# Surgeon as a risk factor for periprosthetic joint infection after total hip and knee arthroplasty following primary osteoarthritis

**Samo Roškar[1,2,*], Vesna Levašič[1,3], Mateja Blas[1,3], René Mihalič[1,2], Rihard Trebše[1,2], Simon Kovač[1,3,4]**

[1] Valdoltra Orthopaedic Hospital, Jadranska cesta 31, Ankaran, Slovenia
[2] Faculty of Medicine, University of Ljubljana, Vrazov trg 2, Ljubljana, Slovenia
[3] Valdoltra Orthopaedic Hospital, The National Arthroplasty Registry of Slovenia, Jadranska cesta 31, Ankaran, Slovenia
[4] Faculty of Medicine, University of Maribor, Taborska ulica 8, Maribor, Slovenia
* e-mail: samo.roskar@ob-valdoltra.si

## Introduction

Periprosthetic joint infection (PJI) is one of the most devastating complications, with an incidence rate of around 1-2% after total hip (THA) and total knee arthroplasty (TKA).

Recent registry-based studies report that the revision rate for TKA and THA is affected by patient and surgeon factors. For THA, some studies report an association between lower case load and a higher risk for PJI. However, none of the available studies analysed the incidence of PJI in relation to the surgeon, focusing only on primary osteoarthritis.

This study aims to assess between-surgeon variation in PJI rates following THA and TKA at a same high-volume teaching institution.

## Methods

**Retrospective analysis**

**between 2010 and 2023**

**6,937 TKAs**

**8,867 THAs**

prospectively collected data or data retrieved from hospital registry:
- patient age
- gender
- side of surgery
- date of primary arthroplasty
- date of revision surgery
- reason for revision surgery
- perioperative PJI diagnostics
- date of death
- date of last follow-up

- **Inclusion criteria:** primary osteoarthritis, arthroplasty performed by a surgeon with >70 primary procedures per year and at least 500 procedures in observing period
- **Statistics:** mixed-effects logistic regression model with gender, age and BMI as fixed effects and surgeon as random intercept

## Results

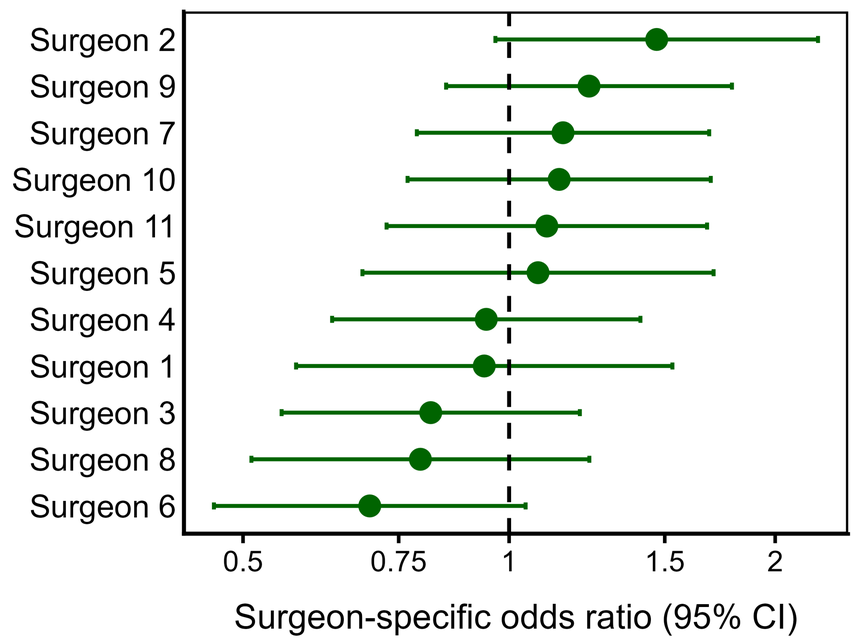
**between 2010 and 2023** | **15,804 procedures** | **11 surgeons** | **128 PJIs within first 2 years**

Descriptive statistics

| Characteristics | Infection | No infection | Total |
|---|---|---|---|
| N (%) | 128 (0.8%) | 15,676 (99.2%) | 15,804 (100%) |
| Gender, female | 55 (43%) | 9,069 (57.9%) | 9,124 (57.7%) |
| Gender, male | 73 (57%) | 6,607 (42.1%) | 6,680 (42.3%) |
| Age* | 69.3 (8.5) | 68.4 (9.3) | 68.4 (9.3) |
| BMI* | 33.1 (6.4) | 30.2 (5.1) | 30.3 (5.2) |

*mean (standard deviation)

Surgeon-specific random effects from a mixed-effects logistic model.
The dashed line represents the average surgeon (OR = 1).




Surgeon-specific estimates showed some variation in PJI risk after adjustment for sex, age, and BMI; overall **between-surgeon heterogeneity** was limited (**ICC = 2.6%**; LRT, **p = 0.061**).

## Main findings

Using a **mixed-effects logistic regression model adjusted for sex, age, and body mass index**, we assessed whether the **variability between surgeons** was sufficient to warrant inclusion in the analysis and resulted in a **marginally statistically significant (LRT, p = 0.061).**

## Conclusions

**Surgeon** appears to be an **important risk factor for PJI** after **THA or TKA**. Using a mixed-effects logistic regression model, surgeon appears as a potential risk factor for PJI revision following THA or TKA, close to statistical significance.

Limitations of the study: **ASA not included** as a potential confounder, the **criteria for patient selection** might differ among the surgeons and **level of surgical skill** was arbitrarily determined.

## References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