

The Management of Hip Fractures in the Elderly Evidence-Based Clinical Practice Guideline

**Peer Review and Public Commentary Report and
AAOS Responses**

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Management of Hip Fractures in the Elderly Evidence-Based Guideline

Summary of Changes to Guideline Draft after Peer Review

Recommendation 15: VTE Prophylaxis - This recommendation was revised to read, “Moderate evidence supports use of venous thromboembolism prophylaxis (VTE) in hip fracture patients.”

Line #1084 - Instead of numbing agent now reads “local anesthetic”.

Line 463 – “Gerontologists” was changed to read “geriatricians”.

Recommendation 6: Anesthesia – The following language to the Risks and Harms section was added: “Because both forms of anesthesia appear to have similar mortality profiles, providers can consider specific circumstances that would favor one form or the other for their particular patient.”

Recommendation 19: Calcium and Vitamin D and Screening – This recommendation was subcategorized:
Recommendation 19a. “Moderate evidence supports use of supplemental vitamin D and calcium in patients following hip fracture surgery.” Recommendation 19b. “Limited evidence supports preoperative assessment of serum levels of albumin and creatinine for risk assessment of hip fracture patients.”

Summary of Changes to Guideline Draft after Public Comment

Introduction Section: Added a “Future Research” section addressing the need for sex segregated data reporting in published articles.

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 thirteen organizations with content expertise to review a draft of the clinical practice guideline during the peer review period in April 2014.

- Ten individuals provided comments via the electronic structured peer review form. Two reviewers asked to remain anonymous.
- Of the 10 submissions, nine were on behalf of a society and have given consent to be listed as a reviewer.
- The work group 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 August 1, 2014.

- AAOS received three comments including one representing specialty societies, two from individuals, and none from industry.
- If warranted and based on evidence, the guideline draft s modified by the work group members in response to the public comments.

PEER REVIEW RESPONSES

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	William Obrebsky	Orthopedic Trauma Association
2	Asokumar Buvanendran	American Academy of Pain Medicine
3	Alexander K Smith	American Academy of Hospice and Palliative Medicine
4	Diana Galindo MD	American Medical Women's Association
5	Laura C. Hanson	American Academy of Hospice and Palliative Medicine
6	Michael Dohm, MD	American Association of Hip and Knee Surgeons
7	Anonymous Review Committee	American Geriatrics Society
8	Robert L. Rich, Jr	
9	American College of Emergency Physicians Review Committee	American College of Emergency Physicians (ACEP)
10	Philip T. Schmitt, D.O.	American Osteopathic Academy of Orthopedics

Peer Reviewer Demographics

Reviewer #	Name of Reviewer (Required)	Primary Specialty	Work Setting	What is the name of the society that you are representing?
1	William Obremskey	Trauma	Academic Practice	Orthopedic Trauma Association
2	Asokumar Buvanendran	Anesthesiology and Pain Management	Academic Practice	American Academy of Pain Medicine
3	Alexander K Smith	Hospice and Palliative Medicine	Academic Practice	American Academy of Hospice and Palliative Medicine
4	Diana Galindo MD	Internal medicine	Group Academic Practice	American Medical Women's Association
5	Laura C. Hanson	Palliative Medicine	Academic Practice	American Academy of Hospice and Palliative Medicine
6	Michael Dohm, MD	Total Joint	Academic Practice	American Association of Hip and Knee Surgeons
7	Anonymous Review Committee	Geriatrics	Medical Association	American Geriatrics Society
8	Robert L. Rich, Jr	Family Medicine	Private Group or Practice	
9	Anonymous Review Committee	Emergency Medicine	Medical Association	ACEP
10	Philip T. Schmitt, D.O.	Adult Hip	Clinical Hospital	American Osteopathic Academy of Orthopedics

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	William Obrenskey	67871	.	.	.	.	.	.	.	.	.	.
2	Asokumar Buvanendran		No	No	No	Yes	No	No	Yes	No	No	Yes
3	Alexander K Smith		No	No	No	No	No	No	No	No	Yes	No
4	Diana Galindo MD		No	No	No	No	No	No	No	No	No	No
5	Laura C. Hanson		No	No	No	No	No	No	No	No	No	No
6	Michael Dohm, MD	27590	.	.	.	.	.	.	.	.	.	.
7	Anonymous Review Committee		No	No	No	No	No	No	No	No	No	No
8	Robert L. Rich, Jr		No	No	No	No	No	No	No	No	No	No
9	Anonymous Review Committee		No	No	No	No	No	No	No	No	No	No
10	Philip T. Schmitt, D.O.		No	No	No	No	No	No	No	No	No	No
Total N	10	10	8	8	8	8	8	8	8	8	8	8

Table 4. Peer Reviewer Detailed Disclosure Information

Reviewer Number	Name of Reviewer (Required)	Question D = Yes	Question G = Yes	Question J = Yes
2	Asokumar Buvanendran	Medtronic, Kimberly Clark, Pzifer	Pfizer	American Society of Regional Anesthesia and Pain Medicine

