
HOW TO REDUCE PPI RATE WITH CUSP OVERLAP TECHNIQUE TCTAP 2021



Hemal Gada, MD, MBA
President, Heart and Vascular Institute
Medical Director, Structural Heart Program
Staff Interventional Cardiologist
UPMC Pinnacle
Harrisburg, PA, USA

DISCLOSURE STATEMENT OF FINANCIAL INTEREST

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

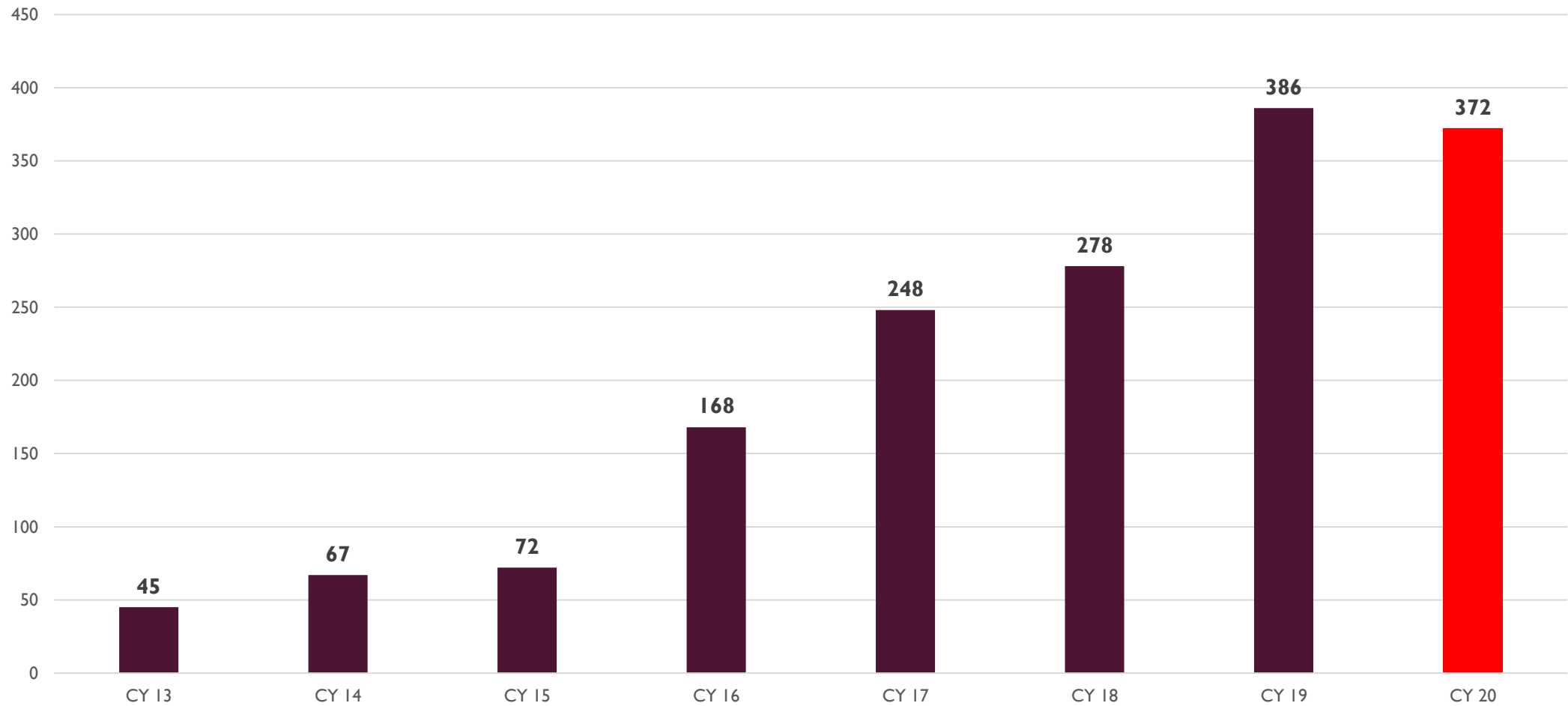
Affiliation/Financial Relationship

- Consulting Fees/Honoraria

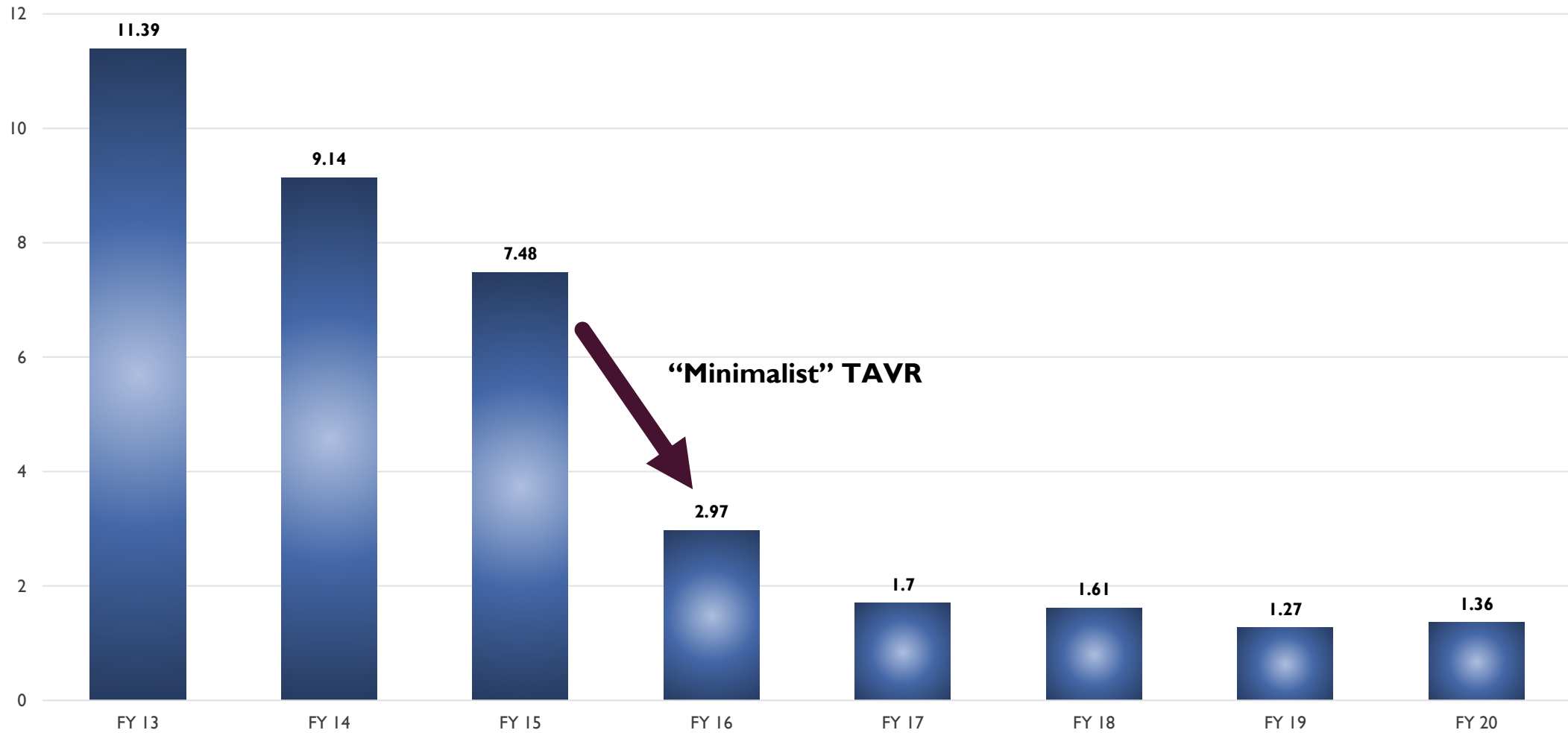
Company

- Abbott Vascular
- Bard Medical
- Boston Scientific
- Medtronic, Inc

