TAVR Explant

-The next Challenging Issue in the lifetime TAVR management-

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SCHOOL OF MEDICINE

NATIONAL LEADERS IN MEDICINE

Disclosure

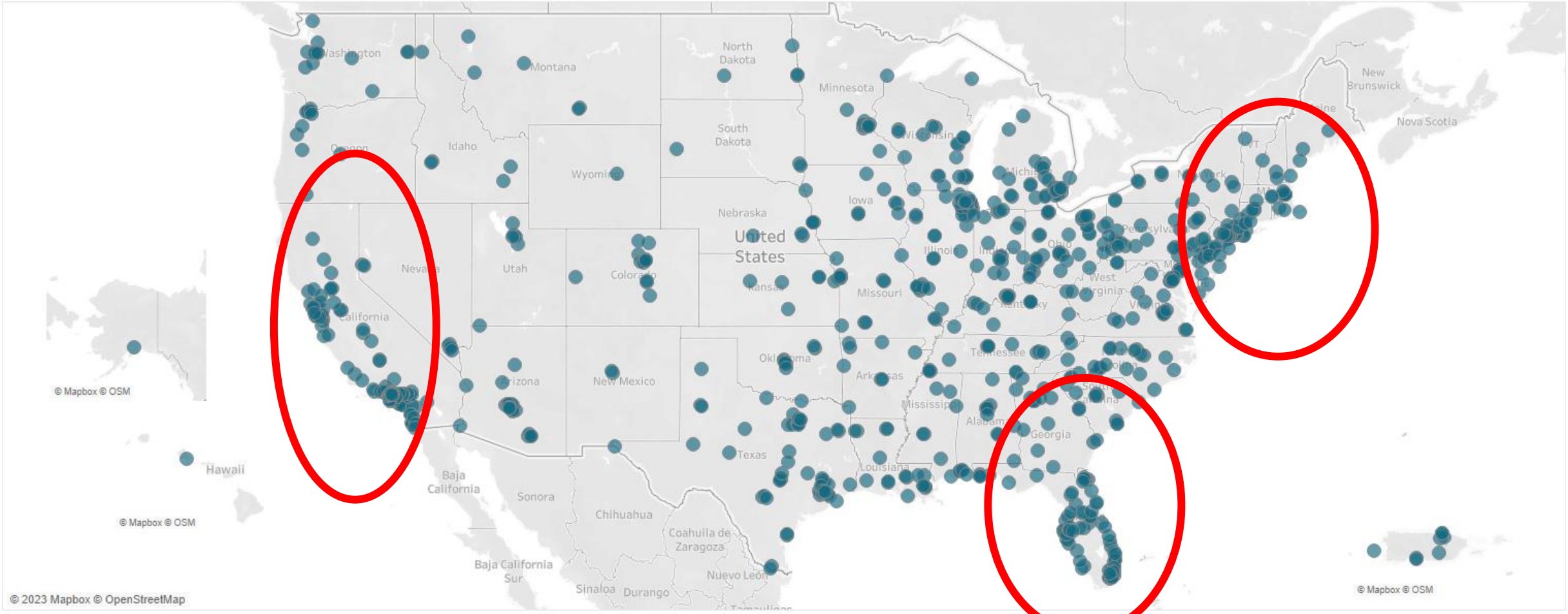
- Advisory Board, Consultant- Edwards Lifesciences, Abbott
- Consultant, Speaker- Medtronic

TVT Registry Participants Across the United States

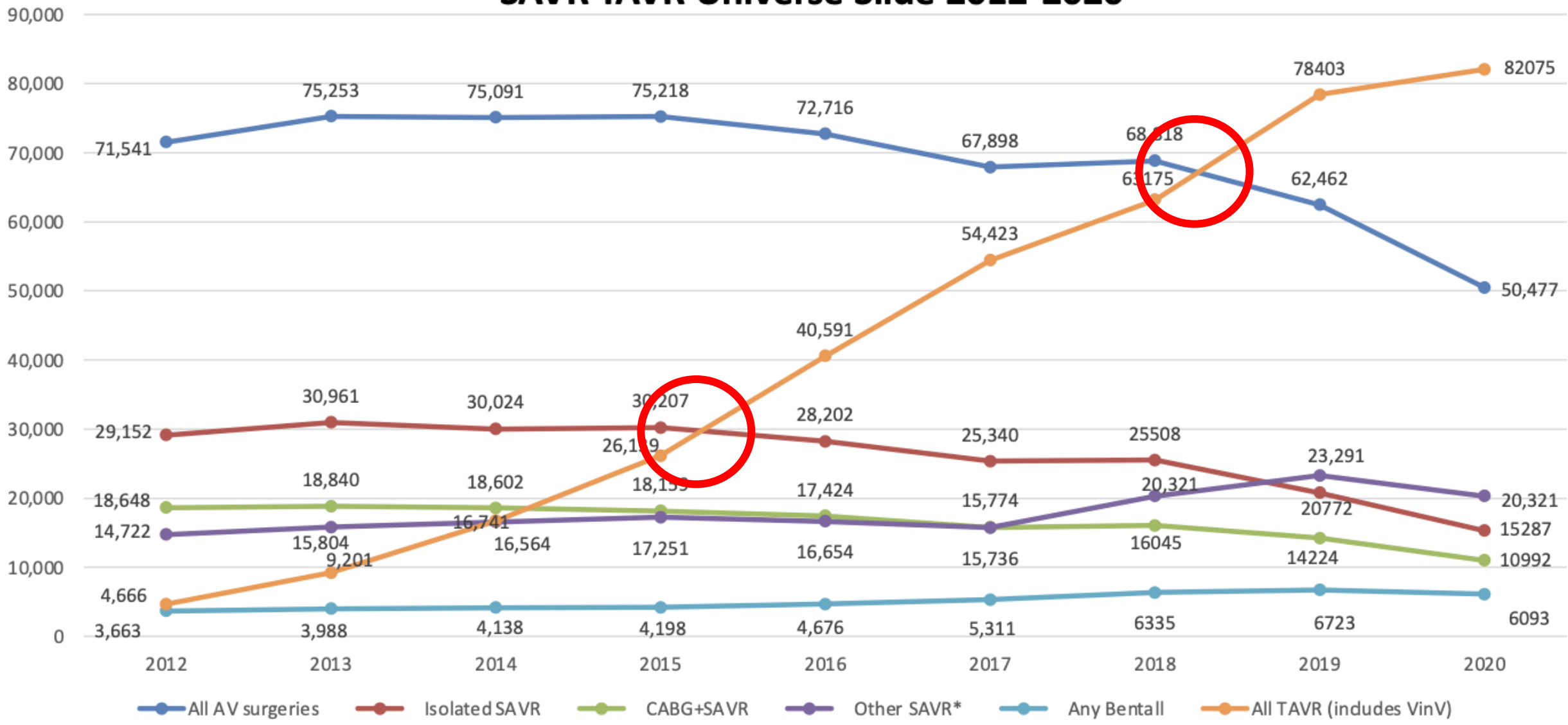
823 Site Participants as of April 2023

NCDR
AMERICAN COLLEGE of CARDIOLOGY

CA	FL	TX	PA	OH	IL	NY	MI	LA	IN	AZ	MO	WI	GA	NJ	NC	VA	TN	AL	WA	SC	KY	MN	MA	CO	OR	IA	OK	KS	CT	AR	PR	MS	MD	NV	UT	NE	WV	MT	ID	NH	ND	SD	NM	ME	DE	HI	DC	AK	WY	VT	RI
89	72	63	44	34	34	33	30	22	20	20	19	18	18	17	17	16	16	16	15	14	14	13	13	12	11	10	9	9	9	9	8	8	8	7	6	6	5	5	5	4	4	3	3	3	3	2	2	2	1	1	1



