How to Treat Patients With Concomitant Coronary Artery Disease?

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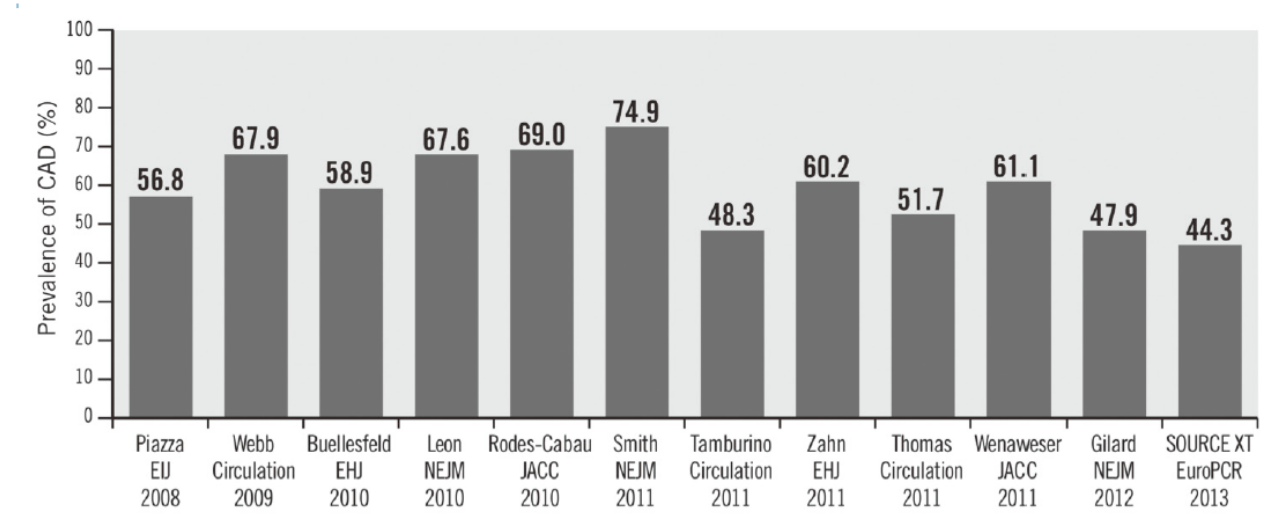
TAVI and concomitant coronary artery disease



Stefanini et al, Eurointervention 2013; 9 Suppl:S63-S68

PCI before or after TAVI

- Pros
  Possibility of safety TAVI
  Prevention of decompensation after TAVI

- Cons
  Bleeding events after TAVI due to DAPT
  Perioperative ACS

Complete Revascularization Is Not a Prerequisite for Success in Current Transcatheter Aortic Valve Implantation Practice

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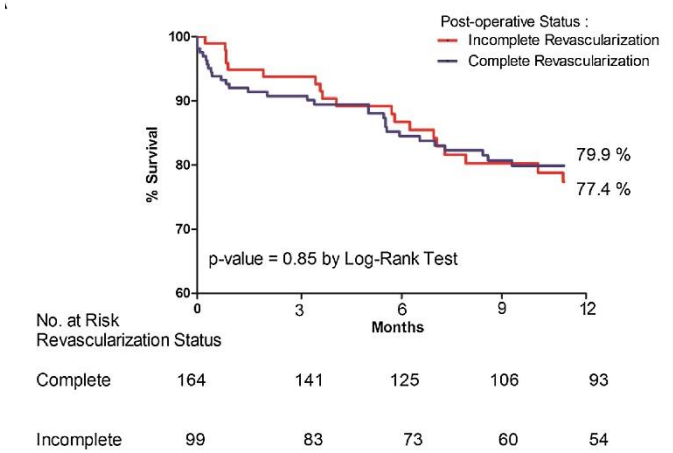
- Complete revascularization before TAVI had no benefit for long-term outcomes



