Cuore e Non Solo - Interventional Cardiology

*Genova, 14 – 15 aprile 2023*

# Una TAVI è per sempre...

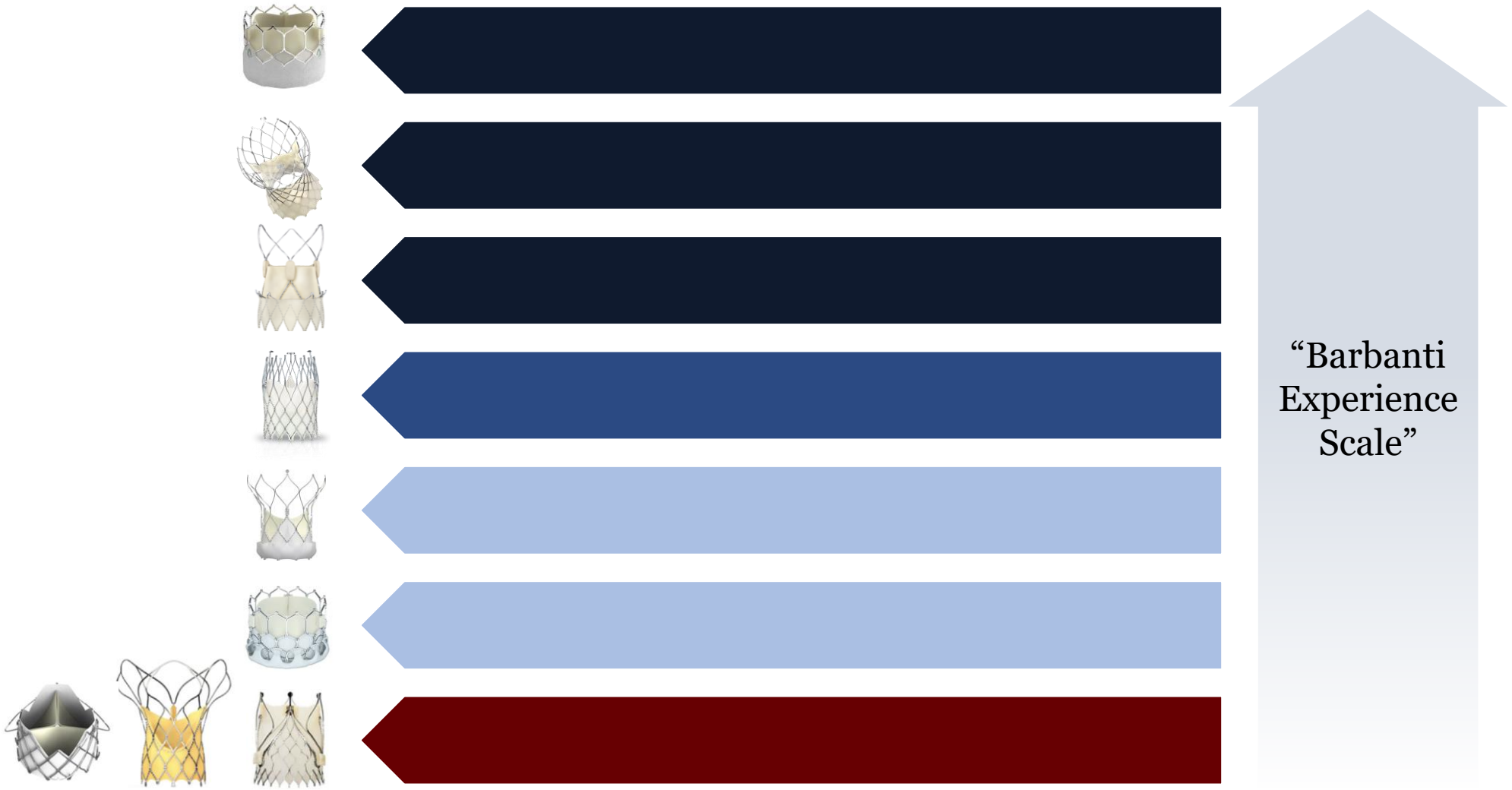
# *Quale device per quale paziente?*

Marco Barbanti

Cvt | Catania valves therapies

AOU Policlinico G. Rodolico-San Marco

# Let’s start from here!



# Evolution of THV selection

## Single valve centers

THV choice dilemma: None!

## Two valves centers

THV choice dilemma:
- Calcium (PVL, rupture)
- RBBB (pacemaker)
- Access
- Local experience

## Multiple valves centers

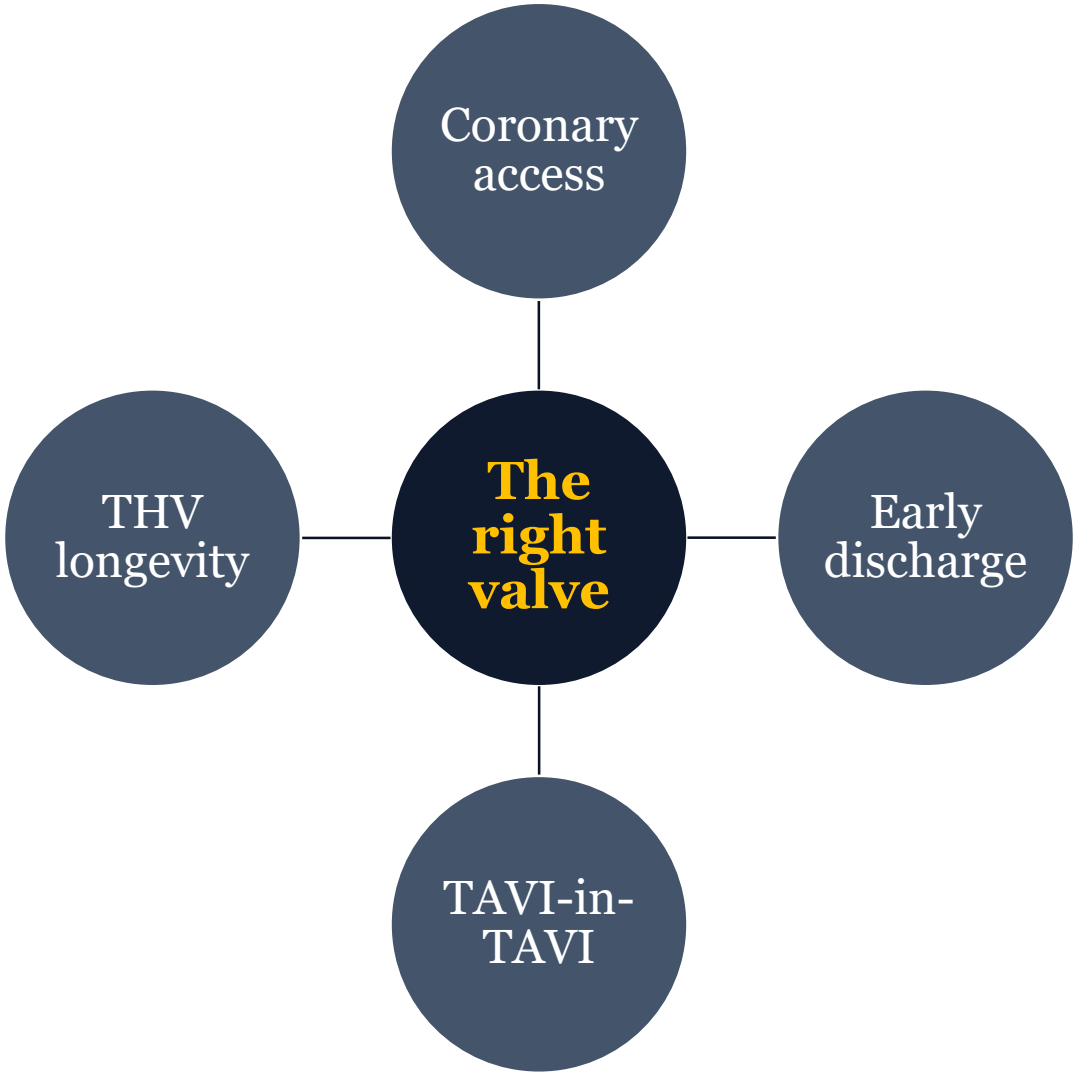
THV choice dilemma:
- Calcium
- RBBB
- Local experience
- Access
- PPM
- Horizontal aorta

Very early days → Early days → Consolidation

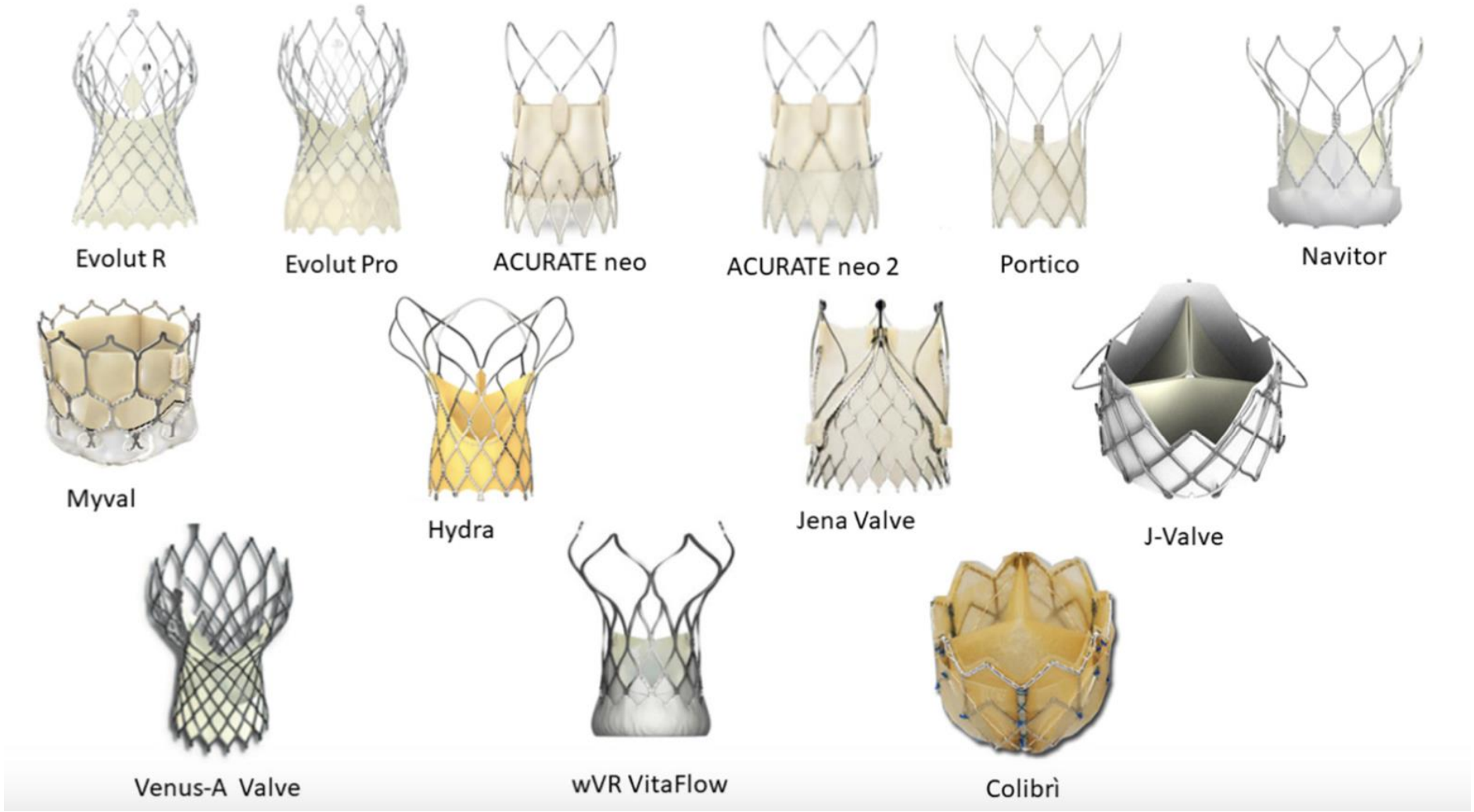
# Valve selection in TAVI today

## Traditional drivers

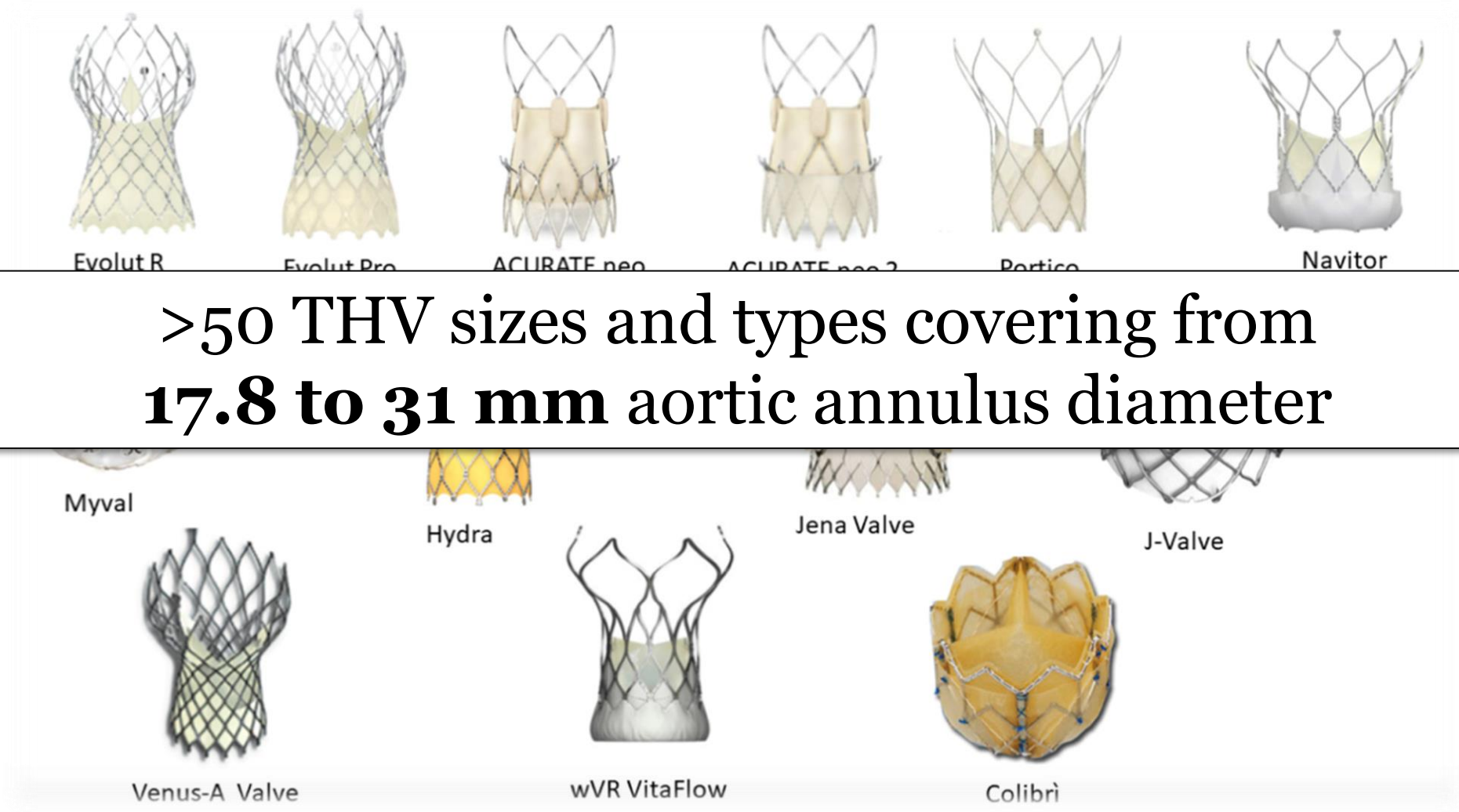
- Calcium
- RBBB
- Local experience
- Access
- PPM
- Horizontal aorta



