AAOS
American Academy of Orthopaedic Surgeons

Review Period Report

Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Clinical Practice Guideline

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Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Clinical Practice Guideline Overview of the Review Period

The reviews and comments related to this clinical practice guideline are reprinted in this document and posted on the AAOS website. All reviewers are required to disclose their conflict of interests.

Review Process:

AAOS contacted 6 organizations with content expertise to review a draft of the clinical practice guideline during the three-week peer review period in May 2024.

Additionally, the draft was also provided to members of the AAOS Board of Directors (BOD), members of the Research and Quality Council (RQC), members of the Board of Councilors (BOC), members of the Board of Specialty Societies (BOS) and members of the Committee on Evidence-Based Quality and Value (EBQV) for review and comment.

- Eleven (11) individuals provided comments via the electronic structured peer review form. No reviewers asked to remain anonymous.
- All eleven reviews were on behalf of a society and/or committee.
- The work group considered all comments and made some modifications when they were consistent with the evidence.

Reviewer Key

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

Table 1. Reviewer Key

Reviewer Number	Name of Reviewer	Society/ Committee Being Represented
1	Sigita Wolfe, MBA	American Association of Hip and Knee Surgeons
2	Antonia Chen, MD, MBA	American Academy of Orthopaedic Surgeons, Key Informants Panel
3	Yasir Hamad, MD, FIDSA	Infectious Diseases Society of America
4	Adolph Yates, MD	American Academy of Orthopaedic Surgeons, Board of Directors
5	Mark Greyson, MD	American Society for Surgery of the Hand
6	Andy Miller, MD	American Academy of Orthopaedic Surgeons, Key Informants Panel
7	Olalekan Omolola, MD, MBA	3M
8	Kay Washington, MD, PhD	College of American Pathologists
9	Creighton Tubb, MD	American Academy of Orthopaedic Surgeons, Research and Quality Council
10	Bryan Springer, MD	The Hip Society
11	Gwo Lee, MD	The Knee Society

Reviewer Demographics

Table 2: Reviewer Demographics

Reviewer Number	Name of Reviewer	Primary Specialty	Work Setting
1	Sigita Wolfe, MBA	Adult Hip	Other
2	Antonia Chen, MD, MBA	Total Joint	Academic Practice
3	Yasir Hamad, MD, FIDSA	Other	Non-Military Government or Public
4	Adolph Yates, MD	Total Joint	Academic Practice
5	Mark Greyson, MD	Hand	Academic Practice
6	Andy Miller, MD	Other	Clinical Hospital
7	Olalekan Omolola, MD, MBA	Other	Other
8	Kay Washington, MD, PhD	Other	Academic Practice
9	Creighton Tubb, MD	Total Joint	Private Group or Practice
10	Bryan Springer, MD	Adult Hip	Academic Practice
11	Gwo Lee, MD	Adult Knee	Academic Practice

Reviewers' Disclosure Information

All reviewers are required to disclose any possible conflicts that would bias their review via a series of 10 questions (see Table 3). For any positive responses to the questions (i.e., "Yes"), the reviewer was asked to provide details on their possible conflict.

Table 3. 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 4. Reviewer's Disclosure Information

Reviewer Number	Name of Reviewer	Disclosure Available via AAOS Disclosure System	A	B	C	D	E	F	G	H	I	J
1	Sigita Wolfe, MBA	Yes										
2	Antonia Chen, MD, MBA	Yes										
3	Yasir Hamad, MD, FIDSA	No	No	No	No	No	No	No	No	No	No	No
4	Adolph Yates, MD	Yes										
5	Mark Greyson, MD	No	No	No	No	No	No	No	No	No	No	No
6	Andy Miller, MD	Yes										
7	Olalekan Omolola, MD, MBA	No	No	No	No	No	No	No	No	No	No	No
8	Kay Washington, MD, PhD	No	No	No	No	Yes	No	No	No	No	No	No
9	Creighton Tubb, MD	Yes										
10	Bryan Springer, MD	Yes										
11	Gwo Lee, MD	Yes										

Reviewer Responses to Structured Review Form Questions

All reviewers are asked 16 structured 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. Reviewer Responses to Structured Review Questions 1-4

