of the bibliographies of all retrieved publications for relevant citations

- Recalled articles evaluated for inclusion based on the study selection criteria
BEST EVIDENCE SYNTHESIS

- Include only highest quality evidence for any given outcome if available.
- If there are fewer than two occurrences of an outcome of this quality, the next lowest quality is considered until at least two occurrences have been acquired.
## STRENGTH OF RECOMMENDATIONS

<table>
<thead>
<tr>
<th>STRENGTH</th>
<th>OVERALL STRENGTH OF EVIDENCE</th>
<th>STRENGTH VISUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRONG</td>
<td>Two or more HIGH Strength Studies with consistent findings</td>
<td>🌟🌟🌟🌟🌟</td>
</tr>
<tr>
<td>MODERATE</td>
<td>1 HIGH OR 2 MODERATE strength studies with consistent findings</td>
<td>🌟🌟🌟🌟🌟</td>
</tr>
<tr>
<td>LIMITED</td>
<td>One or more LOW strength studies and/or only 1 MODERATE strength study with consistent findings or evidence from a single, or the evidence is insufficient, or conflicting</td>
<td>🌟🌟🌟🌟🌟</td>
</tr>
<tr>
<td>CONSENSUS</td>
<td>Expert opinion (no studies) No supporting evidence in the absence of reliable evidence. Work group is making a recommendation based on their clinical opinion</td>
<td>🌟🌟🌟🌟🌟</td>
</tr>
</tbody>
</table>

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## Translating Recommendations in a CPG

<table>
<thead>
<tr>
<th>Strength of Recommendation</th>
<th>Patient Counseling Time</th>
<th>Decision Aids</th>
<th>Impact of Future Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong</td>
<td>Least</td>
<td>Least important, unless the evidence supports no difference between two alternative interventions</td>
<td>Not likely to change</td>
</tr>
<tr>
<td>Moderate</td>
<td>Less</td>
<td>Less important</td>
<td>Less likely to change</td>
</tr>
<tr>
<td>Limited</td>
<td>More</td>
<td>More</td>
<td>Possible / Anticipates</td>
</tr>
<tr>
<td>Consensus</td>
<td>Most</td>
<td>Most Important</td>
<td>Impact unknown</td>
</tr>
</tbody>
</table>
ASSESSING QUALITY OF EVIDENCE

All included studies undergo a quality assessment.

Each study’s design is evaluated for risk of bias and receives a final quality grade, depending on the number of study design flaws.

Study quality tables are made available to the work group in the final data report and the final publication of the guideline/systematic review.
RESULTS OF QUALITY ASSESSMENT: STUDY ATTRITION FLOWCHART

30,010 abstracts reviewed. Primary search performed on April 15, 2016

1,879 articles recalled from abstract review

28,131 articles excluded from title and abstract review

1,782 articles excluded after full text review for not meeting the a priori inclusion criteria or not best evidence available

97 articles included after full text review and quality analysis
VOTING ON THE RECOMMENDATIONS

Recommendations and recommendation strengths voted on by work group during final meeting

Approved and adopted by simple majority (60%) when voting on every recommendation

If disagreement, further discussion to whether the disagreement could be resolved
## GUIDELINE LANGUAGE STEMS

<table>
<thead>
<tr>
<th>GUIDELINE LANGUAGE STEMS</th>
<th>STRENGTH OF RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong evidence supports that the practitioner should/should not do X, because...</td>
<td>STRONG</td>
</tr>
<tr>
<td>Moderate evidence supports that the practitioner could/could not do X, because...</td>
<td>MODERATE</td>
</tr>
<tr>
<td>Limited evidence supports that the practitioner might/might not do X, because...</td>
<td>LIMITED</td>
</tr>
<tr>
<td>In the absence of reliable evidence, it is in the opinion of this guideline work group that...</td>
<td>CONSENSUS</td>
</tr>
</tbody>
</table>
Guideline draft sent for peer review to external experts

Comments and draft of responses reviewed by work group members

Recommendation changes required a majority vote by work group

A detailed report of all resulting revisions is published with the guideline document
PUBLIC COMMENT

Following peer review modifications, CPG undergoes public commentary period

Comments are solicited from:

AAOS Board of Directors
AAOS Council on Research and Quality
AAOS Committee on Evidence-Based Quality and Value
AAOS Board of Councilors
AAOS Board of Specialty Societies

200 commentators have the opportunity to provide input
The work group is charged with:

- Review of data summaries
- Final recommendation language
- Rationale and risk/harm construction
- Future research
MANAGEMENT OF OSTEOARTHRITIS OF THE HIP
CLINICAL PRACTICE GUIDELINE OVERVIEW

- Based on a systematic review of published studies
- Addresses the management of Osteoarthritis of the Hip in adult patients 18 years of age and older.
- Highlights limitations in literature and areas requiring future research
- Trained physicians and surgeons are intended users

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RISK ASSESSMENT TOOLS

- Moderate strength evidence supports that the practitioner could use risk assessment tools to assist in predicting adverse events, assessing surgical risks and educating patients with symptomatic osteoarthritis of the hip undergoing total hip arthroplasty.