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	William Obremskey	Orthopedic Trauma Association	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
2	Asokumar Buvanendran	American Academy of Pain Medicine	Strongly Agree	Strongly Agree	Strongly Agree	Agree
3	Alexander K Smith	American Academy of Hospice and Palliative Medicine	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
4	Diana Galindo MD	American Medical Women's Association	Strongly Agree	Strongly Agree	Strongly Agree	Agree
5	Laura C. Hanson	American Academy of Hospice and Palliative Medicine	Agree	Strongly Agree	Agree	Agree
6	Michael Dohm, MD	American Association of Hip and Knee Surgeons	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
7	Anonymous Review Committee	American Geriatrics Society	Neutral	Neutral	Neutral	Neutral
8	Robert L. Rich, Jr		Neutral	Agree	Strongly Agree	Neutral
9	Anonymous Review Committee	ACEP	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
10	Philip T. Schmitt, D.O.	American Osteopathic Academy of Orthopedics	Strongly Agree	Strongly Agree	Strongly Agree	Strongly 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	William Obremskey	Orthopedic Trauma Association	Disagree	Strongly Agree	Strongly Agree	Strongly Agree
2	Asokumar Buvanendran	American Academy of Pain Medicine	Agree	Strongly Agree	Strongly Agree	Agree
3	Alexander K Smith	American Academy of Hospice and Palliative Medicine	Agree	Agree	Strongly Agree	Strongly Agree
4	Diana Galindo MD	American Medical Women's Association	Agree	Strongly Agree	Strongly Agree	Strongly Agree
5	Laura C. Hanson	American Academy of Hospice and Palliative Medicine	Disagree	Strongly Agree	Strongly Agree	Agree
6	Michael Dohm, MD	American Association of Hip and Knee Surgeons	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
7	Anonymous Review Committee	American Geriatrics Society	Neutral	Neutral	Neutral	Neutral
8	Robert L. Rich, Jr		Agree	Strongly Agree	Agree	Agree
9	Anonymous Review Committee	ACEP	Agree	Strongly Agree	Strongly Agree	Strongly Agree
10	Philip T. Schmitt, D.O.	American Osteopathic Academy of Orthopedics	Strongly Agree	Strongly Agree	Strongly Agree	Strongly 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	William Obremsky	Orthopedic Trauma Association	Agree	Strongly Agree	Strongly Agree	Strongly Agree
2	Asokumar Buvanendran	American Academy of Pain Medicine	Agree	Agree	Agree	Agree
3	Alexander K Smith	American Academy of Hospice and Palliative Medicine	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
4	Diana Galindo MD	American Medical Women's Association	Strongly Agree	Agree	Strongly Agree	Strongly Agree
5	Laura C. Hanson	American Academy of Hospice and Palliative Medicine	Neutral	Strongly Agree	Neutral	Agree
6	Michael Dohm, MD	American Association of Hip and Knee Surgeons	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
7	Anonymous Review Committee	American Geriatrics Society	Neutral	Neutral	Neutral	Neutral
8	Robert L. Rich, Jr		Agree	Agree	Agree	Agree
9	Anonymous Review Committee	ACEP	Neutral	Strongly Agree	Strongly Agree	Strongly Agree
10	Philip T. Schmitt, D.O.	American Osteopathic Academy of Orthopedics	Strongly 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	William Obremsky	Orthopedic Trauma Association	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
2	Asokumar Buvanendran	American Academy of Pain Medicine	Agree	Agree	Agree	Neutral
3	Alexander K Smith	American Academy of Hospice and Palliative Medicine	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
4	Diana Galindo MD	American Medical Women's Association	Strongly Agree	Agree	Strongly Agree	Strongly Agree
5	Laura C. Hanson	American Academy of Hospice and Palliative Medicine	Agree	Agree	Disagree	Neutral
6	Michael Dohm, MD	American Association of Hip and Knee Surgeons	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
7	Anonymous Review Committee	American Geriatrics Society	Neutral	Neutral	Neutral	Neutral
8	Robert L. Rich, Jr		Agree	Agree	Strongly Agree	Neutral
9	Anonymous Review Committee	ACEP	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
10	Philip T. Schmitt, D.O.	American Osteopathic Academy of Orthopedics	Strongly Agree	Strongly Agree	Strongly Agree	Agree

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

Would you recommend these guidelines for use in clinical practice?

	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	William Obrebsky	Orthopedic Trauma Association	Recommend With Revisions
2	Asokumar Buvanendran	American Academy of Pain Medicine	Recommend
3	Alexander K Smith	American Academy of Hospice and Palliative Medicine	Strongly Recommend
4	Diana Galindo MD	American Medical Women's Association	Strongly Recommend
5	Laura C. Hanson	American Academy of Hospice and Palliative Medicine	Recommend With Revisions
6	Michael Dohm, MD	American Association of Hip and Knee Surgeons	Strongly Recommend
7	Anonymous Review Committee	American Geriatrics Society	Unsure
8	Robert L. Rich, Jr		Recommend
9	Anonymous Review Committee	ACEP	Strongly Recommend
10	Philip T. Schmitt, D.O.	American Osteopathic Academy of Orthopedics	Strongly Recommend

Peer Reviewer Detailed Responses

Reviewer #1, William Obremsky, OTA

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	William Obremsky	Orthopedic Trauma Association	<p>A. Concerns are that #2 Preoperative Pain Control - Need to define Preoperative. Define Spinal vs femoral nerve block. Anesthesiologist placing femoral nerve blocks on these patients would delay OR starts.</p> <p>B. #9 Unis and Bipolar results are same</p> <p>C. #15 VTE prophylaxis must be considered. Less strong than ACCP recs. Data clear that this patient population some of highest risk patients in ortho. Other topics? Cardiac Work up? Long vs short IMN? Locked vs non locked IMN?</p>

Workgroup Response

Dear Dr. William Obremsky,

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

- A. The work group respectfully believes that the definition of “preoperative” is clear.
- B. This is stated in the recommendation “...are similar”.
- C. Thank you for your comment. The guideline work group has reviewed the literature and revised the language of Recommendation 15. The revised recommendation reads, “Moderate evidence supports use of venous thromboembolism prophylaxis (VTE) in hip fracture patients.”

Respectfully,

2014 AAOS Hip Fractures Guideline Workgroup

Reviewer #2, Asokumar Buvanendran, AAPM

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	Asokumar Buvanendran	American Academy of Pain Medicine	<p>A. #2: Preoperative Regional Analgesia Suggestion: Change the recommendation to “Strong evidence supports regional analgesia to improve pain control and delirium in patients with hip fracture”</p> <p>B. #2 Need to add reference: Abou-Setta A et al: Comparative effectiveness of pain management interventions for hip fracture: A systematic review. <i>Annals of Internal Medicine</i> 2011; 155: 234-245. This review looked at 83 clinical studies and they state.</p> <p>C. Moderate evidence suggests that nerve blockades are effective for relieving acute pain and reducing delirium.</p> <p>D. Line #1084: Instead of numbing agent- should read “local anesthetic”.</p> <p>E. Recommendation #6: Anesthesia. Suggested change: “Evidence (moderate) support improved outcomes for regional (spinal) anesthesia compared to general anesthesia for patients undergoing hip fracture surgery.”</p> <p>F. #6 Please add references below. Neuman MD et al: Comparative effectiveness of regional versus general anesthesia for hip fracture surgery in adults. <i>Anesthesiology</i> 2012; 117: 72-92. This retrospective study examined 18,158 patients and demonstrated decreased inpatient mortality and pulmonary complications among patients who had regional anesthesia compared to general anesthesia. ? Rashiq S et al: Efficacy of supplemental peripheral nerve blockade for hip fracture surgery. <i>Can J Anesthesia</i> 2013; 60: 230-243. ? Gular P et al: Regional anaesthesia versus general Anaesthesia, morbidity and mortality. <i>Best Pract research Clinical Anesthesiology</i> 2006; 20: 249-263. Please see page 254, table 2. This is a comparison with risk ratio.</p> <p>G. Recommendation #18: Postoperative multimodal analgesia. Suggestion: Recommendation from lines 1933-1940 should also include pharmacological agents for multimodal analgesia such as acetaminophen.</p>

Workgroup Response

Dear Dr. Asokumar Buvanendran,

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

A. Unfortunately, we do not have evidence to support the statement you suggested.

B. AAOS guideline procedures rely on primary research and not secondary research which may not have the same inclusion criteria. Therefore, systematic reviews are not included as an entity; however, AAOS staff scans the bibliographies of all relevant systematic reviews to ensure that any relevant articles meeting the inclusion criteria are utilized in the formation of the recommendation.