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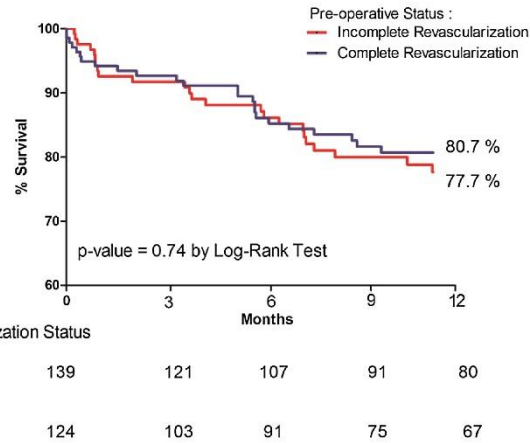

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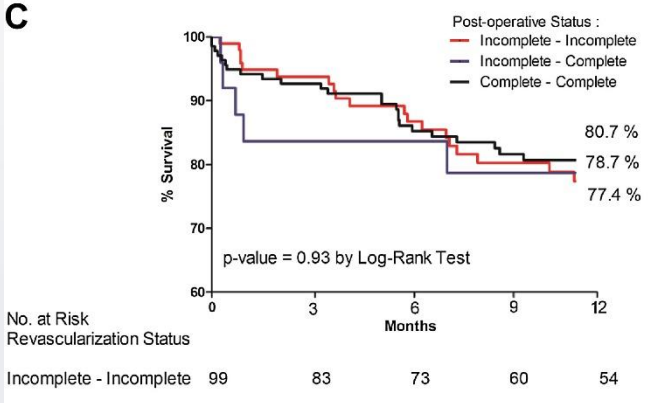

