

# Impact of Access Route on TAVR in Patients with Moderate to Severe Obesity and Low and Intermediate Surgical Risk: An STS/ACC TVT Registry Analysis

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# FUNDING SUPPORT AND DISCLAIMER

This research was supported by the American College of Cardiology Foundation's National Cardiovascular Data Registry (NCDR) and The Society of Thoracic Surgeons National Database. The views expressed in this presentation represent those of the author(s), and do not necessarily represent the official views of either organization. Learn more about the STS/ACC TVT Registry at [www.tvtregistry.org](http://www.tvtregistry.org).



# DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIPS

I, Mansi Maini DO NOT have any financial relationships to disclose.

# BACKGROUND

- Transcatheter aortic valve replacement (TAVR) has become the predominant strategy for aortic valve replacement across all risk groups since FDA approval in 2011.
- Transfemoral (TF) is the default route for TAVR given safety and simplicity.
- However, obesity ( $BMI \geq 35$ ) poses challenges.
- Alternative access (AA), may mitigate some challenges but has historically been linked with higher mortality and stroke.

# OBJECTIVES

To evaluate outcomes of TF versus AA among low- and intermediate-risk patients with moderate to severe obesity undergoing TAVR.

- Compare outcomes of TF vs. AA in patients with obesity (BMI  $\geq 35$ ) without Peripheral Artery Disease (PAD).
- Assess whether BMI modifies the relationship between access and outcomes.
- Explore whether there is a BMI threshold at which AA may be safer than TF.

