

INTERVENTISTICA STRUTTURALE NEL 2030

TAVI. Prospettive future

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NO CONFLICT OF INTEREST



Twenty Years of TAVI Evolution

>250.000

In 2025



Twenty Years of TAVI Evolution

99%

Procedural success
at high-volume centres

1%

30-day mortality
at high-volume centres

<3%

Vascular complication
at high-volume centres

The key to success

- Strength of evidence
- Device evolution
- Pre procedural planning
- Minimalist approach (TF>95%)

Trial	Year	Outcome
PARTNER 1 HR	2011	Non-inf. vs SAVR (HR)
PARTNER 2	2016	Intermediate risk
PARTNER 3	2019	Low risk: parity
Evolut Low Risk	2019	Low risk: non-inf.
NOTION-2	2023	5Y favourable data



1. Expansion of indications
2. Technological innovation
3. Artificial intelligence



Expanding Indications: The Pyramid Widens

High risk (STS>8%)

Standard of care since 2011 — ACC/AHA class I

Intermediate risk

Indication 2017 — well established

Low risk (STS<4%)

Approved 2019–2020 — volume explosion

Patients aged 65–75

Under debate — ongoing trials 2024–2027

Bicuspid aortic valve

Dedicated devices emerging — data 2027–28

Pure aortic regurgitation

GATE, JenaValve — approvals expected 2028–29



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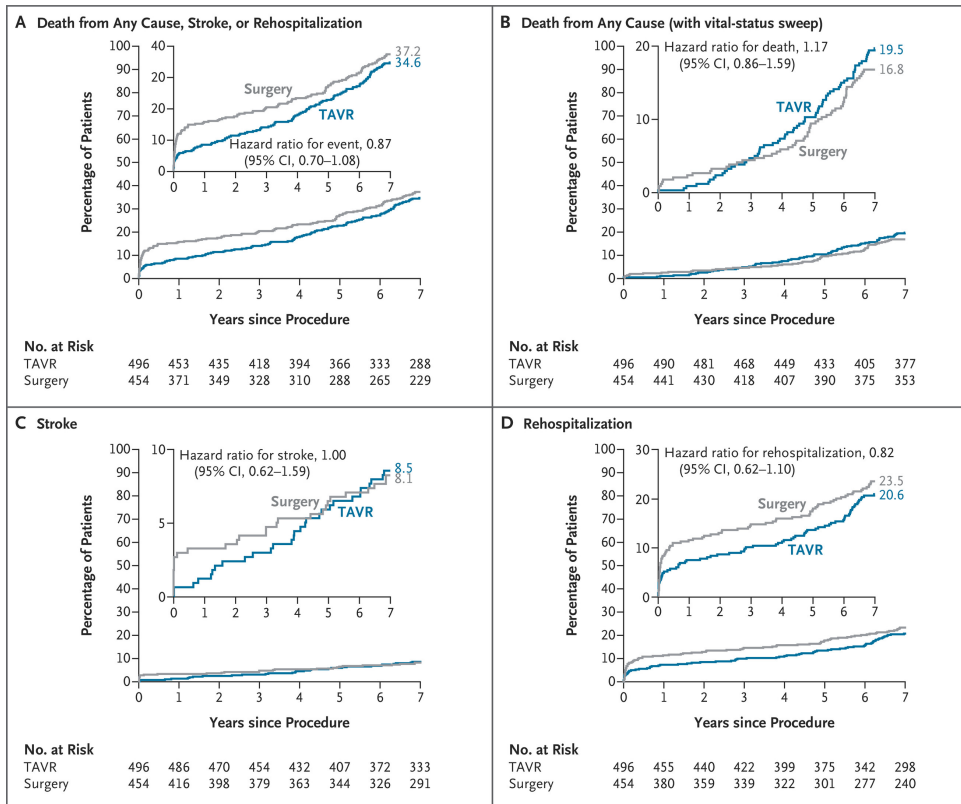
Pure aortic regurgitation