UPMC PINNACLE TAVR VOLUMES



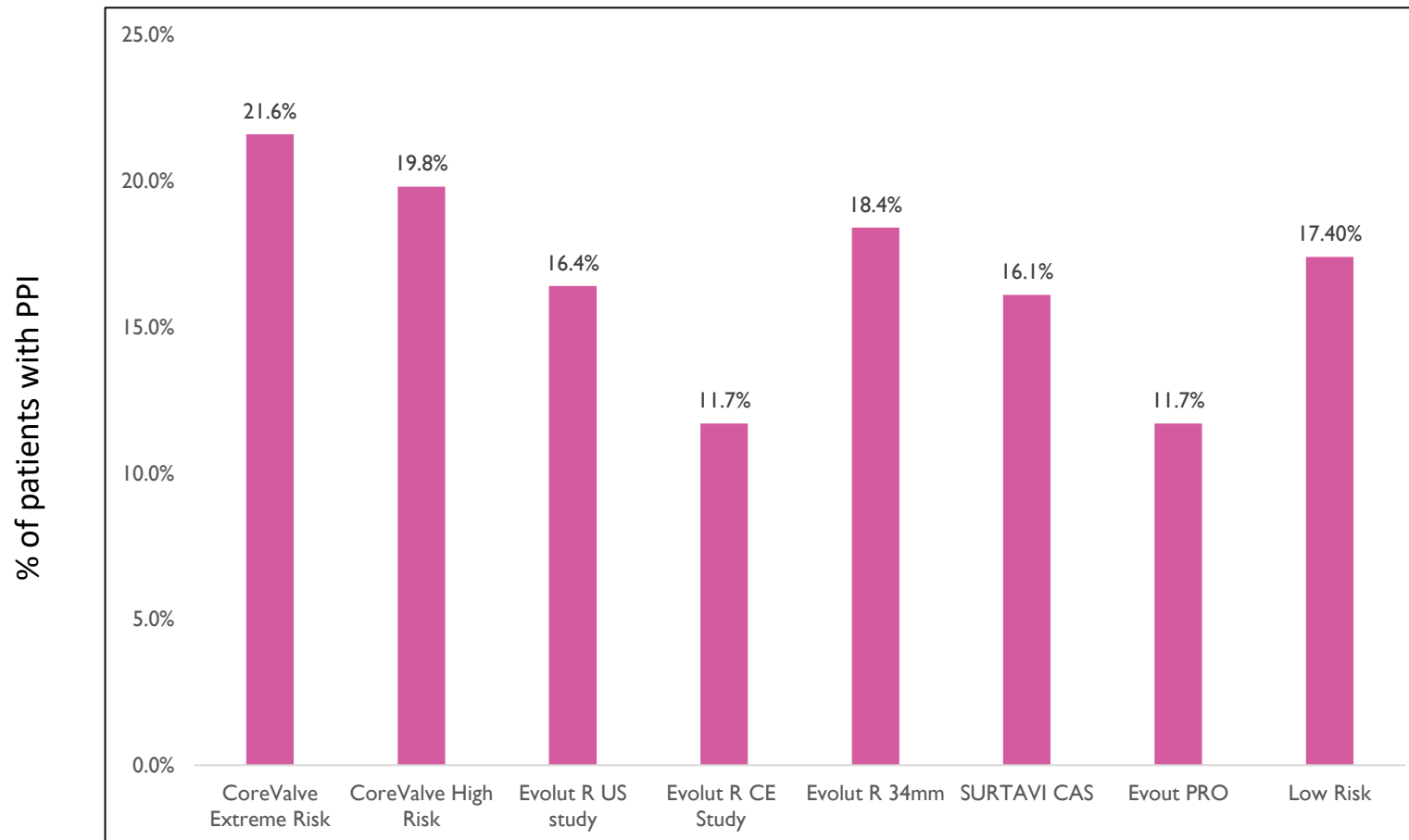
TAVR: REDUCTION IN MEAN LENGTH OF STAY (DAYS)



WHAT MAKES THIS HAPPEN?

- You definitely need to avoid unnecessary complications
 - Vascular complications
 - Stroke
 - Annular rupture
 - Wire perforations; pericardial effusion/tamponade
 - And of course:
 - **PACEMAKERS**

COREVALVE/EVOLUT POST-TAVR PPI @ 30 DAYS

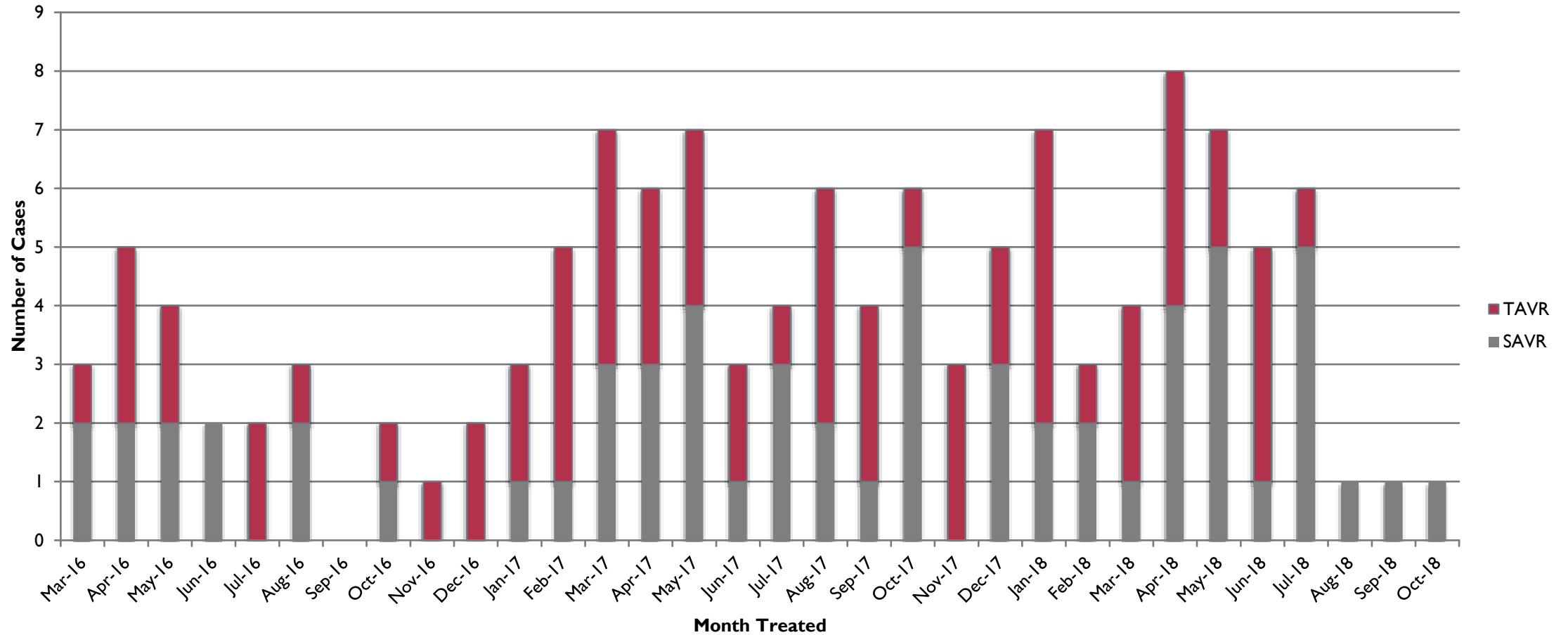




THE MEDTRONIC LOW RISK TRIAL – THE PINNACLE EXPERIENCE

UPMC PINNACLE MEDTRONIC LOW RISK TRIAL ENROLLMENT

128/1200 PATIENTS (10.7%)