Reviewer Number	Name of Reviewer	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	Sigita Wolfe, MBA	Agree	Agree	Agree	Agree
2	Antonia Chen, MD, MBA	Agree	Agree	Agree	Neutral
3	Yasir Hamad, MD, FIDSA	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
4	Adolph Yates, MD	Neutral	Neutral	Agree	Disagree
5	Mark Greyson, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
6	Andy Miller, MD	Strongly Agree	Strongly Agree	Strongly Agree	Agree
7	Olalekan Omolola, MD, MBA	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
8	Kay Washington, MD, PhD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
9	Creighton Tubb, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
10	Bryan Springer, MD	Neutral	Agree	Disagree	Disagree
11	Gwo Lee, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree

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

Reviewer Number	Name of Reviewer	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	Sigita Wolfe, MBA	Agree	Agree	Agree	Agree
2	Antonia Chen, MD, MBA	Agree	Agree	Agree	Agree
3	Yasir Hamad, MD, FIDSA	Agree	Agree	Agree	Agree
4	Adolph Yates, MD	Disagree	Neutral	Neutral	Agree
5	Mark Greyson, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
6	Andy Miller, MD	Agree	Strongly Agree	Strongly Agree	Agree
7	Olalekan Omolola, MD, MBA	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
8	Kay Washington, MD, PhD	Agree	Strongly Agree	Agree	Agree
9	Creighton Tubb, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
10	Bryan Springer, MD	Agree	Disagree	Disagree	Strongly Disagree
11	Gwo Lee, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree

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

Reviewer Number	Name of Reviewer	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	Sigita Wolfe, MBA	Agree	Agree	Agree	Agree
2	Antonia Chen, MD, MBA	Agree	Agree	Agree	Agree
3	Yasir Hamad, MD, FIDSA	Agree	Agree	Agree	Agree
4	Adolph Yates, MD	Neutral	Disagree	Disagree	Disagree
5	Mark Greyson, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
6	Andy Miller, MD	Neutral	Strongly Agree	Strongly Agree	Agree
7	Olalekan Omolola, MD, MBA	Strongly Agree	Agree	Agree	Agree
8	Kay Washington, MD, PhD	Agree	Agree	Agree	Agree
9	Creighton Tubb, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
10	Bryan Springer, MD	Strongly Disagree	Disagree	Agree	Agree
11	Gwo Lee, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree

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

Reviewer Number	Name of Reviewer	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	Sigita Wolfe, MBA	Agree	Agree	Agree	Agree
2	Antonia Chen, MD, MBA	Agree	Agree	Agree	Agree
3	Yasir Hamad, MD, FIDSA	Neutral	Agree	Agree	Agree
4	Adolph Yates, MD	Disagree	Disagree	Strongly Agree	Disagree
5	Mark Greyson, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
6	Andy Miller, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
7	Olalekan Omolola, MD, MBA	Agree	Strongly Agree	Agree	Agree
8	Kay Washington, MD, PhD	Agree	Agree	Agree	Agree
9	Creighton Tubb, MD	Strongly Agree	Agree	Strongly Agree	Strongly Agree
10	Bryan Springer, MD	Neutral	Neutral	Disagree	Agree
11	Gwo Lee, MD	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree

Reviewers' Recommendation for Use of this Guideline in Clinical Practice

Would you recommend these guidelines for use in clinical practice?

Reviewer Number	Name of Reviewer	Would you recommend these guidelines for use in clinical practice?
1	Sigita Wolfe, MBA	Recommend
2	Antonia Chen, MD, MBA	Recommend
3	Yasir Hamad, MD, FIDSA	Recommend
4	Adolph Yates, MD	Would Not Recommend
5	Mark Greyson, MD	Recommend
6	Andy Miller, MD	Strongly Recommend
7	Olalekan Omolola, MD, MBA	Recommend
8	Kay Washington, MD, PhD	Recommend
9	Creighton Tubb, MD	Recommend
10	Bryan Springer, MD	Would Not Recommend
11	Gwo Lee, MD	Recommend

Reviewer Detailed Responses and Editorial Suggestions

Reviewer #1, Sigita Wolfe, MBA

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
1	Sigita Wolfe, MBA on behalf of the American Association of Hip and Knee Surgeons	American Association of Hip and Knee Surgeons	A. The three-month delay for TJA or dental procedures is very prescriptive. Somewhat concerning in the absence of any evidence. The data on bacteremia does not support the recommendation, therefore commitment to this timeline is problematic.