C. Unfortunately, we do not have evidence to support the statement you suggested.

D. Thank you for your suggestion. This change has been made.

E. Thank you for your suggestion, but the recommendation language will remain unchanged.

F. Regarding the Neuman 2012 study, this is a retrospective study, and thus cannot be rated higher than low strength. Because we have higher quality evidence for this recommendation, this study is excluded as not best available evidence. Regarding the Gular and Best Practice Research clinical Anesthesiology systematic reviews, as mentioned in B, our protocol does not allow for inclusion of systematic reviews.

G. Thank you for your suggestions, but evidence is lacking to mention the specified agents.

Respectfully,

2014 AAOS Hip Fractures Guideline Workgroup

Reviewer #3, Alexander K Smith, AAHPM

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	Alexander K Smith	American Academy of Hospice and Palliative Medicine	<p>As a hospice and palliative medicine physician and internist, my comments are:</p> <ul style="list-style-type: none"> A. There is almost nothing about patient-doctor communication in these guidelines, particularly for patients with advanced disability or dementia whose goals of care may or may not align with surgical repair; and B. Surgeons and non-surgeons are sometimes faced with conflicting information about the best way to proceed, as when a patient does not have capacity and the advance directive (Do Not Hospitalize) conflicts with the best interests of the patient (repair the fracture to preserve function and decrease pain). As a reference for both of these points, please see http://archinte.jamanetwork.com/article.aspx?articleid=1710099. C. In future guideline iterations, consider involving communication experts early on in the process when formulating preliminary recommendations (pg 17 line 455). The small paragraph given to these issues on page 16 (line 545) is not commensurate with the importance of the issue. The guidelines pre-suppose an operation will take place, but a critical component of the surgeon's job is to determine if an operation <i>*should*</i> take place. Even if the panel eventually finds the strength of evidence weak for communication recommendations, this will set an important agenda for future research.

Workgroup Response

Dear Dr. Alexander K Smith,

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

A. We agree that this is important and the introduction does mention this, stating, “Hip fracture management is based on the assumption that decisions are predicated on the patient and/or the patient’s qualified health care advocate having physician communication with discussion of available treatments and procedures applicable to the individual patient.”

B. See response “A”.

C. Thank you for your suggestion regarding communication experts in preliminary recommendation construction. We will pass your suggestion on to the Committee on Evidence-Based Quality and Value.

Respectfully,

2014 AAOS Hip Fractures Guideline Workgroup

Reviewer #4, Diana Galindo , AMWA

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	Diana Galindo MD	American Medical Women's Association	<p>A. All aspects of care for older persons with hip fractures were addressed. Excellent guideline. Instead of the "Elderly" in the title, we use the term "OLDER ADULTS" in Geriatrics.</p> <p>B. 323 line 1975: an automatic assessment of these levels during " hospital admission "might not be an ideal value- based clinical practice as many elderly would have been evaluated for D calcium albumin prior. Maybe NOT "at hospital admission" but say "following hip fracture?"</p> <p>C. Page 323: line 1991 There is a controversy about what level of Vit d3 OH is ideal: 20 nmol/liter as Inst of medicine recommended or greater than 30 nmol/liter as the ACCE and others . Can this be added?</p> <p>D. Page 323: line 2003. There is also a controversy in the relationship of calcium supplement and cardiovascular disease but this is not conclusive.</p> <p>E. Page 331 line 2045 (risks and harms) Maybe we should also note how soon we treat osteoporosis after hip fracture surgery (e.g. role of the antiresoptive effect (bisphosphonates , etc) in healing after surgery . How long after surgery do we start treatment? Is there data?</p> <p>F. Page 331 line 2056 Future research : fracture liaison service in open health care has been shown to be beneficial outside the USA. ? ; has this been approved by the JCAH for compliance. Should we look at the quality measurements required by the JCAH for compliance? Is it necessary?</p>

Workgroup Response

Dear Dr. Diana Galindo,

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

- A. Respectfully, “Elderly” will remain the term of choice for this guideline.
- B. The work group agrees with your comment and has revised the recommendation language to read, “Moderate evidence supports use of supplemental vitamin D and calcium in patients following hip fracture surgery.”
- C. Unfortunately, future research studies are needed to clarify the risk of vitamin D supplementation and optimal levels.
- D. Thank you for your comment.
- E. Treatment of osteoarthritis is outside of the scope of this guideline.
- F. This is mentioned in the future research section of this recommendation.

Respectfully,

2014 AAOS Hip Fractures Guideline Workgroup

Reviewer #5, Laura C. Hanson, AAHPM

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
5	Laura C. Hanson	American Academy of Hospice and Palliative Medicine	<p>A. Line 463 - medical specialists in care of older patients are "geriatricians;" ("gerontologists" are social scientists)</p> <p>B. 5. The guideline does not address decision-making for non-operative management, which is critical as a concern for patients with advanced dementia or other neurodegenerative diseases, or other advanced stage illnesses for which goals of care may be more palliative in nature.</p> <p>C. In addition, Guideline 15 (VTE prophylaxis) is confusingly worded and implies absence of evidence on this question. Recommend revising this guideline to state the presence of randomized controlled trials which do in fact address precisely this question, and making a statement about known benefits of VTE prophylaxis and the agents which are proven effective (along with rates of harms). As currently written this guideline suggests that each surgeon simply make up something -- dosage, timing, medication, and duration -- when clearly the existing evidence could be used to define a range of acceptable options.</p> <p>D. The writing style, at least as configured for this comprehensive review, may be too exhaustive in nature to reach practicing providers. Encourage use of alternative formats to ensure that details for this evidence base reach providers. In particular, the evidence tables as currently configured are difficult to follow.</p>

Workgroup Response

Dear Dr. Laura C. Hanson,

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

A. The work group agrees with this change and will revise the language to read “geriatricians.”

B. This is addressed in the introduction section of this guideline.

C. The guideline work group has reviewed the literature and revised the language of Recommendation 15. The revised recommendation reads, “Moderate evidence supports use of venous thromboembolism prophylaxis (VTE) in hip fracture patients.”

D. For quick reference, the AAOS constructs a summary of recommendations document for all guidelines. AAOS encourages anyone who consults the recommendation to read the rationales and understand the evidence on which they were based, but the summary of recommendations may be more practical for everyday clinical use. AAOS is also developing a mobile application for clinical practice guidelines so the recommendations can be accessed from smart phones and tablets.