# TAVI device parade 2023

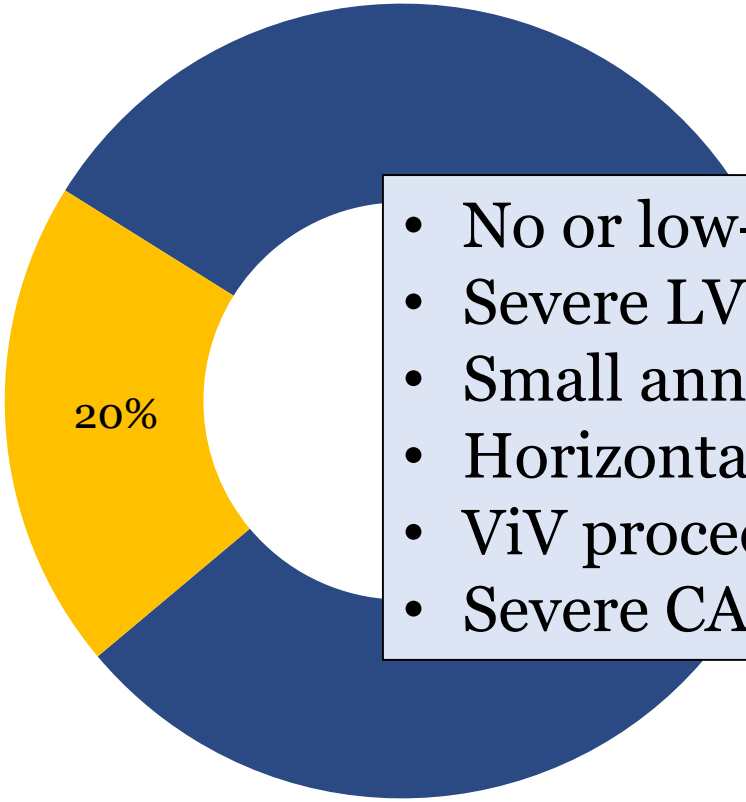


# TAVI device parade 2023




>50 THV sizes and types covering from
**17.8 to 31 mm** aortic annulus diameter

# Which THV for which patient?



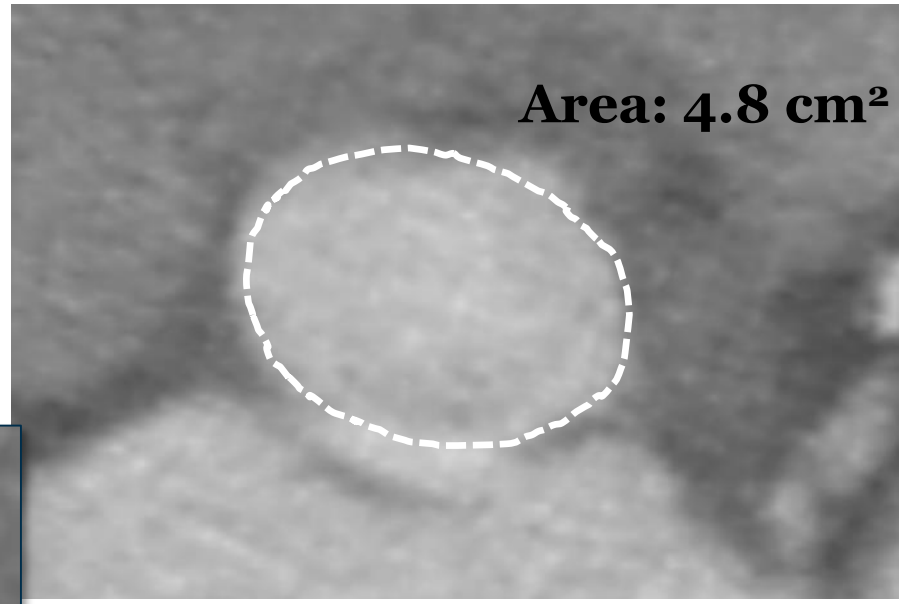

- No or low-quality CTA
- Severe LVOT calcification
- Small annuli
- Horizontal aorta
- ViV procedures
- Severe CAD

Personal estimation

# Which valve for which patient?

## Scenario#1: Low quality CTA

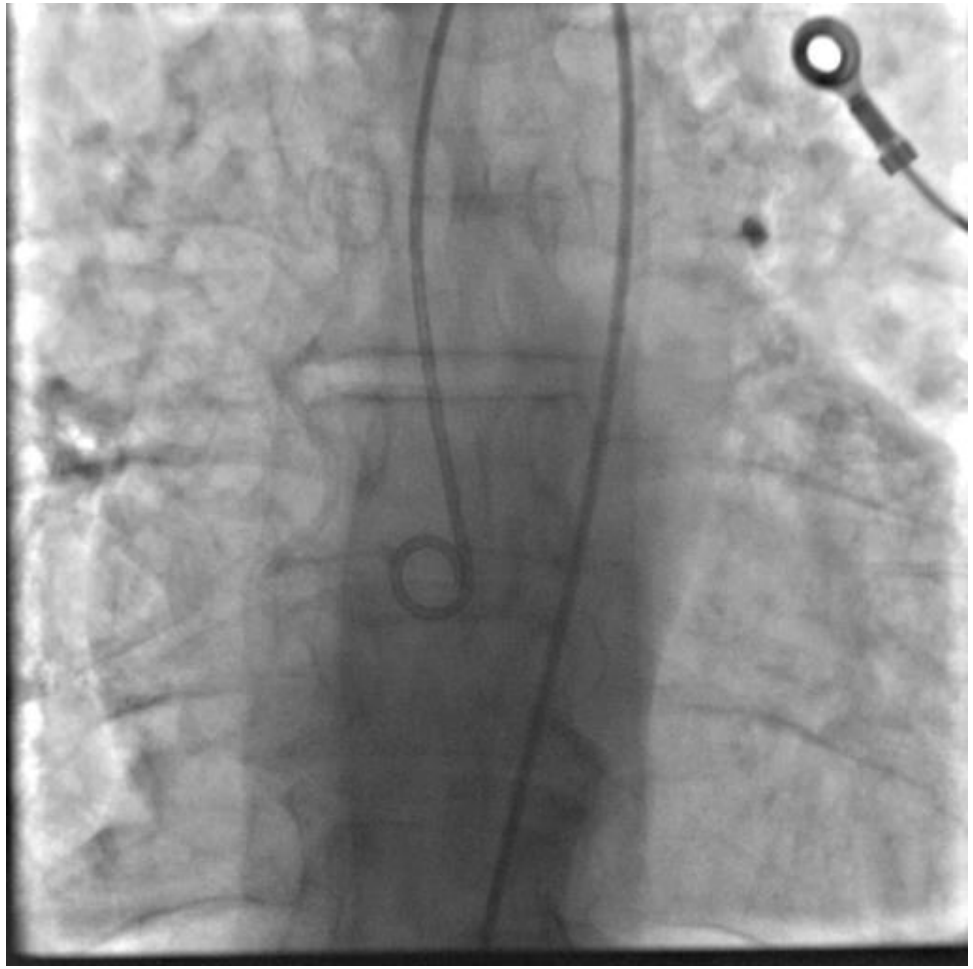
- 84 y.o. Male
- Severe AS
- STS 4.8%
- GFR 35 ml/min
- Accepted for TAVI
- CT Annuls area: 4.8 $cm^2$?




**Motion Artefact!**

# Which valve for which patient?

## Scenario#1: Low quality CTA



# Which valve for which patient?

## Scenario#1: No CTA in an emergent TAVI case

### THV choice: What am I looking for?

1. Highest safety in case of high degree of annulus oversizing and severe calcifications (SE-THV)
2. Lowest delivery profile
3. Recapturability
4. A TAVI platform that I am very experienced with

# Which valve for which patient?

## Scenario#2: Severe LVOT calcifications

- Paravalvular regurgitation
- Aortic rupture

# Which valve for which patient?

## Scenario#2: Severe LVOT calcifications

| Balloon-expandable THV | Univariate | |
|---|---|---|
| | Odds Ratio (95%CI) | P value |
| **Mod/sev LVOT calcium** | 10.92 (3.23-36.91) | <0.001 |
| **Prosthesis oversizing≥20%** | 8.38 (2.67-26.33) | <0.001 |

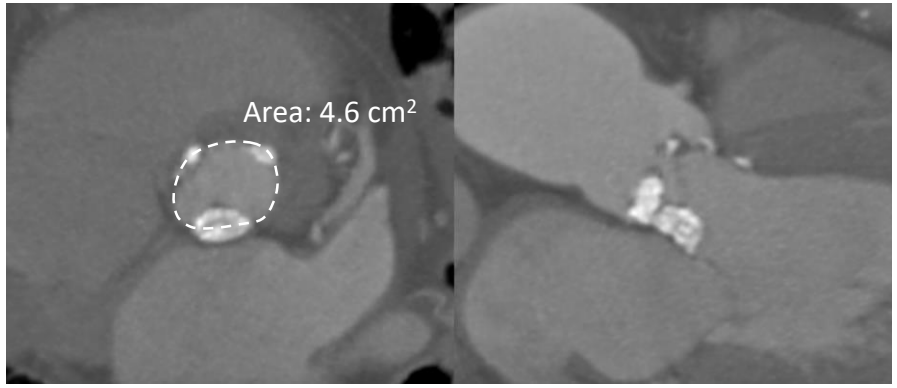



Barbanti et al. Circulation 2013

# Which valve for which patient?

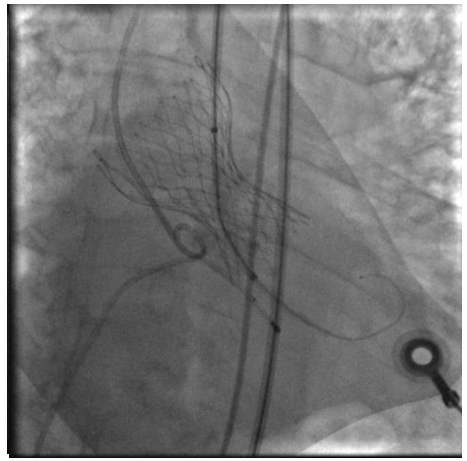
## Scenario#2: Severe LVOT calcifications

- 84 y.o. Male
- Severe AS, STS 12.8%
- Accepted for TAVI
- Unfavorable anatomy (horizontal aorta)
- Severe LVOT $Ca^{++}$



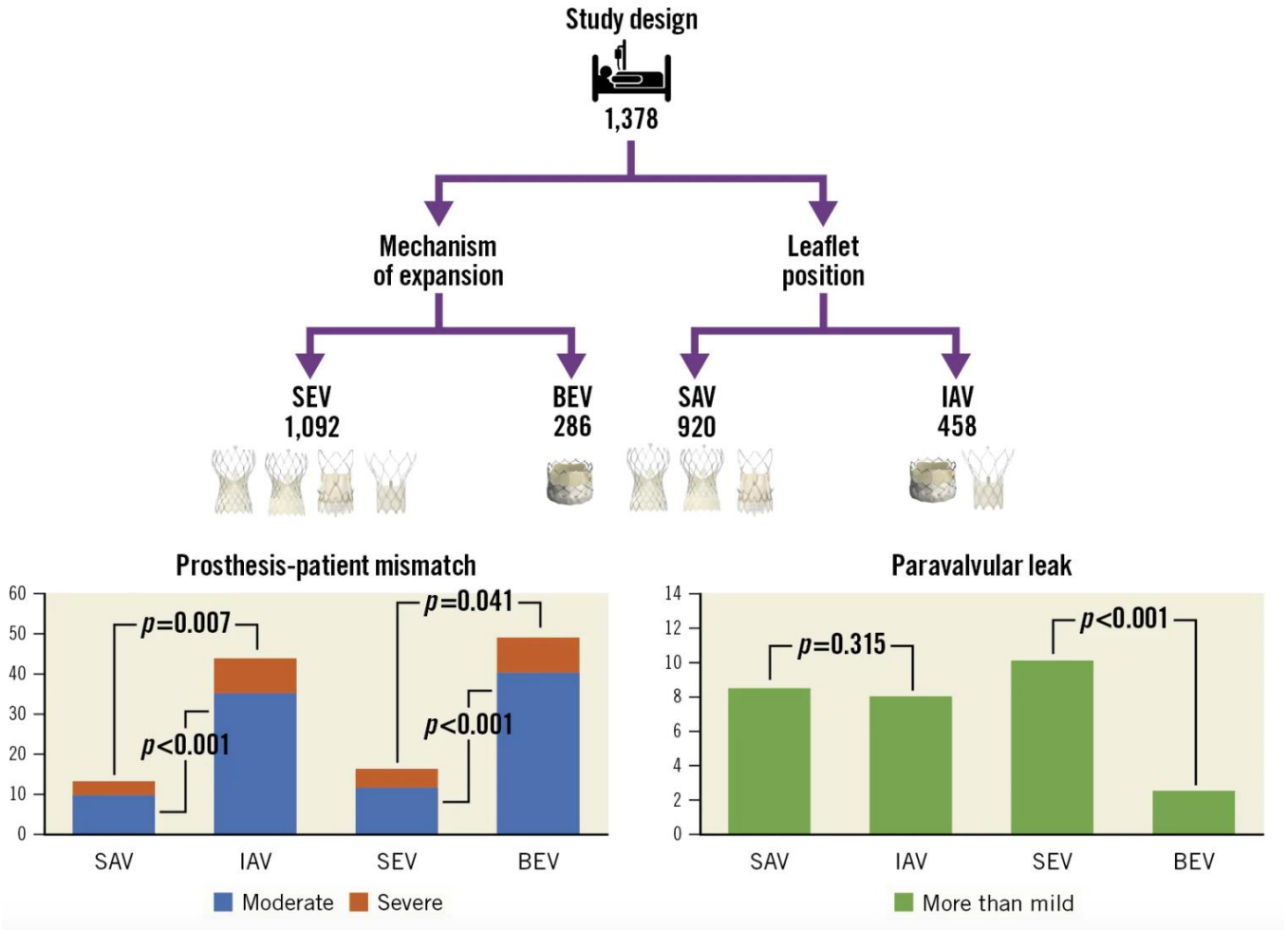

## Strategy & Procedure

- Predilation with undersized balloon (21/40 mm InterValve V8)
- 29 mm Self-expanding CoreValve
- Postdilation with 23/40 mm balloon (undersized)