Workgroup Response to Reviewer #1

Dear Sigita Wolfe, MBA,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. Thank you for your feedback. The recommendation "In the absence of reliable evidence, it is the decision of the workgroup that the decision to delay a dental procedure after hip or knee replacement surgery for 3 months is based on the risk of transient bacteremia, the occurrence of an invasive surgical procedure, or treatment of an active infection. Please see Table 3" has been amended to state ""In the absence of reliable evidence, it is the decision of the workgroup that the decision to delay a dental procedure after hip or knee replacement surgery is based on the risk of transient bacteremia, the occurrence of an invasive surgical procedure, or treatment of an active dental infection. Please see Table 3"

Reviewer Detailed Responses and Editorial Suggestions

Reviewer #2, Antonia Chen, MD, MBA

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
2	Antonia Chen, MD, MBA	American Academy of Orthopaedic Surgeons, Key Informants Panel	A. My biggest concern is the timeline of 3 months being added to the guideline for the "Delay Vs. No Delay of Dental Procedure After a Hip/Knee Arthroplasty". This guideline recommends waiting a maximum of 3 weeks in the text, but it does not place a timeframe in the stem (In the absence of reliable evidence, it is the opinion of the workgroup that the decision to delay a hip or knee replacement surgery is based on the risk of transient bacteremia, the occurrence of an invasive surgical procedure, or treatment of an active infection). I would recommend that similar language be used in the following guideline on "Delay Vs. No Delay of Dental Procedure After a Hip/Knee Arthroplasty." The wording could be: "In the absence of reliable evidence, it is the opinion of the workgroup that the decision to delay a dental procedure after hip or knee replacement surgery is based on the risk of transient bacteremia, the occurrence of an invasive surgical procedure, or treatment of an active infection. Please see Table 3." That way, providers can look at Table 3 and choose to delay by 3 months. Some of the procedures list Same day (dental cleaning without probing and Active Dental Infection) and not 3 months. By removing the timeframe, it allows for individuals to make decisions on their own patients with guidance from the CPG.?

Workgroup Response to Reviewer #2

Dear Antonia Chen, MD, MBA,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. Thank you for your feedback. The recommendation "In the absence of reliable evidence, it is the decision of the workgroup that the decision to delay a dental procedure after hip or knee replacement surgery for 3 months is based on the risk of transient bacteremia, the occurrence of an invasive surgical procedure, or treatment of an active infection. Please see Table 3" has been amended to state ""In the absence of reliable evidence, it is the decision of the workgroup that the decision to delay a dental procedure after hip or knee replacement surgery is based on the risk of transient bacteremia, the occurrence of an invasive surgical procedure, or treatment of an active dental infection. Please see Table 3"

Reviewer Detailed Responses and Editorial Suggestions

Reviewer #3, Yasir Hamad, MD, FIDSA

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
3	Yasir Hamad, MD, FIDSA	Infectious Diseases Society of America	A. The document is succinctly written and well-organized. However, the recommendations are limited by the lack of high-quality studies, which restricts the ability to provide stronger recommendations for most of the PICO questions addressed.

Workgroup Response to Reviewer #3

Dear Yasir Hamad, MD, FIDSA,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. Thank you for your feedback.