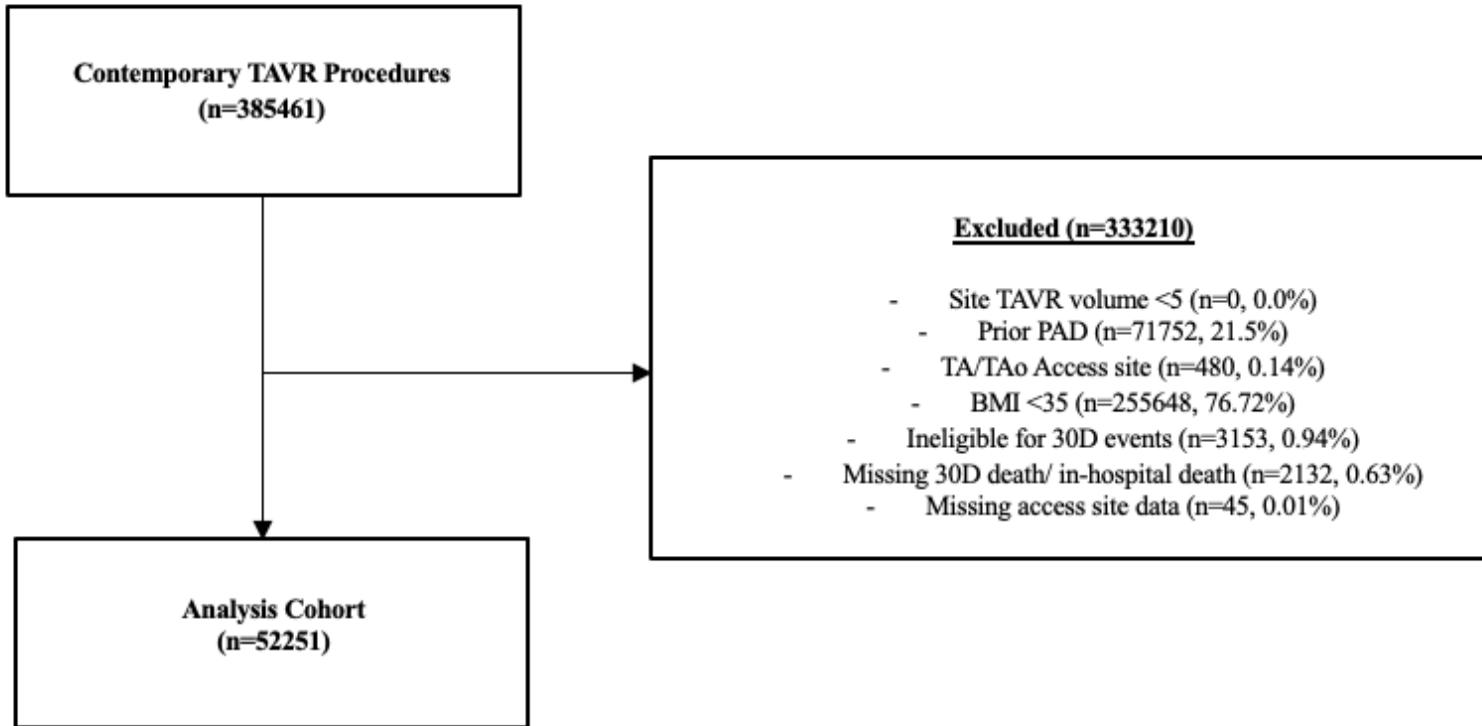
# METHODS

- **Data source:** 2020-2024 STS/ACC TVT Registry
- **Inclusion:** TAVR patients with  $\text{BMI} \geq 35$ , no PAD, low or intermediate surgical risk.
- **Exclusion:** Transapical or transaortic access.

# METHODS

- **Primary outcomes:** 30-day mortality, stroke, in-hospital vascular complications, VARC-3 major or life-threatening bleeding.
- **Propensity-matched 1:4 (AA:TF) cohort, 4,275 patients.**
  - In-hospital and 30-day outcomes assessed by logistic regression.
- **Secondary analysis** at BMI  $\geq 45$ ; subgroup of TC vs TF.