# Which valve for which patient?

## Scenario#3: Small annuli

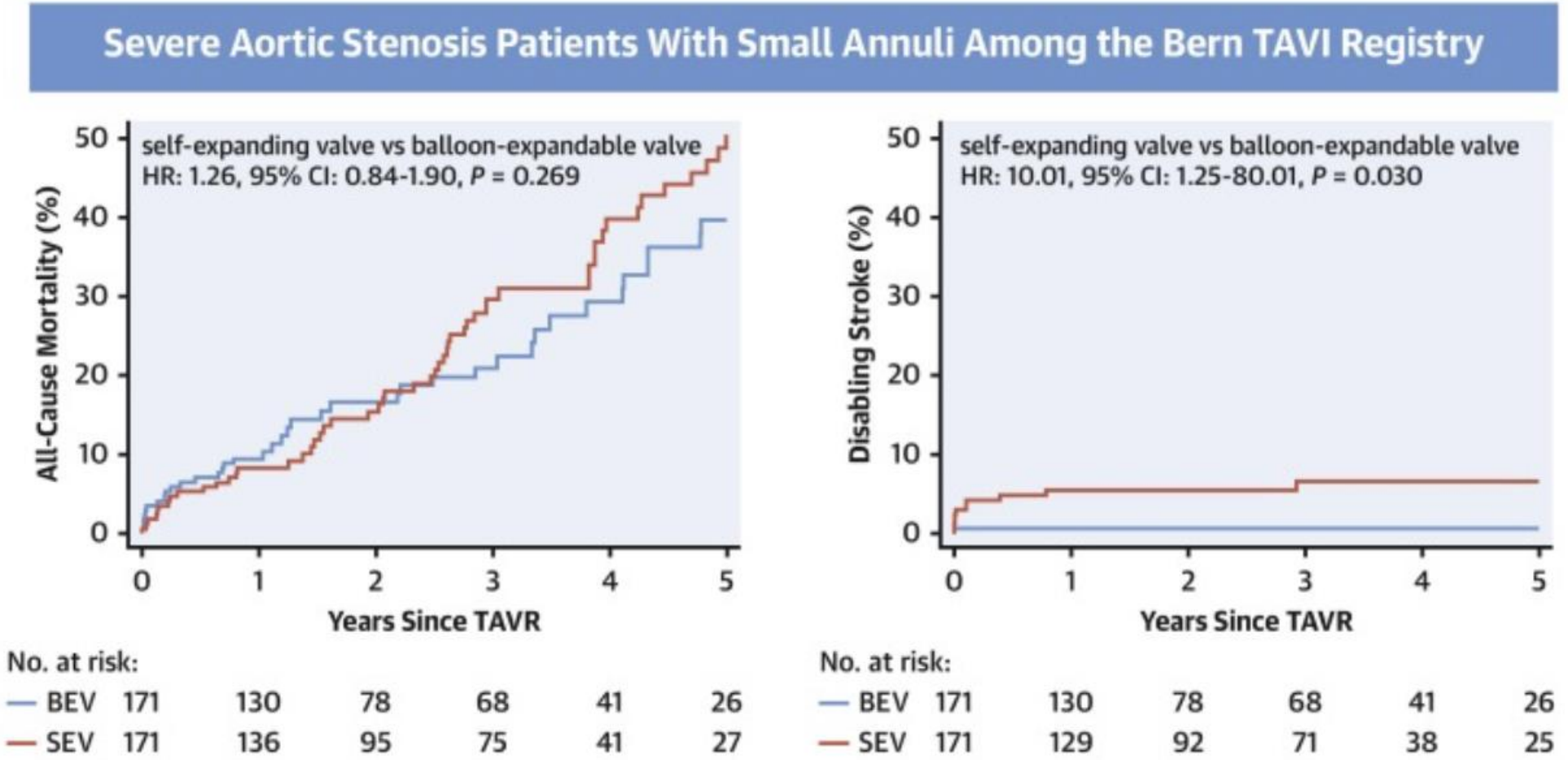





Leone PP et al Eurointervention 2023

# Which valve for which patient?

## Scenario#3: Small annuli

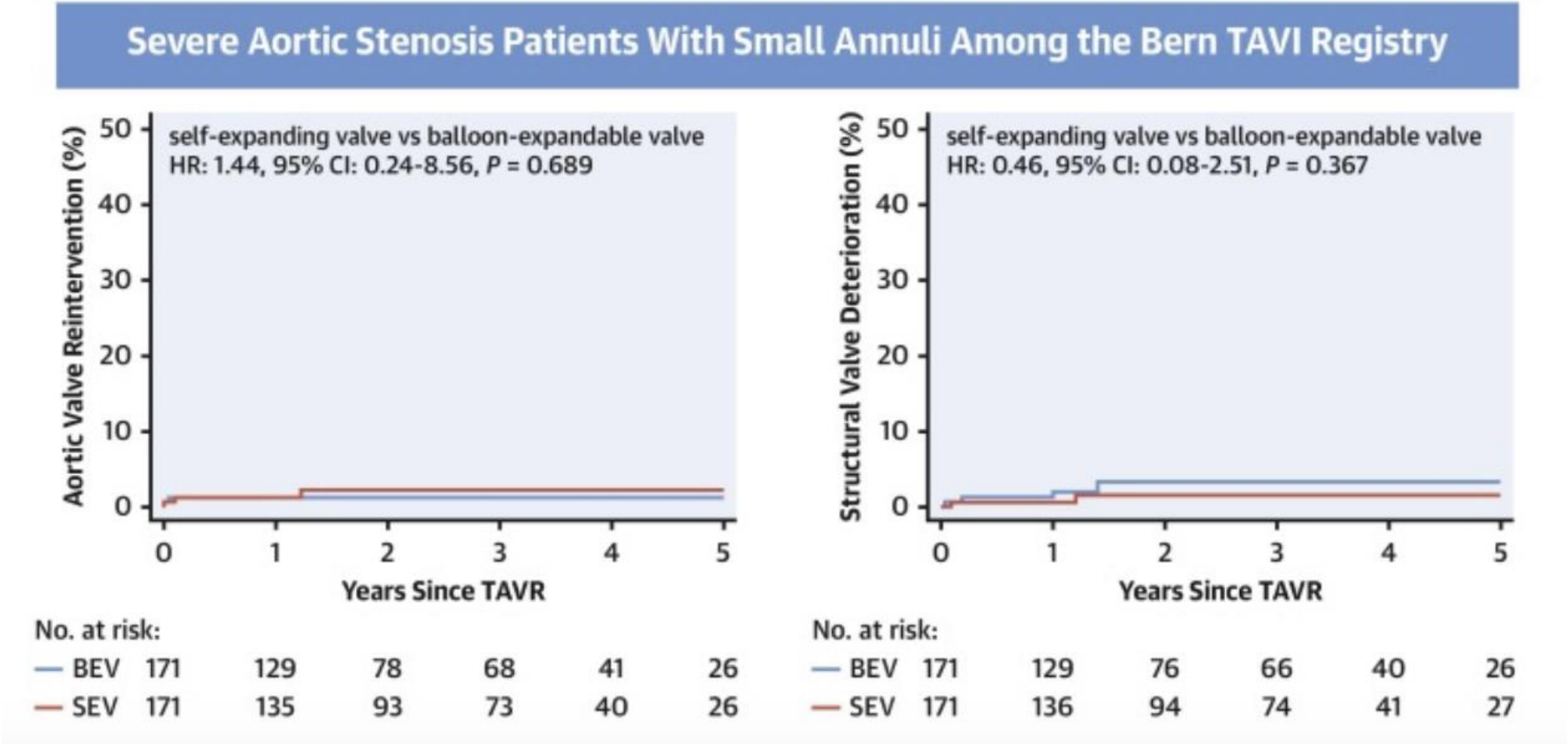





Okuno T, et al. J Am Coll Cardiol Intv. 2023,16(4):429-440.

# Which valve for which patient?

## Scenario#3: Small annuli



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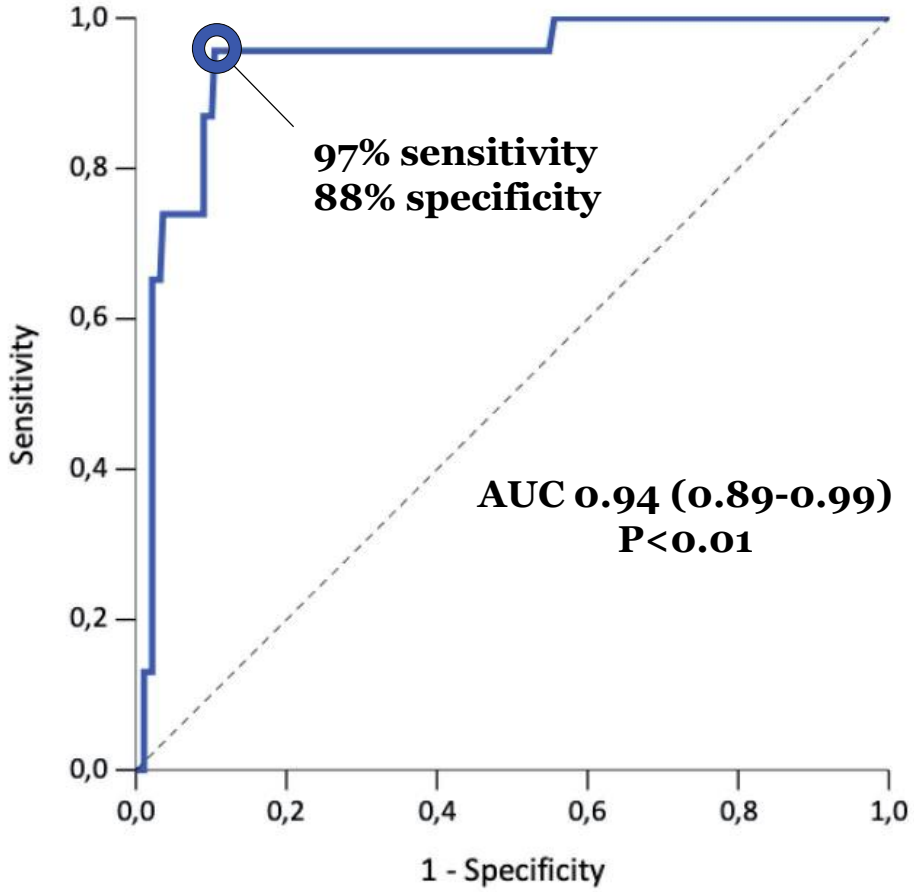
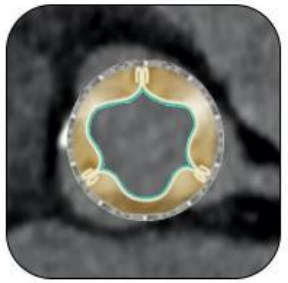
# Which valve for which patient?

## Scenario#4: Severe CAD



**TAV/SoV relation**
OR: 1.1; 95% CI 1.0-1.2; p<0.01

**TAV implant depth**
OR: 1.7; 95% CI 1.3-2.3; p<0.01

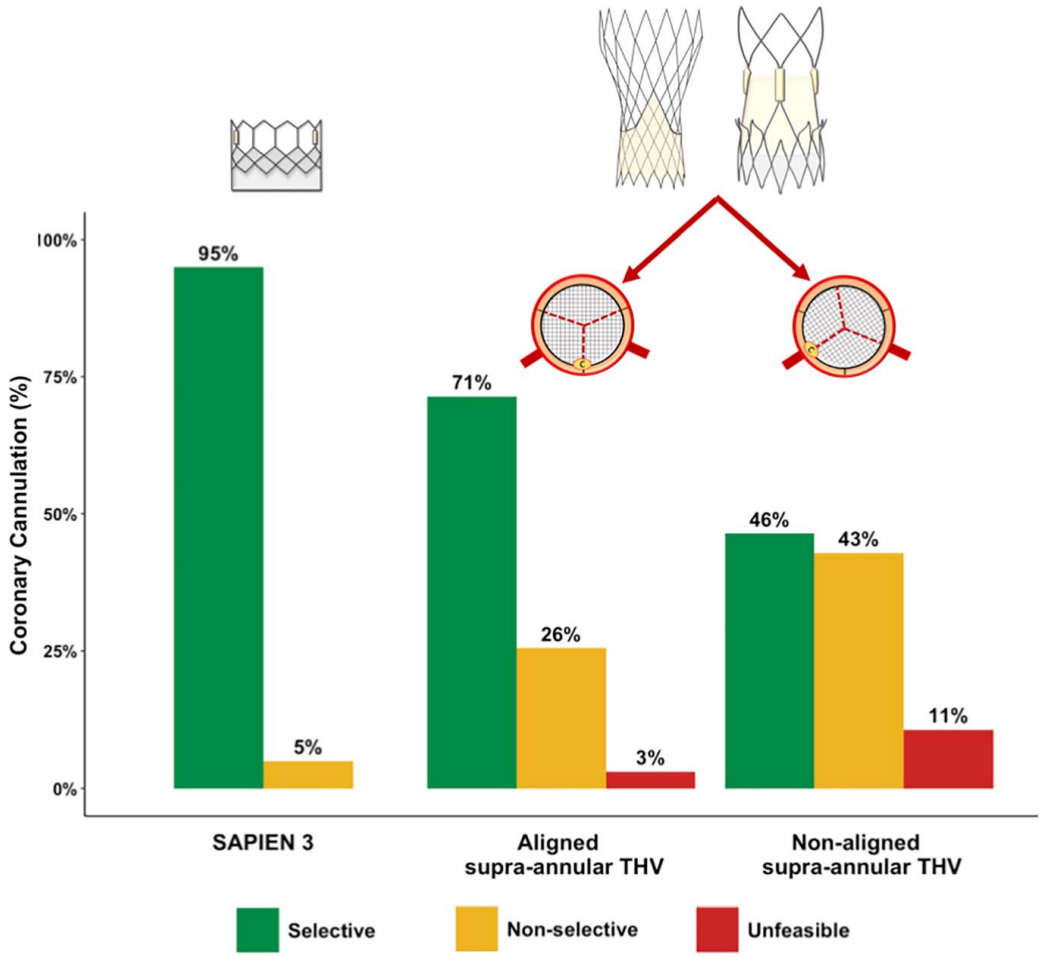
**Evolut TAV**
OR: 29.6; 95% CI 2.6-335.0; p<0.01



