Single vs Multiple Dose Antibiotic Prophylaxis for Primary Arthroplasty

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BACKGROUND

• The optimal duration of perioperative antibiotic prophylaxis in primary arthroplasty remains debated.

• Single-dose prophylaxis may reduce postoperative antibiotic exposure and simplify same-day or short-stay care.

• Previous studies found no clear advantage of multiple-dose prophylaxis, but lacked reliable patient-level data.

METHODS

• Retrospective cohort study using prospectively collected data from two independent treatment centers.

• Primary hip, knee, or shoulder arthroplasties; cefazolin 2 g prophylaxis.

• PJI identified from HiX, LROI, and PREZIES; outcomes at 3 months and 1 year.

• Multivariate logistic regression and adjusted risk-difference non-inferiority analysis; margin +0.50 percentage points.

RESULTS

PJI within 3 months

Follow-up: single n=14,765; multiple n=8,846

PJI, nN/ (%)	Single: 106/14,765 (0.72%) Multiple: 45/8,846 (0.51%)
Adjusted OR	1.15 (95% CI 0.75–1.78) p=0.520
Adjusted risk difference	+0.073 pp 95% CI -0.191 to +0.308
Non-inferiority	YES

PJI within 1 year

Follow-up: single n=11,698; multiple n=8,770

PJI, n/N (%)	Single: 109/11,698 (0.93%) Multiple: 49/8,770 (0.56%)
Adjusted OR	1.27 (95% CI 0.83–1.96) p=0.276
Adjusted risk difference	+0.122 pp 95% CI -0.136 to +0.364
Non-inferiority	YES

