



Edwards

Benchmark Program

Transcatheter Valve Care Pathway



BENCHMARK Registry clinical summary



Edwards

BENCHMARK: streamlined TAVI pathway with uncompromised safety in 28 European centres – 30-day follow-up results

Edwards Benchmark Program is an evidence-based global TAVI optimisation program, developed for all stages of the clinical pathway

Recently added to the bank of evidence are the 30-day results from the BENCHMARK Registry presented at the EuroPCR 2023 Late-Breaking Clinical Data session. The BENCHMARK Registry results further validate the Edwards Benchmark program as an important initiative in reducing the variation in clinical pathways for patients undergoing TAVI across Europe

The Registry 30-day results indicate significant improvements in efficiency without compromising patient safety after implementing the 8 BENCHMARK Practices, with 12-month follow-up in progress

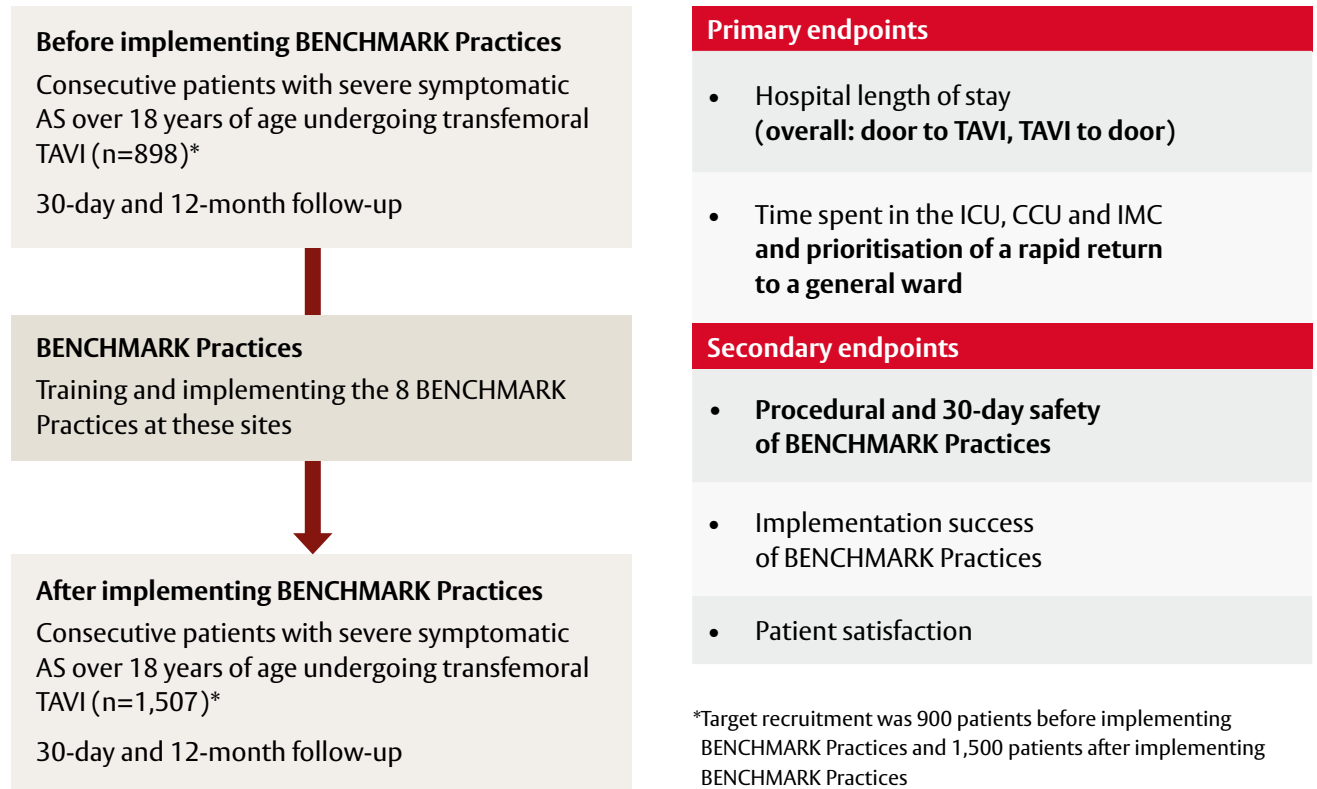
Background

- Investigator-initiated, observational BENCHMARK Registry (ClinicalTrials.gov identifier: NCT04579445) included over 2,400 consecutive patients with severe symptomatic AS from 28 centres across 7 European countries
- Data are now available describing the 30-day outcomes following TAVI before and after implementing the BENCHMARK Practices