Respectfully,

2014 AAOS Hip Fractures Guideline Workgroup

Reviewer #6, 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
6	Michael Dohm, MD	American Association of Hip and Knee Surgeons	<p>A. I believe that based on current best evidence, the analysis is transparent and well evaluated. I have questions regarding stratification of patients based on comorbidity scale, 25 OH vitamin D level, DEXA/t score however I don't think there has been a universal determination of a universal data set regarding these patients so at this point I do believe this is the current best evidence and analysis.</p> <p>B. I also think we should include non-English literature, but perhaps that can be included in a future evaluation.</p> <p>C. I think these guidelines should be enabled and operationalized; outcome measures should be in place to evaluate the effect of these guidelines in current clinical orthopedic practice. And we should reevaluate in a peer fashion in 3 years to see if what was determined actually reflects clinical practice, to include new data if needed for guideline revision and place through the clinical reasoning cycle again.</p>

Workgroup Response

Dear Dr. Michael Dohm,

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

A. Thank you for your comment.

B. Thank you for your suggestion. Currently, translations of foreign language studies are not available and the AAOS does not have a process in place for translating and including foreign language articles in our guideline.

C. Thank you for your suggestion. The AAOS has currently added a Performance Measures Unit to the Department of Research and Scientific Affairs that will measure the implementation and patient-oriented outcomes regarding select guideline topics. We also agree that our clinical practice guidelines should be assessed for clinical usability/usefulness and the effect that they have on patient outcomes. Regarding reevaluating our guidelines for new data, it is AAOS procedure that the literature is monitored for all guidelines and that the Committee on Evidence Based Quality and Value reviews each guideline within five years of publication to consider whether it should be updated, retired or re-issued depending on the amount of new evidence available.

Respectfully,

2014 AAOS Hip Fractures Guideline Workgroup

Reviewer #7, Anonymous Review Committee, AGS

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	Anonymous Review Committee	American Geriatrics Society	<p>A. Overall, we are encouraged by the endeavor and recommendations that AAOS have undertaken in developing these guidelines. We shared your call for comments to AGS member experts relevant to the topic as well as with members of our Clinical Practice and Models of Care Committee. We have compiled the specific comments and thoughts from the specific reviewers, organized by either general guideline comments or by recommendation number.</p> <p>General Guideline Comments Our third reviewer found the term “Moderate evidence supports...” to be a bit awkward and unclear. If this is based on strength of evidence, he would recommend consideration of High, Moderate, Limited, Consensus Only such that the sentence above could read “There is moderate strength evidence to support...”</p> <p>B. In terms of wording, the recommendations do not actually explicitly recommend anything... Similarly, some of the recommendations endorse outcomes (Rec 6: “similar outcomes”) whereas some recommendations endorse the treatment (Rec 7: “operative fixation”); this would read better and more consistently if the format of recommendations was systematic in nature</p> <p>C. Our fifth reviewer notes that the visual of the star strengths connotes bad vs. good, warning vs. recommendation. She recommends leaving it out.</p> <p>Specific Comments to the Recommendations</p> <p>D. Recommendation 1: Advanced Imaging – While MRI has become the gold standard and bone scan secondary, our third reviewer was not sure one can relegate the CT to no recommendation. MRIs are more costly and patients who cannot tolerate an MR (can’t stay still, claustrophobic) or are contraindicated (aneurism clips, for example) (both of which should increase with advanced age) may need another alternative to bone scan. Also the potential down side of radiation exposure is much less clinically significant in a geriatric population. Finally, many smaller (and sometimes larger) medical centers may not be able to perform an MRI in timely fashion and make it more</p>

difficult to surgically treat the patient (if needed) within 48 hrs. Further research is definitely needed.

- E. Recommendation 2: Preoperative Regional Anesthesia – In several of the quoted studies practitioners were taught the technique prior to the study. Since not every institution may have the local expertise, our second reviewer would consider adding “provided that practitioners have been adequately trained.” It is also important to take into consideration the timing of surgery – if patients are going directly (or imminently) to surgery, the risks/time may outweigh the benefits.
- F. Recommendation 4: Surgical Timing – Our third reviewer recommends adding some discussion regarding potential issues with implementing surgical fixation within 48 hours for patients with relative need for medical management; our reviewer does understand that if the patient could be stabilized within 48hrs and fixed that is ideal but recommending surgery within 48 hours without caveats may be risky; take for instance, a critically ill patient who has uncontrolled blood glucose despite being on insulin drip or a patient with hypokalemia who is recalcitrant to potassium repletion etc.
- G. Recommendation 5: Aspirin and Clopidogrel – Our third reviewer recommends adjusting the language to “There is limited strength of evidence to support standard timing of hip fracture surgery for patients on... (ie, current limited evidence does not support the delay of hip fracture surgery due to...” Limited evidence supports not delaying hip fracture surgery for patients on aspirin and/or clopidogrel.
- H. Recommendation 6: Anesthesia – From the third Reviewer -Perhaps the main rec should state “similar mortality outcomes” since there were differences in blood loss in the stated references; also Velentin (L1259) should have ref 47 in superscript. Perhaps under Risks and Harms, we could state “Because both forms of anesthesia appear to have similar mortality profiles, providers can consider specific circumstances that would favor one form or the other for their particular patient.”
- I. Our fourth reviewer is perplexed by the strength of this recommendation. None of the studies are more than moderate strength. The text notes how flawed most of the studies are. In a level one study, depth of anesthesia may be the most important factor

(Sieber et al). Depth of anesthesia confounds all current studies using spinal as this was not measured. In many cases people getting a spinal are sedated at levels consistent with general anesthesia. While I agree that no differences have been shown between spinal and general anesthesia to date, the quality of evidence is not good and this should be a much less strong recommendation.
 Sieber FE1, Zakriya KJ, Gottschalk A, Blute MR, Lee HB, Rosenberg PB, Mears SC. Sedation depth during spinal anesthesia and the development of postoperative delirium in elderly patients undergoing hip fracture repair. *Mayo Clin Proc.* 2010 Jan;85(1):18-26. doi: 10.4065/mcp.2009.0469.

- J. Recommendation 7: Stable Femoral Neck Fractures -From our third reviewer -The Risks and Harms section does not actually address the risks and harms of following the rec (surgery for non-displaced fxs).
- K. Recommendation 8: Displaced Femoral Neck Fractures -From our third reviewer - The Risks and Harms section does not address risks and harms.
- L. Recommendation 9: Unipolar vs. Bipolar – Our third reviewer recommends adjusting the language to “There is moderate evidence to support the use of either unipolar or bipolar hemi... (ie, outcomes between...)”
- M. Recommendation 10: Hemi vs. Total Hip Arthroplasty – Our third reviewer notes that this recommendation could be controversial. While there is moderate strength of evidence to support the functional benefit of total hip arthroplasty in the properly selected patient, there is high strength of evidence to support similar overall outcomes between total and hemi. Hopley in *BMJ* 2010 (PMID:20543010) showed that sensitivity analysis within an MA, based on quality of the study, indicated no significant differences in reoperation rates, general complications, dislocation rates, infection and mortality when the highest quality stratum was examined.
- N. Recommendation 11: Cemented Femoral Stems – Our third reviewer suggests that, if the best evidence (RCT) suggests that the cement v non-cement are largely similar how can we recommend the “preferential use of cemented”? This recommendation could be better delineated and justified.

