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Comparison of effectiveness and safety of TAVI and SAVR in treatment of severe, symptomatic aortic stenosis – a literature review

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ABSTRACT

Introduction

Aortic stenosis is the most common acquired, valvular heart disease among adults in developed countries. It causes exercise tolerance deterioration, left ventricle hypertrophy and leads to heart failure or even death. Available treatment methods for severe, symptomatic aortic stenosis include Transcatheter Aortic Valve Implantation and Surgical Aortic Valve Replacement (SAVR). While it has been proven that TAVI is superior to SAVR in patients with high surgical risk, there is still little data considering patients with lower risk profile.

Aim of study

The aim of this study is to assess the differences between TAVI procedure and the Surgical Aortic Valve Replacement in terms of their efficacy and safety in patients with severe aortic stenosis and low to intermediate surgical risk. This article is based on the analysis of randomised controlled trials published between years 2021 and 2026.

Conclusion

TAVI is a safe and effective alternative to SAVR in patients with severe, symptomatic aortic stenosis and low to intermediate surgical risk. It is associated with a lower incidence of major bleeding, stroke and myocardial infarction while presenting comparable or lower mortality in short to medium term. It is, however, correlated with more frequent vascular complications and pacemaker implantations. There is a need for further research on a larger group of patients, with a longer follow-up time in order to assess optimal guidelines for TAVI and SAVR in patients with this risk profile.

Keywords: Aortic valve stenosis, TAVI, SAVR.

INTRODUCTION

Aortic stenosis

Aortic stenosis is the most common acquired valvular heart disease in adults in developed countries [1]. It is most often caused by calcification of the valve leaflets, but may also be associated with bicuspid valve disease [2]. The incidence of aortic stenosis increases with age[4]. Aortic valve stenosis obstructs the outflow of blood from the left ventricle, which

disrupts the haemodynamics of the heart, leading to left ventricular hypertrophy, poorer exercise tolerance, and the development of heart failure [2]. Risk factors for the development of aortic stenosis include hypertension, smoking, and elevated low-density lipoprotein levels [2]. The classification of aortic stenosis severity is based on echocardiography, which assesses the blood flow velocity through the valve, the pressure gradient at the valve level and the valve cross-sectional area ([1];[2];[3]). In the case of mild and asymptomatic stenosis, lifestyle changes and reduction of risk factors may be sufficient treatment, but severe stenosis requires intervention on the valve ([1],[2];[3]). Currently, the most popular therapeutic options for patients with severe aortic stenosis include surgical aortic valve replacement (SAVR) and transcatheter aortic valve implantation(TAVI) ([1];[2];[3]).

SAVR

Surgical Aortic Valve Replacement (SAVR) is the traditional treatment method for severe aortic stenosis. It is well researched, and for decades it has been the gold standard for patients with aortic stenosis [7]. The procedure is conducted under general anaesthesia, typically through a median sternotomy, though less invasive approaches like a mini-sternotomy, right anterior thoracotomy or endoscopic approach are also used [6]. Cardiopulmonary bypass is used during the surgery to maintain systemic circulation and oxygenation. During SAVR, two types of prosthetic valves are used – mechanical valves and bioprosthetic valves. Mechanical valves are more durable than bioprosthetic valves, they can function well for decades, but require life-long anticoagulation therapy. Bioprosthetic valves, on the other hand, usually composed of porcine or bovine pericardium, deteriorate faster, but do not require anticoagulation therapy [8]. Type of valve used is determined by patient's age, comorbidities and preference [8]. SAVR allows the operator to completely remove calcified leaflets of the aortic valve and implant the prosthetic valve under visual control, thus allowing for an overall better valve positioning. It can also be combined with other surgical procedures like coronary artery bypass grafting. On the other hand, the extensive character of the surgery puts patients at a higher risk of severe complications, such as life-threatening bleeding. It is also associated with a long hospitalization and recovery[9].