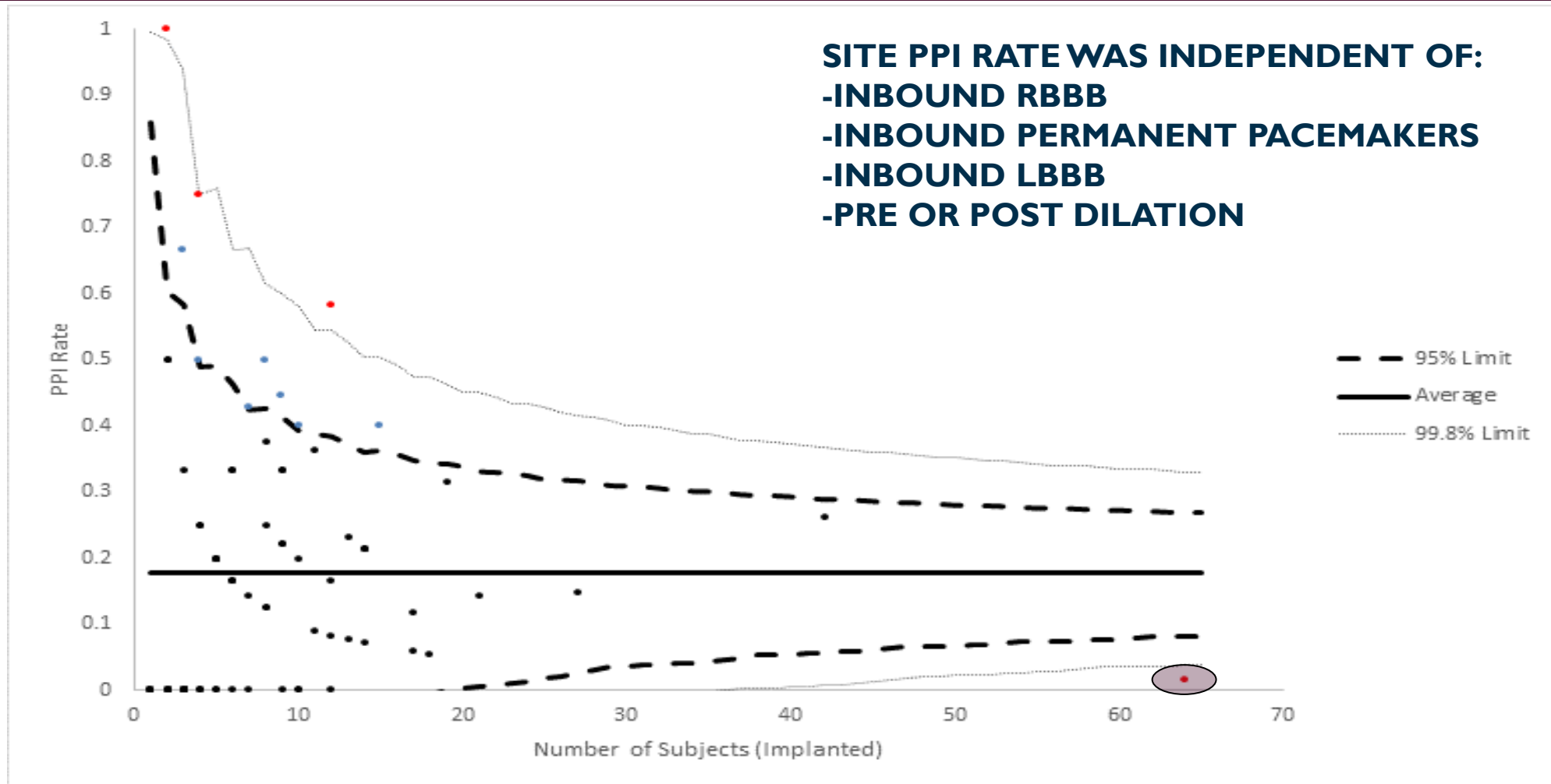
UPMC PINNACLE MEDTRONIC LOW RISK TRIAL – TAVR VS SAVR

	TAVR
Number treated	65
Concomitant/Staged Revasc	6
30-day Reoperation	1
30-day Mortality	1
Disabling Stroke	1
Mean LOS+/-SD	1.39±1.42 (89% POD1)

