EUROVALVE

VAN DER VALK SELYS HOTEL LIÈGE

SAVE THE DATE

SEPTEMBER 25&26 2025

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Bioprosthetic vs. mechanical valves: long-term considerations

Marco Moscarelli MD, PhD
GVM Care&Research

Bioprosthetic vs. mechanical valves: long-term considerations

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NO DISCLOSURE

The NEW ENGLAND JOURNAL of MEDICINE

CORRESPONDENCE

Transcatheter Aortic-Valve Replacement — 10 Years Later

All bioprosthetic heart valves will fail,

Press Release

Almost 50% of Patients Under 60 Years Choose TAVR Over SAVR with Worse Outcomes

All Members

TAVI, SAVR Almost Equally Performed in California Patients Under 60

The analysis, for 2013–2021, found a higher death risk at 5 years with TAVI, but some urged caution in interpreting that finding.

by Yael L. Maxwell | FEBRUARY 01, 2024

All roads lead to mechanical aortic valve replacement…

European Journal of Cardio-Thoracic Surgery 2025, 67(7), ezaf200
https://doi.org/10.1093/ejcts/ezaf200 Advance Access publication 17 June 2025

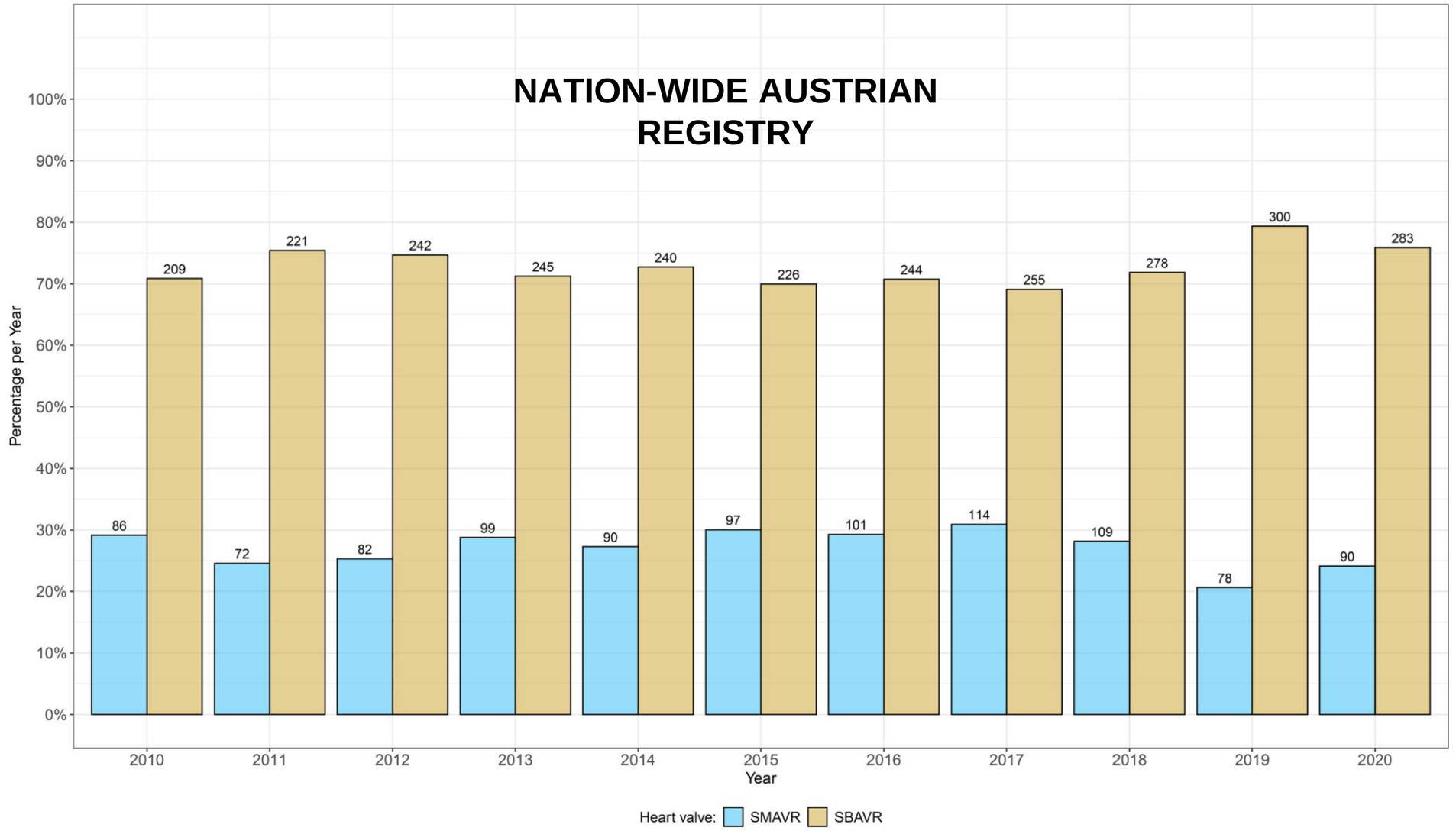
ORIGINAL ARTICLE

Cite this article as: Florian A, Auer J, Reichardt B, Krotka P, Wagenlechner C, Wendt R *et al*. The choice of surgical aortic valve replacement type and mid-term outcomes in 50 to 65-year-olds: results of the AUTHEARTVISIT study. Eur J Cardiothorac Surg 2025; doi:10.1093/ejcts/ezaf200.

