

Intravenous Anesthesia as Compared to Volatile Anesthesia is Associated with Reduced Length of Stay After Transcatheter Aortic Valve Replacement: Results from Two-Year Program at Major Academic Medical Center



Allie Goins¹, BS; Paula Strassle², MSPH; Cassie Ramm³, AGNP; Emily Teeter⁴, MD; Alan Smeltz⁴, MD; Thomas Caranasos⁵, MD; John P Vavalle³, MD; Lavinia Kolarczyk⁴, MD



¹University of North Carolina School of Medicine, Chapel Hill, NC, ²University of North Carolina Department of Epidemiology, Chapel Hill, NC, ³University of North Carolina Department of Medicine, Division of Cardiology, Chapel Hill, NC, ⁴University of North Carolina Department of Anesthesia, Chapel Hill, NC, ⁵University of North Carolina Division of Cardiothoracic Surgery, Chapel Hill, NC

BACKGROUND

- Transcatheter aortic valve replacement (TAVR) is an alternative to surgical aortic valve replacement.
- We sought to identify whether changes in the general anesthetic (GA) technique, specifically using total intravenous anesthesia (TIVA) versus volatile anesthesia (VA), would lead to reductions in hospital length of stay (LOS).

METHODS

- A retrospective review was conducted of 67 consecutive patients at a single institution who underwent TAVR under GA with either TIVA or VA between November 2014 and July 2016.
- Descriptive statistics were conducted using Fisher's exact and Student's t-test. Risk factors for LOS were assessed using unadjusted linear regression.

CONCLUSIONS

- Our study suggests that the anesthetic technique, particularly TIVA vs. VA, does play an important role in affecting hospital LOS following TAVR.
- The reduction in hospital LOS following TAVR at our institution is likely influenced by the entire evolution of the TAVR program, including the shift towards more percutaneous, transfemoral approaches vs. cutdown, the use of TIVA over VA, changing the day of surgery from Thursday to Tuesday, and improvements in valve delivery systems and surgical technique over time.

REFERENCES

- Minerva Anestesiologica 2010; 76 (2): 100-8
- Am J Cardiol. 2016; 118 (3):418-423.
- The authors have no disclosures to report.

RESULTS

- The majority of patients in both the TIVA and VA group underwent TAVR with a transfemoral approach (83% vs. 75%, p=0.55).
- Patients receiving GA with propofol infusion had a reduction in hospital LOS as compared to patients receiving desflurane. Individuals undergoing TAVR via percutaneous approach also demonstrated a reduced LOS. There was no difference in hospital LOS based on valve type used (Figure 1).
- Table 2 illustrates the evolution of the TAVR care pathway at our institution from the initiation of the program until current.
- Patients receiving TIVA had a shorter hospital LOS and shorter ICU LOS as compared to patients receiving VA. No difference was noted in 30-day mortality (Table 3).

Table 1: Patient baseline characteristics

Mean age	78 ± 9 years
Gender	43% female
Race	88% Caucasian
Mean AV gradient	42 ± 17 mm Hg
Mean EF	53 ± 13%

Figure 1: Average LOS, in days, after TAVR and 95% CI, stratified across procedure characteristics

