

Temporal Trends in Isolated and Concomitant Aortic Valve Replacement in Patients Aged <65 Years in the United States

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Disclosure of Relevant Financial Relationships

Within the prior 24 months, I have had a financial relationship with a company producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients:

Nature of Financial Relationship

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- Individual Stock(s)/Stock Options
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- Other Financial Benefit

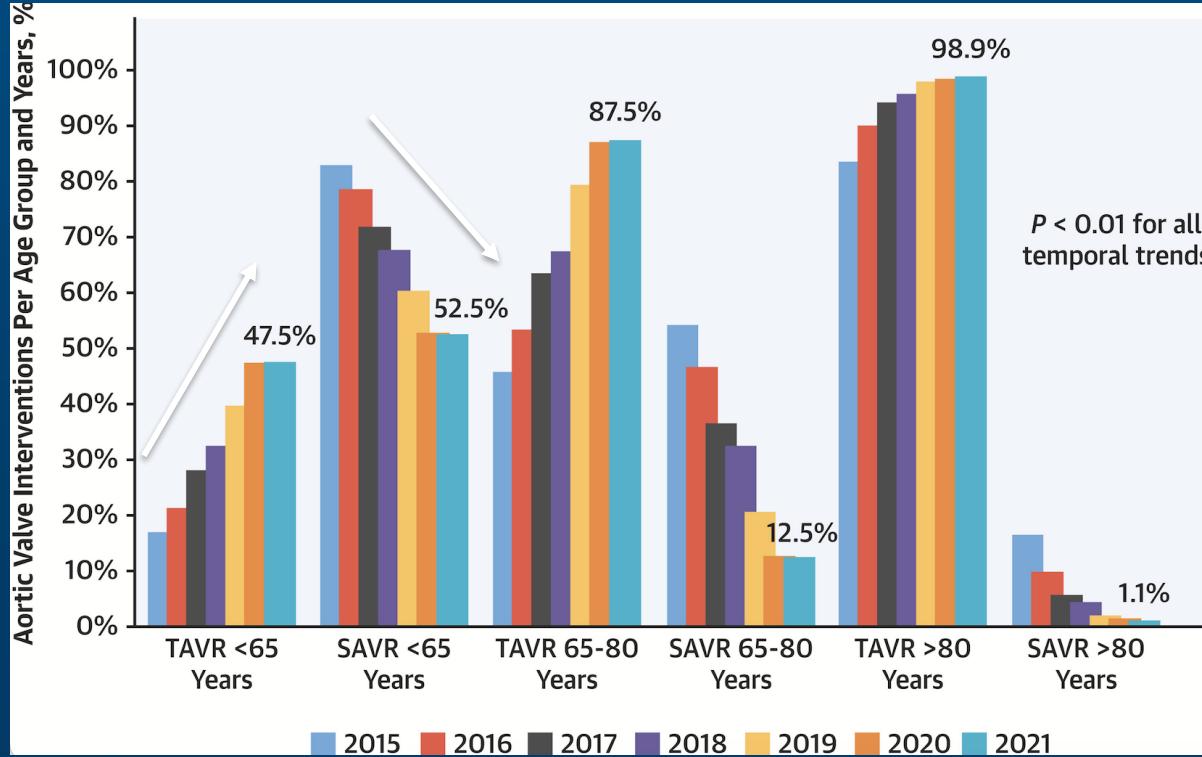
Ineligible Company

- Edwards Lifesciences (institutional)
- Medtronic
- Anteris Technologies
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Background

- Transcatheter aortic valve replacement (TAVR) and surgical aortic valve replacement (SAVR) have not been systemically studied head-to-head in patients aged <65 years. Less than 10% of the patients in PARTNER-3 and Evolut low-risk trials were younger than 65 years.^{1,2}
- Current ACC/AHA guidelines recommend surgical aortic valve replacement (SAVR) as the preferred treatment option for severe AS in patients younger than 65 years who are NOT high-risk for surgery.³
- Registry data demonstrate increasing utilization of TAVR for severe AS in <65-year-old patients with near equalization of TAVR and isolated SAVR utilization.⁴⁻⁷

