

# EUROVALVE

CROWNE PLAZA LINATE



**MILAN**  
**SEPTEMBER**  
**21 & 22, 2023**



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## Commissural alignment and coronary access

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# EUROVALVE

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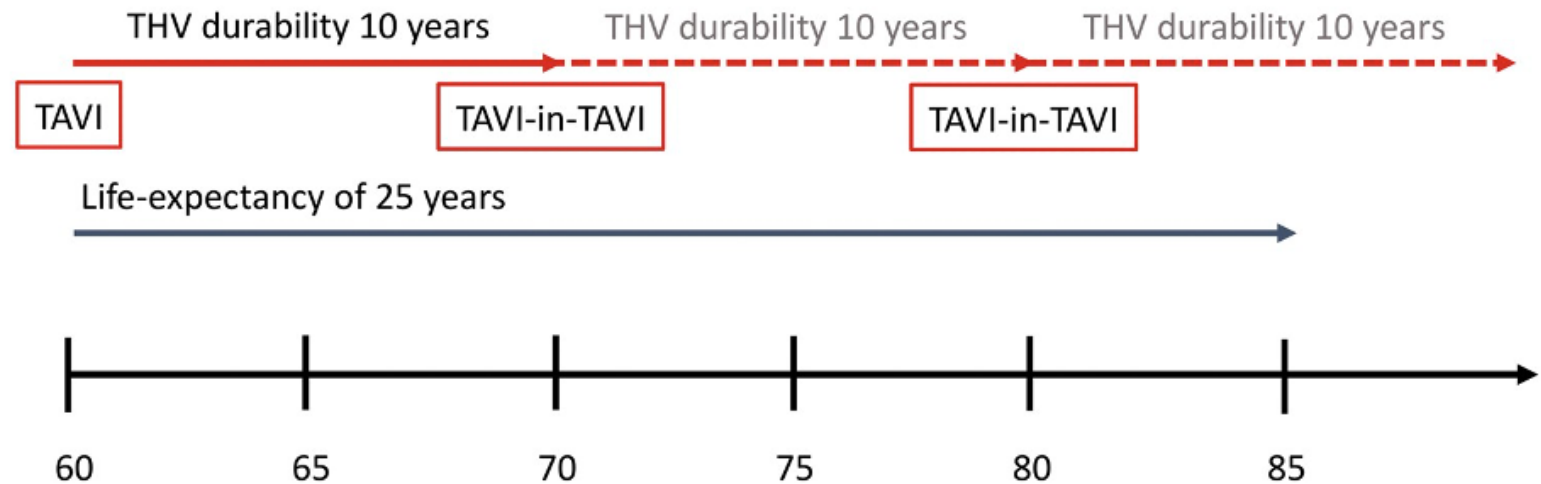
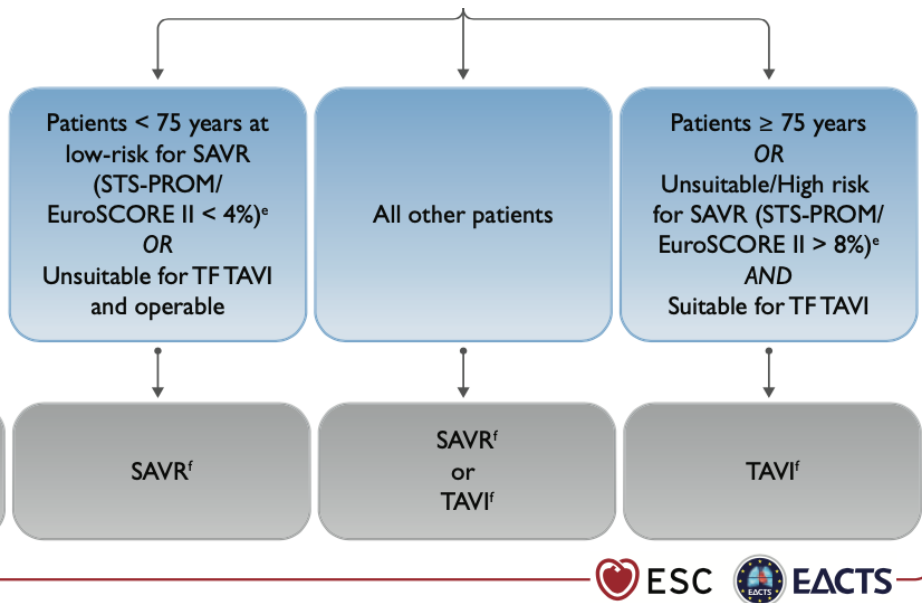
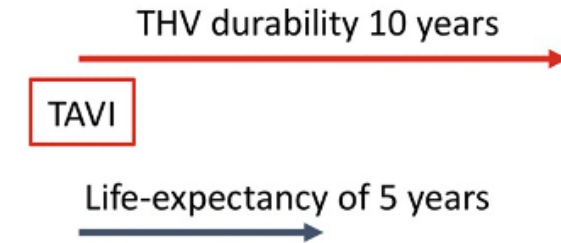
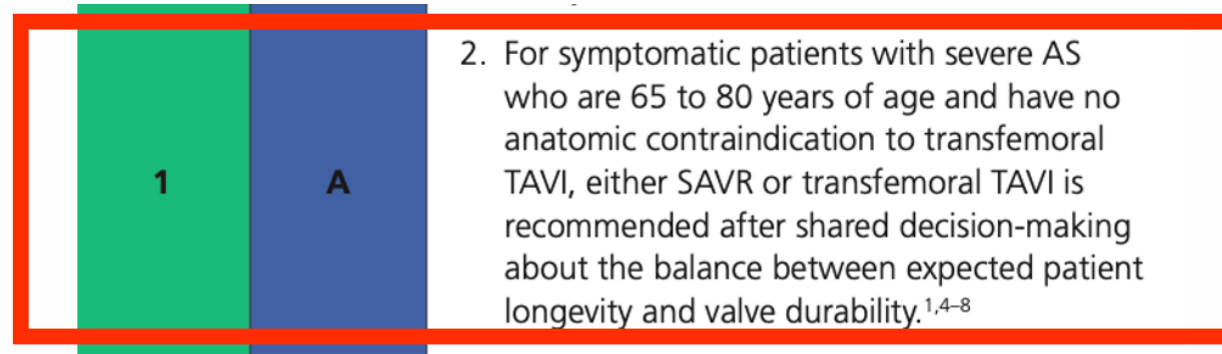
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## FACULTY DISCLOSURE

I disclose the following financial relationships:  
Consultant for Medtronic, Edwards Lifescience and Abbott