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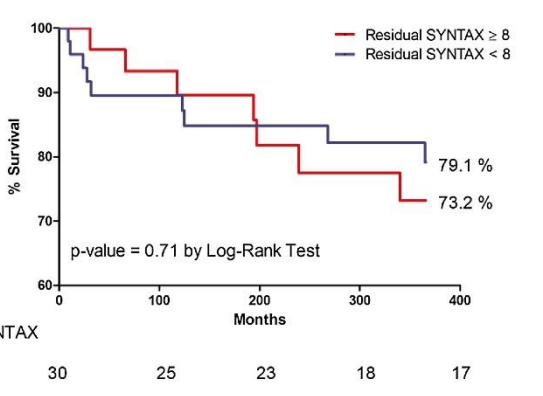
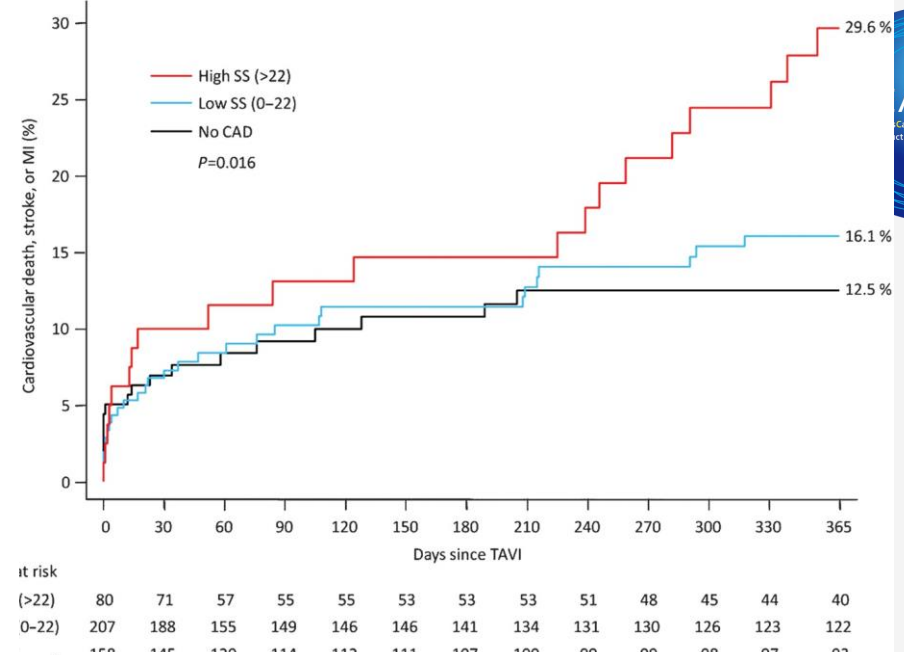
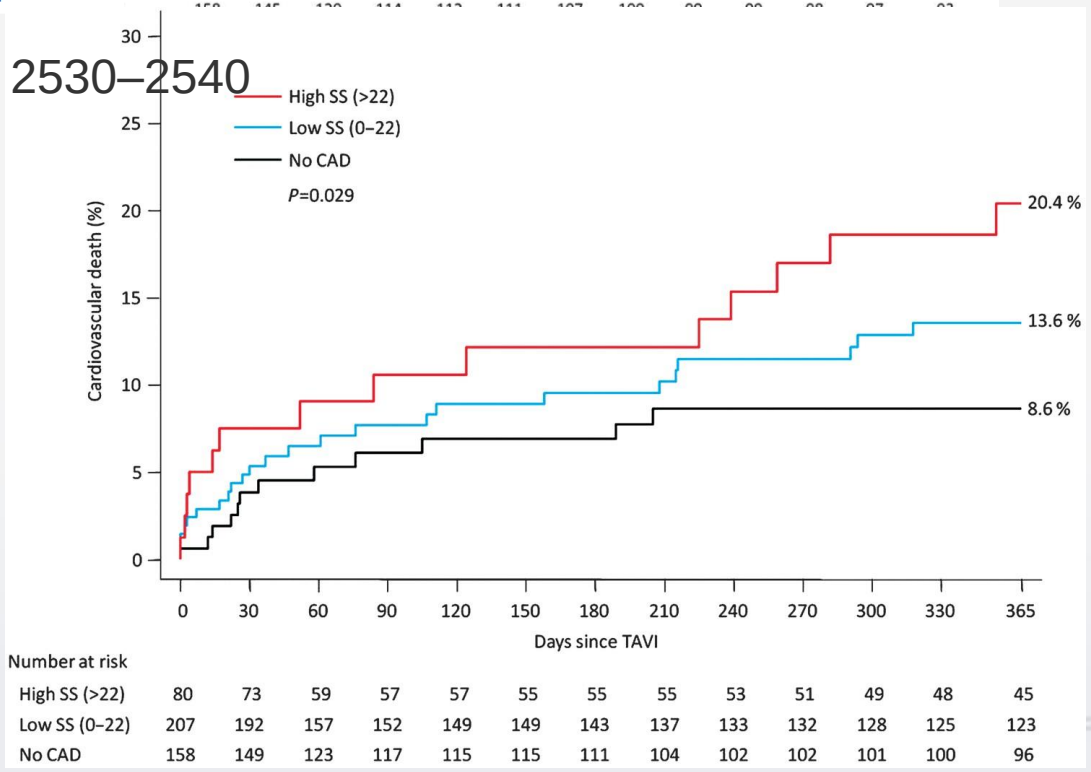


Coronary artery disease severity and aortic stenosis: clinical outcomes according to SYNTAX score in patients undergoing transcatheter aortic valve implantation

Giulio G. Stefanini[1†], Stefan Stortecky[1†], Davide Cao[1], Julie Rat-Wirtzler[2], Crochan J. O'Sullivan[1], Steffen Gloekler[1], Lutz Buellesfeld[1], Ahmed A. Khattab[1], Fabian Nietlispach[1], Thomas Pilgrim[1], Christoph Huber[3], Thierry Carrel[3], Bernhard Meier[1], Peter Jüni[2], Peter Wenaweser[1*], and Stephan Windecker[1]