SAVR TAVR Universe Slide 2012-2020



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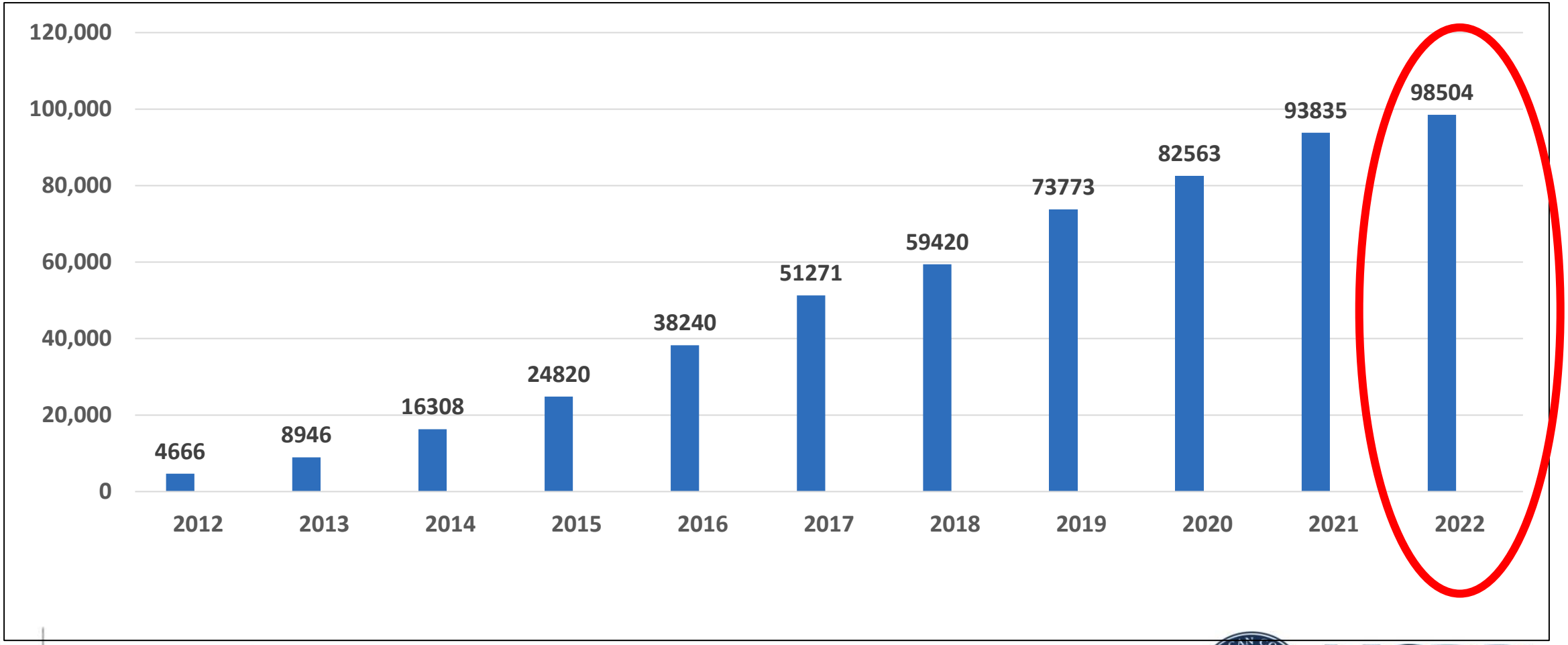
Commercial TAVRs Submitted to TVT Registry



STS National Database™
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Source: STS/ACC TVT Registry Database

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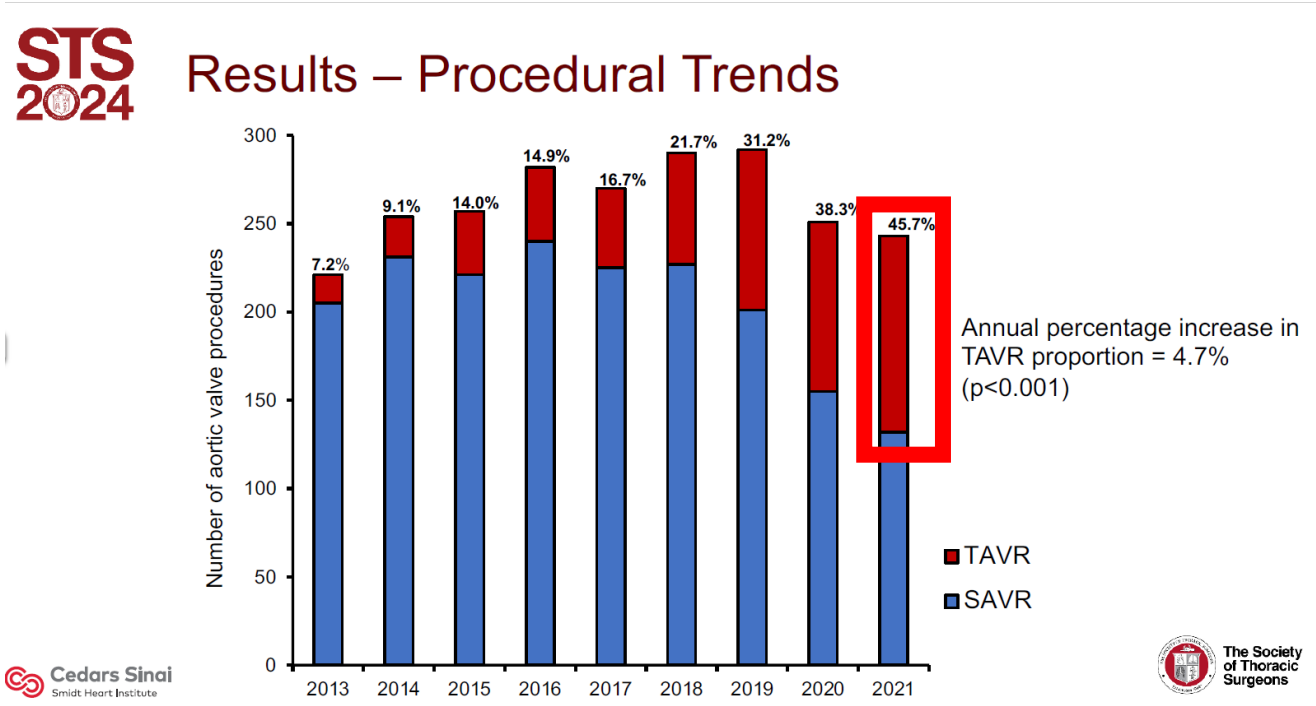
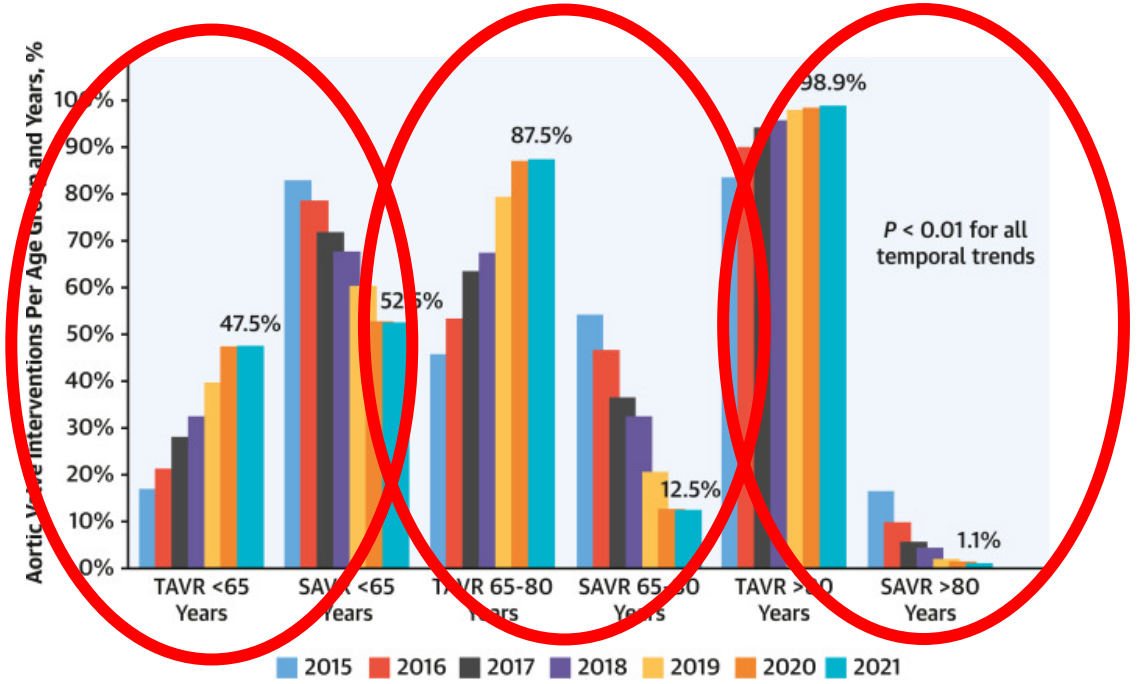
TAVR Usage in Younger Patients