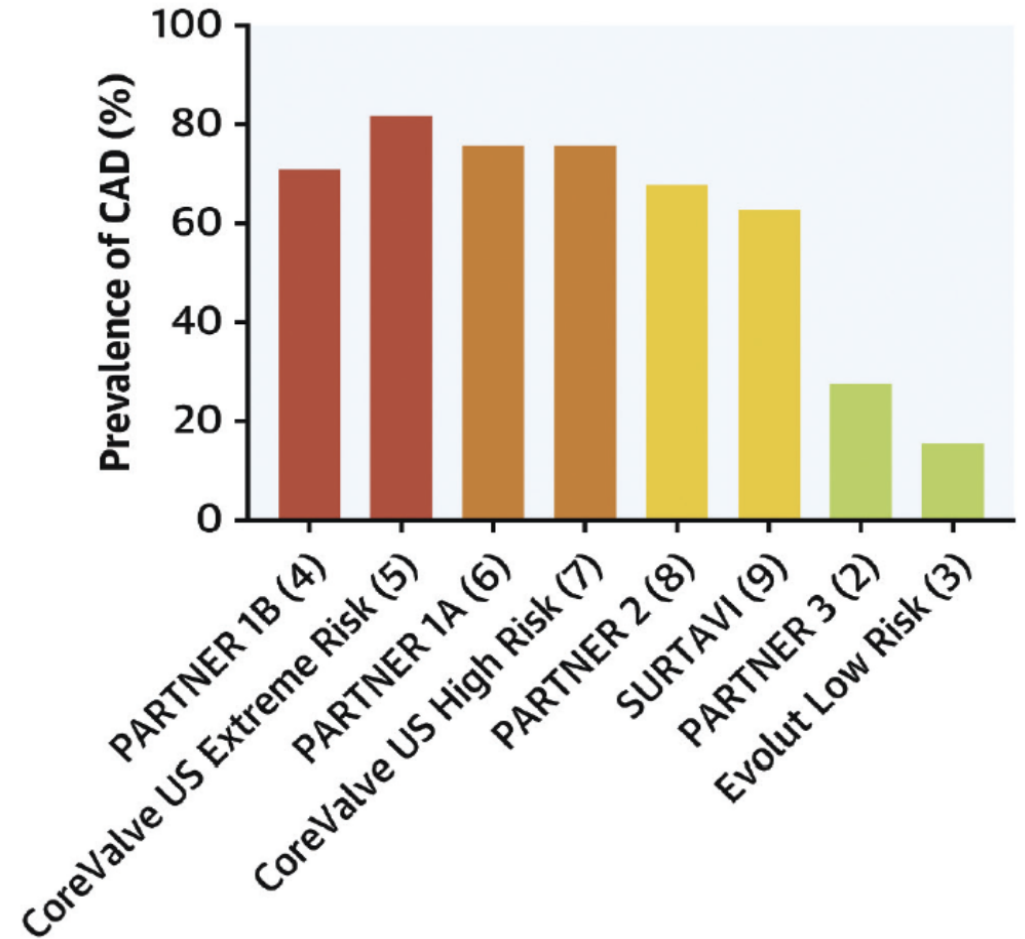
# Introduction





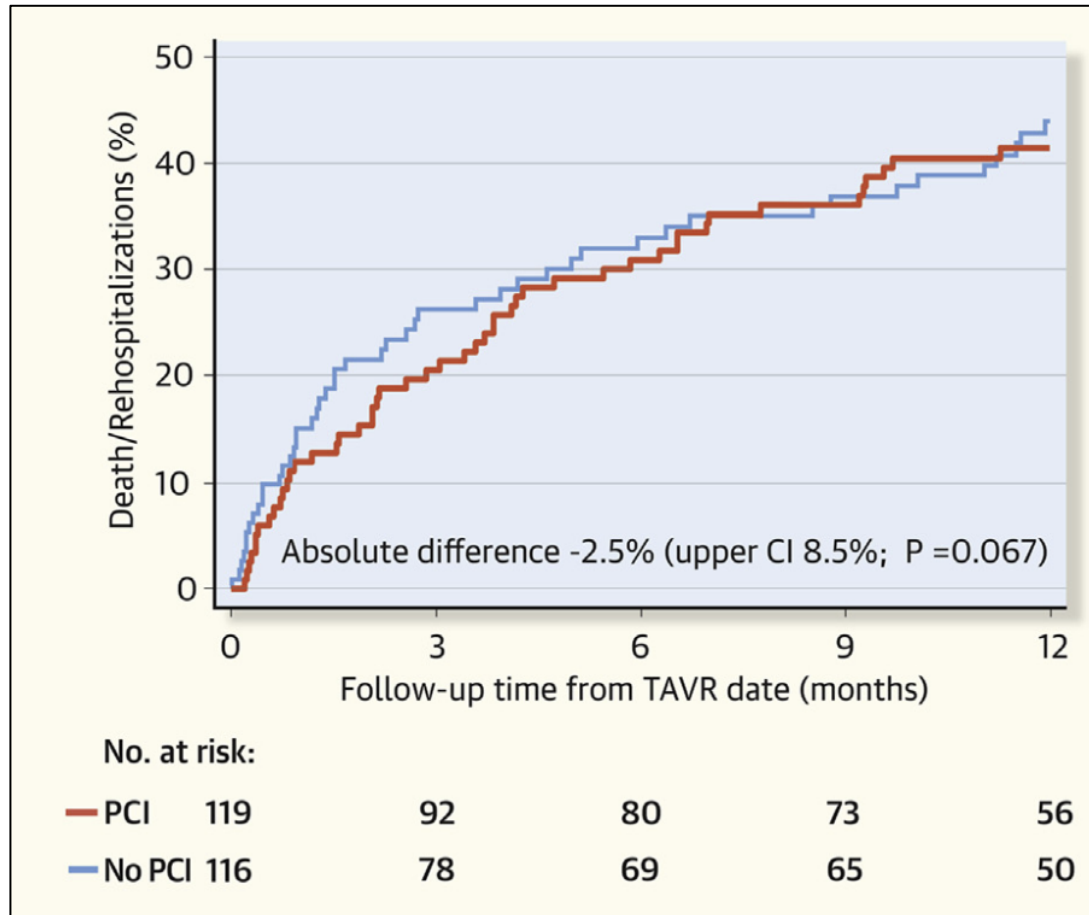
# Is coronary access important after TAVR?

- 30-75% of TAVR patients have co-existent CAD
- Incidence of coronary events is anticipated to increase with age