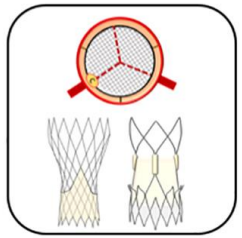
Barbanti M. et al JACC Cardiovasc Interv. 2020;13:2542-2555

# Which valve for which patient?

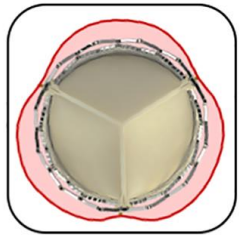
## Scenario#4: Severe CAD



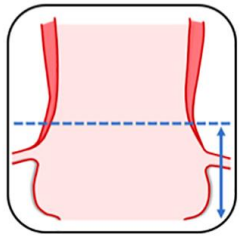

### Predictors of impaired CA after TAVI



**Non-aligned supra-annular THV**
OR: 4.59; 95% CI 1.81-11.61; p<0.01



**THV-SoV relation**
OR: 1.06; 95% CI 1.02-1.1; p<0.01



**SoV height**
OR: 0.83; 95% CI 0.7-0.98; p=0.03

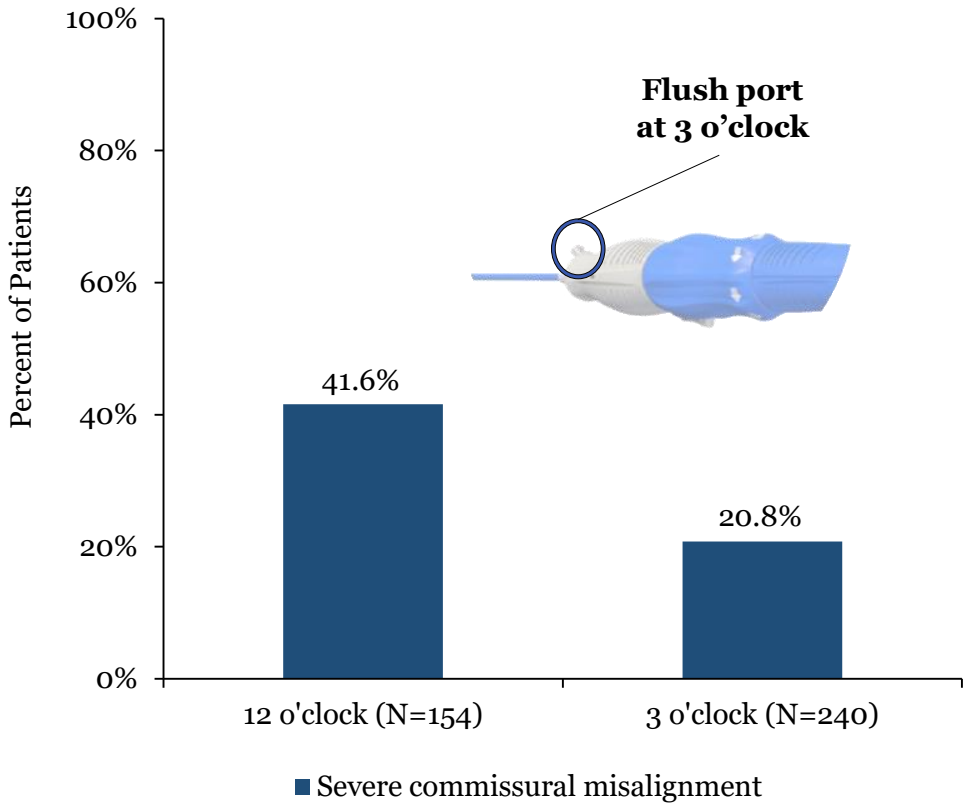


Tarantini G. et al Circ Cardiovasc Interv. 2022 Feb;15(2):e011045

# Which valve for which patient?

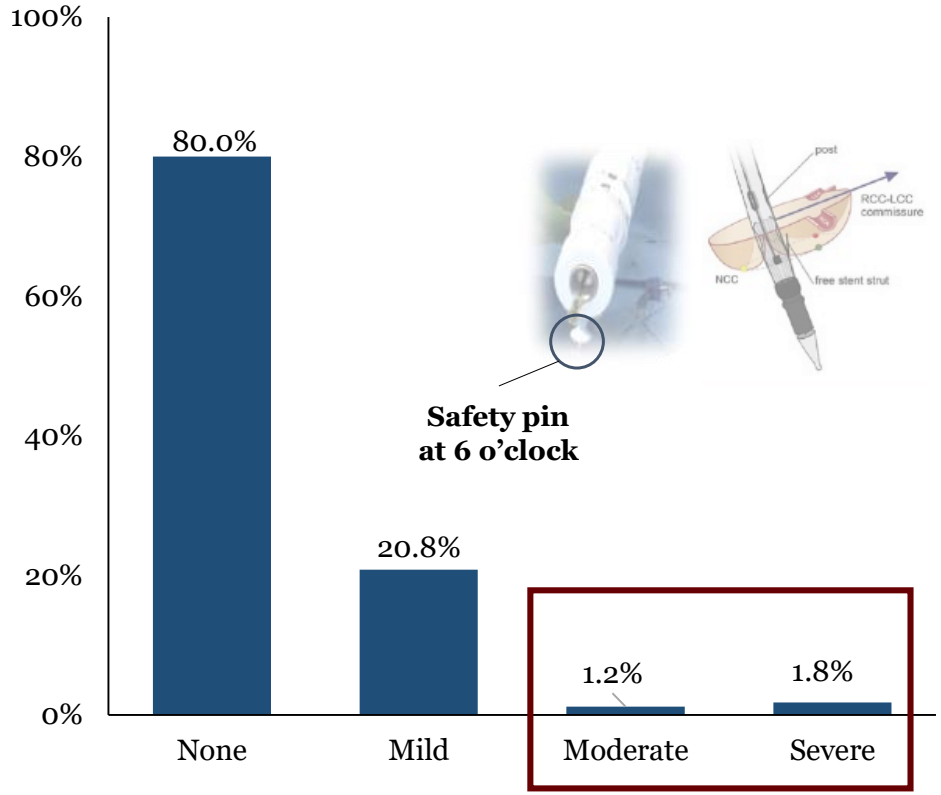
## Scenario#4: Severe CAD

**Evolut THV**




Tang GHL, et al. Catheter Cardiovasc Interv. 2022;99:924-931

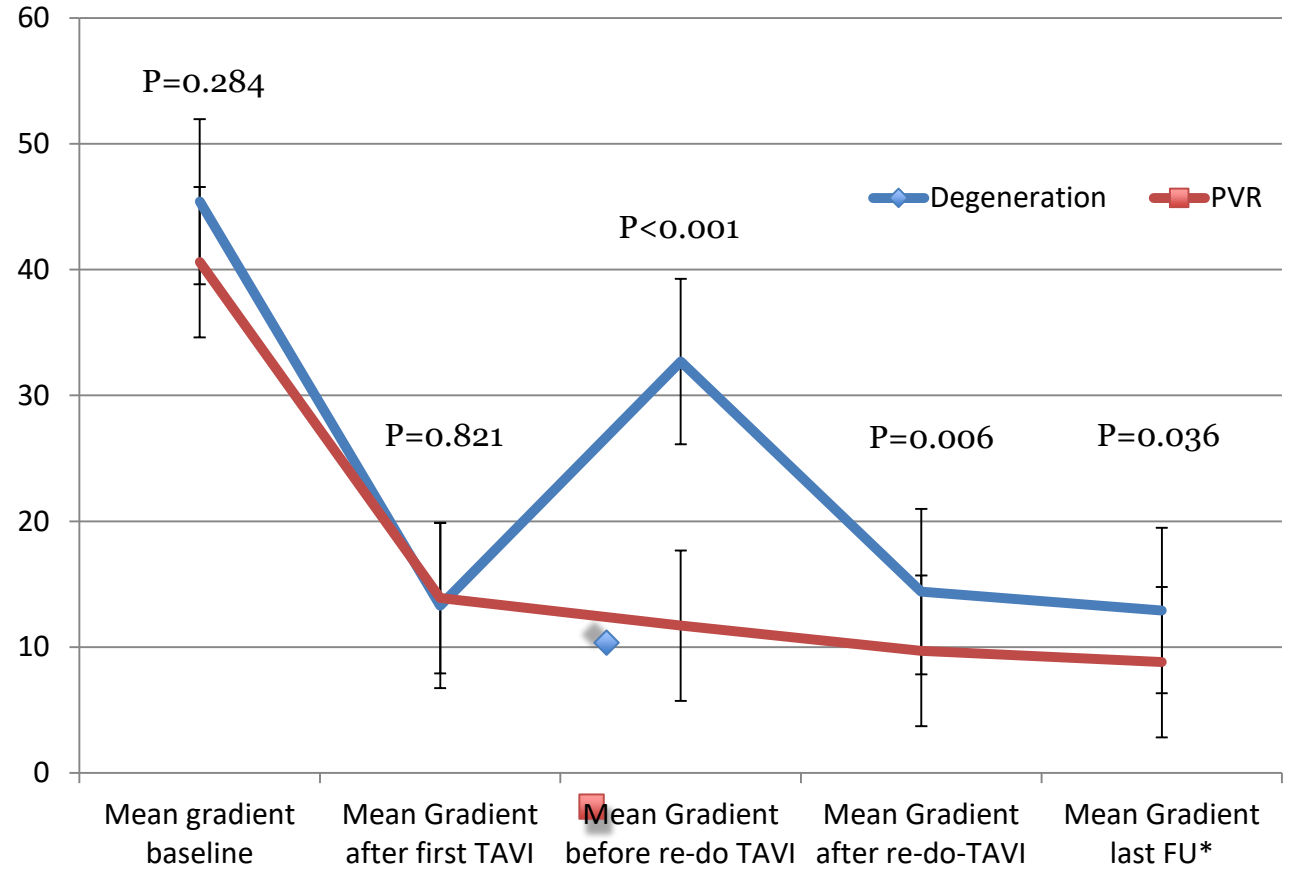
**Acurate Neo 2 THV**

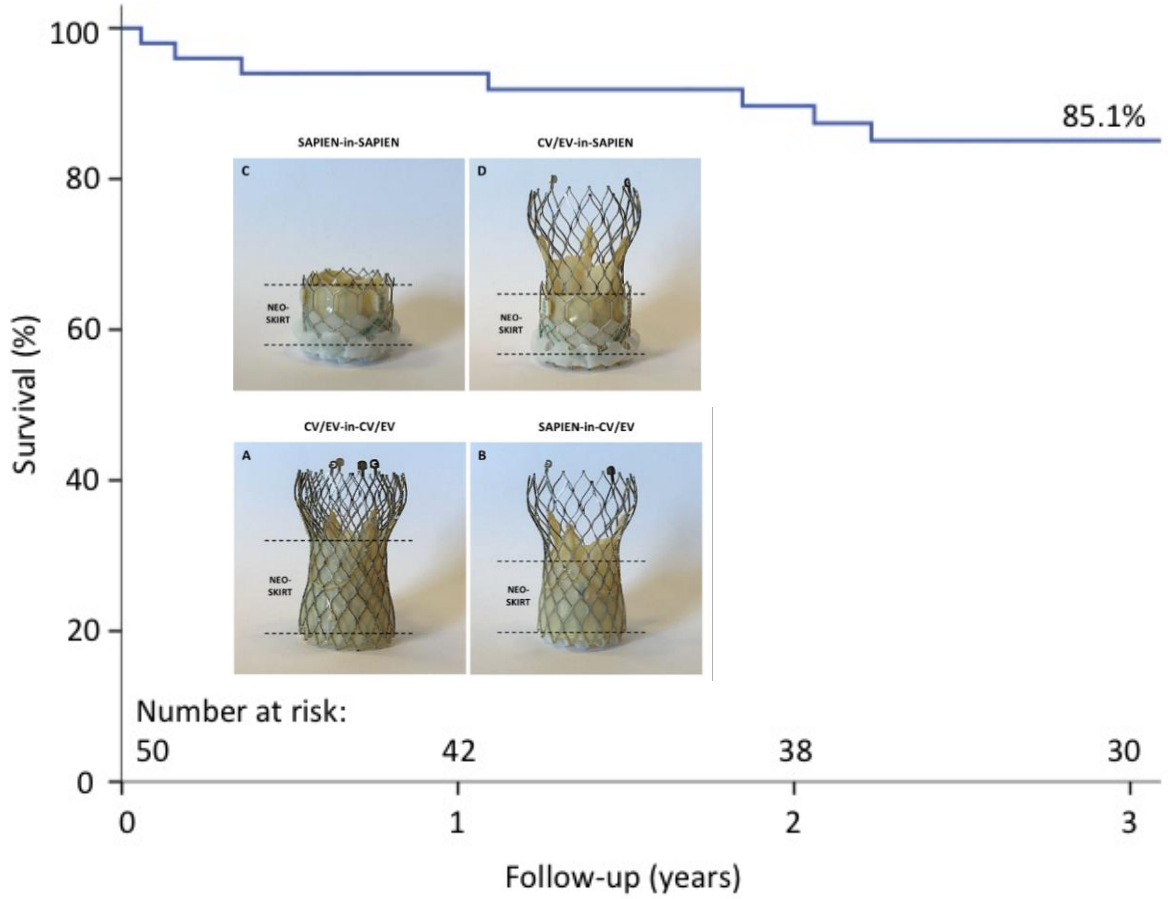



Meduri CU, et al. JACC Cardiovasc Interv. *In press*