Strength of Recommendation: Moderate 🌟🌟🌟🌟
OBESITY (EARLY AND LATE SURGICAL OUTCOMES)

- Moderate strength evidence supports that obese patients with symptomatic osteoarthritis of the hip, when compared to non-obese patients, may achieve lower absolute outcome scores but a similar level of patient satisfaction and relative improvement in pain and function after total hip arthroplasty.

Strength of Recommendation: Moderate ★★★★☆
OBESITY (EARLY AND LATE SURGICAL OUTCOMES)

- Limited strength evidence supports that obese patients with symptomatic osteoarthritis of the hip, when compared to non-obese patients, have increased incidence of postoperative dislocation, superficial wound infection, and blood loss after total hip arthroplasty.

Strength of Recommendation: Limited ★★★★☆
AGE-ADVERSE EVENTS IN THA PATIENTS

• Moderate strength evidence supports that increased age is associated with lower functional and quality of life outcomes in patients with symptomatic osteoarthritis of the hip undergoing total hip arthroplasty.

Strength of Recommendation: Moderate ★★★★☆
AGE-ADVERSE EVENTS IN THA PATIENTS

• Limited strength evidence supports that increased age may be associated with a higher risk of mortality in patients with symptomatic osteoarthritis of the hip undergoing total hip arthroplasty.

Strength of Recommendation: Limited ★★★★☆
AGE-ADVERSE EVENTS IN THA PATIENTS

- Limited strength evidence supports that younger age may be associated with a higher risk of revision in patients with symptomatic osteoarthritis of the hip undergoing total hip arthroplasty.

Strength of Recommendation: Limited ★★★☆☆
MENTAL HEALTH DISORDER

- Moderate strength evidence supports that mental health disorders, such as depression, anxiety, and psychosis, are associated with decreased function, pain relief, and quality of life outcomes in patients with symptomatic osteoarthritis of the hip who undergo total hip arthroplasty (THA).

Strength of Recommendation: Moderate ★★★★☆
TOBACCO USE

- Limited strength evidence supports that patients who use tobacco products are at an increased risk for complications after total hip arthroplasty.

Strength of Recommendation: Limited
NON-NARCOTIC MANAGEMENT

- Strong evidence supports that NSAIDs improve short-term pain, function, or both in patients with symptomatic osteoarthritis of the hip.

Strength of Recommendation: Strong 🟢🟢🟢
GLUCOSAMINE SULFATE

- Moderate strength evidence does not support the use of glucosamine sulfate because it did not perform better than placebo for improving function, reducing stiffness and decreasing pain for patients with symptomatic osteoarthritis of the hip.

**Strength of Recommendation: Moderate**
INTRAARTICULAR INJECTABLES

- Strong evidence supports the use of intraarticular corticosteroids to improve function and reduce pain in the short-term for patients with symptomatic osteoarthritis of the hip.

Strength of Recommendation: Strong ★★★★★
INTRAARTICULAR INJECTABLES

- Strong evidence does not support the use of intraarticular hyaluronic acid because it does not perform better than placebo for function, stiffness, and pain in patients with symptomatic osteoarthritis of the hip.

Strength of Recommendation: Strong ★★★★★
PHYSICAL THERAPY-CONSERVATIVE

- Strong evidence supports the use of physical therapy as a treatment to improve function and reduce pain for patients with osteoarthritis of the hip and mild to moderate symptoms.

Strength of Recommendation: Strong ★★★★★
PREOPERATIVE/POSTOPERATIVE PHYSICAL THERAPY

- Limited evidence supports the use of pre-operative physical therapy to improve early function in patients with symptomatic osteoarthritis of the hip following total hip arthroplasty.

Strength of Recommendation: Limited ★★★★★
PREOPERATIVE/POSTOPERATIVE PHYSICAL THERAPY

- Moderate evidence supports the use of post-operative physical therapy because it could improve early function to a greater extent than no physical therapy management for patients with symptomatic osteoarthritis of the hip who have undergone total hip arthroplasty.

Strength of Recommendation: Moderate 🌟🌟🌟🌟
ANESTHETIC TYPES

- Limited evidence supports the use of neuraxial anesthesia compared to general anesthesia to reduce complications in patients with symptomatic osteoarthritis of the hip undergoing total hip arthroplasty.