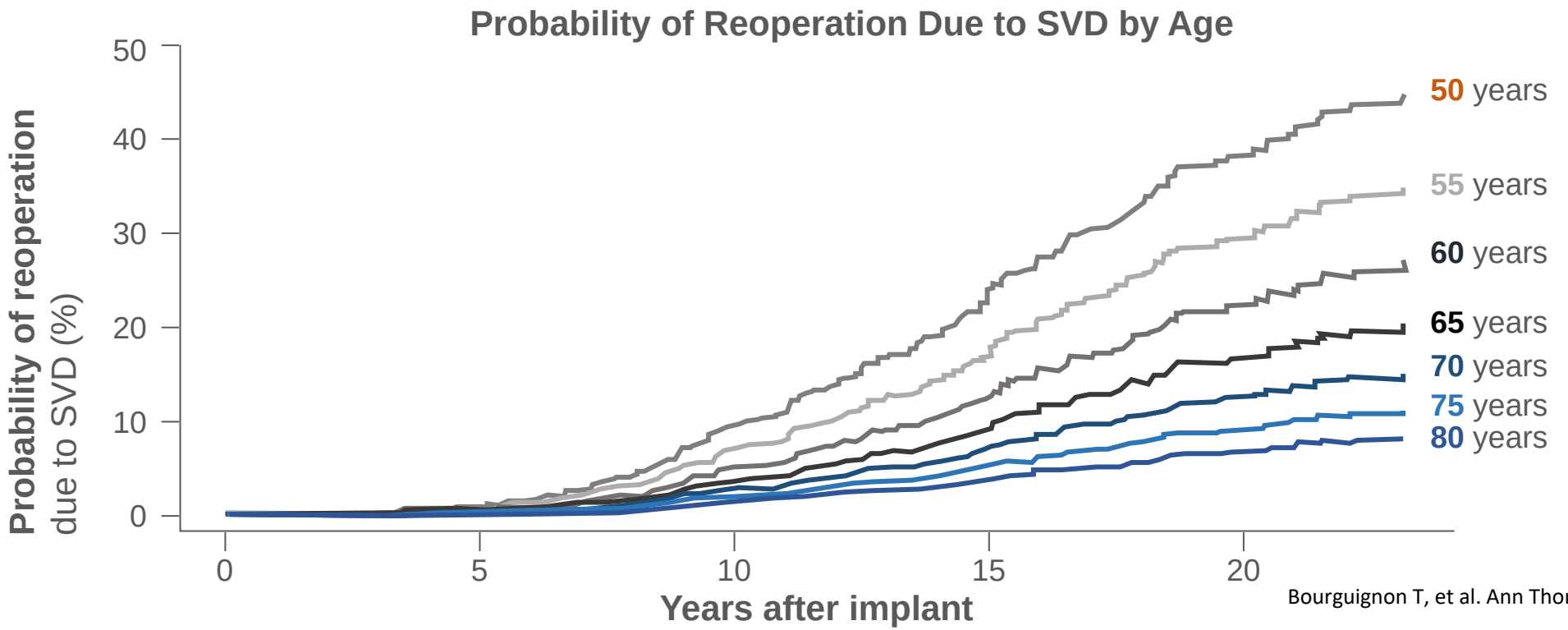


Malas et al. STS 2024



Sharma et al. JACC 2022

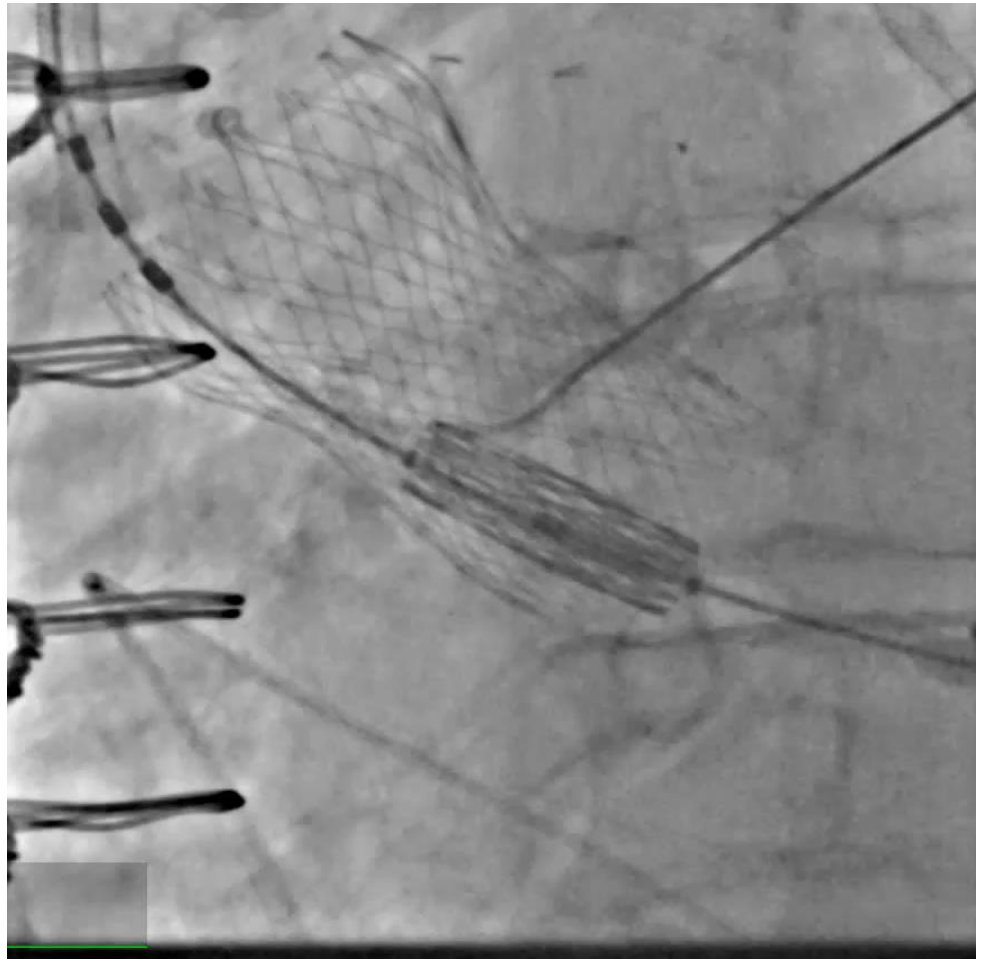
Choice of Bioprosthetic valve

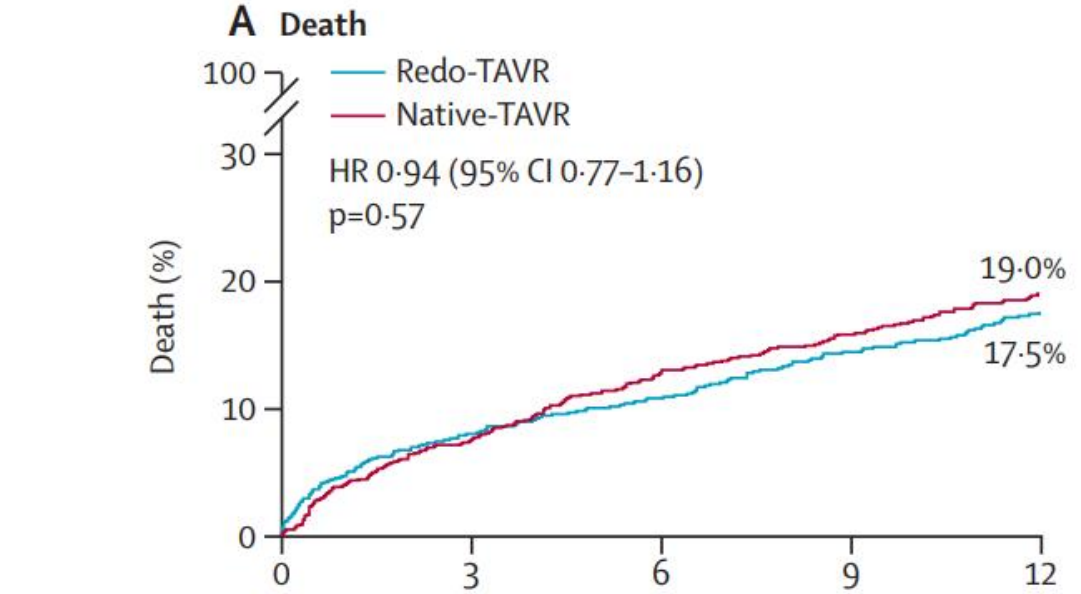


Bourguignon T, et al. Ann Thorac Surg. 2015;99:831–7.