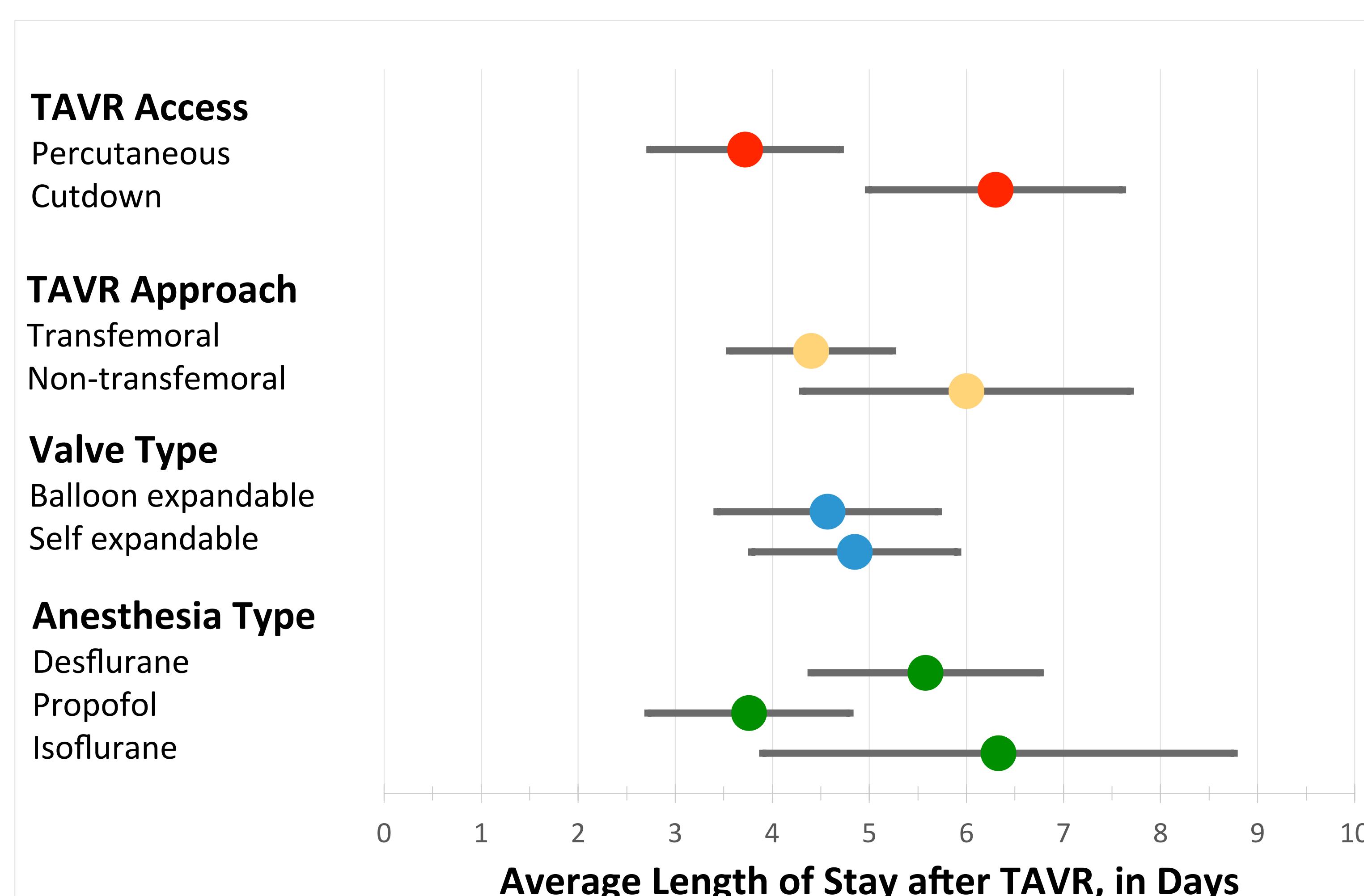


Table 2: Evolution of the TAVR care pathway at our institution

Pathway Component	Start Date (T)	T + 6 mo.	T + 12 mo.	Current
Admit date	1 day prior	Day of TAVR		→
Pre-op eval	Frailty scoring	Frailty scoring, cognitive testing, nutrition eval		→
Lines	R internal jugular introducer + PAC, Pre-induction arterial, 2 PIV, +/- R jugular venous sheath (temp pacing)	Pre-induction arterial, 2 PIV, +/- R jugular venous sheath (temp pacing)	Pre-induction arterial, 2 PIV, +/- subclavian venous sheath (temp pacing)	→
Maintenance anesthesia	Desflurane Remifentanil	Propofol Remifentanil		→
Valve	Edwards Sapien XT	Edwards S3 Medtronic CoreValve	Medtronic EvolutR Edwards S3	→
Location	OR	OR	OR>cath	OR=cath
Post-op	ICU	ICU	ICU>Stepdown	Stepdown>ICU
Day of TAVR	Thursday	Tuesday		→

Table 3: LOS and mortality in patients with TIVA and VA

Mean ± SD	TIVA	VA	P-value
	35 (52.2%)	32 (47.8%)	
Total LOS	3.7 ± 2.6	5.9 ± 3.3	0.003
ICU LOS	1.5 ± 0.8	2.7 ± 2.0	0.004
30-day mortality	0 ± 0.0	2 ± 6.3	0.22