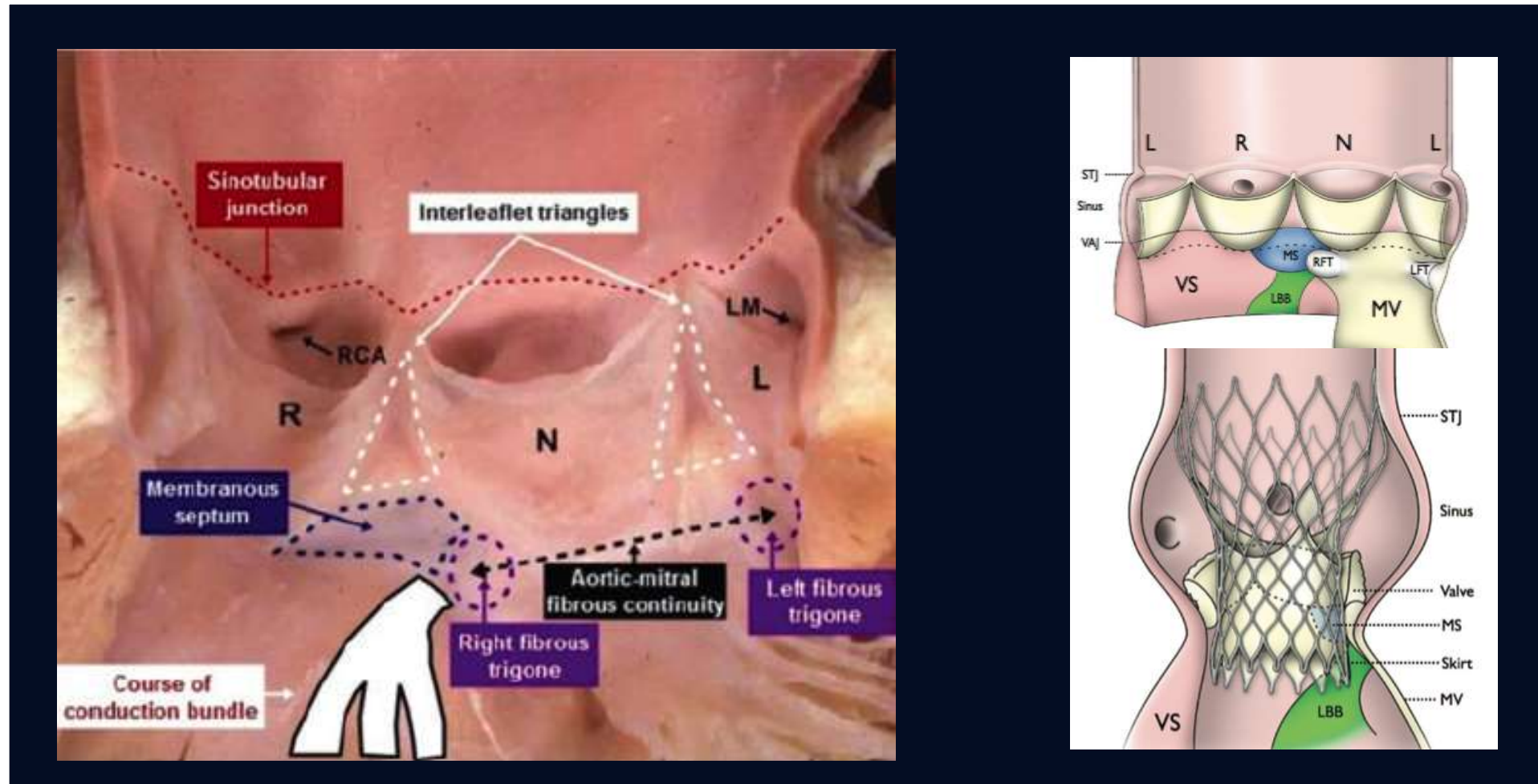
30-day Pacemaker

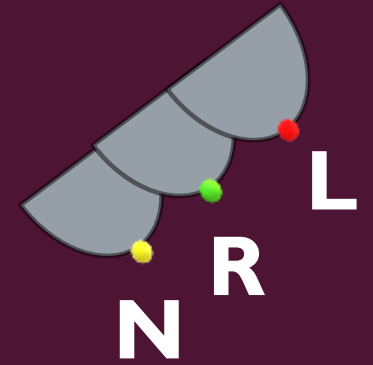
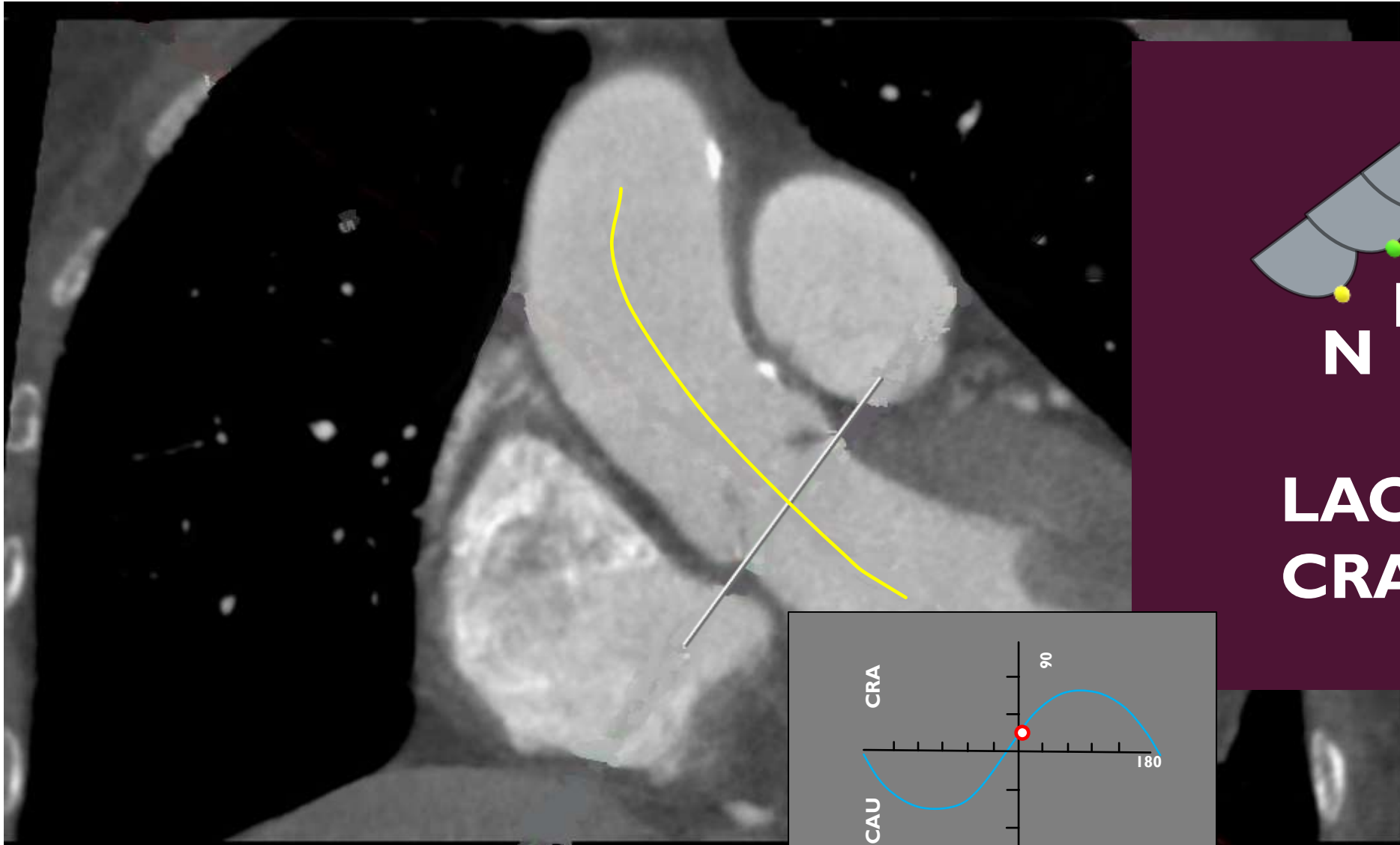
1/65