Eur Heart J, Volume 35, Issue 37, 1 October 2014, Pages 2530–2540



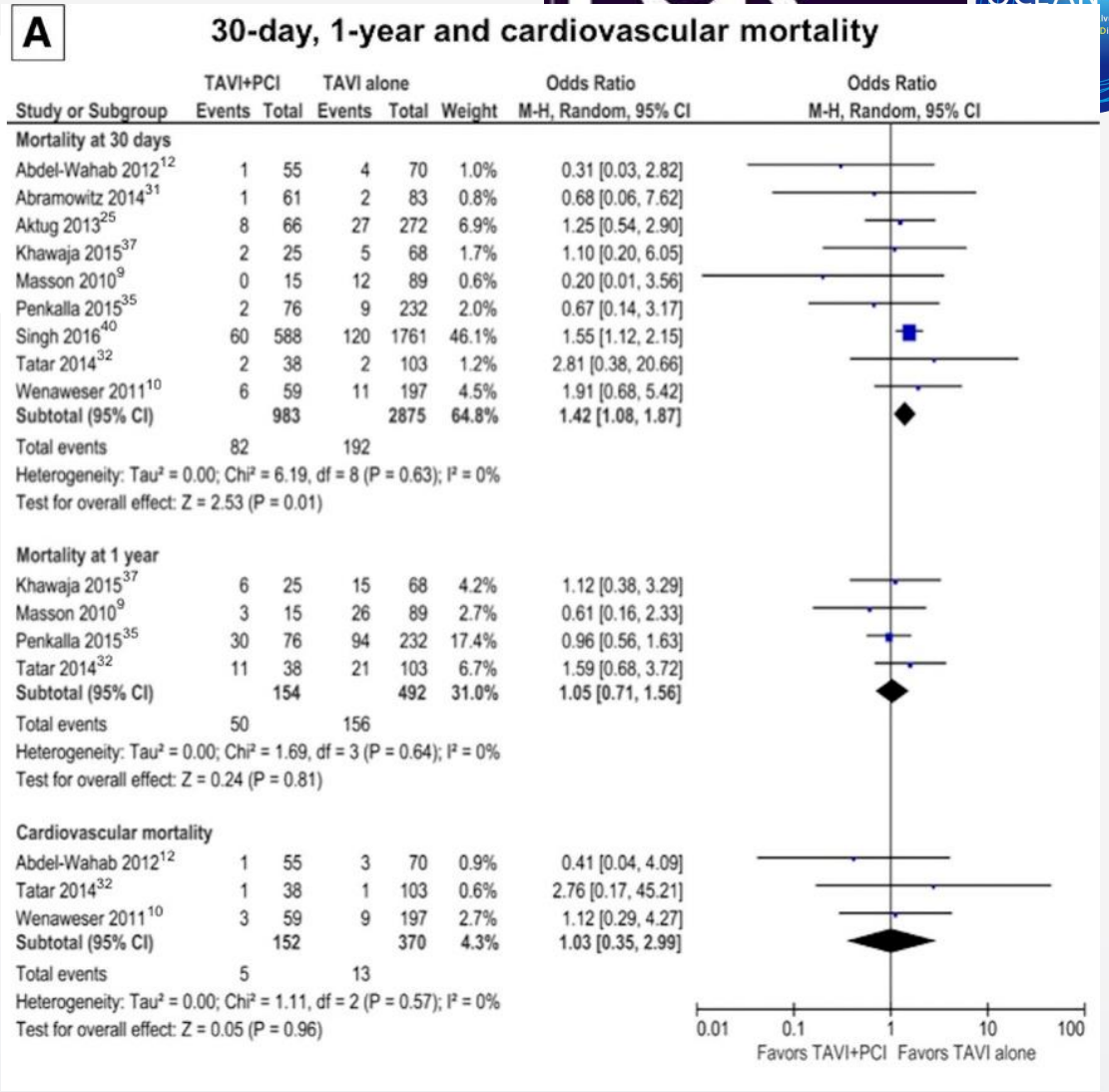


Residual CAD
SYNTAX score > 22 has worse outcomes
No difference in patients with SYNTAX score < 22 and no CAD

Transcatheter Aortic Valve Implantation With or Without Percutaneous Coronary Artery Revascularization Strategy: A Systematic Review and Meta-Analysis

