AAOS

American Academy of Orthopaedic Surgeons

Peer Review & Public Comments and AAOS Responses

Clinical Practice Guideline on the *Surgical Management of Osteoarthritis of the Knee*

Table of Contents

Surgical Management of Osteoarthritis of the Knee Evidence-Based Guideline
Summary of Changes to Guideline Draft

1. Added the date of the final literature search to the flowchart in Appendix IV.
2. Added the following statements into the section titled Future Research for the recommendation about Peripheral Nerve Blockade: "Future studies comparing the effectiveness of a single perioperative peripheral nerve block vs continuous infusion should be performed for standard outcomes. In addition, research should be done to evaluate effectiveness of combination sciatic and femoral nerve blocks compared to other peripheral block methods"
3. Emboldened varying measures used in the quality of recovery outcome domain by Liu 2014 (Table 25).
4. Added "Anesthesiologists" to Intended Users section of guideline.
5. Clarified the objectives of the Risk Stratification section by including the following statement: "This AAOS guideline provides risk stratification for various potentially reversible/maximized factors/conditions (obesity, diabetes, chronic pain, depression/anxiety and cirrhosis/hepatitis C). By design the literature was reviewed as pertains to patients having a total knee arthroplasty. That literature is limited in terms of a wide variety of other risks, especially those that are not reversible. Capturing the rates of certain complications such as myocardial infarction, stroke, pneumonia etc., is not statistically possible from the higher quality levels of the literature because they are rare and the numbers of patients available in most studies limited. These areas were considered beyond the methodology of the current guideline."
6. The original PICO questions have been added to Appendix III in the guideline document.
7. Added "neuraxial anesthesia" to parenthetical in second sentence of future research section for the recommendation on Peripheral Nerve Blockade.
8. Added the following language, the future research section of the Periarticular Local Anesthetic Infiltration recommendation: "…compared with each other and to neuraxial anesthesia such as epidural infusions." to the end of the section.
9. Added the following statement to the future research section of the Neuraxial Anesthesia recommendation: "Future studies comparing the effectiveness of neuraxial anesthesia with periarticular injections and/or peripheral nerve blockade should be performed".
10. Added the following statement to the future research section of the Periarticular Local Anesthetic Infiltration recommendation: "The impact of periarticular injection for pain relief on day of surgery mobilization should also be further explored."
11. Added the following statement to future research section of BMI as a Risk Factor: "Careful analysis of risk category may also be helpful to assess if one or more component of the risk factor contributes significantly or may act as a surrogate (e.g. malnutrition in obesity)."
12. Removed the Hirvonen study from the Delay TKA section.
13. Added the following statement to future research section of Delay TKA: We also support future research examining the potential societal cost of delaying arthroplasty when the patient is otherwise ready to proceed with surgery (missed work, etc.) as well as the effect of surgical delay on the patient's pain and suffering during the delay period."
14. Added the following statement to future research section of Tourniquet: Blood Loss Reduction: "We also support more high quality studies that take into consideration tourniquet use in the context of modern blood conservation protocols such as the addition of tranexamic acid."
15. Changed the wording under the future research section of Surgical Navigation to: "The theoretical benefit of surgical navigation is to improve knee function and long-term implant survival by improving the accuracy of alignment. No consensus on optimal knee alignment in total knee arthroplasty has been

reached. However, coupling of surgical navigation data with registry implant longevity data has the potential to determine if surgical navigation improves implant longevity through alignment The strong evidence indicates that no further research is needed on reviewed current surgical navigation methods. New surgical navigation methods will need randomized controlled trials to determine their effectiveness."

16. Changed the wording under the rationale section of Surgical Navigation to: "The work group recognizes that there are scenarios where computer navigation theoretically could be considered, such as malunions, intramedullary implants, or in training scenarios, but the evidence is insufficient to make a recommendation."
17. Added the following wording to the rationale of Patient Specific Instrumentation: **"**The work group recognizes that there are scenarios where patient specific instrumentation theoretically could be considered but the evidence is insufficient to make a recommendation."

Overview of Peer Review and Public Commentary

The reviews and comments related to this clinical practice guideline are reprinted in this document and posted on the AAOS website. All peer reviewers and public commenters are required to disclose their conflict of interests. Names are removed from the forms of reviewers who requested that they remain anonymous; however their COI disclosures still accompany their response.

Peer Review

AAOS contacted 21 organizations with content expertise to review a draft of the clinical practice guideline during the peer review period in July 2015.

- Seven individuals provided comments via the electronic structured peer review form. No reviewers asked to remain anonymous.
- All seven reviews were on behalf of a society.
- The work group chairs considered all comments and made some modifications when they were consistent with the evidence.

Public Comment

The new draft was then circulated for a 30-day public comment period ending on October 8th, 2015.

- AAOS received one submission on behalf of the Knee Society.
- If warranted and based on evidence, the guideline draft is modified by the work group members in response to the public comments.

Peer Reviewer Key

Each peer reviewer was assigned a number (see below). All responses in this document are listed by the assigned peer reviewer's number.

Table 1. Peer Reviewer Key

Reviewer Number	Name of Reviewer (Required)	What is the name of the society that you are representing?
1	Catherine C. Roberts, M.D.	American College of Radiology
2	Daniel Ari Mendelson, MS, MD, FACP, AGSF, CMD	American Geriatrics Society
3	Samer Narouze, MD, PhD	American Society of Regional Anesthesia and Pain Medicine (ASRA)
4	Toby N Weingarten, MD	American Society of Anesthesiologists (ASA)
5	Alisa Curry, PT DPT GTC GCS	American Physical Therapy Association
6	Keith Fehring, MD	American Association of Hip and Knee Surgeons
7	Michael Dohm, MD, Assistant Professor, ABOS, FAAOS, AAHKS Evidence Based Practice Committee	American Association of Hip and Knee Surgeons

Peer Reviewer Demographics

Reviewer #	Name of Reviewer (Required)	Primary Specialty	Work Setting	What is the name of the society that you are representing?
1	Catherine C. Roberts, M.D.	Musculoskeletal Radiology	Academic Practice	American College of Radiology
2	Daniel Ari Mendelson, MS, MD, FACP, AGSF, CMD	Fragility Fractures, Geriatric Fractures	Academic Practice	American Geriatrics Society
3	Samer Narouze, MD, PhD	Anesthesiology	Clinical Hospital	American Society of Regional Anesthesia and Pain Medicine
4	Toby N Weingarten, MD	Anesthesiology	Academic Practice	American Society of Anesthesiologists
5	Alisa Curry, PT DPT GTC GCS	Rehab/Prosthetics and Orthotics	Clinical Hospital	American Physical Therapy Association
6	Keith Fehring, MD	Total Joint	Academic Practice	American Association of Hip and Knee Surgeons
7	Michael Dohm, MD, Assistant Professor, ABOS, FAAOS, AAHKS Evidence Based Practice Committee	Adult Knee	Academic Practice	American Association of Hip and Knee Surgeons

Peer Reviewers' Disclosure Information

All peer reviewers are required to disclose any possible conflicts that would bias their review via a series of 10 questions (see Table 2). For any positive responses to the questions (i.e. "Yes"), the reviewer was asked to provide details on their possible conflict.

Table 2. Disclosure Question Key

Disclosure Question	Disclosure Question Details
A	A) Do you or a member of your immediate family receive royalties for any pharmaceutical, biomaterial or orthopaedic product or device?
B	B) Within the past twelve months, have you or a member of your immediate family served on the speakers bureau or have you been paid an honorarium to present by any pharmaceutical, biomaterial or orthopaedic product or device company?
C	C) Are you or a member of your immediate family a PAID EMPLOYEE for any pharmaceutical, biomaterial or orthopaedic device or equipment company, or supplier?
D	D) Are you or a member of your immediate family a PAID CONSULTANT for any pharmaceutical, biomaterial or orthopaedic device or equipment company, or supplier?
E	E) Are you or a member of your immediate family an UNPAID CONSULTANT for any pharmaceutical, biomaterial or orthopaedic device or equipment company, or supplier?
F	F) Do you or a member of your immediate family own stock or stock options in any pharmaceutical, biomaterial or orthopaedic device or equipment company, or supplier (excluding mutual funds)
G	G) Do you or a member of your immediate family receive research or institutional support as a principal investigator from any pharmaceutical, biomaterial or orthopaedic device or equipment company, or supplier?
H	H) Do you or a member of your immediate family receive any other financial or material support from any pharmaceutical, biomaterial or orthopaedic device and equipment company or supplier?
I	I) Do you or a member of your immediate family receive any royalties, financial or material support from any medical and/or orthopaedic publishers?
J	J) Do you or a member of your immediate family serve on the editorial or governing board of any medical and/or orthopaedic publication?

Table 3. Peer Reviewer's Disclosure Information

Reviewer Number	Name of Reviewer (Required)	Please list your AAOS Customer # below (Required):	A	B	C	D	E	F	G	H	I	J
1	Catherine C. Roberts		No	No	No	No	No	No	No	No	No	No
2	Daniel Ari Mendelson	1012253										
3	Samer Narouze		No	No	No	No	No	No	No	No	No	No
4	Toby N Weingarten		No	No	No	No	No	No	No	No	No	No
5	Alisa Curry		No	No	No	No	No	No	No	No	No	No
6	Keith Fehring	795699										
7	Michael Dohm, MD	27590										

To review disclosures of submissions with an AAOS customer ID, please visit: http://www7.aaos.org/education/disclosure/search.aspx

Table 4. Peer Reviewer Detailed Disclosure Information
No detailed disclosure items reported

Peer Reviewer Responses to Structured Peer Review Form Questions

All peer reviewers are asked 16 structured peer review questions which have been adapted from the Appraisal of Guidelines for Research and Evaluation (AGREE) II Criteria*. Their responses to these questions are listed on the next few pages.

Table 5. Peer Reviewer Responses to Structured Peer Review Questions 1-4

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	1. The overall objective(s) of the guideline is (are) specifically described.	2. The health question(s) covered by the guideline is (are) specifically described.	3. The guideline's target audience is clearly described.	4. There is an explicit link between the recommendations and the supporting evidence.
1	Catherine C. Roberts	American College of Radiology	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
2	Daniel Ari Mendelson	American Geriatrics Society	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
3	Samer Narouze	American Society of Regional Anesthesia and Pain Medicine	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
4	Toby N Weingarten	American Society of Anesthesiologists	Strongly Agree	Strongly Agree	Agree	Strongly Agree
5	Alisa Curry	American Physical Therapy Association	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
6	Keith Fehring	American Association of Hip and Knee Surgeons	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
7	Michael Dohm	American Association of Hip and Knee Surgeons	Strongly Agree	Strongly Agree	Strongly Agree	Agree

Table 6. Peer Reviewer Responses to Structured Peer Review Questions 5-8

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	5. Given the nature of the topic and the data, all clinically important outcomes are considered.	6. The patients to whom this guideline is meant to apply are specifically described.	7. The criteria used to select articles for inclusion are appropriate.	8. The reasons why some studies were excluded are clearly described.
1	Catherine C. Roberts	American College of Radiology	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
2	Daniel Ari Mendelson	American Geriatrics Society	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
3	Samer Narouze	American Society of Regional Anesthesia and Pain Medicine	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
4	Toby N Weingarten	American Society of Anesthesiologists	Disagree	Strongly Agree	Strongly Agree	Strongly Agree
5	Alisa Curry	American Physical Therapy Association	Agree	Agree	Strongly Agree	Strongly Agree
6	Keith Fehring	American Association of Hip and Knee Surgeons	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
7	Michael Dohm	American Association of Hip and Knee Surgeons	Agree	Strongly Agree	Strongly Agree	Agree

Table 7. Peer Reviewer Responses to Structured Peer Review Questions 9-12

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	9. All important studies that met the article inclusion criteria are included.	10. The validity of the studies is appropriately appraised.	11. The methods are described in such a way as to be reproducible.	12. The statistical methods are appropriate to the material and the objectives of this guideline.
1	Catherine C. Roberts	American College of Radiology	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
2	Daniel Ari Mendelson	American Geriatrics Society	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
3	Samer Narouze	American Society of Regional Anesthesia and Pain Medicine	Agree	Strongly Agree	Strongly Agree	Strongly Agree
4	Toby N Weingarten	American Society of Anesthesiologists	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
5	Alisa Curry	American Physical Therapy Association	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
6	Keith Fehring	American Association of Hip and Knee Surgeons	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
7	Michael Dohm	American Association of Hip and Knee Surgeons	Agree	Strongly Agree	Strongly Agree	Strongly Agree

Table 8. Peer Reviewer Responses to Structured Peer Review Questions 13-16

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	13. Important parameters (e.g., setting, study population, study design) that could affect study results are systematically addressed.	14. Health benefits, side effects, and risks are adequately addressed.	15. The writing style is appropriate for health care professionals.	16. The grades assigned to each recommendation are appropriate.
1	Catherine C. Roberts	American College of Radiology	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
2	Daniel Ari Mendelson	American Geriatrics Society	Strongly Agree	Strongly Agree	Agree	Strongly Agree
3	Samer Narouze	American Society of Regional Anesthesia and Pain Medicine	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
4	Toby N Weingarten	American Society of Anesthesiologists	Strongly Agree	Disagree	Strongly Agree	Strongly Agree
5	Alisa Curry	American Physical Therapy Association	Strongly Agree	Agree	Strongly Agree	Strongly Agree
6	Keith Fehring	American Association of Hip and Knee Surgeons	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
7	Michael Dohm	American Association of Hip and Knee Surgeons	Strongly Agree	Strongly Agree	Strongly Agree	Agree

Table 9. Peer Reviewers' Recommendation for Use of this Guideline in Clinical Practice

Would you recommend these guidelines for use in clinical practice?