Study design

- The primary objective of the BENCHMARK Registry is to evaluate the effect of implementing BENCHMARK Practices at TAVI centres, with the overall aim of decreasing the length of hospital stay and reducing ICU occupancy
- Secondary objectives include increasing implementation of BENCHMARK Practices, ascertaining uncompromised patient safety and patient satisfaction
- The following 8 BENCHMARK Practices were implemented and each centre assessed the level of adoption of these practices and patient outcomes before and after implementing the BENCHMARK Practices
 1. **Education** of patient and family
 2. **Education and alignment** of the internal team
 3. Determination of anticipated discharge date at admission based on **pre-procedural risk stratification**
 4. **Echo- or angiographic check at the end of the procedure** is performed to confirm proper closing of access site/proper management of complications
 5. **Early mobilisation** of the patient
 6. **Decision tree** used to determine the need for new PPM
 7. **Daily visit** to the patient by implanter and interaction with rest of the team
 8. **Criteria-based discharge**

Figure 1. Study design



Results

Patient characteristics

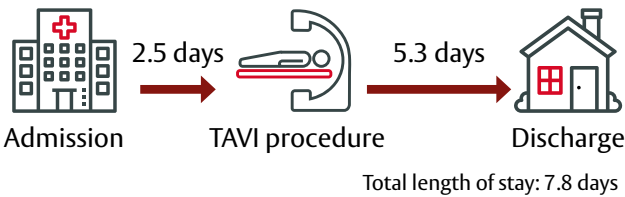
	Before BENCHMARK Mean ± SD or n (%)	After BENCHMARK Mean ± SD or n (%)	p value
Age (years)	79.9 ± 6.6	79.9 ± 6.8	0.904
Female sex	369 (41.1)	567 (38.2)	0.152
EuroSCORE II (%)	5.0 ± 4.8	4.8 ± 6.4	0.428

Primary endpoints

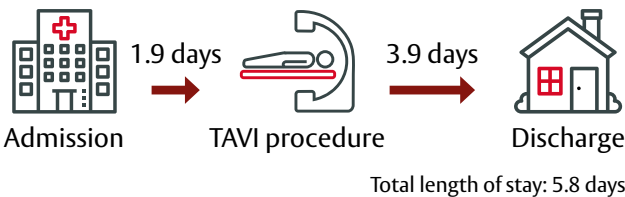
Hospital length of stay

- Mean hospital length of stay reduced by 2 days (0.6 days before and 1.4 days after) after implementing BENCHMARK Practices

Before BENCHMARK



After BENCHMARK



Median (IQR): 6 days (4, 9 days) before BENCHMARK;
4 days (3, 7 days) after BENCHMARK

Intensive care usage

- Combined mean time in ICU/CCU/IMC reduced by more than 14 hours from 1.9 days to 1.3 days after implementing BENCHMARK Practices

Before BENCHMARK



After BENCHMARK



Secondary endpoints

Local anaesthesia with or without conscious sedation

Before BENCHMARK



$p < 0.001$

After BENCHMARK



Significant reductions in mean (\pm SD) intervention time

Procedure time

Before BENCHMARK



$p < 0.001$

After BENCHMARK



Overall intervention time

Before BENCHMARK



$p < 0.001$

After BENCHMARK



Patient safety

- Patient safety at discharge and at 30-day follow-up was uncompromised after implementing BENCHMARK Practices



No change in all-cause mortality



No change in rehospitalisation rate (valve-related or worsening chronic heart failure)



No change in incidence of stroke



Patient satisfaction

Over 90% of patients were satisfied/very satisfied across all aspects of their TAVI experience after implementing BENCHMARK Practices*

*Patient satisfaction survey included: pre-TAVI discussions, active participation in discussions affecting their healthcare, interactions with care team, involvement of family and preparations for discharge

Implementing BENCHMARK Practices

An increase in the adoption of all the BENCHMARK Practices was seen following implementation, with the biggest improvements in:

Criteria-based discharge

Before BENCHMARK

After BENCHMARK



4.2x increase



23%

97%

Early patient mobilisation

Before BENCHMARK

After BENCHMARK



3.5x increase



25%

88%

Patient and family education

Before BENCHMARK

After BENCHMARK



2.0x increase



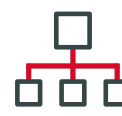
48%

97%

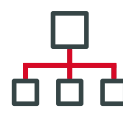
Decision tree for PPI without increasing hospital stay