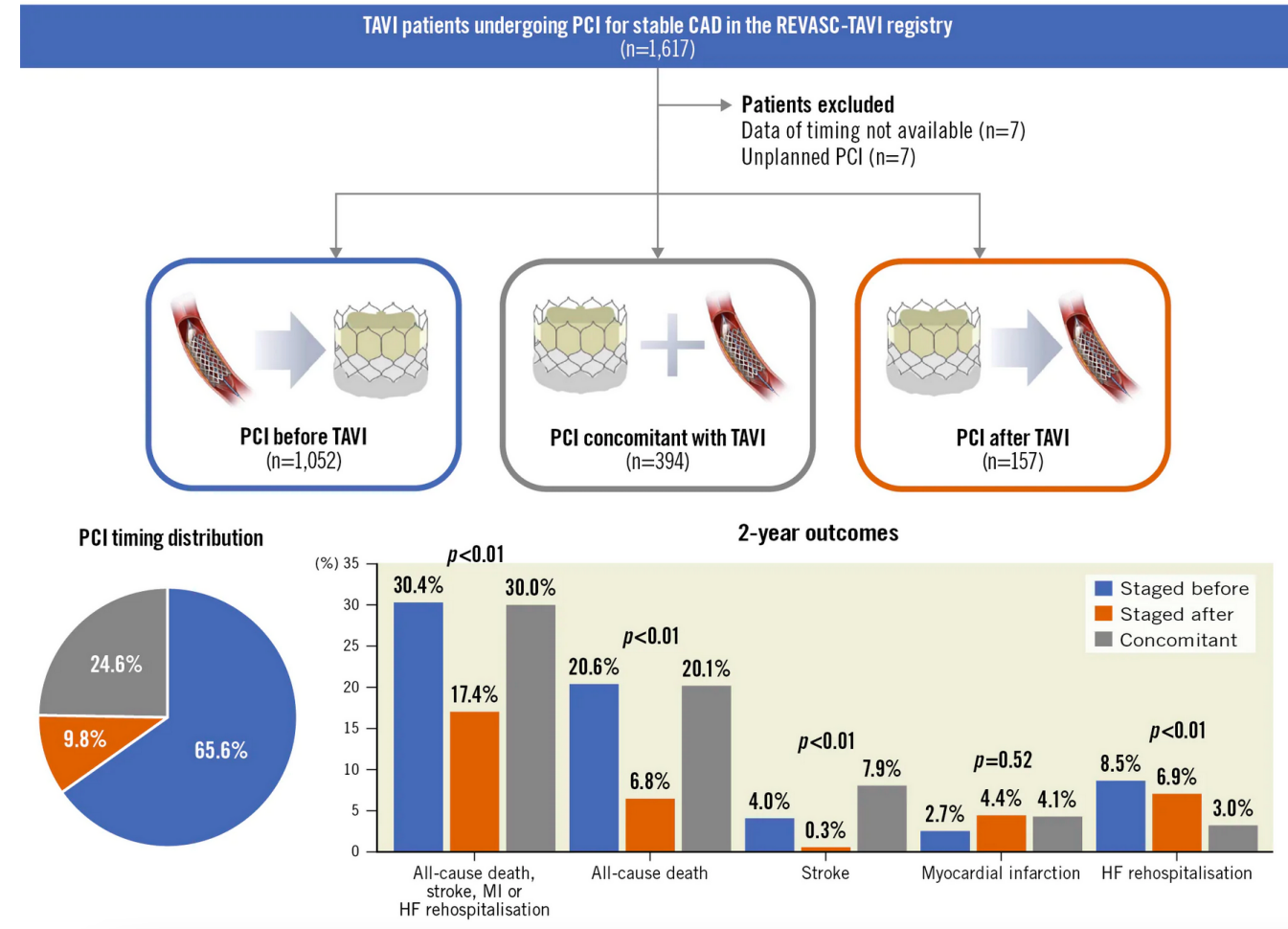


# Is coronary access important after TAVR?

## RCT of PCI pre-TAVR



Patterson, T. et al. J Am Coll Cardiol Interv. 2021

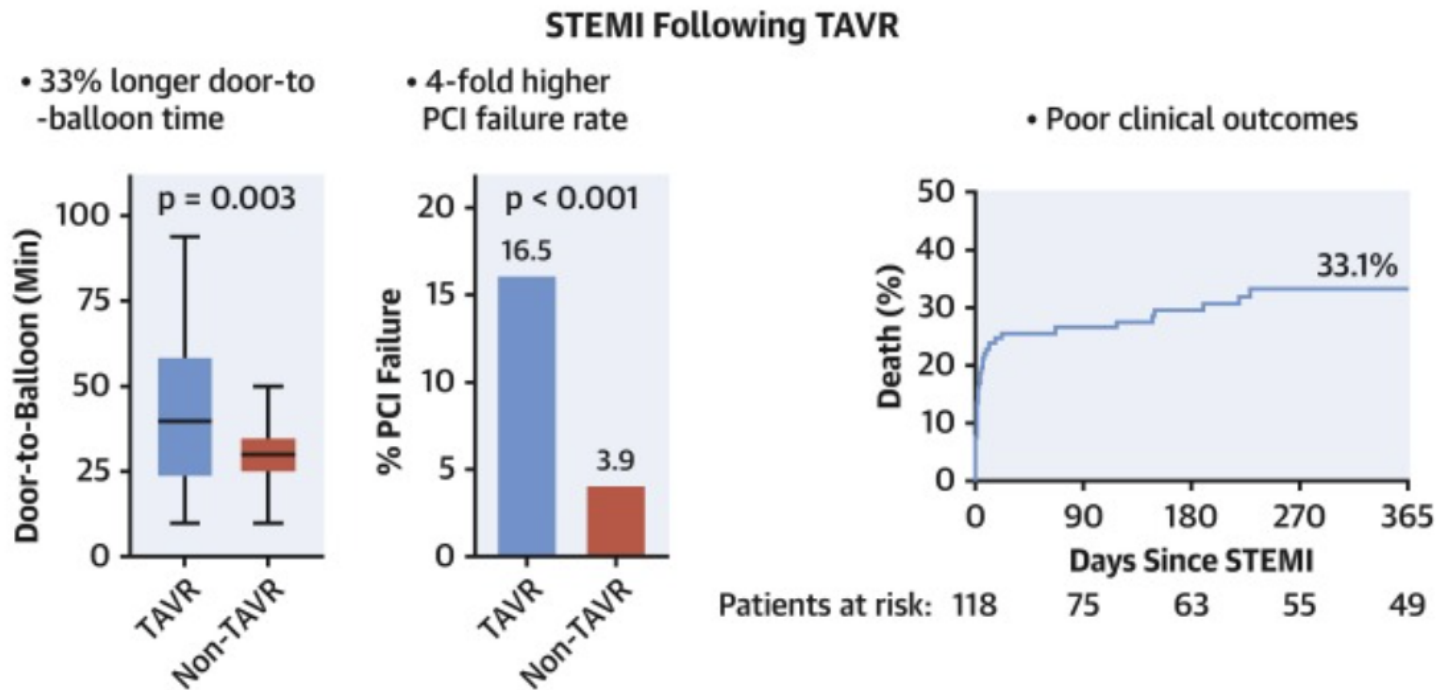


Rheude et al. EuroIntervention 2023;19:589-599

# Prognosis of coronary events after TAVR

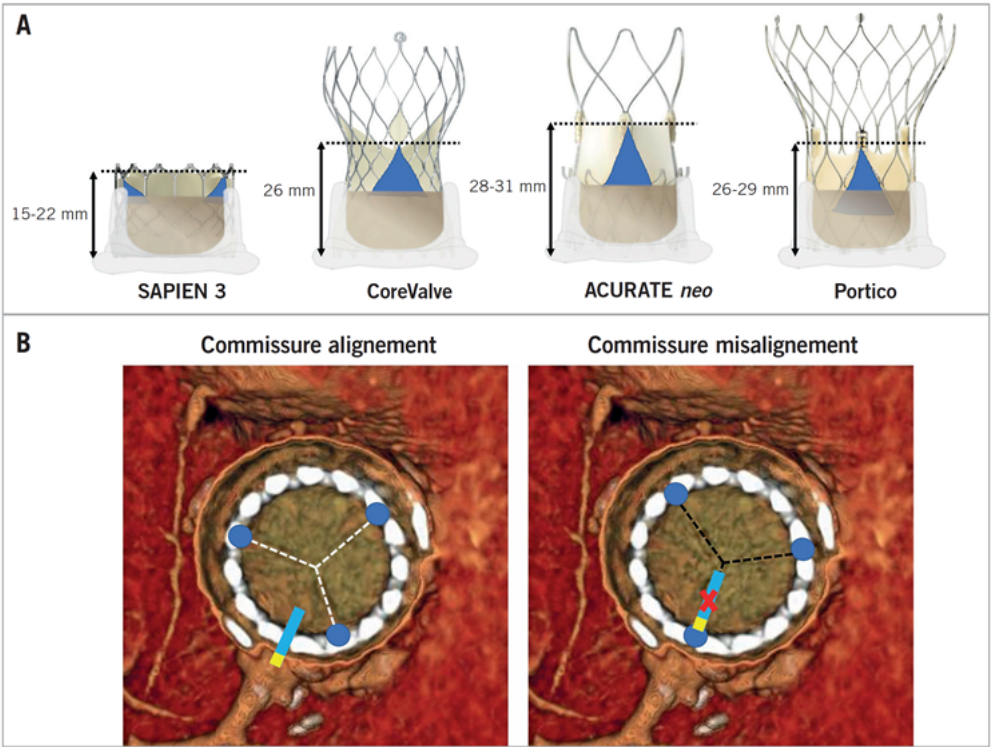
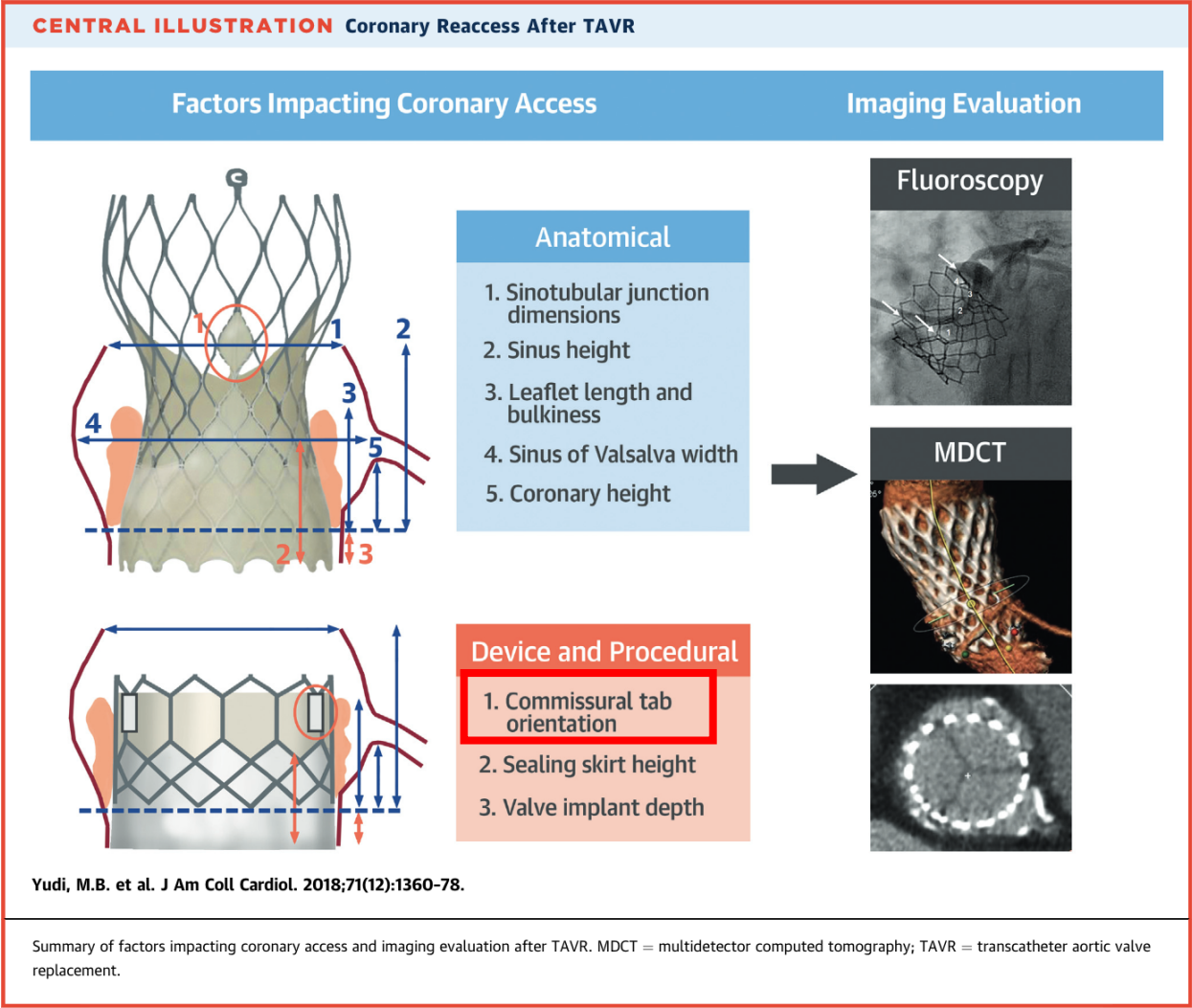
Incidence of ACS up to 2 years following TAVR = 10%

## CENTRAL ILLUSTRATION: ST-Segment Elevation Myocardial Infarction Following Transcatheter Aortic Valve Replacement



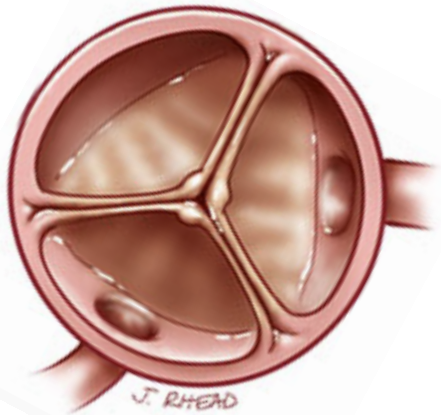
Faroux, L. et al. J Am Coll Cardiol. 2021;77(17):2187-99.

# Why coronary access may be challenging following TAVR?

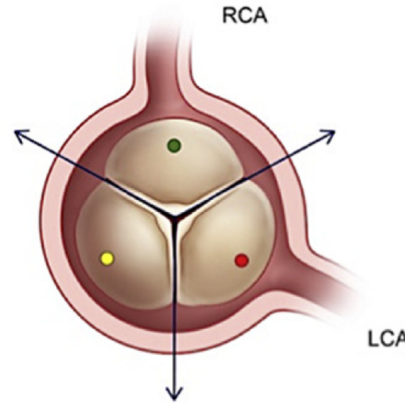
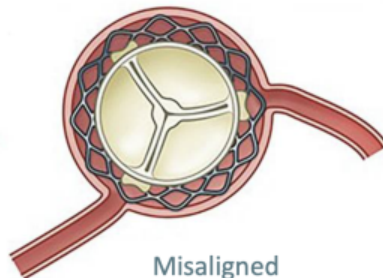
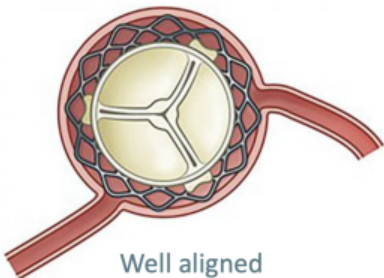




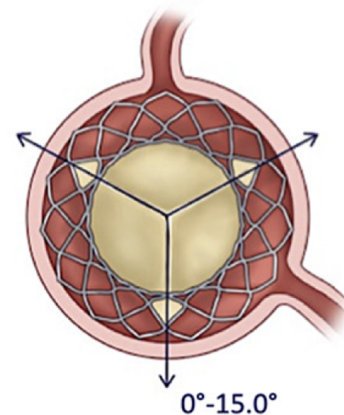
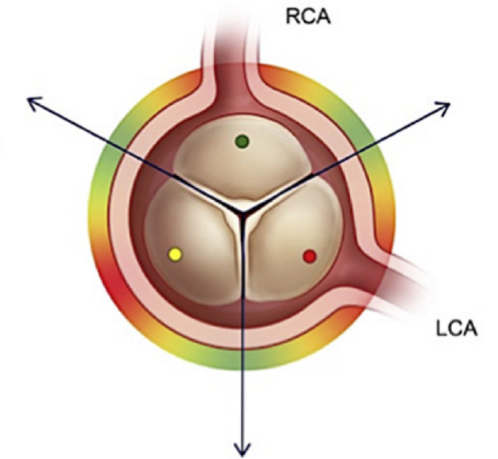
# What is commissural (mis)alignment?



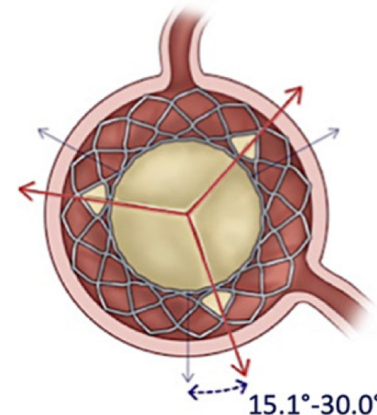
Normal native  
tri-leaflet valve



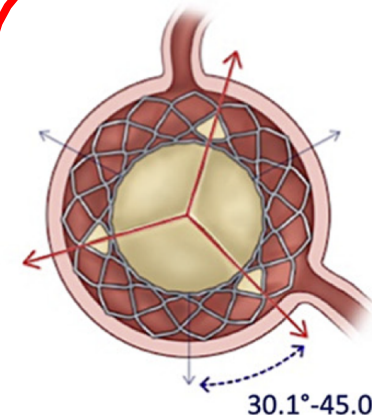
0°-15.0°	commissural alignment
15.1°-30.0°	mild CMA
30.1°-45.0°	moderate CMA
45.1°-60.0°	severe CMA