Reviewer #4, Adolph Yates, MD

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
4	Adolph Yates, MD.	American Academy of Orthopaedic Surgeons, Board of Directors	A. I have three concerns, and only about the first recommendation. 1.) The level of certainty might be too high to reverse a commonly accepted practice. The first three studies (1,2,3) are from large data bases/registries and suffer from the concerns expressed in the recent JBJS editorial regarding such evidence (4), namely issues with causality, effect size, and specificity. The remaining study (5) lacks the power to be convincing. B. 2.) The question could have been addressed with a number needed to treat analysis. If the cost of PJI is estimated at minimum being $25K to $32K (6), the cost of prophylaxis as $10 for four tablets of amoxicillin (7), the incidence of antibiotic associated c-diff as being 0.03%. (8), and the cost of an isolated case of c diff being around $10,000 (9), preventing one PJI case per one thousand patients would be approximately 40% the cost incurred overall, with far less morbidity. C. 3.) Finally, the sense of need for prophylaxis amongst more experienced surgeons should not be discounted, given the questionable evidence (10). In particular, the stance taken by the Mayo clinic should be reviewed (11) which encourages targeted prophylaxis for patients with especially vulnerable comorbidities. Ideally the CPG would add such a proviso. To not consider the more vulnerable patients as possibly needing prophylaxis might violate the concept of "primum non nocere". 1.) Thornhill MH, Crum A, Rex S, Stone T, Campbell R, Bradburn M, Fibisan V, Lockhart PB, Springer B, Baddour LM, Nicholl J. Analysis of Prosthetic Joint Infections Following Invasive Dental Procedures in England. JAMA Netw Open. 2022 Jan 4;5(1):e2142987. doi: 10.1001/jamanetworkopen.2021.42987. PMID: 35044470; PMCID: PMC8771300. 2.) Kao FC, Hsu YC, Chen WH, Lin JN, Lo YY, Tu YK. Prosthetic Joint Infection Following Invasive Dental Procedures and Antibiotic Prophylaxis in Patients With Hip or Knee Arthroplasty. Infect Control Hosp Epidemiol. 2017 Feb;38(2):154-161. doi: 10.1017/ice.2016.248. Epub 2016 Nov 9. PMID: 27825396. 3.) Sax OC, Bains SS, Chen Z, Delanois RE, Nace J. Antibiotic Prophylaxis Is Not Necessary for Invasive Dental Procedures in Existing Total Knee Arthroplasty Implants. Orthopedics. 2023 Mar-Apr;46(2):76-81. doi: 10.3928/01477447-20221024-06. Epub 2022 Oct 28. PMID: 36314873. 4.) Swiontkowski MF, Callaghan JJ, Lewallen DG, Berry DJ. Large Database and Registry Research in Joint Arthroplasty and Orthopaedics. J Bone Joint Surg Am. 2022 Oct 19;104(20):1775-1777. doi: 10.2106/JBJS.22.00405. Epub 2022 Oct 19. PMID: 36260046.

5.) Berbari EF, Osmon DR, Carr A, Hanssen AD, Baddour LM, Greene D, Kupp LI, Baughan LW, Harmsen WS, Mandrekar JN, Therneau TM, Steckelberg JM, Virk A, Wilson WR. Dental procedures as risk factors for prosthetic hip or knee infection: a hospital-based prospective case-control study. Clin Infect Dis. 2010 Jan 1;50(1):8-16. doi: 10.1086/648676. Erratum in: Clin Infect Dis. 2010 Mar 15;50(6):944. PMID: 19951109.
6.) Premkumar A, Kolin DA, Farley KX, Wilson JM, McLawhorn AS, Cross MB, Sculco PK. Projected Economic Burden of Periprosthetic Joint Infection of the Hip and Knee in the United States. J Arthroplasty. 2021 May;36(5):1484-1489.e3. doi: 10.1016/j.arth.2020.12.005. Epub 2020 Dec 9. PMID: 33422392.
7.) https://www.drugs.com/price-guide/amoxicillin#:~:text=The%20cost%20for%20amoxicillin%20oral,on%20the%20pharmacy%20you%20visit.
8.) Zhang J, Chen L, Gomez-Simmonds A, Yin MT, Freedberg DE. Antibiotic-Specific Risk for Community-Acquired Clostridioides difficile Infection in the United States from 2008 to 2020. Antimicrob Agents Chemother. 2022 Dec 20;66(12):e0112922. doi: 10.1128/aac.01129-22. Epub 2022 Nov 15. PMID: 36377887; PMCID: PMC9764966.
9.) Malone DC, Armstrong EP, Gratie D, Pham SV, Amin A. A systematic review of real-world healthcare resource use and costs of Clostridioides difficile infections. Antimicrob Steward Healthc Epidemiol. 2023 Jan 17;3(1):e17. doi: 10.1017/ash.2022.369. PMID: 36714290; PMCID: PMC9879868.
10.) Colterjohn T, de Beer J, Petruccelli D, Zabtia N, Winemaker M. Antibiotic prophylaxis for dental procedures at risk of causing bacteremia among post-total joint arthroplasty patients: a survey of Canadian orthopaedic surgeons and dental surgeons. J Arthroplasty. 2014 Jun;29(6):1091-7. doi: 10.1016/j.arth.2013.11.024. Epub 2013 Dec 2. PMID: 24405623.
11.) Zhou MX, Berbari EF, Couch CG, Gruwell SF, Carr AB. Viewpoint: Periprosthetic joint infection and dental antibiotic prophylaxis guidelines. J Bone Jt Infect. 2021 Oct 1;6(8):363-366. doi: 10.5194/jbji-6-363-2021. PMID: 34646729; PMCID: PMC8498598.