Rafail A. Kotronias, MBChB, MSc; Chun Shing Kwok, MBBS, MSc; Sudhakar George, MBChB; Davide Capodanno, MD, PhD; Peter F. Ludman, MD, FRCP, FESC; Jonathan N. Townend, MD, FRCP; Sagar N. Doshi, MBChB, MD, FRCP; Saib S. Khogali, MBChB, MD, FRCP; Philippe Généreux, MD; Howard C. Herrmann, MD, FACC, MSCAI; Mamas A. Mamas, BMBCh, DPhil; Rodrigo Bagur, MD, PhD, FAHA

- Meta-analysis 9 articles and 3858 pts
- PCI before TAVI has significant incidences of vascular complication and 30-day mortality.
- No differences of MI, AKI, 1-year mortality



Rafail et al, J Am Heart Assoc. 2017;6:e005960. DOI: 10.1161/JAHA.117.005960.)

ACTIVATION (PercutAneous Coronary inTervention prIor to transcatheter aortic VAlve implantaTION)

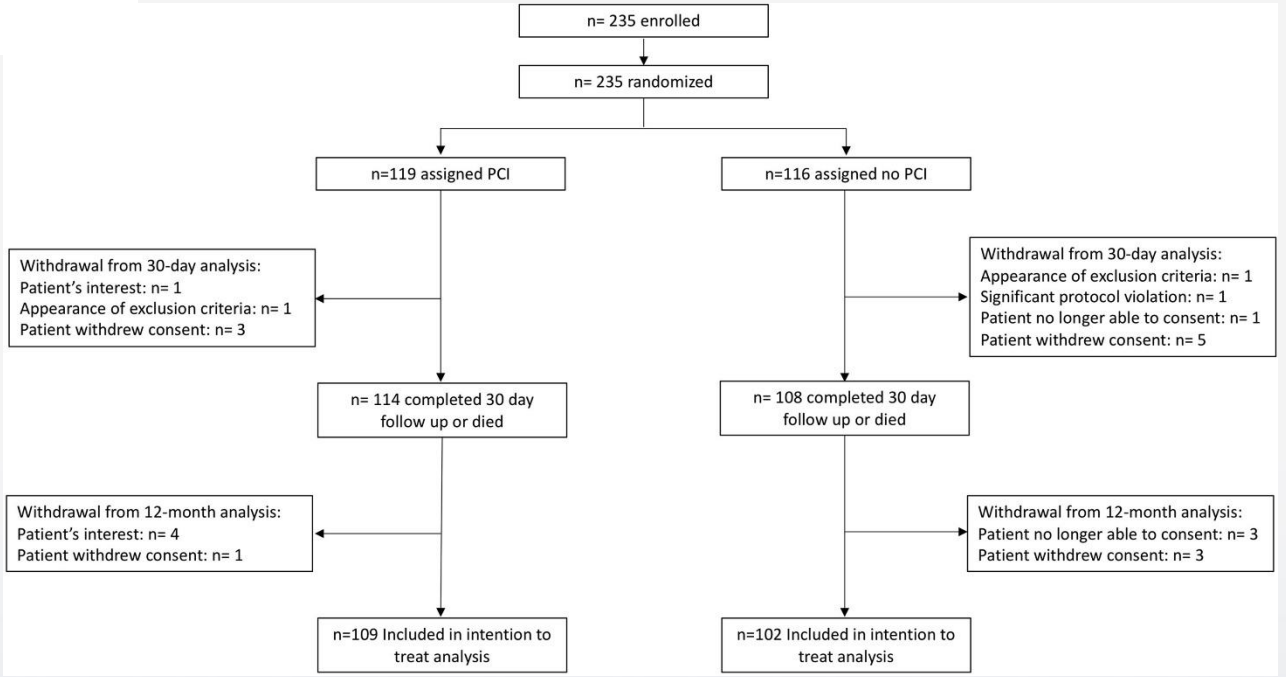
A Randomized Clinical Trial

