

Practice Variation, Outcomes, and Definitions of Suppressive Antimicrobial Therapy for Prosthetic Joint Infections

A Systematic Review and Expert Consensus Statement

BACKGROUND Suppressive antimicrobial therapy (SAT) is used inconsistently across regions and studies, which impairs comparison of PJI outcomes and communication of results

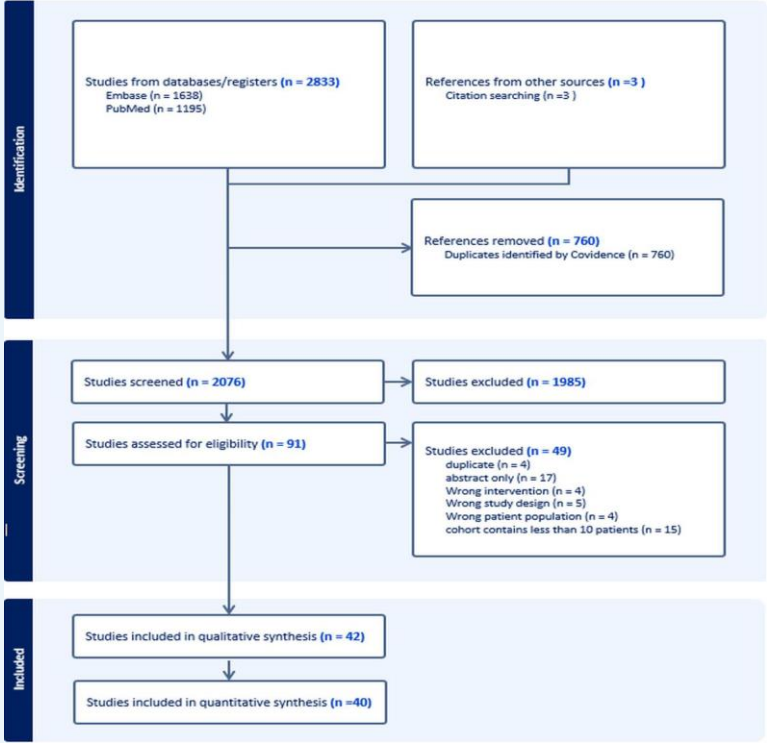
STUDY AIMS

- Describe current SAT strategies in PJI
- Evaluate reported clinical outcomes
- Establish consensus definitions for SAT and EAT

METHODS

Studies from inception to 10 March 2025 with ≥10 patients with PJI treated with SAT were eligible. Study quality was assessed using MINORS; pooled success rates were estimated using random-effects meta-analysis; consensus definitions were developed through a modified Delphi process.

PRISMA flow diagram



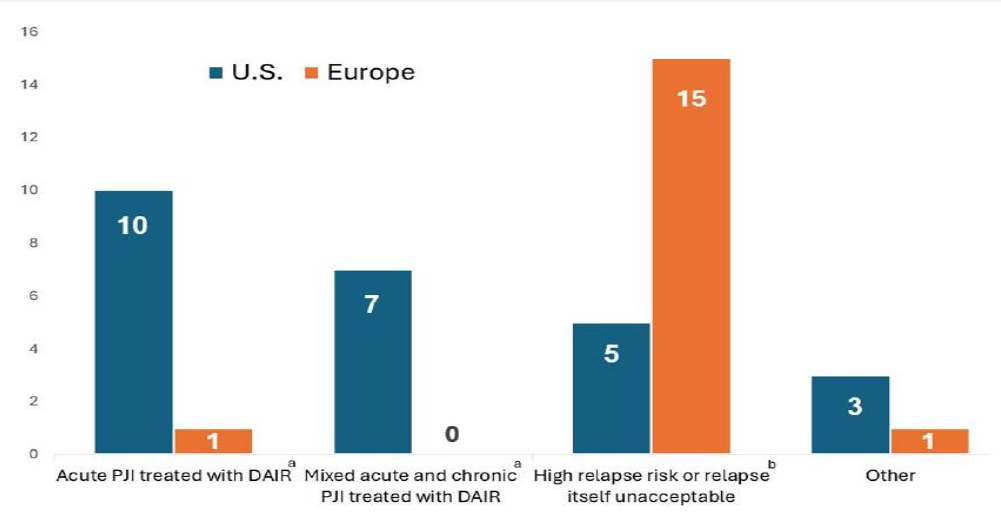
CONSENSUS DEFINITIONS

- SAT: noncurative antimicrobial therapy beyond the recommended therapeutic duration, intended to suppress latent infection and prevent symptoms or consequences.
- Indefinite SAT: no planned stop because curative surgery will not be performed.
- Fixed-term SAT: stopped when conditions improve enough to allow curative surgery.
- EAT: curative-intent therapy continued for a fixed term beyond guideline duration to improve the likelihood of eradication without additional surgery.

CONCLUSIONS

SAT in PJI varies between the United States and Europe. Reported success rates are around 70–74%, but heterogeneity and likely selection bias limit interpretation. The proposed SAT/EAT definitions and risk stratifications can improve future research and clinical communication.

Figure 2. Dominant clinical contexts in which SAT was applied



Note : US studies mainly report SAT after acute PJI treated with DAIR, European studies more often describe SAT in noncurative or high-relapse-risk settings.

KEY POINTS

- 42 observational studies comprising 2524 patients were included.
- U.S.: 25 studies, 1528 patients; Europe: 17 studies, 996 patients.
- Overall pooled reported SAT success: 74% (95% CI 70–79).
- Acute PJI treated with DAIR: 74% (95% CI 63–85).
- Chronic PJI with implant retention: 70% (95% CI 63–78).
- Consensus terminology distinguishes SAT from extended antimicrobial therapy (EAT).

RESULTS

Category	N studies	N patients	Pooled Success Rate, % [95% CI]
All PJI	40	2467	1806, 74 [70–79]
Acute PJI treated with DAIR	11	711	538, 74 [63–85]
Chronic PJI with implant retention	13	732	507, 70 [63–78]
United States	24	1483	1089, 73 [66–79]
Europe	16	984	717, 77 [70–83]
Ongoing at final follow-up	25	944	693, 74 [69–80]
Discontinued	21	526	410, 74 [64–84]

Reported success rates should be interpreted cautiously because outcome definitions, patient populations, and treatment strategies were heterogeneous.

RISK CLASSIFICATION FOR SAT FAILURE

Low risk	Medium risk	High risk	Very high risk	Indeterminate
PJI treated with exchange arthroplasty PJI treated with DAIR under the following conditions: • Well-fixed prosthesis • Acute PJI: – Early acute: ≤4 weeks after index arthroplasty – Late acute: < 3 weeks of symptoms after an uneventful postoperative period • Good conditions of the surrounding soft tissue without a sinus tract	PJI treated with DAIR with the following risk factors: • Early acute: 4–12 weeks after index arthroplasty • Multiple previous revision surgeries • Host and clinical factors: – Rheumatoid arthritis – COPD – Immunosuppressive therapy • S. aureus infection (late acute PJI) • Difficult to treat microorganism – no biofilm active antimicrobial therapy available – and fungal infections • Bacteraemia	PJI treated with DAIR despite not recommended due to: • Loose prosthesis • > 12 weeks after index arthroplasty • > 3 weeks of symptoms • Presence of a sinus tract • Compromised soft tissue	PJI treated without surgery – antimicrobial treatment only	Low-risk profile, but SAT started because of old age or frailty