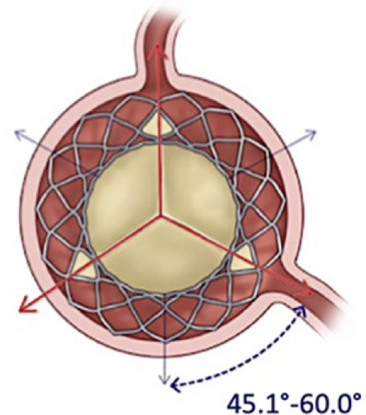
Commissural alignment



Mild CMA

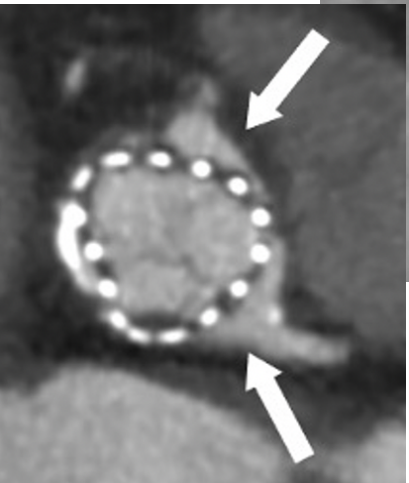
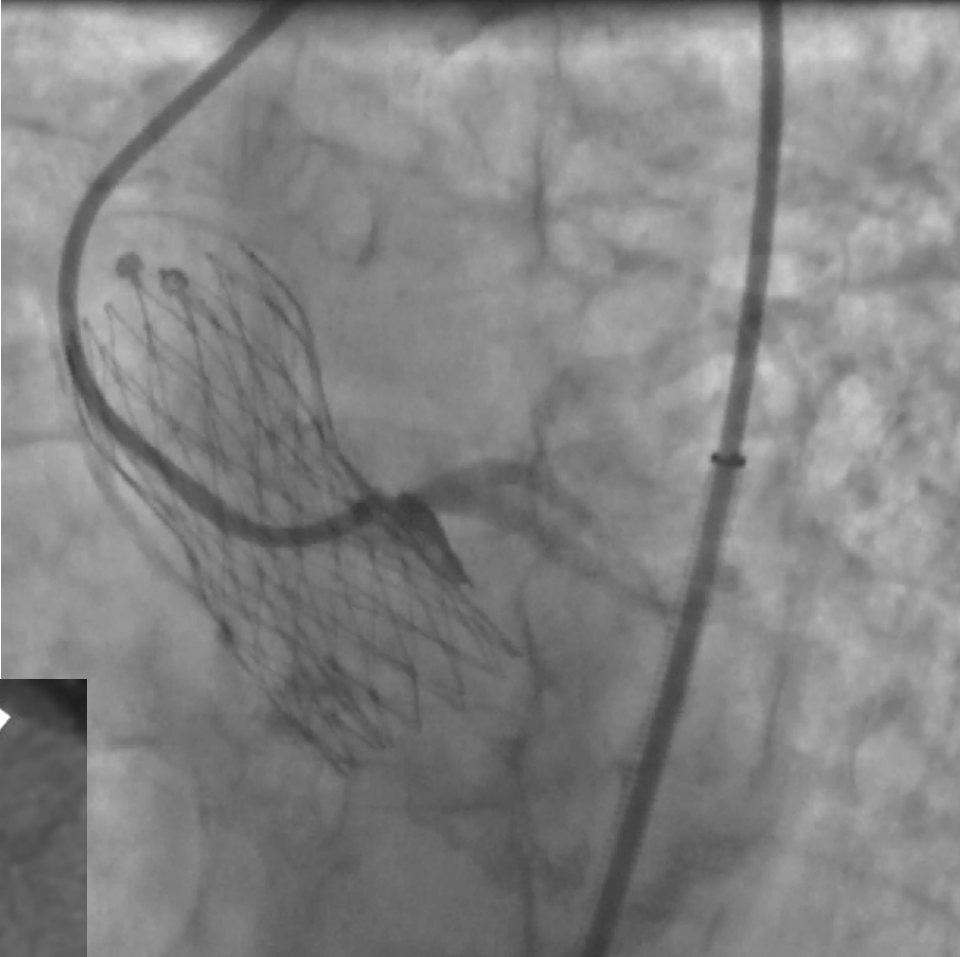


Moderate CMA



Severe CMA

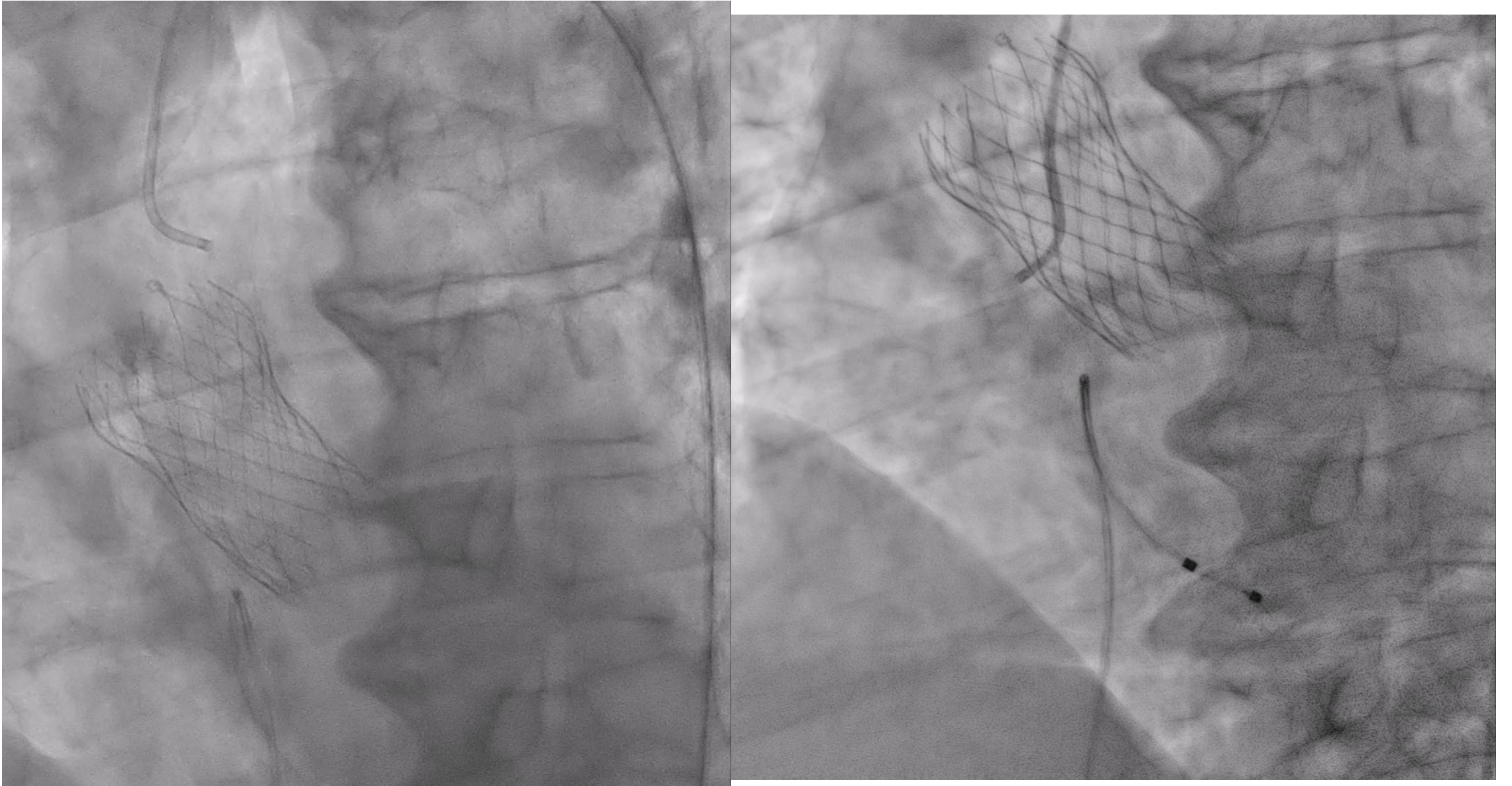
# Why coronary access may be challenging following TAVR?



26 Evolut into 23mm Magna

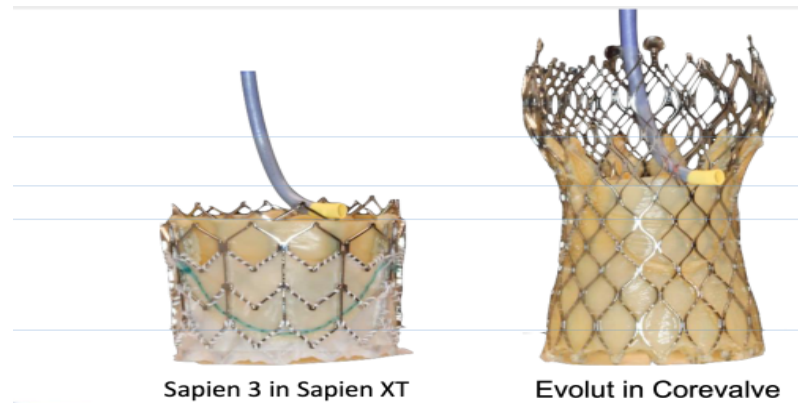
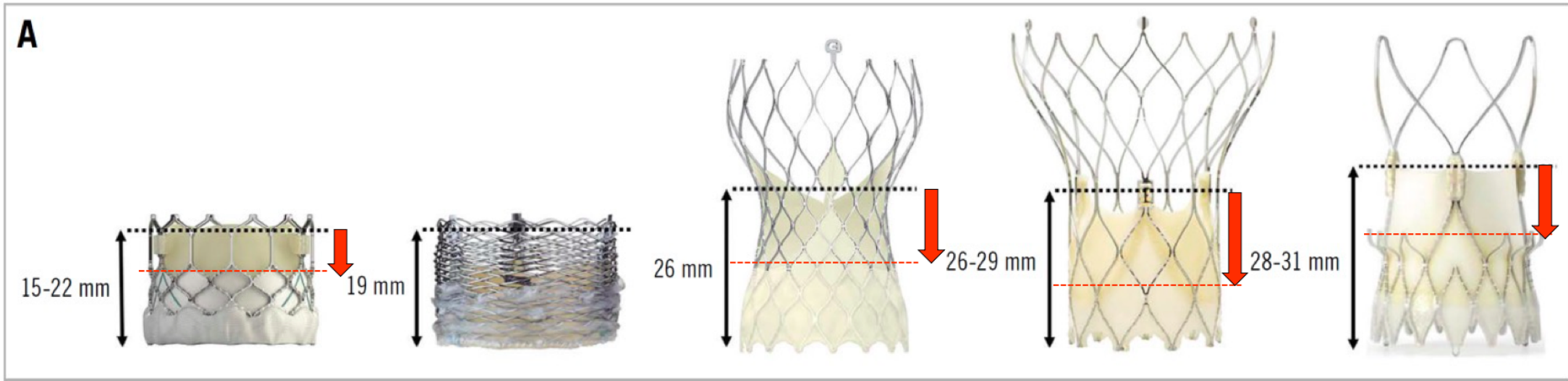


