

# TAVR: Benefits, Risks and Evolving Management

Giovanni Russo\*

*Department of Cardiovascular Medicine, University of Milan, Italy*

## Introduction

The landscape of treating severe aortic stenosis continues to evolve, with Transcatheter Aortic Valve Replacement (TAVR) gaining prominence as a less invasive alternative to Surgical Aortic Valve Replacement (SAVR). Five-year outcomes of TAVR using self-expanding valves demonstrate sustained excellent durability and clinical outcomes, supporting its viability for a wider patient range, including those at lower surgical risk [3].

This procedure also presents a comparable long-term cost-effectiveness profile to SAVR in intermediate-risk patients, largely attributable to shorter hospital stays and an improved quality of life post-procedure [7].

These findings suggest TAVR offers solid value for this patient group.

For patients with bicuspid aortic valves, a particularly complex subset, meta-analyses and reviews are consistently examining TAVR against SAVR. Short-term outcomes from these comparisons indicate that TAVR delivers comparable results to SAVR regarding mortality and stroke, although a slightly higher rate of permanent pacemaker implantation has been noted with TAVR [1].

Here's the thing about this specific patient group: our understanding of anatomical challenges and procedural nuances is still evolving, reinforcing that meticulous patient selection and expert technique are absolutely essential for favorable results in these intricate cases [5].

Expanding the reach of TAVR, randomized trials have explored its application in younger patients, specifically those 75 years or under, with severe aortic stenosis. What emerged was TAVR showing non-inferiority for key endpoints such as all-cause mortality, stroke, or rehospitalization at two years. This really opens up the possibility of TAVR for a younger group of patients who traditionally would have undergone SAVR, though we need to keep an eye on long-term durability [10].

However, the increasing adoption of TAVR brings certain considerations, particularly regarding post-procedural complications. Even mild aortic regurgitation (AR) following TAVR is linked to increased mortality and other adverse cardiovascular events [4].

What this really means is that minimizing AR during the procedure is critical for achieving the best possible patient outcomes. Another growing concern is infective endocarditis after TAVR, which poses significant diagnostic and management challenges. This highlights the urgent need for a more coordinated, multidisciplinary approach and much better, standardized data collection through registries to truly understand and tackle this serious issue head-on [2].

A comprehensive guide on managing TAVR complications covers everything from vascular issues to stroke, paravalvular leaks, and conduction disturbances. The

key message here is the absolute necessity of a multidisciplinary team and acting quickly when complications arise to ensure the best possible outcomes for patients [8].

Beyond immediate complications, antithrombotic therapy after TAVR is also a crucial aspect of patient care. A clear picture of current evidence and guidelines for this therapy addresses the evolving understanding of leaflet thrombosis and offers recommendations for various antiplatelet and anticoagulant regimens, emphasizing a personalized approach tailored to each patient's specific risk factors [9].

Looking forward, current reviews highlight TAVR's dynamic evolution. This includes new device technologies, refined ways to pick the right patients, and even how personalized medicine is fitting into the picture. It also touches on the expansion of TAVR to younger and lower-risk populations. The ongoing research into valve durability and managing complications is, as you'd expect, a key focus [6].

## Description

Transcatheter Aortic Valve Replacement (TAVR) has fundamentally reshaped the treatment paradigm for severe aortic stenosis, offering a less invasive alternative to traditional Surgical Aortic Valve Replacement (SAVR). The procedure has demonstrated remarkable long-term efficacy, with five-year outcomes for self-expanding valves revealing sustained durability and excellent clinical results. This supports its broadening application to a diverse patient population, including those previously considered at lower surgical risk [3]. Furthermore, TAVR provides comparable long-term cost-effectiveness to SAVR in intermediate-risk patients. This favorable economic profile stems from reduced hospital stays and an enhanced quality of life for patients post-procedure, solidifying TAVR's value proposition for this group [7]. Recent randomized trials have even extended the evidence base for TAVR, showing it to be non-inferior to SAVR at two years for patients aged 75 or younger regarding major adverse cardiovascular events. This breakthrough suggests TAVR is a viable option for a younger cohort, though vigilance regarding long-term durability is essential [10].

A significant area of focus within TAVR research concerns its applicability to specific anatomical challenges, such as bicuspid aortic valves (BAV). Recent meta-analyses comparing TAVR and SAVR in individuals with BAV have shown similar short-term outcomes for mortality and stroke. However, it's worth noting a slightly elevated rate of permanent pacemaker implantation with TAVR in this subgroup [1]. The ongoing review of TAVR versus SAVR for BAV stenosis underscores an evolving understanding of the unique anatomical complexities and procedural nuances involved. Here's the thing: careful patient selection and expert procedural technique are paramount to achieving good outcomes in these intricate cases [5].

Despite TAVR's advancements, certain complications remain critical considerations for optimal patient care. A meta-analysis extensively investigated the impact of aortic regurgitation (AR) following TAVR, revealing that even mild AR is associated with increased mortality and other adverse cardiovascular events [4]. What this really means is that aggressively minimizing AR during TAVR is not just aspirational, but crucial for ensuring the best possible patient outcomes. Another concerning complication gaining urgency is infective endocarditis following TAVR. This article points out the formidable diagnostic and management hurdles it presents, underscoring the necessity of a coordinated, multidisciplinary approach and robust, standardized data collection through registries to effectively address this serious issue [2]. Comprehensive guidance is available for managing a spectrum of TAVR complications, ranging from vascular issues and stroke to paravalvular leaks and conduction disturbances. The unequivocal message is the critical importance of a multidisciplinary team and prompt intervention to optimize patient recovery [8].

Beyond the acute management of complications, long-term post-procedural care, particularly antithrombotic therapy, is vital. A state-of-the-art review consolidates current evidence and guidelines concerning antithrombotic regimens after TAVR. It addresses the evolving understanding of leaflet thrombosis and provides recommendations for various antiplatelet and anticoagulant strategies. This truly drives home the importance of a personalized approach, carefully tailored to each patient's specific risk factors to ensure optimal protection [9].

Looking ahead, the trajectory of TAVR is one of continuous innovation and expansion. A thorough review details current and future directions, encompassing new device technologies, refined patient selection criteria, and the integration of personalized medicine. The expansion of TAVR to younger and lower-risk populations is a key theme, alongside ongoing rigorous research into valve durability and advanced strategies for complication management. These efforts collectively aim to solidify TAVR's role as a cornerstone therapy in cardiovascular medicine [6].

## Conclusion

Transcatheter Aortic Valve Replacement (TAVR) has emerged as a compelling alternative to Surgical Aortic Valve Replacement (SAVR) for severe aortic stenosis. Research consistently demonstrates favorable short- and intermediate-term outcomes, with self-expanding valves showing sustained five-year durability. This has broadened TAVR's applicability, even for younger and lower-risk patient populations, where it shows non-inferiority to SAVR at two years. Furthermore, TAVR offers comparable long-term cost-effectiveness in intermediate-risk patients due to shorter hospital stays and improved quality of life.

However, the expansion of TAVR brings critical considerations. Specific complications, such as aortic regurgitation, even if mild, are associated with increased mortality and adverse events, emphasizing the need for meticulous procedural technique. Infective endocarditis post-TAVR is a growing concern, necessitating a multidisciplinary approach and robust data collection. A slightly higher rate of permanent pacemaker implantation is also observed in patients with bicuspid aortic valves undergoing TAVR, despite otherwise comparable short-term outcomes. Effective management of a range of complications, alongside personalized antithrombotic therapy, is crucial for optimizing patient outcomes. The field continues to advance with new technologies, refined patient selection, and ongoing research into long-term durability.

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## Conflict of Interest

None.

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**\*Address for Correspondence:** Giovanni, Russo, Department of Cardiovascular Medicine, University of Milan, Italy, E-mail: giovanni.russo@unimi.it

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