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Would you recommend these guidelines for use in clinical practice?
1	Catherine C. Roberts	American College of Radiology	Strongly Recommend
2	Daniel Ari Mendelson	American Geriatrics Society	Strongly Recommend
3	Samer Narouze	American Society of Regional Anesthesia and Pain Medicine	Strongly Recommend
4	Toby N Weingarten	American Society of Anesthesiologists	Strongly Recommend
5	Alisa Curry	American Physical Therapy Association	Recommend With Revisions
6	Keith Fehring	American Association of Hip and Knee Surgeons	Strongly Recommend
7	Michael Dohm	American Association of Hip and Knee Surgeons	Recommend

Peer Reviewer Detailed Responses

Reviewer #1, Catherine C. Roberts, ACR

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
1	Catherine C. Roberts	American College of Radiology	A. These clinical practice guidelines are clear, comprehensive, and accurate based on the literature. Was it intentional to state "search performed on DATE" (Page 534, Line 3669) or should the actual date be filled in?

Workgroup Response

Dear Dr. Catherine Roberts,

Thank you for your expert review of the Clinical Practice Guideline on the Surgical Management of Osteoarthritis of the Knee. We will address your comments by guideline section in the order that you listed them.

A. Thank you for pointing out this error of exclusion. The final literature search was conducted on January 12, 2015. This is now added to the flowchart in Appendix IV.

   Respectfully,
   2015 SMOAK Guideline Workgroup

Reviewer #2, Daniel A. Mendelson, AGR

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
2	Daniel A. Mendelson	American Geriatrics Society	A. I did notice one typo on line 368 in the Table of Contents on page 14. "Component" should be "Component". Extraordinary and comprehensive job. As a non-orthopaedic with general familiarity with orthopaedics, I found this guideline useful and ease to read and would help me guiding my own patients who might be considering TKA. It would also help me work with and understand what my surgical colleagues are thinking and doing. Thank you for this work and the opportunity to review on behalf of the AGS.

Workgroup Response

Dear Dr. Daniel A. Mendelson,

Thank you for your expert review of the Clinical Practice Guideline on the Surgical Management of Osteoarthritis of the Knee. We will address your comments by guideline section in the order that you listed them.

A. “COmponent” was revised to “Component”

Respectfully,
2015 SMOAK Guideline Workgroup

Reviewer #3, Samer Narouze, ASRA

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
3	Samer Narouze	American Society of Regional Anesthesia and Pain Medicine	A. I would like to see a distinction between single perioperative peripheral nerve block and continuous infusion. Over the past few years there has been a growing body of literature supporting the beneficial role of peripheral nerve catheters over just a single shot. This current report is not distinguishing between both techniques. 1- Continuous Peripheral Nerve Blocks: A Review of the Published Evidence. (Anesth Analg 2011;113:904–25). The above review article discuss the available data supporting continuous infusion for multiple orthopedic procedures including Knee surgery. 2-Brian M. Ilfeld, et al. Ambulatory Continuous Femoral Nerve Blocks Decrease Time to Discharge Readiness after Tricompartment Total Knee Arthroplasty. A Randomized, Triple-masked, Placebo-controlled Study. Anesthesiology 2008; 108:703–13. 3-Hanson NA, et al. Continuous ultrasound-guided adductor canal block for total knee arthroplasty: a randomized, double-blind trial. Anesth Analg. 2014 Jun;118(6):1370-7. B. Some tables are repeated.. pages 145-151.

Workgroup Response

Dear Dr. Samer Narouze,

Thank you for your expert review of the Clinical Practice Guideline on the Surgical Management of Osteoarthritis of the Knee. We will address your comments by guideline section in the order that you listed them.

A. The PICO question related to peripheral nerve blockade related to its effectiveness at improving outcomes and decreasing complications compared to not using peripheral nerve blockade. We did not find high enough quality data that met our search criteria comparing single perioperative peripheral nerve block and continuous infusion. Given the interest in this particular area, we will add the following statements into the section titled Future Research for the recommendation about Peripheral Nerve Blockade: "Future studies comparing the effectiveness of a single perioperative peripheral nerve block vs continuous infusion should be performed for standard outcomes. In addition, research should be done to evaluate effectiveness of combination sciatic and femoral nerve blocks compared to other peripheral block methods"

B. The tables referred to on pages 145-151 all relate to the article by J Liu from 2014. Each table refers to a separate outcome related to quality of recovery. The separate outcomes are now emboldened to assist the reader in differentiating the nuances.

Respectfully,
2015 SMOAK Guideline Workgroup

Reviewer #4, Toby N. Weingarten, ASA

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
4	Toby N Weingarten	American Society of Anesthesiologists	AAOS Surgical Management of Osteoarthritis of the Knee: Evidence-Based Clinical Practice Guideline Review by Toby N Weingarten, MD on behalf of the American Society of Anesthesiologists. Summary: These clinical practice guidelines were developed by the AAOS physician volunteer Guideline Development Group with assistance from the AAOS Evidence-Based Medicine Unit in their Department of Research and Scientific Affairs and is based on a systematic review of peer-reviewed articles published from 1966 – January 27th 2015 with regards to surgical management of osteoarthritis of the knee in patients over the age of 18 years. These guidelines are not intended to be used as a protocol, but to provide guidance without superseding clinical judgment for individual patients. The methods utilized were attempted to minimize bias and enhance transparency in the selection process and analysis of available evidence. The resultant document is 686 pages long. In the beginning of the document there is a summary of recommendations. This is followed by a detailed Introduction outlying the intended users and patient population. **A. Notably, anesthesiologists are not specifically mentioned as an intended user even though, this document does provide specific commentary on anesthetic technique (detailed later).** Next a thorough Methods section is provided which details the development of PICO questions (population, intervention, comparison, and outcome); the literature search strategy and resultant method for evaluating the quality design of identified studies; the method of synthesizing best evidence; and the ranking criteria for the strength of recommendations. A total of 38 topics were reviewed in these guidelines. The guidelines provide an executive summary with ranking criteria for the strength of recommendations. Each topic also contains an extended discussion including the rationale for the recommendation, risks and harms of implementing the recommendation, areas of future research, and then detailed tables that provide specific data elements from the reviewed literature that helped formulate the recommendations. The quality and extent of the work is impressive. The majority of topics are not germane to anesthesiologists (e.g., patellar resurfacing) and I am not qualified to, and therefore will not, provide critiques. However, there are several topics relevant to anesthetic management and my comments will be directed to these areas. RISK STRATIFICATION: The AAOS guidelines provide risk stratification for the following

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
			conditions: obesity, diabetes, chronic pain, depression/anxiety, cirrhosis/hepatitis C, (Page 41). By design the AAOS only considers studies specific to knee arthroplasty. When looking at functional outcomes of knee arthroplasty surgery limiting to just that particular surgery is logical. However, this selection does limit their analysis of medical perioperative complications for these various conditions, namely obesity, diabetes, and liver disease. Such adverse outcomes may be studied in a mixed population such as total hip and total knee arthroplasties. Therefore, some high quality studies may be excluded. Further, this list is not exhaustive if the aim is to weigh the risks of different patient conditions or disease states on perioperative risk such as cardiac disease or obstructive sleep apnea. If the aim is to risk stratify surgical outcomes than this should be stated more clearly in this section. **B. Reviewer recommendation: The objectives of the Risk Stratification section needs to be better defined. Is it limited in scope to only assess the relationship between these conditions and surgical outcomes and complications, or is this stratification to be of a broader scope to encompass assessments of risk for perioperative complications? If the latter, the current list of disease states is inadequate (e.g., risk of severe cardiac, pulmonary, and neurologic diseases/conditions on perioperative risks).** **C. Perhaps these guidelines could recommend the use of other well established guidelines published by other societies to assess the readiness of a patient for surgery (such as ACC/AHA guidelines for cardiac risk).** **D. Further, an explanation of how these conditions generated PICO questions would be helpful.** BMI as a risk factor: Strong evidence was found that obesity has increased risk for less improvement in functional outcomes. They cite mix evidence that obesity results in increased complication rates from four high quality papers with mixed results with two demonstrating higher rates of complications (Jamsen 2013 and Amin 2006) and two not demonstrating increased risk (Bordini 2009, Judge 2012). (Page 42). In review of complications listed, it was notable that postoperative respiratory complications were not assessed in any of the studies presented in Table 8: Risk Stratification Obesity (pages 56 – 77). **E. Reviewer recommendation: Given the high rates of undiagnosed obstructive sleep apnea among surgical patients (Singh M, Brit J Anaesth 2013), and**

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
			high rates of observed respiratory depression among patients undergoing arthroplasty surgery during Phase I anesthesia recovery (Weingarten TN, Anesth Analg 2015) this could be considered an area of needed future research. (Page 43) Diabetes as a risk factor: Moderate evidence was found that diabetes is a risk factor for increased complications based on one high quality study (Jamsen E 2012) (Table 5 Risk Stratification: Diabetes), which were infectious complications. **F. Reviewer recommendation: Other perioperative complications in diabetics (evidence of end organ damage such as kidney injury or myocardial ischemia) were not assessed and should be considered an area of needed future research (Page 43).** Cirrhosis/Hepatitis C as a risk factor: Limited evidence was found that these liver diseases are associated with increased risk (Shih LY 2004, Pour AE 2011) (Table 6 Risk Stratification: Liver Disease) of complications such as increased blood loss, hospital stay, more surgical complications and higher mortality. **G. Reviewer recommendation: Guidelines should mention as a methodological limitation of these guidelines that by excluding similar surgeries (total joint arthroplasty) the evidence supporting that serious liver disease is associated with perioperative complications might be strengthened.** Chronic Pain as a risk factor and Depression/Anxiety as a risk factor had moderate and limited quality evidence that these conditions were associated with poorer outcomes. **H. Other reviewer questions: Table 9 Risk Stratification: Renal Insufficiency and Table 10 Risk Stratification: Smoking Status are included in a guidelines but are not associated with any statement (Page 42) regarding level of evidence regarding whether these conditions are risk factors. As an anesthesiologist, both conditions could have implications for cardiopulmonary complications and for renal insufficiency hemorrhagic complications.** PERIPHERAL NERVE BLOCKADE (PNB) (Page 119). The guidelines state that PNB has strong evidence to support that this anesthetic technique decreases postoperative pain and opioid requirements. The guidelines cite 7 high quality studies and 3 low quality studies to support these recommendations. Listed risks and harms of PNB include bleeding, infection, nerve injury, and motor weakness. The guidelines state that these

