

Impact of Valve Frame Height on PCI Outcomes After TAVI

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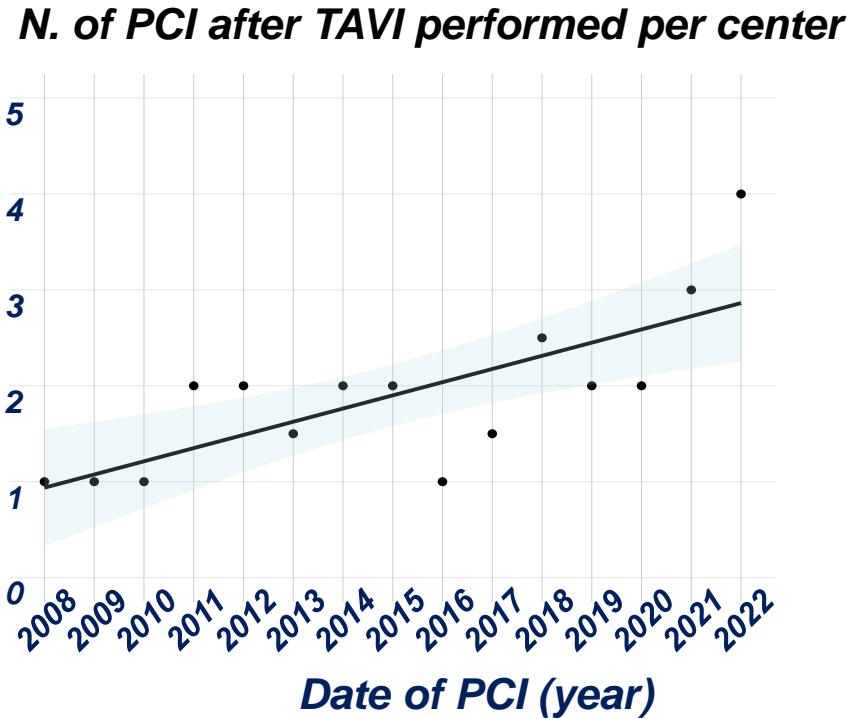


Disclosure of Relevant Financial Relationships

I, [Carlo A. Pivato](#) DO NOT have any financial relationships to disclose.

Background

- CAD and AS share common pathophysiology.
- Up to 75% of TAVI candidates have concomitant CAD.
- As TAVI expands to younger populations → PCI after TAVI is becoming increasingly relevant.



Clinical Problem

- PCI after TAVI can be challenging, especially with tall framed valves (TFV) as opposed to short framed valves (SFV)

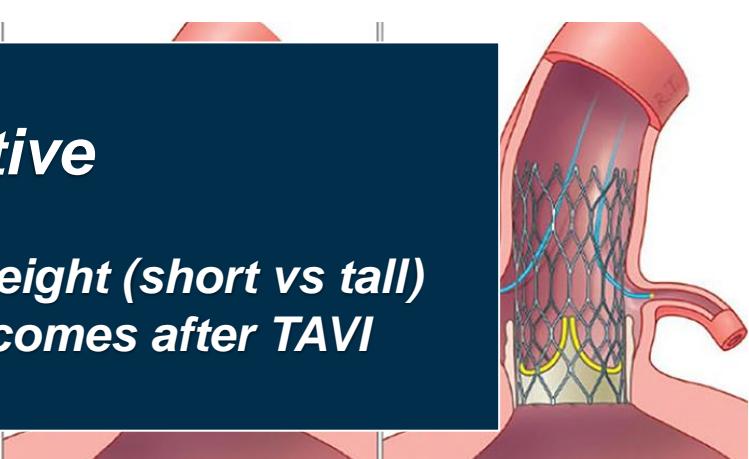
SFV

TFV

Study Objective

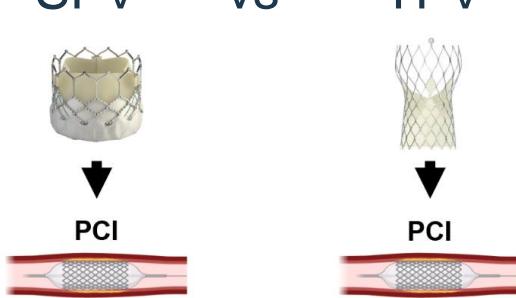
Evaluate whether valve frame height (short vs tall) influences long-term PCI outcomes after TAVI