			<p>O. Recommendation 13: Stable Intertrochanteric Fractures – Our third reviewer wonders if there should be discussion regarding relative benefits of one versus the other.</p> <p>P. Recommendation 14A and 14B: Subtrochanteric or Reverse Obliquity Fractures and Unstable Intertrochanteric Fractures – Our third reviewer wonders if this is relative to extramedullary device? Are we distinguishing between sliding hip screw and 95degree plate device? Or are we purely endorsing a cephalomedullary device regardless of comparison? This could be clarified.</p> <p>Q. Recommendation 15 (review committee member 1): VTE Prophylaxis -In the absence of reliable evidence, it is the consensus of the work group that the use of VTE prophylaxis in hip fracture patients must be considered; evidence regarding timing and choice of therapy is insufficient. Our first reviewer is concerned about this 1 star rating. It is true that the evidence from RCTs done specifically in hip fracture patients is relatively limited, but these studies do provide a compelling rationale for treating most or all patients with low VTE rates in both arms compared to extraordinarily high rates in historical cohorts. In addition, our reviewer thinks it is a mistake not to consider the multitude of data from RCTs of hip arthroplasty patients; there is no reason to consider that the pathophysiology or risk of VTE is different between the populations, and if anything hip fracture patients will be at higher risk and more likely to benefit. The choice of agent and duration questions for orthopedic procedures in general have been extensively reviewed in the Chest guidelines and elsewhere. The 1 star rating here may imply to a casual reader that it is “optional” to provide VTE prophylaxis when in fact your real message, the reviewer believes, is simply that this hasn’t been studied specifically in hip fracture patients (and probably won’t be). Our reviewer would strongly suggest a higher star rating for a statement supporting VTE prophylaxis for all patients with hip fracture without contraindications, acknowledging that choice and duration must be inferred from studies of THA and other orthopedic conditions, and perhaps referring to existing guidelines.</p> <p>R. Recommendation 15 (review committee member 2): Our second reviewer had similar thoughts on this recommendation. This is a complex and multi-faceted topic which really addresses several sub-topics, including 1) prophylaxis vs. no prophylaxis; 2)</p>
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specific agent; 3) timing; 4) duration; and 5) pharmacologic and/or non-pharmacologic prophylaxis. While she agrees that there is minimal data with head-to-head comparisons of specific agents in elderly hip fracture patients, there is randomized, controlled data on efficacy of pharmacologic prophylaxis in hip fracture patients. Ignoring this and giving an overall one-star rating to the whole topic (the only one-star rating in the entire document) undermines the role of thromboprophylaxis in this high-risk population. Our second reviewer would recommend, at a minimum, dividing the topic into 1) prophylaxis vs. no prophylaxis (strong evidence), and 2) choice of agent (no/poor evidence). The other topics can be folded into these 2 discussions.

S. Recommendation 15 (review committee member 3): Our third reviewer notes that this recommendation is confusing. Are we recommending that any VTEP be considered or that chemoprophylaxis be considered? If this is based on consensus alone, would it not be more prudent to recommend SCD mechanical prophylaxis and consideration of chemoprophylaxis? Also, why is the PEP trial (Lancet 2000, PMID:10776741) not considered evidence? This should definitely be mentioned as it is one of few studies that has looked at this at all.

T. Recommendation 15 (review committee member 4): Our fourth reviewer wonders why this is so different from current guidelines. CHEST guidelines give dvt prophylaxis after hip fracture surgery a grade 1C rating. He thinks it strange that the methodology used in this document gives such a different answer. He recommends relooking at this and the wording to make more compatible with other current guidelines, otherwise this is very confusing as a practical guide to physicians. At the least, this should be discussed in the text on the section so that people understand this doesn't give any evidence or support for not giving dvt prophylaxis in this population.

U. Recommendation 15 (review committee member 5): Our fifth reviewer also had concerns with this recommendation. This recommendation to "consider" DVT prophylaxis has the potential to cause harm to the hip fracture patient by suggesting that prophylaxis is not necessary. While studies supporting prophylaxis are old (1950s-1970s), they have been incorporated into the American College of Chest Physicians Guidelines and are standard of care at the present. As Dr Friedman points

out several concepts are being rolled into one recommendation and this should be separated out (length of treatment, agents, dose). I think a review of studies addressing these issues should be mentioned or a statement of its use based on expert consensus be included.

- V. Recommendation 17C: Nutrition -Moderate evidence supports that postoperative nutritional supplementation reduces mortality and improves nutritional status. Our first reviewer notes that this rating is primarily based on the small RCT from Duncan, which was not a trial of nutritional supplements, but rather a study of using dietary assistants to help the patient at mealtime. The use of nutritional supplements per se is much weaker, as is noted. Suggest changing the wording of the recommendation to "...perioperative nutritional support" instead of supplementation.
- W. Recommendation 19: Calcium and Vitamin D --This is written as a 2-part recommendation. The first is substantiated in the rationale by trial data. The second part (checking vit D, calcium, albumin and creatinine levels) is clinical best-practices and at the level of expert opinion. Our second reviewer would therefore consider dividing these 2 issues into separate recommendations, keeping the first as a 3-star recommendation, and the second as a 1-star recommendation. Although our third reviewer believes in and practices Ca and Vit D supplementation in all his hip fx patients, for the purposes of these guidelines, there should be clear distinction between studies in hip fracture patients and studies to prevent hip fractures. Also under Risks and Harms, there should be mention of studies suggesting cardiac risk in subpopulation of patients who take Ca alone but that this is likely mitigated with Ca + Vit D. Under Future Research, there should be studies to investigate modes, routes forms of Vit D supplementation (oral v IV, D2 v D3, sustained low dose v bolus high dose etc).
- X. Recommendation 20: Evaluation and Treatment of Osteoporosis – Similar to the comment for Recommendation 19, this incorporates 2 concepts – first, does evaluation lead to treatment, and second, does treatment work? Our second reviewer would consider changing the rationale to specify this, as the recommendation quotes literature pertaining to each issue.
- Y. Recommendation 20 (review committee member 3): Our third reviewer thinks it

			<p>should be clarified on whether or not the guidelines are specifically recommending pharmacologic treatment.</p> <p>Z. Recommendation 15 (review committee member 5): Our fifth reviewer had similar concerns as the previous two reviewers on this recommendation. She thinks the evidence is strong to recommend an upgrade. Low impact hip fractures have been shown to correlate with osteoporotic bone and predict a second hip fracture with higher incidence. The National Osteoporotic Foundation has issued guidelines recommending evaluation and treatment based on their review of the literature and she thinks this recommendation should be in line with theirs. The downside to not recommending strongly the evaluation and treatment of osteoporosis after a hip fracture is to see an increase in preventable low impact fractures.</p>
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Workgroup Response

Dear AGS Review Committee,

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

A. Thank you for your comment. The recommendation used by this work group is standardized for all AAOS guidelines, thus the work group cannot revise as suggested.