Workgroup Response to Reviewer #4

Dear Adolph Yates, MD,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. Thank you for your feedback. As a limited recommendation (option), future research has the potential to change the directionality of this statement. The language stem used (i.e. 'may not') is the standardized verbiage for a limited strength statement.

B. Thank you for your feedback. The work group has recommended against the use of prophylaxis antibiotics due to a lack of evidence supporting causation between dental procedure and PJI. If there isn't a difference in PJI rate between abx and non-abx patients, the cost of PJI in the two groups would be the same but the abx group would have the cost of the antibiotic and c-diff treatment.

C. Thank you for your feedback, the Future Research section of the rationale has been edited.

Reviewer Detailed Responses and Editorial Suggestions

Reviewer #5, Mark Greyson, MD,

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
5	Mark Greyson, MD	American Society for Surgery of the Hand	A. All of these guidelines are based on low or very low/consensus evidence quality. I would consider placing table 514 before the summary of options, as to better convey the strength of evidence before the reader reviews the summary guidelines.

Workgroup Response to Reviewer #5

Dear Mark Greyson, MD,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. Thank you for your feedback. The placement of Table 1 is standard to all AAOS guidelines. The table explains the strength visuals with each which recommendation; the strength of evidence is listed for each recommendation/option. Table 1 is situated between the Summary of Recommendations/Options and the full text presentation of Recommendations/Options and their respective rationales.

Reviewer Detailed Responses and Editorial Suggestions

Reviewer #6, Andy Miller, MD

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
6	Andy Miller, MD	American Academy of Orthopaedic Surgeons, Key Informants Panel	A. Excellent document, on the whole, which clarifies and simplifies previous guidance. This guidance is clearly written, and practical. Re: Table 3: The somewhat arbitrary selection of intervals before and after TJA seem quite wise to me, and are clinically useful. I would love to see data backing them up, but they seem reasonable. Re the statement "All important studies that met the article inclusion criteria are included," I have opted to answer neutrally, but I'm not aware of any studies that were missed B. I think the authors of the guidelines will acknowledge that not all dentists and orthopedists will follow these guidelines, particularly in patients deemed "high risk." These guidelines will exist in a world where plenty of patients receive dental prophylaxis. So I would consider adding a section where the CHOICE of antibiotics is discussed. The risk of a fatal outcome from a single 2-g dose of amoxicillin is likely less than 1/1,000,000, and is much lower than from a single dose of clindamycin or Augmentin (mostly attributable to C. difficile). This sort of guidance - to use amoxicillin at all costs, and to avoid other antibiotics - might be helpful to mitigate individual harm (and social harm) for those patients who get dental ppx despite these guidelines. [In summary: I propose adding a section, expanding from lines 698-699, to strongly recommend amoxicillin over other abx if surgeons insist on giving something at all]. C. Consider a short discussion, or mention, of PJI patients already on suppressive oral antibiotics. This is a small, but particularly concerning group of people with constant questions. Should they stay on their routine suppressive antibiotic? Increase the dose? Take a different medicine? Tough topic, little evidence, but it's a very good question when it comes up. I'd love to know whether the committee considered this, and if not,

			whether it should be added. I would be happy to help if the group is interested in tackling this.

Workgroup Response to Reviewer #6

Dear Andy Miller, MD,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. Thank you for your feedback.

B. Thank you for your feedback. While the work group acknowledges that there will not be absolute adherence to the CPG, the recommendation herein is against the use of antibiotic prophylaxis. It would not be appropriate to recommend a type of antibiotic should the practitioner not adhere to the recommendation.

C. Thank you for your feedback. This subset of patients was out of the a priori scope as determined by the work group.

Reviewer Detailed Responses and Editorial Suggestions

Reviewer #7, Olalekan Omolola, MD, MBA

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
7	Olalekan Omolola, MD, MBA	3M	A. No comment.

Workgroup Response to Reviewer #7

Dear Olalekan Omolola, MD, MBA,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. No comment.

