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RWD 37

COMPARISON OF POSTOPERATIVE ATRIAL FIBRILLATION, STROKE, MORTALITY, AND ECONOMIC OUTCOMES IN LOW-RISK TAVR PATIENTS

A Systematic Review Using the PARTNER 3 Trial as a Comparator to Real-World Evidence

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Background

- Transcatheter aortic valve replacement (TAVR) is a standard alternative to surgery (SAVR) for severe aortic stenosis.
- Indications expanded to low-risk patients in 2019 following the PARTNER 3 trial.

Gap

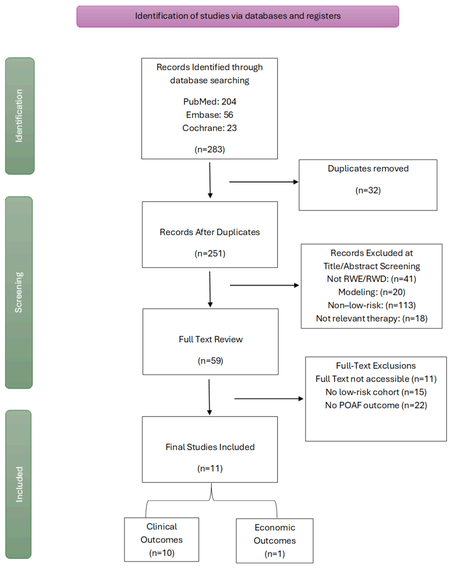
Limited evidence comparing real-world outcomes of Post Operative (POAF) and economic impacts after TAVR with RCT findings in low-risk populations.

Objective

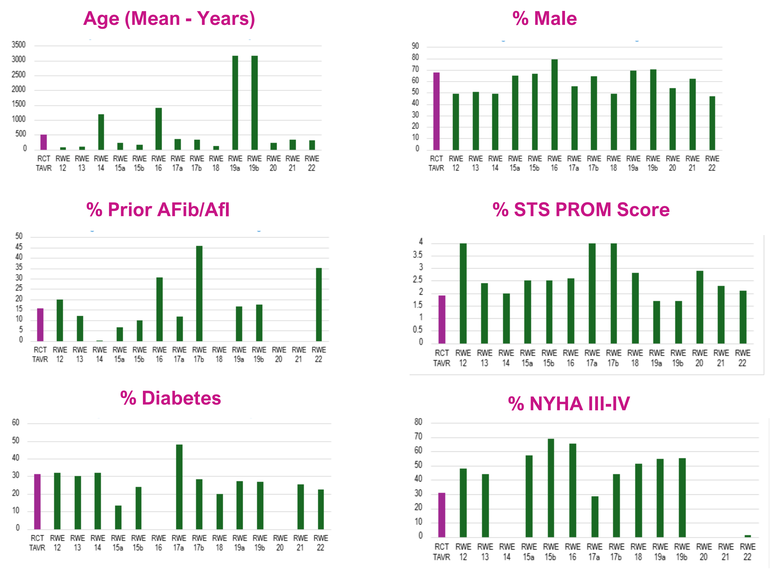
To systematically evaluate real-world evidence (RWE) on postoperative atrial fibrillation (POAF), stroke, mortality, and economic outcomes in low-risk TAVR patients, and compare findings with the PARTNER 3 randomized trial.

Methodology

- Review Type: Systematic literature review (PRISMA 2020 guidelines).
- Search Period: Jan 1, 2019 – June 30, 2025.
- Data Sources: PubMed, Embase, Scopus, Cochrane, and clinical registries.

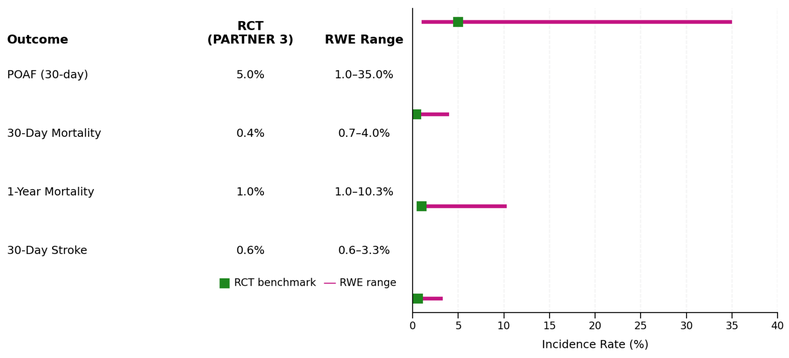


Baseline Characteristics: RCT VS RWE



Clinical Outcomes RCT Vs Real-World Evidence

RCT Benchmarks Compared with Observed Real-world Ranges



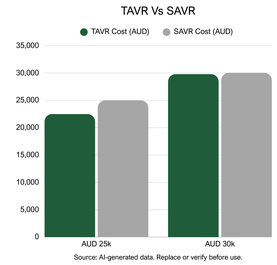
Economic Outcomes

RCT Based Dominance of TAVR Vs SAVR (PARTNER 3)

- USD 66,834 vs USD 68,864
- Shorter ICU LOS 0.8 vs 2.7 days
- Higher QALYs (+0.05).

Real World Evidence Sensitivity Analyses

- Efficiency: TAVR reduces hospital stay by 4.4 days vs. SAVR.
- Cost Savings: ~10% lower (Index + 30 days) at AUD 25k device price.
- Sensitivity: Savings cancelled out if device price exceeds AUD 30k.



Key Findings

- **The Risk Paradox:** "Low-risk" labels mask real-world frailty (NYHA Class, Diabetes status), and anatomical complexity (bicuspid/VIV) excluded from trials.
- **POAF Variability:** RWE rates are highly variable (1%–35%) vs. 5% in PARTNER 3. Trial results represent the "best-case" lower bound.
- **Safety Stability:** Mortality and stroke show minimal variation between RCT and RWE, confirming TAVR's robust safety profile.
- **Price Ceiling:** A 4.4-day LOS reduction drives savings, but economic dominance vanishes if device costs exceed AUD 30,000.

Conclusion

Real-world TAVR populations demonstrate greater clinical hetergeneity and variability in outcomes compared with RCT cohorts, highlighting limitations in generalizing trial findings to routine practice, while economic outcomes remain insufficuently characterized, representing an important gap for future studies.

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