STUDY POPULATION

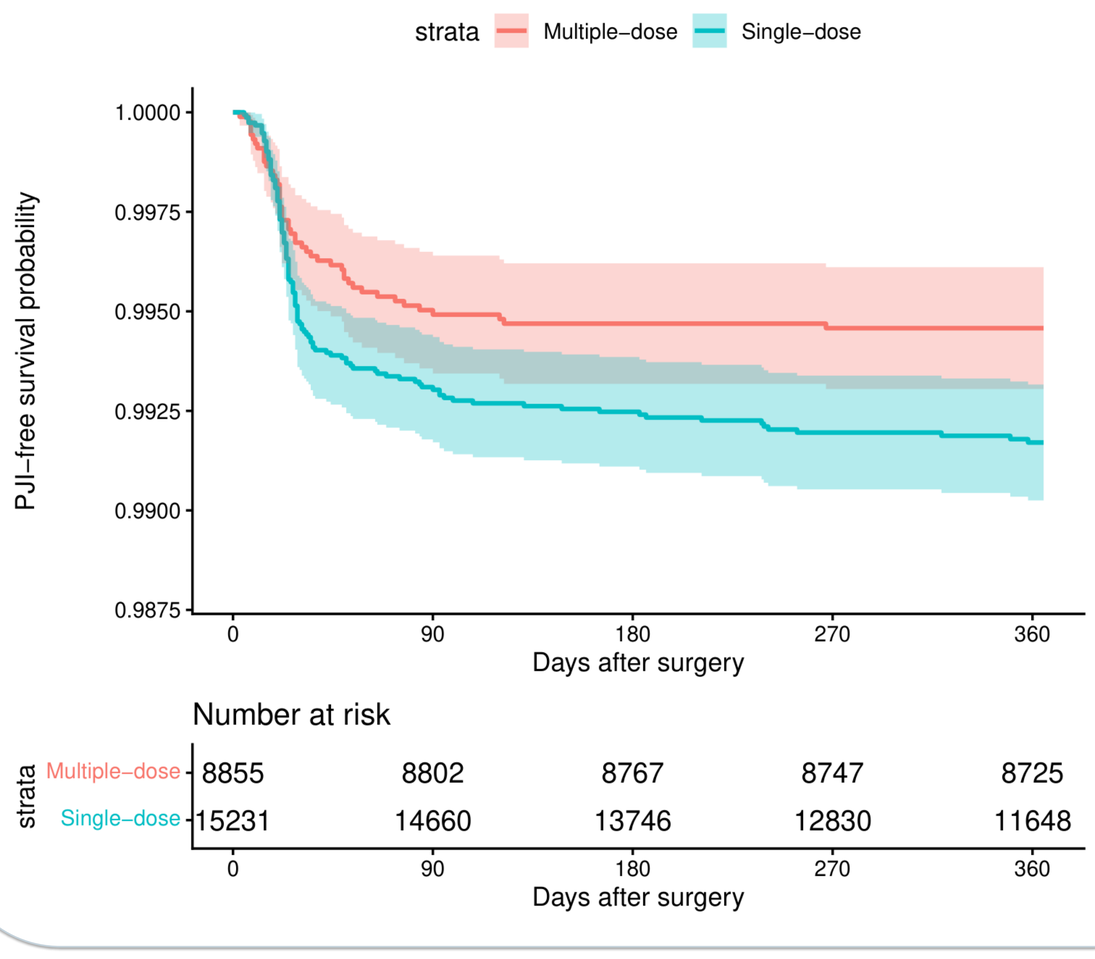
24,087

primary arthroplasty procedures

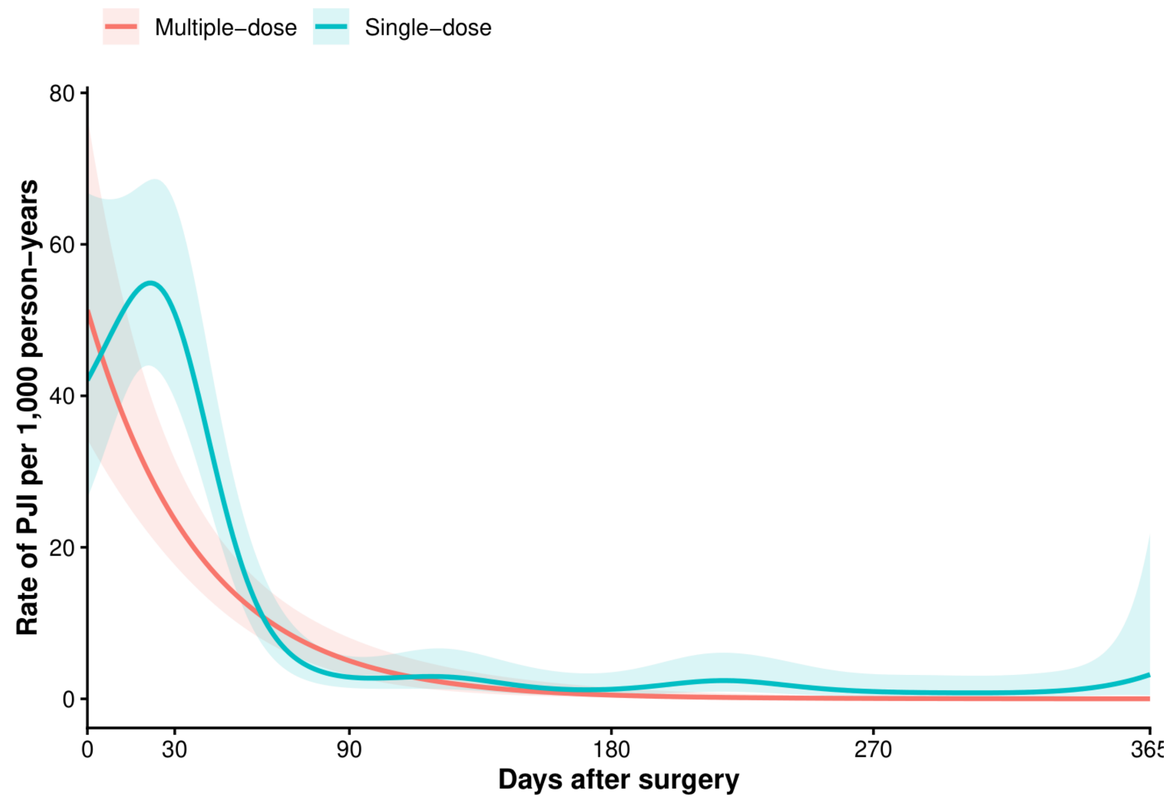
Single-dose	Multiple-dose
15,232	8,855
63.2%	36.8%

Outcome analyses used timepoint-specific follow-up denominators.

PJI-free survival (Kaplan–Meier)

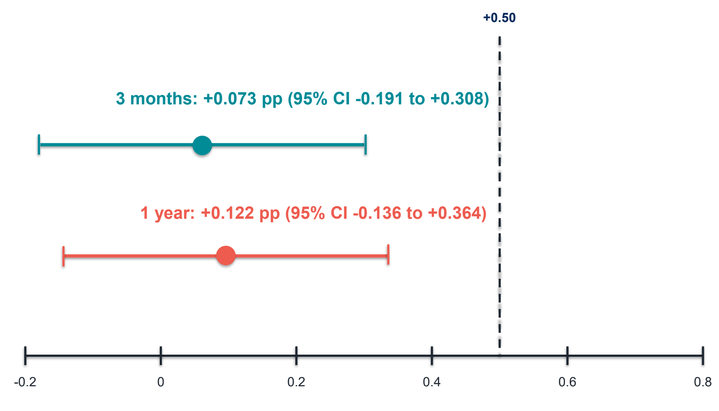


Incidence rate of PJI



NON-INFERIORITY MARGIN

Prespecified margin = +0.50 percentage points



Non-inferiority demonstrated at 3 months and 1 year.

Discussion

- This study extends existing evidence by incorporating **patient-level data** on antibiotic prophylaxis and PJI.
- Single-dose antibiotic prophylaxis was **not associated** with increased odds of PJI at 3 months or 1 year.
- Single-dose prophylaxis was **non-inferior** to multiple-dose prophylaxis at both time points.
- These findings support the use of single-dose antibiotic prophylaxis.