- Concerns about increased risk of complications during PCI procedure, particularly if there are associated coronary artery disease.
- Data on long-term outcomes after PCI post-TAVI are scarce.



Study population

- **Data source:** Multicenter *REVIVAL-PCI* registry (21 European centers).
- **Period:** 2008–2023.
- **Population:** Consecutive patients undergoing PCI after TAVI.
- **Exclusions:** Mechanical or transapical valves.
- **Classification:** SFV vs TTV



Study population

- **Total included:** 441 patients (SFV = 230; TFV = 211).
- **Median follow-up:** 908 days (IQR 322–1728).

Type	Example Device	Mechanism	% of Group
SFV	 SAPIEN	Balloon-expandable	98%
TFV	 CoreValve, Acurate, Portico	Self-expanding	100%

Methods

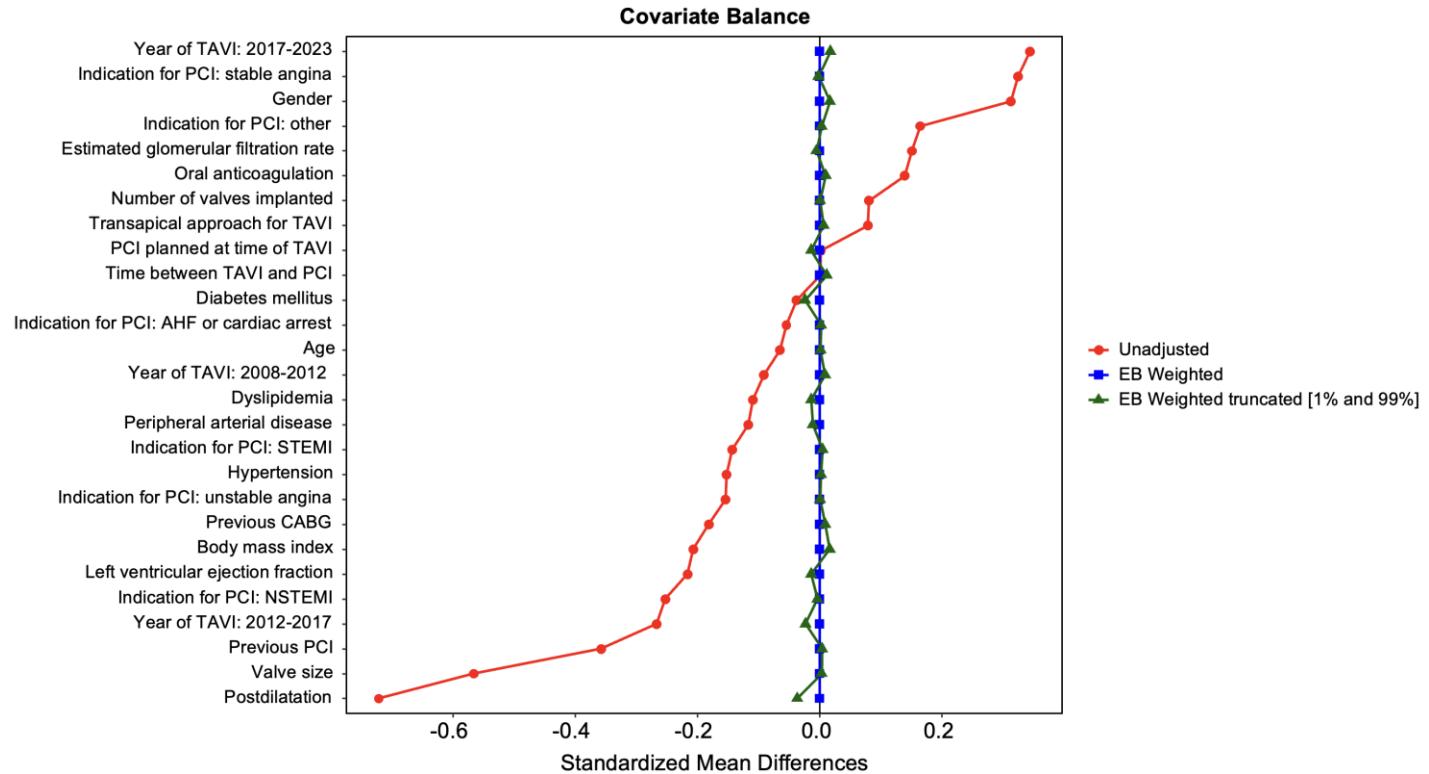
Primary Endpoint:

- 4-year **MACE** = CV death + MI + stroke.

Statistical analysis:

- Entropy balancing to achieve covariate balance.
- Weighted Cox regression (robust variance).
- Kaplan-Meier cumulative event rates.

Baseline Characteristics Before and After Weighting



Baseline Characteristics After Weighting

Patient Characteristics

Mean age: 81 years

Female sex: 38%

Diabetes mellitus: 37%

CKD: 42%

Atrial fibrillation: 28%

Prior PCI: 33%

EuroSCORE II: 5.2 ± 2.1 %

Clinical presentation: 35% ACS

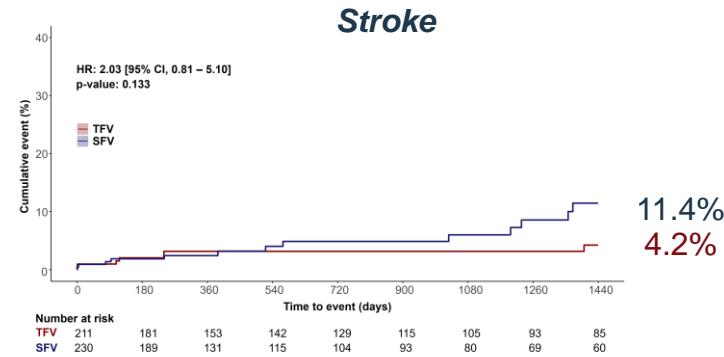
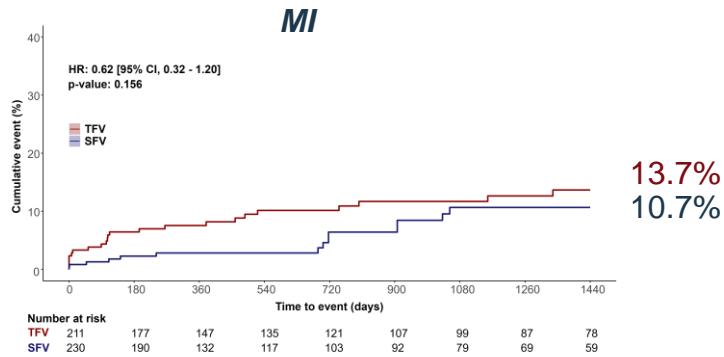
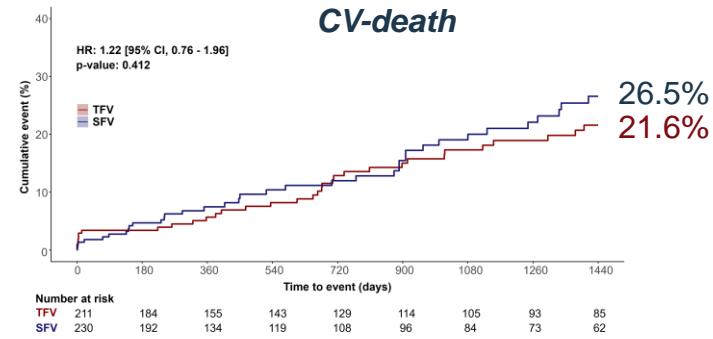
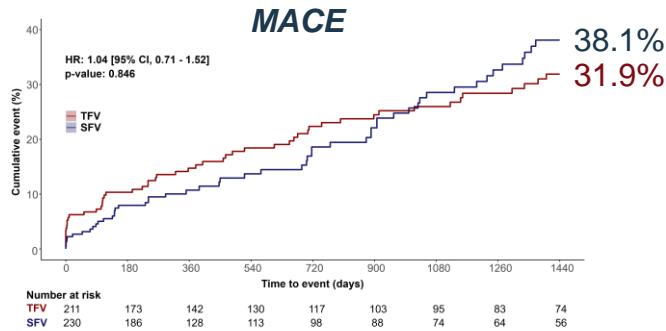
Procedural Details