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
			are rare and that care must be taken to minimize the risk of patient falls. Areas of future research are long term analgesic benefits, and comparative studies with other analgesic modalities such as periarticular injections. Risks and Harms of Implementing This Recommendation. **I. Reviewer recommendations: A reference to ASRA guidelines for regional anesthesia in patients on anticoagulation could be provided. (Horlocker TT, Wedel DJ, Rowlingson JC, et al. Regional anesthesia in the patient receiving antithrombotic or thrombolytic therapy: American Society of Regional Anesthesia and Pain Medicine evidence-based guidelines (third edition). Reg Anesth Pain Med. 2010;35:64-101.) Future research.** **J. Reviewer recommendation: • Benefit of single shot injection versus indwelling catheters with infusions of local anesthetic should be evaluated. • Benefits of sciatic nerve block in combination with femoral nerve block should be evaluated. • Line 1670 Add neuraxial analgesia after periarticular injections. PERI-ARTICULAR LOCAL ANESTHETIC INFILTATION (PAI) (Page 165).** The guidelines state that PAI has strong evidence to support that this analgesic technique decreases postoperative pain and opioid requirements while improving function and patient satisfaction. The guidelines state that 27 high quality studies met selection criteria but because of heterogeneity of studies PAI could only be compared to placebo and not PNB or epidural blocks. This was listed as an area of needed future research. **K. Reviewer recommendation: Line 1757-1758, in the area of future research the guidelines only state that PAI and PNB need to be compared. Epidural infusions should also be specifically mentioned.** NEURAXIAL ANESTHESIA The guidelines state that there is moderate evidence to support the use of neuraxial anesthesia to improve perioperative outcomes and complication rates compared to general anesthesia. The guidelines state that there are 2 high quality and 1 low quality studies demonstrating a reduction of DVT compared to GA. However, they note that these studies (Nielson WR 1990, Jorgensen LN 1991, Sharrock NE 1991) did not use DVT prophylactic regimens that are commonly used in contemporary practice, reflecting these studies were conducted > 20 years ago. Two high quality studies demonstrated improved short-term function outcomes. Williams-Russo 1996 found improved short term range of motion and ambulation with epidural

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
			versus general anesthesia. Nielson WR 1990 found less short-term cognitive dysfunction with neuraxial anesthesia versus general anesthesia. The guidelines site several lower quality studies which demonstrate improvement in mortality and morbidity with neuraxial anesthesia. Risks and Harms of Implementing This Recommendation. **L. Reviewer recommendation: It could be helpful if ASRA guidelines were provided [Horlocker TT, et. al. Reg Anesth Pain Med. 2010;35:64-101] Future Research**. The guidelines state that research should try to clarify if certain unique patient cohorts may benefit from neuraxial anesthesia. **M. Reviewer recommendation: Outcomes with the use of neuraxial anesthesia (mainly epidural catheters) should be compared against peripheral nerve blocks (with or without indwelling catheters) and intraarticular injections.** TOURNIQUETS The guidelines state that there is moderate evidence to support the use of tourniquets to reduce blood loss but strong evidence that their use increases postoperative pain in the short term. Though this topic can influence anesthetic management, I have no recommendations regarding this section. TRANEXAMIC ACID The guidelines state that there is strong evidence that tranexamic acid decreases postoperative blood loss and blood transfusions in patients undergoing total knee arthroplasty. They provide a cautionary statement as well as a call for further research regarding thromboembolic complications and that many of the studies would exclude patients at risk of such complications introducing a selection bias. Further, they state that this is not an FDA approved use of this drug. Lastly, they caution that tranexamic acid may lead to visual changes, specifically color blindness. Though this topic can influence anesthetic management, I have no recommendations regarding this section. Toby N Weingarten, MD On behalf of the ASA

Workgroup Response

Dear Dr. Toby N. Weingarten,

Thank you for your expert review of the Clinical Practice Guideline on the Surgical Management of Osteoarthritis of the Knee. We will address your comments by guideline section in the order that you listed them.

A. Thank you for pointing out the unintended omission of anesthesiologists as 'intended users' of this guideline. We agree that there are multiple recommendations that have relevance to the field of Anesthesia and have modified the document accordingly.
B. We have better defined the objectives of the Risk Stratification section by including the following statement: "This AAOS guideline provides risk stratification for various potentially reversible/maximized factors/conditions (obesity, diabetes, chronic pain, depression/anxiety and cirrhosis/hepatitis C). By design the literature was reviewed as pertains to patients having a total knee arthroplasty. That literature is limited in terms of a wide variety of other risks, especially those that are not reversible. Capturing the rates of certain complications such as myocardial infarction, stroke, pneumonia etc., is not statistically possible from the higher quality levels of the literature because they are rare and the numbers of patients available in most studies limited. These areas were considered beyond the methodology of the current guideline."
   The reviewer is correct that we only considered studies specific to total knee arthroplasty for osteoarthritis and excluded studies that combined both total knee and total hip arthroplasty. There is a separate total hip arthroplasty guideline in production at AAOS currently. The risk stratification recommendations were based on the factors deemed to have the most robust evidence in the literature relevant to this patient population. It is intentionally limited to assess the risk factors as related to surgical outcomes and complications. It is beyond the scope of this guideline to provide risk assessment for a broader array of patient risk factors related to general perioperative complications. It is possible that some of the risk factors you mention (cardiac, pulmonary, neurologic) may be addressed in the Appropriate Use Criteria related to total knee arthroplasty that will start immediately after the peer review period is completed for this guideline.
C. We appreciate the reviewer's suggestion. However, the AAOS has a formal process for endorsement of guidelines created by other organizations and without having undergone this process, referencing the ACC/AHA guideline is not possible.
D. The PICO questions were generated by the guideline workgroup prior to literature review. The risk factors of obesity, diabetes, chronic pain, depression/anxiety and cirrhosis/hepatitis C were chosen as specific factors likely to affect surgical outcomes and complications after total knee arthroplasty. There were other risk factors initially selected (i.e. smoking, renal insufficiency) but a literature search yielded no data that was able to be included in the guideline given our specific methodology and inclusion criteria. The original PICO questions have been added to Appendix III in the guideline document.
E. We did not formally review the existing literature for data related to obstructive sleep apnea and respiratory depression (see response B).
F. The perioperative complications of end organ damage related to the preoperative diagnosis of diabetes was not within the scope of this guideline that was specifically focused on surgical outcomes and complications (see response B).
G. We acknowledge that higher quality evidence related to the association of serious liver disease to postoperative complications may have been identified if our guideline was expanded to include total hip arthroplasty but this specific guideline was focused only on data related to total knee arthroplasty. A current AAOS guideline on total hip arthroplasty is currently in progress.

H. Table 9 listed 2 articles that met our inclusion criteria related to renal insufficiency (1 moderate, 1 low quality) but neither had statistically significant data related to the outcomes or complications utilized in the search criteria. Table 10 listed 1 article (moderate quality) that met our inclusion criteria related to smoking and this was not significant for any of the searched for outcomes or complications. They may be related to medical (vs surgical) complications and this has been added to the Future Research section.

I. We appreciate the reviewer's suggestion. However, the AAOS has a formal process for endorsement of guidelines created by other organizations and without having undergone this process, referencing the ASRA guideline is not possible.

J. We did not specifically ask the question about single shot injection vs indwelling catheters in terms of peripheral nerve blockade. That being said, there was no data that emerged showing a significant difference between the two methods as related to our specific surgical outcomes or complications. The same is true for comparison of sciatic plus femoral nerve block compared to other peripheral nerve blockade methods. These have been added to the Future Research section of this recommendation. We will add 'neuraxial analgesia' after periarticular injections on page 165, line 1670.

K. The comparison of PAI to epidural infusions (neuraxial anesthesia) will be added to the Future Research Section under the PAI recommendation. Added the following language, "…compared with each other and to neuraxial anesthesia such as epidural infusions." to the end of the section.

L. We appreciate the reviewer's suggestion. However, the AAOS has a formal process for endorsement of guidelines created by other organizations and without having undergone this process, referencing the ASRA guideline is not possible.

M. Given the quality of the data, we were unable to find data on specific surgical outcomes and complications when comparing Neuraxial anesthesia, PAI and PNB. We will add this under the Future Research in this recommendation: "Future studies comparing the effectiveness of neuraxial anesthesia with periarticular injections and/or peripheral nerve blockade should be performed".

Respectfully,
2015 SMOAK Guideline Workgroup

Reviewer #5, Alisa Curry, APTA

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
3	Alisa Curry	American Physical Therapy Association	A. Pg. 112 - Delayed TKA: Risk and Harm - I agree that this is good at recognizing potential for longer disability B. 1658 RISKS AND HARMS OF IMPLEMENTING THIS RECOMMENDATION - Need to address potential for protocols to modulate the removal of these blocks to facilitate return of motor function gradually. Also may impact need for the transition to opioid medications from completely off to gradual. Facilitation of a better transitional process. C. 1756 FUTURE RESEARCH - May also want to include future research on the impact of functional mobility since there is also an initiative mentioned on DOS mobilization. D. 1832 FUTURE RESEARCH - Effects of post nausea? E. 1920 FUTURE RESEARCH - Future research - Tourniquet time is an area where postop Rehab and early functional return can be affected based upon the length of time the tourniquet is on. This is frequently overlooked as a cause of early pain and limiting factor for ROM. Horlocker, TT. et. al. Anesthetic, Patient, and Surgical Risk Factors for Neurologic Complications After Prolonged Total Tourniquet Time During Total Knee Arthroplasty. Anesthesia & Analgesia. 2006; 102(3): 950-955. Jacob AK. Perioperative Nerve Injury after Total Knee Arthroplasty Regional Anesthesia Risk during a 20-Year Cohort Study. Anesthesiology 2011; 114: 311–7. Olivecrona C. Tourniquet time affects postoperative complications after knee arthroplasty. International Orthopaedics. 2013; 37(5): 827-832. p. 376 - Typo - Dr. Memtsoudis is the correct spelling I believe. There is no "P" F. 3051 CRYOTHERAPY DEVICES - Cryotherapy is not clearly defined as bags or motorized pumps so there might need to be clarification. May also want to specify that this does not mean it does not positively decrease pain or function. 3080 One low quality study (Theinpoint, 2014) - Ice is usually not used DURING exercise so this study is already slightly controversial in citing it for evidence at all. G. 3094 FUTURE RESEARCH - I think making a moderate evidence determination on 4 studies for this is a bit of a leap considering the number of studies that exist

			for this subject. In addition, the highest quality study is 20 years old. I suggest that future research should be directed specifically in this area to get better results. May need to discuss the need for research into decreasing opioid usage. H. 3174 RISKS AND HARMS OF IMPLEMENTING THIS RECOMMENDATION - This should be clarified for uncomplicated TKA. There are indications for CPM in cases of revisions, patient's level of compliance, patient's capability to comply with post op exercise program. May want to correlate this with the Choosing Wisely initiative from ABIM for continuity. I. 3265 RISKS AND HARMS OF IMPLEMENTING THIS RECOMMENDATION - Risks and harms should be listed to include: - fall risk with neuraxial analgesia (blocks) if the patient does not have sufficient control of the operative limb - fall risk with Regional analgesia if not assessed appropriately (NEED TO RESEARCH ON EFFECTIVE ASSESSMENT TOOL for ambulation) - ability to mobilize affected by effective pain mgmt., mgmt. of postoperative hypovolemic recovery - coordinated effort is imperative J. 3272 FUTURE RESEARCH - Agree with evaluation recommendations. An interprofessional approach is becoming more common, with the role of Physical Therapy changing. From the shifting work hours to same day mobilization to moving patients into the post acute services earlier, the rehabilitation model is changing. This does not mean that patients are healing faster acutely however the rehab professionals must meet the demands of the acute care patient in home health, rehab and outpatient settings. It is requiring that we all modify and advance our treatment mindset with a healthy regard for the body's healing process. This is being answered with the advent of joint camps, rapid recovery protocols and group treatment models. K. 3374 RISKS AND HARMS OF IMPLEMENTING THIS RECOMMENDATION - May again want to look at the dose response for rehabilitation L. 3377 FUTURE RESEARCH - There also needs to be a coordinated effort between pain mgmt. and performing exercise programs. Many post hospital exercise programs are combating habits and deficits from earlier inabilities. Multimodal pain management strategies, early focus on ROM and definitive answers on what goals truly lay the best foundation for the best outcomes will be a good direction to aim the research. I believe there are a few clarifications needed in the recommendations for future research. The AAOS has the opportunity to make recommendations that will push better collaboration with

			other interdisciplinary team members that can help patients to achieve desired outcomes. In addition, there are some statements on Cryotherapy that run the risk of assumptions and conclusions being drawn to withhold treatment so they must take care to provide a better explanation of their position. Thank you for the opportunity to review this Clinical Practice Guideline! Alisa Curry PT DPT GTC GCS

Workgroup Response

Dear Dr. Alisa Curry,

Thank you for your expert review of the Clinical Practice Guideline on the Surgical Management of Osteoarthritis of the Knee. We will address your comments by guideline section in the order that you listed them.

