

QUESTION 1: Does the type of anesthesia (general (GA) vs. neuraxial (NA)) influence the risk of subsequent surgical site infections/periprosthetic joint infections (SSIs/PJIs)?

RECOMMENDATION: Compared to GA, NA appears to be associated with reduced risks of SSIs/PJIs after total hip arthroplasties (THAs) and total knee arthroplasties (TKAs).

LEVEL OF EVIDENCE: Limited

DELEGATE VOTE: Agree: 76%, Disagree: 12%, Abstain: 12% (Super Majority, Strong Consensus)

RATIONALE

Anesthetic technique may be a modifiable risk factor for the development of infectious complications after THA or TKA [1]. There are 16 observational studies [1–16] and 2 systematic reviews [17–18] comparing anesthetic type with risks of SSIs after joint arthroplasty.

Nine studies associated NA with reduced risks of SSIs after THA [2–3], TKA [4–6] or combined THA/TKA cohorts [1,7–9]. The earliest retrospective study of 3,081 patients from a national database in Taiwan described a protective benefit of NA [1]. Three large-scale reviews of The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) concluded that GA was associated with more wound infections and more overall complications than NA [3–5]. Four additional large-scale studies sampled institutional [6], health system [7–8] or surveillance [9] databases and associated NA with lower incidences of post-arthroplasty SSIs. A large 30-year prospective study of SSIs after THA by a single surgeon found no overall influences of primary anesthetic choices on SSIs [10]. However, NA was associated with reduced risks of blood transfusions and avoiding transfusion reduced the incidence of SSIs.

Seven observational studies concluded that there is no influence of anesthetic type on the risks of SSIs after THAs [10–11], bilateral TKAs [12] or in combined THA/TKA cohorts [13–16]. However, two studies did find that NA was associated with decreased incidences of overall systemic infections compared to GA (including SSIs, sepsis, urinary tract infections and pneumonia) [11–12]. One case-control study of primary and revision THAs/TKAs found no effects of anesthetic type on the development of SSI [14]. The remaining six population-based studies derived data from ACS-NSQIP [11], administrative [12,16], joint registries [15] or institutional databases [10,13] and found no associations between anesthesia type and SSIs.

There are two systematic reviews [17–18] (with one meta-analysis) [18] addressing this topic. Results were conflicting, with one systematic review/meta-analysis concluding that NA lowers the risk of post-arthroplasty SSIs [18] and the other failing to find any influences of anesthetic types on SSIs after total joint arthroplasties [17]. Notably, the latter systematic review included fewer than half the number of studies analyzed.

In summary, most of the available evidence investigating SSIs after joint arthroplasty is retrospective in nature or comprises prospectively collected data derived from large databases. Nevertheless, the overall study quality was moderate to high based on the individual study quality assessment. The evidence either (1) favors the use of NA, compared to GA or (2) shows no effect of anesthetic choice for reducing SSI risks after THAs/TKAs. Given that there is no evidence to support the use of GA to mitigate the risks of SSIs after joint arthroplasty and the preponderance of available data supports NA, we strongly recommend NA, when feasible, as the preferred anesthetic for THAs/TKAs.

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