PCI-to-TAVI interval: ≈4 months

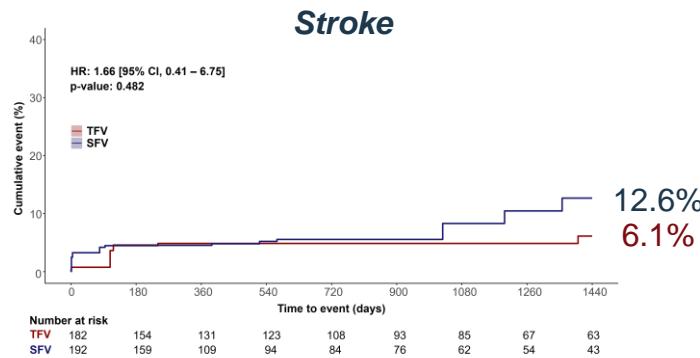
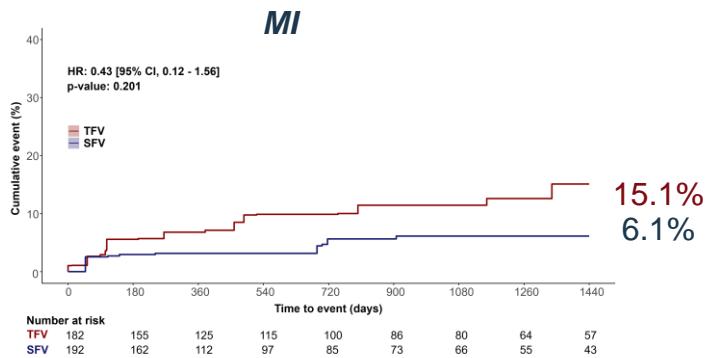
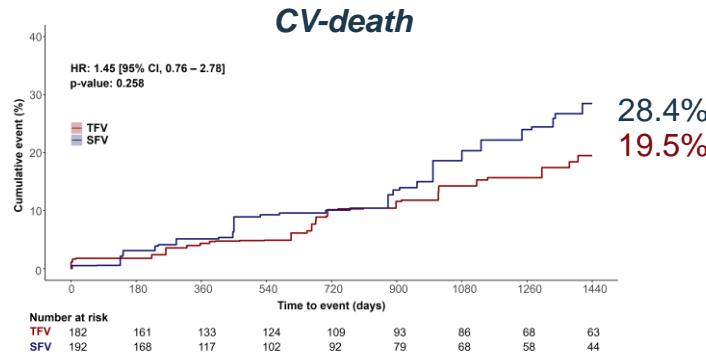
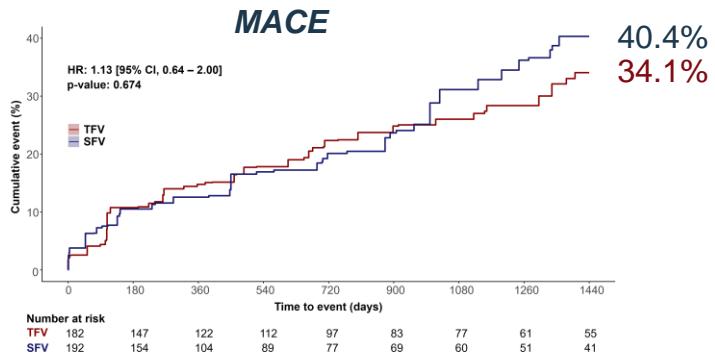
Drug-eluting stents: >90%