CONVENTIONAL VALVE OPERATIONS

The choice of surgical aortic valve replacement type and mid-term outcomes in 50 to 65-year-olds: results of the AUTHEARTVISIT study

Alissa Florian [a], Johann Auer [b], Berthold Reichardt [c], Pavla Krotka [d], Christine Wagenlechner [d], Ralph Wendt [e], Michael Mildner [f], Julia Mascherbauer [g,h], Hendrik Jan Ankersmit [i,j,†,*], Daniel Zimpfer [a,†,*] and Alexandra Graf [d,†]


NATION-WIDE AUSTRIAN REGISTRY
Percentage per Year
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
86
209
72
221
82
242
99
245
90
240
97
226
101
244
114
255
109
278
78
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2020
Year
Heart valve: SMAVR SBAVR

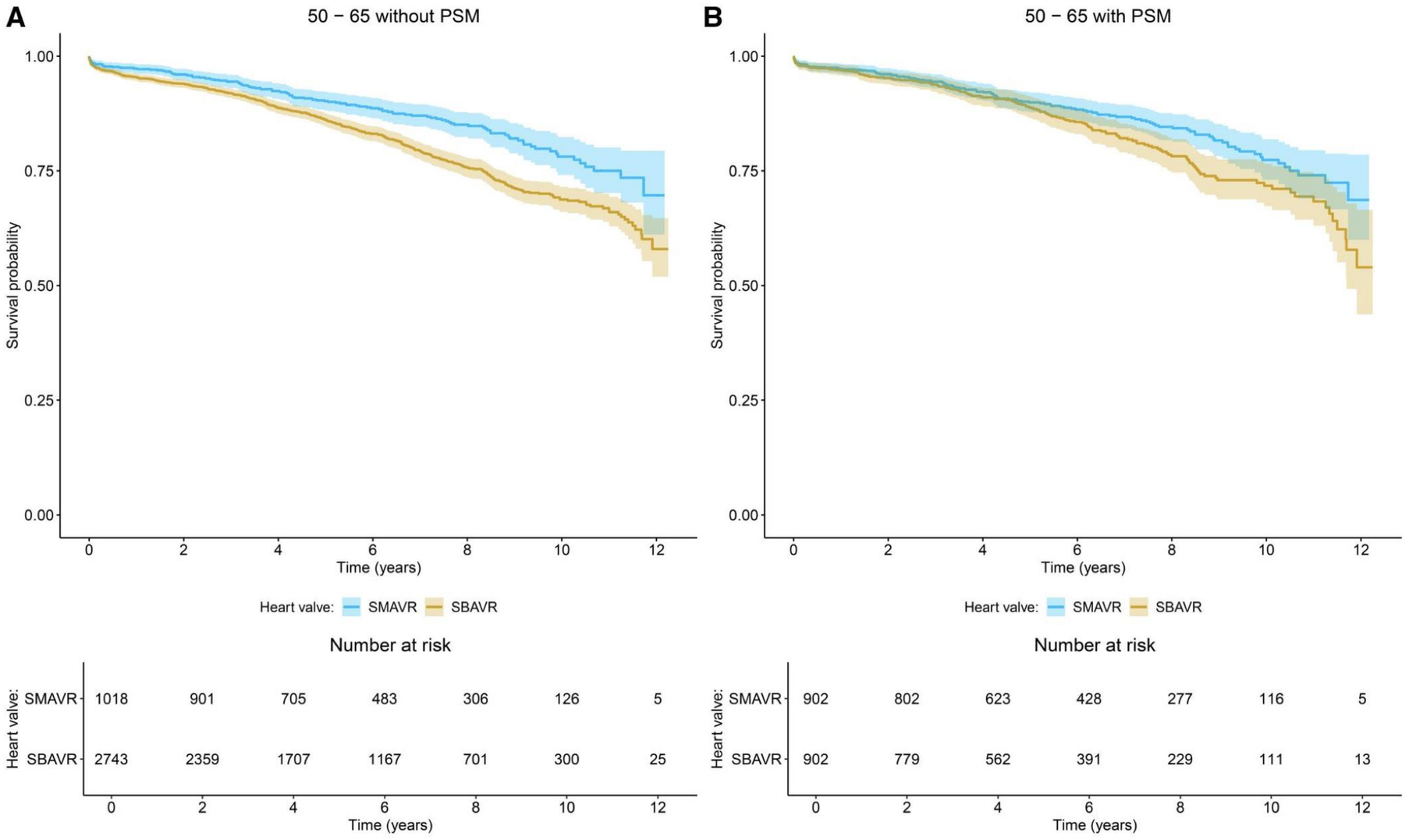


Figure 2: Kaplan–Meier curves and 95% confidence intervals for all-cause death before (**A**) and after (**B**) PSM. PSM: propensity score matching.