B. The recommendations are based off of preliminary recommendations that were constructed a priori with various treatments or outcomes in mind.

C. The star rating system is standard for all AAOS guidelines. We will share your feedback with the Committee on Evidence Based Quality and Value.

D. This issue is addressed in the future research section of this recommendation.

E. This issue is addressed in the Introduction section of the guideline.

F. This issue is addressed in the Introduction section of the guideline.

G. The work group believes that the original language is clear, thus no changes will be made.

H. The work group agrees with your suggestion and the new language will be reflected in the Risk/Harms section of this recommendation.

I. Your reviewer's comments regarding the incorrect strength of the recommendation is correct. The Casati et al. study was mistakenly listed as high strength, but is actually moderate strength. This recommendation only has one high quality study (Davis 1981), and the rest are moderate. The strength typo and rationale is corrected and the recommendation was downgraded to moderate.

J. This is addressed in the Risks/Harms section of this recommendation.

K. Thank you for your comment. The Work group did not make changes to the risk/harms statement.

L. Thank you for your comment. The work group voted not to amend the recommendation language.

M. Thank you for your comment. No change will be made.

N. The work group has rewritten the rationale for this recommendation to give additional explanation as to why cemented was recommended (e.g. reduced fracture risk, increased mobility, reduced pain all favor cemented).

O. Thank you for your comment. No change will be made.

P. Thank you for your comment. No change will be made.

Q-U. The guideline work group has reviewed the literature and revised the language of Recommendation 15. The revised recommendation reads, "Moderate evidence supports use of venous thromboembolism prophylaxis (VTE) in hip fracture patients."

V. Thank you for your suggestion, the work group agrees and has revised the recommendation to read, “Moderate evidence supports that perioperative nutritional support reduces mortality and improves nutritional status.”

W. Thank you for your suggestion, the work group agrees and has subcategorized recommendation 19, creating the following recommendations:

Recommendation 19a. Moderate evidence supports use of supplemental vitamin D and calcium in patients following hip fracture surgery.

Recommendation 19b. Limited evidence supports preoperative assessment of serum levels of albumin and creatinine for risk assessment.

X. Thank you for your suggestion, but this is beyond the scope of this guideline.

Y. Thank you for your suggestion, but this is beyond the scope of this guideline.

Z. Thank you for your suggestion, but this is beyond the scope of this guideline.

Respectfully,

2014 AAOS Hip Fractures Guideline Workgroup

Reviewer #8, Robert L. Rich, Jr

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
8	Robert L. Rich, Jr		<p>A. I would have anticipated that the objectives of the guideline would have been broken down to list areas of focus such as evaluation of the patient including imaging, surgical and nonsurgical management, rehabilitation care, etc. The goal I saw listed in the introduction was listed only as "to improve treatment based on the current best evidence" lines 440-441. 4. & 16.</p> <p>B. cursory reading of the data tables following several of the recommendations leads one to question the evidence for the recommendation when the majority of the listed outcomes were either "NS" or equally favoring the alternative intervention instead of the listed recommendation. The best example to me was Table 101 looking at epidural analgesia vs placebo.</p> <p>C. Primary care will primarily focus on the diagnosis and post-operative care aspects of this guideline and will forego the rather technical aspects focusing on the specifics of the hip surgery.</p>

Workgroup Response

Dear Dr. Robert L. Rich, Jr,

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

- A. Thank you for your comment. No change will be made. The work group attempted to arrange the recommendations to reflect stage of care (i.e. preoperative, intraoperative, and postoperative).
- B. Thank you for your comment.
- C. Thank you for your comment. The work group agrees.

Respectfully,

2014 AAOS Hip Fractures Guideline Workgroup

Reviewer #9, Anonymous Review Committee, ACEP

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
9	Anonymous Review Committee	ACEP	<p>A. I applaud the AAOS authors' review of original research, I disagree with the decision to automatically exclude systematic reviews or guidelines compiled by others. Systematic reviews top the evidence based medicine information hierarchy and those authored by different groups invariably reflect distinct viewpoints and perspectives that the AAOS ought to consider, even if different inclusion criteria and underlying priorities yielded these other systematic reviews.</p> <p>B. The issue of admission labs (Vitamin D, calcium, albumin, and creatinine) is tangentially related to acute care in that many emergency department providers write admission orders. Although not randomized controlled trials of hip fracture patients, some evidence exists suggesting a benefit to obtaining these labs and initiating appropriate Vitamin D or calcium replacement therapy in the emergency department following geriatric trauma, whether or not the hip is fractured or admission occurs (Example # utine emergency department care, but those that do (advanced imaging, pre-operative regional analgesia, pre-operative traction, calcium/Vit D supplementation) are essential aspects of high-quality, acute hip fracture care and reflect principles recently advocated in the American College of Emergency Physicians-American Geriatrics Society-Emergency Nurses Association-Society for Academic Emergency Medicine "Geriatric Emergency Department" guidelines in terms of definitive diagnostic testing and appropriately aggressive pain control.</p> <p>C. Outcome that these guidelines neglect in the pre-advanced imaging period of clinical care is the optimal disposition of these patients while awaiting advanced imaging. Many emergency departments lack access to MRI around-the-clock and already overcrowded EDs often expend significant personnel resources to disposition these patients from the ED while awaiting advanced imaging. Without an established hip fracture (pending advanced imaging confirmation) the otherwise healthy but currently non-ambulatory patient with hip pain is often not admitted by the orthopedic surgery service and Medicine-Hospitalist services are frequently resistant to admitting these patients, too. They cannot and should not stay in the ED</p>

			<p>for days awaiting an MRI or bone scan, but they are not ambulatory for home discharge. It would have been novel and enlightening for the AAOS guideline developers to address this common scenario in their otherwise excellent review of the hip fracture literature. We are pleased that AAOS is advocating preoperative pain relief in patients with hip fractures and emphasizing the role of nerve blocks. Although there is insufficient evidence at this time to support sonographic guidance of regional blocks, there may be sufficient evidence to consider including when this guideline is due for its next revision.</p>
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Workgroup Response

Dear ACEP Review Committee,

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

A. Thank you for your comments regarding including systematic reviews in our guidelines. We search the bibliographies of all relevant systematic reviews to ensure that we are assessing all relevant articles, per the inclusion criteria that our clinician work groups assemble a priori to undertaking our own systematic literature review. Because we are creating our own systematic literature review, with its own unique criteria for study inclusion, which provides the foundation for our recommendations, including the pooled results of other systematic reviews would be redundant and methodologically flawed.

