

G3- Is there a role for preoperative dental screening in patients undergoing major orthopaedic procedures?

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Response/Recommendation: No. There is no concrete evidence that routine preoperative dental screening is needed in patients undergoing major orthopaedic procedures.

Strength of recommendation: Moderate

Delegate Vote:

Rationale:

Surgical site infection (SSI) is a serious complication following orthopaedic procedures, carrying major implications for patient morbidity, mortality, and healthcare costs. The possibility of oral infections contaminating the surgical site and causing SSI or periprosthetic joint infection (PJI) has prompted the widespread implementation of preoperative dental screening, yet its efficacy continues to be a matter of debate [2]. Proponents argue that it identifies and addresses potential sources of oral infection like periodontal disease or dental caries, thereby reducing bacterial load and minimizing hematogenous spread [3,4]. Conversely, critics point to the insufficient evidence supporting its effectiveness in reducing SSI/PJI rates, arguing that the costs, delays, and inconvenience may not be justified for every patient, particularly those who have good oral health or are undergoing low-risk procedures [1,5].

Although our research question focused on the major orthopaedic procedures, most studies identified through our literature search pertained specifically to arthroplasty, with only one examining the role of preoperative dental screening in elective spinal surgery [1]. There were three online databases (PubMed/Medline, Scopus, and Embase) that were searched from inception to September 2024 to identify all the studies investigating the association between preoperative dental screening and the rates of SSI/PJI in patients undergoing major orthopaedic procedures. The initial database search yielded 2,115 articles, from which 428 duplicates were removed, resulting in 1,686 records available for screening based on title and abstract. Among these, 1,658 were excluded, leaving 28 papers for full-text evaluation. Ultimately, five studies [2–4,6,9] met the eligibility criteria and underwent qualitative and quantitative synthesis in our meta-analysis, which directly compared the SSI rates between patients who have and who do not have preoperative dental screening to examine the risk ratio (RR) of SSIs between these patient groups. There were 12,586 patients in the dental screening group and 10,892 patients in the no-screening group. The pooled analysis showed no statistically significant difference in the risk of SSI/PJI between the two groups (RR: 0.92, 95% CI 0.52 – 1.63) (Figure 1). However, moderate heterogeneity was observed among the studies ($I^2 = 57\%$), suggesting some variability in the results. Importantly, age was recognized as a significant confounding factor ($P = 0.0128$), indicating that the relationship between DS and SSI/PJI is affected by patient age.

The included studies demonstrated low to moderate quality of evidence, with none being a randomized controlled trial. Although most studies involved primary THAs and TKAs, the populations may have different risks of infection. Merging diverse populations that exhibit variations in age, sex, medications, or comorbidities could lead to inaccurate conclusions. Kwan

et al. and Lampley et al. found no significant difference in PJI rates between patients who underwent routine preoperative dental clearance and those who did not [2,6]. Fenske et al. reported no overall association between early infection rates and preoperative oral screening; however, they found that the screening by either a dentist or an orthopaedic surgeon significantly impacted the prevalence of PJI [4]. Tokarski et al. found that 12% of patients failed dental clearance, with risk factors including tobacco use, poor flossing habits, a history of tooth extraction, age, narcotic use, and not having visited a dentist in the past 12 months [7]. Sonn et al. found no statistically significant association between complications (including PJI) and preoperative dental evaluations or extractions [3]. Tye et al. found that an orthopaedic surgeon's oral examination demonstrated a high positive predictive value in identifying high-risk patients needing an oral surgical intervention before total joint arthroplasty [5]. Mirzashahi et al. showed a significant association between SSI and caries, gingivitis/periodontitis, and a history of dental abscess in patients undergoing elective spinal surgery [1]. Vuorinen et al. concluded that the inspection and treatment of dental pathology in all patients are important interventions before elective arthroplasty due to the high need for dental care revealed by their unselected patient population [8].

In conclusion, our meta-analysis findings did not reveal a statistically significant difference in the risk of SSI/PJI between patients who underwent dental screening versus those who did not. Therefore, we do not recommend routine preoperative dental screening for patients undergoing major orthopaedic procedures. However, screening elderly patients may be recommended because the relationship between DS and SSI/PJI is affected by patient age according to our meta-analysis. Ultimately, the decision should be individualized, considering patient risk factors and preferences, in consultation with their orthopaedic surgeon and dentist.

References

- [1] Mirzashahi B, Tonkaboni A, Chehrassan M, Doosti R, Kharazifard MJ. The role of poor oral health in surgical site infection following elective spinal surgery. *Musculoskelet Surg* 2019;103:167–71. <https://doi.org/10.1007/s12306-018-0568-2>.
- [2] Lampley A, Huang RC, Arnold W V, Parvizi J. Total joint arthroplasty: should patients have preoperative dental clearance? *J Arthroplasty* 2014;29:1087–90. <https://doi.org/10.1016/j.arth.2013.11.019>.
- [3] Sonn KA, Larsen CG, Adams W, Brown NM, McAsey CJ. Effect of Preoperative Dental Extraction on Postoperative Complications After Total Joint Arthroplasty. *J Arthroplasty* 2019;34:2080–4. <https://doi.org/10.1016/j.arth.2019.04.056>.
- [4] Fenske F, Krause L, Meyer S, Kujat B, Repmann J, Neuhaus M, et al. Oral Health Screening for Risk Reduction for Early Periprosthetic Joint Infections of Hip and Knee Endoprostheses-Results of a Prospective Cohort Study. *J Clin Med* 2023;12. <https://doi.org/10.3390/jcm12134451>.
- [5] Tye EY, Taylor AJ, Kay RD, Bryman JA, Andrawis JP, Runner RP. An Orthopedic Surgeon's Dental Examination: Reducing Unnecessary Delays in Joint Replacement Surgery for Marginalized Patients in a Safety Net Hospital System. *Arthroplast Today* 2021;12:76–81. <https://doi.org/10.1016/j.artd.2021.10.001>.

- [6] Kwan SA, Lau V, Fliegel BE, Baker C, Courtney PM, Deirmengian GK. Routine Preoperative Dental Clearance for Total Joint Arthroplasty: Is There a Benefit? *Cureus* 2023;15:e41352. <https://doi.org/10.7759/cureus.41352>.
- [7] Tokarski AT, Patel RG, Parvizi J, Deirmengian GK. Dental clearance prior to elective arthroplasty may not be needed for everyone. *J Arthroplasty* 2014;29:1729–32. <https://doi.org/10.1016/j.arth.2014.04.018>.
- [8] Vuorinen M, Mäkinen T, Rantasalo M, Leskinen J, Välimaa H, Huotari K. Incidence and risk factors for dental pathology in patients planned for elective total hip or knee arthroplasty. *Scand J Surg* 2019;108:338–42. <https://doi.org/10.1177/1457496918816911>.
- [9] Fenske F, Kujat B, Krause L, Meyer S, Sander A-K, Repmann J, et al. Preoperative dental screening can reduce periprosthetic infections of hip and knee endoprostheses in the first month after surgery: results of a cohort study. *Infection* 2024;52:535–43. <https://doi.org/10.1007/s15010-023-02128-2>.

Figure

Fig.1