# Which valve for which patient?

## Scenario#5: TAVI-in-TAVI



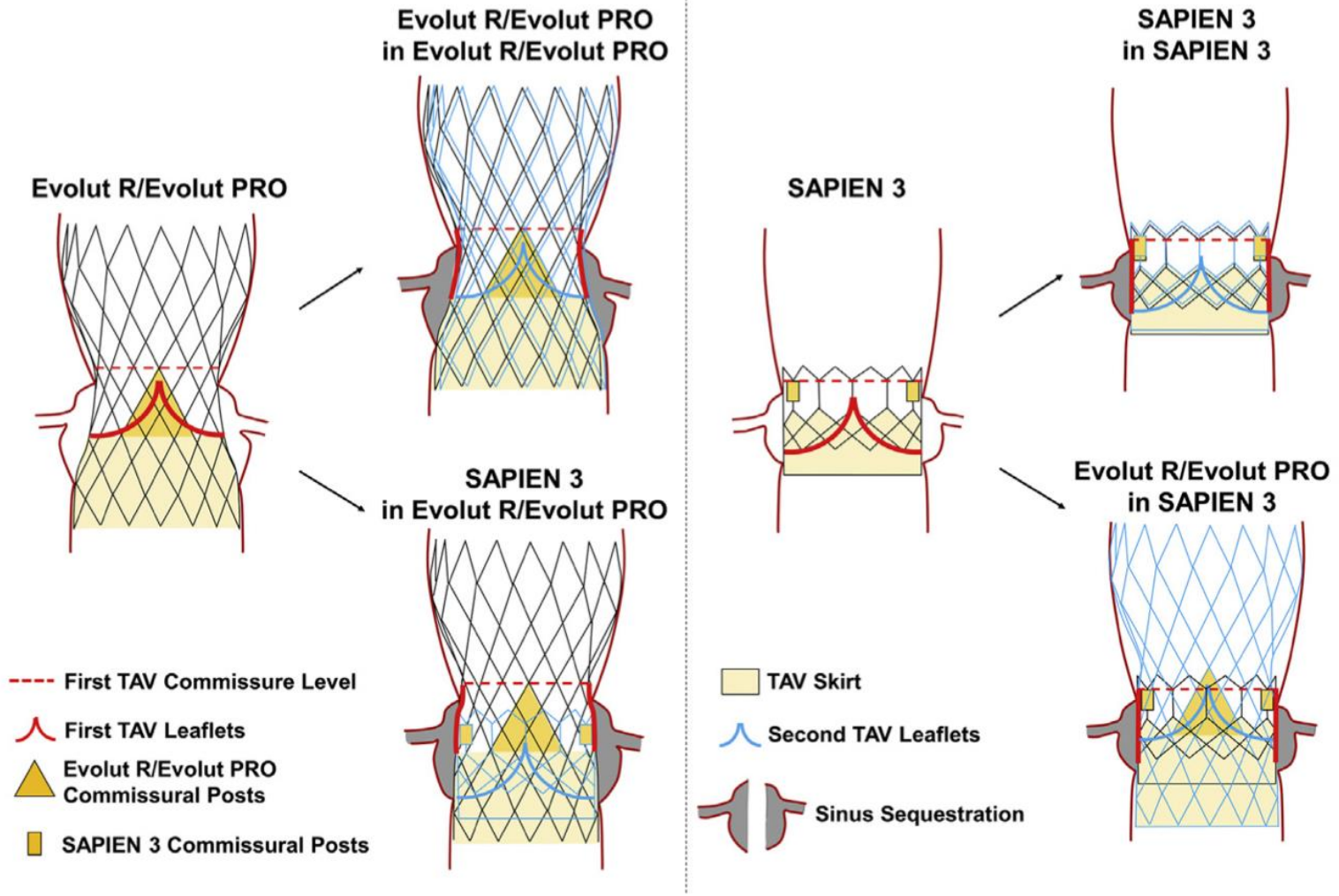






Barbanti M et al., Circ Cardiovasc Intv. 2016

# Which valve for which patient?

## Scenario#5: TAVI-in-TAVI

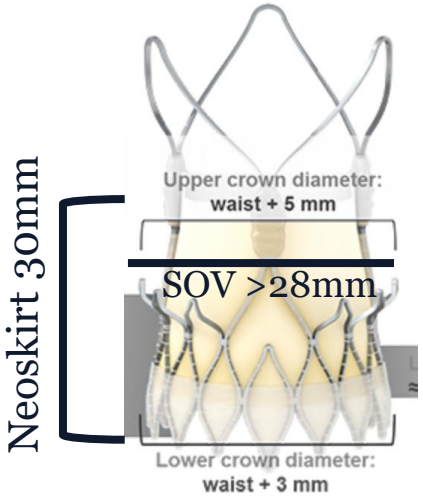


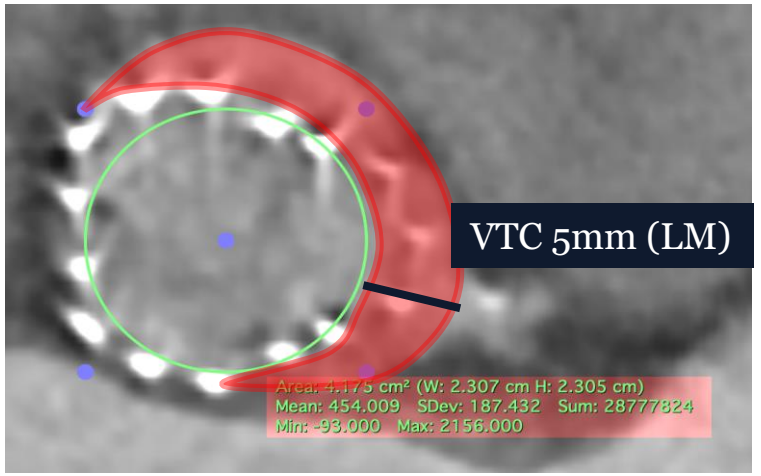
# Which valve for which patient?

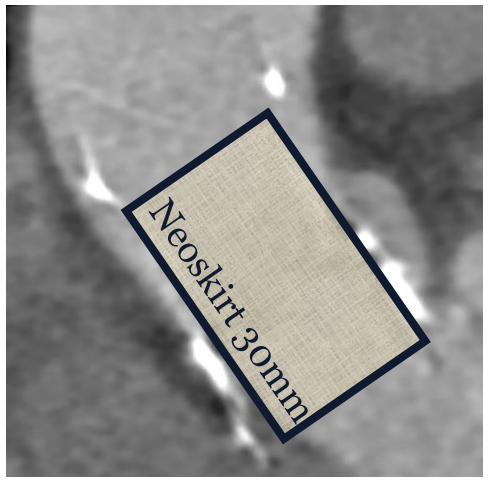
## Scenario#5: TAVI-in-TAVI

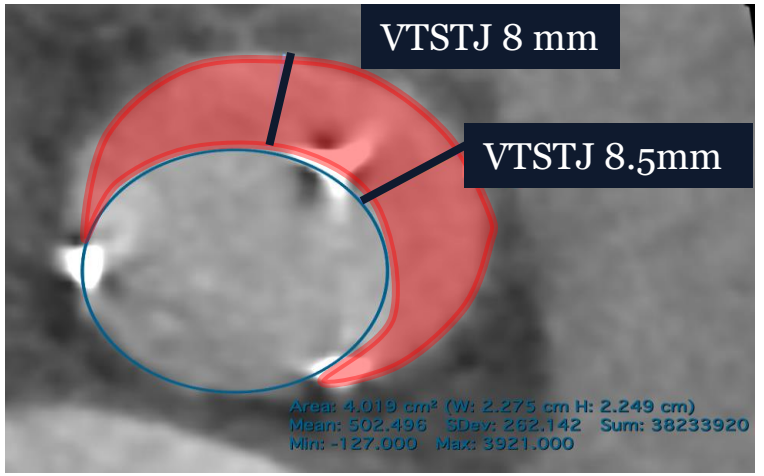
| CTA Parameters | |
|---|---|
| Sinus of Valsalva (SOV) | 33 mm |
| Sinutubular Junction (STJ) | 30 mm |
| STJ Height | 25 mm |
| Valve To Coronaries Left Main (VTC LM) | 5 mm |
| VTC Right Coronary Artery (VTC RCA) | 4.5 mm |
| Valve To Sinotubular Junction (VTSTJ) | 8.5 mm |
| Left Main Height (LM) | 15.5 mm |
| Right Coronary Artery Height (RCA) | 14 mm |
| No leaflets mass | |
| Good commissural alignment ( 25° misalignment) | |