A. Thanks for your comment. No change is recommended to the text.
B. Your points are well taken regarding the transition off of peripheral nerve blockade. However, the details about this transition are beyond the scope of this clinical practice guideline. We are not able to comment formally on existing protocols.
C. Added the following statement to the future research section of the Periarticular Local Anesthetic Infiltration recommendation: "The impact of periarticular injection for pain relief on day of surgery mobilization should also be further explored."
D. It is not clear what the reviewer is suggesting by the effect of post nausea related to neuraxial anesthesia. No changes were recommended to guideline.
E. The study by Liu 2014 showed better quadriceps function when no tourniquet was used. Given that this recommendation supports in a limited fashion the use of no tourniquet, no further changes will be made. The articles the reviewer suggests were not able to be included in this guideline based on our strict inclusion criteria (i.e. the referenced studies are retrospective designs).
   On p. 376, we have changed the spelling to Dr. Memtsoudis. Thank you.
F. Cryotherapy in this guideline was defined as any cold therapy. The Theinpoint, 2014 article suggested less flexion due to use of the device in general. We don't believe it was used 'during' therapy.
G. Please note the specific methodology for development of an AAOS Clinical Practice Guideline. There are strict rules as to how evidence from studies is classified. The workgroup determines the inclusion criteria for articles prior to literature review to minimize bias. The endpoint of pain relief implies decreased narcotic use.
H. The recommendations from this Clinical Practice Guideline relate only to primary Total Knee Arthroplasty and not revisions. The available evidence in this area did not support further conclusions. Decisions about the ABIM Choosing Wisely campaign are made by the AAOS Board of Directors.
I. We agree with your comments and feel that your suggestion about a coordinated multidisciplinary effort is covered in the Risks/Harms section.
J. Thanks for the reviewer's comments and support.
K. We are not clear what specific question is being asked by the reviewer.
L. We appreciate your comments and passion. We believe the Future Research section covers the essence of your suggestions.

Respectfully,
2015 SMOAK Guideline Workgroup

Reviewer #6, Keith Fehring, AAHKS

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
6	Keith Fehring	American Association of Hip and Knee Surgeons	A. Page 9, line 211: I worry that these recommendations will be extrapolated to all patients undergoing TKA due to these guidelines, which I think is inappropriate. This statement is true in the right patient in experienced hands. I do not believe this statement has strong evidence and question its ability to be applied to all TKAs by all surgeons. It is noted on page 306, line 2547 that there are concerns of using these implants in certain patients and some are at high risk of complications, however this is not apparent unless you read the entire document. Registry data from UK, Australia, Sweden and New Zealand show lower failure rates with cemented fixation, as do a meta-analysis from JBJS Br 2009. Most data supporting cementless fixation in TKA have small numbers and are usually published by surgeons very experienced with the technique. Two of the articles (Pulido et al. and Fernandez-Fairen et al) use TM implants which I would argue is different in terms of performance and cost than the average cementless TKA components on the market, and these seem to be the basis for much of the argument. My opinion on this recommendation can also be applied to the moderate/limited recommendations regarding cementless femoral and tibial components or hybrid fixation. B. Page 10, line 268: I would recommend this as limited evidence that UKA has improved survivorship and lower complications when compared HTO, as there are a few articles that support this claim. One of the articles cited (Stukenborg) showed higher survivorship with UKA during a time period where the design of the UKA was arguably and stated an older design of UKA. One of the issues is that comparative data on this topic is difficult to find in recent literature, likely due to the success of UKA and the almost abandonment of the HTO in this patient population in many practices. Many studies cite the difficulty in comparing these groups as a reason there is a lack of comparative data on the subject. I think when evaluating this subject we need to compare recent mid-term and long term data looking at UKA and HTO results separately and then try to draw conclusions rather than looking at the few comparative studies looking at these procedures. Although comparative literature is limited, recent studies (Price et al., Miettinen et al., Kim et al., Streit et al.) have shown 9-20 year survival rates of UKA at 85-95% which is comparable to TKA and improved from earlier reports of UKA and osteotomy. 2 more recent articles (Dettoni et al. (2010) and Griffin et al. (2007)) reviewed the literature on this

			topic and found UKA had increased survivorship, lower complications, and similar function when compared to HTO, although the results were not statistically significant. A Cochrane review of the subject (Brower et al.) also showed evidence that there were more complications and similar function when compared with UKA. I would recommend changing the recommendation to limited evidence that UKA has improved survivorship and lower complications when compared HTO, or add to the current recommendation that there are increased complication rates with HTO over UKA, as this is supported by the literature. C. Page 11, line 244: The wording of this statement is too definitive with "no increased complications," and there is concern with adding this statement to the recommendation. We believe this should be tempered with regards to this statement. We do not believe that we can definitively say there are no increased complications as the one cited study (Yoon et al. 2010) concludes that there is a minimal increase in systemic complications. Fu et al. (Journal of Arthroplasty 2013) also published a systematic review of available studies on the subject finding increased mortality, PE, and blood transfusion when comparing simultaneous bilateral TKA vs. staged bilateral TKA. Also, the body of the CPG cites registry studies and retrospective reviews that showed increased complications with the simultaneous bilateral TKA group. Thus, we believe the statement that "there are no increased complications" is too definitive and should be removed until further comparative, prospective studies can be performed. D. Page 11, line 274. The wording of this recommendation seems too strong. If there is no difference in outcomes or complications, then it seems reasonable to use navigation if preferred. This statement as is states one should not use navigation, however there are certain situations where navigation is beneficial, supported by literature, and are noted in the body (malunion, severe deformity, intramedullary implants). E. Page 11, Line 280 and 287: The wording of this recommendation seems too strong based on the current literature. If there is no difference in pain, function, transfusions and complications as an alternative treatment, then it seems reasonable to use PSI because there is no difference in outcome. Similar rationale as the navigation recommendation. F. Page 6, line 125: I do not believe that an 8 month delay in TKA is optimal and do not agree with the moderate recommendation that it does not worsen outcomes. This recommendation is based primarily on one study as cited in the body. Studies from Canada (Multiple studies by Desmeules et al.) have looked at delays in TKA and

			found that delays > 9 months showed significantly worse outcomes in pain, function, and HRQoL. Thus, the literature is lacking to support the claim that there are worse outcomes with a delay in TKA and this should be investigated further prior to this recommendation.

Workgroup Response

Dear Dr. Keith Fehring,

Thank you for your expert review of the Clinical Practice Guideline on the Surgical Management of Osteoarthritis of the Knee. We will address your comments by guideline section in the order that you listed them.

A) The evidence for the use of contemporary uncemented implants was systematically analyzed in this set of PICO questions. The Pulido, et al. study was graded as moderate quality, the Fernandez-Fairen, et al. study was characterized as high quality. Although they both involved "Trabecular Metal tibia" (Zimmer, Inc., Warsaw, IN, USA), the majority of implants/ designs studied were various brands other than Trabecular Metal. These included: *High quality (*Beupre et al.: Stryker (Scorpio); Lizaur-Utrilla et al.: Lima (Multigen); Kim et al.: Zimmer (NexGen); Demey: Tornier (HLS Noetos) and *Moderate quality* (Baker et al.: J+J (PFC); Carlsson et al.: J+J (PFC); Khaw et al.: J+J (PFC); Pandit et al.: Biomet (Oxford); Parker et al.: Zimmer (Miller-Galante); Park et al.: Zimmer (NexGen)). The studies were appropriately adjusted for surgeon-designer/ conflicts.

   Formal registry data, unless published in a peer review manuscript, cannot be used in the AAOS paradigm. Rather, we focused on studies with patient-oriented outcomes of sufficient quality.

   The JBJS (Br) meta analysis referred to (Gandhi, et al.) was not originally retrieved by our search because the authors included all primary diagnoses for patients undergoing TKA in their analysis, and we focused on studies of patients where at least 90 % of enrollees had osteoarthritis as the primary diagnosis. However, we did include appropriate RCTs that were used in the Gandi, et al. analysis (i.e. those that met our inclusion criteria). One note about their meta-analysis is that they include observational studies along with RCTs which dilutes the end result. They even clarify the differences in their analyses when using RCTs vs. RCTs and observational studies, stating, “The results of this meta-analysis, with inclusion of RCTs and observational studies, demonstrate a statistically significant benefit towards improved survival of the cemented compared to uncemented components, with follow-up ranging from two to 11 years. However, subgroup analysis of the RCT data in isolation showed no differences between groups for odds of implant survival. There were no clinical differences in outcomes between groups as measured by the Knee Society Score.” It seems that their statistical conclusions were similar to ours regarding no difference between cemented and uncemented components.

B) Reviewing the literature cited, there are no further comparative studies that meet inclusion criteria that change the guideline outcome. The RCT by Stuckenborg, et al is included. Non-comparative studies did not fulfill the CPG inclusion criteria. When Dettoni (2010), Griffin (2007), and Brower (2007) were deconstructed to primary sources per the AAOS paradigm, moderate evidence supports no difference between unicompartmental knee arthroplasty (UKA) or valgus-producing proximal tibial osteotomy in outcomes and complications in patients with medial compartment knee osteoarthritis (Table 10).

Table 10. Breakdown of articles presented by reviewer

Dettoni (2010)	Systematic review. Results from bibliography search of nine studies in this review: 5 articles did not meet quality standards for inclusion, 1 was not published in a journal, 1 was unclear if patient population was relevant, and two RCT's by Stukenborg 2001 and Borjesson 2005 were already included in the guideline
Griffin (2007)	Systematic review. Bibliography was already screened. Results from screening of 18 included studies: 5 studies were included in the guideline (Newman, Cameron, Stukenborg, Borjesson, Weidenhielm). 6 studies did not meet minimum quality criteria for inclusion. 3 studies were not in English. 1 used an unvalidated outcome, and 1 had no patient oriented outcomes. 1 study was unclear if patient population was relevant. 1 study was of cost not patient reported outcomes.
Brower (2007)	Systematic review. Results from bibliography screening of 11 studies in this review: 9 out of 11 included studies compared variations of osteotomy to each other, and would not adequately answer if osteotomy was better or worse than UKA or TKA. Two RCT's by Stukenborg 2001 and Weidenhielm 1993 compared HTO to UKA, and are already included in the guideline.

C) The evidence to report "no increased complications" was determined only for the subset of patients who had an ASA score of 1 or 2 and were less than 70 years of age in the Yoon, et al 2010 study.

The systematic review referred to (Fu et al. Journal of Arthroplasty 2013) was reviewed by the AAOS analysts after you brought it to our attention. Four of the manuscripts referenced could not be used based on criteria that were agreed upon before the manuscripts were pulled (as is reviewed in Table 2). A summary is given below in Table 11.