PCI success: SFV 98% vs TFV 95%

4-year Clinical Outcomes in the Crude Cohorts



4-year Clinical Outcomes in the Weighted Cohorts



Sensitivity Analyses

- **Consistent findings across:**
 - Country-level adjustment
 - Competing risk models
 - One-year analyses
 - PCI-procedural adjustment (Model 2)
 - Subgroups of interest
 - Median age
 - Sex
 - Clinical presentation

Key Findings

- **Feasibility:** PCI achievable in both SFV and TFV recipients.
- **Outcomes:** No difference in 4-year MACE.
- **Procedural complexity:** Greater in TFV, but no adverse impact on long-term results.

*Tall-frame design may hinder coronary access but does **not** worsen outcomes.*

Limitations

- Observational, retrospective design.
- Potential residual confounding.
- Limited sample size → low power for secondary endpoints.
- Long study period → evolving valve generations and techniques.

Take-home Message

- Valve frame height alone should not dictate valve choice in patients with coronary disease.
- Attention should instead focus on coronary access strategies.
- Future research will determine if newer valves and coronary access strategies will improve patients' outcomes.

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ORIGINAL RESEARCH

Impact of Valve Frame Height on PCI Outcomes After TAVR

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ABSTRACT

BACKGROUND Coronary access after transcatheter aortic valve replacement (TAVR) remains challenging, particularly with tall-framed valves (TFVs), raising concerns about long-term percutaneous coronary intervention (PCI).

OBJECTIVES The aim of this study was to evaluate the impact of bioprosthetic aortic valve type on long-term clinical outcomes in patients undergoing PCI following TAVR.

METHODS Data were derived from the multicenter REVIVAL-PCI registry, which included patients from 21 European centers who underwent PCI after TAVR between 2008 and 2023. Patients were classified according to valve frame height: TFVs or short-framed valves (SFVs). The primary endpoint was the 4-year incidence of major adverse cardiovascular events, defined as the composite of cardiovascular death, myocardial infarction, or stroke. Cumulative event rates were estimated using Kaplan-Meier method, and weighted Cox regression models using an entropy balance approach were used to adjust for imbalances in clinical and procedural confounders.

RESULTS The analysis included 441 patients, with 230 having undergone TAVR with SFVs (30.9% women) and 211 with TFVs (44.1% women). The median follow-up after PCI was 908 days (Q1-Q3: 322-1,728 days). The 4-year incidence of major adverse cardiovascular events was comparable between the SFV and TFV groups (38.1% [95% CI: 24.6%-43.9%] vs 31.9% [95% CI: 24.8%-41.0%]; HR: 1.04; 95% CI: 0.71-1.52; $P = 0.846$). Similar findings were observed after adjustment for potential confounders.

CONCLUSIONS In current practice, long-term outcomes after PCI in TAVR patients do not appear to be significantly different between those receiving SFVs and TFVs. Future investigations with newer generation valves and refined implantation techniques are needed to clarify these associations and optimize management strategies. (JACC Cardiovasc Interv. 2025;■:■-■) © 2025 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).