Contemporary real-world analysis of >100,000

JACC VOL. 85, NO. 12, 2025

ORIGINAL RESEARCH

Bioprosthetic vs Mechanical Aortic Valve Replacement in Patients 40 to 75 Years of Age

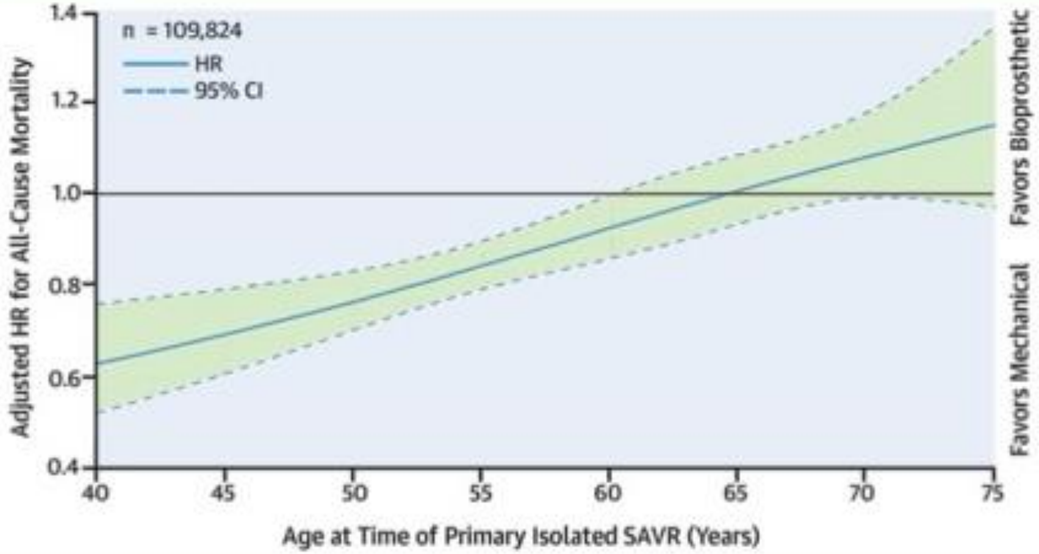
Michael E. Bowdish, MD, MS,[a] J. Hunter Mehaffey, MD, MSc,[b] Shu-Ching Chang, PhD,[c] Patrick T. O'Gara, MD,[d] Michael J. Mack, MD,[e] Andrew B. Goldstone, MD, PhD,[f] Joanna Chikwe, MD,[a] A. Marc Gillinov, MD,[g] Changfu Wu, PhD,[h] Gregory P. Fontana, MD, PhD,[i] Joseph E. Bavaria, MD,[j] Chris S. Malaisrie, MD,[k] Tsuyoshi Kaneko, MD,[l] Ibrahim S. Sultan, MD,[m] Moritz C. Wyler von Ballmoos, MD, PhD,[n] Kathrine B. Harrington, MD,[e] Jeffrey P. Jacobs, MD,[o] Vinod H. Thourani, MD,[p] Wilson Y. Szeto, MD,[q] Joseph F. Sabik, MD,[r] Robert H. Habib, PhD,[c] Vinay Badhwar, MD[b]

Age-Dependent Mortality Risk: Bioprosthetic vs Mechanical Valves in Patients Undergoing Isolated SAVR

Bioprosthetic

Mechanical

Adjusted for all STS ACSD predicted risk of operative mortality (PROM) model covariates using all cases with a continuous age variable and prosthesis type interaction term



- 109,842 patients
  91,125 bioprosthetic AVR
  15,717 mechanical AVR
- **Longitudinal all-cause mortality favors mechanical valves in patients ≤60 years of age**
- STS Adult Cardiac Surgery Database linked to United States National Death Index

Bowdish ME, et al. JACC. 2025;85(12):1289-1298.

European Journal of Cardio-Thoracic Surgery 2025, 67(2), ezaf033
https://doi.org/10.1093/ejcts/ezaf033 Advance Access publication 1 February 2025

ORIGINAL ARTICLE

Cite this article as: Chan J, Narayan P, Fudulu DP, Dong T, Vohra HA, Angelini GD. Long-term clinical outcomes in patients between the age of 50–70 years receiving biological versus mechanical aortic valve prostheses. Eur J Cardiothorac Surg 2025; doi:10.1093/ejcts/ezaf033.