TAVI

Transcatheter Aortic Valve Implantation (TAVI) is a minimally invasive procedure used to treat aortic stenosis ([4];[5]). In the most common approach this procedure involves insertion of a

catheter through the femoral artery in order to reach the aortic valve, but other accesses, such as the transapical approach are also possible ([10], [11], [12]). The bioprosthetic valve is then implanted over native valve. Valves used in TAVI procedures can be balloon-expandable, self-expandable, or mechanically-expandable, depending on anatomical considerations and clinical scenarios([13], [14]). TAVI has several important advantages over surgical replacement of aortic valve. The biggest benefit of TAVI is it's minimally invasive character, it makes TAVI especially suitable for patients with high perioperative risk. TAVI is also associated with shorter hospitalization, lower incidence of life-threatening bleeding or acute kidney injury. However, TAVI is known to cause more vascular complications, and is associated with higher rates of pacemaker implantations[15].

METHODOLOGY

This article describes the current state of knowledge on treatment of severe aortic stenosis, with a focus on randomized clinical trials, comparing the effectiveness of transcatheter aortic valve implantation and surgical replacement of aortic valve, published between 2021 and 2026. The analysis was performed using the PubMed platform. The search terms were "TAVI vs SAVR"; "aortic stenosis"; "TAVI"; "SAVR".

REVIEW OF LITERATURE

In the last 5 years, seven randomized controlled clinical trials have been conducted regarding the comparison of TAVI and SAVR in patients with severe aortic stenosis.

Blankenberg et al. (2024) compared the effects of TAVI and SAVR on patients with severe, symptomatic aortic stenosis, who were at low or intermediate surgical risk, thus eligible for the surgical and percutaneous approach. 38 facilities were part of this research, and a total of 1414 patients took part in the trial. 701 patients were assigned to the TAVI group and 713 to the SAVR group. TAVI procedures were conducted mostly via transfemoral vascular access, but alternative access was allowed. Surgical aortic valve replacements were conducted through a sternotomy or with a minimally invasive approach. Type of valves used in this trial were chosen by a local heart team for each patient individually. In a 1-year follow-up, researchers have found that TAVI group represented a lower incidence of death or stroke than SAVR group (5,4% and 10,0% respectively). Also, incidence of death from any cause, new onset atrial fibrillation or

life-threatening bleeding was lower in the TAVI group. On the other hand, TAVI was followed by a higher frequency of pacemaker implantations (11,8% vs 6,7%) and prosthetic-valve dysfunction (1.6% for TAVI and 0.6% for SAVR group) [16].

In the NOTION trial, researchers have conducted a 10 year follow-up on a randomized group of 280 patients to assess the long-term outcomes of TAVI compared to SAVR. Patients suffered from symptomatic, severe aortic stenosis and were over 70 years old. All patients were eligible both for TAVI and SAVR. TAVI procedures were conducted using self-expanding first- or second-generation CoreValve bioprosthesis, using a transfemoral access. SAVR patients received porcine or bovine stented bioprosthesis. After 10 years, the researchers have found that there was no significant difference between the groups in all-cause mortality (TAVI 62.7%, SAVR 64%, HR 1.0; 95% CI 0.7-1.3, P = 0.8). Also there was no significant difference in frequency of stroke or myocardial infarction. In the TAVI group there was a higher incidence of permanent pacemaker implantation. In the SAVR group there was a higher rate of structural valve disfunction. Re-intervention rate difference between the groups did not display statistical significance [17].

The UK TAVI Trial Investigators (Toff et al. (2022)) compared the clinical results of TAVI and SAVR in patients aged over 70 years old with severe, symptomatic aortic stenosis and moderately increased operative risk. This trial was conducted within 34 UK centres. A total of 913 patients were enrolled to the randomization. TAVI procedures used any valve with a CE mark. Every technical aspect of the TAVI procedure was determined by the local clinical team. Aortic valve replacement surgeries were conducted using any commercially available valve except sutureless valves. Technical aspects of the surgery and anaesthesia were determined by the clinical team. At 1 year follow-up researchers have reported a lower all-cause mortality amongst TAVI patients (4.6%) as opposed to SAVR (6.6%). TAVI was also associated with lower incidence of major bleeding events and a shorter hospitalization period. On the other hand, TAVI group represented a higher rate of vascular complications, pacemaker implantations and mild to moderate aortic regurgitation. Researchers have reported that TAVI is noninferior to surgery in patients with symptomatic, severe aortic stenosis with a moderate operative risk[18] .

Tchetche et al. (2025), in the RHEIA trial, have compared the effects and safety of TAVI and SAVR in women with severe, symptomatic aortic stenosis. The patients were eligible for both types of treatment. RHEIA trial was conducted across 48 European centres, with a total of 443 women enrolled to the study. TAVI procedures were conducted using balloon-expandable

SAPIEN 3 and SAPIEN 3 ultra system, while surgeries used any commercially available bioprosthetic valves. At 1 years follow-up, the researchers reported lower rate of death from any cause, rate of stroke and rate of rehospitalization among TAVI group compared to SAVR. Also, TAVI was associated with a lower incidence of new-onset atrial fibrillation and a shorter hospitalization, but a higher rate of new pacemaker implantations [19].

Kehdi et al. (2024) have conducted a randomized controlled clinical trial to assess the non-inferiority of TAVI and fractional flow reserve (FFR)-guided percutaneous coronary intervention (PCI) compared to SAVR and coronary artery bypass grafting (CABG) in patients, over 70 years old, with severe, symptomatic aortic stenosis and complex coronary artery disease. The study was realised across 18 European centres and included a total of 172 patients, who were randomly assigned to TAVI plus PCI or SAVR plus CABG groups. FFR-guided PCI procedures were conducted mostly with intravenous or intracoronary adenosine, followed by a modern drug-eluting stent implantation. TAVI procedures used CoreValve Evolut R or CoreValve Evolut PRO valves. Two procedures could be conducted simultaneously or within a maximum 40 days delay. SAVR group received bioprosthetic aortic valves, CABG procedures used mostly arterial grafts. At 1 year follow-up TAVI plus PCI group presented a lower rate of death from any cause, lower rate of stroke and shorter hospitalization. SAVR plus CABG group was associated with a lower rate of pacemaker implantation, but a higher rate of new-onset atrial fibrillation. Researchers have found TAVI plus PCI to meet superiority criteria compared to SAVR plus CABG [20].

In the DEDICATE-DZHK6 trial, researchers have examined the differences between safety and clinical outcomes of TAVI procedures compared to SAVR in patients with severe, symptomatic aortic stenosis, taking into account the gender criterion. A total of 1394 patients (43.3% women) with severe, symptomatic aortic stenosis and low to intermediate operative risk were enrolled to randomization in this study. After 1 year follow-up, researchers have reported a lower rate of death from all cause in both women and men, TAVI has been proven non-inferior to SAVR in that matter. Also, among both groups the incidence of strokes, major bleedings and myocardial infarction have been lower for TAVI patients. Similarly to previous research, TAVI was characterized by lower rate of new-onset atrial fibrillation, but higher rate of pacemaker implantation and vascular complications [21].

O'Hair et al. (2022) have reviewed data from two randomized controlled trials, with a total of 2099 patients with severe aortic stenosis to assess and compare the rate of valve deterioration after TAVI and SAVR in patients with severe aortic stenosis. The researchers used the data from

CoreValve US High Risk Pivotal [23] and SURTAVI [24] randomized clinical trials. Patients have undergone either TAVI or SAVR, with a 5 year follow-up. Structural Valve Deterioration (SVD) was assessed using Doppler Echocardiography. Researchers have reported TAVI group to have a lower incidence of SVD after 5 years from valve implantation. SVD was also associated with a higher rate of death from all cause [22].

CONCLUSION

The analysis of randomized controlled trials from the last 5 years shows that TAVI is a viable, safe and effective alternative to SAVR for patients with severe, symptomatic aortic stenosis with low to intermediate surgical risk. Research indicates that TAVI procedures were associated with lower rates of major bleeding, acute kidney injury and myocardial infarction and comparable or lower death rates. It also required shorter hospitalization, and led to faster recovery. Despite these positive results, some limitations persist. TAVI is still associated with a higher incidence of paravalvular leak, vascular complications and leads to pacemaker implantations more frequently than SAVR. Keeping in mind these differences, TAVI and SAVR should be considered with attention to patient's individual, clinical needs.

There is still need for larger clinical trials, involving a broader spectrum of patients to assess the best, patient tailored, approach in treatment of aortic stenosis.

Disclosure

Author's contribution

Conceptualization, I. Zydlewski; methodology, A. Zielińska and M. Blecharczyk; software, M. Mrozek; check, M. Pacanowska-Trawnicka, Z. Kamińska and M. Mrozek; formal analysis, A. Jakimowicz; investigation, A. Malcher; resources, M. Blecharczyk; data curation, Z. Kamińska; writing - rough preparation, M. Pacanowska- Trawnicka; writing - review and editing, A. Zielińska, A. Jakimowicz; visualization, A. Malcher; supervision, I. Zydlewski; project administration, I. Zydlewski;

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Conflict of interest

The authors deny any conflict of interest.

References:

1. Osnabrugge RL, Mylotte D, Head SJ, Van Mieghem NM, Nkomo VT, LeReun CM, Bogers AJ, Piazza N, Kappetein AP. Aortic stenosis in the elderly: disease prevalence and number of candidates for transcatheter aortic valve replacement: a meta-analysis and modeling study. J Am Coll Cardiol. 2013 Sep 10;62(11):1002-12. doi: 10.1016/j.jacc.2013.05.015. Epub 2013 May 30. PMID: 23727214.Boskovski MT, Gleason TG. Current Therapeutic Options in Aortic Stenosis. Circ Res. 2021 Apr 30;128(9):1398-1417. doi: 10.1161/CIRCRESAHA.121.318040. Epub 2021 Apr 29. PMID: 33914604.
2. Catherine M. Otto, Rick A. Nishimura, Robert O. Bonow, Blase A. Carabello, John P. Erwin, Federico Gentile, Hani Jneid, Eric V. Krieger, Michael Mack, Christopher McLeod, Patrick T. O'Gara, Vera H. Rigolin, Thoralf M. Sundt, Annemarie Thompson, Christopher Toly, 2020 ACC/AHA Guideline for the Management of Patients With Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines, Journal of the American College of Cardiology, Volume 77, Issue 4, 2021, Pages e25-e197, ISSN 0735-1097, https://doi.org/10.1016/j.jacc.2020.11.018.
3. Wal, P., Rathore, S., Aziz, N. *et al.* Aortic stenosis: a review on acquired pathogenesis and ominous combination with diabetes mellitus. *Egypt Heart J* **75**, 26 (2023). https://doi.org/10.1186/s43044-023-00345-6
4. Angioletti C, Moretti G, Manetti S, Pastormerlo L, Vainieri M, Passino C. The evolution of TAVI performance overtime: an overview of systematic reviews. BMC Cardiovasc

Disord. 2024 Jun 21;24(1):314. doi: 10.1186/s12872-024-03980-2. PMID: 38907344; PMCID: PMC11191264.

5. Ahmad S, Prabhu MM, Bhat R, Hasan A, Ahmad A, Ahmad R. TAVI Through the Years: A Systematic Review of Progress. J Pharm Bioallied Sci. 2025 Jun;17(Suppl 2):S1115-S1123. doi: 10.4103/jpbs.jpbs_30_25. Epub 2025 Jun 18. PMID: 40655733; PMCID: PMC12244892.
6. Cabrucci F, Sicouri S, Baudo M, Magouliotis DE, Yamashita Y, Bacchi B, Petrone D, Wasef B, Dokollari A, Bonacchi M, Ramlawi B. Not All SAVR Are Created Equal: All the Approaches Available for Surgical Aortic Valve Replacement. J Cardiovasc Dev Dis. 2025 Feb 24;12(3):84. doi: 10.3390/jcdd12030084. PMID: 40137082; PMCID: PMC11942817.
7. Jneid H, Chikwe J, Arnold SV, Bonow RO, Bradley SM, Chen EP, Diekemper RL, Fugar S, Johnston DR, Kumbhani DJ, Mehran R, Misra A, Patel MR, Sweis RN, Szerlip M. 2024 ACC/AHA Clinical Performance and Quality Measures for Adults With Valvular and Structural Heart Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Performance Measures. Circ Cardiovasc Qual Outcomes. 2024 Apr;17(4):e000129. doi: 10.1161/HCQ.0000000000000129. Epub 2024 Mar 14. PMID: 38484039.
8. Caus T, Chabry Y, Nader J, Fusellier JF, De Brux JL and for the EpiCard investigators (2023) Trends in SAVR with biological vs. mechanical valves in middle-aged patients: results from a French large multi-centric survey. Front. Cardiovasc. Med. 10:1205770. doi: 10.3389/fcvm.2023.1205770
9. Terré, J., George, I., & Smith, C. (2017). Pros and cons of transcatheter aortic valve implantation (TAVI). *Annals Of Cardiothoracic Surgery, 6*(5), 444-452. doi:10.21037/acs.2017.09.15
10. Webb JG, Chandavimol M, Thompson CR, Ricci DR, Carere RG, Munt BI, Buller CE, Pasupati S, Lichtenstein S. Percutaneous aortic valve implantation retrograde from the femoral artery. Circulation. 2006 Feb 14;113(6):842-50. doi: 10.1161/CIRCULATIONAHA.105.582882. Epub 2006 Feb 6. PMID: 16461813.
11. Grube E, Laborde JC, Gerckens U, Felderhoff T, Sauren B, Buellesfeld L, Mueller R, Menichelli M, Schmidt T, Zickmann B, Iversen S, Stone GW. Percutaneous implantation of the CoreValve self-expanding valve prosthesis in high-risk patients with aortic valve disease: the Siegburg first-in-man study. Circulation. 2006 Oct

10;114(15):1616-24. doi: 10.1161/CIRCULATIONAHA.106.639450. Epub 2006 Oct 2. PMID: 17015786.

12. Walther, T, Simon, P, Dewey, T, et al. Transapical minimally invasive aortic valve implantation: multicenter experience. *Circulation* 2007;116:Suppl:I-240
13. Agrawal A. Transcatheter Heart Valves—An Update on Types of Valves Available, Hardware Characteristics, and Patient Selection: An Indian Perspective. *Indian Journal of Clinical Cardiology*. 2024;5(2):139-149. doi:10.1177/26324636241241372
14. Yang, Yi-Xing PhD; Liu, Xin-Ming PhD; Fu, Yuan MD; Li, Chuang MD; Wang, Hong-Jiang PhD; Xu, Li PhD; Xia, Kun MD; Zhang, Zhi-Yong PhD; Zhong, Jiu-Chang PhD; Chen, Mu-Lei PhD; Su, Pi-Xiong PhD; Wang, Le-Feng PhD. Comparisons of different new-generation transcatheter aortic valve implantation devices for patients with severe aortic stenosis: a systematic review and network meta-analysis. International Journal of Surgery 109(8):p 2414-2426, August 2023. | DOI: 10.1097/JS9.0000000000000456
15. Swift SL, Puehler T, Misso K, Lang SH, Forbes C, Kleijnen J, Danner M, Kuhn C, Haneya A, Seoudy H, Cremer J, Frey N, Lutter G, Wolff R, Scheibler F, Wehkamp K, Frank D. Transcatheter aortic valve implantation versus surgical aortic valve replacement in patients with severe aortic stenosis: a systematic review and meta-analysis. BMJ Open. 2021 Dec 6;11(12):e054222. doi: 10.1136/bmjopen-2021-054222. PMID: 34873012; PMCID: PMC8650468.
16. Blankenberg S, Seiffert M, Vonthein R, Baumgartner H, Bleiziffer S, Borger MA, Choi YH, Clemmensen P, Cremer J, Czerny M, Diercks N, Eitel I, Ensminger S, Frank D, Frey N, Hagendorff A, Hagl C, Hamm C, Kappert U, Karck M, Kim WK, König IR, Krane M, Landmesser U, Linke A, Maier LS, Massberg S, Neumann FJ, Reichenspurner H, Rudolph TK, Schmid C, Thiele H, Twerenbold R, Walther T, Westermann D, Xhepa E, Ziegler A, Falk V; DEDICATE-DZHK6 Trial Investigators. Transcatheter or Surgical Treatment of Aortic-Valve Stenosis. N Engl J Med. 2024 May 2;390(17):1572-1583. doi: 10.1056/NEJMoa2400685. Epub 2024 Apr 8. PMID: 38588025.
17. Thyregod HGH, Jørgensen TH, Ihlemann N, Steinbrüchel DA, Nissen H, Kjeldsen BJ, Petursson P, De Backer O, Olsen PS, Søndergaard L. Transcatheter or surgical aortic valve implantation: 10-year outcomes of the NOTION trial. Eur Heart J. 2024 Apr 1;45(13):1116-1124. doi: 10.1093/eurheartj/ehae043. PMID: 38321820; PMCID: PMC10984572.
18. The UK TAVI Trial Investigators. Effect of Transcatheter Aortic Valve Implantation vs Surgical Aortic Valve Replacement on All-Cause Mortality in Patients With Aortic

Stenosis: A Randomized Clinical Trial. *JAMA.* 2022;327(19):1875–1887. doi:10.1001/jama.2022.5776

19. Tchetche D, Pibarot P, Bax JJ, Bonaros N, Windecker S, Dumonteil N, Nietlispach F, Messika-Zeitoun D, Pocock SJ, Berthoumieu P, Swaans MJ, Timmers L, Rudolph TK, Bleiziffer S, Leroux L, Modine T, van der Kley F, Auffret V, Tomasi J, Stastny L, Hengstenberg C, Andreas M, Leclercq F, Gandet T, Mascherbauer J, Trescher K, Prendergast B, Vasa-Nicotera M, Chieffo A, Mares J, Wesselink W, Rakova R, Kurucova J, Bramlage P, Eltchaninoff H. Transcatheter vs. surgical aortic valve replacement in women: the RHEIA trial. Eur Heart J. 2025 Jun 9;46(22):2079-2088. doi: 10.1093/eurheartj/ehaf133. PMID: 40171878.
20. Kedhi E, Hermanides RS, Dambrink JE, Singh SK, Ten Berg JM, van Ginkel D, Hudec M, Amoroso G, Amat-Santos IJ, Andreas M, Campante Teles R, Bonnet G, Van Belle E, Conradi L, van Garsse L, Wojakowski W, Voudris V, Sacha J, Cervinka P, Lipsic E, Somi S, Nombela-Franco L, Postma S, Piayda K, De Luca G, Kolkman E, Malinowski KP, Modine T; TCW study group. TransCatheter aortic valve implantation and fractional flow reserve-guided percutaneous coronary intervention versus conventional surgical aortic valve replacement and coronary bypass grafting for treatment of patients with aortic valve stenosis and complex or multivessel coronary disease (TCW): an international, multicentre, prospective, open-label, non-inferiority, randomised controlled trial. Lancet. 2025 Dec 21;404(10471):2593-2602. doi: 10.1016/S0140-6736(24)02100-7. Epub 2024 Dec 4. PMID: 39644913.
21. Bleiziffer S, Leuschner F, Rudolph TK, Vonthein R, Meyer AL, Haeusler KG, Hofmann U, Gorski A, Hagendorff A, Kim WK, Baumgartner H, Borger MA, Choi YH, Cremer J, Falk V, Frey N, Hagl C, König IR, Landmesser U, Massberg S, Reichenspurner H, Renker M, Thiele H, Walther T, Ziegler A, Blankenberg S, Dreger H, Arif R, Unbehaun A, Seiffert M; DEDICATE Study Investigators. Sex-specific outcomes after transcatheter or surgical treatment of aortic valve stenosis: the DEDICATE-DZHK6 trial. Eur Heart J. 2026 Mar 13;47(11):1339-1353. doi: 10.1093/eurheartj/ehaf519. PMID: 40900118.
22. O'Hair D, Yakubov SJ, Grubb KJ, Oh JK, Ito S, Deeb GM, Van Mieghem NM, Adams DH, Bajwa T, Kleiman NS, Chetcuti S, Søndergaard L, Gada H, Mumtaz M, Heiser J, Merhi WM, Petrossian G, Robinson N, Tang GHL, Rovin JD, Little SH, Jain R, Verdoliva S, Hanson T, Li S, Popma JJ, Reardon MJ. Structural Valve Deterioration After Self-Expanding Transcatheter or Surgical Aortic Valve Implantation in Patients

at Intermediate or High Risk. JAMA Cardiol. 2023 Feb 1;8(2):111-119. doi: 10.1001/jamacardio.2022.4627. PMID: 36515976; PMCID: PMC9857153.

23. Adams DH, Popma JJ, Reardon MJ, et al; U.S. CoreValve Clinical Investigators. Transcatheter aortic-valve replacement with a self-expanding prosthesis. *N Engl J Med*. 2014;370(19):1790-1798. doi:10.1056/NEJMoa1400590
24. Reardon MJ, Van Mieghem NM, Popma JJ, et al; SURTAVI Investigators. Surgical or transcatheter aortic-valve replacement in intermediate-risk patients. *N Engl J Med*. 2017;376(14):1321-1331. doi:10.1056/NEJMoa1700456