Temporal Trends in TAVR and Isolated SAVR (Vizient Clinical Data Base)



Exclusions

- Concomitant surgery (CABG, mitral/tricuspid, thoracic aorta)
- AR as indication for AVR

Background

- Prior temporal trend studies on TAVR vs. SAVR utilization in <65-year-old patients have excluded SAVR patients who received mechanical valves or concomitant procedures (CABG, ascending aorta surgery, mitral/tricuspid valve surgery), thereby excluding approximately three-fourth of all SAVRs.
- Therefore, prior data give an inflated perception of equalization in TAVR and SAVR utilization in <65-year-old patients.
- It is important to study TAVR use relative to the entire spectrum of AVR procedures.

Methods

- Data were obtained from the nationally representative Vizient Clinical Database (CDB) from 2016 to 2024.
- Patients younger than 65 years who underwent TAVR, SAVR, or Ross Procedure for AS at 190 hospitals were included.
- Exclusions included prior AVR, pure aortic regurgitation, and infective endocarditis.
- SAVR patients were categorized by valve type (mechanical or bioprosthetic) and into isolated or concomitant SAVR (defined as SAVR with combined CABG, ascending aorta surgery, mitral/tricuspid surgery, and/or surgical maze procedure).

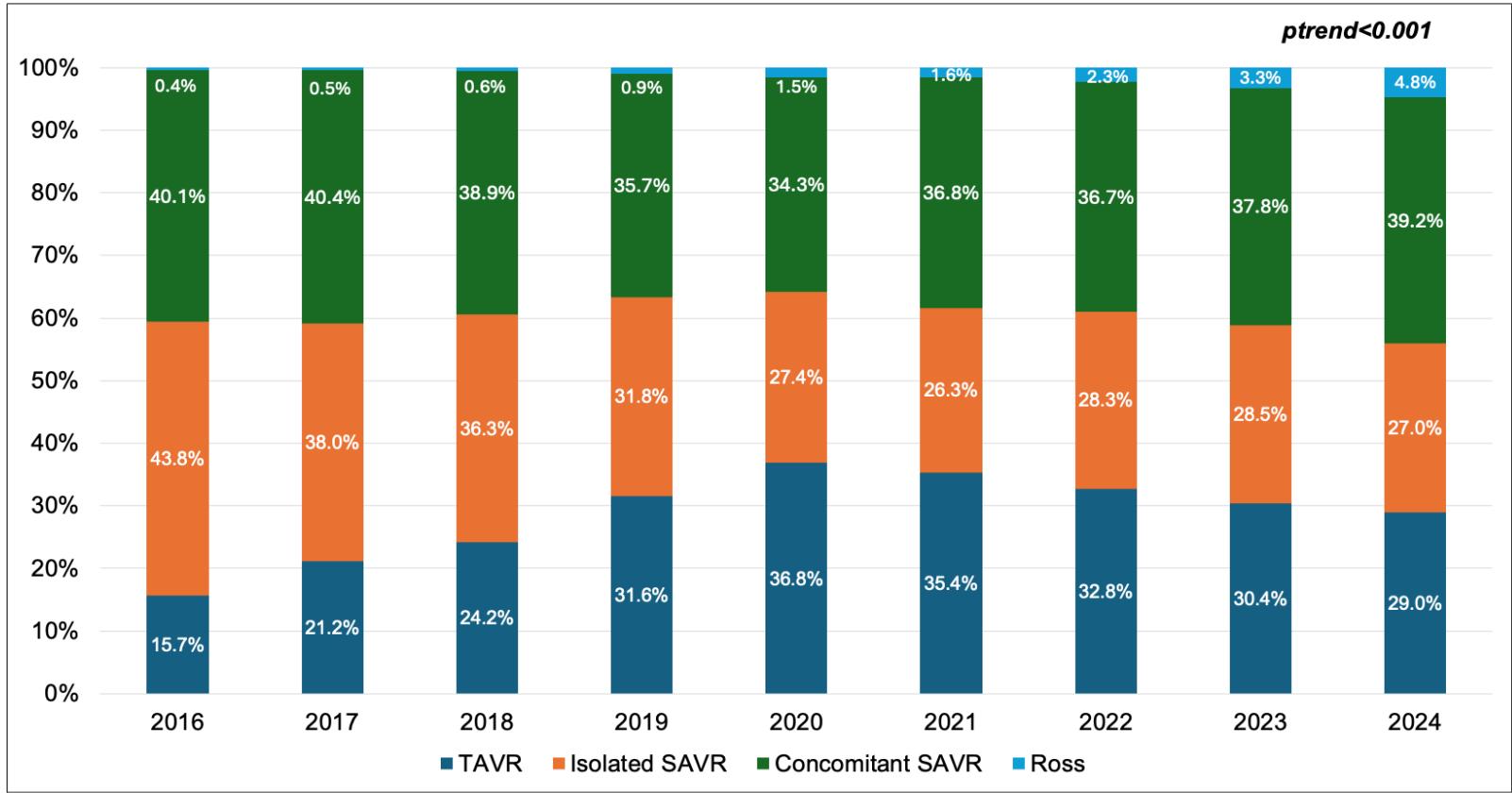
Methods

- The primary outcome was to study temporal trends in utilization of TAVR, isolated SAVR, concomitant SAVR, and Ross Procedure for severe AS in patients <65 years of age.
- Secondary objective was to compare demographics and baseline comorbidities between patients who received TAVR or surgery.