B. Thank you for your comments, the work group elected to subcategorize recommendation 19, creating the following recommendations:

Recommendation 19a. Moderate evidence supports use of supplemental vitamin D and calcium in patients following hip fracture surgery.

Recommendation 19b. Limited evidence supports preoperative assessment of serum levels of albumin and creatinine for risk assessment.

C. Thank you for your comment. This is beyond the scope of this guideline. Liaison services are addressed in the future research section of Recommendation 20.

Respectfully,

2014 AAOS Hip Fractures Guideline

Reviewer #10, Philip T. Schmitt, AOA

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
10	Philip T. Schmitt, D.O.	American Osteopathic Academy of Orthopedics	Overall paper was very well presented and supported.

Workgroup Response

Dear Dr. Philip T. Schmitt

Thank you for your expert review of the Clinical Practice Guideline on the Management of Hip Fractures in the Elderly.

Respectfully,

2014 AAOS Hip Fractures Guideline Workgroup

PUBLIC COMMENT RESPONSES

Public Comment Participant Key

Participant #	Name of Participant	Primary Specialty	Work Setting	What is the name of the society that you are representing?
1	Anonymous	Anonymous	Anonymous	
2	John Healey, MD	Ortho/Oncology	Academic Practice	AAOS Womens Health Issues Advisory Board
3	Ruth Jackson Orthopaedic Society Taskforce (Julie Balch Samora; Lisa Cannada; Tamara Rozental; Carmen Quatman; Jennifer Moriatis Wolf)	Multiple Specialties	Academic Practice	Ruth Jackson Orthopaedic Society

Public Comment Participant’s Disclosure Information

All public comment participants 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 public comment participant was asked to provide details on their possible conflict.

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?

Disclosure Information for Public Comment Participants

Participant Number	Name of Participant (Required)	A	B	C	D	E	F	G	H	I	J
1	Anonymous	None	None	None	None	None	None	None	None	<ul style="list-style-type: none"> • Elsevier • Journal of Bone and Joint Surgery - American • Journal of Bone and Joint Surgery - American • Journal of the American Academy of Orthopaedic Surgeons • Spine 	<ul style="list-style-type: none"> • Lumbar Spine Research Society • Medicare Coverage and Advisory Commission
2	John Healey, MD	None	None	None	None	None	None	None	Clinical Orthopaedics and Related Research	Clinical Orthopaedics and Related Research; Journal of Orthopaedic Science	Association of Bone and Joint Surgeons; Musculoskeletal Tumor Society; Orthopaedic Research Society; Orthopaedic Research and Education Foundation; Musculoskeletal Transplant Foundation ; AAOS
3	Ruth Jackson Orthopaedic Society Taskforce	None	None	None	None	None	None	None	None	None	None

Public Comment Participants' Responses to Structured Public Comment Questions

Questions 1-4

Reviewer #	Name of Reviewer (Required)	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	Anonymous	Strongly Agree	Strongly Agree	Agree	Neutral
2	John Healey, MD	Neutral	Neutral	Neutral	Strongly Disagree
3	Ruth Jackson Orthopaedic Society Taskforce	Agree	Agree	Agree	Neutral

Questions 5-8

Reviewer #	Name of Reviewer (Required)	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	Anonymous	Neutral	Agree	Neutral	Agree
2	John Healey, MD	Strongly Disagree	Neutral	Strongly Disagree	Neutral
3	Ruth Jackson Orthopaedic Society Taskforce	Neutral	Neutral	Agree	Neutral

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	Anonymous	None Listed	Agree	Neutral	Agree	Neutral
2	John Healey, MD	None Listed	Neutral	Strongly Disagree	Strongly Disagree	Neutral
3	Ruth Jackson Orthopaedic Society Taskforce	None Listed	Disagree	Disagree	Neutral	Neutral

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	Anonymous	None Listed	Agree	Agree	Disagree	Neutral
2	John Healey, MD	None Listed	Strongly Disagree	Neutral	Strongly Agree	Neutral
3	Ruth Jackson Orthopaedic Society Taskforce	None Listed	Disagree	Neutral	Agree	Agree

Would you recommend these guidelines for use in clinical practice?

Participant Number	Name of Participant (Required)	Would you recommend these guidelines for use in clinical practice?
1	Anonymous	Recommend
2	John Healey, MD	Would Not Recommend
3	Ruth Jackson Orthopaedic Society Taskforce	Recommend With Revisions

Public Comment Participants' Responses

Public Comment Participant #1, Anonymous

I commend the authors of the guidelines for the work they have done. The recommendations are generally appropriate. I recognize that standard "guidelines" methodology has been followed. The statements are likely all accurate in terms of "guidelines language" but developing a moderate recommendation on the basis of two published papers is of questionable benefit. The AAOS needs to seriously consider whether they should get out of the guidelines business. There has to be realization that interpretation of the literature in the way the guidelines process requires will not allow strong recommendations for most orthopaedic literature.

Public Comment Participant #2, John Healey, MD (AAOS Women’s Health Issues Advisory Board)

Tragically the Herculean task of reviewing and distilling the literature regarding hip fracture management is fatally flawed. The effort was structured to only review “full article reports” (line 625), yet there was no mention that major factors such as sex were analyzed in any of the contributing studies. It appears that the Committee didn’t follow its self-defined rules. Thus, the analysis is incomplete at best. The document includes no description of effort to evaluate the influence of sex on the disease process or treatment effects. There is no documentation of the extent and detail of the analysis of the “demographic factors” for each of the studies reviewed. Undoubtedly it varied widely. The report fails to discuss the lack of analysis of the most important factor (sex) that predisposes to hip fracture, in the aged. It fails to address the issue of sexual dimorphism in terms of anatomy and physiology, as well. As a minimum I call on the Committee to amend the Clinical Guidelines in the following manner. 1. Comment on the lack of study of this topic. 2. Review the effect of sex on each of the existing recommendations. 3. Recommend that sexual dimorphism is an essential future research topic for each recommendation. Below are noted the only references to sex in the document and the identification of glaring oversights. Line 527-9. Between 1986 and 2005, the annual mean number of hip fractures was 957.3 per 100 000 (95% confidence interval [CI], 921.7-992.9) for women and 414.4 per 100 000 (95% CI, 401.6-427.3) for men. Line 536. Risk factors should include age and female sex. Line 625. “ Article must be a full article report of a clinical study “ Since none of the studies examined the role of sex in any of the outcome measures, none of them are comprehensive. None should be accepted as being “full”. Each of the elements should be examined for sex differences in outcome. Since none of them have been, all of the recommendations should include a recommendation that the role of sex in the incidence, management, and outcome of hip fractures needs to be studied extensively. Line 2057. “fractures (Harwood et al in a moderate strength double blinded study in elderly women with hip fractures” This is the only aspect in the entire set of recommendations that addresses sex differences.) Sincerely, John H. Healey, MD, FACS Member, AAOS Council on Research and Quality Member, AAOS Women’s Health Issues Advisory Board Stephen McDermott Professor in Surgery and Professor of Orthopaedic Surgery, Weill Medical College of Cornell University Chief of Orthopaedic Surgery, Memorial Sloan Kettering Cancer Center