FUNNEL PLOT OF SITE-LEVEL VARIABILITY OF POST-TAVR PPI

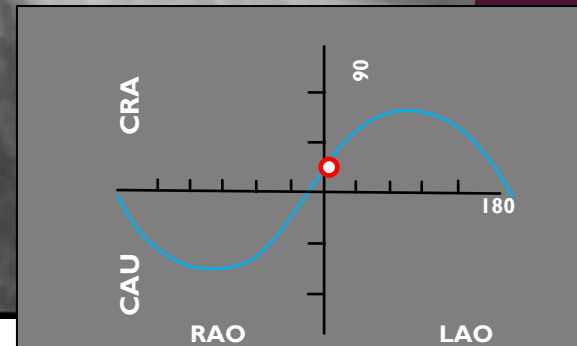


TAVR AND CARDIAC CONDUCTION

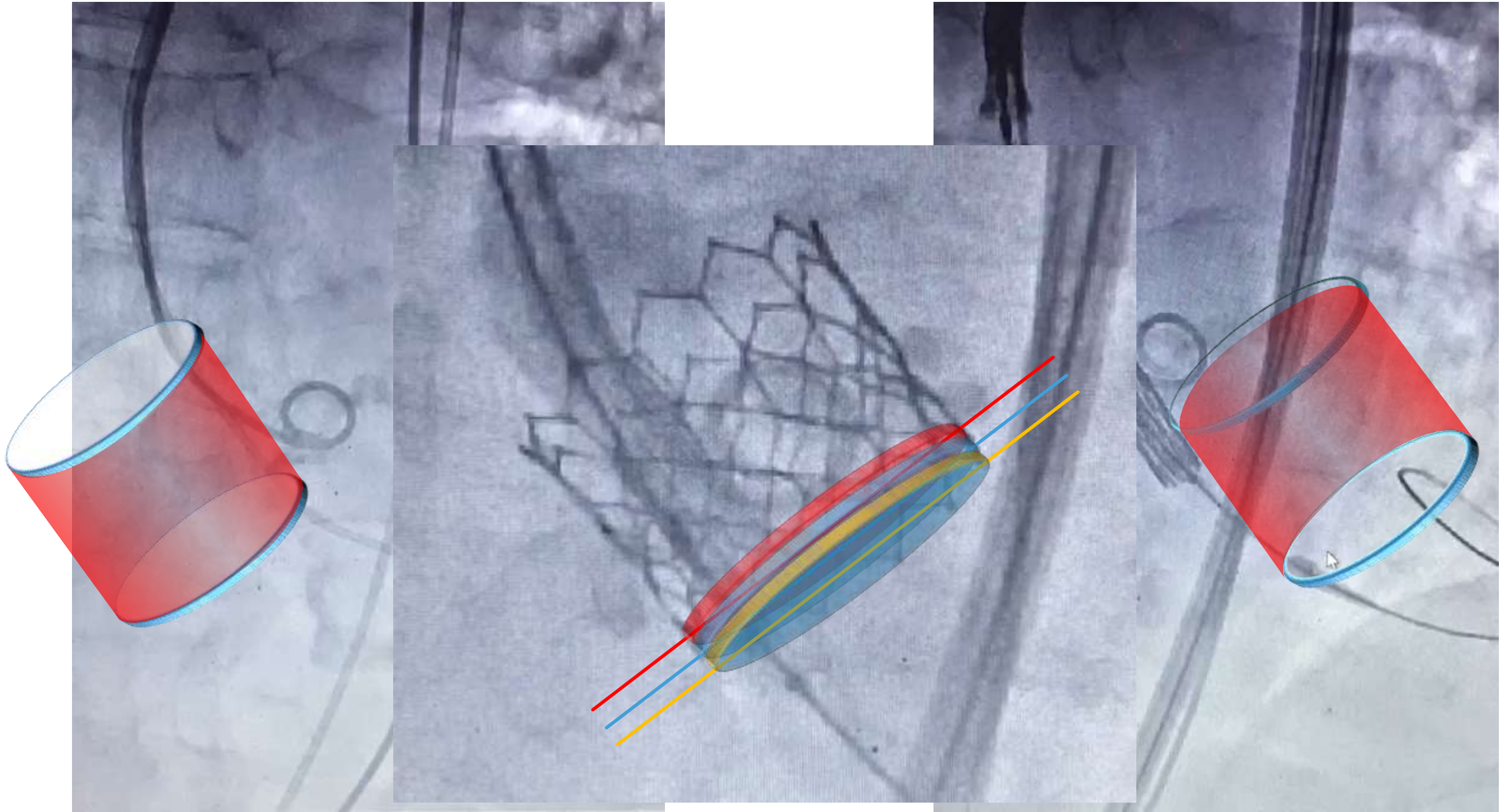


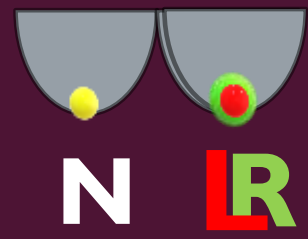
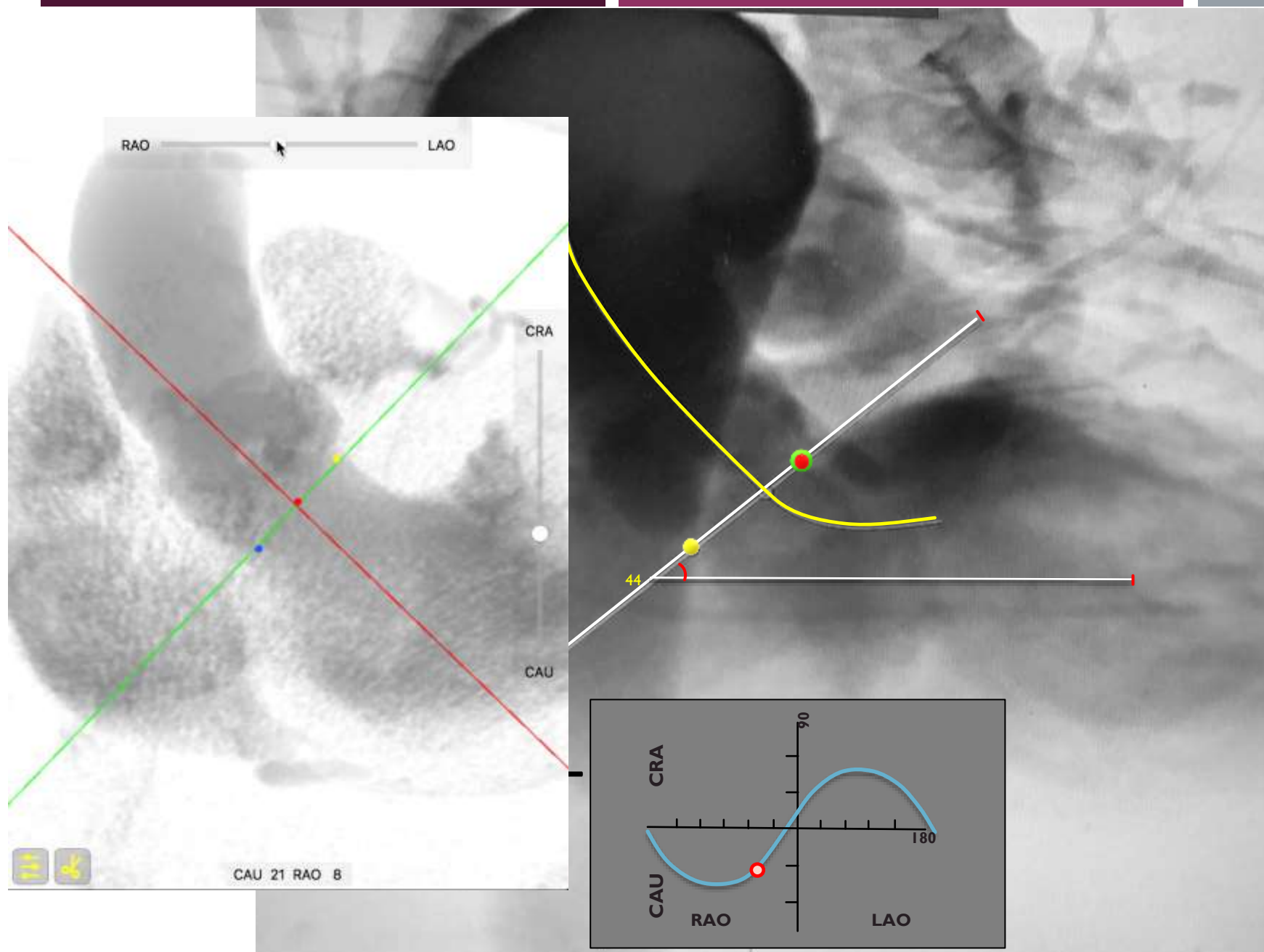