CONVENTIONAL VALVE OPERATIONS

Long-term clinical outcomes in patients between the age of 50–70 years receiving biological versus mechanical aortic valve prostheses†

Jeremy Chan [a,†], Pradeep Narayan [b], Daniel P. Fudulu [a], Tim Dong [a], Hunaid A. Vohra [a] and Gianni D. Angelini [a,*]

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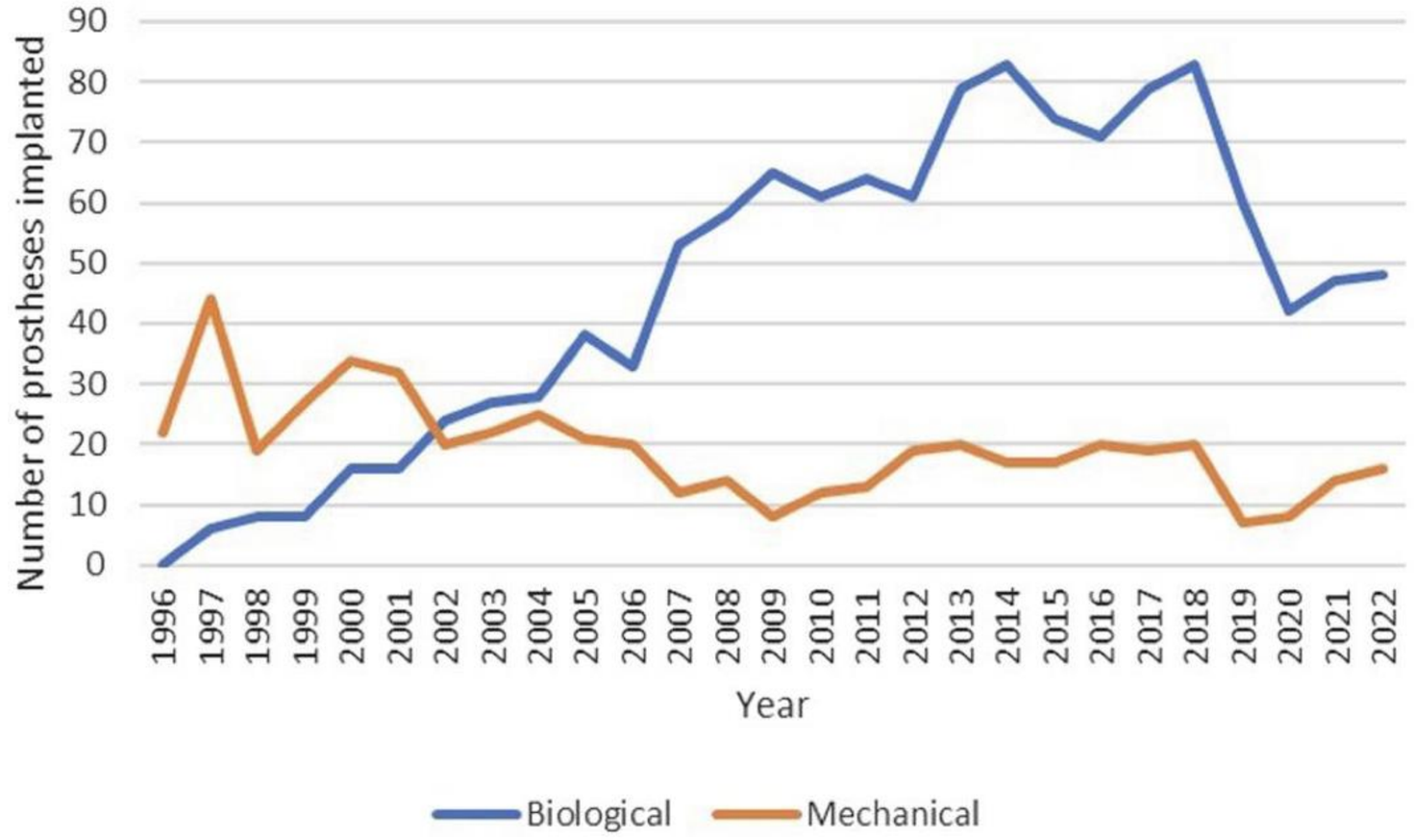
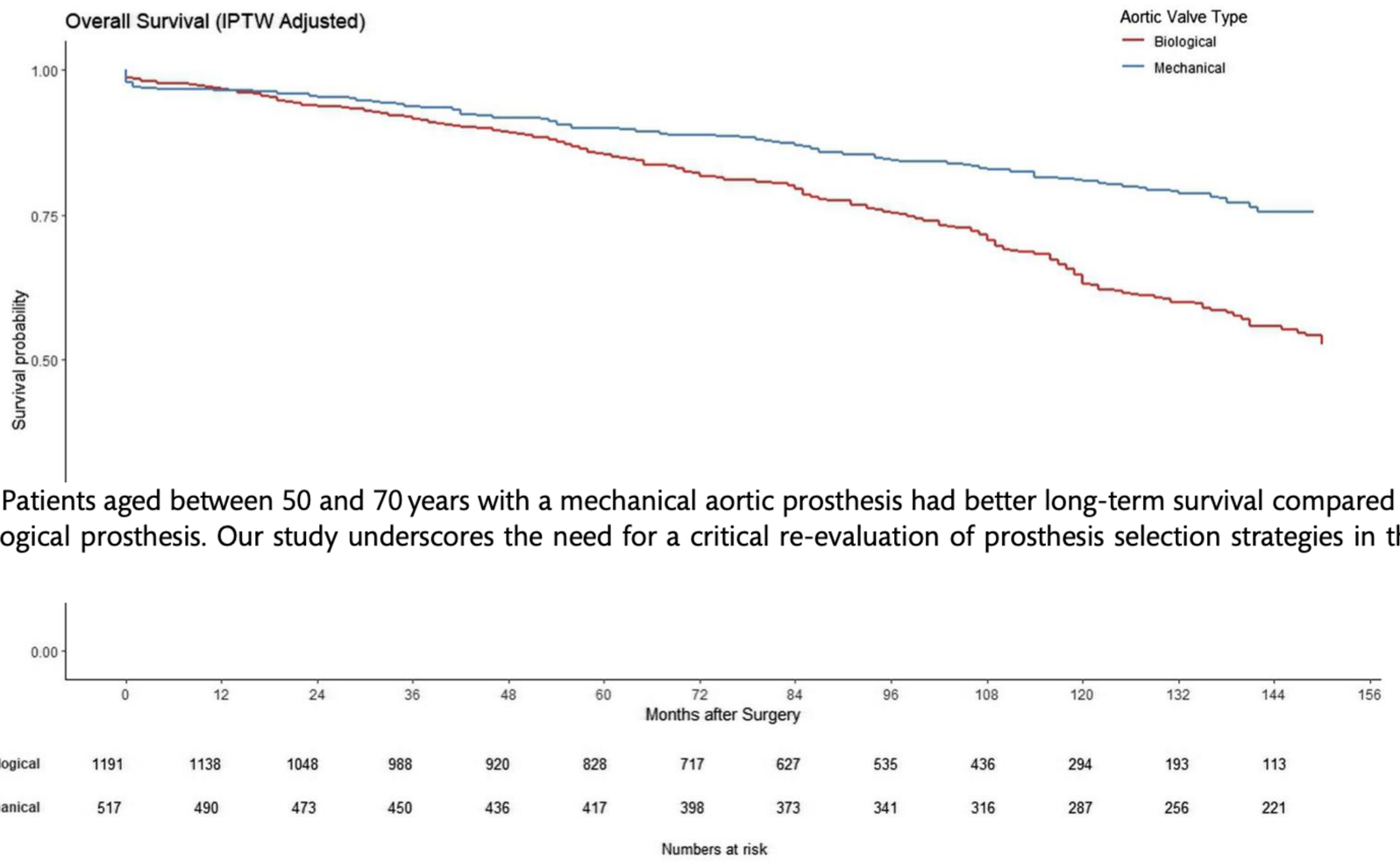


Figure 1: The trend in the number of biological and mechanical aortic valve prosthesis used from 1996 to 2022.



CONCLUSIONS: Patients aged between 50 and 70 years with a mechanical aortic prosthesis had better long-term survival compared to those with a biological prosthesis. Our study underscores the need for a critical re-evaluation of prosthesis selection strategies in this age group.

Figure 3: The long-term survival in patient's age between 50 and 70 years receiving biological or mechanical aortic valve prostheses in the propensity score matching cohort (0: biological, 1: mechanical). IPTW: inverse probability of treatment weighting.

Mechanical or biological prosthesis for aortic valve replacement in patients aged 45 to 74 years

Daokun Sun, MD, MPH,[a] Hartzell V. Schaff, MD,[a] Kevin L. Greason, MD,[a] Ying Huang, MD, PhD,[a] Gabor Bagameri, MD,[a] Alberto Pochettino, MD,[a] Patrick A. DeValeria, MD,[b] Joseph A. Dearani, MD,[a] Richard C. Daly, MD,[a] Kevin P. Landolfo, MD, MSc,[c] Robert J. Wiechmann, MD,[d] Sorin V. Pislaru, MD, PhD,[e] and Juan A. Crestanello, MD[a]

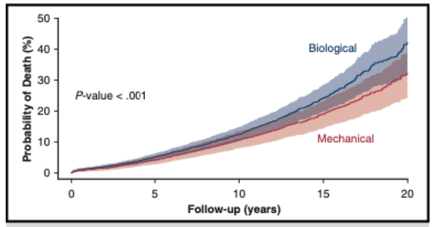
ABSTRACT

Objective: The selection of valve prostheses for patients undergoing surgical aortic valve replacement remains controversial. In this study, we compared the long-term outcomes of patients undergoing aortic valve replacement with biological or mechanical aortic valve prostheses.