Table 11. Articles included in Fu et al. meta-analysis with reasons for exclusion from guideline

First Author	Year	Reason for exclusion from guideline	Found in AAOS literature search/ peer
Meehan	2011	Unclear if 90% of TKA patients had OA. They excluded those with ICD-9 codes 696 (Psoriasis and similar disorders), 710(diffuse diseases of connective tissue), and 714(RA and inflammatory polyarthopathies), but exclusions were not made for post traumatic arthroplasty (ICD-9 716)	no
Qian	2008	Pub med says this article is in chinese	no
Morrey	1987	Less than 90% OA and would be very low quality due to no adjustment for confounding variables	no
Willian	1978	Improperly cited in the review, so unable to locate article in bib screening. They mention this study in table 1 a/b of the systematic review, but I couldn't find the citation in the bibliography	no
forster	2006	Very low quality due to retrospective and no adjustment for confounding variables	yes
Jankiewicz,J.J	1994	Less than 90% OA	yes
Sliva,C.D.	2005	Very low quality	yes
Hutchinson,J.R.M.	2006	Very low quality due to preoperative demographic differences, and different lengths of follow-up. Not all patients had knee OA	yes
Soudry,M	1985	Very low quality. Patients deemed too unhealthy to undergo anesthesia multiple times were given simultaneous surgery. There was no control for this confounding factor; not all patients have OA	yes
McLaughlin,T.P.	1985	Very low quality due to being retrospective, and not adjusting for potential confounders in the analysis; not all patients had knee OA	yes
Mangaleshkar,S.R.	2001	Unclear if 90% of patients had knee OA	yes

First Author	Year	Reason for exclusion from guideline	Found in AAOS literature search/ peer
Stefansdottir,A.	2008	Unclear if all patients had bilateral arthroplasty. The author makes the assumption that all patients in the registry who had another arthroplasty within the next hear had bilateral symptoms at baseline.	yes
Yoon,H.S.	2010	Included	yes
Ritter,M.	1997	Less than 90% OA; would be very low quality due to not adjusting for potential confounding variables.	yes
Liu,T.K.	1998	Very low quality because allocation was based on clinical characteristics that would have resulted in differences in group demographics. Potential confounders were not controlled for in the statistical analysis, resulting in very low quality rating; not all patients had knee OA	yes
Stubbs,G.	2005	Very low quality. Retrospective inadequate confounding adjustment	yes
ritter	2003	Less than 90% OA; would likely be very low quality due to not adjusting for potential confounding factors	yes
Stanley	1990	Not recalled due to all patients having RA	yes

The registry studies and retrospective reviews that showed increased complications with the simultaneous bilateral TKA group noted in the discussion were not included in the analysis as they did not meet inclusion criteria. Memtsoudis 2011 was mentioned as this study helped define the higher risk patient by showing that patients who suffered a major complication had a higher prevalence of comorbidities including, specifically, chronic lung diseases, congestive heart failure and pulmonary hypertension.

D) The AAOS CPG paradigm stipulates that we are supposed to recommend against an additional technology or intervention (in this case navigation) that does not improve the more commonly used technology (knee arthroplasty). The situations brought forward by the reviewer are salient and are mentioned in the CPG discussion, line 2846-48, malunion / severe deformity / intramedullary implants.

E) The AAOS CPG process stipulates that we are supposed to recommend against an additional technology or intervention (PSI) that does not improve the more commonly used technology (knee arthroplasty).

F) The recommendation does not disagree with your point. Using systematic analysis the evidence supports up to an 8 month delay in TKA without worsening outcomes. This recommendation is based primarily on one study. The Desmeules et al. (2012) study did find that delays > 9 months showed significantly worse outcomes in pain, function, and HRQoL. This study met our inclusion criteria, but quality was rated very low. The article did a good job controlling for confounding variables, but was downgraded for large loss to follow-up and selective reporting.

Respectfully,
2015 SMOAK Guideline Workgroup

Reviewer #7, Michael Dohm, AAHKS

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Please provide a brief explanation of both your positive responses to the Structured Peer Review Form Questions
7	Michael Dohm, MD	American Association of Hip and Knee Surgeons	A. Page 42: Rationale: BMI as a Risk Factor: The 2014 National Joint Registry for England, Wales and Northern Ireland reports that BMI between 25 and 30 (units should be verified) has the lowest risk of mortality. B. Page 42: Risk/ Harms Statement: The 2014 National Joint Registry for England, Wales and Northern Ireland reports a "particular risk of death" associated with TKA in patients with liver disease, Diabetes, Renal Disease, and Cancer. These (rather than the above) co-morbidity groups. C. Page 231: Future Research: The 2013 Annual Report of the Dutch Arthroplasty Register states that 89% of all implants are placed with gentamicin in the bone cement. The results over the next 5-10 years may be very illuminating. D. Page 252: Line 2255: (All Poly tibia) In the 2014 National Joint Registry for England, Wales and Northern Ireland The increased popularity of a non-modular all poly tibial TKA is reported but there is no further delineation between all poly UKA vs TKA and this should be further investigated. Some 2 and 5 years studies suggest questionable results with all polyethylene components. A randomized trial of all-polytheylene and metal-backed tibial components in unicompartmental arthroplasty of the knee, J.R.B. Hutt, P. Farkhadria, V. Masse', M. Lavigne, P.A. Vendittoli in Bone Joint J June 2015 97-B: 786-792 Discuss inferior outcomes in all-polyethylene tibial components at 7 years. Utilization of all-polyethylene components should be further studied. E. Page 275: Line 2367: In the Australian Orthopaedic Association National Joint Replacement Registry Annual Report 2014 patients with Rheumatoid Arthritis had a 5.4% revision rate at 13 years if patella resurfaced and 6.0 % if no patellar resurfacing at 13 years. If Osteoarthritis, there was a 6.0% revision rate at 13 years if resurfaced and 7.4% at 13 years if not resurfaced. Also noted was that "There may be benefit to using a patellar prosthesis in a major revision if the patella has not been previously resurfaced". The Swedish Knee Arthroplasty Register 2014 reported that in 2003-2012 that TKA with patellar button had higher risk of revision than those without. The 2013 Annual Report of the Dutch Arthroplasty Register reports that only 20% of patellas are resurfaced in TKA in the Netherlands.

			F. Page 306: (Bone Cement): Line 2541: The Swedish Knee Arthroplasty Register 2014 reports that an uncemented Tibial component has 1.7 x the risk for revision compared to cemented. G. Page 382: (UKA): The Swedish Knee Arthroplasty Register 2014 reports a recent reversal of previous findings: UKA conversions are at 2 x the risk of revision compared to TKAs (over study period). The Australian Orthopaedic Association National Joint Replacement Registry Annual Report 2014 states that UKA revisions are 19% at 13 years with younger than 55 year old patients at 29% revision and 55-64 year old age group at 22% cumulative revision rate. The Australian Register does not report one of the most frequently used UKA implants found in the Swedish Register. The Dutch also do not report using this frequently used UKA in Sweden. There is also no delineation of all poly tibial component vs metal backed tiba in UKA. The Swedish, Australian and Dutch Registries report an 8-10% utilization of UKA for all knee arthroplasties. In the 2014 National Joint Registry (NJR) for England, Wales and Northern Ireland patients with a UKA are at much lower risk for mortality than with TKA. The short term mortality of UKA is less than TKA. The NJR does not separate medial from lateral uni. 60% of their UKAs are mobile bearing and there is a 3 x higher uni revision rate compared to a TKA. H. H. Page 437: The Swedish Knee Arthroplasty Register 2014 reports drains used in only 17% of all cases.

Workgroup Response

Dear Dr. Michael Dohm,

Thank you for your thoughtful comments and insights on the proposed clinical practice guideline. Many, if not all, of the comments reference one or more joint registries; the AAOS currently does not include registry data as evidence unless that data is published in a peer review manuscript.

A) Formal registry data, unless published in a peer review manuscript, cannot be used in the AAOS paradigm. Rather, we focused on studies with patient-oriented outcomes of sufficient quality.

B) Formal registry data, unless published in a peer review manuscript, cannot be used in the AAOS paradigm. Rather, we focused on studies with patient-oriented outcomes of sufficient quality.

C) Formal registry data, unless published in a peer review manuscript, cannot be used in the AAOS paradigm. Rather, we focused on studies with patient-oriented outcomes of sufficient quality.

D) Formal registry data, unless published in a peer review manuscript, cannot be used in the AAOS paradigm. Rather, we focused on studies with patient-oriented outcomes of sufficient quality.

We agree that the use of all-polyethylene components should be further studied, based on our prior review as well as the paper that you referenced. We have highlighted this approach in the future research section. Unfortunately, the reference that you cited was published after the end cut-off date for inclusion in the CPG.

E) Formal registry data, unless published in a peer review manuscript, cannot be used in the AAOS paradigm. Rather, we focused on studies with patient-oriented outcomes of sufficient quality.

F) Formal registry data, unless published in a peer review manuscript, cannot be used in the AAOS paradigm. Rather, we focused on studies with patient-oriented outcomes of sufficient quality.

G) Formal registry data, unless published in a peer review manuscript, cannot be used in the AAOS paradigm. Rather, we focused on studies with patient-oriented outcomes of sufficient quality.

H) Formal registry data, unless published in a peer review manuscript, cannot be used in the AAOS paradigm. Rather, we focused on studies with patient-oriented outcomes of sufficient quality.

Respectfully,
2015 SMOAK Guideline Workgroup

Public Comment Submissions

Public Comment Disclosure Information

Reviewer Number	Name of Reviewer (Required)	Please list your AAOS Customer # below (Required):
1	Thomas Vail, MD	25439

To review disclosures of submissions with an AAOS customer ID, please visit:
http://www7.aaos.org/education/disclosure/search.aspx

Public Comment Responses to Structured Public Comment Form Questions

All public commenters are asked 16 structured peer review questions which have been adapted from the Appraisal of Guidelines for Research and Evaluation (AGREE) II Criteria*. Their responses to these questions are listed on the next few pages.

Table 9. Peer Reviewer Responses to Structured Peer Review Questions 1-4

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	1. The overall objective(s) of the guideline is (are) specifically described.	2. The health question(s) covered by the guideline is (are) specifically described.	3. The guideline's target audience is clearly described.	4. There is an explicit link between the recommendations and the supporting evidence.
1	Thomas Vail, MD	The Knee Society	Strongly Agree	Strongly Agree	Strongly Agree	Agree

Table 10. Peer Reviewer Responses to Structured Peer Review Questions 5-8

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	5. Given the nature of the topic and the data, all clinically important outcomes are considered.	6. The patients to whom this guideline is meant to apply are specifically described.	7. The criteria used to select articles for inclusion are appropriate.	8. The reasons why some studies were excluded are clearly described.
1	Thomas Vail, MD	The Knee Society	Strongly Agree	Strongly Agree	Agree	Agree

Table 11. Peer Reviewer Responses to Structured Peer Review Questions 9-12

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	9. All important studies that met the article inclusion criteria are included.	10. The validity of the studies is appropriately appraised.	11. The methods are described in such a way as to be reproducible.	12. The statistical methods are appropriate to the material and the objectives of this guideline.
1	Thomas Vail, MD	The Knee Society	Agree	Strongly Agree	Strongly Agree	Strongly Agree

Table 12. Peer Reviewer Responses to Structured Peer Review Questions 13-16

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	13. Important parameters (e.g., setting, study population, study design) that could affect study results are systematically addressed.	14. Health benefits, side effects, and risks are adequately addressed.	15. The writing style is appropriate for health care professionals.	16. The grades assigned to each recommendation are appropriate.
1	Thomas Vail, MD	The Knee Society	Agree	Strongly Agree	Strongly Agree	Agree

Table 13. Public Commenter's Recommendation for Use of this Guideline in Clinical Practice

Would you recommend these guidelines for use in clinical practice?

Reviewer #	Name of Reviewer (Required)	What is the name of the society that you are representing?	Would you recommend these guidelines for use in clinical practice?
1	Thomas Vail, MD	The Knee Society	Recommend

Public Commenter Detailed Responses
Submission #1, Thomas Vail, MD; The Knee Society

A) BMI AS A RISK FACTOR

Lines 83 to 88

Strength of recommendation: Strong evidence

The literature used to make this recommendation was based on four high quality papers extracted that addressed complication rates after total knee arthroplasty for obese 1374 patients. Two (Bordini 2009, Judge 2012) demonstrated no higher complication rates in obese patients, whereas the 1375 other two (Jamsen, 2013, Amin,2006) did show higher rates of complications. The conflicting high quality papers 1376 negate each other and did not allow for a recommendation regarding complications. There were two high quality papers 1377 that demonstrated less improvement in functional outcomes in obese patients after total knee arthroplasty (Judge 2012, 1378 Amin 2006). As such the recommendation was made that strong evidence supports the risk for less good outcomes 1379 after total knee arthroplasty.

Although there are 2 high quality studies demonstrating fewer improvements in functional outcomes, we found an additional high quality study that negates this. In a prospective matched cohort study by Lizaur-Utrilla et al. (JOA 2014) of 171 obese versus 171 non-obese cementless TKAs, there were no significant differences in overall functional outcomes or component alignment. There was similar implant survivorship between groups at 7 years. We found a further two peer-reviewed and high quality studies that have been published more recently, demonstrating no difference/more improvements in patients who undergo TKA. One study by Nelson et al. (CORR 2015) demonstrated that it is not obesity itself that influences outcomes, but rather low albumin levels. Morbidly obese patients did not have an increased mortality rate (0.14 vs 0.14%; p=0.94) compared to nonmorbidly obese patients. However, mortality was significantly higher in the low serum albumin group compared with the group with normal serum albumin (0.64% vs 0.15%; OR, 1.27; 95% CI, 1.09-2.75; p = 0.020). Cherian et al. (CORR 2015) demonstrated that obesity was not associated with higher rates of aseptic loosening (OR 2.28; 95% CI 0.6-8.62; p=0.22).