LAO 9
CRA 14

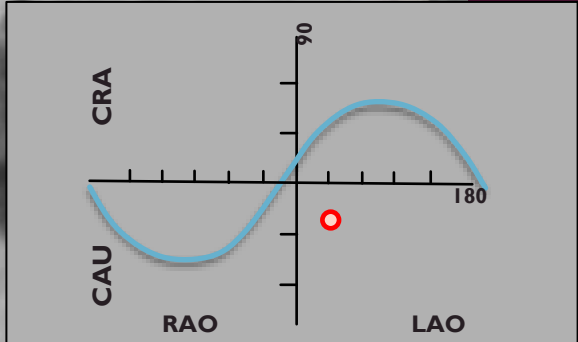
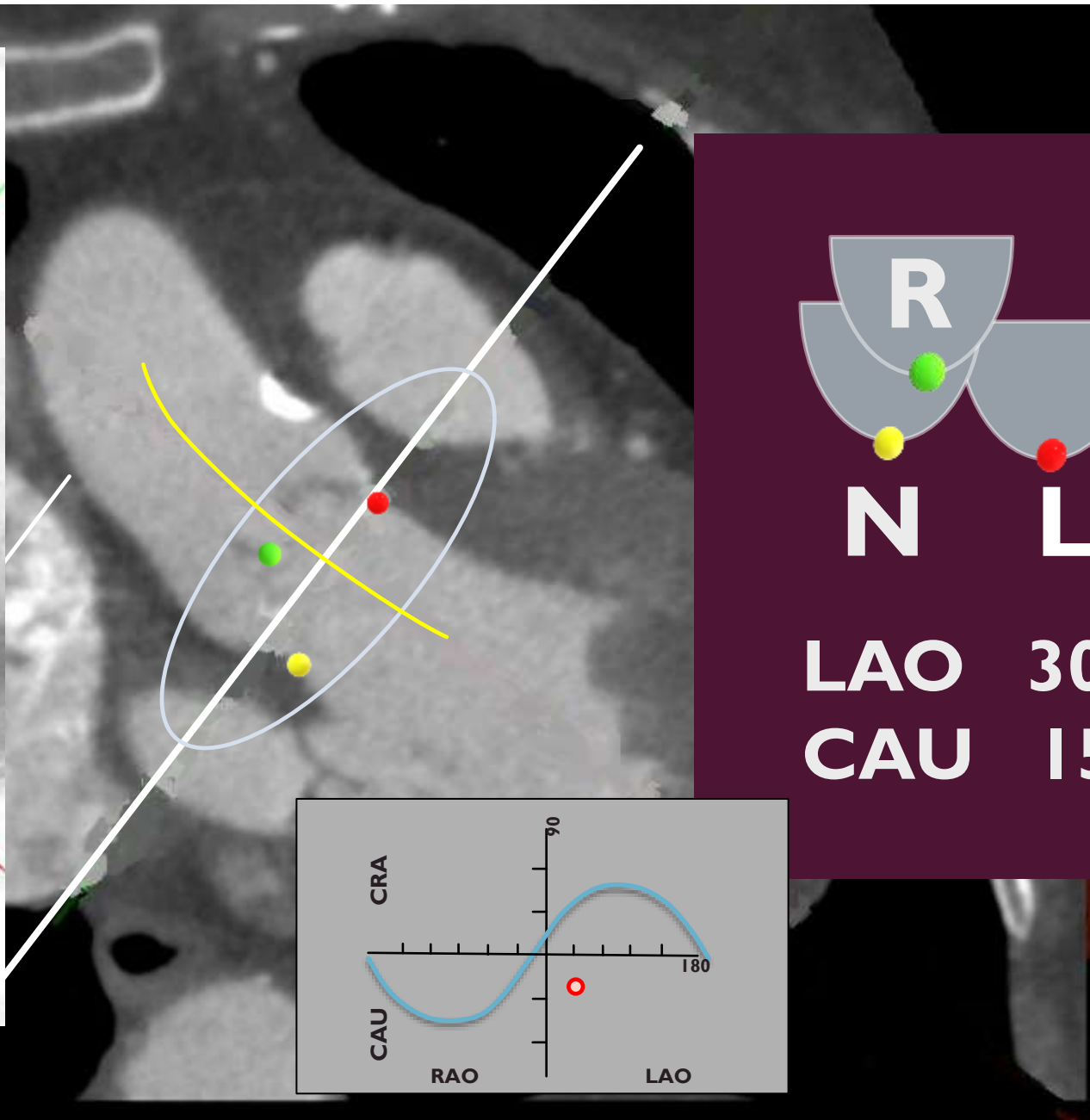
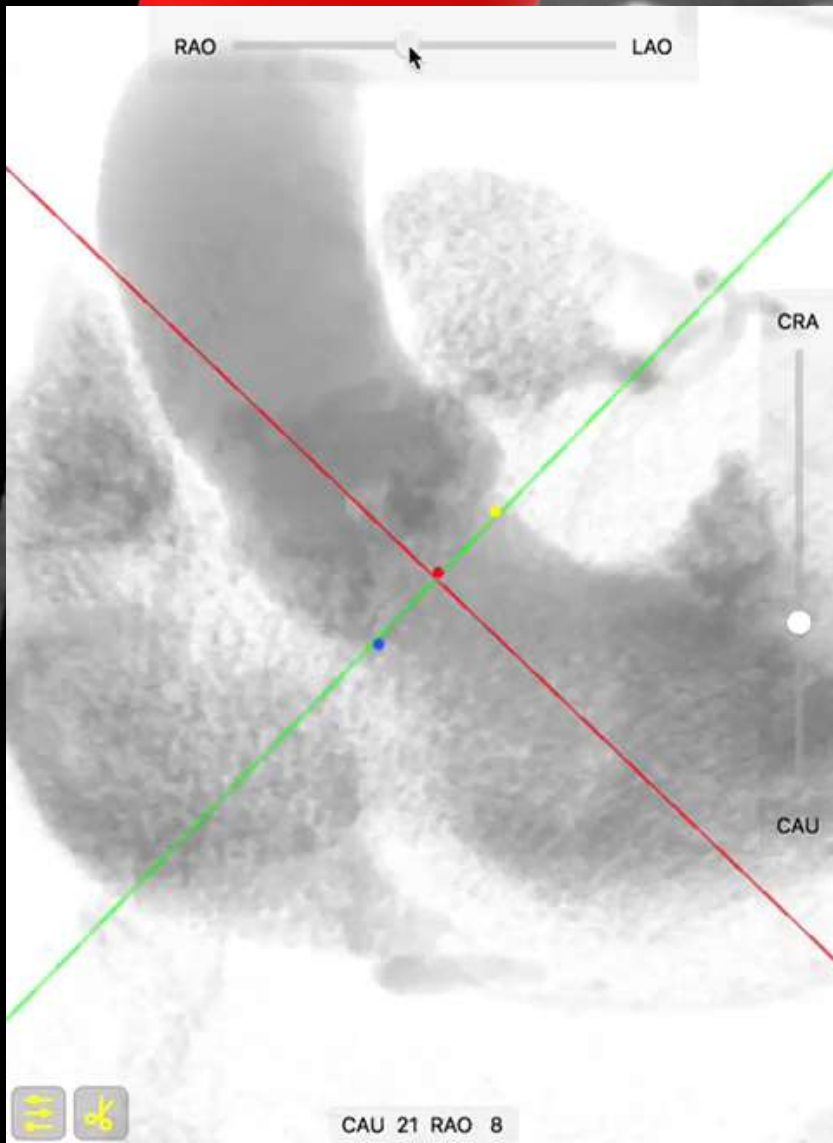


WHERE DID IT LAND?





RAO 22
CAU 18



THE IMPLANTATION TECHNIQUE – 2 VIEWS – THAT’S IT

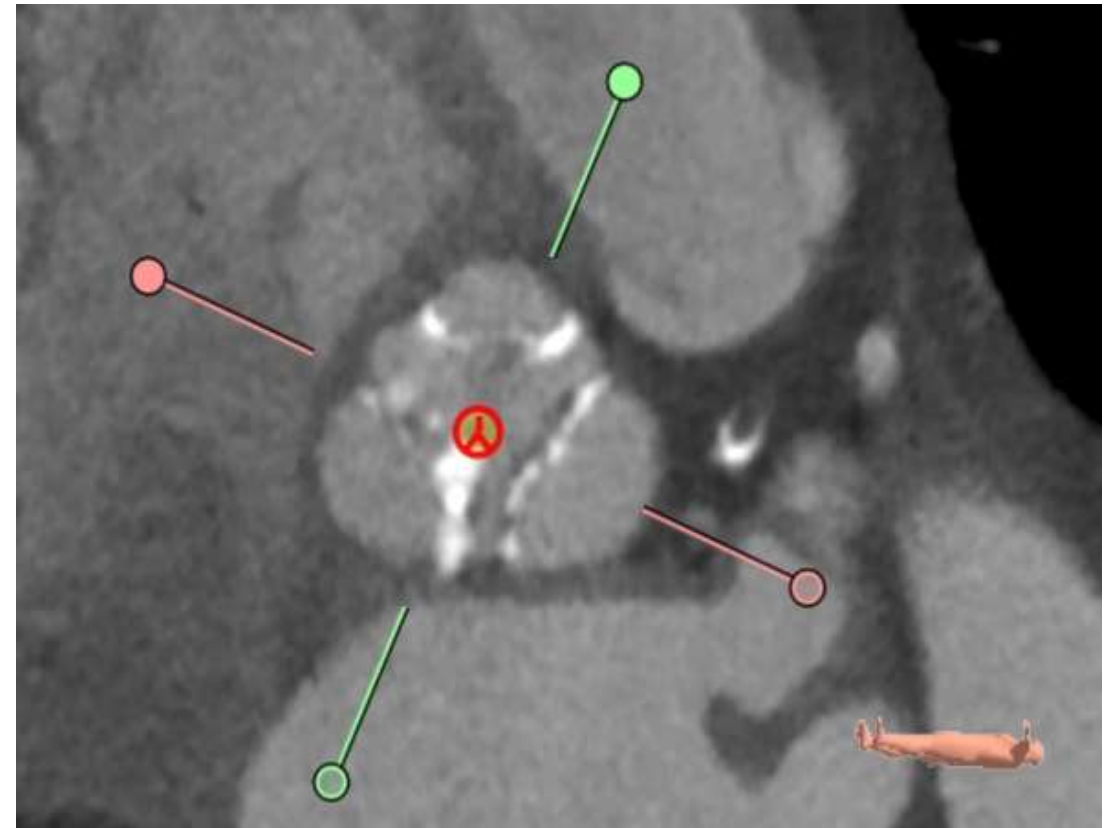
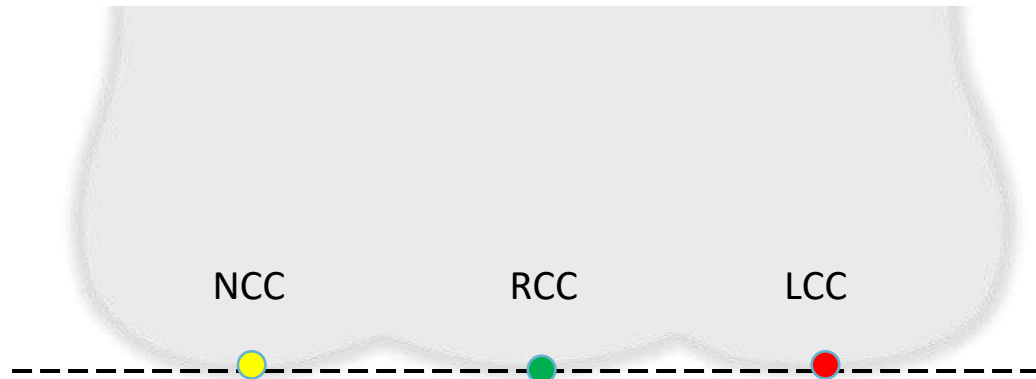
- Start out in a view that overlaps the RCC/LCC leaving the NCC independent
 - Most often an RAO/AP Caudal view
 - This view will also take parallax out of the ring of the delivery catheter of the Evolut
- For Evolut, after flaring out and understanding depth relative to the NCC, rotate LAO to take parallax out of the valve
 - Ignore everything but the depth relative to the LCC