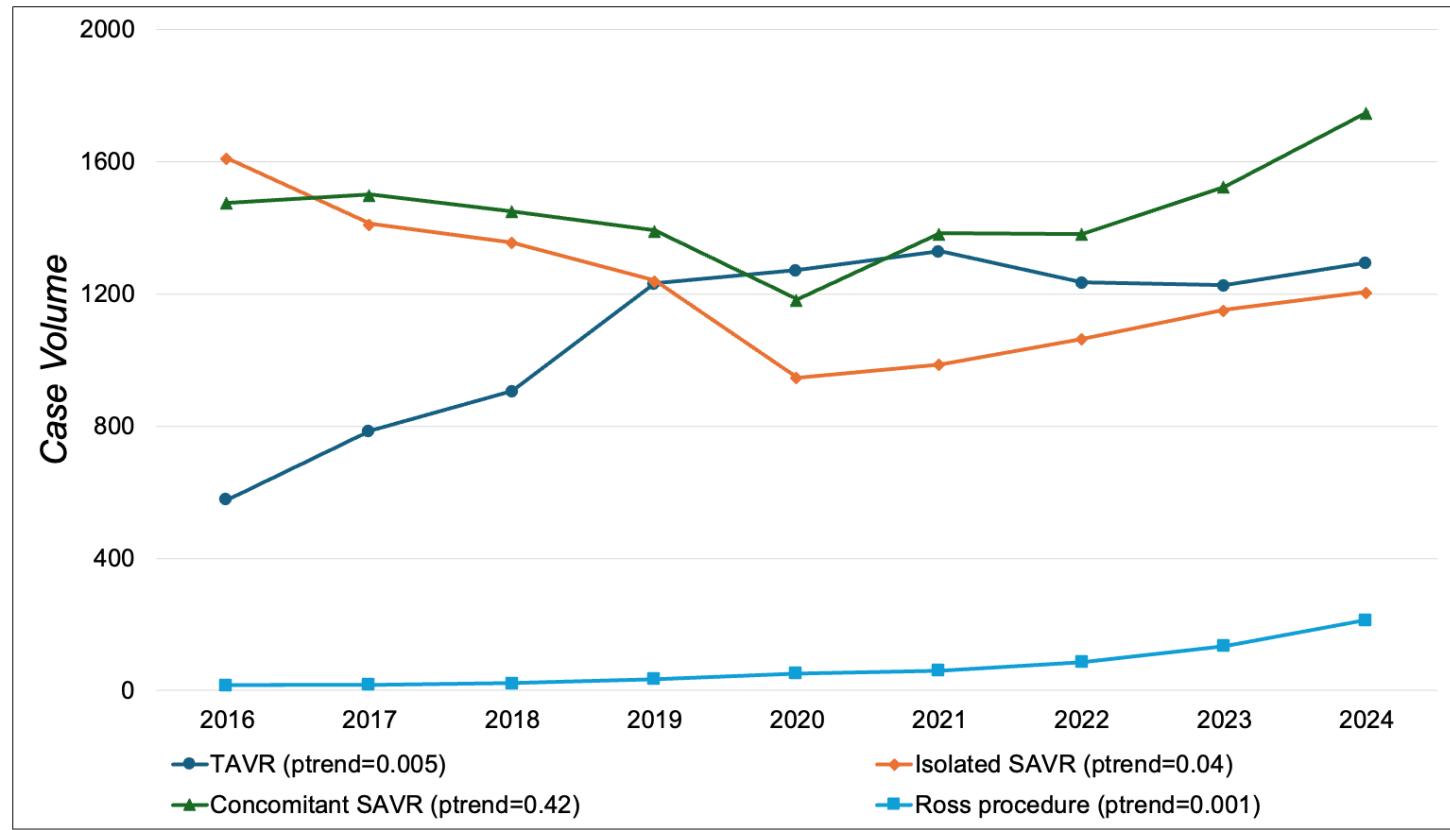
Results

	TAVR (n=9,834)	Isolated SAVR (n=10,982)	Concomitant SAVR (n=13,053)	Ross Procedure (n=635)	p value
Age, median (IQR)	61.3 (57.6-63.4)	58.8 (53.1-62.2)	59.1 (53.5-62.4)	40.3 (28.9-50.7)	<0.001
Women, n (%)	3,596 (36.6%)	3,576 (32.6%)	3,730 (28.6%)	244 (38.4%)	<0.001
Comorbidities, n (%)					
Prior PCI	1,943 (19.8%)	685 (6.2%)	1,250 (9.6%)	8 (1.3%)	<0.001
Prior CABG	1,156 (11.8%)	283 (2.6%)	344 (2.6%)	<5 (<1.0%)	<0.001
Prior MI	1,355 (13.8%)	642 (5.9%)	1,231 (9.4%)	11 (1.7%)	<0.001
Heart failure	6,924 (70.4%)	3,787 (34.5%)	5,293 (40.6%)	169 (26.6%)	<0.001
Cirrhosis	904 (9.2%)	176 (1.6%)	303 (2.3%)	6 (0.9%)	<0.001
COPD	2,209 (22.5%)	1,221 (11.1%)	1,607 (12.3%)	<5 (<1.0%)	<0.001
Chronic dialysis	1,297 (13.2%)	284 (2.6%)	531 (4.1%)	<5 (<1.0%)	<0.001
Home oxygen	669 (6.8%)	119 (1.1%)	167 (1.3%)	<5 (<1.0%)	<0.001
Prior stroke	1,250 (12.7%)	789 (7.2%)	1,169 (9.0%)	21 (3.3%)	<0.001
Elixhauser comorbidities, median (IQR)	6 (4-7)	4 (3-6)	5 (4-7)	3 (2-5)	<0.001