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Original Article Transcatheter or Surgical Aortic-Valve Replacement in Low-Risk Patients at 7 Years

N Engl J Med
Volume 394(8):773-783
February 19, 2026

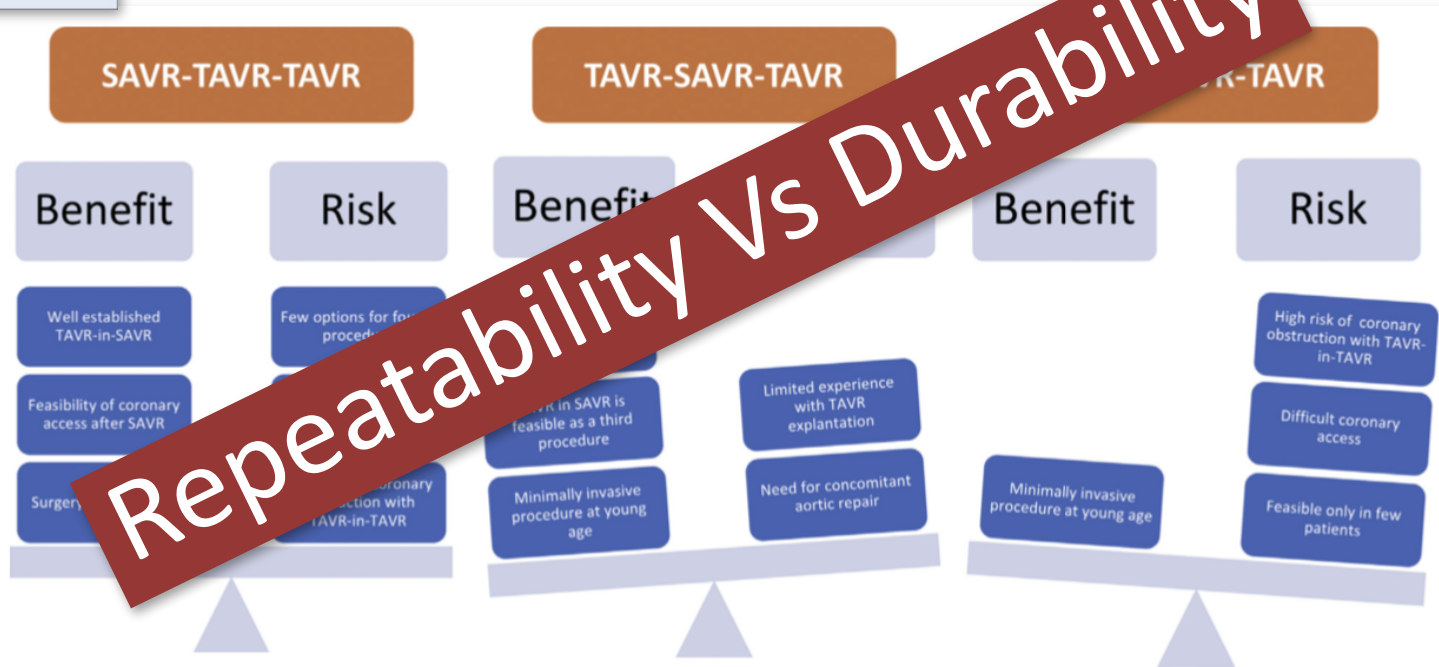


Structural Valve Deterioration

Intrinsic permanent changes to the prosthetic valve, including:

- Wear and tear
- Leaflet disruption
- Flail leaflet
- Leaflet fibrosis and/or calcification
- Strut fracture or deformation

LIFE-LONG STRATEGY



Yerasi, C. et al. J Am Coll Cardiol Interv. 2021;14(11):1169-80.