Tiffany Patterson, PhD,[a] Tim Clayton, MSc,[b] Matthew Dodd, MSc,[b] Zeeshan Khawaja, MBBS,[c] Marie Claude Morice, MD,[d,e] Karen Wilson, MSc,[a] Won-Keun Kim, MD,[f] Nicolas Meneveau, MD,[g,h] Rainer Hambrecht, MD,[i] Jonathan Byrne, PhD,[j] Didier Carrié, MD,[k] Doug Fraser, MD,[l] David H. Roberts, MD,[m] Sagar N. Doshi, MD,[n] Azfar Zaman, MD,[o] Adrian P. Banning, MD,[p] Hélène Eltchaninoff, MD,[q] Hervé Le Breton, MD,[r] David Smith, MD,[s] Ian Cox, MD,[t] Derk Frank, MD,[u] Anthony Gershlick, MD,[v] Mark de Belder, MD,[w] Martyn Thomas, MD,[x] David Hildick-Smith, MD,[y] Bernard Prendergast, MD,[a] Simon Redwood, MD,[a] on behalf of the ACTIVATION Trial Investigators

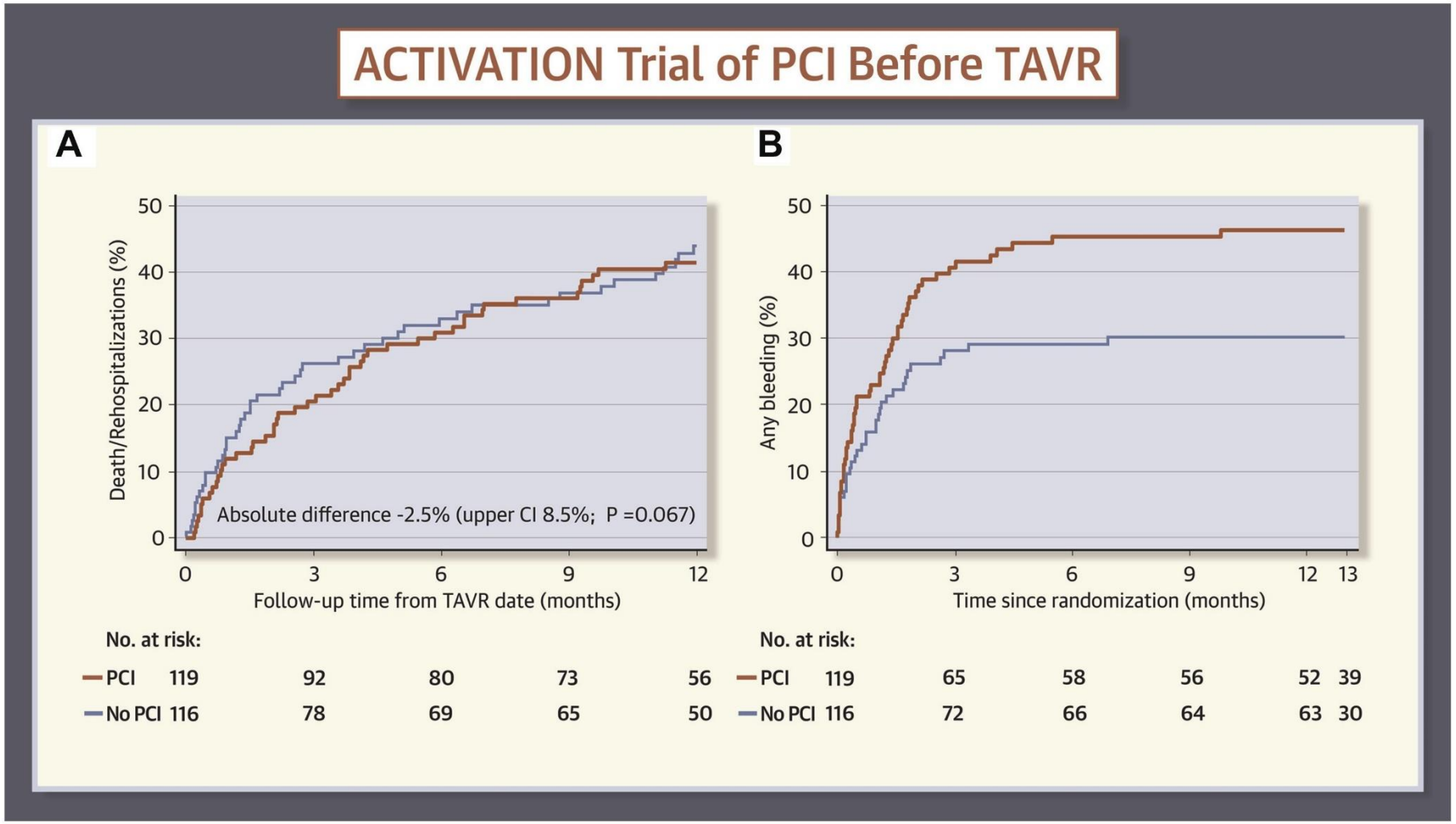
- Randomize trial PCI group and no PCI before TAVI group