# Coronary access and commissural alignment



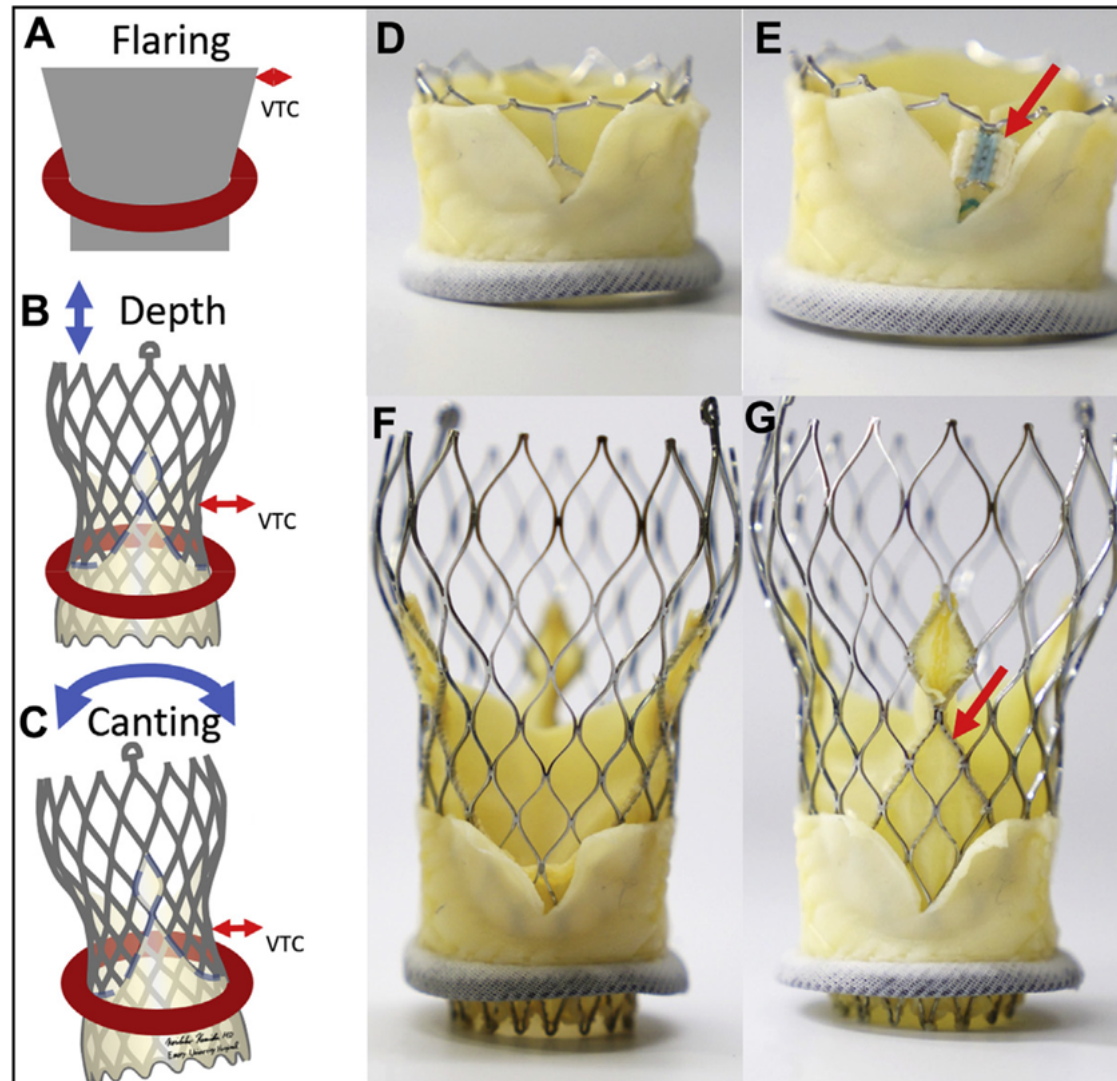
# Commissural alignment and redoTAVR

Increase likelihood of redo TAVR by reducing risk of sinus sequestration and coronary obstruction

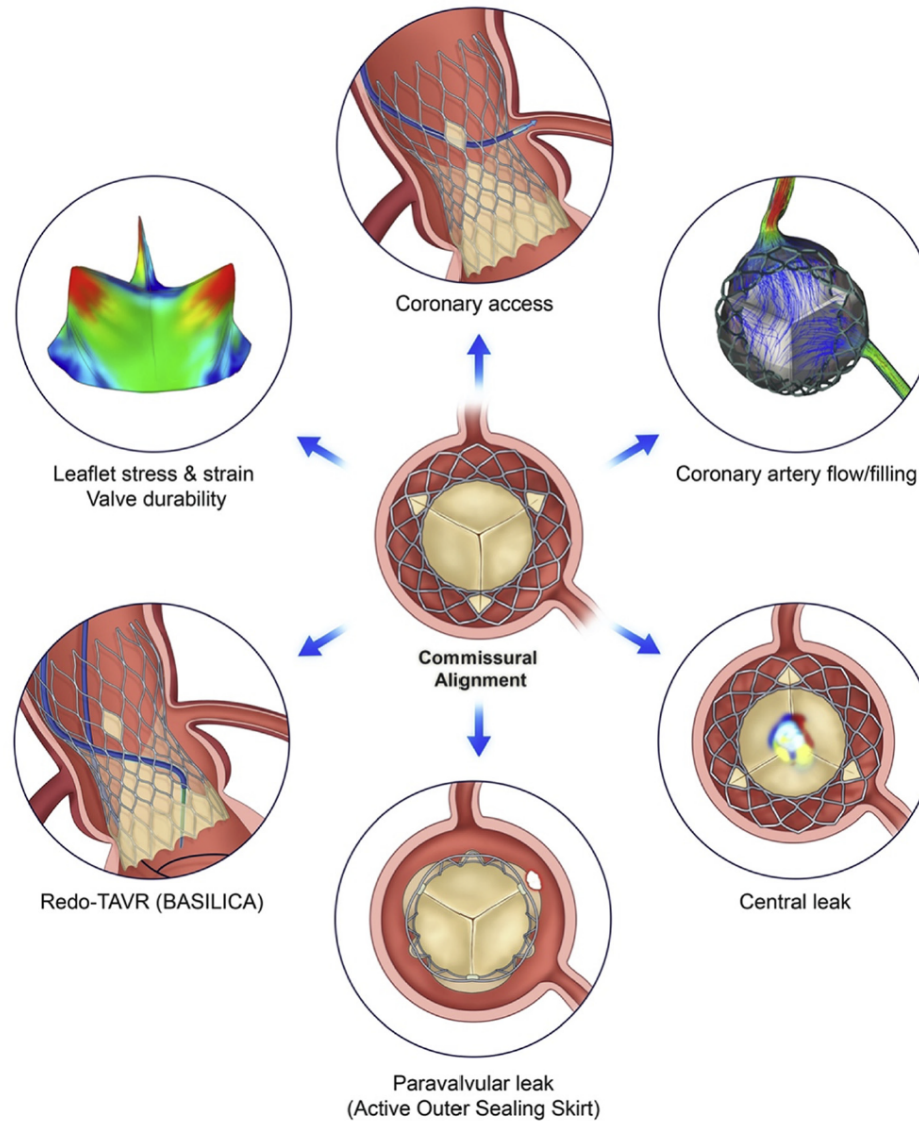




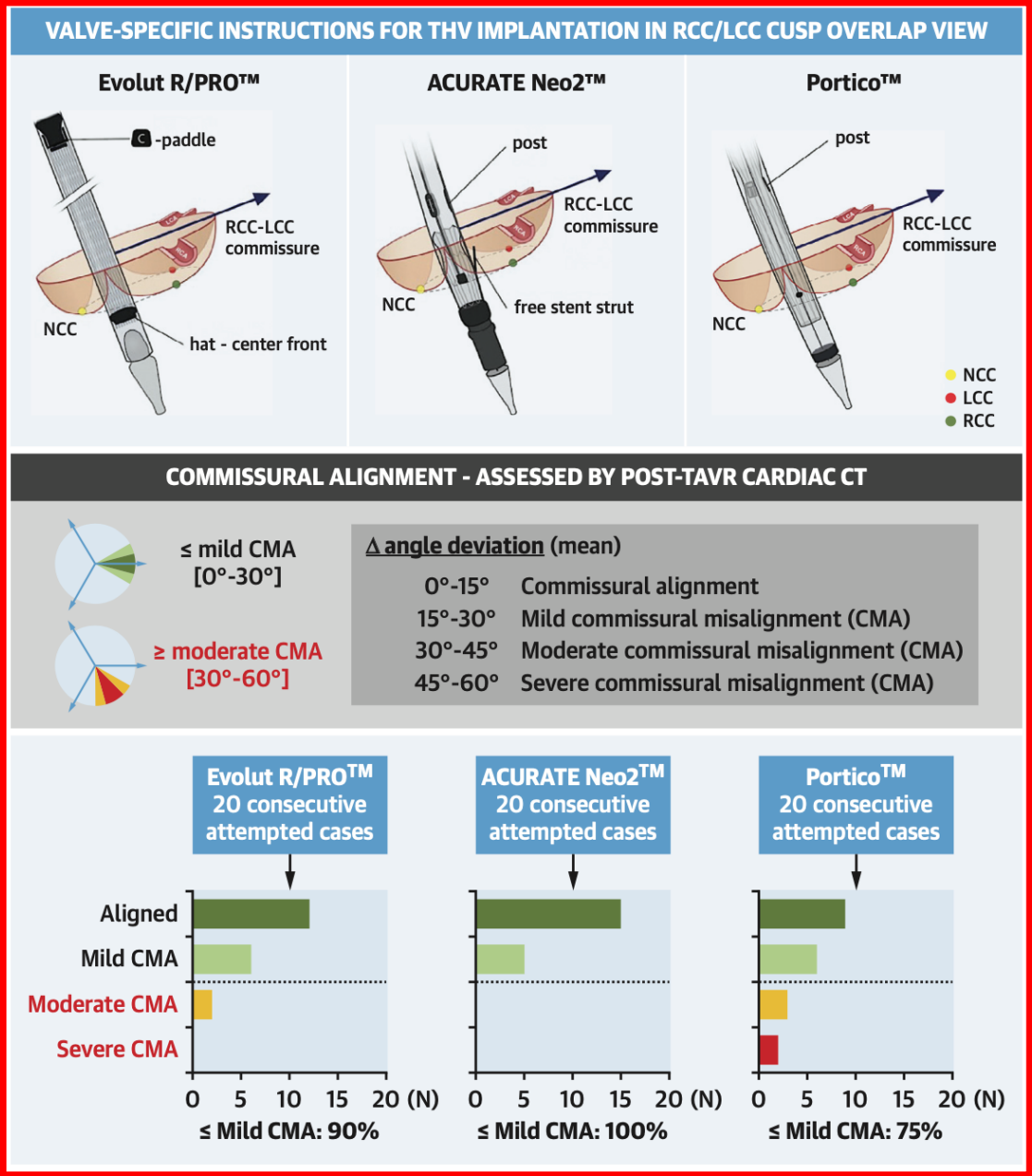
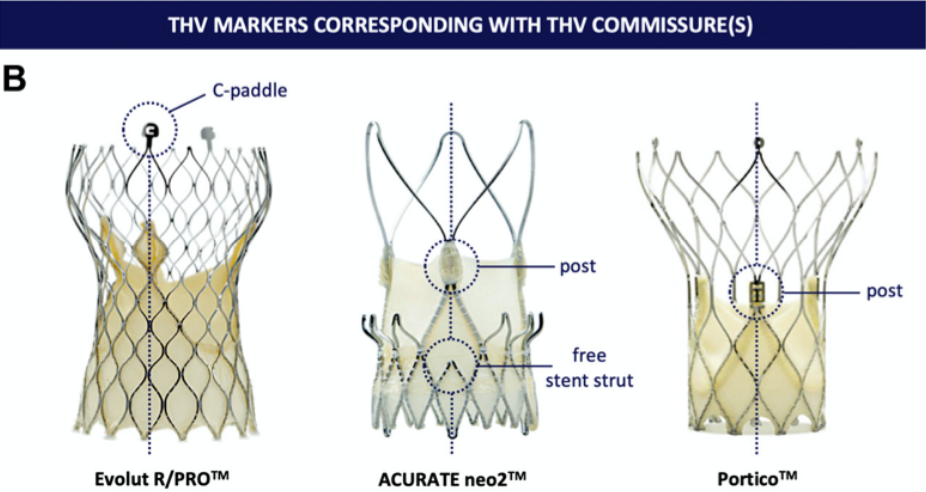
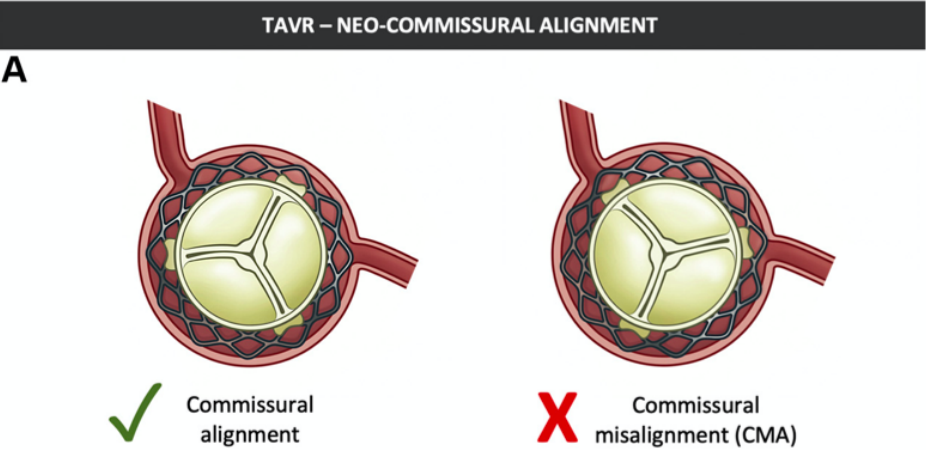
# Commissural alignment and ViV