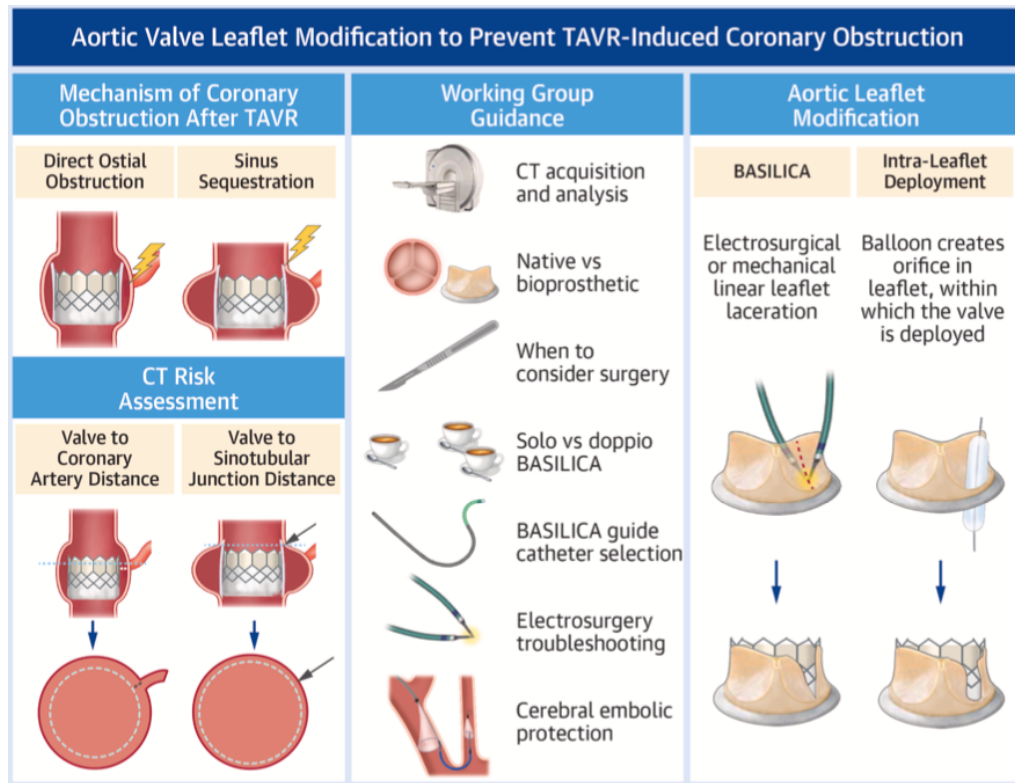


FOCUS: VALVE LEAFLET MODIFICATION

STATE-OF-THE-ART REVIEW

Aortic Valve Leaflet Modification

A Working Group Position Statement on Best Practices and Step-by-Step Guide



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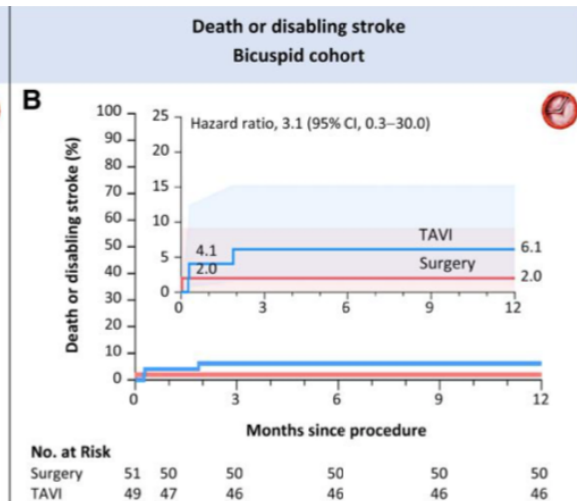
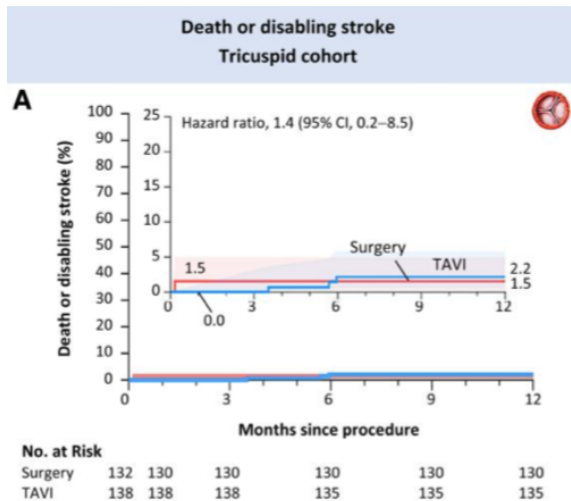
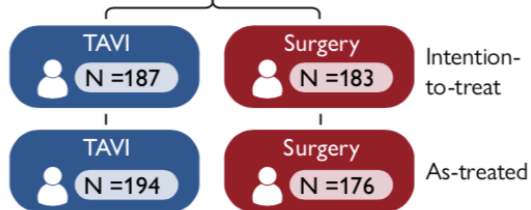