Reviewer Detailed Responses and Editorial Suggestions

Reviewer #8, Kay Washington, MD, PhD

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
8	Kay Washington, MD, PhD	College of American Pathologists	A. My responses pertain to the overall structure and content. I like the way the guideline is organized- each section is clearly written and exactly the kind of information needed to assess the guideline process. Users should find it easy to find the recommendations- they are easily accessible at the beginning of the document. The guideline development process appears rigorous, and I applaud the inclusion of sections on emotional and physical impact and potential harms, as "value" judgments can significantly impact recommendations in a guideline and should be clearly elucidated, as in the document.

Workgroup Response to Reviewer #8

Dear Kay Washington, MD, PhD,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. Thank you for your feedback.

Reviewer Detailed Responses and Editorial Suggestions

Reviewer #9, Creighton Tubb, MD

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
9	Creighton Tubb, MD	American Academy of Orthopaedic Surgeons, Research and Quality Council	A. Well-presented guideline. B. The wording on the first recommendation seems stronger than the evidence would support. "Routine use of a systemic prophylactic antibiotic prior to a dental procedure in patients with a hip or knee replacement is not recommended as it may not reduce the risk of a subsequent periprosthetic joint infection." This wording is somewhat prescriptive and is based off very poor data. Another option would be to word this more like the second recommendation. That would read: "Routine use of a systemic prophylactic antibiotic prior to a dental procedure in patients with a hip or knee replacement may not reduce the risk of subsequent periprosthetic joint infection." The latter seems more consistent with the available data and frees the surgeon / physician / dentist / healthcare provider to make their own decision regarding when to use or not use prophylactic antibiotics barring the availability of better-quality data.

Workgroup Response to Reviewer #9

Dear Creighton Tubb, MD,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. Thank you for your feedback.

B. Thank you for your feedback. The work group followed the standard language against routine use and was consistent with AAOS guideline recommendation protocol to be written as actionable statements.

Reviewer Detailed Responses and Editorial Suggestions

Reviewer #10, Bryan Springer, MD

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
10	Bryan Springer, MD	The Hip Society	A. Thank you for the opportunity to review this CPG. I will disclose up front that I am one of the authors on 2 of the papers that were reviewed for this guideline and therefore have a potential conflict as well as opinions on this topic. As much of the guidance listed is opinion, I feel my opinion is as valid as those of the reviews provided. B. My concerns: The title of the CPG: Prevention of Orthopedic Implant Infection in patients undergoing dental procedures is vague and incorrect. All of your studies specifically look at and address Total Hip and Total knee arthroplasty not orthopedic implants. Is one to assume that these studies extrapolate to Spine Implants, Foot and Ankle Implats etc etc? I suggest you consider be more direct in your title as this represents literature based on Hip and Knee Implants. C. I am uncertain as to why certain studies were included and certain ones left out. While this study was included: Thornhill MH, Gibson TB, Pack C, Rosario BL, Bloemers S, Lockhart PB, Springer B, Baddour LM. Quantifying the risk of prosthetic joint infections after invasive dental procedures and the effect of antibiotic prophylaxis. The Journal of the American Dental Association.2023 Jan 1;154(1):43-52. This study was excluded: Thornhill MH, Crum A, Rex S, Stone T, Campbell R, Bradburn M, Fibisan V, Lockhart PB, Springer B, Baddour LM, Nicholl J. Analysis of prosthetic joint infections following invasive dental procedures in England. JAMA Network Open. 2022 Jan 4;5(1):e2142987-. The appendix states it was excluded because it had an irrelevant outcome.

Yes, the Thornhill et al study in JADA had the identical outcome measure. The Thornhill et al study in JAMA had 5x the number of patients and was methodologically powered appropriately.

I am unclear as to why this identical study with a different patient population where there were no confounders (antibiotic prophylaxis was excluded) when it is the largest study in the literature to look at your primary

In addition, the following study should be included.

> Park HJ, Koh K, Choi YJ, Suh DH, D'Lima D, Kim JG. Is Prophylactic Antibiotic Use Necessary Before Dental Procedures in Primary and Revision TKA? A Propensity Score–matched, Large-database Study. Clinical Orthopaedics and Related Research®. 2024 Mar 1;482(3):411-22.

I understand you have time limits and need to have cutoffs for your search. However, this is a large and impactful study and looks at primary and revision TJA from a huge database.

Since you have included only 8 studies from over the past decade, I suspect it would not be too big of a lift to ensure you are adding the most up to date literature by the addition of one other study.

By including the two most recent and most impactful studies it would lend credibility to your CPG.