Primary endpoint:

composite of all-cause death or rehospitalization at 1 year.



CENTRAL ILLUSTRATION: The ACTIVATION Trial of PCI Compared With No PCI Prior to TAVR Demonstrated No Difference in the Primary Endpoint of Death or Rehospitalization at 1 Year and Increased Bleeding Events in the PCI Arm



Patterson, T. et al. J Am Coll Cardiol Intv. 2021;14(18):1965-1974.

Impact of untreated chronic obstructive coronary artery disease on outcomes after transcatheter aortic valve replacement

Persits et al, Eur Heart J 2024

A TAVR procedural safety with obstructive CAD

Definition of CAD Risk/Severity

- **Non-obstructive**: All lesions in LAD, LCx and RCA <70%, LM <50%
- **Intermediate**: LCX or RCA or non-prox LAD ≥70%
- **High**: LCX and LAD ≥70% or RCA and either LAD or LCX ≥70% or prox LAD ≥70% or 50%≤ LM <70%
- **Extreme**: Triple vessel disease (all lesions ≥70%) or LM ≥70%

SEV 9%

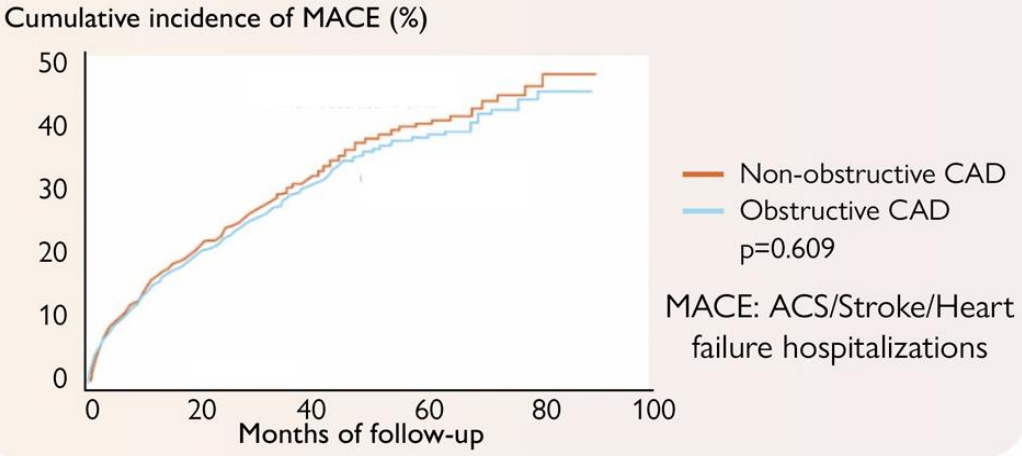
BEV 91%

1911 included for analysis

	Non-obstructive CAD:1432	Intermediate CAD:116	High CAD:199	Extreme CAD:199
Intra-aortic balloon pump	0.1%	0.0%	0.0%	0.0%
Ventricular arrhythmia requiring shock	0.1%	0.0%	0.0%	0.0%
ECMO	0.1%	0.0%	0.0%	0.6%
Shock	0.0%	0.0%	0.0%	0.6%
Death	0.4%	0.0%	0.5%	0.6%