Transcatheter aortic valve implantation in low-risk tricuspid or bicuspid aortic stenosis: the NOTION-2 trial

Aims and methods

NOTION-2

370 patients with severe symptomatic aortic stenosis ≤ 75 years



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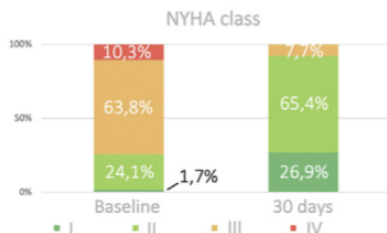
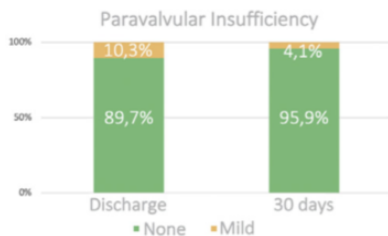
Pure aortic regurgitation

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European Real-World Experience

- 6 EU centers, 58 patients



Adam M et al. JACC Interv. 2023;16:1965-1973

Technical Success

100% | | 95%

Paravalvular AR ≥ moderate

0% | | 0%
30d | 1y

New permanent pacemaker

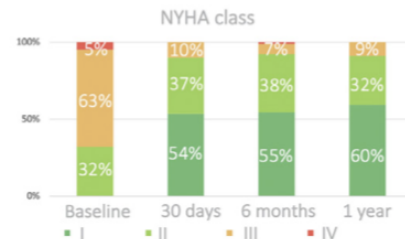
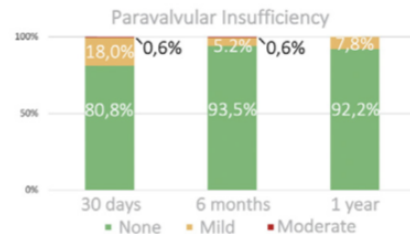
19,6% | | 24,0%