Additionally, we found three peer-reviewed and moderate quality studies that have been published more recently, demonstrating no difference/more improvements in patients who undergo TKA. In Shetty et al.'s level II study (CORR 2015), 635 TKAs with BMI < 30 were compared to 520 TKAs with BMI >30. No significant difference in postoperative limb alignment (179.7° ± 1.7° vs 179.6° ± 1.8°), coronal femoral (90.2° ± 1.6° vs 89.8° ± 1.9°) and tibial component (90.2° ± 1.6° vs 90.3° ± 1.7°) alignment and outlier rates (6.2% vs 7.5%) was found between non-obese and obese individuals. Similarly, alignment and the outlier rates were similar when non-obese individuals and a subgroup of morbidly obese individuals (BMI >40 kg/m(2)) were compared. In addition, Plate et al.'s (KSSTA 2015) evaluation of 746 UKAs demonstrated no correlation of obesity with post-operative Oxford knee scores or revision surgery rates. Napier et al. (Knee 2014) also evaluated complication rates (anesthetic times and length of hospital stay) up to one year post-operatively and noted that they were not significantly higher in morbidly obese patients.

Given the recent increasing trends of obese patients, consideration should be given to these more recent studies that demonstrate comparable post-operative results compared to non-obese patients. **Based on these additional studies, we do not think this should be classified as 'strong evidence' against, but potentially as inconclusive or moderate evidence against.**

B) DIABETES AS A RISK FACTOR

Also see: Page 43, Rationale: Diabetes as a Risk Factor.

Recommendation is OK

Strength of the recommendation: **moderate evidence is generous. It could just as easily be Limited based upon the points noted below.**

In table 5, pages 50-51, there is one high quality study (Jamsen E 2013) that shows higher revision after TKA in patients with Diabetes only between 0-5 years but not after 5 years. In addition, there are 3 moderate quality studies listed (Duchman KR 2014; Jamsen E 2012; Jones CA 2012). Two of these moderate studies do not show any increase in complications (Duchman KR 2014; Jamsen E 2012) and one (Jones CA 2012) notes no difference in WOMAC function but increased pain in Diabetic patients. This study therefore offsets itself while the other two moderate studies contradict

the one high quality study that only found higher revision in years 0-5 but not beyond. Moderate versus Limited strength is high debatable.

CHRONIC PAIN AS A RISK FACTOR
No concern with recommendation

DEPRESSION/ANXIETY AS A RISK FACTOR
Agree with recommendation.

There is increasing evidence showing that depression and anxiety maybe associated with higher rates of dissatisfaction and pain but not enough evidence to change this recommendation.

CIRRHOSIS/HEPATITIS C AS A RISK FACTOR
Recommendation is OK

Strength of the recommendation is OK

PREOPERATIVE PHYSICAL THERAPY
These studies may demonstrate better short-term outcomes and potentially patient satisfaction in those who undergo prehabilitation. **We agree that there is limited evidence for improved long-term outcomes with these therapies, and this warrants further study.**

C) DELAY TKA
The guideline states in the Rationale section that there was ONE high quality study (Tuominen, U., 2010) but both the graphic depicting the number of high quality studies on page 41 and the Rationale section on page 113-117 list TWO high quality studies (Hirvonen, J., 2007). The study by Hirvonen looks at the preadmission scores of patients who were randomized to a short (median=73 days) vs. non-fixed waiting time (median=266 days). We question why this study was included since it does not examine the postoperative outcome of the patients as an effect of waiting time.

Therefore, it does not support or contribute to the Recommendation. Furthermore, there **needs to be further research** on the cost to society of delaying arthroplasty when the patient is otherwise ready to proceed with surgery (missed work, etc.). There also needs to be further study on the effect of surgical delay on the patient's pain and suffering during the delay period.

PERIARTICULAR LOCAL ANESTHETIC INFILTRATION
We agree with the recommendations set forth regarding the use of "Peri-Articular local injection".

PERIPHERAL NERVE BLOCKADE
Agree with recommendations. Good randomized controlled trials all demonstrating decreased opioid consumption compared to no peripheral neve block.
Only comment is that these nerve blocks are comparable to epidural or spinal anesthesia in terms of postoperative pain control and not superior. That is, the power of nerve blocks is most evident when general anesthesia is used. The efficacy of single shot blocks when long acting spinals and postoperative epidurals are used are not clear.

Risks of femoral nerve block such as falls and nerve injury should not be downplayed.

D) NEURAXIAL ANESTHESIA
Agree with the recommendations. The references below all support neuraxial over general but were likely excluded given that they are large database reviews. We not sure it is absolutely the right thing to do to leave these out given the increasing significance of "big data" approaches to help answer clinical questions.
Pugely AJ, Martin CT, Gao Y, Mendoza-Lattes S, Callaghan JJ. Differences in short-term complications between spinal and general anesthesia for primary total knee arthroplasty. *J Bone Joint Surg Am*. 2013 Feb 6;95(3):193-9. doi: 10.2106/JBJS.K.01682.

Liu J, Ma C, Elkassabany N, Fleisher LA, Neuman MD. Neuraxial anesthesia decreases postoperative systemic infection risk compared with general anesthesia in knee arthroplasty. *Anesth Analg.* 2013 Oct;117(4):1010-6. doi: 10.1213/ANE.0b013e3182a1bf1c. Epub 2013 Sep 10.
Memtsoudis SG1, Rasul R, Suzuki S, Poeran J, Danninger T, Wu C, Mazumdar M, Vougioukas V. Does the impact of the type of anesthesia on outcomes differ by patient age and comorbidity burden? *Reg Anesth Pain Med*. 2014 Mar-Apr;39(2):112-9. doi: 10.1097/AAP.0000000000000055.

E) TOURNIQUET: BLOOD LOSS REDUCTION

We agree with recommendation and strength of recommendation. In addition, the future direction for more high quality, Level one studies that take into consideration modern blood conservation techniques such as tranexamic acid are warranted. It would be helpful if the table was stratified by complication. Since the only complication addressed with tourniquet use in the guideline was blood loss/transfusions, the addition of other complications (DVT, MUA) into this table make it confusing to read and these should either be separated out or removed since they are not addressed in the guideline.

F) TOURNIQUET: POSTOPERATIVE PAIN REDUCTION

We agree with recommendation and strength of recommendation.

G) TOURNIQUET: POSTOPERATIVE FUNCTION

Suggest revision of the recommendation as follows: Limited evidence supports that tourniquet use in total knee arthroplasty (TKA) decreases postoperative function and quality of life in the short term.

The study by Ejaz, A demonstrated that KOOS (QoL) scores were significantly better in the no tourniquet group at 2 months but not at 6 months and 1 year so therefore I added the words “and quality of life” to the Recommendation.

TRANEXAMIC ACID

We agree with recommendation and strength of recommendation.

H) ANTIBIOTIC BONE CEMENT

We agree that **literature is lacking in evidence to either support or not support the use of antibiotic loaded bone cement** (ALBC) in primary TKA. However, the statement as read seems to favor not using ALBC, even in high risk patients. In addition, it seems to conflict with the data presented in the chart. Both moderate quality studies cited on page 230 depict less infection complications in the antibiotic group. In addition, given the low frequency of infection and the mixed population, these studies are most likely underpowered. In addition, the lack of inclusion of worldwide registry data makes these even more difficult to decipher.

A more appropriate statement would be: There is limited evidence in the literature that the routine use of antibiotic loaded bone cement reduces infection in primary total knee arthroplasty. As opposed to stating the limited evidence does not support the use as the data would suggest evidence in favor just low quality.

CRUCIATE RETAINING ARTHROPLASTY

We agree with recommendation and strength of recommendation.

I) POLYETHYLENE TIBIAL COMPONENT

We have some concern about the strong recommendations for an all poly tibia. They have "missed" one important, level 1 study but it was just published and we are not sure they can include it. While this is a UKA study, the rationale includes UKA in their data reviewed.

Bone Joint J. 2015 Jun;97-B(6):786-92. doi: 10.1302/0301-620X.97B6.35433.
A randomised trial of all-polyethylene and metal-backed tibial components in unicompartmental arthroplasty of the knee.

Hutt JR1, Farhadnia P1, Massé V1, LaVigne M1, Vendittoli PA1.

Abstract
This randomised trial evaluated the outcome of a single design of unicompartmental arthroplasty of the knee (UKA) with either a cemented all-polyethylene or a metal-backed modular tibial component. A total of 63 knees in 45 patients (17 male, 28 female) were included, 27 in the all-polyethylene group and 36 in the metal-backed group. The mean age was 57.9 years (39.6 to 76.9). At a mean follow-up of 6.4 years (5 to 9.9), 11 all-polyethylene components (41%) were revised (at a mean of 5.8 years; 1.4 to 8.0) post-operatively and two metal-backed components were revised (at one and five years). One revision in both groups was for unexplained pain, one in the metal-backed group was for progression of osteoarthritis. The others in the all-polyethylene group were for aseptic loosening. The survivorship at seven years calculated by the Kaplan-Meier method for the all-polyethylene group was 56.5% (95% CI 31.9 to 75.2, number at risk 7) and for the metal-backed group was 93.8% (95% CI 77.3 to 98.4, number at risk 16) This difference was statistically significant ($p < 0.001$). At the most recent follow-up, significantly better mean Western Ontario and McMaster Universities Arthritis Index Scores were found in the all-polyethylene group (13.4 vs 23.0, $p = 0.03$) but there was no difference in the mean Kneeinjury and Osteoarthritis Outcome scores (68.8; 41.4 to 99.0 vs 62.6; 24.0 to 100.0), $p = 0.36$). There were no significant differences for range of movement ($p = 0.36$) or satisfaction ($p = 0.23$). This randomised study demonstrates that all-polyethylene components in this design of fixed bearing UKA had unsatisfactory results with significantly higher rates of failure before ten years compared with the metal-back components.

KEYWORDS:
All Polyethylene; Fixed Bearing; Knee; Randomised; Unicompartmental
Further, they did not include in their analysis the following study which showed suboptimal results with the AGC all poly tibia:

J Bone Joint Surg Am. 2003 Mar;85-A(3):489-93.
The AGC all-polyethylene tibial component: a ten-year clinical evaluation.
Faris PM1, Ritter MA, Keating EM, Meding JB, Harty LD.

Abstract
BACKGROUND: While high success rates have been achieved in association with other all-polyethylene tibial components, an alarming number of failures have occurred at our institution in association with the use of an all-polyethylene version of the AGC tibial component. The purpose of the present study was to describe the survival of the AGC all-polyethylene tibial component.

METHODS:
Five hundred and thirty-six AGC all-polyethylene tibial components were implanted in 405 patients and were followed over a ten-year period. The average age of the patients at the time of surgery was 70.3 years, the average weight was 78 kg, and the most common diagnosis was osteoarthritis (prevalence, 92.9%). A clinical and radiographic analysis was performed, Knee Society knee and function scores were determined, and Kaplan-Meier survivorship analysis was conducted. Failure was defined as aseptic loosening as evidenced by progressive radiolucent lines and/or revision due to aseptic loosening or collapse.

RESULTS:
A high rate of failure was noted in the early postoperative period, with a survival rate of 90.04% (95% confidence interval, 87.35% to 92.72%) after three years. At ten years, the survival rate was 68.11% (95% confidence interval, 57.57% to 78.65%). Fifty-eight (73.4%) of seventy-nine failures occurred in association with loosening or collapse of the bone beneath the medial tibial plateau.

CONCLUSION:

While some all-polyethylene tibial designs have been successful, the low success rate among knees treated with the AGC all-polyethylene tibial component suggests that the results associated with all-polyethylene tibial components are design-sensitive.

