# Capacity-Enhancing Innovation (CEI) and the Treatment of Severe Symptomatic Aortic Stenosis (sSAS) in England

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## Introduction

Surgical aortic valve replacement (SAVR) has been the default treatment for sSAS, although transcatheter aortic valve implantation (TAVI) has emerged as an effective option since its introduction[1]. CEI refers to technologies that increase the ability of an organization to produce more, perform better, or operate at a higher level of efficiency. This study aims to quantify the role of TAVI as a CEI in reducing hospital length of stay (LoS) and its ability to expand treatment to more patients with sSAS.

## Methods

This retrospective cohort study used secondary care patient-level Hospital Episode Statistics (HES) data for England, to identify two patient cohorts from inpatient records: SAVR cohort and TAVI cohort, between January 2017 and December 2022. Each admission was associated with the Healthcare Resource Groups (HRGs) to enable the differentiation between levels of care complexity (**Table 1**). Three primary outcomes, *average length of stay (LoS)* in 1.Intensive Care Unit (*ICU*), 2.post-operation (*post-op*) period and 3.for the *entire admission* were compared between the two cohorts.

## Results

The HES database included 21,535 TAVI and 15,815 SAVR procedures across the 6 years study period **(Figure 1).** Compared to 2019, TAVI admissions increased from by 26.3% (from 3630 to 4585) in 2022 while SAVR admissions decreased by 30.3% (from 3120 to 2175) **(Figure 2)**. In 2022, the *average admission LoS* ranged between 4 and 10 days for TAVI and 9 and up to 14 days for SAVR cases respectively for standard and complex CC groups. The *average post op LoS* ranged between 2 and 5 days for TAVI cases in the standard and complex CC groups respectively whilst 7 and up to 10 days for SAVR. *Average ICU LoS* was 0 for TAVI in both the CC groups while ranging between 1 and 2 days for SAVR. All the outcomes are summarized in **Figure 3**.

## Conclusion

TAVI represents a CEI for sSAS patients as it enables more patients to treated at a higher level of efficiency, as reflected in the primary length of stay outcomes. Given that clinical practice guidelines now suggest the inclusion of lower risk patients, we expect TAVI's contribution to the healthcare system organization to grow.

Table 1

| Care complexity(CC) | HRGs | Description |
|---|---|---|
| **Standard** | EY21B | Transcatheter Aortic Valve Implantation (TAVI) using Transfemoral Approach, with CC Score 0-7 |
| | ED25C | Standard, Single Heart Valve Replacement or Repair, with CC Score 0-5 |
| | ED24C | Complex, Single Heart Valve Replacement or Repair, with CC Score 0-5 |
| **Complex** | EY21A | Transcatheter Aortic Valve Implantation (TAVI) using Transfemoral Approach, with CC Score 8+ |
| | ED24A | Complex, Single Heart Valve Replacement or Repair, with CC Score 11+ |
| | ED25A | Standard, Single Heart Valve Replacement or Repair, with CC Score 11+ |
| | ED25B | Standard, Single Heart Valve Replacement or Repair, with CC Score 6-10 |
| | ED24B | Complex, Single Heart Valve Replacement or Repair, with CC Score 6-10 |

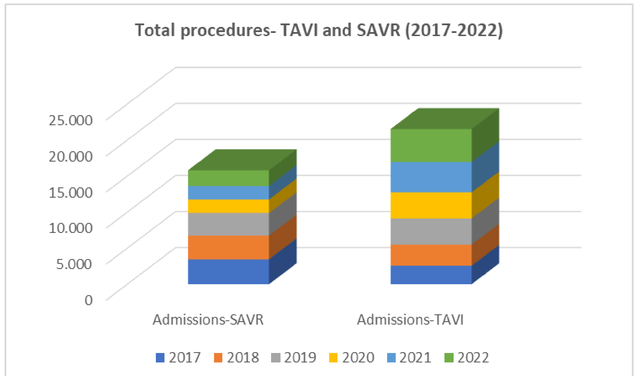


Figure 1

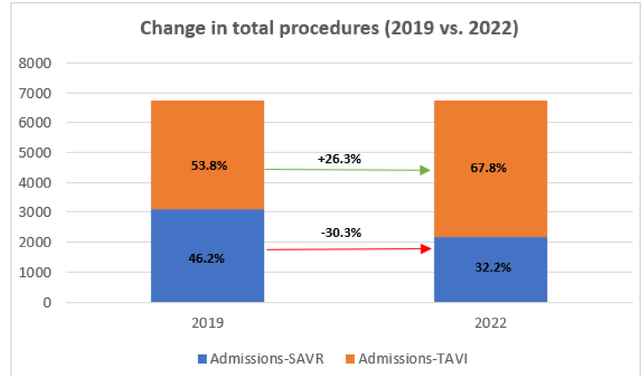


Figure 2

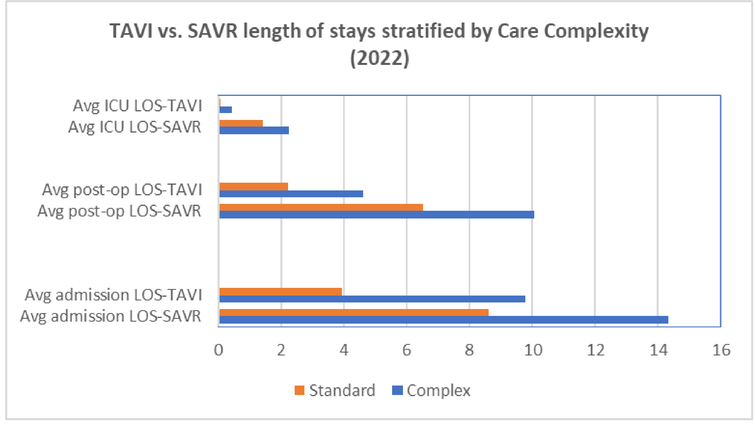


Figure 3

### References

[1]Vahanian, A., F. Beyersdorf, F. Praz, M. Milojevic, S. Baldus, J. Bauersachs, D. Capodanno, L. Conradi, M. De Bonis, R. De Paulis, V. Delgado, N. Freemantle, M. Gilard, K. H. Haugaa, A. Jeppsson, P. Jüni, L. Pierard, B. D. Prendergast, J. R. Sádaba, C. Tribouilloy and W. Wojakowski (2021). "2021 ESC/EACTS Guidelines for the management of valvular heart disease." Eur J Cardiothorac Surg **60**(4): 727-800.

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