Mortality

1,7% | | 2,2% 7,8%
30d | 30d 1y

ALIGN-AR Study

- 20 centers, 180 patients



Vahl T et al. Lancet 2024; 403(10435):1451-1459



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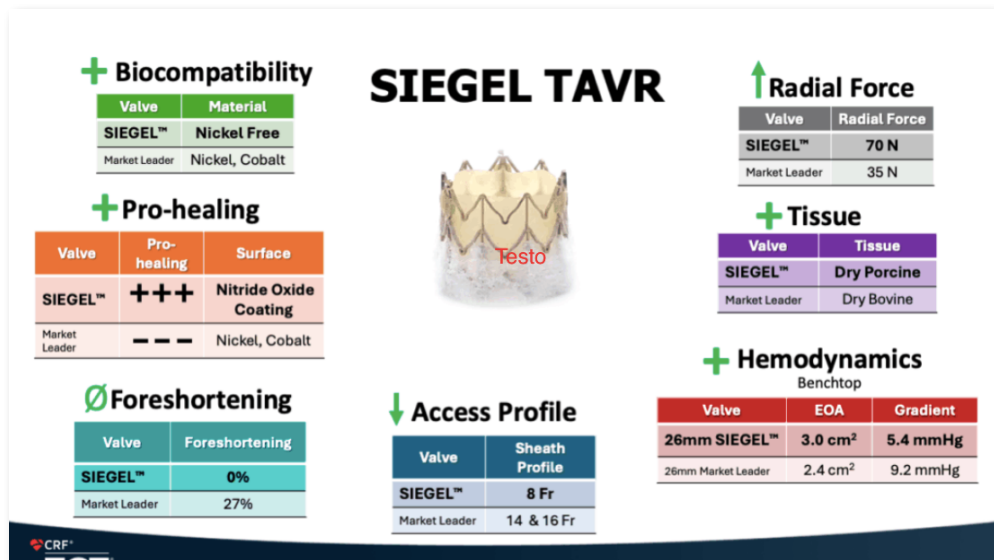


EDITORIAL COMMENT

Polymeric Transcatheter Heart Valves

Are We Entering the Next Era of TAVR Durability?

Shinichi Shirai, MD, Masaomi Hayashi, MD, Kenichi Ishizu, MD



1. Expansion of indications
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1 Device selection & sizing

2 Results prediction

3 Pre-procedural Digital Twin

4 Real-time AR/AI intraprocedural guidance

5 Predictive remote follow-up

Expected AI Impact 2030

-35% complications

+28% accuracy

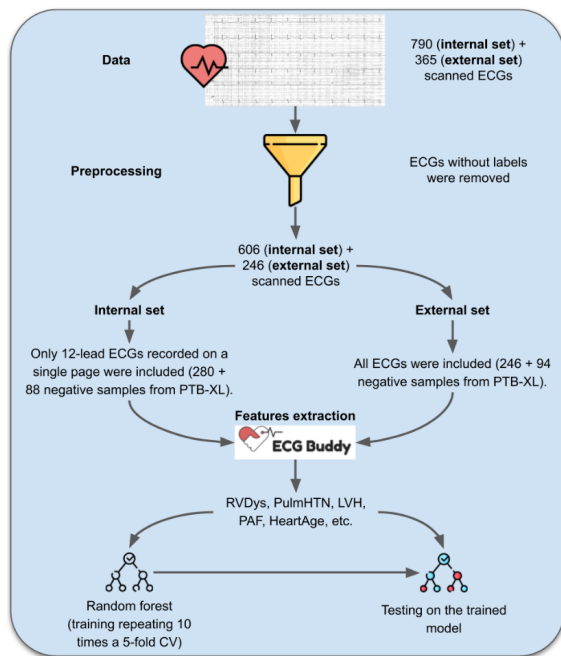
-60% variability

AI Platforms Already in Use

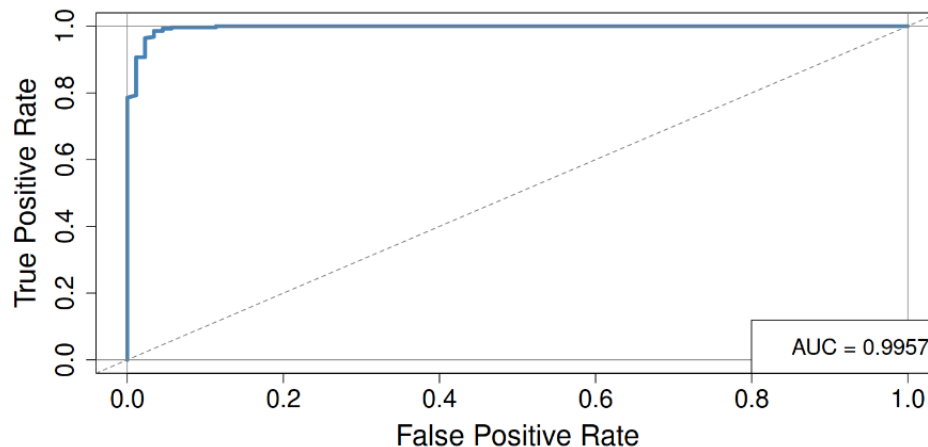
- 3mensio Structural Heart (Pie Medical)
- HeartFlow TAVI Planner
- Siemens PURE (AI annulus sizing)
- Caption Health Echo AI
- Medtronic AI-powered LAAO