Before BENCHMARK

After BENCHMARK



2.0x increase



50%

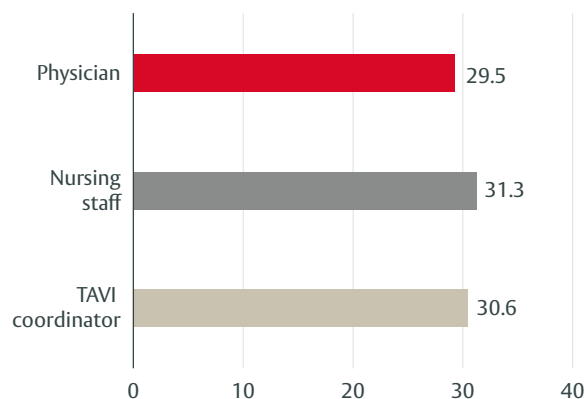
99%

Staff satisfaction

Successful implementation of BENCHMARK Practices

%	Physicians	Nursing staff	TAVI coordinator
Yes	78.6	80.0	84.6
No	14.3	6.7	0
Yes but with room for improvement	7.1	13.3	15.4

Mean overall satisfaction score (maximum score = 40)



Summary

After implementing BENCHMARK Practices

- Mean hospital length of stay reduced by more than 25%
- Over 14 hours reduction in average intensive care usage (ICU/CCU/IMC combined)
- Average procedure and overall intervention times reduced by 17% and 8%
- Uncompromised safety at discharge and 30-day follow-up
- Improvement in the adoption of all BENCHMARK Practices
- High levels of patient satisfaction
- High levels of staff satisfaction

Conclusion

A wider implementation of BENCHMARK Practices will make the in-hospital TAVI pathway more efficient and cost-effective without compromising patient safety. These changes provide potential capacity and efficiency benefits to hospitals

Frank D *et al.* BENCHMARK: streamlined TAVI pathway with uncompromised safety in 28 European centres. Late-breaking clinical data presented at EuroPCR 16–19 May 2023, Paris

McCalmont G BENCHMARK Registry: setting a benchmark for resource utilisation and quality of care in patients undergoing transcatheter aortic valve implantation in Europe. Presented at a satellite symposium, EuroPCR 16–19 May 2023, Paris

Abbreviations

AS:	aortic stenosis
CCU:	coronary care unit
EuroSCORE:	European system for cardiac operative risk evaluation
ICU:	intensive care unit
IMC:	intermediate care unit
IQR:	interquartile range
PPM:	permanent pacemaker
SD:	standard deviation
TAVI:	transcatheter aortic valve implantation



To learn more and to join the Edwards Benchmark program, write to Benchmark_EU@edwards.com or talk to our local representatives

BENCHMARK Registry centres



Austria:

- 1 St. Pölten University Hospital
- 2 KH Nord, Klinik Floridsdorf, Vienna

Czechia:

- 3 IKEM Prague

France:

- 4 Centre Hospitalier Universitaire de Besançon
- 5 Polyclinique Du Bois, Lille
- 6 Infirmerie Protestante de Lyon
- 7 Hopital Saint Joseph, Marseille
- 8 Centre Hospitalier Universitaire de Montpellier
- 9 IMM (Institut Mutualiste Montsouris), Paris
- 10 Pitie Salpetriere Hospital Paris
- 11 CHU Rennes
- 12 CHRU Tours

Germany:

- 13 Herzzentrum Köln, Cologne
- 14 University Medical Center Göttingen
- 15 University Hospital Heidelberg
- 16 Saarland University Medical Center, Homburg
- 17 CKMS Munich, Artemed Clinics,
- 18 Brüderkrankenhaus Trier

Italy:

- 19 L'ospedale S.Giuseppe Moscati di Avellino
- 20 Careggi Hospital, Florence
- 21 Centro Cardiologico, Monzino Hospital, Milan
- 22 Azienda Ospedaliera Ordine Mauriziano di Torino

Romania:

- 23 Institutul de Urgenta pentru Boli Cardiovasculare, Bucharest

Spain:

- 24 Hospital de la Santa Creu i Sant Pau, Barcelona
- 25 Hospital Bellvitge, Barcelona
- 26 Hospital Clinico San Carlos, Madrid
- 27 Hospital Regional Universitario de Málaga
- 28 Hospital Universitari Son Espases, Palma De Mallorca

Edwards, Edwards Lifesciences, the stylized E logo and Edwards Benchmark are trademarks of Edwards Lifesciences Corporation or its affiliates. All other trademarks or service marks are the property of their respective owners.

© 2023 Edwards Lifesciences Corporation. All rights reserved. NP--EU-1769 v1.0

Edwards Lifesciences • Route de l'Etraz 70, 1260 Nyon, Switzerland • [edwards.com](https://www.edwards.com)



Edwards