The younger the faster the valve fails

TAV-in-TAV



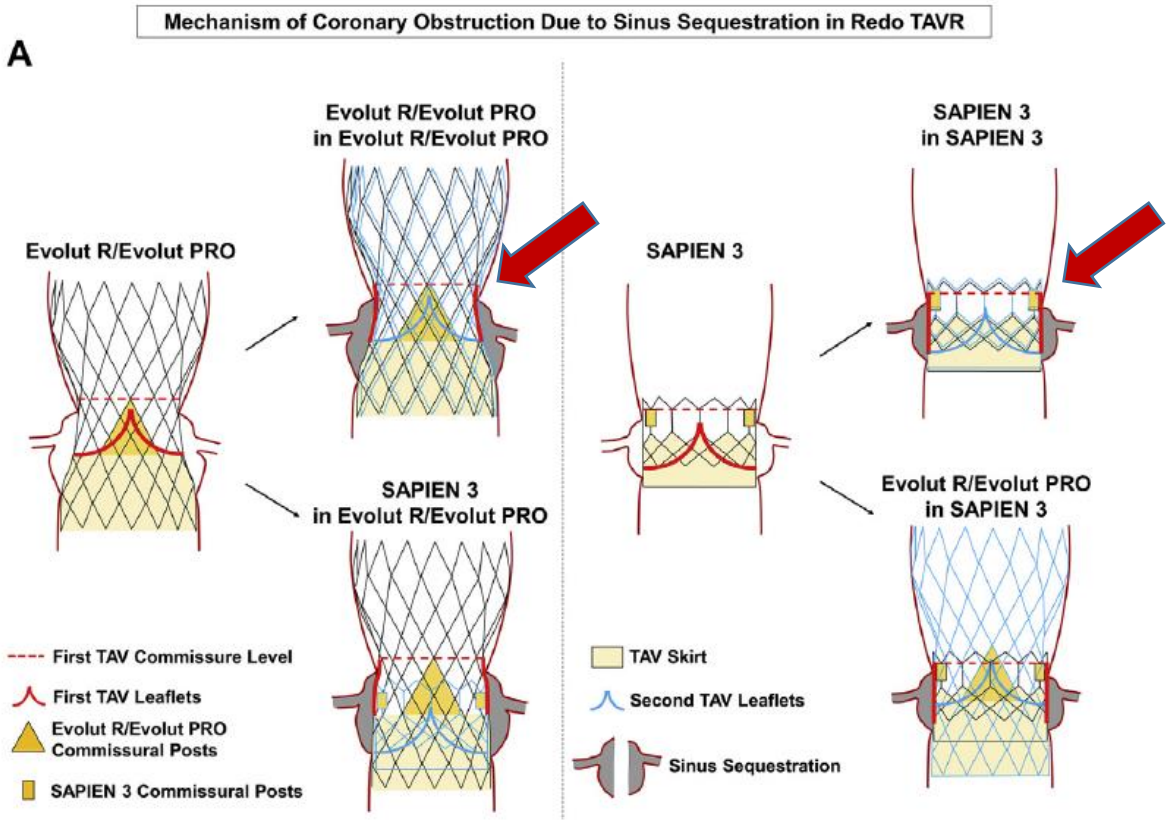


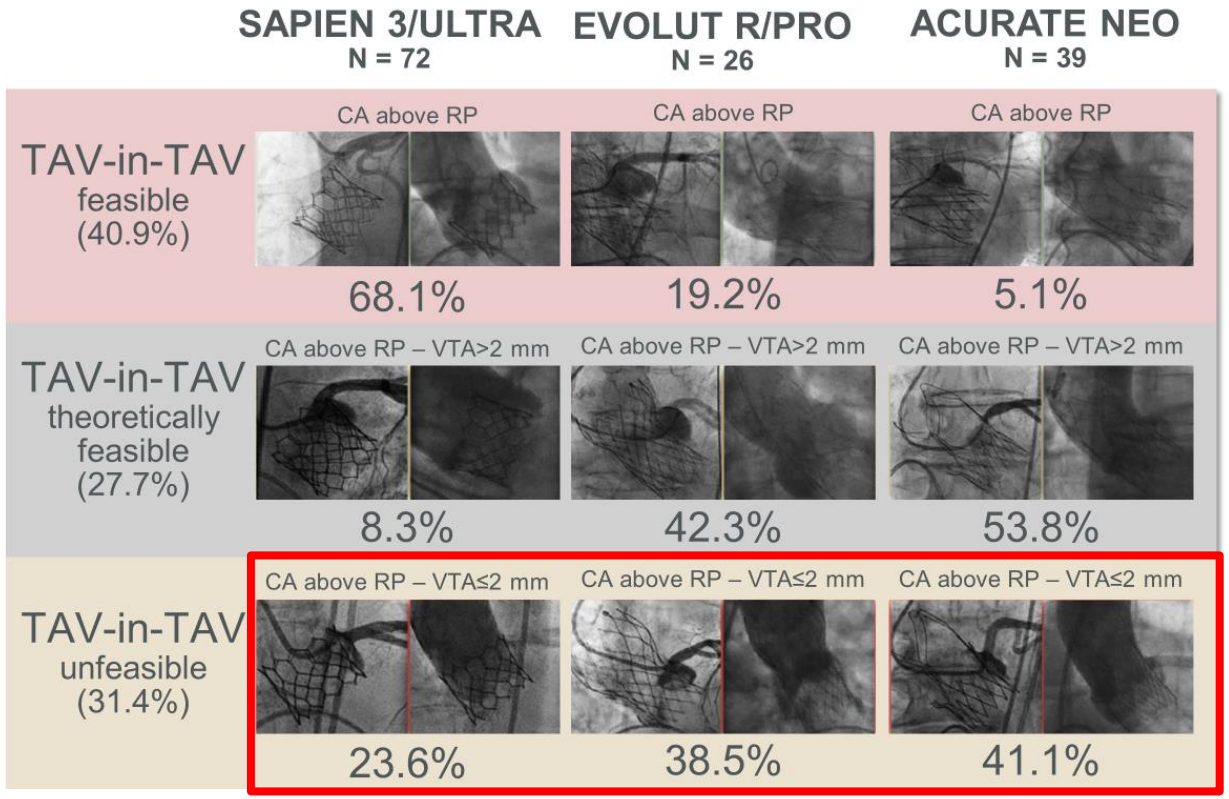
Number at risk

Redo-TAVR	1320	782	726	674	537
Native-TAVR	1320	895	820	770	631

Makkar, Thourani et al. Lancet 2023

Issue with TAV-in-TAV: Sinus Sequestration

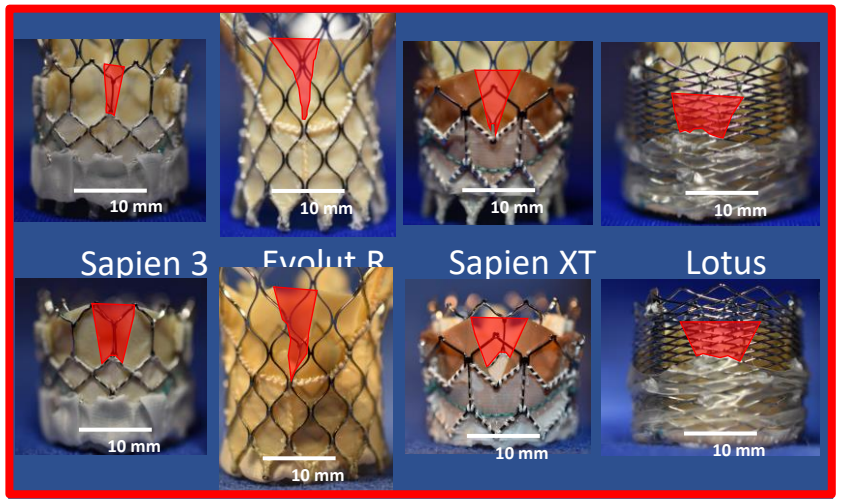




Ochiai et al. JACC int 2020

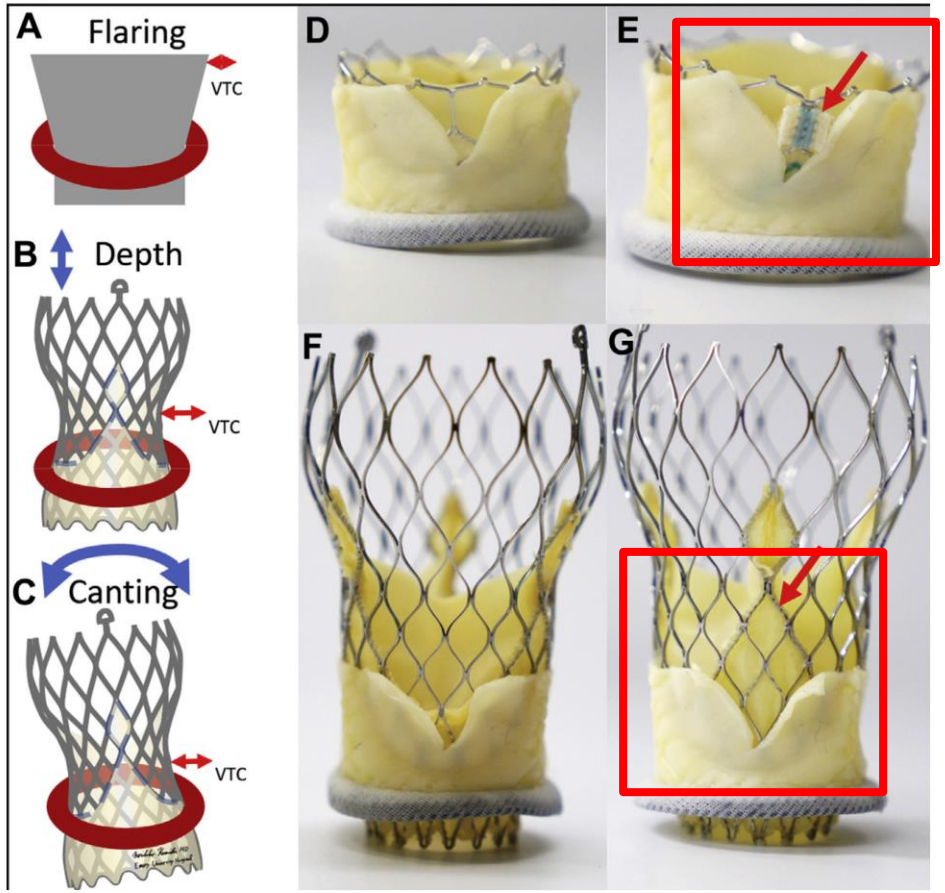
Fovino LN, et al. J Am Heart Assoc. 2020.

Just BASILICA?



