AAOS
American Academy of Orthopaedic Surgeons

Management of Patients with Orthopaedic Implants Undergoing Dental Procedures

Appropriate Use Criteria

Adopted by:
The American Academy of Orthopaedic Surgeons Board of Directors
September 23, 2016

Approved by:
The American Dental Association Council on Scientific Affairs
October 24, 2016

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Disclaimer
Volunteer physicians and dentists from multiple medical and dental specialties created and categorized these Appropriate Use Criteria. These Appropriate Use Criteria are not intended to be comprehensive or a fixed protocol, as some patients may require more or less treatment or different means of diagnosis. These Appropriate Use Criteria represent patients and situations that clinicians treating or diagnosing musculoskeletal conditions are most likely to encounter. The clinician's independent medical judgment, given the individual patient's clinical circumstances, should always determine patient care and treatment.

Disclosure Requirement
In accordance with American Academy of Orthopaedic Surgeons policy, all individuals whose names appear as authors or contributors to this document filed a disclosure statement as part of the submission process. All authors provided full disclosure of potential conflicts of interest prior to participation in the development of these Appropriate Use Criteria. Disclosure information for all panel members can be found in Appendix B.

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FDA Clearance
Some drugs or medical devices referenced or described in this document may not have been cleared by the Food and Drug Administration (FDA) or may have been cleared for a specific use only. The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or device he or she wishes to use in clinical practice.

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www.OrthoGuidelines.org/auc

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I. INTRODUCTION

OVERVIEW

The American Academy of Orthopaedic Surgeons (AAOS) and American Dental Association (ADA) Council on Scientific Affairs have developed this Appropriate Use Criteria (AUC) to identify the appropriateness of the use of prophylactic antibiotics in the management of patients who have had orthopaedic implants, undergoing dental procedures. An "appropriate" healthcare service is one for which the expected health benefits exceed the expected negative consequences by a sufficiently wide margin.[2] Evidence-based information, in conjunction with the clinical expertise of clinicians from multiple medical and dental specialties, was used to develop the criteria in order to improve patient care and obtain the best outcomes while considering the subtleties and distinctions necessary in making clinical decisions.

The purpose of this AUC is to help determine the appropriateness of clinical practice guideline recommendations for the heterogeneous patient population routinely seen in practice. The best available scientific evidence is synthesized with collective expert opinion on topics where gold standard randomized clinical trials are not available or are inadequately detailed for identifying distinct patient types. When there is evidence corroborated by consensus that expected benefits substantially outweigh potential risks, exclusive of cost, a procedure is determined to be appropriate. The AAOS uses the RAND/UCLA Appropriateness Method (RAM).[2] Our process includes these steps: reviewing the results of the evidence analysis, compiling a list of clinical vignettes, and having an expert panel comprised of representatives from multiple medical specialties to determine the appropriateness of each of the clinical indications for treatment as "Appropriate," "May be Appropriate," or "Rarely Appropriate." To access an intuitive and more user-friendly version of the appropriate use criteria for this topic online, please visit our AUC web-based application at www.orthoguidelines.org/auc.

These criteria should not be construed as including all indications or excluding indications reasonably directed to obtaining the same results. The ultimate judgment regarding any specific criteria should address all circumstances presented by the patient and the needs and resources particular to the locality or institution. It is also important to state that these criteria were developed as guidelines and are not meant to supersede clinician expertise and experience or patient preference.

INTERPRETING THE APPROPRIATENESS RATINGS

To prevent misuse of these criteria, it is extremely important that the user of this document understands how to interpret the appropriateness ratings. The appropriateness rating scale ranges from one to nine and there are three main range categories that determine how the median rating is defined (i.e. 1-3 = "Rarely Appropriate", 4-6 = "May Be Appropriate", and 7-9 = "Appropriate"). Before these appropriate use criteria are consulted, the user should read through and understand all contents of this document.

ASSUMPTIONS OF THE WRITING PANEL

We recognize that in the office setting, some specific laboratory values and other patient data are not always readily available. This also may include timely access to published scientific studies

that can support clinical decision-making. Appropriate Use Criteria (AUC) specify when it is appropriate to perform a clinical procedure or service. An "appropriate" procedure is one for which the expected health benefits greatly exceed the expected health risks. Ideally, AUC are evidence-based, but in the absence of sufficient evidence, may be derived from a "consensus of expert opinion" and "accepted practice".

With this AUC, we have attempted to define clinical situations in which antibiotic prophylaxis in certain at-risk dental patients could reduce a theoretical risk of post-surgical prosthetic joint infection. This AUC was developed as a decision support tool to facilitate the treatment of defined "high risk" and "immune compromised" patients who are on the more severe end of the clinical spectrum of disease. In the absence of readily available laboratory data or suggestive clinical suspicion, it would be reasonable to assume that most patients will fall outside of these criteria and therefore lay outside the confines of our strict definitions. As always, sound judgment should guide clinical decisions about when it may be necessary or prudent to delay a dental procedure until more information is available.

ASSUMPTIONS LIST

Before these AUC are consulted, it is assumed that:

Planned Dental Procedures

- The chance of oral bacteremia being related to joint infections is extremely low, with no evidence for an association.
- Oral bacteremia frequently occurs secondary to activities of daily living such as tooth brushing and eating.
- Virtually all dental office procedures have the potential to create bacteremia.

Immunocompromised Status

1. Severely immunocompromised patients include:
    a. Patient with Stage 3 HIV (i.e. AIDS) as defined by the Centers for Disease Control and Prevention (CDC) Guidelines when the immune system becomes severely compromised due to reduced CD4 T lymphocyte counts (<200) or opportunistic infection as defined by CDC[8] see list of diseases below.
    b. Cancer patient undergoing immunosuppressive chemotherapy with febrile (Celsius 39) neutropenia (ANC <2000) OR severe neutropenia irrespective of fever (ANC <500)
    c. Rheumatoid arthritis with use of biologic disease modifying agents including tumor necrosis factor alpha or prednisone >10 mg per day. Methotrexate, Plaquenil not considered immunocompromising agents.
    d. Solid organ transplant on immunosuppressants
    e. Inherited diseases of immunodeficiency (e.g., congenital agammaglobulinemia, congenital IgA deficiency)

f. Bone marrow transplant recipient in one of the following phases of treatment:
    i. Pretransplantation period
    ii. Preengraftment period (approximately 0-30 d posttransplantation)
    iii. Postengraftment period (approximately 30-100 d posttransplantation)
    iv. Late posttransplantation period (≥100 d posttransplantation) while still on immunosuppressive medications to prevent GVHD (typically 36 months post transplantation) (see Table reference below)

*Opportunistic illness in AIDS: (as per CDC[6])