LEVEL OF EVIDENCE:
Therapeutic study, Level IV (case series [no, or historical, control group]). See Instructions to Authors for a complete description of levels of evidence.
While the rationale says that the results may be design specific, We are concerned that the present wording may be misleading and could lead to harm as most of the studies included were of one design, particularly combined with the strong recomendation. I might suggest a **change to the wording to better reflect this**: ***Strong evidence supports use of either all-polyethylene or modular tibial components in knee arthroplasty (KA) because of no difference in outcomes, with certain (or specific) implant designs .***

PATELLAR RESURFACING: PAIN AND FUNCTION
Agree with recommendation

PATELLAR RESURFACING: REOPERATIONS
Page 9, Line 205: Patellar Resurfacing :Reoperations
Recommendation is OK

Strength of the recommendation is OK. However, this is close to strong evidence rather than moderate evidence, as there is 1 high quality study (Breeman 2011 and Murray 2014) that show reduced re-operation after resurfacing, and two moderate quality studies (Newman 2000 and Barrack 2001) that showed reduced re-operation after resurfacing. Do two moderate studies and 1 high quality study equal two high quality studies? Should this be strong evidence? The summary of recommendations on Page 4 does not address this specifically.

J) CEMENTED TIBIAL COMPONENTS VS. CEMENTLESS TIBIAL COMPONENTS (RMM)
There is concern that the data included obviously cannot cover all knees currently on the market and hence, some of the findings could be very design specific. While the rationale includes this statement, not many will read that part and hence I think the recommendation itself should have that wording included. The clarification does state that the recommendations must be tempered that they are design specific and for that reason alone, which supports that there should not be any 4-star recommendations on cemented versus cementless fixation in TKA because the data is not robust across patients and designs. **We would favor downgrading the recommendation to 3 stars to be consistent with the literature and also across all cementless fixation.**

CEMENTED FEMORAL & TIBIAL COMPONENTS VS. CEMENTLESS FEMORAL & TIBIAL COMPONENTS
We agree with recommendation and strength of recommendation.

LL CEMENTED COMPONENTS VERSUS HYBRID FIXATION (CEMENTLESS FEMORAL COMPONENT)
We agree with recommendation and strength of recommendation.

ALL CEMENTLESS COMPONENTS VERSUS HYBRID FIXATION (CEMENTLESS FEMORAL COMPONENT)
We agree with recommendation and strength of recommendation.

BILATERAL TKA
We agree with recommendation and strength of recommendation.

K) UKA: REVISIONS
We do not agree with the two statements concerning Revision and UKR and Risk of DVT with UKR.

While many agree that TKR is a more predictable procedure than UKR, when done by surgeons with appropriate expertise and on appropriate patients, the results of re operation are comparable out to the second decade. A recent paper (Brottle et al, Bone and Joint Journal, 2014) looking at the risk of return to the OR and found that the risk of a return to OR was 1/2 compared to TKR in a large data set. Riff et al (in Clin Sports Med 2014) found that UKR was an acceptable alternative to TKR in appropriate patients.

It is unclear why the RCT by Newman et. al was considered of moderate quality? It was an RCT? Further, they only considered the 1998 data (at 5 years) and not the 15 year data that was published in 2009 and shows a HIGHER rate of revision amongst TKA compared to UKA with survivorship of 89.8% at 15 years for UKA compared to 78.7% for TKA? To conclude that TKA reduces the risk of revision based on the above just does not seem to have been an evidence based decision

L) UKA: DVT & MANIPULATION UNDER ANESTHESIA

Brown NM et al J of A 2012 retrospectively reviewed the peri-op complications of 2235 TKR and 605 UKR and found a significantly lower risk of complications with the UKR (11% v 4.3%). In their study they also found a trend toward lower DVT in the UKR ().64% v 1%). Why was there only a focus on these 2 outcomes? Why not Length of stay? Transfusion rate? Similarly on page 380 the table seems to suggest that UKA lowers the risk of mortality and reoperation?
It seems that most of the literature suggests lower morbidity of UKA compared to TKA and to not include a broader statement on this risk reduction is "picking and choosing" and probably not an accurate reflection of the data.

M) UKA VS. OSTEOTOMY

Under the title it says that "Moderate evidence supports……."
Under strength of recommendation it says: "Limited Evidence"

Recommend a change to limited evidence, not moderate evidence, as only two studies are cited and they are not high quality studies.

N) SURGICAL NAVIGATION

Disagree with the tone of the comment. The studies do support no significant differences in terms of outcomes or complications but data from the Australian Registry shows that the use of navigation was associated with reduced revision rates in patients under age 65. Additionally, there is data showing that CAS can bring up the quality of arthroplasty in less experienced surgeons.

Recommend rewording: "Strong evidence supports not routinely using intraoperative navigation in primary total knee arthroplasty (TKA) in patients over age 65 because there is not difference in outcomes or complications."

de Steiger RN, Liu YL, Graves SE. Computer navigation for total knee arthroplasty reduces revision rate for patients less than sixty-five years of age. J Bone Joint Surg A. 2015 Apr 15;97(8):635-42.

Khakha RS, Chowdhry M, Sivaprakasam M, Kheiran A, Chauhan SK. Radiological and Functional Outcomes in Computer Assisted Total Knee Arthroplasty Between Consultants and Trainees - A Prospective Randomized Controlled Trial. J Arthroplasty 2015 Aug;30(8):1344-7.

O) PATIENT SPECIFIC INSTRUMENTATION: PAIN AND FUNCTION

Agree with statement and increasing number of high quality RCT support this. However, like CAS, probably should temper the recommendation by adding words like routine to the recommendation.

Recommend a change to "Strong evidence supports not using patient specific instrumentation compared to conventional instrumentation for routine TKA because there is no difference in pain or functional outcome."

PATIENT SPECIFIC INSTRUMENTATION: TRANSFUSIONS AND COMPLICATIONS
We agree with recommendation and strength of recommendation.

P) DRAINS

Do not agree that the literature supports the findings. The guideline states in the Rationale section on page 432 that the RISKS AND HARMS OF IMPLEMENTING THIS RECOMMENDATION include increased incidence of knee stiffness requiring manipulation with resultant poor range of motion, and increased wound drainage.

However, it is not clear whether this statement is implying whether or not the non-use of a drain resulted in long-term poor range of motion or whether the non-use of a drain resulted in acute poor range of motion thereby leading to the manipulation. The potential for increased wound drainage is included as wound complications, but these wound complications do not seem to be significantly different in the high quality studies included (Li, C 2011, Miskanen, R.O., 2000, Ritter M.A., 1994).

CRYOTHERAPY DEVICES

We agree with recommendation and strength of recommendation.

CONTINUOUS PASSIVE MOTION

We agree with recommendation and strength of recommendation.

POSTOPERATIVE MOBILIZATION: LENGTH OF STAY

We agree with recommendation and strength of recommendation.

Q) POSTOPERATIVE MOBILIZATION: PAIN AND FUNCTION

We agree that there is evidence that supports the use of "**Post Operative Mobilization: Pain and Function**". A further "moderate" study that support this include a randomized, prospective study (den Hertog et al., 2012) evaluating the use of 'fast-track rehabilitation', which incorporates early rehabilitation following surgery. Those in this group demonstrated enhanced recovery compared to standard rehabilitation, specifically in the WOMAC index score ($p<0.0001$), reduced intake of analgesic drugs, reduced length of stay (6.75 vs. 13.2 days; $p<0.0001$), and lower number of adverse events. Given these current studies, post-operative mobilization should be strongly supported.

However, according to the AAOS instructions, "Evidence from two or more "High" strength studies with consistent findings for recommending for or against the intervention." –lines 80 to 81 qualifies as a "strong" recommendation. AAOS states "Two high quality studies (Labraca et al 2011; Larsen et al 2008) investigated the effects of starting rehabilitation on the day of surgery compared to delayed rehabilitation (start on the day after surgery or later)." –lines 3259 to 3261. **Therefore, "Post Operative Mobilization: Pain and Function" this should be considered a "Strong" recommendation as per AAOS definition stated on chart from.**

EARLY STAGE SUPERVISED EXERCISE PROGRAM: FUNCTION

We agree with this statement and therefore, the recommendations set forth regarding the use of "Early stage supervised Exercise Program: Function".

EARLY STAGE SUPERVISED EXERCISE PROGRAM: PAIN

We agree with recommendation and strength of recommendation.

R) LATE STAGE POSTOPERATIVE SUPERVISED EXERCISE PROGRAM: FUNCTION

Evidence does not support the recommendation. Could only find this reference below that looked at care initiated 4-6 weeks after procedure that showed and advantage for total distance walked and quadriceps strength for the treatment group. Not sure that this fits in to the criteria for late treatment. This is likely later than when most guys initiate PT for TKA but not sure how it fits in.

Doerfler D, Gurney B, Mermier C, Rauh M, Black L, Andrews R. High-Velocity Quadriceps Exercises Compared to Slow-Velocity Quadriceps Exercises Following Total Knee Arthroplasty: A Randomized Clinical Study. *J Geriatr Phys Ther*. 2015 Sep 30. [Epub ahead of print] (4-6 weeks)

Workgroup Response

Dear Dr. Thomas Vail,

A) The reviewer presents multiple different definitions of obesity and "outcome." Within the more narrow definitions that we chose used to define outcomes, patients with greater obesity had more muted changes in outcome that go along with the more limited mobility associated with obesity. In the Lizaur-Utrilla et al. (JOA 2014) study, the cohort was not randomized, and component alignment was a surrogate, not a functional outcome.

The new studies discussed are analyzed below:

Article	Comment
Nelson 2015	Published after final literature search. We cannot include because we would have to re-run the entire literature search to ensure we capture all relevant literature published since the final search
Shetty et al. 2015	Published after final literature search; uses overweight BMI>30, not obese. For morbidly obese, BMI >40, uses surrogate of alignment. We used clinical outcomes
Plate et al. 2015	Published after final literature search date. The abstract appears to show no attempt to adjust for potential confounding factors; the quality therefore is low. Does not use functional outcomes
Cherian, 2015	Systematic review published after final literature search; uses overweight as definition of obese, BMI>30. Looks at loosening, not a functional outcome
Napier 2014	Is already included; anesthetic times and length of stay not functional outcomes

The following wording is added to future research, p 43. Careful analysis of risk category may also be helpful to assess if one or more component of the risk factor contributes significantly or may act as a surrogate (e.g. malnutrition in obesity).

B) The high quality study (Jamsen E 2013) shows that the early follow up (0 to 5 years) is significant, but the later follow up (>5 years) is not. However, the late follow-up does not contradict the earlier follow up. The authors use a cox proportional hazards model. One of the assumptions of this model is the proportional hazards assumption, which states that the proportion of hazard rates of group one to group two is constant over time. If this assumption is not met, it is recommended that two separate analyses are performed: one analysis of the earlier time points, and one for later time points. The assumption was not met for this article, so the authors did an early and late follow up analysis. The fact that the later follow-up was not significant doesn't change the fact that the early follow up was. The fact that the proportional hazards assumption was not met, means that the results of one follow up should not be used to counteract the other follow up, since the effect is not constant over time. The fact that risk revision up to 5 years was significantly greater for diabetics was enough for the work group to make the recommendation.

Additionally, the 3 moderate studies listed (Duchman KR 2014; Jamsen E 2012; Jones CA 2012) are moderate levels of evidence, not moderate quality.

C) The reviewer correctly points out that the Hirvonen study is an earlier follow-up of the Tuominen study, which the moderate recommendation was based on. The Tuominen study measured post-operative outcomes and is definitely relevant to the recommendation. The Hirvonen study measures outcomes on hospital admission before surgery, and its relevance to the PICO question is less clear. The Hirvonen study has been removed.

The following wording is added to future research, pg 112, " We also support future research examining the potential societal cost of delaying arthroplasty when the patient is otherwise ready to proceed with surgery (missed work, etc.) as well as the effect of surgical delay on the patient's pain and suffering during the delay period."