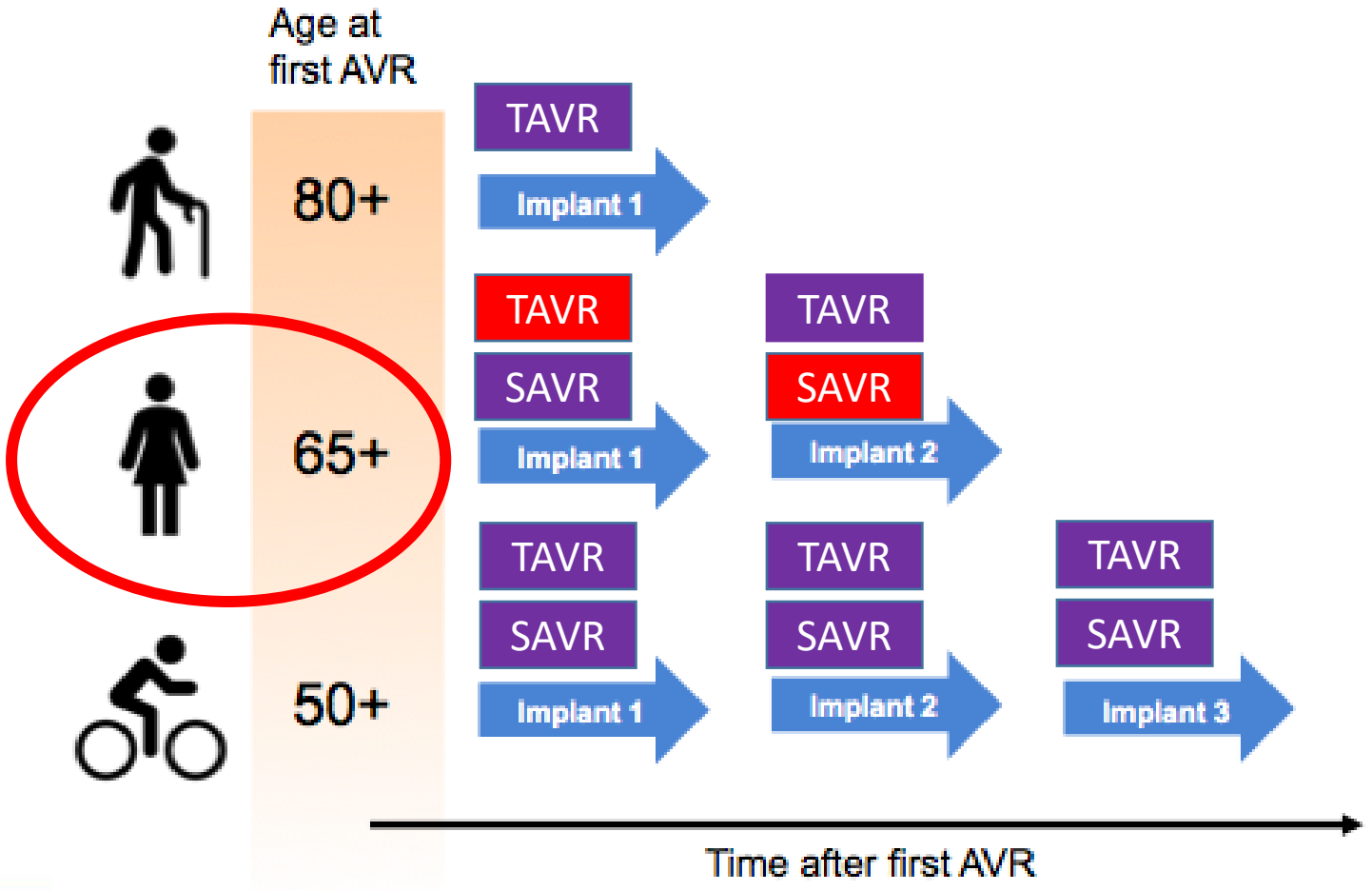
Degenerated Valve	Splay Angle (degrees, min/max)	Slit width maximum (mm)	Slit height (mm)	Splay area free of TAVR skirt (mm^2)
Evolut R implanted in prior TAVR				
Sapien 3 23mm	11	3	14	12
Evolut R 23mm	16 / 52	7	12	29
Sapien XT 23mm	34	6	9	26
Lotus 25mm	59	10	10	37
Sapien 3 implanted in prior TAVR				
Sapien 3 23mm	22	6	14	32
Evolut R 23mm	19 / 34	6	12	33
Sapien XT 23mm	49	8	9	30
Lotus 25mm	56	11	11	41