1. Bacterial infections, multiple or recurrent*
2. Candidiasis of bronchi, trachea, or lungs
3. Candidiasis of esophagus
4. Cervical cancer, invasive†
5. Coccidioidomycosis, disseminated or extrapulmonary
6. Cryptococcosis, extrapulmonary
7. Cryptosporidiosis, chronic intestinal (>1 month's duration)
8. Cytomegalovirus disease (other than liver, spleen, or nodes), onset at age >1 month
9. Cytomegalovirus retinitis (with loss of vision)
10. Encephalopathy attributed to HIV§
11. Herpes simplex: chronic ulcers (>1 month's duration) or bronchitis, pneumonitis, or esophagitis (onset at age >1 month)
12. Histoplasmosis, disseminated or extrapulmonary
13. Isosporiasis, chronic intestinal (>1 month's duration)
14. Kaposi sarcoma
15. Lymphoma, Burkitt (or equivalent term)
16. Lymphoma, immunoblastic (or equivalent term)
17. Lymphoma, primary, of brain
18. Mycobacterium avium complex or Mycobacterium kansasii, disseminated or extrapulmonary
19. Mycobacterium tuberculosis of any site, pulmonary†, disseminated, or extrapulmonary
20. Mycobacterium, other species or unidentified species, disseminated or extrapulmonary
21. Pneumocystis jirovecii (previously known as "Pneumocystis carinii") pneumonia
22. Pneumonia, recurrent†
23. Progressive multifocal leukoencephalopathy
24. Salmonella septicemia, recurrent
25. Toxoplasmosis of brain, onset at age >1 month
26. Wasting syndrome attributed to HIV[§]

* Only among children aged <6 years.

† Only among adults, adolescents, and children aged ≥6 years.

§ Suggested diagnostic criteria for these illnesses, which might be particularly important for HIV encephalopathy and HIV wasting syndrome[7, 8]

Glycemic Control

1. A1C scores should be recent within 3-6 months.
2. Point-of-care measurement in dental office blood glucose level is equivalent to a patient self-report.
3. Blood glucose tests are assumed to be random (not necessarily fasting).

PATIENT POPULATION & SCOPE OF GUIDELINE

This document addresses the management of patients who have had orthopaedic implants, undergoing dental procedures.

BURDEN OF DISEASE AND ETIOLOGY

Approximately 332,000 primary total hip arthroplasties and 719,000 primary total knee arthroplasties were performed in the United States in 2010.[1] Orthopaedic implant infection rates range from 0.3% to 8.3% in the published literature.[3] These infections can be caused by entry of organisms into the wound during surgery, hematogenous spread, recurrence of sepsis in a previously infected joint, or contiguous spread of infection from a local source.[5]

POTENTIAL BENEFITS, HARMS, AND CONTRAINDICATIONS

The goal of the management of patients who have had orthopaedic implants, undergoing dental procedures is avoidance of potentially serious complications resulting from orthopaedic implant infection. Most treatments are associated with some known risks. In addition, contraindications vary widely based on the treatment administered. Therefore, discussion of available treatments applicable to the individual patient rely on mutual communication between the patient, dentist and physician, weighing the potential risks and benefits for that patient. Any perceived potential benefit of antibiotic prophylaxis must be weighed against the known risks of antibiotic toxicity, allergy, and development, selection and transmission of microbial resistance. Practitioners must exercise their own clinical judgment in determining whether or not antibiotic prophylaxis is appropriate.

II. METHODS

This AUC for the management of patients who have had orthopaedic implants, undergoing dental procedures is based on a review of the available literature and a list of clinical scenarios (i.e. criteria) constructed and voted on by experts in orthopaedic surgery and dental medicine. This section describes the methods adapted from the RAND/UCLA Appropriateness Method (RAM)[2]. This section also includes the activities and compositions of the various panels that developed, defined, reviewed, and voted on the criteria.

Two panels participated in the development of the AAOS AUC for the management of patients with prosthetic knee and hip joints who are Undergoing Dental Procedures (see list on page i). Members of the writing panel developed a list of 64 patient scenarios, for which 2 treatments

were evaluated for appropriateness. The voting panel participated in two rounds of voting. During the first round of voting, the voting panel was given approximately one month to independently rate the appropriateness of each of the provided treatments for each of the relevant patient scenarios as 'Appropriate', 'May Be Appropriate', or 'Rarely Appropriate' via an electronic ballot. After the first round of appropriateness ratings were submitted, AAOS staff calculated the median ratings for each patient scenario and specific treatment. A web conference voting panel meeting was held via GoToMeeting on April 27th of 2016. During this meeting, voting panel members addressed the scenarios/treatments which resulted in disagreement (definition of disagreement can be found in Table 3). The voting panel members were asked to rerate their first round ratings during and after the voting panel meeting, only if they were persuaded to do so by the discussion and available evidence. Voting occurred following the web conference and continued for approximately two weeks following the meeting. The voting panel determined appropriateness by rating scenarios (i.e. criteria) as 'Appropriate', 'May Be Appropriate', or 'Rarely Appropriate'. There was no attempt to obtain consensus about appropriateness.

AAOS Appropriate Use Criteria Section, the AAOS Council on Research and Quality, and the AAOS Board of Directors sequentially approved the Appropriate Use Criteria for the management of patients who have had orthopaedic implants, undergoing dental procedures. AAOS submits this AUC to the National Guidelines Clearinghouse and, in accordance with the National Guidelines Clearinghouse criteria, will update or retire this AUC within five years of the publication date.

DEVELOPING CRITERIA

Members of the AUC for the management of patients who have had orthopaedic implants, undergoing dental procedures writing panel, who are orthopaedic or dental professionals, developed clinical scenarios using the following guiding principles:

- Patient scenarios must include a broad spectrum of patients that may be eligible for the management of patients who have had orthopaedic implants, undergoing dental procedures *[comprehensive]*
- Patient indications must classify patients into a unique scenario *[mutually exclusive]*
- Patient indications must consistently classify similar patients into the same scenario *[reliable, valid indicators]*