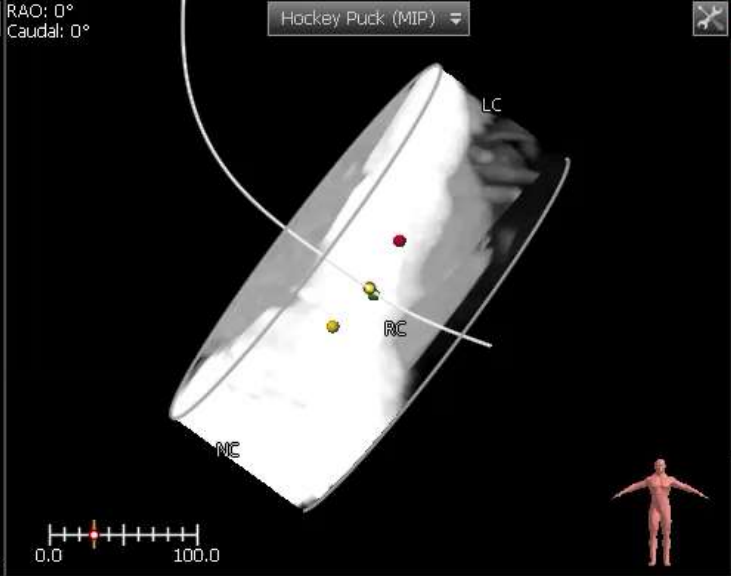
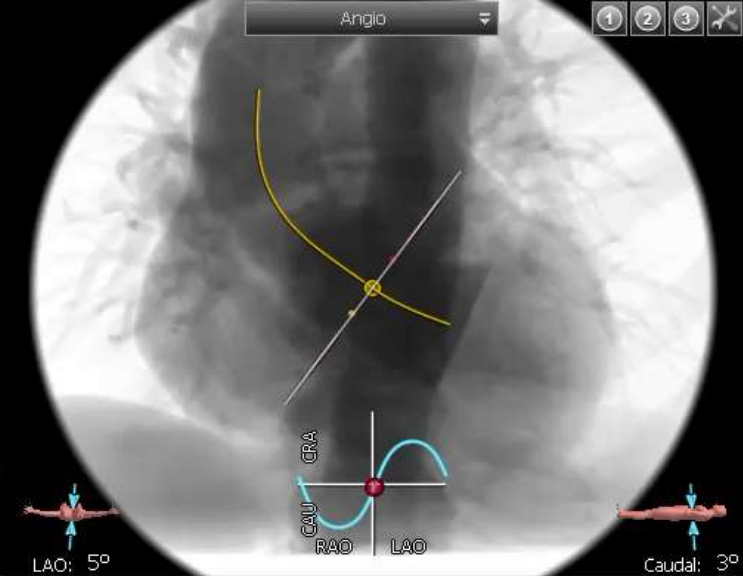
PRE-PROCEDURE CT PLANNING

BASAL ANNULAR PLANE

Set basal annular plane by placing markers at lowest point in the center of each cusp in short axis view.

- Centering markers on the cusps is critical for CT determination of overlap imaging projections.





Aortic Valve ES **Advanced**

- Workflow Assistant
1. Define Centerline
 2. Adjust Annulus Plane
 - 3. **Measurements**



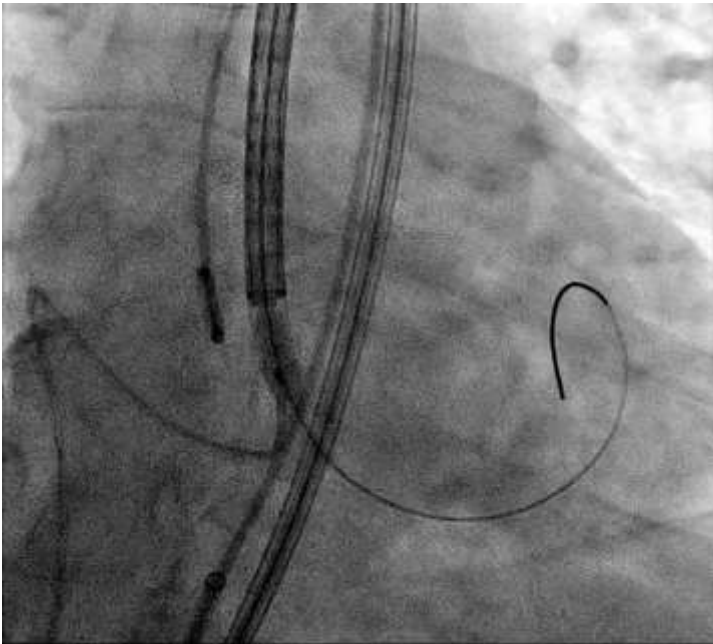
SAPIEN PROCEDURAL MODIFICATIONS



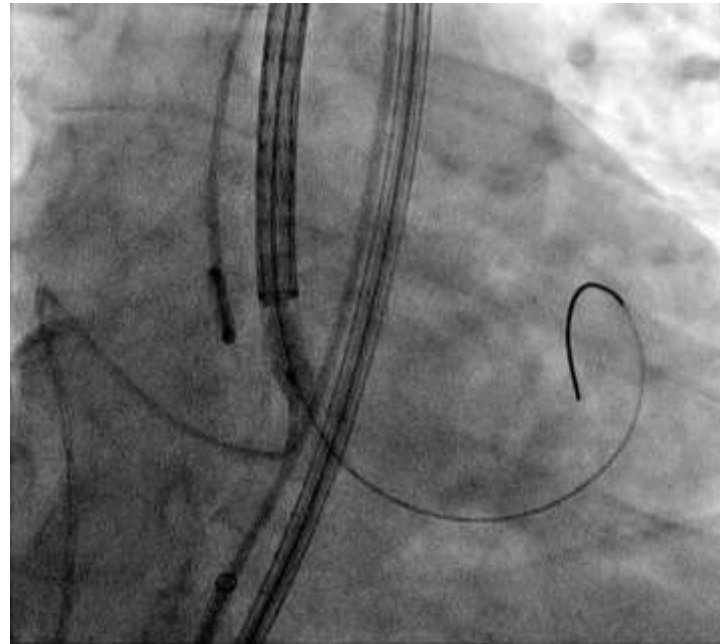
- Position mid-marker at mid-NCC pigtail in RCC/LCC cusp overlap view
- "Radiolucent line" just below base of pigtail