Khan et al. JACC int 2020

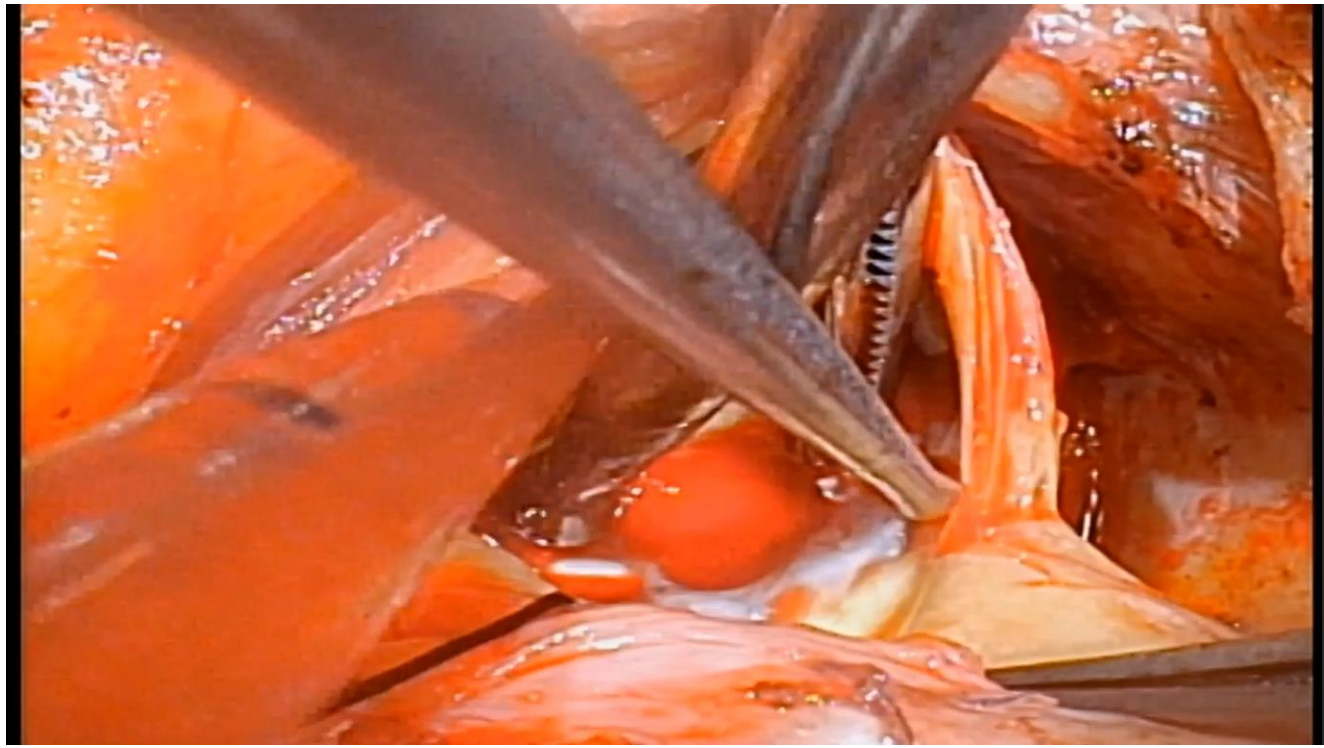


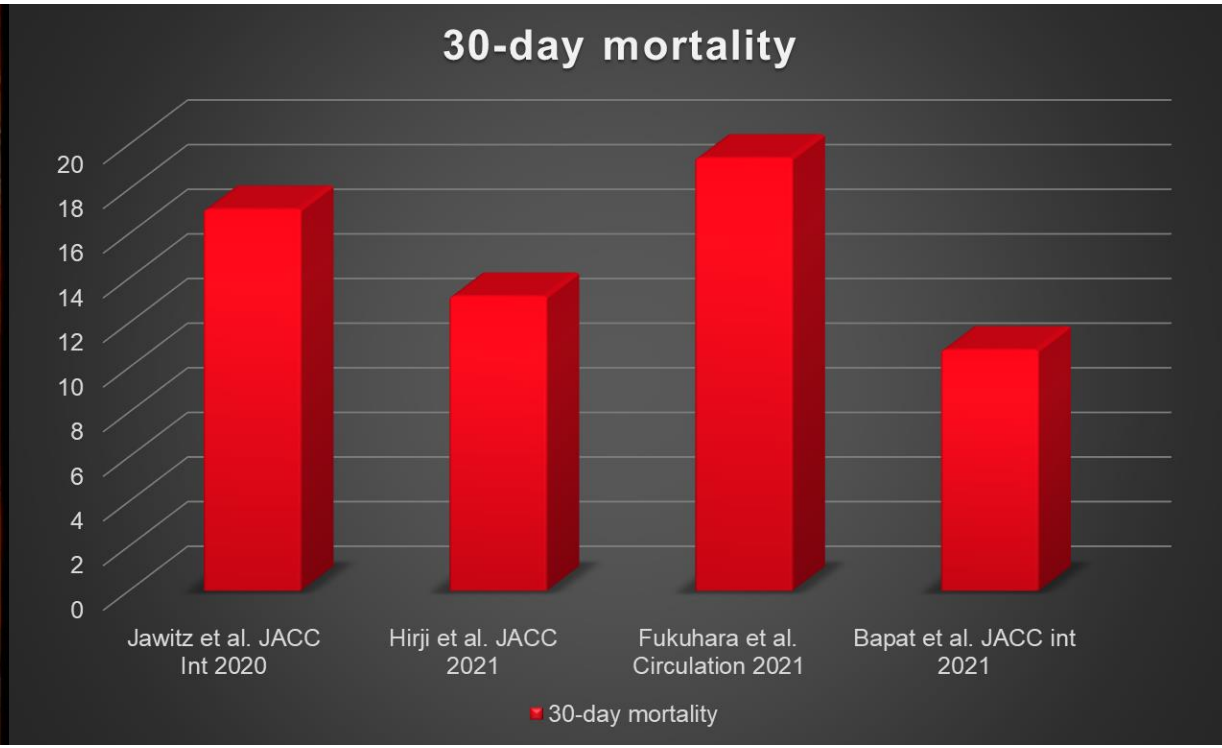
Lederman RJ et al. JACC Int 2020

Last Resort- TAVR Explant



TAVR Explant is reported to have high mortality





These are non-old, non-high-risk patients

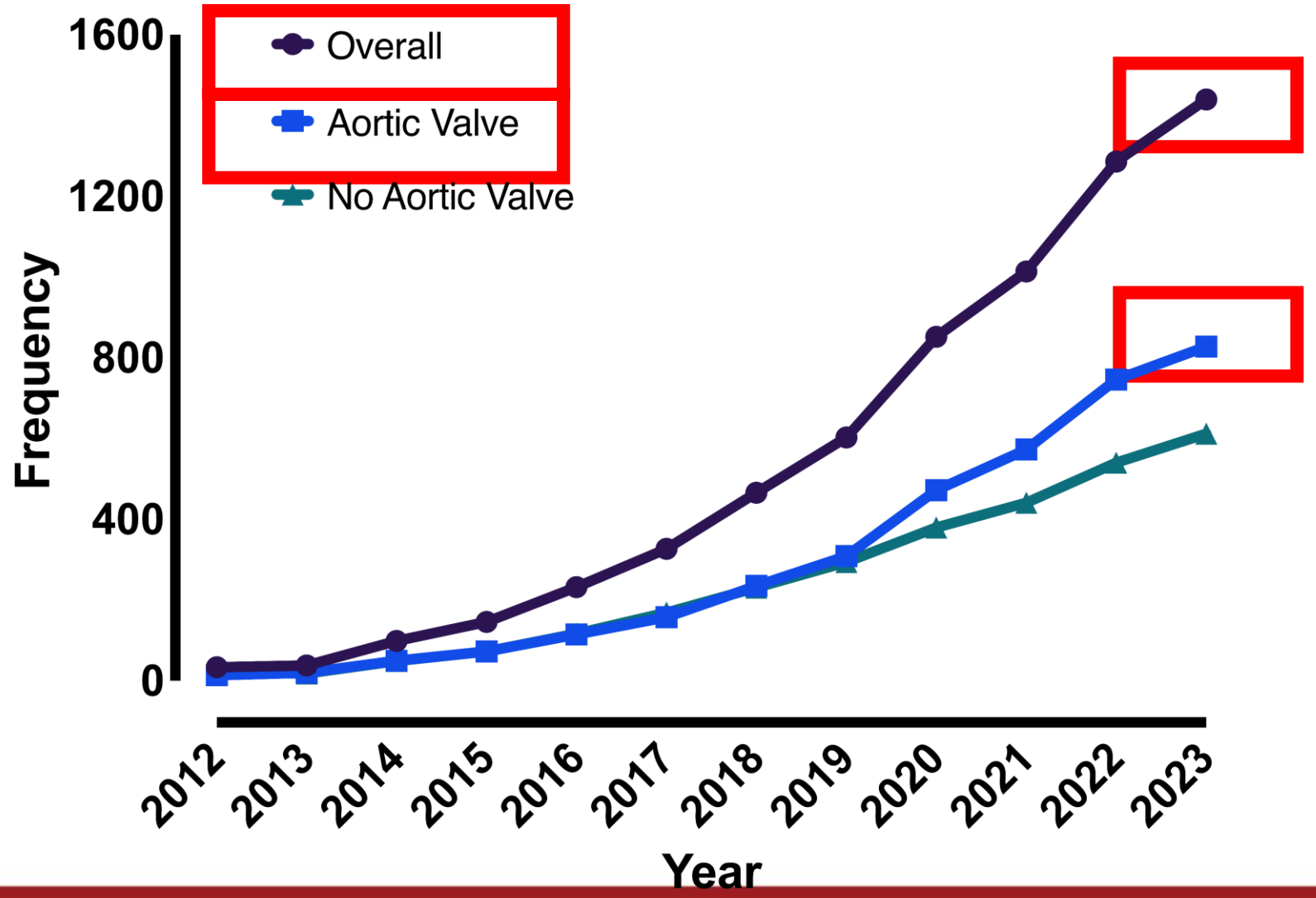
Variables expressed as N (%) or Mean [Stdev]	
Age (Years)	72.4 [10.3]
Female	78 (35)
Frailty	68 (31.1)
Coronary Artery Disease	117 (52.5)
Stroke	37 (16.6)
Porcelain Aorta	16 (7.2)
Left Ventricular Ejection Fraction (%)	50.7 [12.2]
Prior Permanent Pacemaker/ICD	49 (22)
Prior PCI	66 (29.6)
Previous Cardiac Surgery	93 (41.7)
Previous Valve-in-Valve TAVR	
STS-PROM at Original TAVR	4.8 [4.7]
Euro-SCORE II at Original TAVR	7.8 [9.8]
Risk Stratification at Original TAVR	
Low	45 (28)
Intermediate	61 (37.9)
High	41 (25.5)
Extreme	14 (8.7)

Bapat et al. JACC Int 2021

	TAVR Requiring Surgical Explantation (N=227)	*TAVR Not Requiring Explantion (N=132,288)*	*P-Value*
Age, (mean, SD)	73.7 (8.9)	81.7 (8.1)	0.001
≥85 yo, (%)	18 (7.9)	55,693 (42.1)	0.001
Women, (%)	80 (35.2)	62,181 (47.0)	0.001
Dyslipidemia, (%)	156 (68.7)	91,153 (68.9)	0.947
Hypertension, (%)	186 (81.9)	110,211 (83.3)	0.598
Diabetes, (%)	118 (52.0)	58,806 (44.5)	0.023
PVD, (%)	29 (12.8)	17,897 (13.5)	0.837
Stroke or TIA, (%)	14 (6.2)	10,998 (8.3)	0.332
Anemia, (%)	114 (50.2)	67,780 (51.2)	0.791
COPD, (%)	69 (30.4)	34,323 (25.9)	0.128
CKD, (%)	100 (44.1)	63,901 (48.3)	0.137

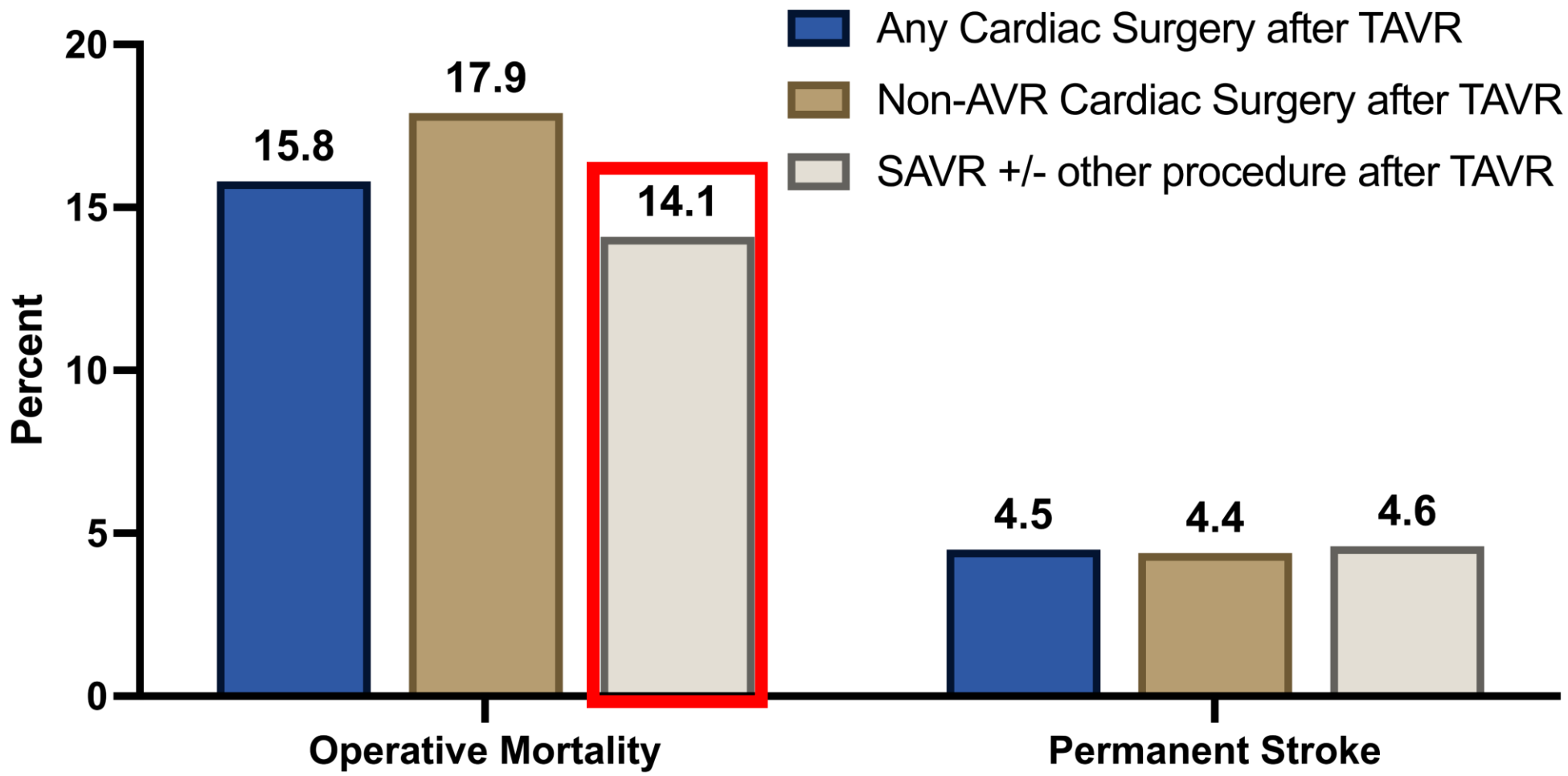
Hirji, Kaneko et al. JACC 2021

Latest data on TAVR Explant from STS Database



Bowdish et al. STS 2024

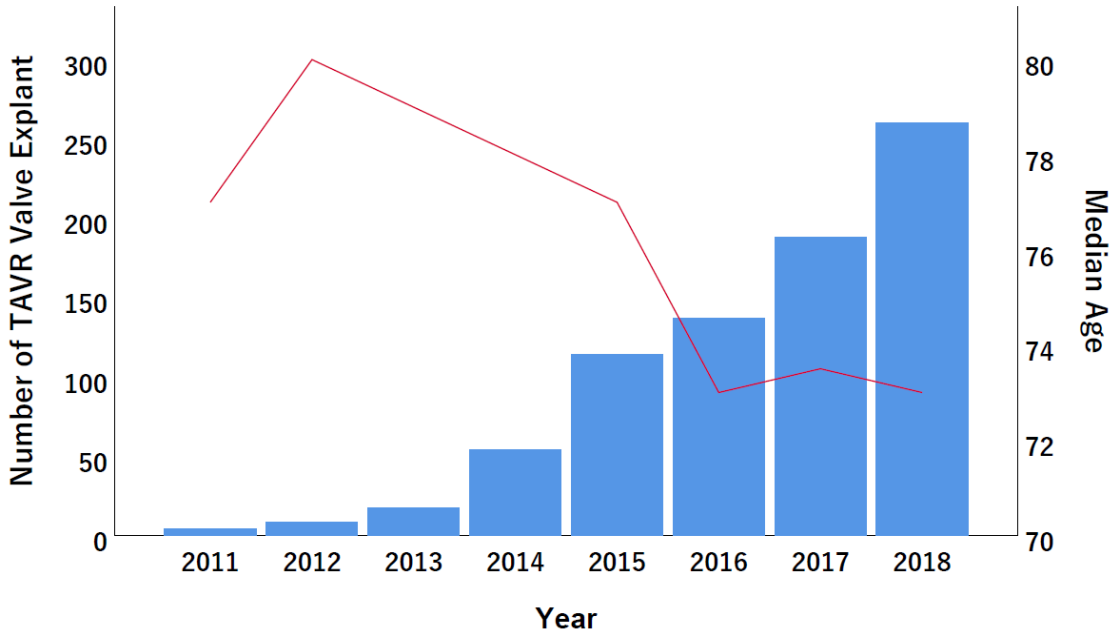
Latest data on TAVR Explant



Bowdish et al. STS 2024

Why is the mortality so high?

TAVR Explant is done by only a small number of surgeons

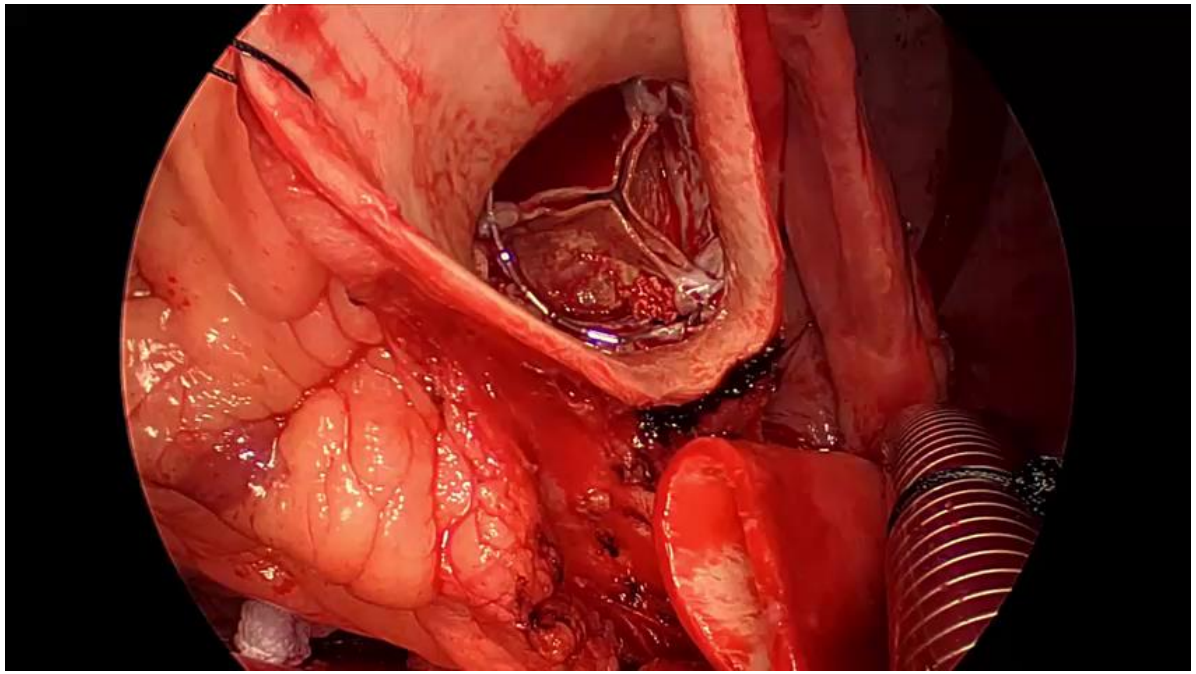


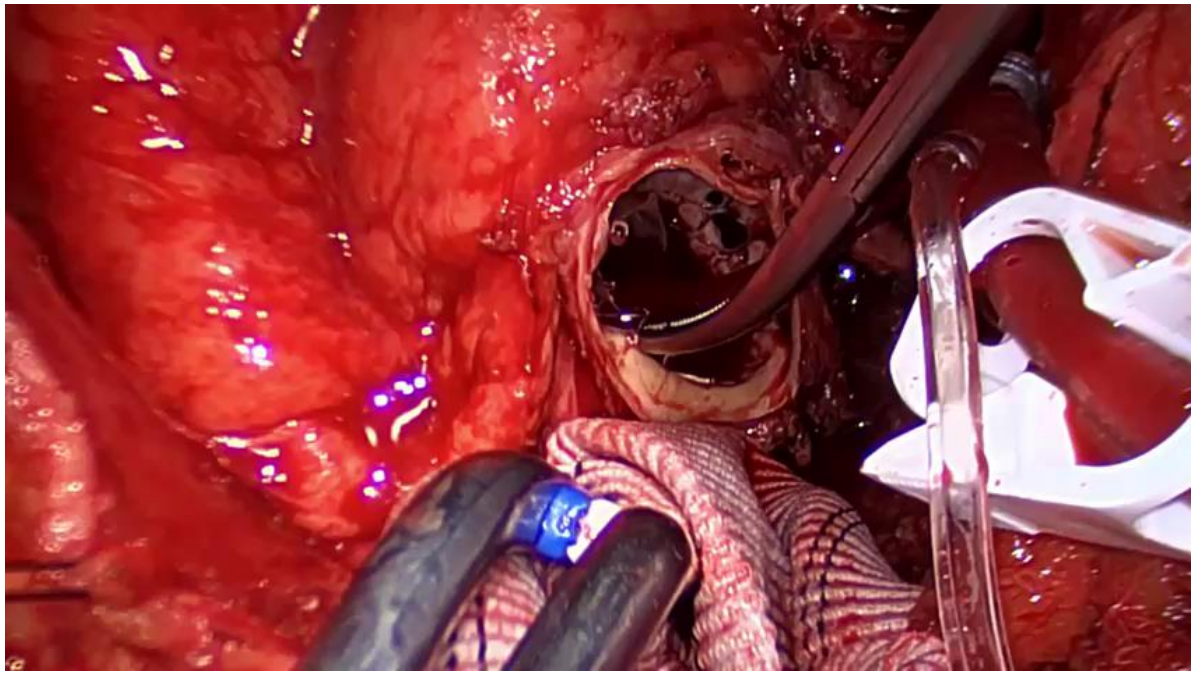
TAVR Explant from 2011-2018 performed by

- 483 surgeons
  - Median 1.0 case per surgeon [IQR 1.0–2.0]
- 313 centers
  - Median 1.0 case per center [IQR 1.0–3.0])