# Commissural alignment beyond coronary access



# Patient-Specific Implantation Technique to Obtain Neo-Commissural Alignment With Self-Expanding Transcatheter Aortic Valves

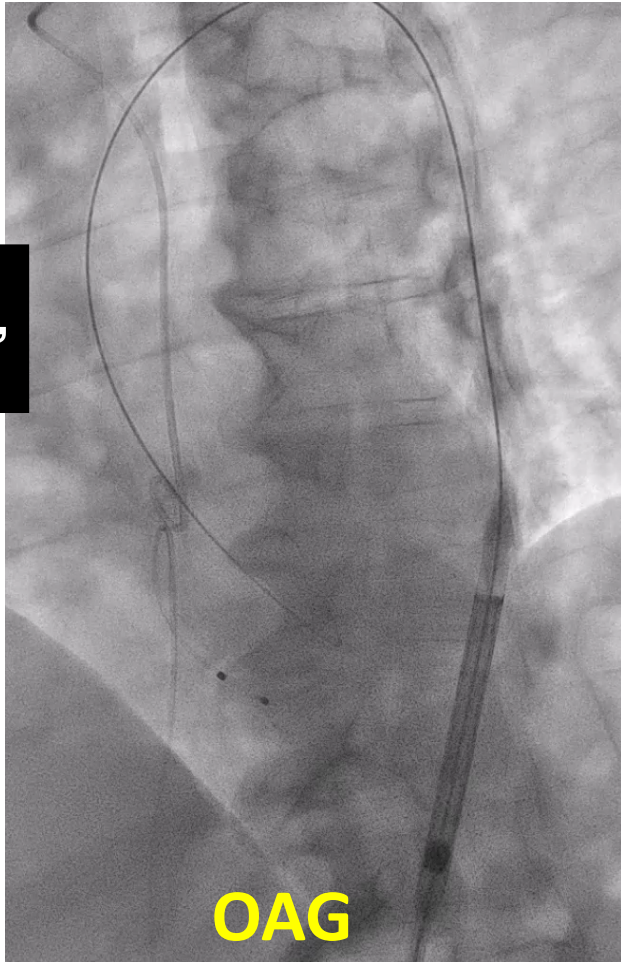




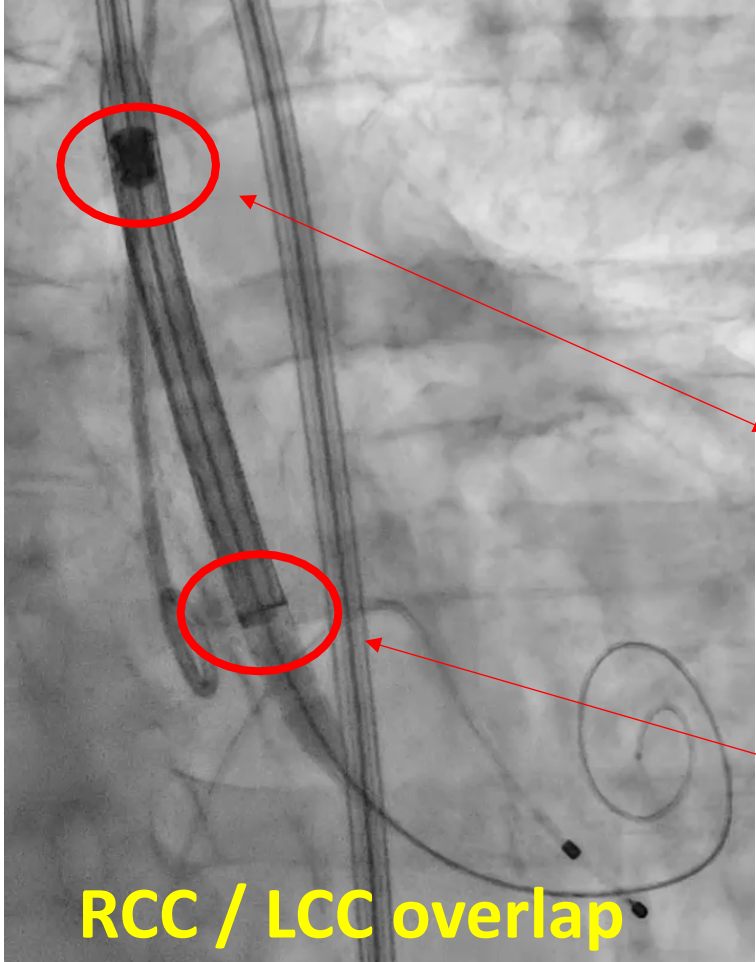
# How to achieve commissural alignment in practice



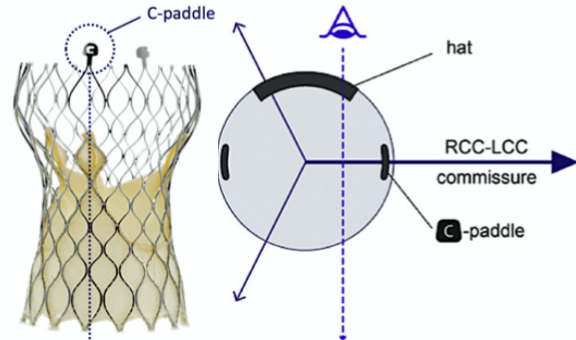
flush  
port at 3'