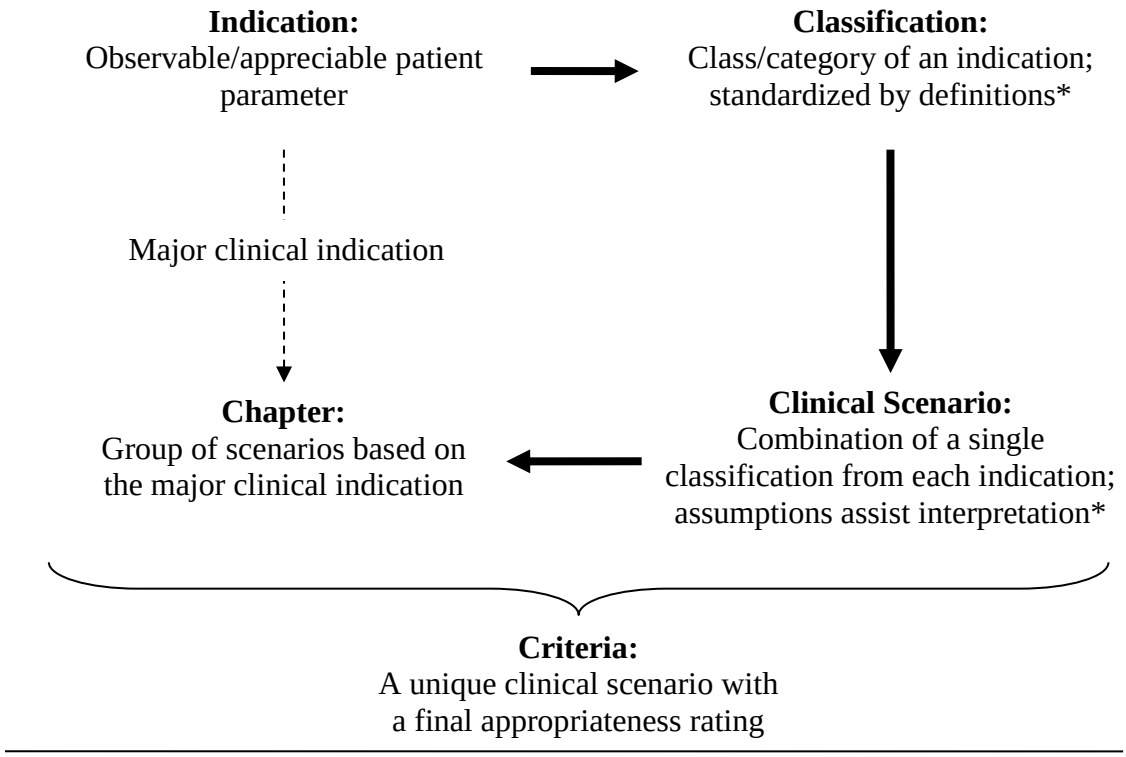
The writing panel developed the scenarios by categorizing patients in terms of indications evident during the clinical decision making process (Figure 1). These scenarios relied upon definitions and general assumptions, mutually agreed upon by the writing panel during the development of the scenarios. These definitions and assumptions were necessary to provide consistency in the interpretation of the clinical scenarios among experts voting on the scenarios and readers using the final criteria.

FORMULATING INDICATIONS AND SCENARIOS

The AUC writing panel began the development of the scenarios by identifying clinical indications that may put patients at the highest risk for orthopaedic implant infection in clinical practice independent of dental procedures. Indications are most often parameters observable by

the clinician, including symptoms or results of diagnostic tests. Additionally, "human factor" (e.g. activity level) or demographic variables can be considered.

Figure 1. Developing Criteria



The writing panel organized these indications into a matrix of clinical scenarios that addressed all combinations of the classifications. The writing panel was given the opportunity to remove any scenarios that rarely occur in clinical practice, but agreed that all scenarios were clinically relevant. The major clinical decision making patient indications chosen by the writing panel divided the matrix of clinical scenarios into chapters, as follows: planned dental procedure, immunocompromised status, diabetic glycemic control, history of periprosthetic or deep prosthetic joint infection of the hip or knee that required an operation, timing since hip or knee joint replacement procedure (Table 4).

CREATING DEFINITIONS AND ASSUMPTIONS

The AUC for the management of patients who have had orthopaedic implants, undergoing dental procedures writing panel constructed concise and explicit definitions for the indications and classifications. This standardization helped ensure the way that the writing panel defined the patient indications was consistent among those reading the clinical scenario matrix or the final criteria. Definitions drew explicit boundaries when possible and were based on standard medical practice or existing literature.

Additionally, the writing panel formulated a list of general assumptions in order to provide more consistent interpretations of a scenario (see Assumptions of the Writing Panel). These assumptions differed from definitions in that they identified circumstances that exist outside of the control of the clinical decision making process.

Assumptions also addressed the use of existing published literature regarding the effectiveness of treatment and/or the procedural skill level of the clinician. Additionally, assumptions highlighted intrinsic methods described in this document such as the role of cost considerations in rating appropriateness or the validity of the definition of appropriateness. The main goal of assumptions was to focus scenarios so that they apply to the average patient presenting to an average physician or dentist at an average facility.[2]

The definitions and assumptions should provide all readers with a common starting point in interpreting the clinical scenarios. This list of definitions and assumptions accompanied the matrix of clinical scenarios in all stages of the development of this AUC and appears in the Assumptions of the Writing Panel section of this document.

LITERATURE REVIEW

The literature assessed in the 2012 AAOS-ADA [(3)] and 2015 ADA [(4)] clinical practice guidelines was provided to the writing and voting panels as the evidence base for this AUC[9, 10, 11, 12]. This literature informed the decisions relevant to the indications identified by the writing panel when they were available and necessary.

Direct links to the evidence related to prophylactic antibiotic use used to inform this AUC can be found below:

AAOS-ADA Clinical Practice Guideline Recommendation

ADA Clinical Practice Guideline

DETERMINING APPROPRIATENESS

VOTING PANEL

A multidisciplinary panel of clinicians was assembled to determine the appropriateness of the use of prophylactic antibiotics in the management of patients who have had orthopaedic implants, undergoing dental procedures. One non-voting moderator, who is an orthopaedic surgeon moderated the voting panel. The moderator was familiar with the methods and procedures of AAOS Appropriate Use Criteria and led the panel (as a non-voter) in discussions. Additionally, no member of the voting panel was involved in the development (writing panel) of the scenarios.

The voting panel used a modified Delphi procedure to determine appropriateness ratings. The voting panel participated in two rounds of voting while considering evidence-based information provided in the literature review. While cost is often a relevant consideration, panelists focused their appropriateness ratings on the management of patients who have had orthopaedic implants, undergoing dental procedures.

RATING APPROPRIATENESS

When rating the appropriateness of a scenario, the voting panel considered the following definition:

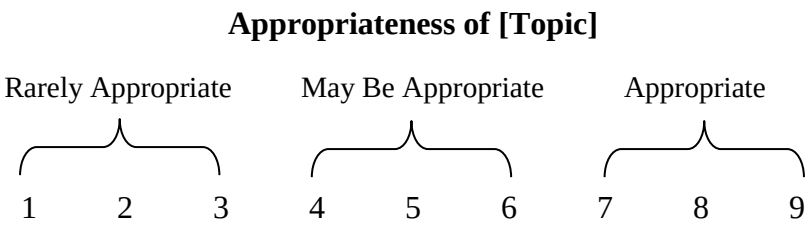
"An appropriate prophylactic treatment for the management of patients who had orthopaedic implants, undergoing dental procedures **is one for which the treatment is generally acceptable, is a reasonable approach for the indication, and is likely to improve the patient's health outcomes or survival."**

They then rated each scenario using their best clinical judgment, taking into consideration the available evidence, for an average patient presenting to an average physician at an average facility as follows:

Table 1 Interpreting the 9-Point Appropriateness Scale

Rating	Explanation
7-9	**Appropriate**: Appropriate for the indication provided, meaning treatment **is** generally acceptable and **is** a reasonable approach for the indication and **is** likely to improve the patient's health outcomes or survival.
4-6	**May Be Appropriate**: Uncertain for the indication provided, meaning treatment **may** be acceptable and **may** be a reasonable approach for the indication, but with uncertainty implying that more research and/or patient information is needed to further classify the indication.
1-3	**Rarely Appropriate**: Procedure is not generally acceptable and is not generally reasonable for the indication. Exceptions should have documentation of the clinical reasons for proceeding with this care option. **Rarely** an appropriate option for management of patients in this population due to the lack of a clear benefit/risk advantage; **rarely** an effective option for individual care plans.

Each panelist uses the scale below to record their response for each scenario:



ROUND ONE VOTING

The first round of voting occurred after completion of the independent review of the scenarios by the review panel and approval of the final indications, scenarios, and assumptions by the writing panel. The voting panel rated the scenarios electronically using a personalized ballot created by AAOS staff using the AAOS AUC Electronic Ballot Tool. There was no interaction between panel members while completing the first round of voting. Panelists considered the following materials:

- The instructions for rating appropriateness
- The completed literature review, that is appropriately referenced when evidence is available for a scenario
- The list of indications, definitions, and assumptions, to ensure consistency in the interpretation of the clinical scenarios

ROUND TWO VOTING

The second round of voting occurred following the web conference voting panel meeting on April 27, 2016. Before the meeting started, each panelist received a personalized document that included their first round ratings along with summarized results of the first-round ratings that resulted in disagreement. These results indicated the frequency of ratings for a scenario for all panelists. The document contained no identifying information for other panelists' ratings. The moderator also used a document that summarized the results of the panelists' first round voting. These personalized documents served as the basis for discussions of scenarios which resulted in disagreement.

During the discussion, the voting panel members were allowed to record a new rating for any scenarios if they were persuaded to do so by the discussion or the evidence. After the final ratings were submitted, AAOS staff used the AAOS AUC Electronic Ballot Tool to export the median values and level of agreement for all voting items. There was no attempt to obtain consensus among the panel members.

FINAL RATINGS

Using the median value of the second round ratings, AAOS staff determined the final levels of appropriateness. Disagreement among raters can affect the final rating. Agreement and disagreement were determined using the BIOMED definitions of Agreement and Disagreement, as reported in the RAND/UCLA Appropriate Method User's Manual [2], for a panel of 14-16 voting members (see Table 2 below). For this panel size, disagreement is defined as when ≥ 5 members' appropriateness ratings fell within the appropriate (7-9) and rarely appropriate (1-3) ranges for any scenario (i.e. ≥ 3 members' ratings fell between 1-3 and ≥ 4 members' ratings fell between 7-9 on any given scenario and its treatment). If there is still disagreement in the voting panel ratings after the second round of voting, that voting item is labeled as "5" regardless of median score. Agreement is defined as ≤ 2 panelists rated outside of the 3-point range containing the median.

Table 2 Defining Agreement and Disagreement for Appropriateness Ratings

Panel Size	**Disagreement** Number of panelists rating in each extreme (1-3 and 7-9)	**Agreement** Number of panelists rating outside the 3-point region containing the median (1-3, 4-6, 7-9)
8,9,10	≥ 3	≤ 2
11,12,13	≥ 4	≤ 3
14,15,16	**≥ 5**	**≤ 4**

Adapted from RAM [1]

The classifications in the table below determined final levels of appropriateness.

Table 3 Interpreting Final Ratings of Criteria

Level of Appropriateness	Description
Appropriate	• Median panel rating between 7-9 and no disagreement
May Be Appropriate	• Median panel rating between 4-6 or • Median panel rating 1-9 with disagreement
Rarely Appropriate	• Median panel rating between 1-3 and no disagreement

REVISION PLANS

These criteria represent a cross-sectional view of current appropriate use of antibiotics for patients who have had orthopaedic implants, undergoing dental procedures and may become outdated as new evidence becomes available or clinical decision making indicators are improved. In accordance with the standards of the National Guideline Clearinghouse, AAOS will update or withdraw these criteria in five years. AAOS will issue updates in accordance with new evidence, changing practice, rapidly emerging treatment options, and new technology.

DISSEMINATING APPROPRIATE USE CRITERIA

Publication of the Appropriate Use Criteria (AUC) document is on the AAOS website at [http://www.aaos.org/auc]. This document provides interested readers with full documentation about the development of AUC and further details of the criteria ratings.

AUCs are first announced by an Academy press release and then published on the AAOS website. AUC summaries are published in the *AAOS Now* and the Journal of the American Academy of Orthopaedic Surgeons (JAAOS). In addition, the Academy's Annual Meeting showcases the AUCs on Academy Row and at Scientific Exhibits.

The dissemination efforts of AUC include web-based mobile applications, webinars, and online modules for the Orthopaedic Knowledge Online website, radio media tours, and media briefings.

In addition AUCs are also promoted in relevant Continuing Medical Education (CME) courses and distributed at the AAOS Resource Center.

Other dissemination efforts outside of the AAOS include submitting AUCs to the National Guideline Clearinghouse and to other medical specialty societies' meetings.

III. PATIENT INDICATIONS AND PROCEDURE RECOMMENDATIONS

INDICATION PROFILE

Table 4 Patient Indications and Classifications

Indication	Classification(s)
Planned Dental Procedure	a. Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa b. Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa
Immunocompromised Status	a. Not severely immunocompromised b. Severely Immunocompromised
Glycemic Control	a. No current or active diabetes diagnosis b. Active known diabetic, Hemoglobin A1C < 8 or Blood Glucose < 200 c. Active known diabetic, Hemoglobin A1C ≥ 8 or Blood Glucose ≥ 200 d. Active known diabetic, Hemoglobin A1C Unknown, Glucose Unknown

History of periprosthetic or deep prosthetic joint infection of the hip or knee that required an operation:	a. No b. Yes
Timing since hip or knee joint replacement procedure:	a. < 1 year b. ≥ 1 year

PROCEDURE RECOMMENDATIONS

Actions Addressed Within This AUC

1. **Prescribe prophylactic antibiotics**
   (Scenarios where prophylactic antibiotics are appropriate or may be appropriate lead the user to the following decision tool: **https://aaos.webauthor.com/go/auc/default.cfm?auc_id=224965&actionxm=Terms)**

2. **Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test**
   (This option is only applicable in the 16 scenarios with unknown A1C and unknown blood glucose)

SECONDARY RESOURCE: WHICH ANTIBIOTICS MAY BE APPROPRIATE?

The writing panel chose to provide users with an additional tool as a resource, and this choice was reaffirmed by the voting panel. In scenarios where prophylactic antibioticsmay be appropriate (i.e., scenario with a median score of 4 or higher), users of the online web-application are given the option to "click" on that appropriateness score and be led to a linked tool. The content of this tool is based on a 2007 statement by the American Heart Association[5], but amended to more accurately reflect the current state of medicine. It is also preceded with the following disclaimer:

> The AAOS Appropriate Use Criteria goes as far as stating whether or not prophylactic antibiotics may be appropriate for a particular patient profile. These antibiotic dosage recommendations are provided as an additional resource and based solely on the 2007 statement released by the American Heart Association. The only adjustments from the original statement are the removal of Clindamycin and Cefazolin as antibiotic options. This change is based on more recently published evidence.[13-15]
>
> Cross reactivity of cephalosporin antibiotics in patients with penicillin allergy is low; 5% for first generation drugs, and 1% for third generation drugs. Unless there is a history of anaphylaxis to penicillin, cephalosporin antibiotics should be the drug of choice If allergic reactivity is a concern, patients should be referred for allergy testing prior to administering antibiotic prophylaxis.

The additional tool may be accessed directly at:
https://aaos.webauthor.com/go/auc/default.cfm?auc_id=224965&actionxm=Terms

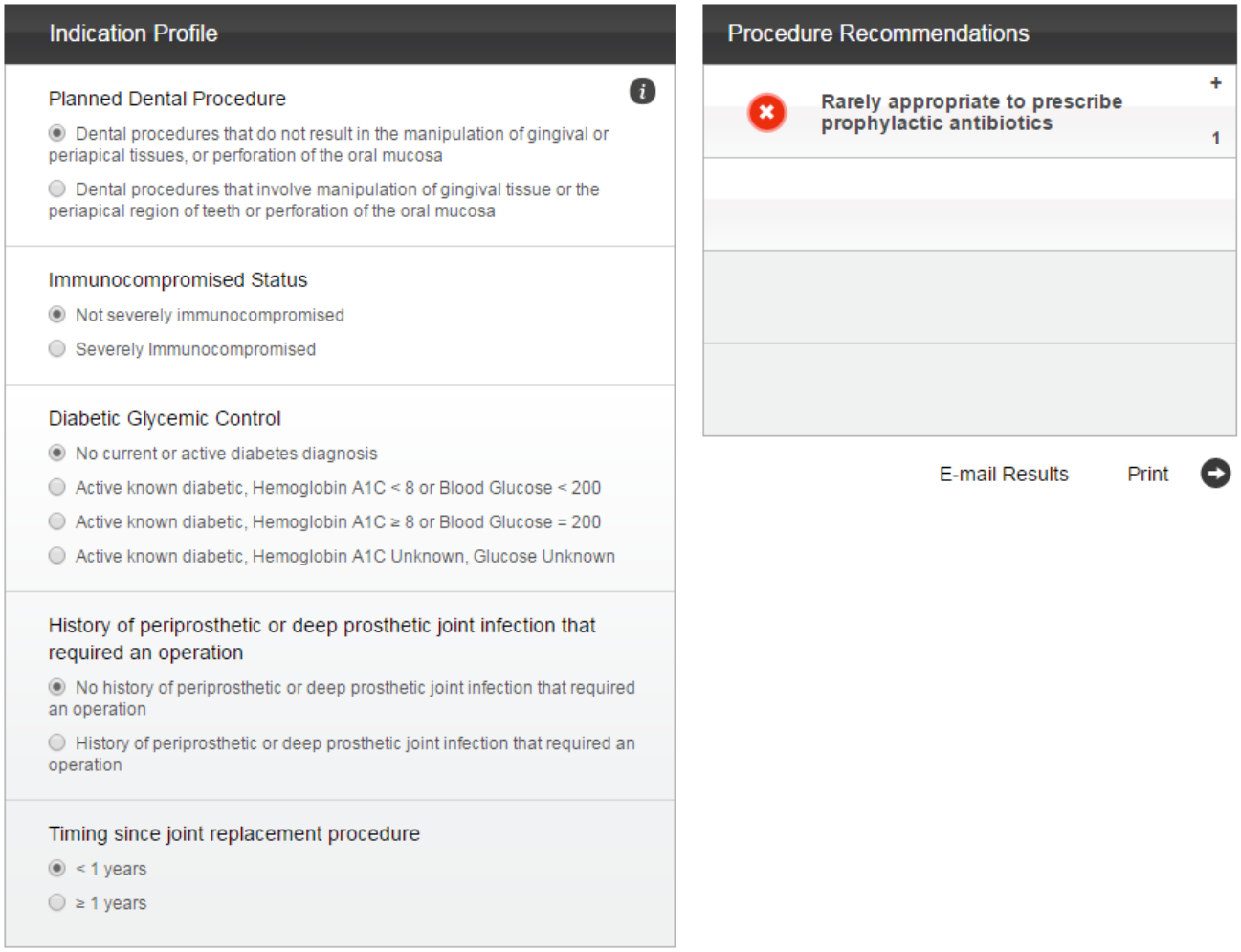
Situation	Agent	Regimen – Single Dose 30-60 minutes before dental procedure	
Oral	Amoxicillin	Adults	Children
		2 gm	50 mg/kg
Unable to take oral medication	Ampicillin or ceftriaxone	2 g IM or IV* 1 g IM or IV	50 mg/kg IM or IV 50 mg/kg IM or IV
Allergic to oral penicillins or ampicillin	Cephalexin**† or Azithromycin or clarithromycin	2 g 500 mg	50 m/kg 15 mg/kg
Allergic to penicillins or ampicillin and unable to take oral medication	Ceftriaxone† Azithromycin, clarithromycin	1 g IM or IV Equivalent Dose 500 mg IV	50 mg/kg IM or IV Equivalent Dose

*Intramuscular injections should be avoided in persons receiving anticoagulants;
**Or other first- or second-generation oral cephalosporin in equivalent adult or pediatric dosage.
†Cephalosporins should not be used in an individual with a history of anaphylaxis, angioedema, or urticaria with penicillins or ampicillin

IV. RESULTS OF APPROPRIATENESS RATINGS

For a user-friendly version of these appropriate use criteria, please access our AUC web-based application at www.orthoguidelines.org/auc.

Web-Based AUC Application Screenshot



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Results

The following AUC tables contain the final appropriateness ratings assigned by the fourteen members of the voting panel. Patient characteristics are found under the column titled "Scenario". The Appropriate Use Criteria for each patient scenario can be found within each of the 2 treatment rows. These criteria are formatted by appropriateness labels (i.e. "R"=Rarely Appropriate, "M"=May Be Appropriate, and "A"=Appropriate), median rating, and + or - indicating agreement or disagreement amongst the voting panel, respectively.

Out of 64 total prophylactic antibiotic voting items (i.e. 64 patient scenarios x 1 treatment), 8 (12%) voting items were rated as "Appropriate", 17 (27%) voting items were rated as "May Be Appropriate", and 39 (61%) voting items were rated as "Rarely Appropriate" (Figure 1). Additionally, the voting panel members were in agreement on 36 (56%) voting items and were in disagreement on 2 (< 3%) voting items (Figure 2). For a within treatment breakdown of appropriateness ratings, please refer to Figure 3.

When the patient is an active known diabetic, hemoglobin A1C is unknown, and glucose is unknown, the additional treatment option is presented to delay treatment until consult with Primary Care Physician or order blood glucose or A1C test. When these 16 voting items are added, a total of 80 voting items were evaluated by the voting panel. Of these voting items, 8 (10%) voting items were rated as "Appropriate", 19 (24%) voting items were rated as "May Be Appropriate", and 53 (63%) voting items were rated as "Rarely Appropriate". Additionally, the voting panel members were in agreement on 45 (56%) voting items and were in disagreement on 2 (< 3%) voting items. For a within treatment breakdown of appropriateness ratings, please refer to Figure 3.

Figure 1. Breakdown of Appropriateness Ratings for Prophylactic Antibiotics

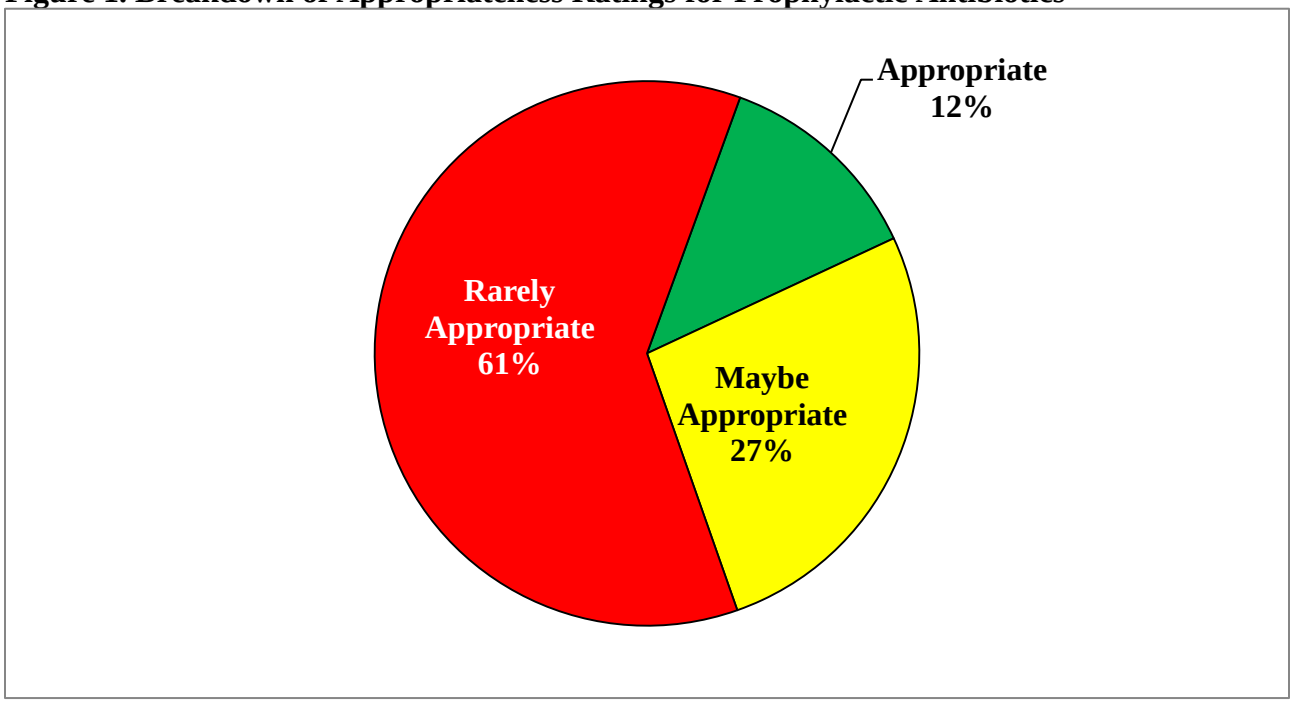


Figure 2. Breakdown of Agreement amongst Voting Panel

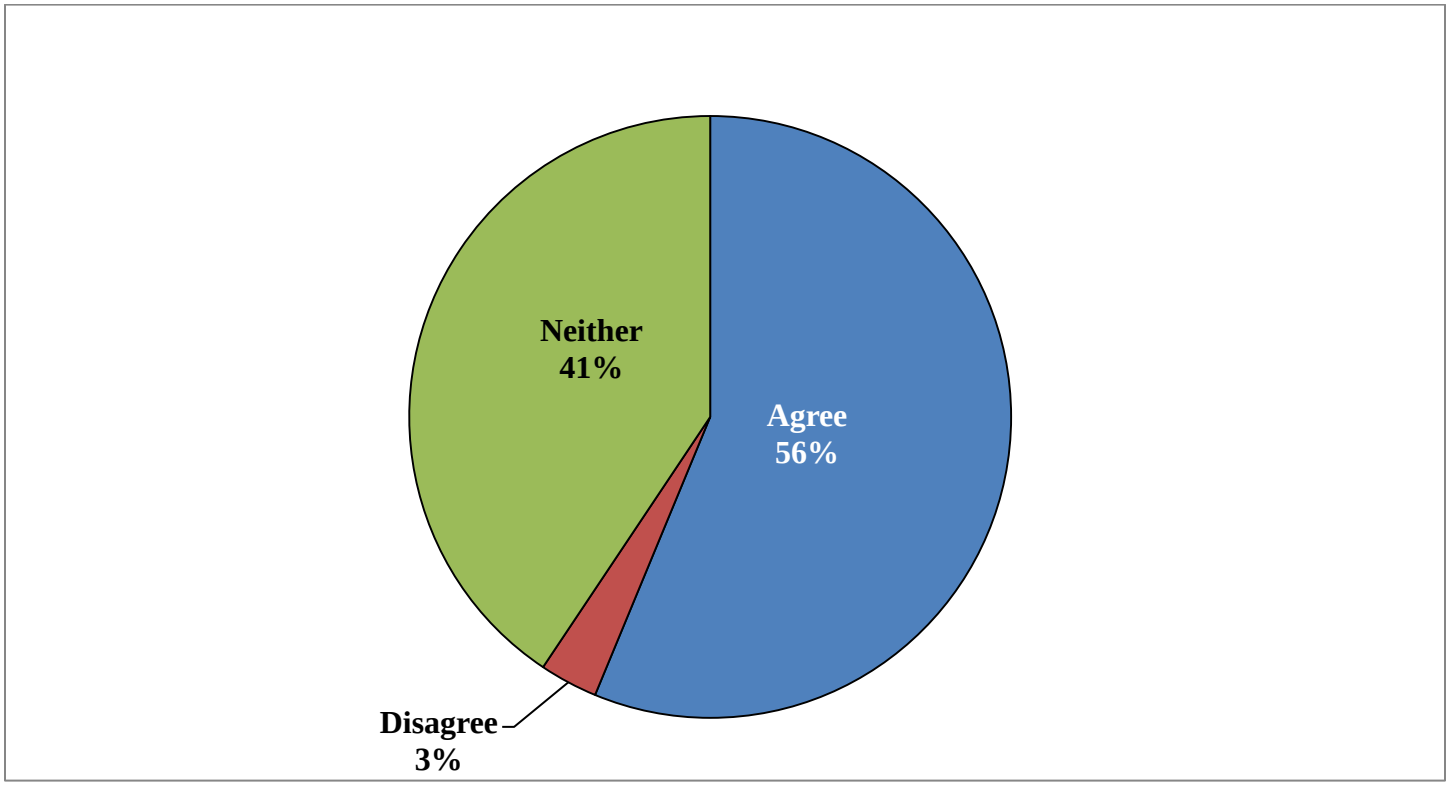
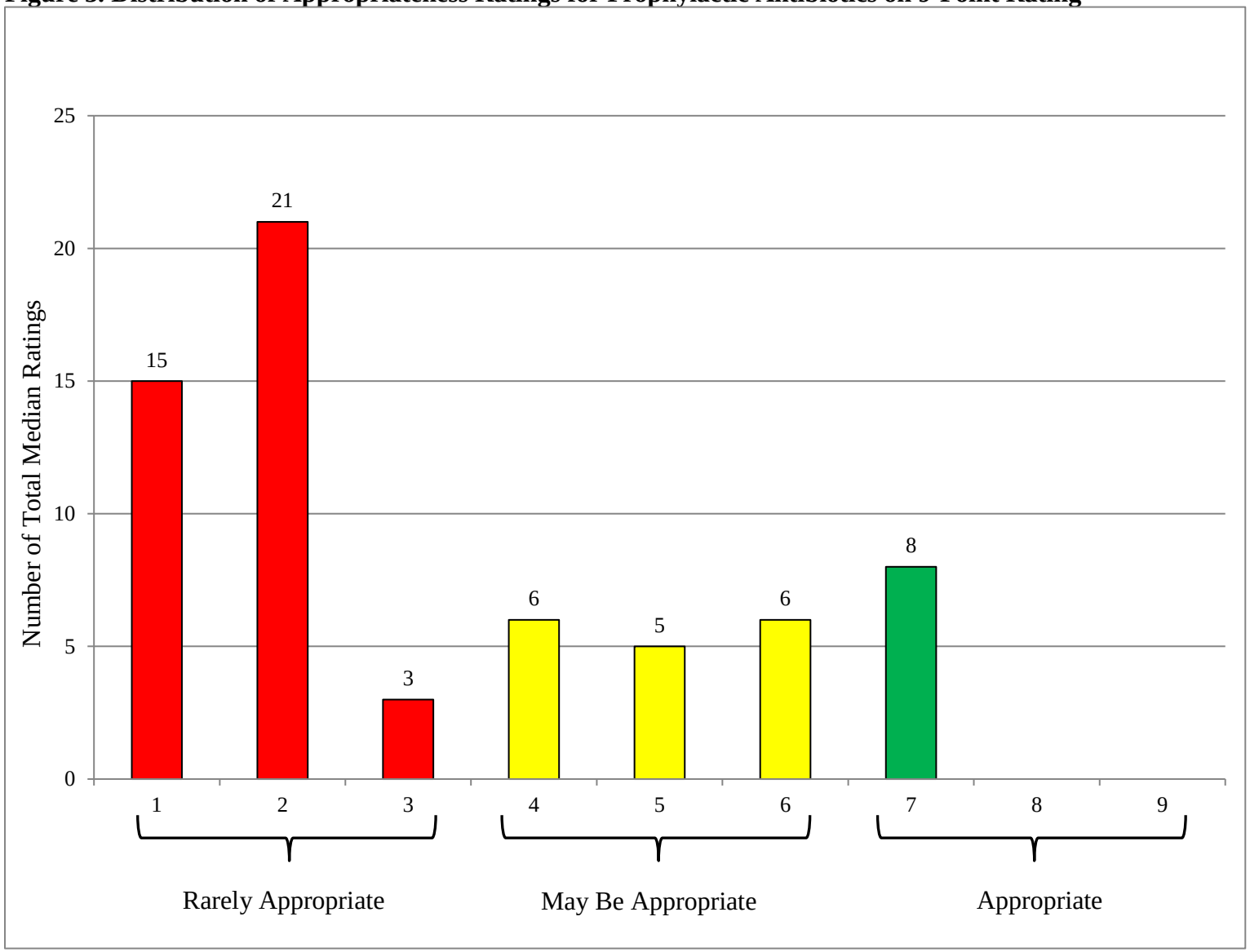


Figure 3. Distribution of Appropriateness Ratings for Prophylactic Antibiotics on 9-Point Rating



APPROPRIATE USE CRITERIA FOR THE MANAGEMENT OF PATIENTS WHO HAVE HAD ORTHOPAEDIC IMPLANTS, UNDERGOING DENTAL PROCEDURES

Interpreting the AUC tables:

- R = Rarely Appropriate, M = May Be Appropriate, A = Appropriate
- Numbers under "Median" column indicate the median rating of voting panel
- A plus symbol (+) indicates agreement between voting panel members and a minus symbol (-) indicates disagreement between voting panel members

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
1	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, No current or active diabetes diagnosis, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	1	+
2	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, No current or active diabetes diagnosis, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	1	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
3	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, No current or active diabetes diagnosis, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	1	+
4	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, No current or active diabetes diagnosis, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	1	+
5	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	1	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
6	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	1	+
7	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	1	+
8	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	2	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
9	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	1	+
10	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	1	+
11	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
12	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	2	+
13	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	1	+
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	1	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
14	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	1	+
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	1	+
15	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	2	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
16	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	2	+
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	2	+
17	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, No current or active diabetes diagnosis, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
18	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, No current or active diabetes diagnosis, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	1	+
19	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, No current or active diabetes diagnosis, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+
20	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, No current or active diabetes diagnosis, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	2	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
21	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+
22	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	1	+
23	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
24	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	2	+
25	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	1	+
26	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	2	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
27	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+
28	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	2	+
29	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	2	+
30	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	1	+
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	1	+
31	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	2	+
32	Dental procedures that do not result in the manipulation of gingival or periapical tissues, or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	2	+
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	2	+
33	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, No current or active diabetes diagnosis, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
34	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, No current or active diabetes diagnosis, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	2	+
35	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, No current or active diabetes diagnosis, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	M	5	
36	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, No current or active diabetes diagnosis, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	M	4	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
37	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	2	+
38	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	2	+
39	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	M	5	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
40	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	M	4	
41	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	M	4	
42	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	3	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
43	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	M	5	
44	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	M	4	
45	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	R	3	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	3	+
46	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	R	3	
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	3	
47	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	M	5	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	M	4	
48	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Not severely immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	M	4	-
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	3	
49	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, No current or active diabetes diagnosis, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	M	5	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
50	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, No current or active diabetes diagnosis, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	M	4	-
51	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, No current or active diabetes diagnosis, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	A	7	
52	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, No current or active diabetes diagnosis, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	M	6	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
53	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	M	6	
54	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	M	6	
55	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	A	7	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
56	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C < 8 or Blood Glucose < 200, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	A	7	
57	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	A	7	
58	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	A	7	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
59	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	A	7	
60	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C ≥ 8 or Blood Glucose = 200, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	A	7	
61	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, No history of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	M	6	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	M	4	
62	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, No history of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	M	6	
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	3	
63	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, History of periprosthetic or deep prosthetic joint infection that required an operation, < 1 year	Prescribe prophylactic antibiotics	A	7	

Scenario Number	Scenario Details	Treatment	Appropriateness	Median Rating	Agreement
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	3	
64	Dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa, Severely Immunocompromised, Active known diabetic Hemoglobin A1C Unknown Glucose Unknown, History of periprosthetic or deep prosthetic joint infection that required an operation, ≥ 1 year	Prescribe prophylactic antibiotics	M	6	
		Delay treatment until consult with Primary Care Physician or order blood glucose or A1C test	R	3	

APPENDICES

APPENDIX A. DOCUMENTATION OF APPROVAL

AAOS BODIES THAT APPROVED THIS APPROPRIATE USE CRITERIA

AUC Section: Approved on 9/22/2016
The AAOS Appropriate Use Criteria Section of the Committee on Evidence Based Quality and Value consists of six AAOS members. The overall purpose of this Section is to plan, organize, direct, and evaluate initiatives related to Appropriate Use Criteria.

Council on Research and Quality: Approved on 9/23/2016
To enhance the mission of the AAOS, the Council on Research and Quality promotes the most ethically and scientifically sound basic, clinical, and translational research possible to ensure the future care for patients with musculoskeletal disorders. The Council also serves as the primary resource to educate its members, the public, and public policy makers regarding evidenced-based medical practice, orthopaedic devices and biologics regulatory pathways and standards development, patient safety, occupational health, technology assessment, and other related areas of importance.

Board of Directors: Approved on 9/23/2016
The 16 member AAOS Board of Directors manages the affairs of the AAOS, sets policy, and determines and continually reassesses the Strategic Plan.

APPENDIX B. DISCLOSURE INFORMATION

Voting Panel

1. **William C. Watters III, MD**
   American Academy of Orthopaedic Surgeons
   William Charles Watters III, MD Submitted on: 11/03/2015
   American Board of Spine Surgery: Board or committee member ($0) (Self) Board of Directors
   Official Disability Guidelines: Editorial or governing board ($0) (Self) Board of Advisers
   Spine: Editorial or governing board ($0) (Self) Reviewer
   Stryker: IP royalties ($12,000) (Self) - 0.5% royalty on cervical plate
   The Spine Journal: Editorial or governing board ($0) (Self) Editorial Board

2. **Angela Hewlett, MD**
   Society for Healthcare Epidemiology of America
   Angela Hewlett, MD, MS Submitted on: 11/04/2015
   Infectious Diseases Society of America: Board or committee member ($0)
   Society for Healthcare Epidemiology of America: Board or committee member ($0)

3. **C. Anderson Engh, Jr., MD**
   The Knee Society
   C Anderson Engh Jr, MD Submitted on: 11/10/2015
   AAOS: Board or committee member ($0)
   American Association of Hip and Knee Surgeons: Board or committee member ($0)
   DePuy, A Johnson & Johnson Company: IP royalties ($0)
   DePuy, A Johnson & Johnson Company: Paid consultant ($0)
   DePuy, A Johnson & Johnson Company: Stock or stock Options Number of Shares: 0
   DePuy, A Johnson & Johnson Company: Research support ($0)
   Hip Society: Board or committee member ($0)
   Smith & Nephew: Research support ($0)

4. **Michael P. Rethman, DDS, MS**
   American Academy of Orthopaedic Surgeons
   Michael P Rethman, DDS, MS Submitted on: 11/10/2015
   Colagate-Palmolive: Stock or stock Options Number of Shares: 250 stock (Self)
   Colgate-Palmolive: Paid consultant ($22,500) Paid consultant (Self)

5. **Mark J. Steinberg, DDS, MD**
   American Association of Oral and Maxillofacial Surgeons
   Mark J Steinberg, DDS, MD Submitted on: 11/10/2015
   American Association of Oral and Maxillofacial Surgeons: Board or committee member ($0) Committee member onthe committee of continuing education and professional development (Self)

6. **Elie Berbari, MD**
   Musculoskeletal Infection Society
   Elie Berbari, MD Submitted on: 11/11/2015
   Pfizer: Research support ($0)

UpToDate: Publishing royalties, financial or material support ($0)

7. **Scott M. Sporer, MD**
   American Association of Hip and Knee Surgeons
   Scott M Sporer, MD Submitted on: 10/03/2015
   American Joint Replacement Registry: Board or committee member ($0)
   Central Dupage Hospital: Research support ($0) (Self) Hospital Provides research assistant to facilitate quality improvement initiatives.
   Hip Society: Board or committee member ($0) (Self) Hip Research Representative to the BOS
   Paciria: Paid consultant ($0)
   SLACK Incorporated: Publishing royalties, financial or material support ($200) (Self) Textbook royalties
   Smith & Nephew: Paid consultant ($28,000) (Self) Medical Education Consulting. Surgeon, fellow and resident surgical skills courses including didactic teaching
   Stryker: Research support ($0)
   Zimmer: Paid consultant ($56,000) (Self) Medical Education Consulting. Surgeon, fellow and resident surgical skills courses including didactic teaching
   Zimmer: Research support ($82,700) (Self) RSA study evaluating Micromotion of porous tantalum acetabular component and Vitamin E Polyethylene. Amount includes all Principal investigator costs for a 2 year study.

8. 8. **Scott S. De Rossi, DMD**
   American Dental Association
   Scott S De Rossi Submitted on: 01/07/2016
   OOOO: Editorial or governing board ($0)

9. **Joel Brian Epstein, DMD**
   American Dental Association
   Joel B Epstein Submitted on: 12/29/2015
   Amgen Co: Stock or stock Options Number of Shares: 0
   Amgen Co: Research support ($0)
   Bristol-Myers Squibb: Stock or stock Options Number of Shares: 0
   Medactive: Paid presenter or speaker ($0) Number of Presentations: 0
   Medactive: Research support ($0)
   Oral Oncology: Editorial or governing board ($0)
   Oral Surgery Oral Medicine Oral Pathology Oral Radiology: Editorial or governing board ($0)
   Supportive Care in Cancer: Editorial or governing board ($0)
   Syndedgen: Research support ($0)

10. **Joel M. Laudenbach, DMD**
    American Dental Association
    Joel M Laudenbach (This individual reported nothing to disclose); Submitted on: 01/14/2016

11. **Lauren L. Patton, DDS**
    American Dental Association
    Lauren L Patton, DDS Submitted on: 01/06/2016
    American Academy of Oral Medicine: Board or committee member ($0)
    John Wiley and Sons: Publishing royalties, financial or material support ($0)
    Oral Diseases: Editorial or governing board ($0)

Oral Surgery Oral Medicine Oral Pathology Oral Radiology: Editorial or governing board ($0)

12. **Thomas M. Paumier, DDS**
    American Dental Association
    Thomas Paumier, DDS (This individual reported nothing to disclose); Submitted on: 12/29/2015

13. **Robert J. Weyant, DMD, DrPH**
    American Dental Association
    Robert J Weyant Submitted on: 01/07/2016
    Philips: Paid presenter or speaker ($0) Number of Presentations: 0
    Wiley: Publishing royalties, financial or material support ($0)

14. **Steven Armstrong, DDS, PhD**
    American Dental Association
    Steven Armstrong, DDS Submitted on: 01/05/2016
    Academy of Dental Materials: Board or committee member ($0)

Moderator

Robert H. Quinn, MD
American Academy of Orthopaedic Surgeons
Robert H Quinn, MD Submitted on: 10/12/2015
AAOS: Board or committee member ($1,800) (Self)
Member Evidence Based Practice Committee
YOC Section Editor (Tumor)
American Orthopaedic Association: Board or committee member ($0) Development Committee (Self)
Jaypee: Publishing royalties, financial or material support ($250) n/a (Self)
Journal of Wilderness & Environmental Medicine: Editorial or governing board ($0) n/a (Self)
Musculoskeletal Transplant Foundation: Research support ($8,500) Member Medical Board of Directors (Self)
Musculoskeletal Tumor Society: Board or committee member ($0) Treasurer (Self)
Wilderness Medical Society: Board or committee member ($0) (Self)

Appendix C. References

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