Fukuhara et al. Circulation 2020

Techniques for TAVR Explant





TAVR Explant Education

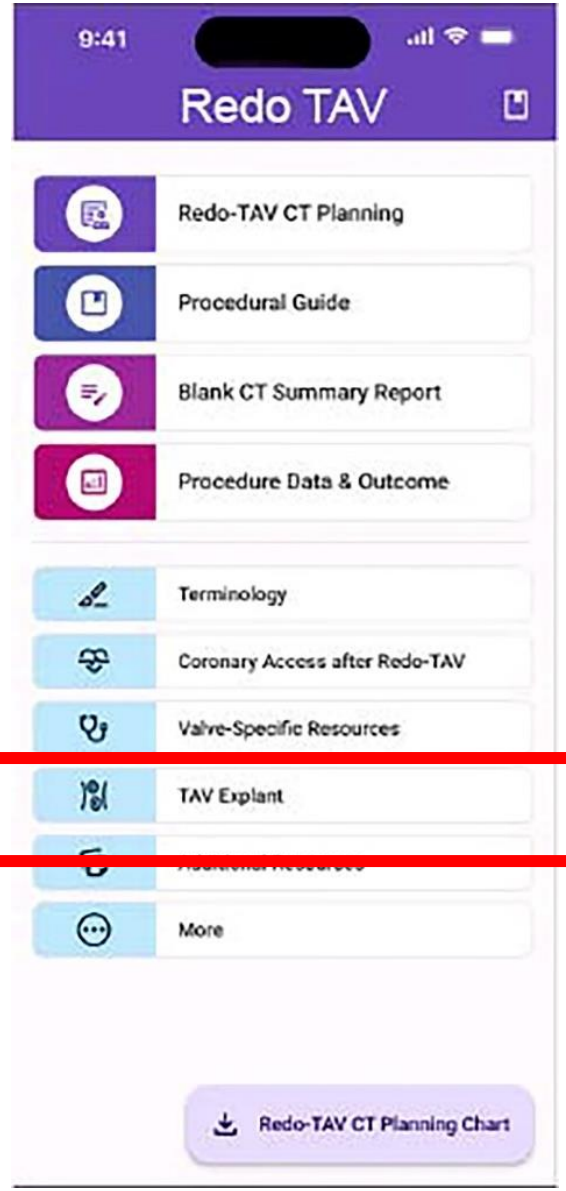
TAVR Explant: The Fastest Growing Cardiac Surgery Procedur

The Journal of Thoracic and Cardiovascular Surgery

JTCVS

AATS

Heart Valve COLLABORATORY



TAV-in-TAV vs TAVR Explant

Contemporary Repeat Transcatheter Aortic Valve Replacement Outcomes in the United States

Fee-For-Service Medicare Beneficiaries | Nationally Representative, Multicenter Analysis | N= 133,250 patients | 2012 - 2017

N=617 (0.46%)
Repeat TAVR procedure

154 days (IQR 58-537)
Median Time-to-Intervention

30-Day Procedural Outcomes

Mortality
6.0%

Stroke
1.8%

Pacemaker Rate
4.2%

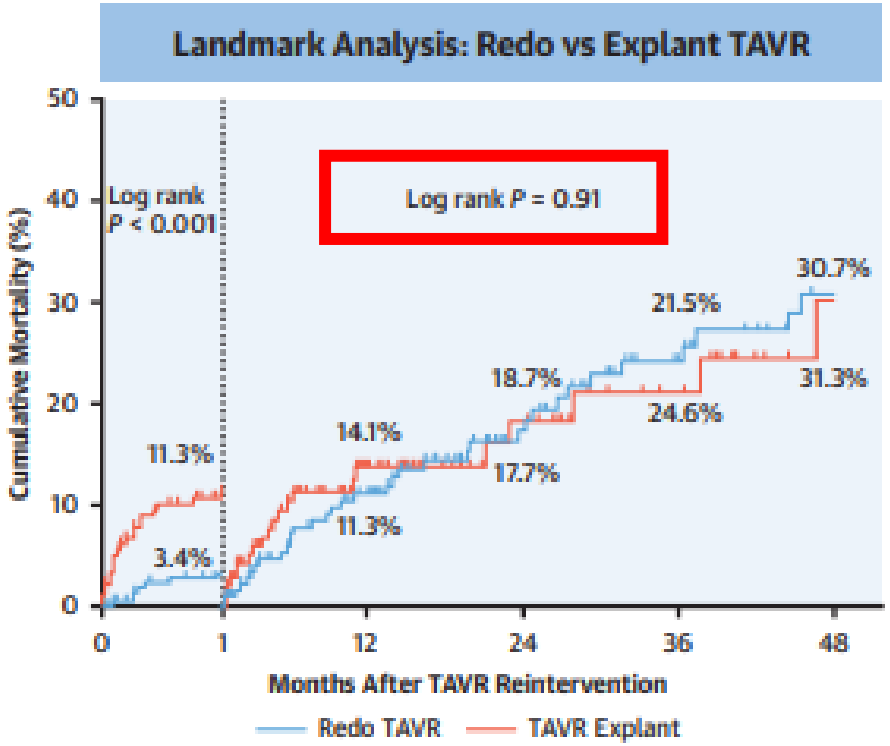
Repeat TAVR **VS.** TAVR Explant

Lower 30-Day Mortality
6.2% vs. 12.3%

Lower 30-Day MACE
Relative Risk: 2.92
(95% CI: 1.88 – 4.99)

Repeat TAVR can be performed with acceptable 30-day mortality and may be considered as a potential option in appropriate patients

Percy, Kaneko et al. JACC int. 2021.

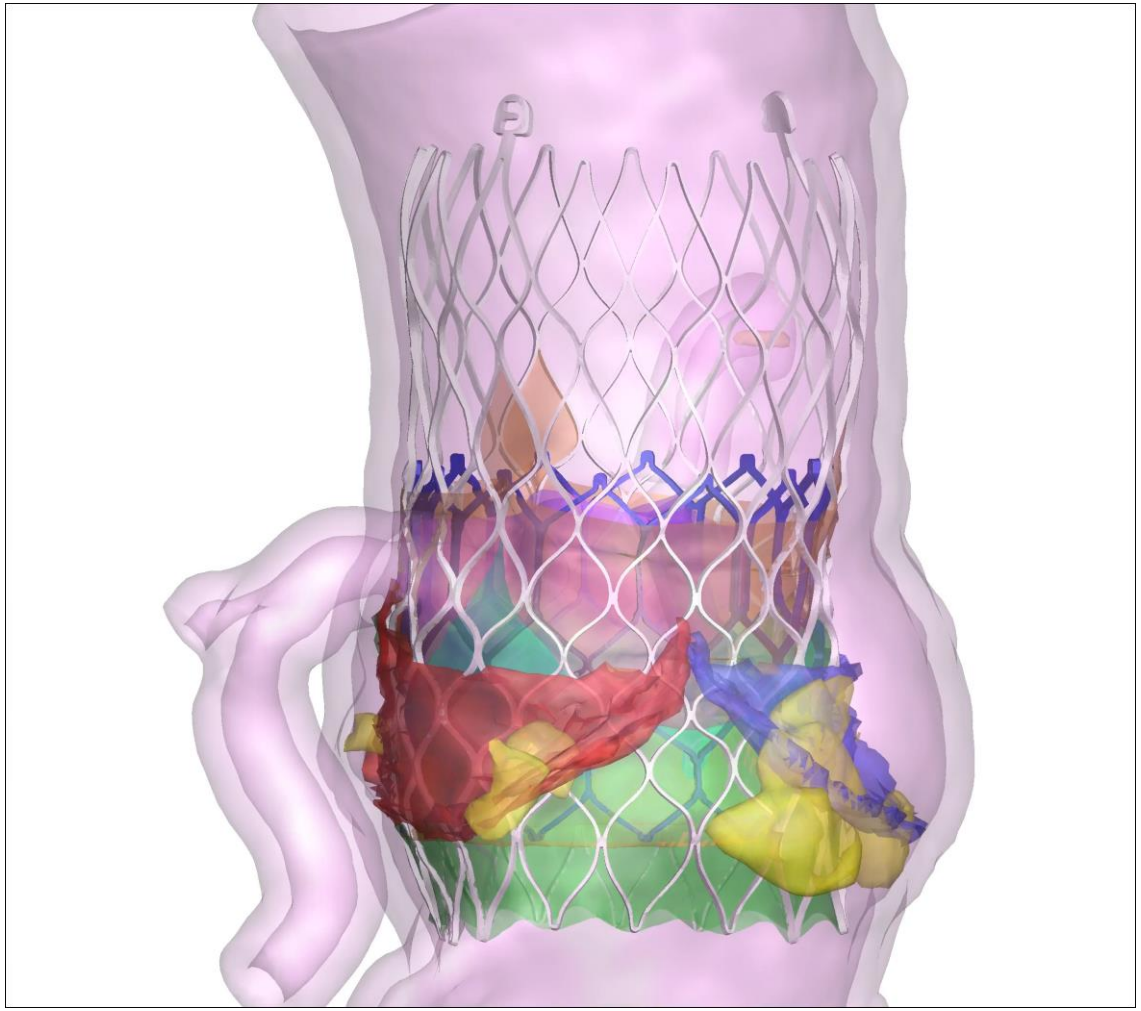


Tang et al. JACC Int 2023

“My” Prediction about TAVR Explant

1. Outcomes will improve to 30-day mortality of 5-6%?
2. Complex Explant (multi-valves, >10yrs) will be done in High Level Valve Centers.
3. The need for root replacement/aortic replacement will decrease.
4. Annual Echo surveillance and early referral will be critical
5. The volume will be higher than Repeat SAVR

Importance of Lifetime Management



Provided by Dasi Simulations

Tackle the problem of Lifetime management together