D) The studies recommended by the reviewer are analyzed below:

Article	Comment/reason for exclusion
Pugely AJ, Martin CT, Gao Y, Mendoza-Lattes S, Callaghan JJ. Differences in short-term complications between spinal and general anesthesia for primary total knee arthroplasty. *J Bone Joint Surg Am*. 2013 Feb 6;95(3):193-9	Use of registry data in peer reviewed publications can make our guidelines. However, it is generally hard for retrospective registry studies to meet the minimum quality level to do so. The authors of this study attempted to minimize bias in there statistical analysis. However, as is often the problem in retrospective studies, the database did have data on certain variables that they thought were important to control for (such as socioeconomic status and hospital characteristics). Despite their best efforts to control for confounding, they were handicapped because the database didn't have information collected on all relevant variables, which is why it didn't meet the quality standard to be included
Liu J, Ma C, Elkassabany N, Fleisher LA, Neuman MD. Neuraxial anesthesia decreases postoperative systemic infection risk compared with general anesthesia in knee arthroplasty. *Anesth Analg.* 2013 Oct;117(4):1010-6. doi: 10.1213/ANE.0b013e3182a1bf1c. Epub 2013 Sep 10.	Used the same database as Pugely, and was also missing information. Again, despite the authors' best efforts to control for confounding, there were still relevant variables missing from the database, resulting in a very low quality rating
Memtsoudis SG1, Rasul R, Suzuki S, Poeran J, Danninger T, Wu C, Mazumdar M, Vougioukas V. Does the impact of the type of anesthesia on outcomes differ by patient age and comorbidity burden? *Reg Anesth Pain Med*. 2014 Mar-Apr;39(2):112-9. doi: 10.1097/AAP.0000000000000055	The article was rated as very low quality because it was retrospective and there was no attempt to account for the missing data in their analysis. It is worth noting that we included an earlier large database study by Memtsoudis (2013). The difference in the 2013 study is that their model accounted for the missing data on

	anesthetic type used, and they performed a sensitivity analysis to see if the missing data was influential. It was, therefore, included in the guideline.

E) We agree that having blood loss/transfusions in a separate table be appropriate, and the table will be reformatted. The following wording will be added to future research, pg. 202, "We also support more high quality studies that take into consideration tourniquet use in the context of modern blood conservation protocols such as the addition of tranexamic acid."

F) The reviewer is correct, as quality of life at 2 months is significant. The addition of "and quality of life" to the recommendation was considered, but the work group thought that this might be somewhat confusing to add for the 2 month post-operative period. Instead, the rationale mentions that all the KOOS subscales (which includes quality of life) were significant at the early follow up.

G) We disagree that the statement as written seems to favor not using ALBC, even in high risk patients and point out that we use the word "routine" to make sure that this point is brought forth. Next, we point out in the rationale that the two moderate quality studies noted lacked generalizability. The reasoning was that the Chiu 2001 performed operations "in operating rooms without modern features." The Chiu 2009 moderate quality study was done on revision patients only, and was therefore not considered applicable to all TKA patients. Also, we did cite a DM study to demonstrate that ALBC may be appropriate in select patient populations.

H) The RCT suggested was published after our final literature search date, and cannot be included in this version of the guideline. The AGC study is excluded because it is not best available evidence, since we have multiple higher quality studies. "Both unicondylar and total knees were included in the results because the original PICO question asked about knee arthroplasty, and two of the included studies evaluated unicompartmental knee replacement (Murray, et al, 2014 and Hyldahl, et al, 2001)." We feel that the rationale adequately explains that the recommendation must be interpreted in the context of well-designed implants in lines 2250-2252, "The practitioner must be aware that results in the literature may be implant specific, and that surgical technique and surgeon experience with particular methods are important factors in achieving durable results."

The implant designs used in each of the included studies can be found below:

Study	design
Adalberth,G., 2000	AGC cemented TKA (Biomet, Warsaw, IN)
Adalberth,G., 2001	Freeman-Samuelson (Sulzer Orthopaedics AG, Zug, Switzerland) cemented TKA

Gioe,T.J., 2000	Both groups with identical articulating surfaces, cemented femoral components, and cemented polyethylene patellas (Press Fit Condylar, J & J/Depuy, Warsaw, IN)
Hyldahl,H.C., 2001	Miller-Galante unicondylar prosthesis (Zimmer, Inc., Warsaw, IN)
Kalisvaart,M.M., 2012	posterior-stabilized knee design (P.F.C. [Press-Fit Condylar] Sigma; DePuy, Warsaw, Indiana)
Muller,S.D., 2006	cruciate-retaining condylar PFC-∑ (Depuy, Johnson & Johnson, Leeds, United Kingdom)
Murray,D.W., 2014	No specific implants mentioned, but total knee and unicondylar knee replacements were included.
Norgren,B., 2004	Profix cemented TKA (Smith & Nephew, Memphis, Tennessee,USA)

I) We need a minimum of 2 high quality studies for a high strength recommendation. If a single high quality study is included, the strength of evidence would still be moderate regardless of how many lower quality studies are included. Of note, the meta-analysis (Figure 10) is helpful in understanding the rationale described in paragraph 1 of the rationale section.

J) The design details of the included studies are listed below:
The evidence for the use of contemporary uncemented implants was systematically analyzed in this set of PICO questions. The Pulido, et al. study was graded as moderate quality, the Fernandez-Fairen, et al. study was characterized as high quality. Although they both involved "Trabecular Metal tibia" (Zimmer, Inc., Warsaw, IN, USA), the majority of implants/ designs studied were various brands other than Trabecular Metal. These included: *High quality (*Beupre et al.: Stryker (Scorpio); Lizaur-Utrilla et al.: Lima (Multigen); Kim et al.: Zimmer (NexGen); Demey: Tornier (HLS Noetos) and *Moderate quality* (Baker et al.: J+J (PFC); Carlsson et al.: J+J (PFC); Khaw et al.: J+J (PFC); Pandit et al.: Biomet (Oxford); Parker et al.: Zimmer (Miller-Galante); Park et al.: Zimmer (NexGen)). The studies were appropriately adjusted for surgeon-designer/ conflicts.

K) The studies recommended by the reviewer are analyzed below:

Study	Comment/reason for exclusion
Bottle et al 2014.	The Bottle article would not be best available evidence since there are already multiple RCT's included for revision
Riff et al 2014	This is a narrative literature review, and therefore does not meet the inclusion criteria

Newman et al 2000	This is included. It was downgraded to moderate quality for unclear allocation concealment, unclear use of blinding, and potential for investigator conflict of interest.
Newman et al 2009	This is a follow up to the Newman 2000 study (note that authors received financial assistance from one of the manufacturers). Unlike the first study, they did a survival analysis where they defined failure as either a revision or a Bristol knee score of <60. The problem is that this is a composite outcome because it combines the clinical and revision outcomes. Exclusion of composite outcomes is a criteria in all of our guidelines. It is worth noting that the authors did not find a significant difference in survival under this definition (p=.51). They do present the number of revisions separately, and we could have computed relative risk (like we did for the 2000 study), but the number lost to follow up at 15 years was greater than 50%, which is also an exclusion criteria.
Brown et al. 2012	Was appraised as very low quality. They used "kozin and scott criteria" to determine which patients qualified for UKA. I found the Kozin and scott article listing these criteria. Their regression analysis only controlled for some of the criteria which would cause the groups to be unbalanced at baseline. Baseline pain, level of activity and range of motion were not adjusted for in their analysis.

L) The reviewer correctly points out that other outcomes in the summary of findings table on page 380 are significant too, even after removal of the Liddle study. The work group excluded the Liddle study, because not all of the patients in the TKA group had unicompartmental osteoarthritis, which was the patient population specified in the PICO question. Even with the Liddle study removed, Newman (moderate quality) found that UKA had a shorter length of stay, although this is not an outcome, per se. Hunt et al (a low quality study) found that mortality was significantly lower at 45 days in the UKA group than the TKA group; however, this finding was only reported in one low quality article. To add language to a recommendation, there would have to be at least two low quality articles addressing mortality.

M) This is a typographical error in the body, but not the summary in the beginning of the document and has been fixed. One high quality (Stukenborg-Colsman) and two moderate studies (Wedenhielm and Borjesson) compared the outcomes of UKA and HTO in patients with predominantly medial compartment osteoarthritis. There were no statistically significant differences in complications or outcomes. Therefore there is moderate evidence.

N) Both manuscripts suggested by the reviewer were published after final literature search. We cannot include because we would have to re-run the entire literature search to ensure we capture all relevant literature published since the final search. We can allude to these concepts in the future research section. Of note, we do point out in the rationale section of the recommendation that we are referring to routine use of surgical navigation, and there may be times when it is appropriate and indicated. In lines 2846-48, we write "The work group recognizes that there are scenarios where computer navigation theoretically could be considered, such as malunions or intramedullary implants, but the evidence is insufficient to make a recommendation."

We have changed the wording under Future Research, lines 2854-61. "The theoretical benefit of surgical navigation is to improve knee function and long-term implant survival by improving the accuracy of alignment.

No consensus on optimal knee alignment in total knee arthroplasty has been reached. However, coupling of surgical navigation data with registry implant longevity data has the potential to determine if surgical navigation improves implant longevity through alignment (instead of : However, inclusion of surgical navigation data in the American Joint Replacement Registry coupled implant longevity data has the potential to determine if surgical navigation improves implant longevity through alignment). The strong evidence indicates that no further research is needed on reviewed current surgical navigation methods. New surgical navigation methods will need randomized controlled trials to determine their effectiveness."

Additionally, we have changed the wording under Rationale to "The work group recognizes that there are scenarios where computer navigation theoretically could be considered, such as malunions, intramedullary implants, or in training scenarios, but the evidence is insufficient to make a recommendation."

O) The work group has in general not used "routine" in the recommendations. We have added wording to Rationale **"**The work group recognizes that there are scenarios where patient specific instrumentation theoretically could be considered but the evidence is insufficient to make a recommendation."

P) The risk harms statement is transparently indicating that one study did find that no use of drains led to a statistically significant increase in manipulation. However, that one finding is heavily outweighed by the other outcome findings from the 5 high and two moderate quality studies indicating that whether or not a drain is used, there is no difference in patient outcomes.

Q) The Postop Mobilization Recommendation A (length of stay) is Strong, because there were two high quality studies that addressed this outcome. Recommendation B (pain and function) is Moderate, because only one high quality study looked at pain and function.

No change or addition is recommended, but Hertog 2012 has been added for completeness. The study did not show up in our literature search, but it would have been included if it did. However, it was appraised as moderate, and they used composite knee society and WOMAC total scores, which both have pain and function subscales, but are not specifically pain and function measures. Therefore, the strength and interpretation of the recommendation is not changed. The data from this study will be added to the evidence tables.

R) The reviewer is correct that there are two included studies in table 32 that aren't mentioned in the rationale (Kauppila 2010 and Vourenmaa 2014). The reviewer didn't specify why he or she thought the evidence didn't support the recommendation, but it seems like they are commenting on the strength of recommendation. There are 4 high quality studies, and timed functional tests for two of the studies are green dots (indicating significance). However, the work group concluded that types and intensities of the exercise programs were so heterogeneous (i.e. far too varied) across the studies to warrant lumping them together under one category. The wide variety of treatments resulted in a mix of results, and this is why the recommendation was downgraded to limited.

Respectfully,
2015 SMOAK Guideline Workgroup

Appendix A – Structured Peer Review/Public Comment Form

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. The overall objective(s) of the guideline is (are) specifically described.	○	○	○	○	○
2. The health question(s) covered by the guideline is (are) specifically described.	○	○	○	○	○
3. The guideline's target audience is clearly described.	○	○	○	○	○
4. The guideline development group includes individuals from all the relevant professional groups.	○	○	○	○	○
5. There is an explicit link between the recommendations and the supporting evidence.	○	○	○	○	○
6. Given the nature of the topic and the data, all clinically important outcomes are considered.	○	○	○	○	○
7. The patients to whom this guideline is meant to apply are specifically described.	○	○	○	○	○
8. The criteria used to select articles for inclusion are appropriate.	○	○	○	○	○
9. The reasons why some studies were excluded are clearly described.	○	○	○	○	○
10. All important studies that met the article inclusion criteria are included.	○	○	○	○	○
11. The validity of the studies is appropriately appraised.	○	○	○	○	○
12. The methods are described in such a way as to be reproducible.	○	○	○	○	○
13. The statistical methods are appropriate to the material and the objectives of this guideline.	○	○	○	○	○
14. Important parameters (e.g., setting, study population, study design) that could affect study results are systematically addressed.	○	○	○	○	○
15. Health benefits, side effects, and risks are adequately addressed.	○	○	○	○	○
16. The writing style is appropriate for health care professionals.	○	○	○	○	○
17. The grades assigned to each recommendation are appropriate.	○	○	○	○	○

Please provide a brief explanation of both your positive and negative answers in the preceding section. If applicable, please specify the draft page and line numbers in your comments. Please feel free to also comment on the overall structure and content of the Guideline.

Would you recommend these guidelines for use in clinical practice?*

- Strongly Recommend
- Recommend
- Would Not Recommend
- Unsure

Additional Comments: