Budget impact analysis of transcatheter aortic valve replacement (TAVR) versus surgical aortic valve replacement (SAVR) in low, intermediate, and high-risk patients with severe, symptomatic aortic stenosis in the United States

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INTRODUCTION

- Aortic stenosis (AS) is a degenerative valvular disease that involves the narrowing of the aortic valve opening leading to an increased risk of heart failure, mortality, and reduction in quality of life.
- Possible treatments include medications or valve repair, but most undergo either surgical aortic valve replacement (SAVR) or transcatheter aortic valve replacement (TAVR).
- TAVR was approved in the United States in 2011, providing a less invasive alternative therapy for patients with severe AS. Compared to SAVR, TAVR has been associated with improved survival, reduced complications, shorter hospital lengths of stay, and reduced post-procedure wound infection.[1]

METHODS

- We adapted an international budget impact model, consisting of a Markov model that compared TAVR with SAPIEN 3 to SAVR calculating the 5-year expected cost a patient accumulates through 6 mutually exclusive states.[2]
- States included: (1) an in-hospital, post-operative 30-day period covering all outcome-related costs, (2) a state in the outpatient setting for patients at risk of long-term complications, three maintenance states for outpatient with either a (3) new permanent pacemaker implantation (PPI), (4) new onset atrial fibrillation (AF), or (5) major / disabling stroke (MDS), and an (6) absorptive state for death.
- Event rates, costs, and mortality rates were derived, estimated, and synthesized from publicly published evidence. Majority of the cost inputs were derived from sources on Medicare or Medicaid populations in the US.
- One-way sensitivity analyses (OWSA) were performed on the cost and probability inputs.
- Costs for the in-hospital, post-operative 30-day period were disaggregated into Procedure covering Device, Non-Device Costs and ICU / non-ICU stays; and In-Hospital Complications for PPI, AF, MDS, and surgical site infections (SSI).

TAVR with SAPIEN 3 is budget saving versus SAVR across various surgical risk levels in the United States

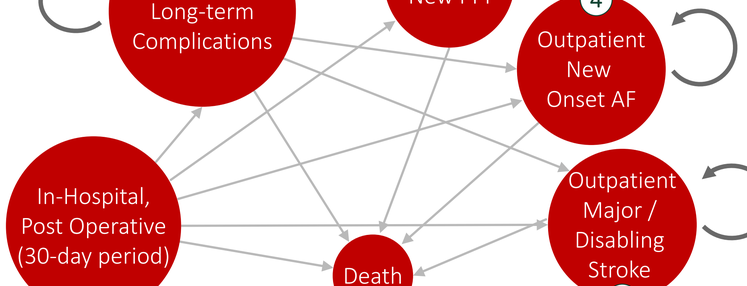
OBJECTIVE

To analyze the budget impact of TAVR with SAPIEN 3 versus SAVR in low, intermediate, and high surgical risk patients with severe, symptomatic aortic stenosis patients (SSAS) in the United States.

RESULTS

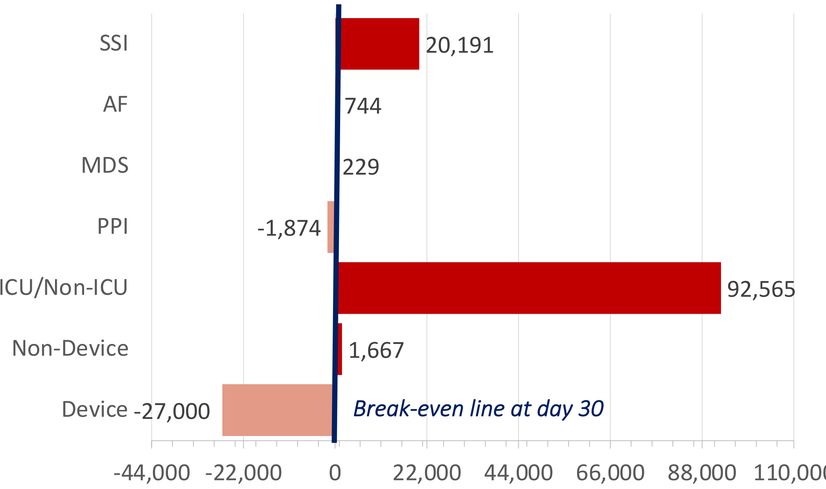
TAVR with SAPIEN 3 is overall consistently budget saving compared to SAVR among all surgical risk patients after 5 years in the US.

Cumulative savings, TAVR versus SAVR over 5 years United States Dollars



- Over 5 years, TAVR showed budget savings compared to SAVR of $20,567, $21,913, and $78,730 among low, intermediate and high-risk patients, respectively.
- Within 30-days, TAVR resulted in overall budget savings in high-risk patients. TAVR device costs were higher, but costs are offset by cost savings in Non-Device, ICU/Non-ICU, MDS, AF, and SSI, except PPI.
- Results of the OWSA revealed that the cost driver for low-risk surgical patients is SAVR per month cost of AF, TAVR device cost for intermediate-risk, and TAVR cost of ICU per day for high-risk.

30-days costs delta with TAVR versus SAVR among high-risk patients – United States Dollars



State Transition Diagram

CONCLUSIONS

- TAVR is projected to be economically beneficial by lowering inpatient and long-term complication costs compared with SAVR in the US.
- TAVR with SAPIEN 3 may be the preferred treatment strategy for SSAS patients from the perspective of Medicare and Medicaid.

References

1. Hu P. TAVR and SAVR: Current Treatment of Aortic Stenosis. *Clinical Medicines Insights: Cardiology.* 2012;6:125–139.
2. Carapinha J, Al-Omar H, Alqoofi F, et al. Budget impact analysis of transcatheter aortic valve replacement in low, intermediate, and high-risk patients with severe aortic stenosis in Saudi Arabia. *Journal of Medical Economics*, 2022;25(1):77-86.

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