# STUDY POPULATION



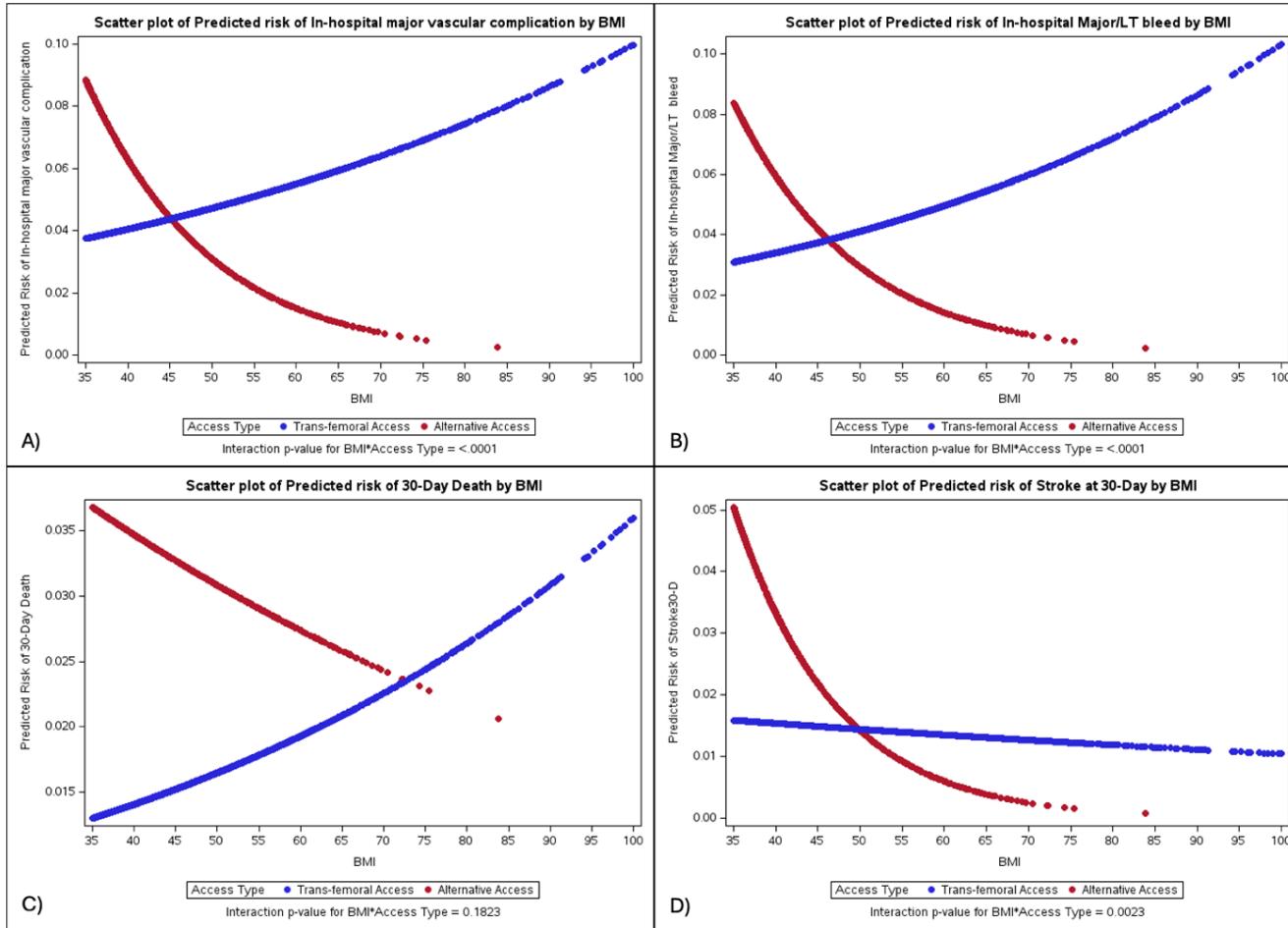
# BASELINE CHARACTERISTICS

Variable	Overall (N=52,251)	TF (N=51,396)	AA (N=855)	P-value
Age, years, median (IQR)	74 (69-79)	74 (69-79)	72 (67-77)	<0.0001
Female sex, n (%)	28,318 (54.2)	27,856 (54.2)	462 (54.0)	0.923
BMI, kg/m <sup>2</sup> , median (IQR)	39.0 (36.7-42.8)	38.9 (36.6-42.7)	42.6 (37.9-50.2)	<0.0001
BMI 35-40, n (%)	30,555 (58.5)	30,238 (58.8)	319 (37.3)	0.717
BMI 40-45, n (%)	13,102 (25.1)	12,919 (25.1)	183 (21.4)	0.057
BMI >45, n (%)	8,596 (16.4)	8,239 (16.0)	353 (41.3)	<0.0001
BSA, mean± SD	2.2 ± 0.2	2.2 ± 0.2	2.3 ± 0.3	<0.0001
Race				0.0056
White	48202 (92.3)	47492 (92.3)	773 (90.4)	
Black	2551 (4.9)	2491 (4.8)	60 (7.0)	
Asian	170 (0.3)	170 (0.3)	0 (0)	
Other	230 (0.4)	224 (0.4)	6 (0.7)	
Missing	1098 (2.1)	1082 (2.1)	16 (1.9)	
Ejection fraction, %, mean± SD	58.3 ± 10.4	58.3 ± 10.4	56.6 ± 11.7	<0.0001
Hemoglobin, g/dL, mean± SD	12.6 ± 2.0	12.6 ± 2.0	12.2 ± 2.0	<0.0001
Platelet count, MuL, mean± SD	217435.4± 69497.4	217341.3± 69436.0	223085.9 ± 72904.0	0.0316
Current/former smoker, n (%)	2,636 (5.0)	2,565 (5.0)	71 (8.3%)	<0.0001
Prior PCI, n (%)	12377 (23.7)	12152 (23.6)	225 (26.3)	0.069
Prior CABG, n (%)	4,663 (8.9)	4,561 (8.9)	102 (11.9)	0.002
Prior aortic valve procedure, n (%)	3,713 (7.1)	3,625 (7.1)	88 (10.3)	0.0003
Prior TIA/stroke, n (%)	4,183 (8.0)	4,098 (8.0)	85 (9.9)	0.035
Carotid stenosis, n (%)	4,835 (9.3)	4,700 (9.1)	135 (15.8)	<0.0001
On dialysis, n (%)	1354 (2.6)	1331 (2.6)	23 (2.7)	0.8504
Chronic lung disease, n (%)	14,915 (28.5)	14,577 (28.4)	338 (39.5)	<0.0001
Proximal LAD ≥70%, n (%)	3,889 (7.4)	3,811 (7.4)	78 (9.1)	0.047
Atrial fibrillation/flutter, n (%)	17,351 (33.2)	17,033 (33.1)	318 (37.2)	0.013
Prior permanent pacemaker, n (%)	4222 (8.1)	4166 (8.1)	56 (6.5)	0.0976
Diabetes mellitus, n (%)	27,996 (53.6)	27,494 (53.5)	502 (58.7)	0.002