Acurate Neo M 23-25mm



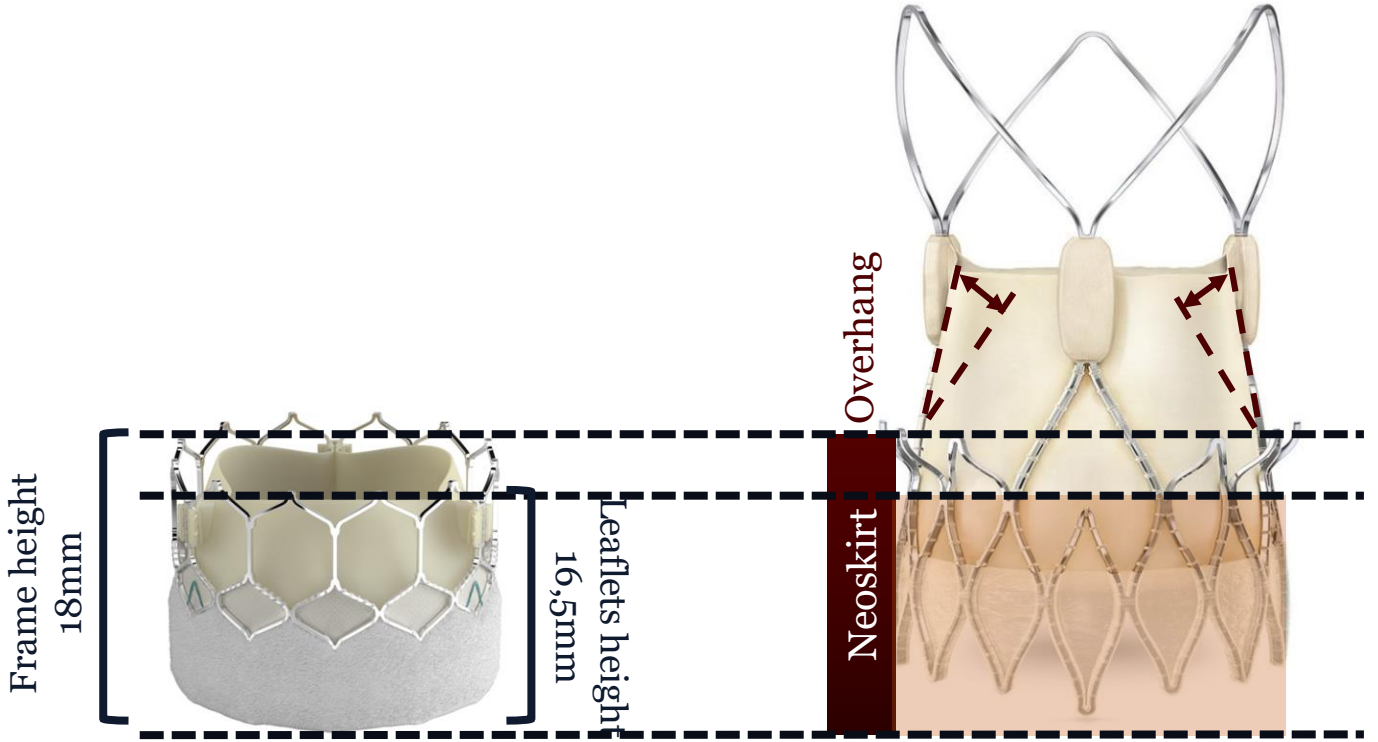



# Which valve for which patient?

## Scenario#5: TAVI-in-TAVI

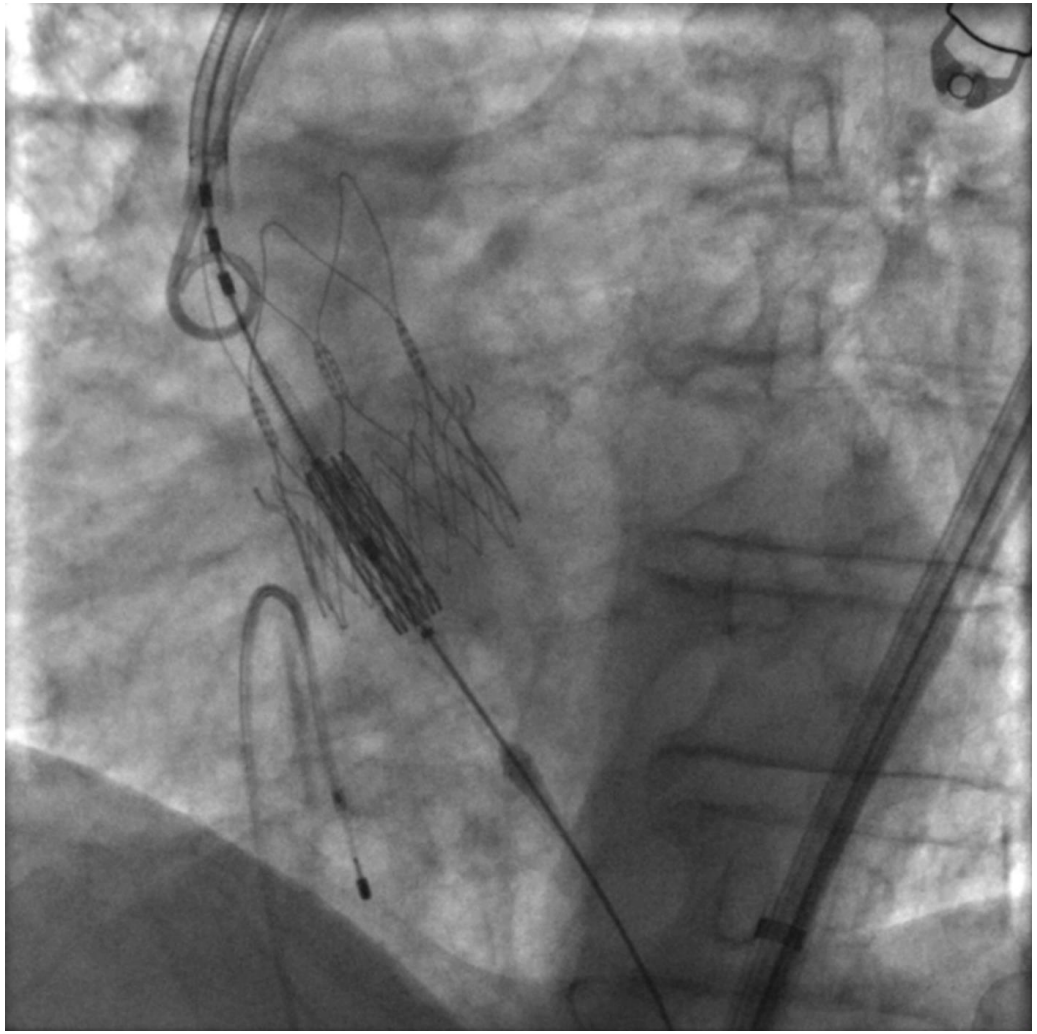


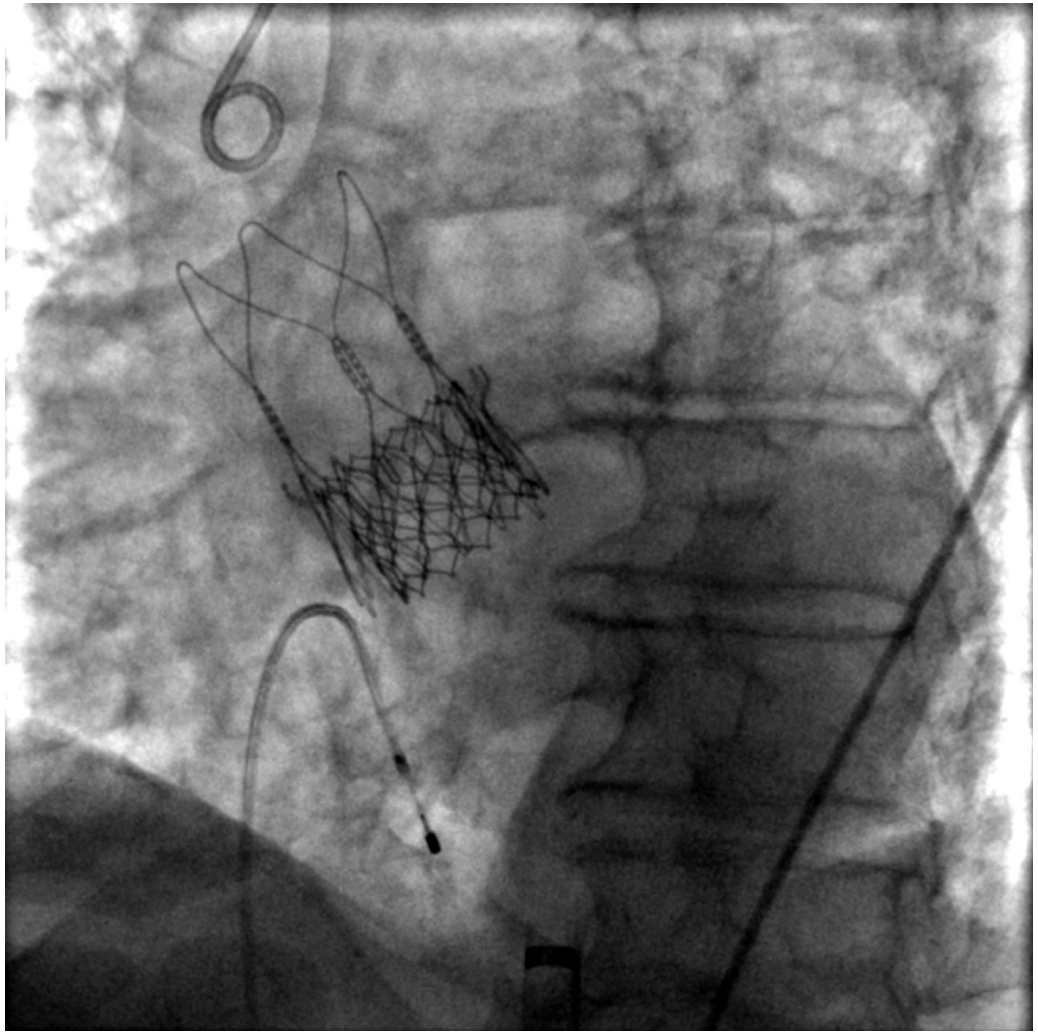

**Sapien ULTRA 23mm**
- Short frame
- Open cell
- Intra-annular

**Acurate Neo M 23-25mm**
- Long frame
- Open cell
- Supra-annular

# Which valve for which patient?

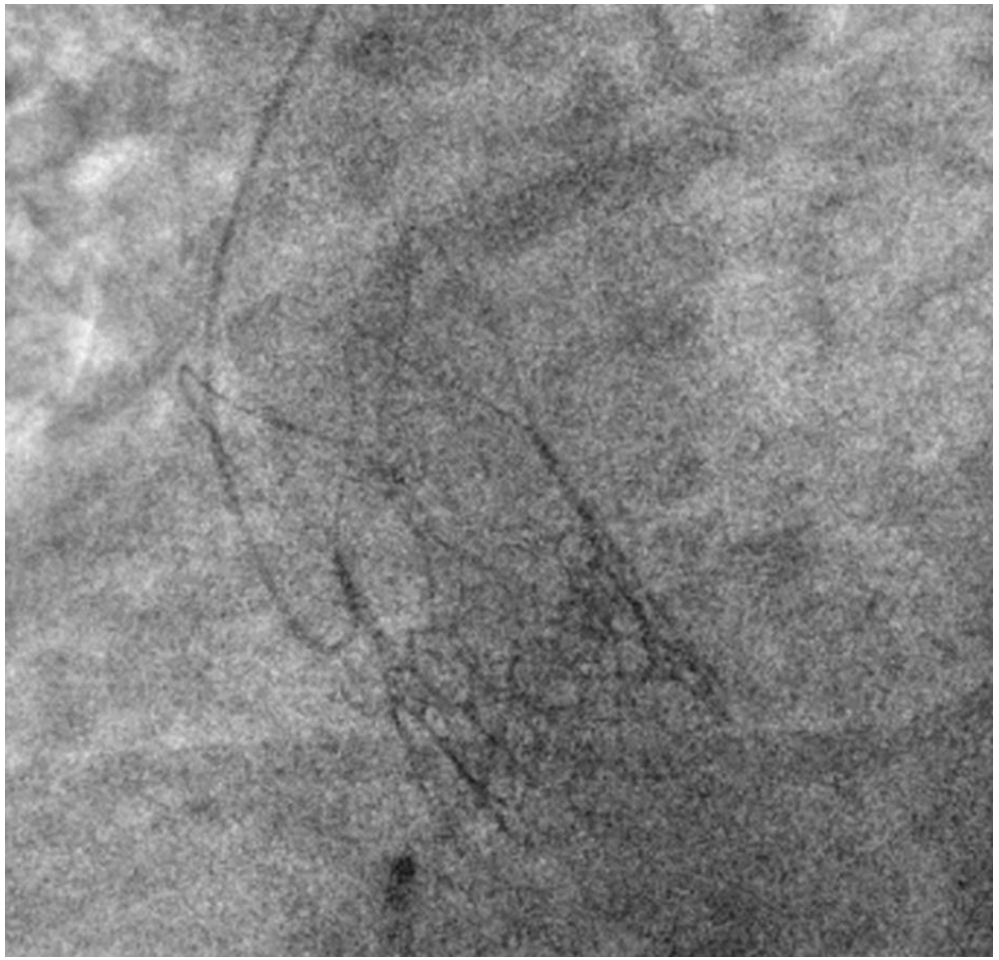
## Scenario#5: TAVI-in-TAVI

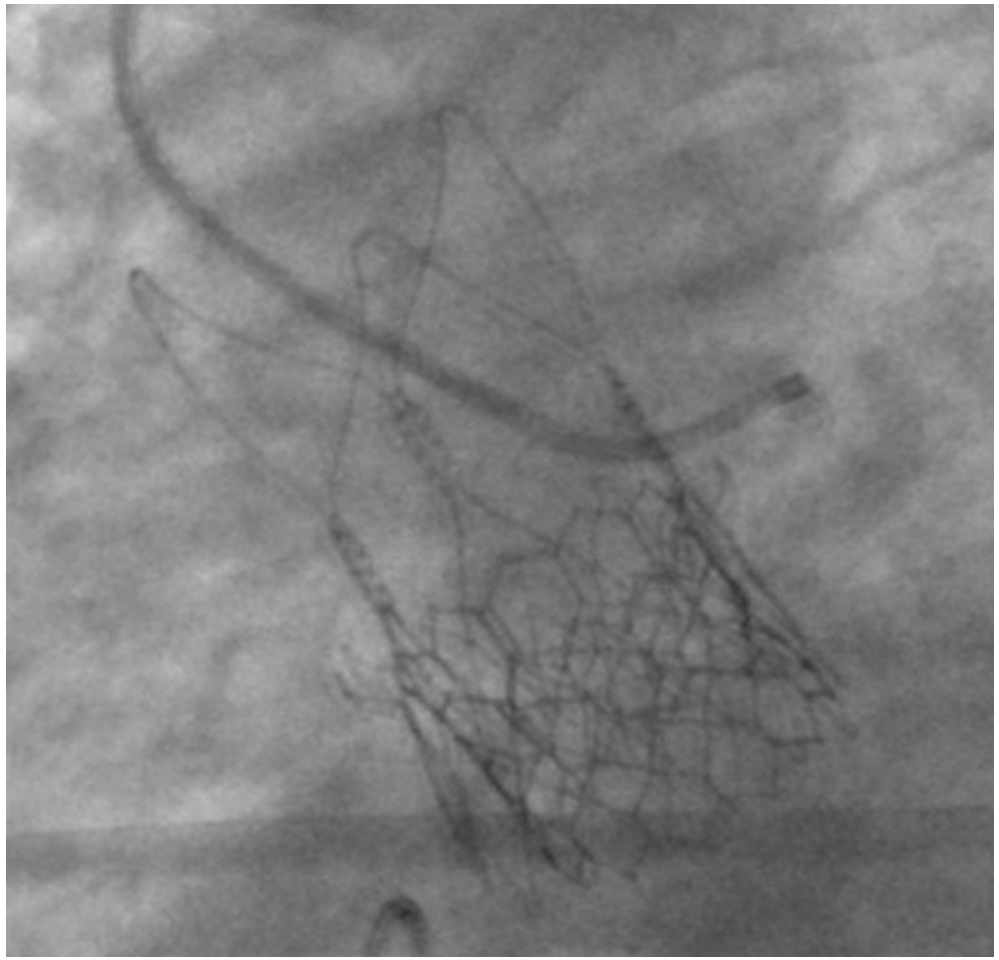




# Which valve for which patient?

## Scenario#5: TAVI-in-TAVI

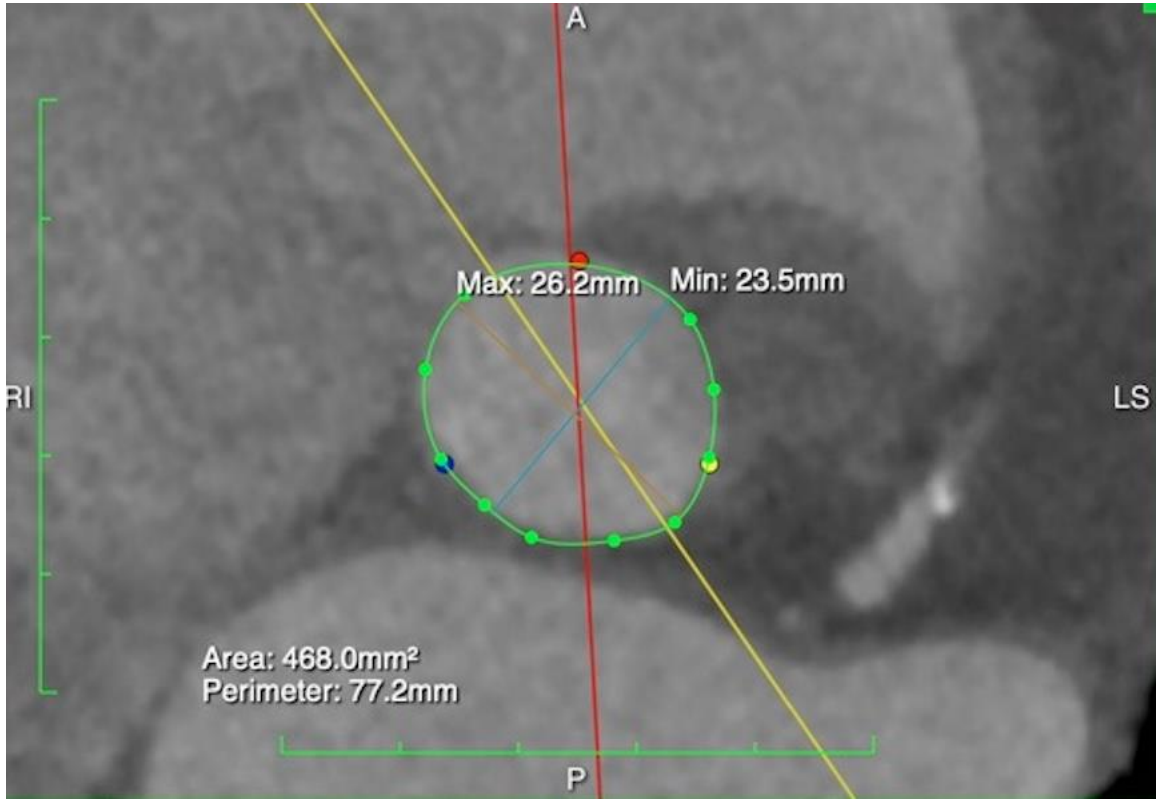


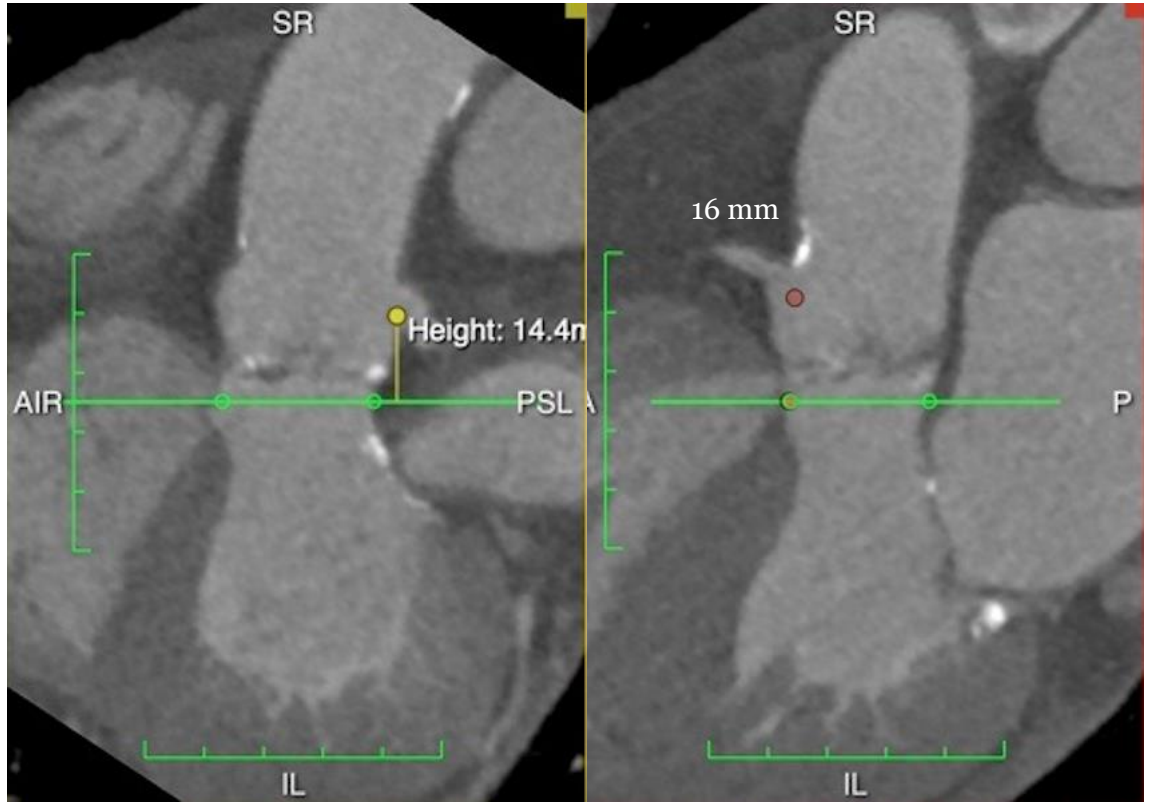


# Which valve for which patient?

## Scenario#5: TAVI-in-TAVI

Case example: 74 y.o. male with severe AS

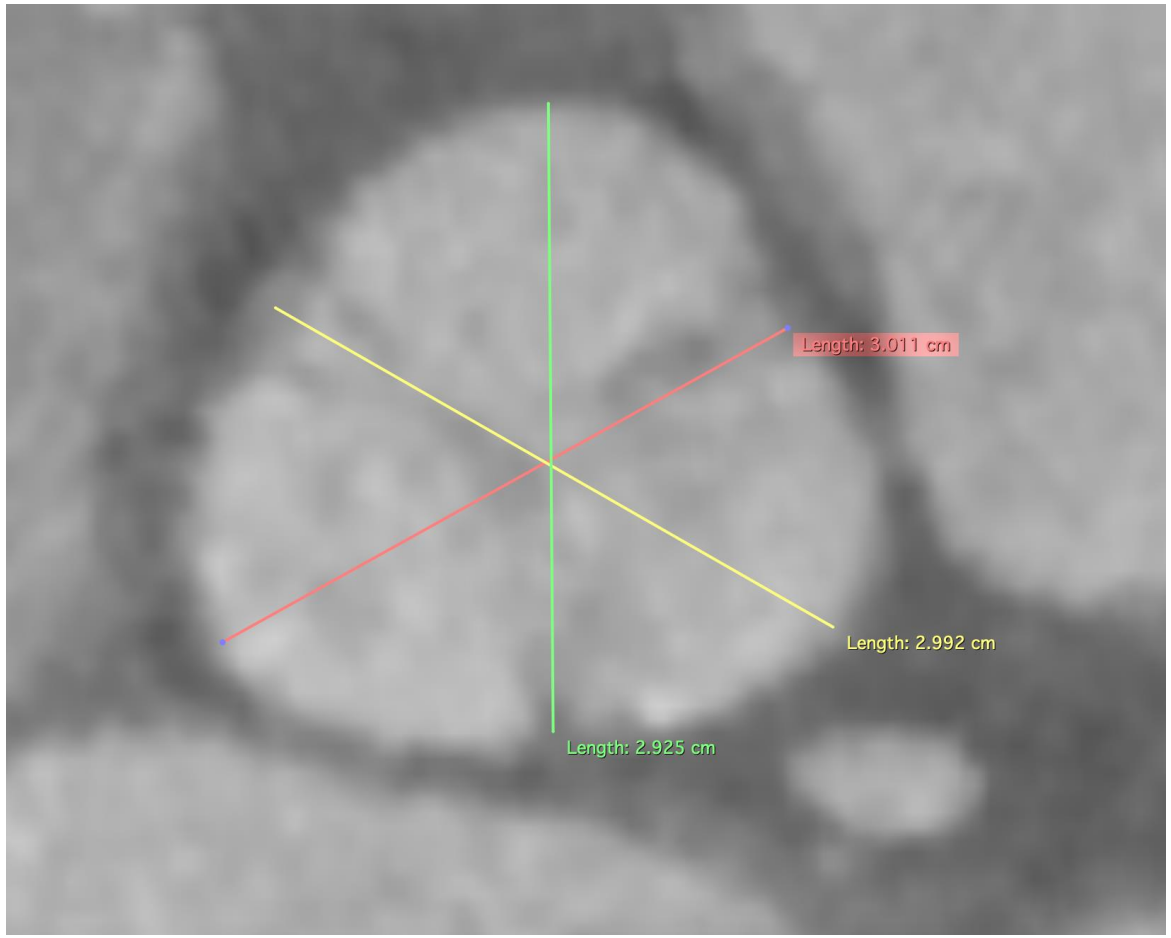


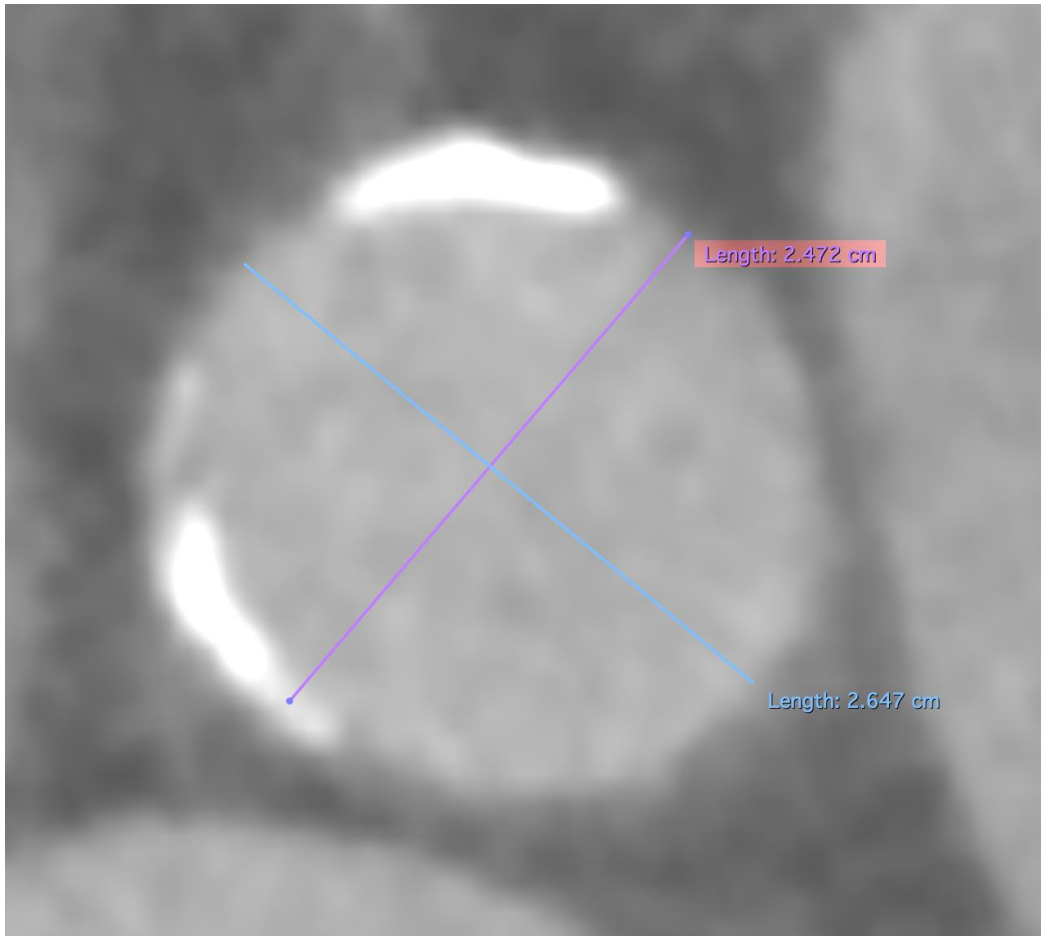
# Which valve for which patient?