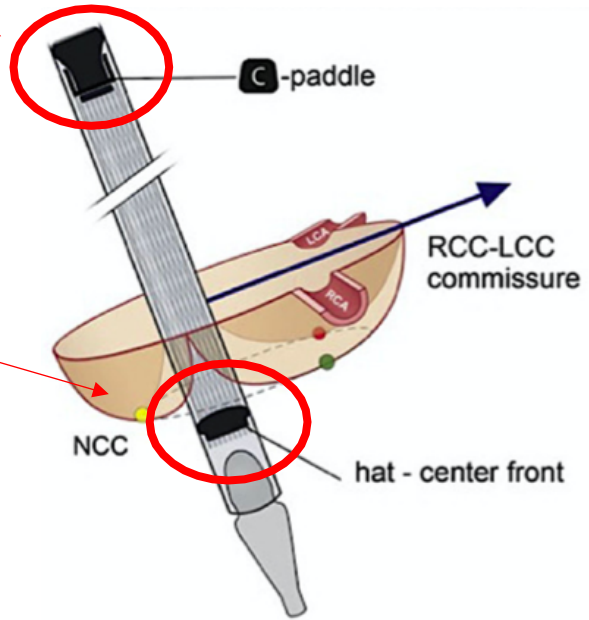
Hat Marker - Outer Curve



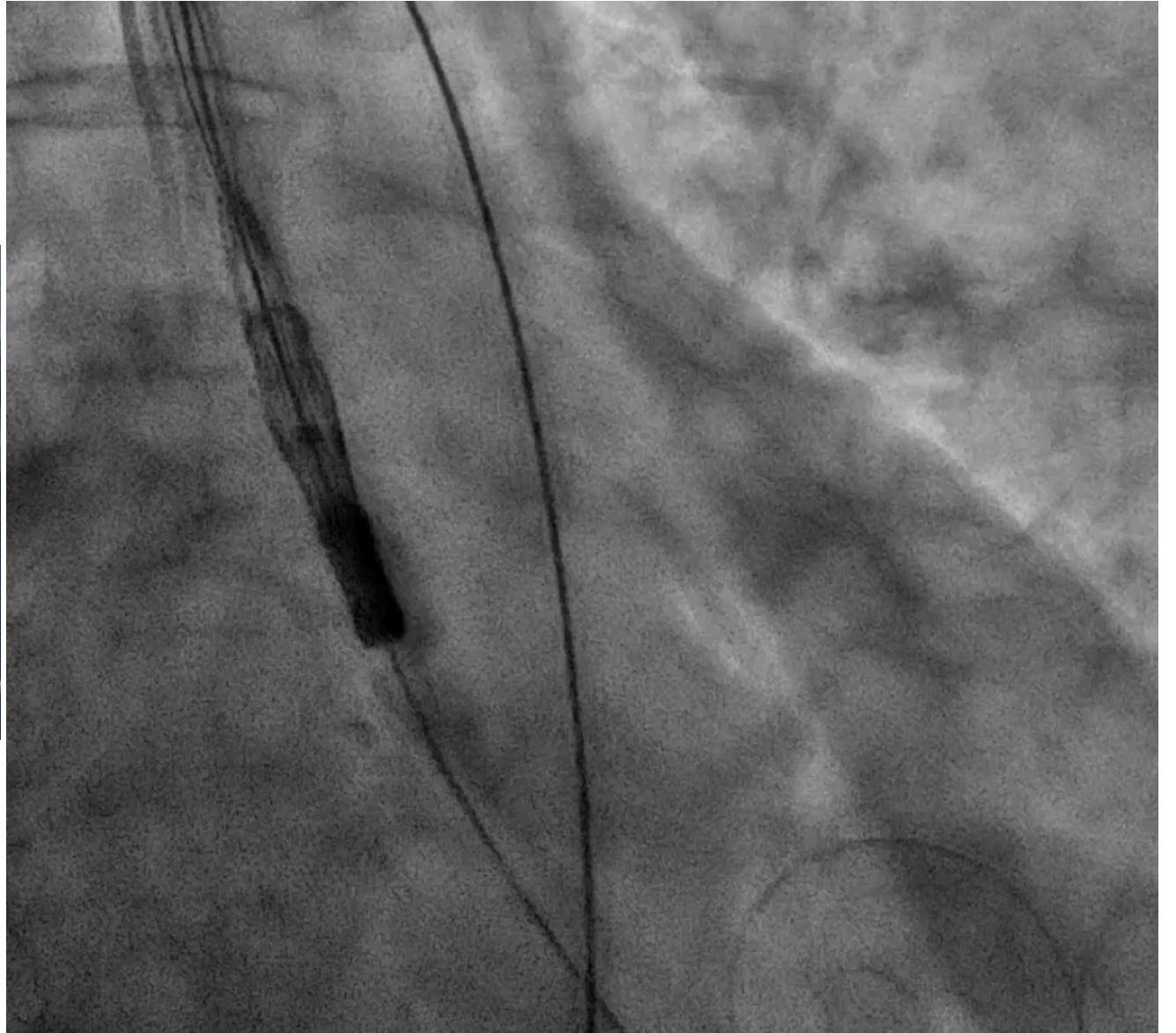
Hat Marker - Center Front



90° angle between C-paddle & « hat » marker

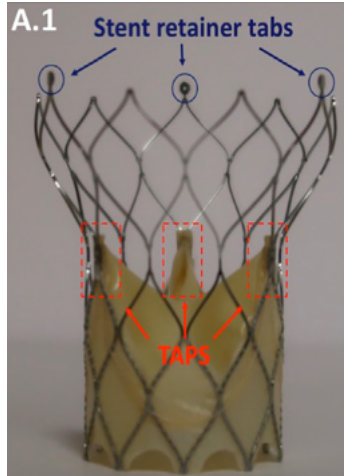


# How to achieve commissural alignment in practice

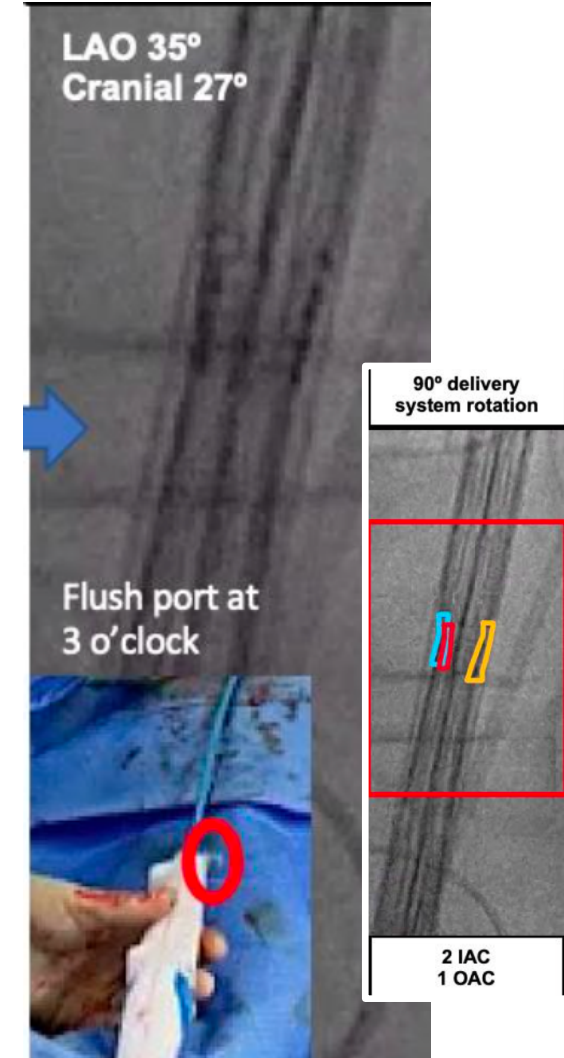
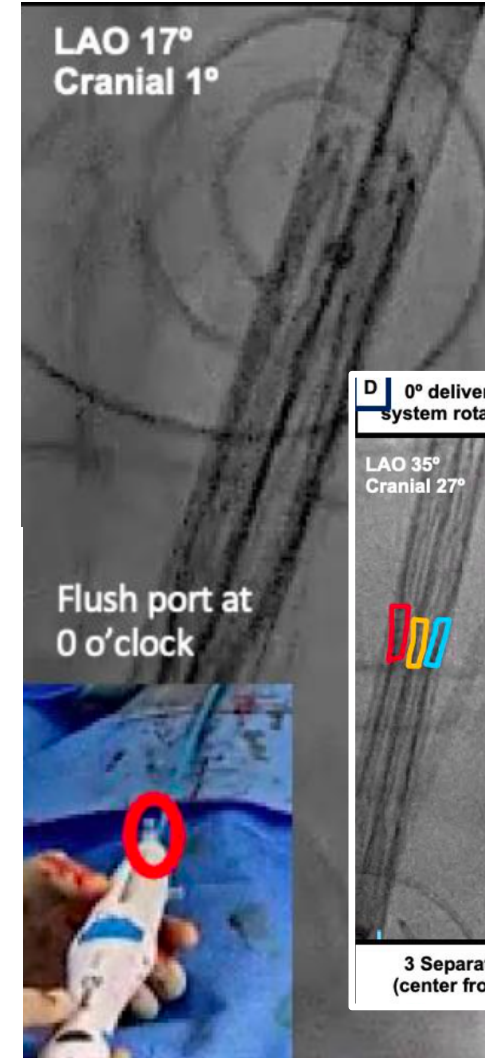




# How to achieve commissural alignment in practice



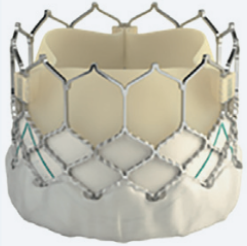


**Start with Flush Port at 12 o'clock**



# Commissural alignment with balloon-expandable valves

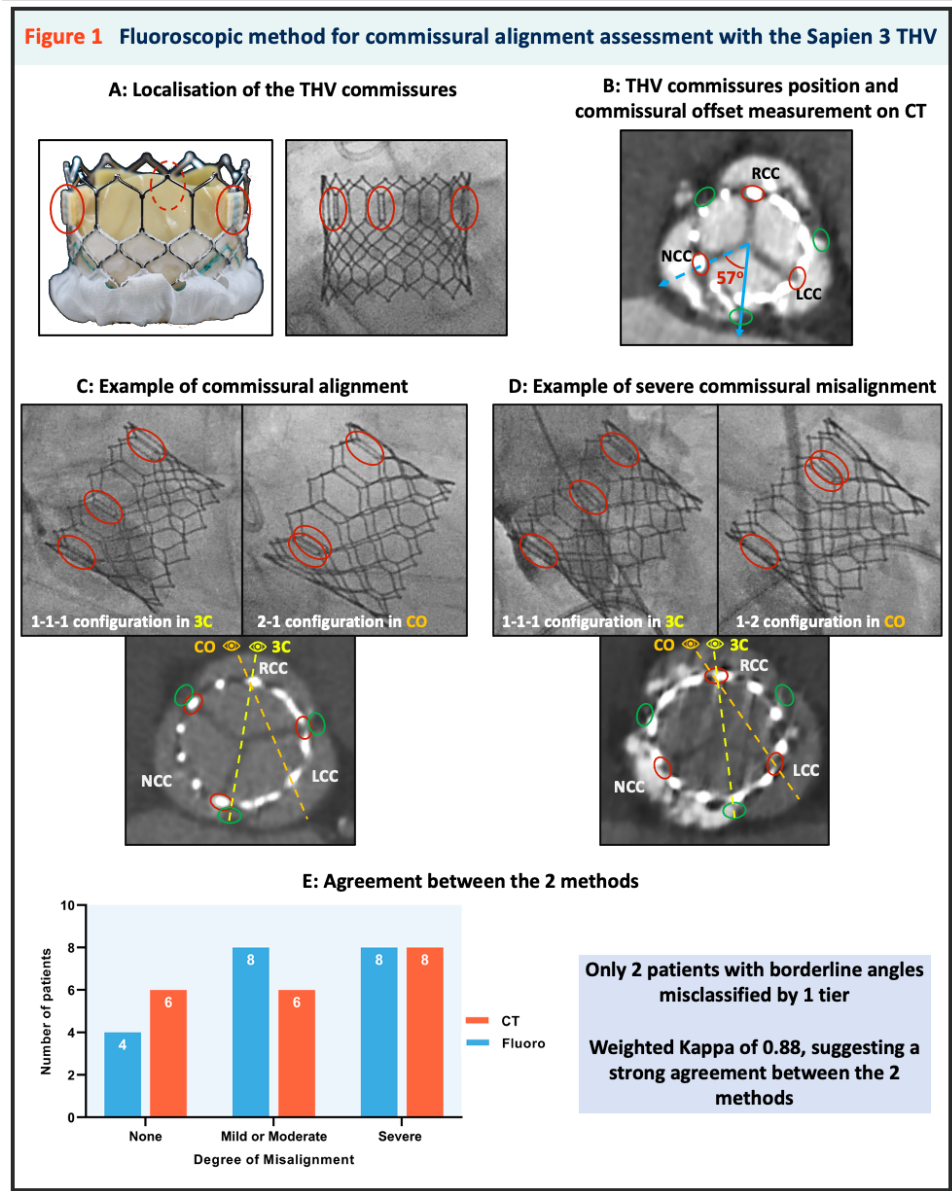
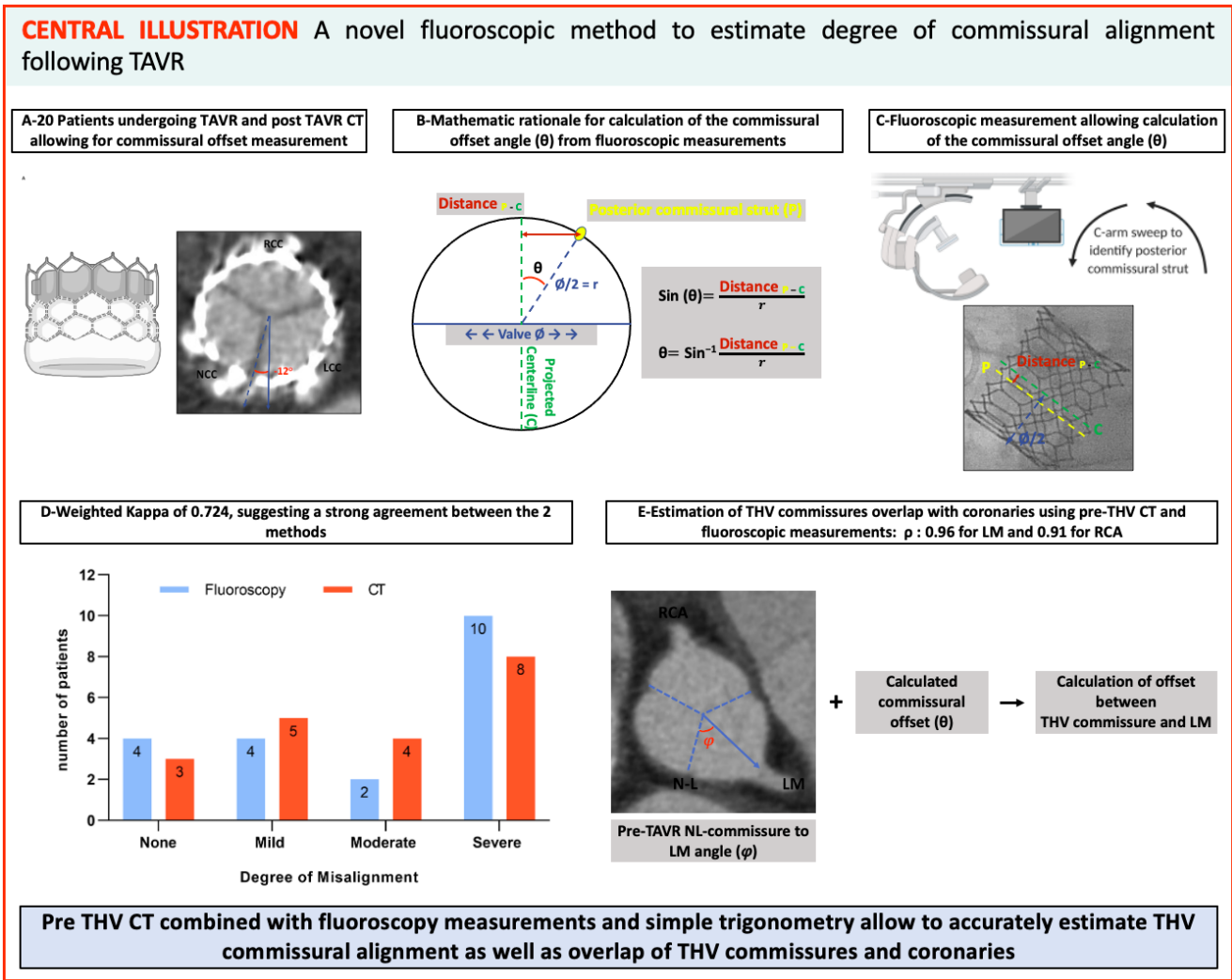
## S3 THVs