# OUTCOMES: MATCHED COHORT BMI $\geq 35$

Outcome	TF (N=3,420)	Alternative (N=855)	P-value
30-day Mortality, n (%)	71, (2.1)	28, (3.3)	0.0007
30-day Stroke, n (%)	45, (1.3)	23 (2.7)	0.0053
In-hospital Significant Vascular Complications, n (%)	149 (4.4)	45 (5.3)	0.190
In-hospital Major or Life-threatening Bleeding (VARC-3), n (%)	131 (3.8)	43 (5.0)	0.100
In-hospital VARC degree of Bleeding (TAVR), n (%)			0.0788
No VARC major or LT bleeding	3,289 (96.2)	810 (94.7)	
Major bleeding event, not LT	81 (2.4)	33 (3.9)	
LT or disability bleeding event	48 (1.4)	11 (1.3)	
In-hospital Minor vascular complication, n (%)	81 (2.4)	23 (2.7)	0.9621
In-hospital VARC-3 Degree of Bleeding, n (%)			0.0003
No bleeding	3,966 (92.8)	772 (90.3)	
Type I bleeding	135 (3.2)	40 (4.7)	
Type II bleeding	115 (2.7)	29 (3.4)	
Type III bleeding	56 (1.3)	13 (1.5)	
Type IV bleeding	3 (0.1)	1 (0.1)	
Composite In-hospital/30-day Mortality, n (%)	72 (2.1)	29 (3.4)	0.0004
30-day Composite TAVR Outcome, n (%)	277 (8.10)	89 (10.40)	0.0024
Fluoroscopy Time, minutes			
Mean $\pm$ SD	16.8 $\pm$ 12.6	20.0 $\pm$ 13.9	<0.0001
Median (IQR)	13.0 (9.4-18.5)	16.9 (12.3-23.1)	<0.0001
Procedural Complications			
In-hospital Stroke	274 (8.0)	84 (9.8)	0.0231
In-hospital TIA	33 (1.0)	18 (2.1)	0.0032
Conversion to open surgery	0 (0.0)	3 (0.4)	0.0059
Other unplanned cardiac interventions	11 (0.3)	6 (0.7)	0.0325
	39 (1.1)	17 (2.0)	0.0019