## Scenario#5: TAVI-in-TAVI

### Sinus of Valsalva diameters

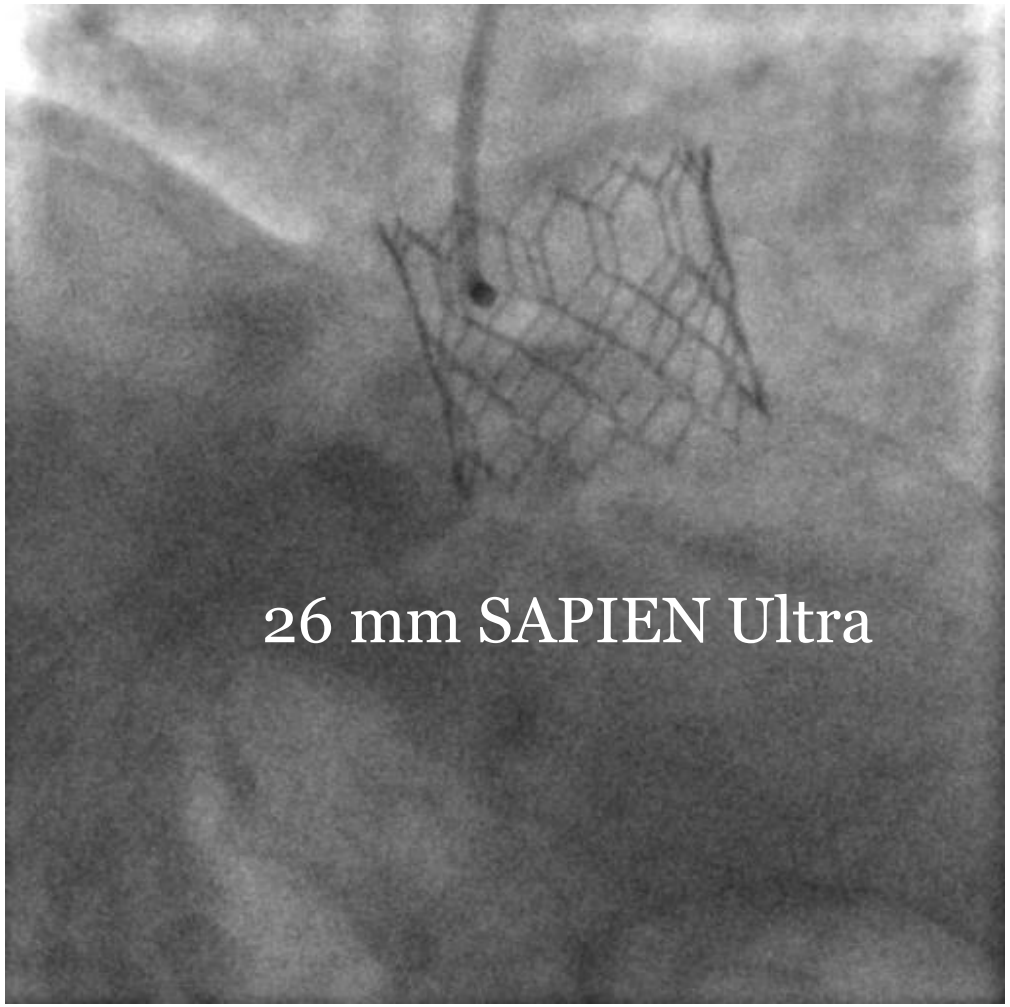


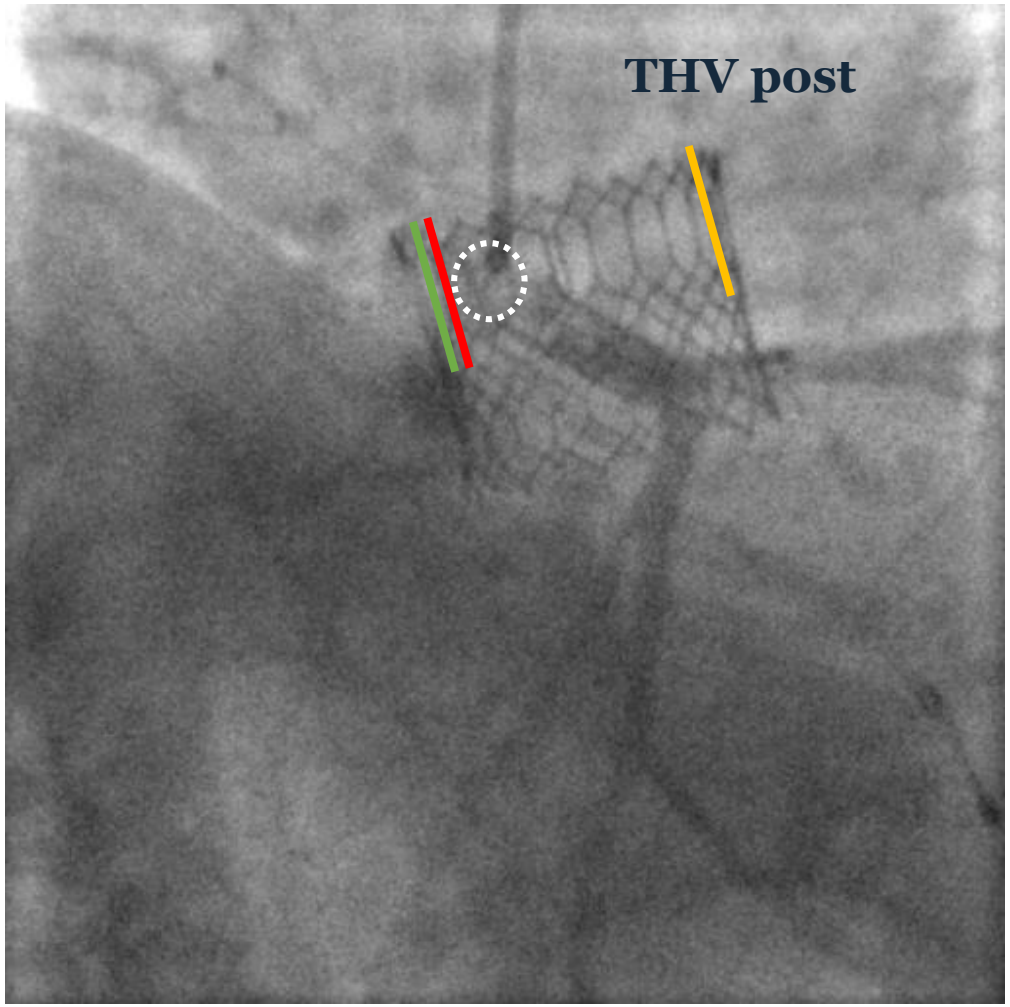

### Sinotubular junction diameters



# Which valve for which patient?

## Scenario#5: TAVI-in-TAVI

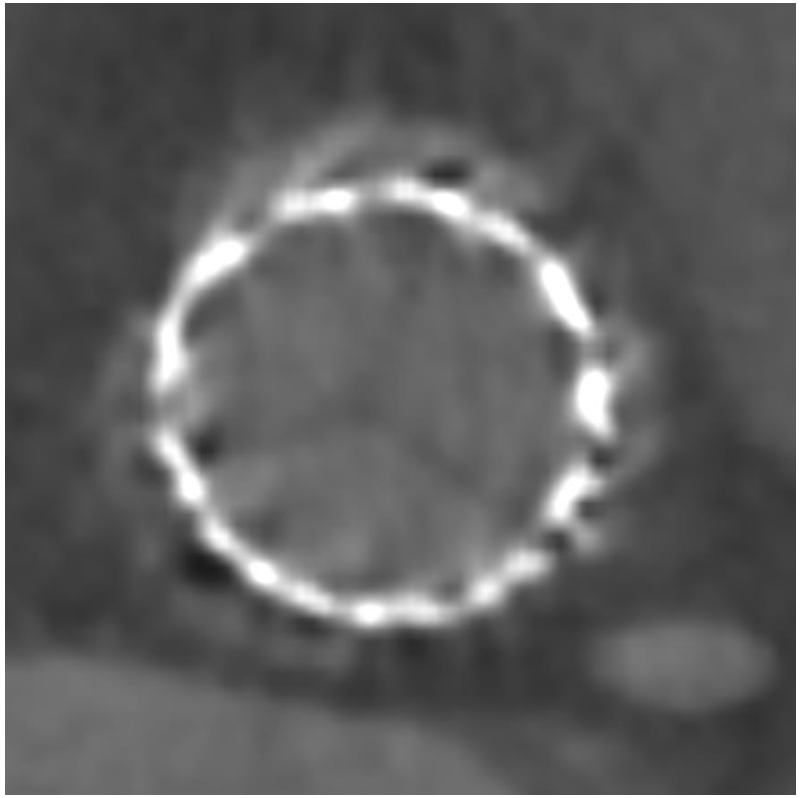


# Which valve for which patient?

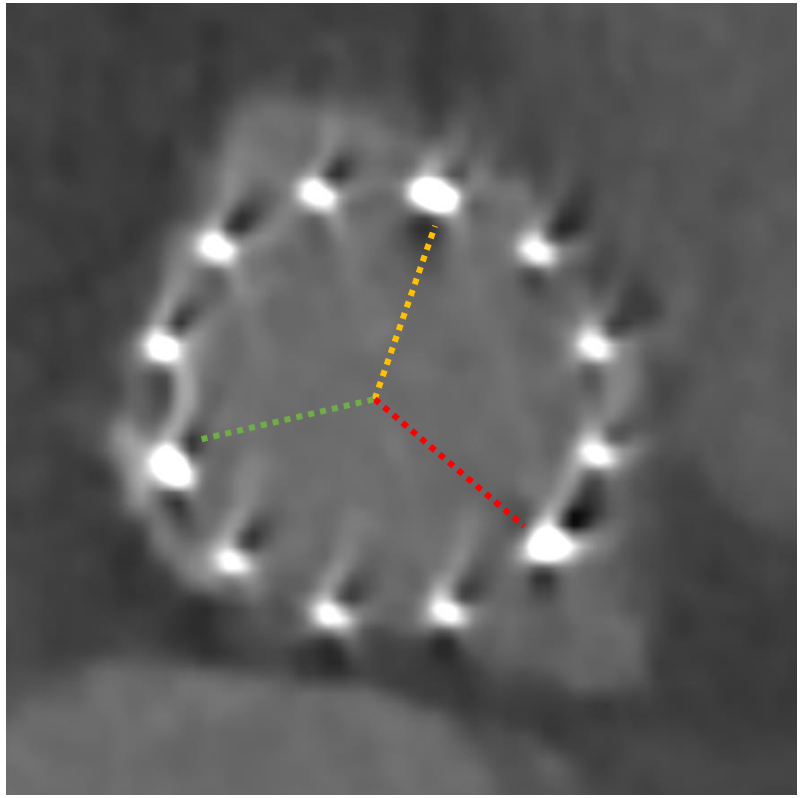
## Scenario#5: TAVI-in-TAVI

**Severe commissure misalignment**



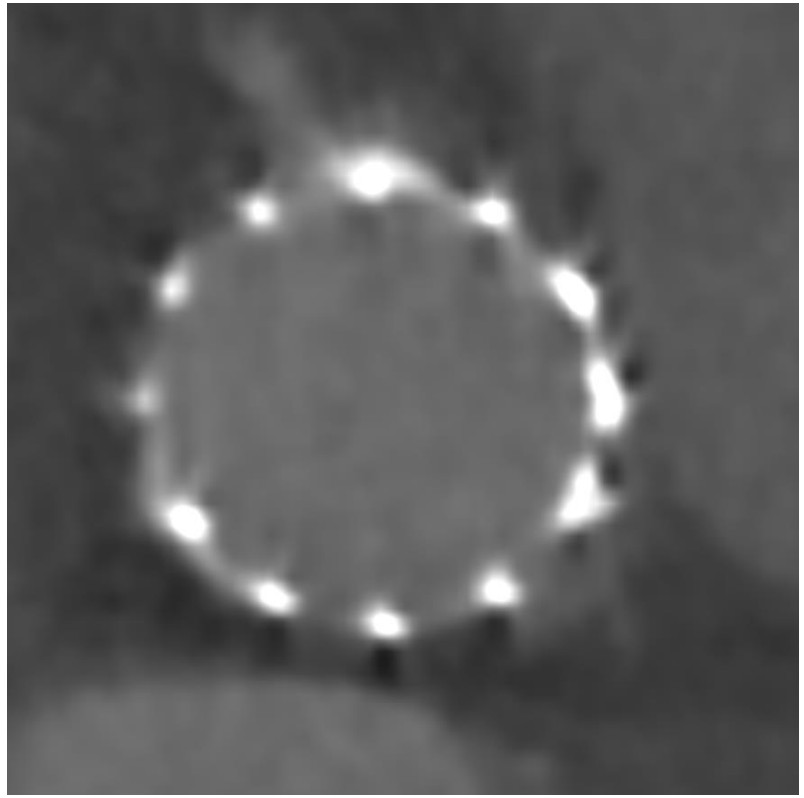
THV commissures level

**Severe commissure misalignment**



Coronary ostia level

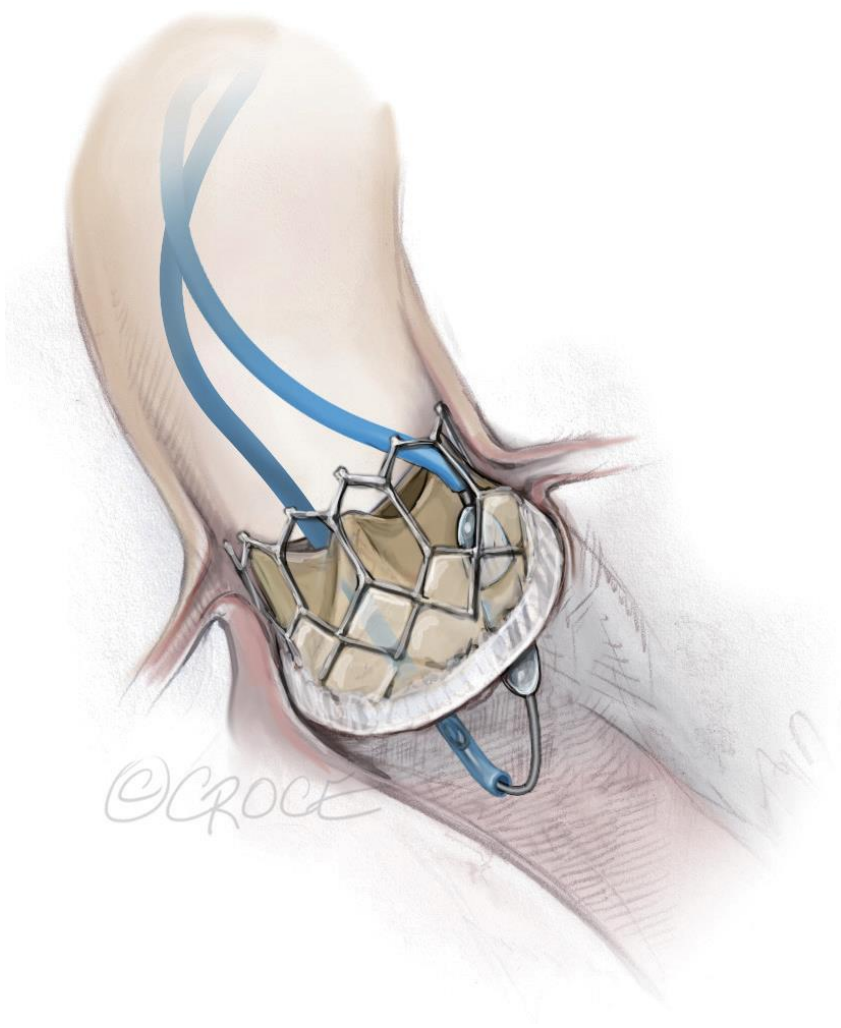
**Potential SoV sequestration**

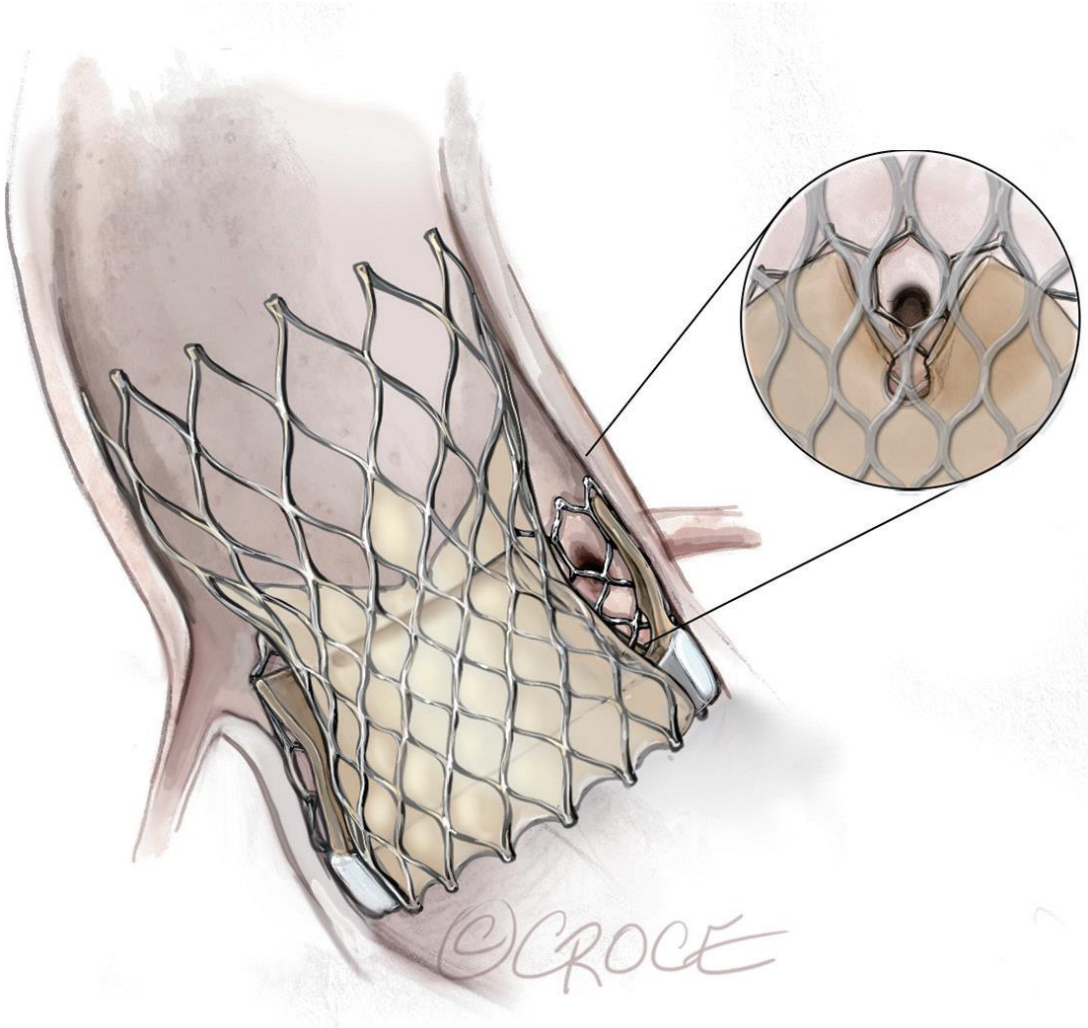


Sinotubular junction level

# Which valve for which patient?

## Scenario#5: TAVI-in-TAVI



# Conclusions

- Current THVs are capable to cover almost all aortic anatomies
- No clear indications for the use of a specific THV platform for different anatomical subsets
- In the majority of cases TAVI can be carried out with different THVs with similar results
- There exist some anatomical setting that would benefit from a specific TAVI device
- THV choice still remains up to operator's experience