Public Comment Participant #3, Ruth Jackson Orthopaedic Society Taskforce

This is a thorough, thoughtful, well-crafted document. There is a lack of recognition of sex/gender difference for this injury and we are grateful to have the opportunity to provide some input. Specifically, we noted the large disparity and age differences between women and men sustaining hip fractures in the listed references, which is not mentioned in this document. The inferior outcomes observed in men compared to women is also not highlighted. There were few data included on Vitamin D and Calcium supplementation, especially for men. We feel strongly that a section on DEXA screening should be included. We have outlined some of our specific comments below, but have some general thoughts: The inclusion criteria indicates articles from as early as 1966 (page 246, Eskeland et al, 1966; a few from 1971 -page 72, page 86). The work group should ponder whether articles from this era are truly relevant today. Is there justification for the inclusion of these earlier studies? 'Elderly patients' are defined as 65 and older. Perhaps the work group should include age stratification in this CPG, such as into 65-75-85? Perhaps we should also be taking into account factors other than just chronological age. There really are different levels of "frailty" in terms of this population. Some elderly patients can be high functioning, independent community ambulators. On the other hand, there are the severely demented, low functioning, bedridden patients, for which treatment is often palliative. There are few reports on the preoperative activity level of women vs men who sustain hip fractures, and perhaps this should be an area of future research. This "hierarchy" warrants further discussion especially in light of the significant sex disparity in mortality/outcomes (higher for males), which is not discussed at all in the current draft. Many of these studies do report demographics on patients (male vs. females included in the study cohort) but few actually compare and contrast outcomes or results in the reported results. A reasonable task to ask of the authors would be to go through each of these studies to summarize these data. A way to present this would be to include a section at the end that discusses all of these categories as they relate to sex differences. This could have its own separate table with specific details encompassing all items (imaging, mortality, surgical timing, rehab, etc). It might be easier to follow and could set a precedent for future CPGs incorporating the differences in incidence and outcome between men and women into research, thus making it easy to identify areas of deficiency in research recruitment/outcome reporting for musculoskeletal issues. Many of these studies have an over-abundance of female subjects but we know overall that males tend to have a much higher complication rate and incidence of mortality after this injury. Whether this is a reflection of the preoperative physiologic state of males should be an area of interest. Our specific comments are as follows: Line 367 (page 159 line 1501): cemented femoral stems has moderate evidence. There are significant concerns about risks with cement which would be helpful for the reader. Perhaps add a phrase such as: "Cement is not without significant risks, and patient co-morbidities must be taken into account when deciding on utilization of cement." Line 379: stable intertrochanteric hip fractures recommends either use of a sliding hip screw or cephalomedullary device. It might be helpful to discuss the difference in implant cost of treating stable intertrochanteric fractures with the two types of devices. Cost issues are alluded to in 'future research' section, but some studies have already been performed and these have not been included in the 'Rationale section', Line 1572. Line 392: stable intertrochanteric fractures recommending the cephalomedullary device-- perhaps they should add a discussion of short vs long devices? Line 398 (Section VTE prophylaxis Line 1723): VTE prophylaxis is supported – this section is vague and does not specify medications being utilized (this is listed in some of the following tables, however). This section should consider mentioning AAOS vs.

CHEST guidelines and ASA as option. Line 537: being female should be mentioned as a risk factor- there should be mention that hip fractures disproportionately affect post-menopausal women. Line 1605: If subtrochanteric hip fractures are going to be included in this CPG, should a section on pathologic fractures due to bisphosphonate use be included? Line 1802: Transfusion threshold. Women are at higher risk of transfusion, given lower preoperative H/H. This information should be included here. Line 1931: Nutrition- protein energy malnutrition is more common in elderly women. One study found that elderly women were found to be 19 percent at risk for malnutrition vs 10.5% for men, which would place them at higher risk for fragility fractures (J Clin Nurs. 2009 May;18(9):1354-64. Malnutrition in a home-living older population: prevalence, incidence and risk factors. A prospective study. Johansson Y, Bachrach-Lindström M, Carstensen J, Ek AC.) Line 1990: Postoperative multimodal analgesia- perhaps in future research, the authors could add a line about investigating differential responses to medications based on sex, which has been observed, but the underlying etiology has not yet been identified (Eur J Pain. 2004 Oct;8(5):413-25. Sex differences in opioid analgesia: clinical and experimental findings. Fillingim RB, Gear RW). Line 2036: Calcium and Vitamin D screening In most cases, a woman requires a higher intake of vitamins and minerals in proportion to total dietary energy intake than a man. For example, a woman needs 2.5 times more iron than a man. Translated into units of food energy in the context of her smaller intake, her requirement is 3.5 times greater. Women and men need the same amount of calcium and vitamin C, but women's diets need to be 40 percent richer in these nutrients. These differences are not discussed. Line 2047: Although this section uses references that examine this topic exclusively in women, this information is not mentioned in the text (eg Chapuy MC, Arlot ME, Bueouf F, et al. Vitamin D and calcium to prevent hip fractures in the elderly woman. N Engl J Med. 1992;327:1637–1642). The section should really be titled Calcium and Vitamin D and include the following: "moderate evidence supports the use of supplemental vitamin D and calcium in post-menopausal women following hip fracture surgery". There should be a separate sentence added indicating that "evidence is lacking whether Ca and vitamin D supplementation is useful in men." Line 2074: Future research should focus on understanding sex differences in supplemental vitamin D and calcium. Line 2085: Screening- perhaps a discussion whether a lab work-up is recommended in terms of Ca, vitamin D and bone turnover markers? Should the screening be the same for women and men? Line 2138: A section should be added on screening for osteoporosis in the hip fracture workup with DXA and lab workup. This should include whether the literature supports obtaining DXA scans on all patients, and whether there are sex differences.

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

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: