

## The Antibiotic Prophylaxis Guideline for Prosthetic Joints: Trying to Do the Right Thing

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*J Am Acad Orthop Surg* 2013;21:193-194

<http://dx.doi.org/10.5435/JAAOS-21-03-193>

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In 1997, the American Dental Association (ADA) and the American Academy of Orthopaedic Surgeons (AAOS) published the first advisory statement on antibiotic prophylaxis (AP) for dental patients with prosthetic joints.<sup>1</sup> This advisory statement was updated in 2003 with new information and concluded that AP is not routinely indicated for most patients with total joint arthroplasty who undergo dental procedures, and that, although bacteremia can cause hematogenous seeding of total joints, there is no evidence linking dental procedures to prosthetic joint infection (PJI).<sup>2</sup> These advisory statements were fairly specific concerning which patient populations the clinician might choose to give AP, including the period of time following joint implantation (ie, 2 years following placement), dental procedures of concern, antibiotic protocols, and alternatives, and there was discussion of the benefits and risks from this practice.<sup>2</sup> In 2009, the AAOS released a new statement: “Given the potential adverse outcomes and cost of treating an infected joint replacement, the AAOS recommends that clinicians consider AP for all total joint replacement patients prior to any invasive procedure that may cause bacteremia.”<sup>3,4</sup>

The new 2012 clinical practice guideline (CPG) from the AAOS and ADA, recently published online,<sup>5</sup> is distinctly different from the previous advisory statements.<sup>1-3</sup> For example, (1) the 2012 guideline involved a more formal systematic review and analysis of the literature, with an evidence-based approach to a pro-

cess that involved orthopaedists, infectious disease specialists, dentists, neurosurgeons, basic scientists, and other healthcare providers. (2) Rather than cover the full spectrum of issues for clinicians, the 2012 AAOS-ADA guideline addresses three questions: (i) the need for AP for patients with prosthetic joints; (ii) the benefit of pre-procedure topical antimicrobials; and (iii) the role of oral health in PJI.<sup>5</sup>

Recommendation 1 in the guideline, which states, “The practitioner might consider discontinuing the practice of routinely prescribing prophylactic antibiotics for patients... undergoing dental procedures,” is based largely on the only published case-control study to address this question, although this study found no relationship between dental procedures and PJI.<sup>6</sup> This study was graded as being of moderate strength and, hence, this recommendation received a “limited” rating.<sup>5</sup> Some published clinical studies citing a lack of a relationship between dental procedures and joint infections but employing surrogate measures as outcomes (eg, bacteremia) were not included in the AAOS-ADA CPG.<sup>5</sup> Therefore, the first recommendation is based primarily on a single case-control study that found no relationship between dental procedures and PJI.<sup>6</sup> Rather than be prescriptive with regard to which patients should be covered with AP—and because there are no other prospective clinical trials evaluating the use of AP to prevent PJI following dental procedures—the AAOS-ADA CPG work group was unable to make a stronger

statement about the lack of evidence to support this longstanding practice.

(3) The 2003 advisory statement<sup>2</sup> attempted to define different levels of risk for certain patient populations with prosthetic joints but, given the lack of evidence in the literature, the 2012 guideline makes no distinction between, for example, a healthy young individual with a longstanding prosthetic joint and, at the other extreme, an elderly diabetic patient on corticosteroids with a recent history of a replacement of an infected prosthetic joint. The case-control study mentioned above lacked sufficient power to make definitive conclusions about these presumed higher risk patients.

(4) The 2003 advisory statement<sup>2</sup> borrows from the 1997 American Heart Association guideline,<sup>7</sup> which addressed the issue of dental procedures felt to create the highest risk for bacteremia and therefore of seeding of prosthetic joints. (5) Finally, unlike the 2003 advisory statement, the 2012 guideline does not address the issue of which antibiotics should be considered, and the dosing for each, in the event that the orthopaedist or patient decides that prophylaxis is desirable. Again, this lack of specificity is due to the limitations of the existing literature on this topic.

It is clear that high levels of evi-

dence are not available for every clinical situation. Therefore, practitioners must rely on their experience and clinical judgment, as well as on their patients' preferences and values, when making clinical decisions regarding the use of AP in patients with implantable devices who undergo dental procedures.

We strongly support the development of practical, evidence-based CPGs for clinicians and their patients.<sup>8</sup> It is our hope that the gaps in evidence highlighted by the 2012 AAOS-ADA CPG will be used to develop large, multicenter research protocols that address all of the issues surrounding the management of prosthetic joint arthroplasty patients undergoing invasive dental procedures. We believe that medical professional societies such as The Hip Society, The Knee Society, the American Association of Hip and Knee Surgeons, the AAOS, and the ADA can serve as valuable conduits for conducting such valuable research. This research could serve as a foundation for future evidence-based CPGs on this important topic.

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