



Time to Reimplantation: Waiting Longer May Increase the Risk of Subsequent Failure

M. Lane Moore, MD, MBA; Collin L. Braithwaite, MD; Saad Tarabichi, MD; Jens T. Verhey, MD; Zachary K. Christopher, MD; David G. Deckey, MD; Henry D. Clarke, MD; Mark J. Spangehl, MD; Joshua S. Bingham, MD

Mayo Clinic Arizona Department of Orthopedic Surgery

BACKGROUND

- Two-stage exchange arthroplasty remains an important treatment strategy for chronic periprosthetic joint infection (PJI). Following resection arthroplasty and antibiotic spacer placement, surgeons must determine the appropriate timing of definitive reimplantation.
- The optimal interstage interval remains uncertain. While delaying reimplantation may allow additional time for antimicrobial treatment, prolonged spacer retention extends functional impairment and may increase morbidity.
- Whether longer intervals improve infection eradication or adversely affect outcomes remains unclear.
- **Purpose:** To evaluate the association between time to reimplantation and treatment failure following two-stage exchange for chronic knee PJI.

METHODS

- Retrospective review of 576 patients undergoing two-stage exchange for chronic knee PJI.
- PJI defined using 2013 MSIS criteria.
- Excluded reimplantation >180 days (n=76) and spacer exchange (n=49).
- Final cohort: 451 patients; mean follow-up 5.8 ± 3.6 years.
- Failure was defined as reoperation for infection or PJI-related mortality.
- Interstage duration was analyzed per 10-day increase and by intervals of <76, 76–100, and ≥100 days.
- Multivariable regression identified independent predictors of failure.

RESULTS

- Among 451 patients, 71 (15.7%) experienced treatment failure and 380 (84.3%) experienced success. Baseline health status and infecting organisms did not differ between timing groups (all p>0.05).
- Every additional 10 days increased the adjusted odds of failure by 22%
—Adjusted OR 1.219 (95% CI 1.072–1.370); p=0.001

Time to Reimplantation	Adjusted OR (95% CI)	P-value
< 76 days	0.265 (0.059–0.810)	0.039
76-100 days	0.664 (0.293–1.425)	0.308
≥ 100 days	3.022 (1.416–6.707)	0.005

- Reimplantation at ≥100 days was associated with approximately 3-fold greater odds of failure, while reimplantation at <76 days was associated with treatment success.
- Active smoking was also independently associated with failure (OR 10.20; 95% CI 2.398–46.47; p=0.002).

CONCLUSION

- Longer time to reimplantation was independently associated with greater treatment failure following two-stage exchange for chronic knee PJI.
- Every additional 10 days increased the adjusted odds of failure by 22%. Reimplantation within <76 days was associated with lower odds of failure.
- These findings suggest that unnecessary delays in reimplantation may be detrimental and that prolonged spacer retention should not be pursued solely to extend the interstage interval.