Strength of Recommendation: Limited 🌟🌟🌟
TRANEXAMIC ACID

- Moderate strength evidence supports that the practitioner could use intravenous or topical tranexamic acid for patients with symptomatic osteoarthritis of the hip who are undergoing total hip arthroplasty (THA) as a part of the effort to reduce blood loss.

Strength of Recommendation: Moderate ★★★★☆
APPROACH EXPOSURE

- Moderate strength evidence supports that there were no clinically significant differences in patient oriented outcomes related to the surgical approach for patients with symptomatic osteoarthritis of the hip undergoing total hip arthroplasty.

Strength of Recommendation: Moderate ★★★★☆
WEIGHT LOSS AS A CONSERVATIVE STATEMENT

- In the absence of reliable evidence, it is the opinion of the guideline development group that weight loss may be beneficial in the non-operative management of pain, function, and quality of life in patients with osteoarthritis of the hip.

Strength of Recommendation: Consensus ★★★★★
DIABETES AS A RISK FACTOR FOR TOTAL HIP ARTHROPLASTY (THA)

- In the absence of reliable evidence, it is the opinion of the guideline development group that patients with poorly controlled diabetes may be at a higher risk for short-term adverse events after total hip arthroplasty.

Strength of Recommendation: Consensus ★★★★★
SOCIAL COMORBIDITIES AS A RISK FACTOR FOR TOTAL HIP ARTHROPLASTY

- In the absence of reliable evidence, it is the opinion of the guideline development group that while total hip arthroplasty for patients with lower socioeconomic status and educational levels with symptomatic osteoarthritis of the hip remains beneficial, risk adjustment may be appropriate as inferior outcomes and increased complication rates may occur in this population.

Strength of Recommendation: Consensus ★★★★★
INTRAARTICULAR IMAGING

- In the absence of reliable evidence, it is the opinion of the guideline development group that in patients with normal x-rays but a history and physical exam consistent with IA hip pathology, advanced imaging and/or diagnostic IA injection may be indicated.

Strength of Recommendation: Consensus ★★★★★
PRESCRIPTION OPIOIDS

In the absence of reliable evidence, it is the opinion of the guideline development workgroup that long-term prescription opioids are not recommended in the treatment of symptomatic osteoarthritis of the hip.

Strength of Recommendation: Consensus
FUTURE RESEARCH – RISK ASSESSMENT TOOLS

• Understanding the causes of adverse events and readmission to the hospital after THA is of paramount importance with respect to improving patient safety, managing patient expectations, and lowering cost of care. Identifying modifiable risk factors and then providing and optimizing patients’ health prior to THA is recommended. Further multi-institutional studies are warranted to evaluate the efficacy of risk assessment tools with respect to managing patients’ expectations and improving shared-decision making. Future studies should attempt to better delineate between clinical outcome tools and risk assessment tools which incorporate comorbidities such as diabetes, tobacco use, etc. by the orthopedic community, but there exists minimal evidence to support this choice.
FUTURE RESEARCH – OBESITY (EARLY AND LATE SURGICAL OUTCOMES)

Future research should examine the following:

1. BMI >30 incrementally upwards to detect risk stratification for adverse events and inferior outcomes.

2. Find new measurements to be used in conjunction with BMI that will refine the risk stratification for adverse events and poor outcomes. Perhaps direct measurements of local fat deposition (e.g. Depth of surgical wound) vs. BMI would be more helpful in stratifying the risk of wound problems such as dehiscence, hematoma, and infection.

3. Encourage longitudinal studies that evaluate the effects of weight loss in an individual and the outcomes of total hip replacement in patients who have lost significant weight pre-operatively.
FUTURE RESEARCH – AGE-ADVERSE EVENTS IN THA PATIENTS

• Continued long term studies following younger (age < 50) and older (age > 80) patients with symptomatic osteoarthritis of the hip undergoing total hip arthroplasty using contemporary techniques.
FUTURE RESEARCH – MENTAL HEALTH DISORDER

- Addressing mental health disorders as modifiable risk factors should be considered as an important focus of research. Research questions might include the treatment of depression prior to surgery and managing anxiety through the episode of care and the impact on outcomes and patient satisfaction.
FUTURE RESEARCH – TOBACCO USE

- A randomized controlled trial of patients who use tobacco and are undergoing total hip arthroplasty is warranted, comparing patients who cease or decrease tobacco use, to those who continue smoking during the perioperative period. Consideration should also be given to evaluation of the efficacy of nicotine replacement therapy and/or counseling on smoking behavior.
FUTURE RESEARCH – NON-NARCOTIC MANAGEMENT