Methods: We evaluated late results among 5762 patients aged 45 to 74 years who underwent biological or mechanical aortic valve replacement with or without concomitant coronary artery bypass from 1989 to 2019 at 4 medical centers. The Cox proportional hazards model was used to compare late survival; the age-dependent effect of prosthesis type on long-term survival was evaluated by an interaction term between age and prosthesis type. Incidences of stroke, major bleeding, and reoperation on the aortic valve after the index procedure were compared between prosthesis groups.

Results: Overall, 61% (n = 3508) of patients received a bioprosthesis. The 30-day mortality rate was 1.7% (n = 58) in the bioprosthesis group and 1.5% (n = 34) in the mechanical group ($P = .75$). During a mean follow-up of 9.0 years, the adjusted risk of mortality was higher in the bioprosthesis group (hazard ratio, 1.30, $P < .001$). The long-term survival benefit associated with mechanical prosthesis persisted until 70 years of age. Bioprosthesis (vs mechanical prosthesis) was associated with a similar risk of stroke ($P = .20$), lower risk of major bleeding ($P < .001$), and higher risk of reoperation ($P < .001$).

Conclusions: Compared with bioprostheses, mechanical aortic valves are associated with a lower adjusted risk of long-term mortality in patients aged 70 years or less. Patients aged less than 70 years undergoing surgical aortic valve replacement should be informed of the potential survival benefit of mechanical valve substitutes. (J Thorac Cardiovasc Surg 2025;169:1234-41)



Overall adjusted probability (95% CI) of death curve.

CENTRAL MESSAGE

Undergoing aortic valve replacement with mechanical prostheses (vs bioprostheses) is associated with a lower adjusted risk of long-term mortality in patients aged 70 years or less.

PERSPECTIVE

Among patients undergoing aortic valve replacement, receiving mechanical prostheses (vs bioprostheses) is associated with a lower adjusted risk of long-term mortality in patients aged 70 years or less. Patients aged less than 70 years should be informed of the potential survival benefit of mechanical valve substitutes.

ADULT

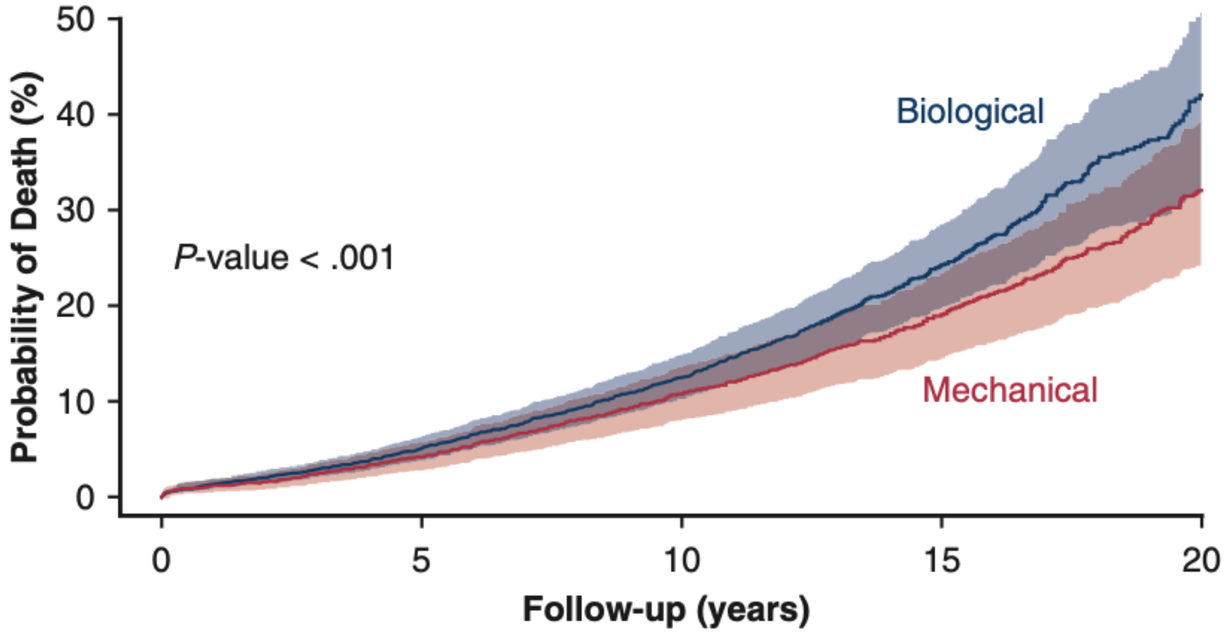
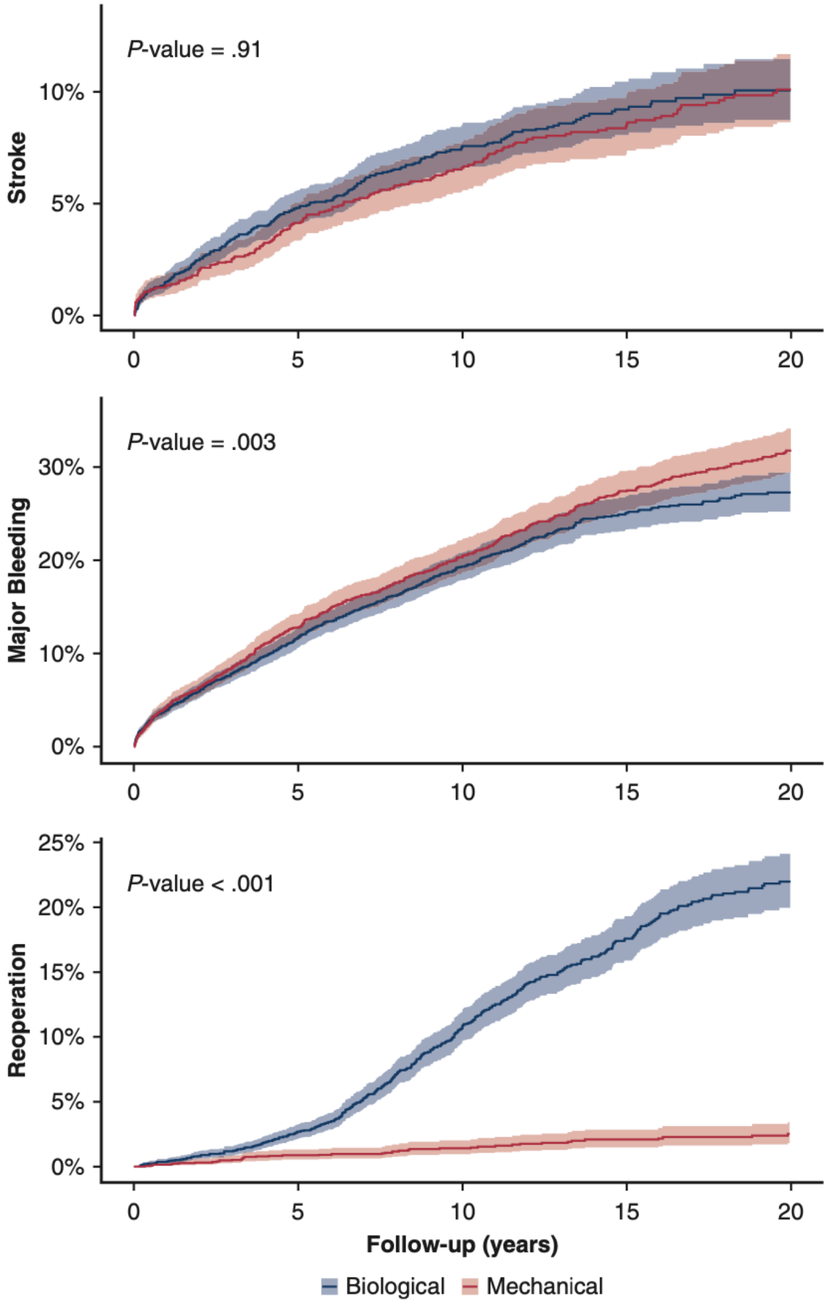


FIGURE 1. Overall adjusted probability (95% CI) of death curve. The adjusted survival curves were depicted from a stratified Cox model adjusting to the median levels or modal categories of age, sex, year of surgery, clinical site, hypertension, diabetes, body mass index, atrial fibrillation, chronic kidney disease, heart failure, peripheral vascular disease, history of stroke, coronary artery disease, myocardial infarction, history of CABG, and concomitant CABG. *CABG*, Coronary artery bypass grafting.



10 times higher in the BIO !!

Abbott Trifecta valves (Trifecta & Trifecta GT)
In **July 2023**, Abbott announced a *U.S. market withdrawal* of the Trifecta family of surgical aortic bioprosthetic valves, due to a *potential risk of early structural valve deterioration (SVD)*.
Unused inventory is being removed from distribution

Abbott

UPDATE TO IMPORTANT INFORMATION REGARDING SVD IN TRIFECTA FAMILY OF VALVES
Trifecta™ Valve and Trifecta™ Valve with Glide Technology
Model: TF-19A, TF-21A, TF-23A, TF-25A, TF-27A, TF-29A, TFGT-19A, TFGT-21A, TFGT-23A, TFGT-25A, TFGT-27A, and TFGT-29A

Abbott decided to discontinue its Trifecta family of valves to focus on tissue heart valve solutions that maximize possibilities for lifetime management of valvular heart disease. Abbott is initiating inventory-related activities world-wide in accordance with respective regulatory frameworks.

EDITORIAL COMMENTARY

The Mitroflow aortic valve: A past, present, and future illuminated

Leora B. Balsam, MD,[a] and Abe DeAnda, Jr, MD[b]

Recommendation Table 13 — Recommendations for prosthetic valve selection

Recommendations	Class[a]	Level[b]
Mechanical heart valve		
An MHV is recommended according to the desire of the informed patient and if there is no contraindication to long-term anticoagulation.	I	C
An MHV should be considered in patients with an estimated long life expectancy,[c] if there are no contraindications for long-term OAC.[801,807–811]	IIa	B
An MHV should be considered in patients aged <60 years for prostheses in the aortic position and aged <65 years for prostheses in the mitral position.[801,807–811]	IIa	C
An MHV should be considered in patients with a pre-existing MHV in another position.	IIa	C
An MHV may be considered in patients with a clear indication for long-term OAC.	IIb	C
Biological heart valve		
A BHV is recommended according to the desire of the informed patient.	I	C
A BHV is recommended when an adequate quality of anticoagulation with VKA is unlikely, in patients at high bleeding risk, or with estimated short life expectancy.[c]	I	C
A BHV should be considered in patients aged >65 years for prostheses in the aortic position or aged >70 years for prostheses in the mitral position.	IIa	C
A BHV should be considered in women contemplating pregnancy.	IIa	C

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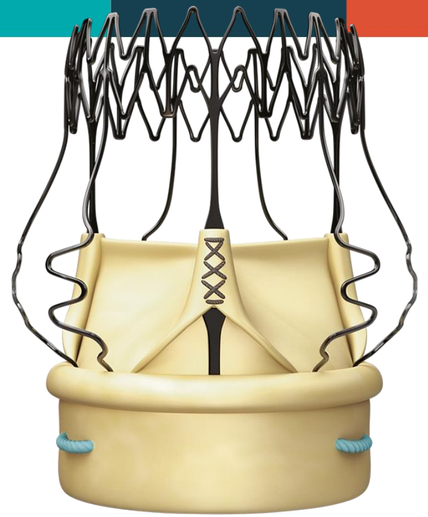
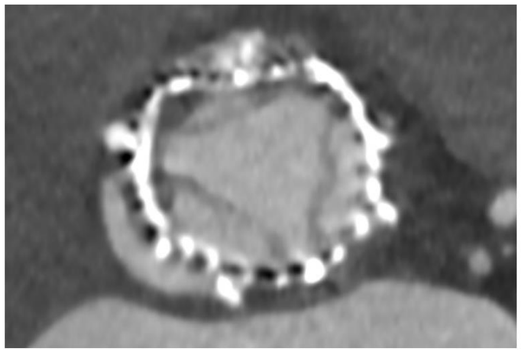
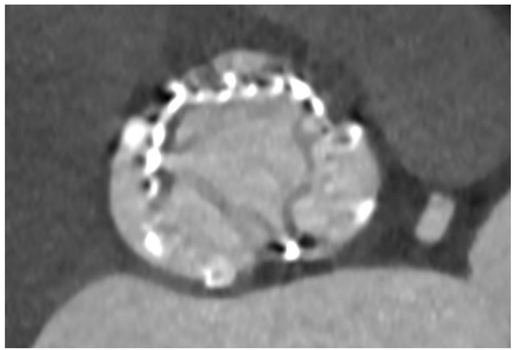
Early MDCT assessment ?

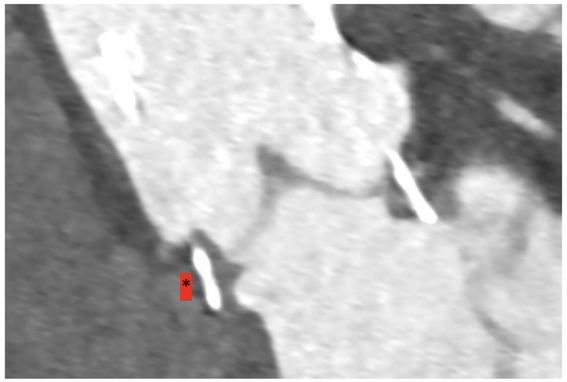


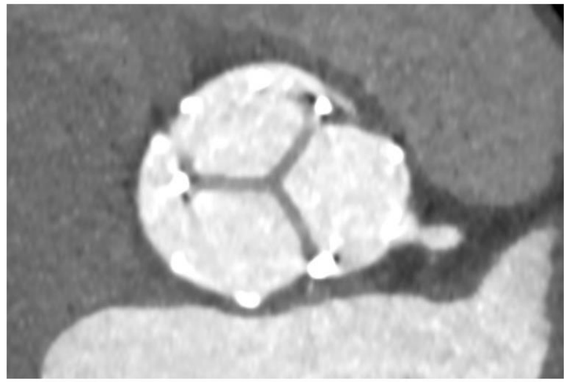
Diastolic

Sistolic









Conclusions:

- Trial TAVI versus Mechanical Aortic Valve (??)
- Every bio prosthesis will fail, do consider mechanical in low risk for bleeding – young individual, even if no minimally invasive friendly
- Choose TAVI viv ready prosthesis
- Early detection and prevention may be the key for long term durability

Thank you

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