

## QUESTION 2: Is it necessary for a patient to postpone having an invasive dental procedure after total joint arthroplasty (TJA)?

**RECOMMENDATION:** In the absence of evidence, we recommend that non-urgent invasive dental procedures, if possible, be delayed until osseointegration of uncemented components are complete.

**LEVEL OF EVIDENCE:** Consensus

**DELEGATE VOTE:** Agree: 82%, Disagree: 10%, Abstain: 8% (Super Majority, Strong Consensus)

### RATIONALE

Hematogenous periprosthetic joint infection (PJI) occurs when bacteria are seeded to the prosthesis via the bloodstream from a distant anatomic source. It has been estimated that hematogenously-seeded infection may cause almost one third of all PJI cases [1]. In patients with joint prostheses in place, dental procedures have historically been considered a concern for producing a transient bacteremia that could potentially cause a hematogenously-seeded PJI [2,3]. Contributing to this concern are case reports in the literature that have attempted to link PJI temporally to dental procedures [4–12]. Such infections generally involve anaerobic organisms that could be expected to be part of the normal dental flora.

Given these concerns for possible hematogenous PJI from an oral source, questions have arisen regarding the value of antibiotic prophylaxis in joint arthroplasty patients undergoing dental procedures [13]. Both the American Academy of Orthopaedic Surgeons (AAOS) and the American Dental Association (ADA) have published guidelines with regard to such prophylaxis. The most recent of these, co-developed by the AAOS and the ADA, were issued in 2012 [14,15]. However, this latest guideline makes no definitive statement for or against antibiotic prophylaxis in arthroplasty patients prior to dental procedures. Overall recommendations indicate that there is limited evidence to support the practice of routine antibiotic prophylaxis for all dental patients with prosthetic implants and inconclusive evidence for or against the use of topical oral antimicrobials in these cases. There is a strong recommendation (unanimous consensus) for continued adequate oral hygiene in total joint replacement patients. More recently in 2016, the AAOS and ADA co-issued Appropriate Use Criteria for this topic [16]. The recommended actions seem to advocate an individualized approach for patients based upon the planned dental procedure, the immunocompromised status of the patient and the glycemic control of the patient, if the patient is diabetic. It can be argued that much of the conclusions of this latest report amount to nothing more than expert opinion/consensus.

A systematic review of the literature in this area yielded 90 individual studies, of which 9 [10,11,17–23] were felt to be adequate for inclusion. Six studies corresponded to a grade IV level of evidence, two studies to level III, and one study to level I. Methodological quality measurements showed an overall low quality of the included studies scoring a median of 6 (range 4 to 7) for case series studies [10,11,17–20]. The methodological quality of Berbari et al. [21], Skaar et al. [22] and Kao et al. [23] showed great heterogeneity in terms of study design and outcome assessment and mostly low methodological quality. Three of the studies were prospective in nature and the remaining were retrospective, six of them being case-series, two case-controlled and only one retrospective cohort study. All were conducted between 1980 and 2016, 7 were conducted among patients treated at a single institution, and 2 included data collected from research databases (Taiwan National Registry [23] and Medicare Registry [22]). None of the studies have suggested and/or been indicated to postpone having an invasive dental procedure after a TJA.

Accordingly, there is still limited evidence to stand for or against the use of antibiotic prophylaxis prior to a dental procedure in joint arthroplasty patients. Although some retrospective articles have associated extensive dental procedures with PJI [10,11] a prospective case-control study found that neither low-risk nor high-risk dental procedures were associated with PJI [21]. In that study, Berbari et al., studied dental prophylaxis prospectively in 339 PJI patients with 339 control patients. They found that antibiotic prophylaxis prior to a surgical procedure conferred no benefit in terms of reducing the incidence of PJI. However, the authors admit that the numbers studied might not have been enough to detect a minor increase in PJI following dental procedures [21].

The issue of whether undergoing a dental procedure soon after TJA increases the risk of implant seeding and potential PJI has not been studied. To design a study that would examine this issue would be challenging. We speculate that the seeding of an implant is more likely to occur if the implant has not osseointegrated. Thus, in patients undergoing uncemented TJA, delaying the invasive non-urgent dental procedures may minimize the risk of seeding without exposing the patient to any risk.

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