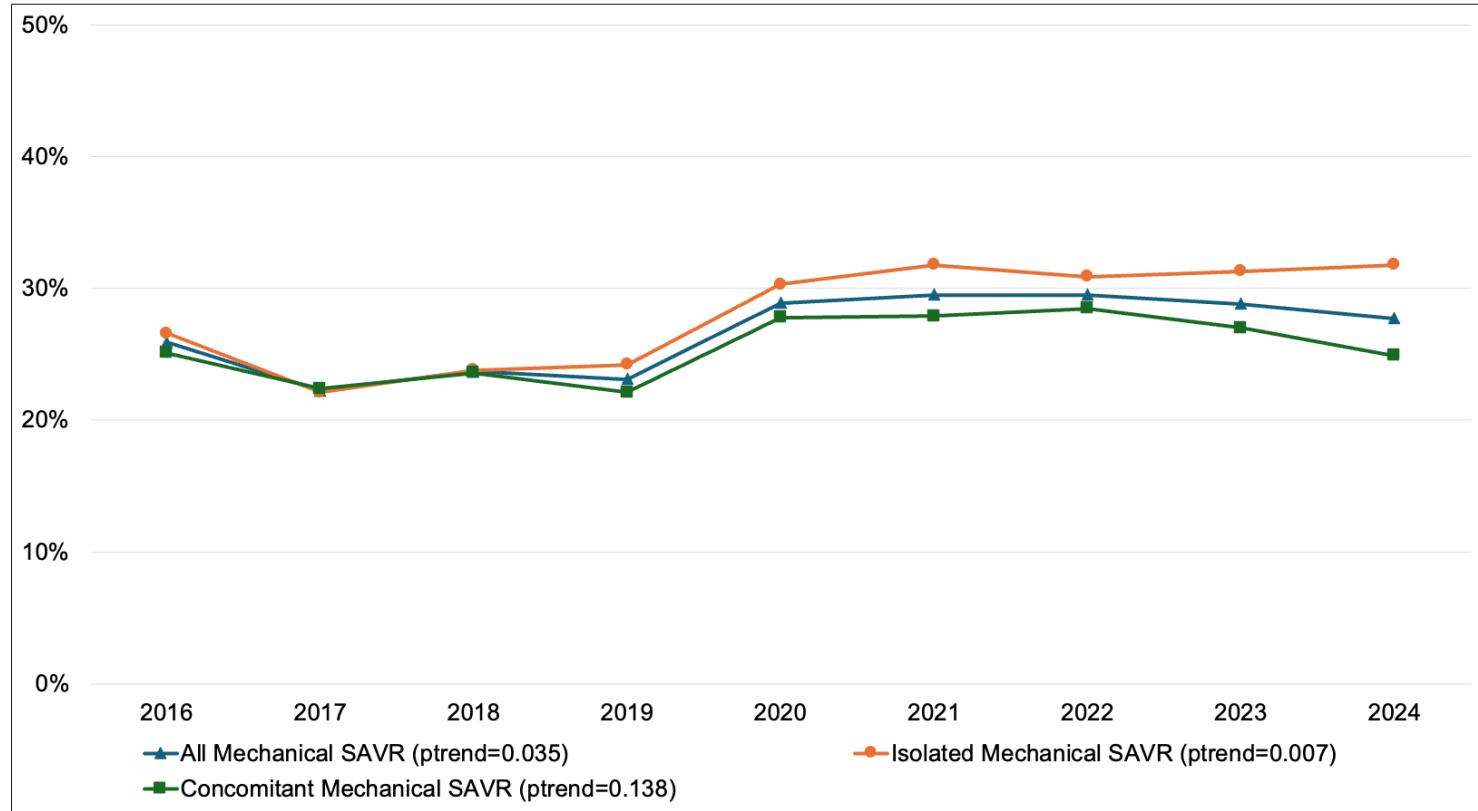
Trends in Relative Utilization of AVR in Patients <65 Years



Trends in Case Volumes of AVR in Patients <65 Years



Trends in Mechanical Valve Use in SAVR Patients <65 Years



Conclusions

- There has been growth in utilization of TAVR in younger patients with TAVR volumes exceeding isolated SAVR from 2020 onwards.
- TAVR represents approximately one-third of all AVR procedures in <65-year-old age group when including those receiving concomitant SAVR or Ross procedure.
- Patients younger than 65 years who receive TAVR have a substantially higher comorbidity burden compared with similar aged patients receiving SAVR or Ross procedure... not low-risk patients.

Conclusions (contd.)

- Ross procedure utilization increased substantially and comprised 4.8% of all AVR procedures in the <65-year age group in 2024.
- Mechanical valves were used in approximately 25% of SAVR patients less than 65 years old with minimal increase over the study period.
- Concomitant SAVR was the most frequent aortic valve intervention in patients younger than 65 years being performed in approximately 40% of the overall AVR cohort with no significant change over time.
- These data demonstrate that in the context of all AVR procedures, TAVR is used in minority of patients in the <65-year-old age group with preferential utilization in patients with higher disease burden.