- Future studies performed assessing the efficacy and potential complications of long-term use of NSAIDs for the treatment of symptomatic hip osteoarthritis may be of benefit.
FUTURE RESEARCH – GLUCOSAMINE SULFATE

- As only one high quality study was discovered for this inquiry, additional high-powered placebo randomized controlled trials could further clarify this recommendation.
FUTURE RESEARCH – INTRA-ARTICULAR INJECTIONS

- Further randomized control studies to better elucidate the effect of repeat IA injections of corticosteroids on the cartilage may be warranted. Similarly, randomized placebo control trials may be warranted to establish if PRP, stem cells and prolotherapy are efficacious.
FUTURE RESEARCH – CONSERVATIVE PHYSICAL THERAPY

- There were relatively few placebo controlled clinical trials for this patient population. Of the existing studies, both the duration and type of intervention was heterogeneous. Future research should focus on identifying the optimal dose and types of physical therapy interventions and modalities that may prove most useful to reduce long term pain and dysfunction.
FUTURE RESEARCH – PREOPERATIVE/POSTOPERATIVE PHYSICAL THERAPY

- Future work should identify the individuals who are most likely to receive benefit from pre- or post-operative physical therapy interventions.
FUTURE RESEARCH – ANESTHESIA

- A randomized controlled trial of spinal vs general endotracheal anesthesia in total hip arthroplasty patients should be conducted to evaluate this question further.
FUTURE RESEARCH – TRANEXAMIC ACID

- Randomized, prospective trials comparing IV TXA, topical TXA, and oral TXA are warranted to specifically assess dosing, technique and timing of administration, uniform measures of perioperative blood loss, cost, including impact on blood transfusion, and contraindications.
FUTURE RESEARCH – APPROACH EXPOSURE

- Randomized controlled trial comparing common and emerging techniques on approaches to THA.
This Guideline has been endorsed by the following organizations:
ACKNOWLEDGEMENTS:

Development Group Roster:
Greg Polkowski, MD, Co-Chair
Norman Johanson, MD, Co-Chair
Mark Barba, MD
John C. Grady-Benson, MD
Theodore Toan Le, MD
Harold Rees, MD
Ralph T. Salvagno, MD
Richard Schultz, MD
James Browne, MD
Albert Song, MD
Joseph A. Zeni, PT, PhD
David Podeszwa, MD
Ira Zaltz, MD

AAOS Guidelines Chair/Appropriate Use Criteria Section Leader:
Robert H. Quinn, MD

AAOS Clinical Practice Guidelines Section Leader:
Gregory Brown, MD, PhD

AAOS Committee on Evidence-Based Quality and Value Chair:
Kevin Shea, MD

AAOS Council on Research and Quality Chair:
David Jevsevar, MD, MBA

Additional Contributing Members:
Atul F. Kamath, MD
Greg McComis, MD

AAOS Staff:
William Shaffer, MD
Deboarah Cummins, PhD

Jayson N. Murray, MA
Nilay Patel, MA
Patrick Donnelly, MA
Nicole Nelson, MPH
Mary DeMars
Yasseline Martinez
Kaitlyn Savarino, MBA
Peter Shores, MPH
Anne Woznica, MLIS, AHIP
Yupei Chen
PLEASE CITE CLINICAL PRACTICE GUIDELINE AS:

American Academy of Orthopaedic Surgeons Evidence-Based Clinical Practice Guideline on the Management of Osteoarthritis of the Hip
Free for both iOS and Android or at www.orthoguidelines.org

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References provided for each recommendation


Appropriate Use Criteria Tool
Acute Achilles Tendon Rupture
Acute Compartment Syndrome
Anterior Cruciate Ligament Injuries
Carpal Tunnel Syndrome
Diagnosis and Prevention of Periprosthetic Joint Infections
Distal Radius Fractures
Glenohumeral Joint Osteoarthritis
Hip Fractures in the Elderly
Osteoarthritis of the Hip
Osteoarthritis of the Knee (Arthroplasty)
Osteoarthritis of the Knee (Non-Arthroplasty)
Osteochondritis Dissecans
Pediatric Developmental Dysplasia of the Hip in infants up to Six Months
Pediatric Diaphyseal Femur Fractures
Pediatric Supracondylar Humerus Fractures
Prevention of Orthopaedic Implant Infections in Patients Undergoing Dental Procedures
Rotator Cuff Injuries
Surgical Site Infections
VTE Disease in Patients Undergoing Elective Hip & Knee Arthroplasty
Tranexamic Acid in Total Joint Arthroplasty (Endorsement)
Use of Imaging Prior to Referral to a Musculoskeletal Oncologist (Endorsement)

For additional information, please visit http://www.orthoguidelines.org/