EVOLUT PROCEDURAL MODIFICATIONS

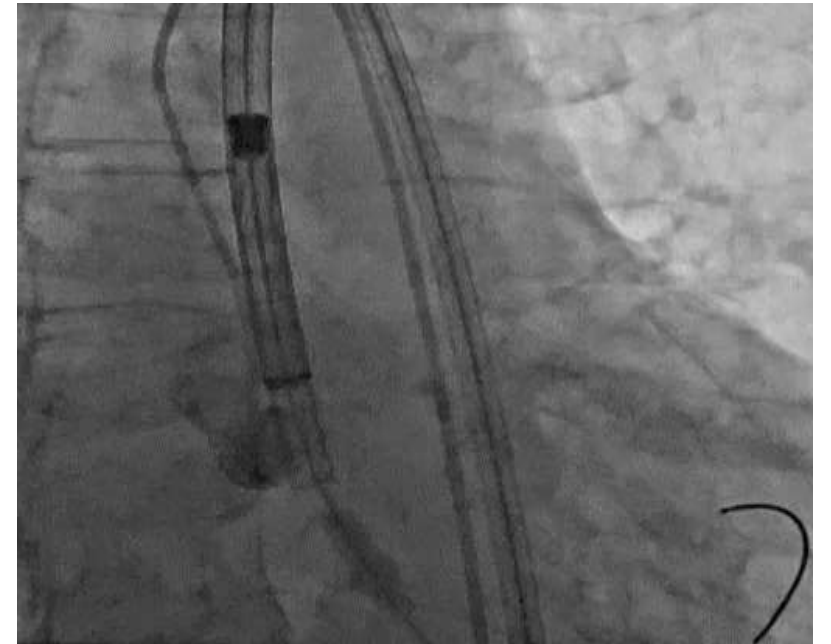
1. Start Higher



2. Allow the Valve to Descend

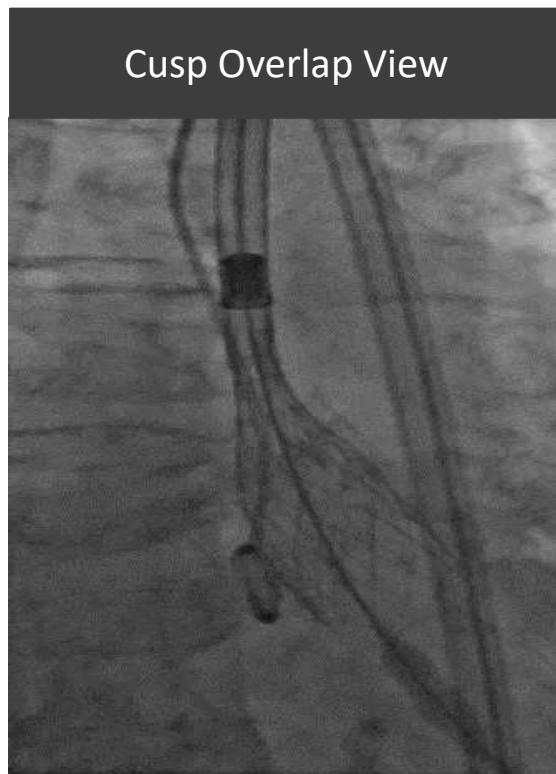


3. Control Pace to Point of No-Capture

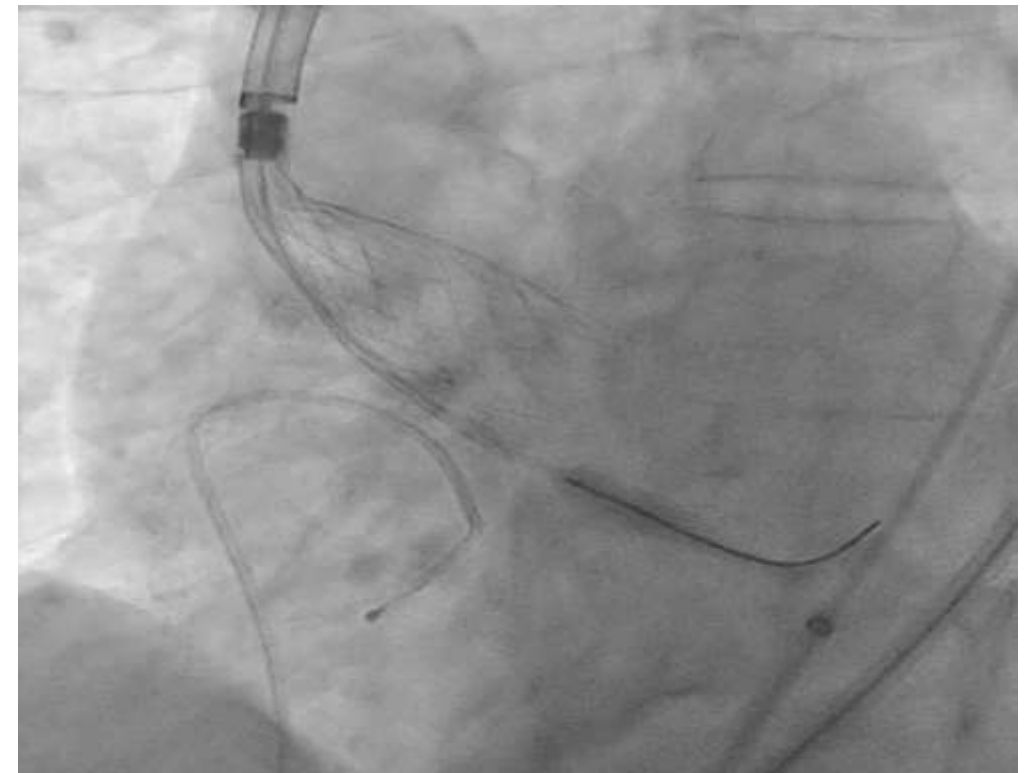


EVOLUT PROCEDURAL MODIFICATIONS

4. Confirm Depth and Performance



5. Release Slowly and Methodically



FREQUENT QUESTIONS/ISSUES

- Do you get popouts?
 - Not really (frequency = $\sim 1/200$ with Evolut; and because of something stupid). We are mindful of the depth of implantation in particular anatomies and have more control over our depth because of the view – we can be shallower/deeper at will.
- What if you want to post-dilate?
 - Implant the valve more at 3, not more at 0.
- Does this work for TAV in SAV?
 - YES! It's quite easy – just overlap two of the surgical stent posts and deploy just like you would in native cusp overlap.
 - You'll have an RAO-Caudal and LAO-Cranial view to choose from.

OTHER PERTINENT TOPICS

- Double Curve Lunderquist with Evolut and SAPIEN
 - Really a great wire to support a shallow implant
 - Stands the valve upright along the posterior (NCC/RCC commissure) aspect of the annular plane
 - Essential for symmetric and predictable implants, especially with larger valves
- “Rapid” pacing with Evolut
 - Idiosyncratic → I avoid in patients that are hypotensive, have critical coronary artery disease, poor EFs, bad pulmonary hypertension
 - Works really well to make the procedure the most efficient
 - Pace at the rate that works for you → stabilize hemodynamics, make the procedure predictable and efficient
- It is very much a recipe → reasoned out, nothing arbitrary
 - Use all parts of it (the imaging reconstruction, the gantry view, the procedural steps, the technical features) → this is how to get the outcomes

CONCLUSIONS

- Mitigating conduction disturbances is paramount in TAVR, especially in low risk populations
- The optimal gantry angle for TAVR deployment can usually be scripted quite nicely on CTA planning
- The annulus, delivery catheter, and prosthetic valve are all three dimensional structures – when their relationship changes, the 2D fluoroscopy can be misleading
- Pacemaker rates can be significantly reduced with proper implantation depth; cusp overlap is a simple way to obtain this
 - True implantation depth is not determined by simply taking parallax out of the valve