33–43% of moderate or severe misalignment

CENTRAL ILLUSTRATION Summary of the ALIGN TAVR Study on Transcatheter Valve Orientation and its Impact on Commissural Alignment and Coronary Artery Overlap			
	Sapien 3	Evolut	ACURATE-neo
			
Method of Transcatheter Valve Orientation	1 commissure crimped at 3, 6, 9 and 12 o'clock	"Hat" marker position at initial deployment	Commissure position at initial deployment
Impact of Initial Deployment Orientation on Commissural Alignment	None	<ul style="list-style-type: none"><li>• Insert catheter with flush port facing 3 o'clock</li><li>• Alignment improves when "Hat" at outer curve (OC)/ center front (CF)</li></ul>	<ul style="list-style-type: none"><li>• Insert catheter with flush port facing 12 o'clock</li><li>• Alignment improves when commissure at center back (CB)/ inner curve (IC)</li></ul>
Severe Overlap With Left Main	I 32.7%-39.7%	15.7% (OC/CF) vs. 66.0%	0-7.1% (CB/IC) vs. 14.8%-75.9%
Severe Overlap With Right Coronary Artery	28.8%-51.6%	7.1% (OC/CF) vs. 51.1%	7.1%-12.5% (CB/IC) vs. 62.1%-74.1%

Tang, G.H.L. et al. J Am Coll Cardiol Int 2020;13(9):1036-42.

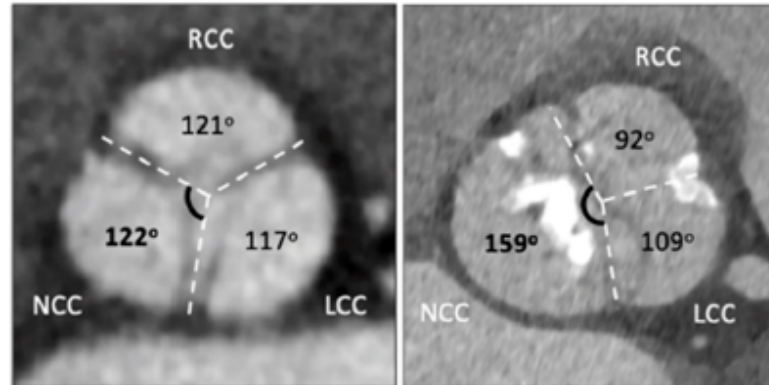
# Commissural alignment with balloon-expandable valves





# Limitations

## (A) AV CUSP SYMMETRY



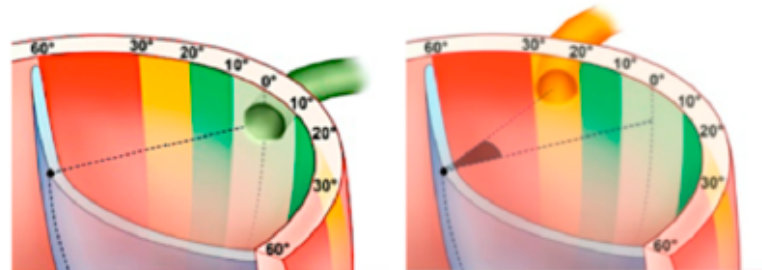
*Symmetric*

*Severely asymmetric*

### Inter-commissural angle of the largest cusp

120°-125°	symmetric
125°-130°	mildly asymmetric
130°-135°	moderately asymmetric
>135°	severely asymmetric

## (B) CORONARY OSTIAL ECCENTRICITY



*Centered*

*Moderate eccentricity*

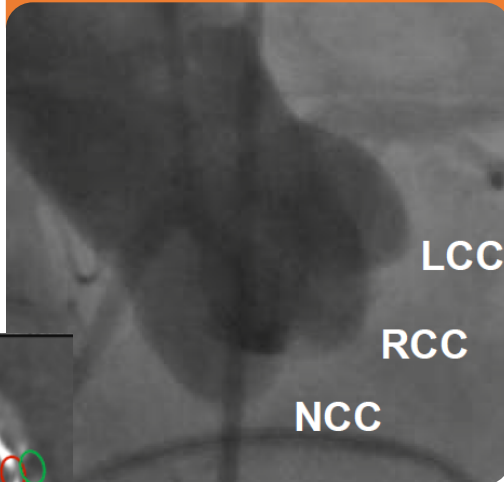
### Angle between center-cusp and coronary ostium

0°-10°	centered
10°-20°	mild eccentricity
20°-30°	moderate eccentricity
>30°	severe eccentricity

# Glimpse into the future (in France)

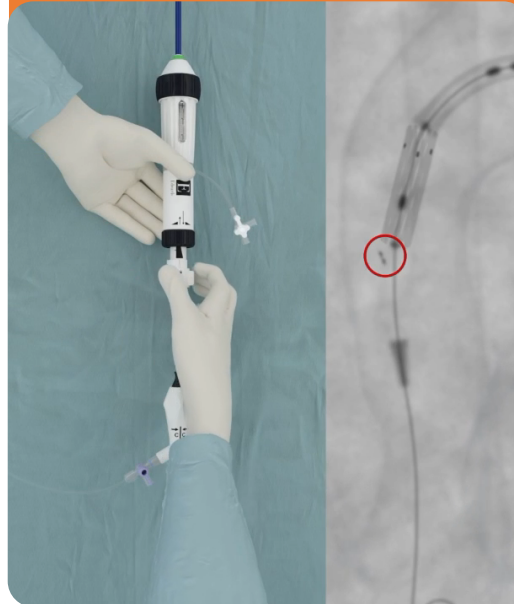
1

Standard 3 cusp view



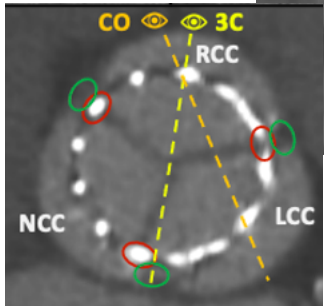
2

Align radiopaque marker prior to deployment



3

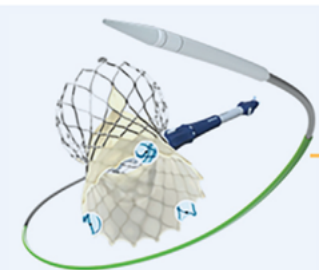
Commissural Alignment  
Coronary Access



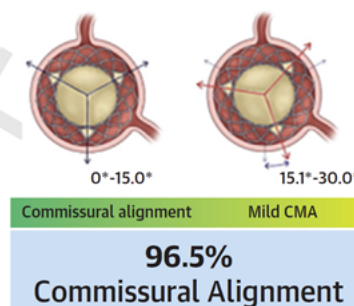
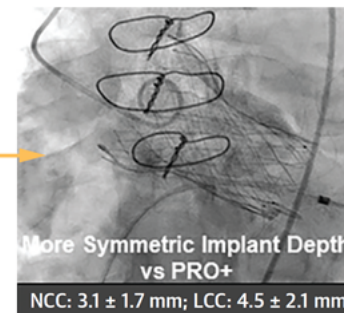
## Transfemoral TAVR With Evolut FX 226 Patients, 9 US Centers 6/27/2022-9/16/2022

- Age  $80 \pm 9$ , 51.8% Female
- 34.1% Low Surgical Risk
- 4.0% Bicuspid Aortic Valve
- 10.6% Valve-in-valve

- 94.2% Conscious Sedation
- 67.6% Direct Inline Sheath
- 35.4% Lundquist Stiff Wire Use
- 98.4% "Hat" marker at Optimal Orientation during Deployment



Technical Success: 99.1%



# Take-home message

- Further coronary access and repeatability are crucial in younger TAVR patients
- Less than moderate commissural misalignment can be achieved with self-expandable THVs
- Next-generation devices may allow for more accurate commissural alignment
- CT-based patient specific simulation may be helpful in some cases

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## Thank you for your attention