D. The wording of recommendations 4 and 5 is confusing. They both should state for "treatment of active DENTAL infections not just infection as it confuses PJI with dental infection.

E. For recommendations 4 and 5, it appears you give conflicting information relative to your most important recommendation #1.

In recommendation #1, you establish, although with low quality evidence, (which may chance with the addition of the above-mentioned articles) that there is no association between dental procedures and PJI and that antibiotic are not effective in prophylaxis.

By recommending a delay of 3 months for dental work after arthroplasty you are contradicting your findings. In addition, you are potentially creating more confusion as people interpret this as not having any procedures done, including avoiding those that may lead to infection if left untreated.

			In addition, you have left the door open to interpretation as to whether or not these people should be given prophylactic antibiotics or not. As is often the case with these guidelines, there will is confusion between what is prophylaxis and what is treatment, and your narrative should clearly define this difference. F. I am disappointed that AAOS chose to do this guideline without a panel from the ADA. Both sides have created a huge rift by doing these CPG independent of each other and remain concerned that doing this in isolation will only continue to create confusion among patients. G. In their current form, I would not recommend. Based on the above and others comments would reconsider based on changes suggested and improvements in language. .

Workgroup Response to Reviewer #10

Dear Bryan Springer, MD,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. Thank you for your feedback and your disclosure.

B. The title of the guideline has been changed to "Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures."

C. Thank you for your feedback. The Thornhill, 2023 study was included as it pertained to the effect of antibiotic prophylaxis and was therefore directly relevant to the PICO question and overall scope of the guideline. The Thornhill, 2022 study assessed the incidence of PJI following dental procedures without antibiotic prophylaxis. The priori PICO question as determined by the work group was "In hip or knee arthroplasty patients presenting for dental procedure, does systemic antibiotic use prior to the procedure affect patient outcomes?" The Park, 2024 study was published after the final search for this guideline.

D. Thank you for your feedback. Both recommendations have been edited to clarify dental infection.

E. Thank you for your feedback. The 3-month specification has been removed from the recommendation language and additional clarification has been added to the rationale.

F. Although this guideline was done in partnership with the American Association of Hip and Knee Surgeons, there were two American Dental Association appointed representatives on the guideline development work group.

G. Thank you for your feedback.

Reviewer Detailed Responses and Editorial Suggestions

Reviewer #11, Gwo Lee, MD

Reviewer Number	Reviewer Name	Society or committee you are representing	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: The response(s) below also includes all editing suggestions received from the Additional Comments section of the structured review form.
11	Gwo Lee, MD	The Knee Society	A. Overall the guidelines are clear and to the point. B. My only comment is the arbitrary establishment of 3 months waiting period after arthroplasty for all dental procedures may handcuff our dental colleagues and our patients. The rationale of transient bacteremia is reasonable but also a theoretical risk. There are dental procedures that are generally less invasive and so to lump all of them as causing equal risk (for example, routine cleaning) may not be reasonable. (See table 3). C. Please see comment about waiting period for all dental procedures except active infections being 3 months.

Workgroup Response to Reviewer #11

Dear Gwo Lee, MD,

Thank you for your expert review of the Prevention of Total Hip and Knee Arthroplasty Periprosthetic Joint Infection in Patients Undergoing Dental Procedures Evidence-Based Clinical Practice Guideline. We will address your comments by guideline section in the order that you listed them.

A. Thank you for your feedback.

B. The 3-month specification has been removed from the recommendation language and additional clarification has been added to the rationale.

C. The recommendation "In the absence of reliable evidence, it is the decision of the workgroup that the decision to delay a dental procedure after hip or knee replacement surgery for 3 months is based on the risk of transient bacteremia, the occurrence of an invasive surgical procedure, or treatment of an active infection. Please see Table 3" has been amended to state ""In the absence of reliable evidence, it is the decision of the workgroup that the decision to delay a dental procedure after hip or knee replacement surgery is based on the risk of transient bacteremia, the occurrence of an invasive surgical procedure, or treatment of an active dental infection. Please see Table 3"

Appendix A – Structured Review Form

Review Questions (REQUIRED)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
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.	○	○	○	○	○
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.	○	○	○	○	○
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.	○	○	○	○	○
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.	○	○	○	○	○

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? (REQUIRED)

- ○ Strongly Recommend
- ○ Recommend
- ○ Would Not Recommend
- ○ Unsure

Additional Comments regarding this clinical practice guideline?