# BMI AND PREDICTED RISK OF ADVERSE OUTCOMES



# OUTCOMES: MATCHED COHORT BMI $\geq 45$

Outcome	TF (N=353)	Alternative (N=353)	P-value
30-day mortality, n (%)	6 (1.7)	10 (2.8)	0.3121
30-day stroke, n (%)	1 (0.3)	4 (1.1)	0.1785
In-hospital significant vascular complications, n (%)	20 (5.7)	10 (2.8)	0.0623
In-hospital major or LT bleeding (VARC-3), n (%)	17 (4.8)	9 (2.5)	0.1102
In-hospital VARC degree of bleeding (TAVR), n (%)			0.0425
No VARC major or LT bleeding	336 (95.2)	344 (97.5)	
Major bleeding event, not LT	6 (1.7)	6 (1.7)	
LT or disability bleeding event	11 (3.1)	2 (0.6)	
In-hospital minor vascular complication, n (%)	14 (4.0)	5 (1.4)	0.0365
In-hospital VARC-3 degree of bleeding, n (%)			0.4163
No bleeding	329 (91.5)	772 (90.3)	
Type I bleeding	13 (3.7)	40 (4.7)	
Type II bleeding	11 (3.1)	29 (3.4)	
Type III bleeding	6 (1.7)	13 (1.5)	
Type IV bleeding	-	-	
Composite in-hospital/30-day mortality, n (%)	7 (2.0)	11 (3.1)	0.3399
30-day composite TAVR outcome, n (%)	25 (7.1)	24 (6.8)	0.8302
Fluoroscopy time (minutes), mean $\pm$ SD	16.0 $\pm$ 8.4	19.4 $\pm$ 10.1	<0.0001
Procedural complications, n (%)			
In-hospital Stroke	26 (7.4)	27 (7.6)	0.9140
In-hospital TIA	1 (0.3)	4 (1.1)	0.1785
Conversion to open surgery	0 (0.0)	1 (0.3)	0.3173
Other unplanned cardiac interventions	0 (0.0)	1 (0.3)	0.3180
	4 (1.1)	8 (2.3)	0.2445

# ODDS OF OUTCOMES IN MATCHED COHORT BMI $\geq$ 45

Outcome	Unadjusted Odds Ratio	P-value
30-day mortality	1.69 (0.60-4.74)	0.3221
30-day stroke	4.03 (0.45-36.46)	0.2143
In-hospital significant vascular complication	0.49 (0.22-1.07)	0.0726
In-hospital VARC-3 Major or LT bleed	0.52 (0.24-1.12)	0.0926
In-hospital minor vascular complication	0.35 (0.12-0.99)	0.0473
Fluoroscopy time	1.67 (1.22-2.29)	0.0014

Access type reference: TF Access, TC n=216, TF n=432

# ODDS OF OUTCOMES IN MATCHED COHORT

## TC vs. TF BMI $\geq 45$

Outcome	Unadjusted Odds Ratio	P-value
30-day mortality	0.89 (0.27-2.95)	0.8445
30-day stroke	0.36 (0.08-1.64)	0.1863
In-hospital Significant Vascular Complication	0.34 (0.13-0.92)	0.0340
In-hospital VARC-3 Major or LT bleed	0.23 (0.07-0.78)	0.0180

Access type reference: TF Access; n=648

# LIMITATIONS

- Retrospective registry analysis.
- Residual confounding (frailty, anatomy not captured).
- Short-term (30-day) follow-up.
- BMI does not reflect fat distribution.

# CONCLUSIONS

- Overall, AA has higher risk of stroke and 30-day mortality in patients with  $\text{BMI} \geq 35$  relative to TF.
- At  $\text{BMI} \geq 45$ , the balance shifts:
  - AA, especially TC, offers vascular safety without added mortality or stroke.
- Implications:
  - Procedural planning should integrate BMI along with anatomy and comorbidity.
  - As obesity prevalence rises, tailored access strategies including increased use of TC will be critical to optimize outcomes.

# ACKNOWLEDGEMENTS

**Co-authors:** Aneel S. Maini, M.D., Miloni Shah, M.S., Andrzej Kosinski, Ph.D., Ambarish Pandey, M.D., Saket Girotra, M.D., Sreekanth Vemulapalli, M.D., Tsuyoshi Kaneko, M.D., Thomas Koshy, M.D., Ki Park, M.D., Ian Neeland, M.D., Brian R. Lindman, M.D., M.Sc.

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