**Q84: Does Extended Antibiotic Prophylaxis Reduce Periprosthetic Joint Infection Rate in Patients Undergoing Aseptic Hip or Knee Revision Arthroplasty**

Joost T.P. Kortlever, Karin Veerman,Raul Bogola, Thiago Busato, Harriet Hughes, Fabiano Kupczik, Jon H.M. Goosen

**Response/Recommendation:** No. There is no concrete evidence that adminsitartion of extended antibiotic prophylaxis reduced the rate of PJI in patients undergoing aseptic revision knee or hip arthroplasty.

**Level of Evidence**: Limited

**Delegate Vote:**

**Rationale:**

Failures after aseptic knee or hip arthroplasty are often because of periprosthetic joint infections (PJI).[1, 10, 14, 15, 19] Prophylactic administration of antibiotics is used to prevent PJIs or even superficial surgical site infections (SSI). However, there is conflicting evidence for using extended antibiotic prophylaxis following total joint arthroplasty (TJA), for both primary and aseptic revision arthroplasty.[6–9, 21, 24]

To answer the posed question, we conducted a comprehensive literature search using PubMed and EMBASE databases, using the MeSH terms developed by librians. We searched for studies, in English, starting from 2010, including aseptic revision knee or hip arthroplasty. Only studies comparing the use of short-term antibiotics (24 hours or less) with extended antibiotic use (more than 24 hours), and mentioning the outcome of PJI following the aseptic procedure were included. Our search revealed 349 potential studies. After title and abstract screening 78 studies remained for full text review. Seventy studies were excluded based on our predefined study criteria, leaving 8 studies for analysis.[2–5, 11–13, 23] GRADE (Grading of Recommendations Assessment, Development and Evaluation)[18] was used to evaluate the certainty of evidence. The remaining studies were performed in the USA, Taiwan, and Spain. Three studies had the same first author, but different collaborators and patient populations (revision TKA and revision THA) and 2 studies were performed by the same study group, but included different patient populations. All of the included studies were performed in 2015[5] or later.[2–4, 11–13, 23]

From the studies included both primary arthroplasty and revision arthroplasty, the patients who underwent primary TJA were excluded. Patients with unsuspected PJI based on culture samples taken during revision arthroplasty were also excluded. We used a random effects and inverse variants model reporting an odds ratio with a 95% confidence interval for our final outcome. We considered $p < 0.05$ significant. Data extraction was done using the online platform Covidence[22] and data was transferred to the online platform RevMan[20] of Cochrane to create a forest plot based on the total number of PJIs in each group (short vs extended use of antibiotics).

All studies were retrospective. A total of 4,480 aseptic revision surgeries were assessed with follow-up periods from 90 days to 10 years. There was no clear distinction between patients according to risk factors for infection. All studies defined aseptic revision arthroplasty as a surgical intervention with replacement of at least one component, including isolated insert

replacement, and no evidence of infection based on the Musculoskeletal Infection Society (MSIS) criteria[16, 17] or a description thereof.

None of the included studies showed a statistical difference to prevent a PJI in patients undergoing aseptic revision knee or hip arthroplasty with extended use of antibiotics compared to antibiotic usage of 24 hours or less. However, our final analysis and forest plot show a combined odds ratio of 0.61 with a 95% confidence interval of 0.42 to 0.87, slightly favoring the use of extended postoperative antibiotics.

There are several limitations to this study and its results. First, certainty of evidence was very low because of several factors. All studies were of retrospective design, with many of them coming from a single institution, lowering overall quality of evidence. Follow-up periods differed significantly; different antibiotic regimens were used postoperatively. Only 2 studies had a fixed number of days of postoperative extended antibiotics consisting of 5 days intravenously[5] or 7 days orally[4], all others had either completely oral or a combination of intravenously and oral extended antibiotic prophylaxis, in addition, these decisions were also based on the surgeon's choice and duration of antibiotics varied substantially from 2 to 180 days.[2, 3, 11–13, 23] There was some variation in the type of antibiotics given, although most used either cephalosporin, vancomycin (in case of allergies), and clindamycin orally. None of the studies focused on a difference in host risk factors for developing an infection so no distinction could be made between these factors. Further, different definitions for PJI were used. Finally, we included only studies starting from 2010 and later. Doing so, we might have missed some earlier studies. However, surgical protocols concerning preoperative screening and nasal decolonization, surgical site preparation and cleaning prior to closing have evolved and improved over time and we wanted to include the most recent studies to have a more homogenous comparison.

Two authors from this review (KV and JG) are part of a research group that have just completed a randomized controlled trial (RCT) comparing the use of a single dose intravenous antibiotics preoperatively to adding 5 days of extended oral antibiotics in patients undergoing aseptic knee or hip revision surgery [25]. They found 11 out of 379 (2.9%) PJIs in the single dose group and 8 out of 371 (2.2%) PJIs in the extended group (P=0.64), while observing significantly more antibiotic related side effects in the extended group. Though, this data is currently submitted for publication.

## Conclusion

Although based on prior, retrospective studies, a very weak signal exists that the rate of PJI may be slightly lower in patients reciving extended oral antibiotics after revision joint arthroplasty, a recent prospective study (pending publication) did not detect any benefit for extended oral antibiotics in this patient population.

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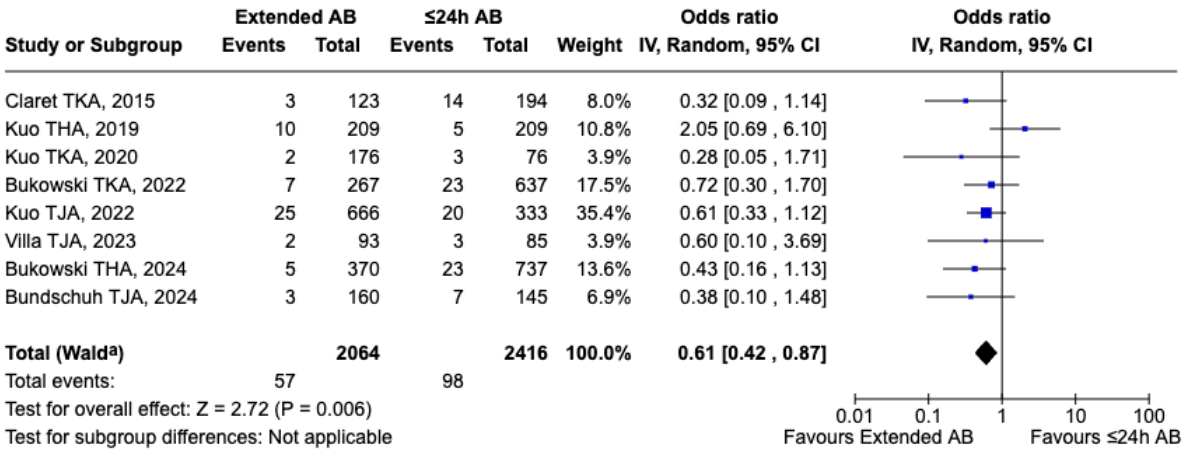
Figure 1. Meta analysis for periprosthetic joint infection after aseptic revision hip or knee arthroplasty comparing >24 hours versus ≤24 hours antibiotic prophylaxis.




**Footnotes**

[a]CI calculated by Wald-type method.

[b]Tau² calculated by Restricted Maximum-Likelihood method.