AI-enhanced baseline ECG for Staging Secondary Cardiac Damage in Severe Aortic Stenosis Undergoing TAVI: a multicenter retrospective study



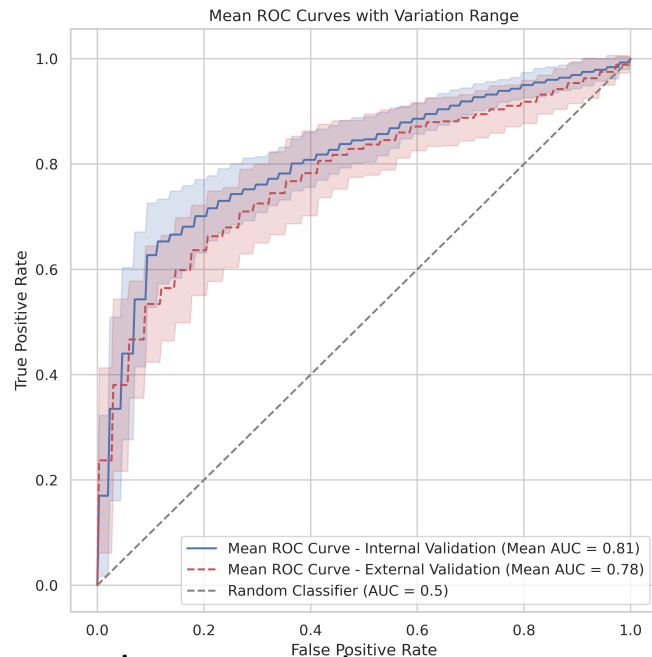
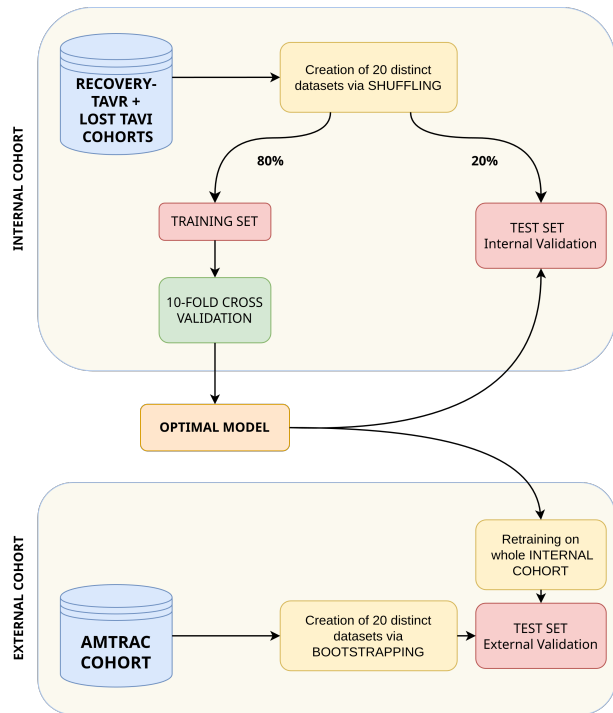
ROC Curve - Binary Classification



F D'Ascenzo et al



Machine learning prediction of myocardial recovery after Transcatheter aortic valve replacement. The RECOVERY-AI Model.



F D'Ascenzo et al



Thanks for you attention