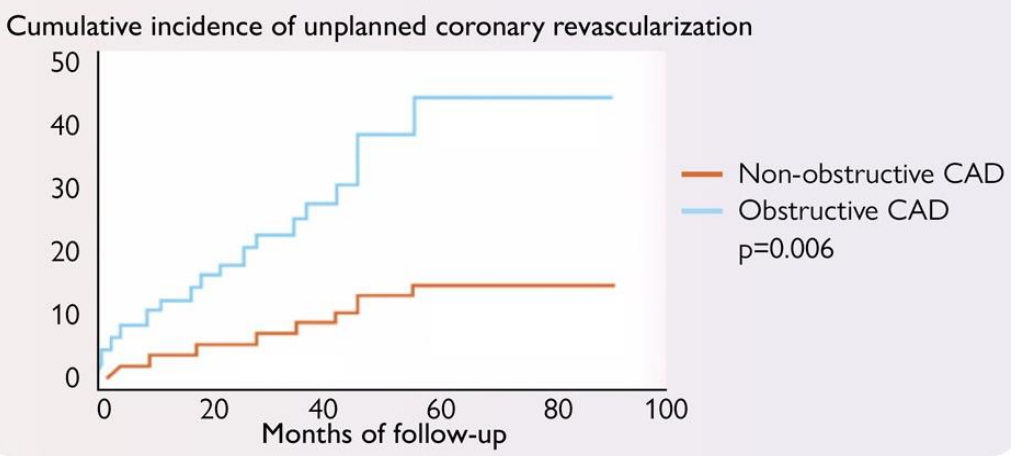
Overall procedural complications: p=0.60 (across groups)

B Cumulative incidence of MACE



MACE: ACS/Stroke/Heart failure hospitalizations

C Cumulative incidence of unplanned coronary revascularization



Coronary access after TAVR

POST-TAVR ANGIOGRAPHY AND PCI SUCCESS RATES

Clinical data show that coronary access post-TAVR is technically feasible and generally reported positive outcomes for all TAV types:

Source	TAVs	PCI Success Rate**
Tanaka, et al. Cardiovascular Revasc Med, 2019[1]	37 CoreValve™ 4 Evolut R™	28/30 **(93.3%)**
Kleiman, et al. Presentation at CRT, 2019[2]	20 CoreValve	30/33 **(90.9%)**
Htun et al., Catheter Cardiovasc Inter, 2018[3]	28 CoreValve	29/29 **(100%)**
Zivelonghi et al., Am J Cardiol, 2017[4]	41 SAPIEN 3™* 25 Evolut R	17/17 **(100%)**
Chetcuti et al., TCT, 2016[5]	169 CoreValve	103/113 **(91.2%)**
Allali et al. Cardiovasc Revasc Med, 2016[6]	24 CoreValve	23/24 **(95.8%)**
Blumenstein et al., Clin Res Cardiol, 2015[7]	19 SAPIEN™* 10 CoreValve 4 Symetis™* 1 Portico™* 1 Jena Valve™*	10/10 **(100%)**

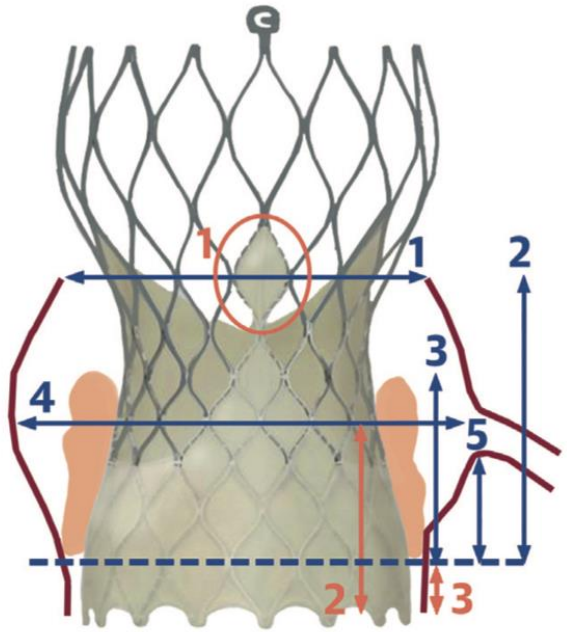
Average PCI Success Rate[1-7]**

93.8%

Refer to individual study for definition of PCI success rates.

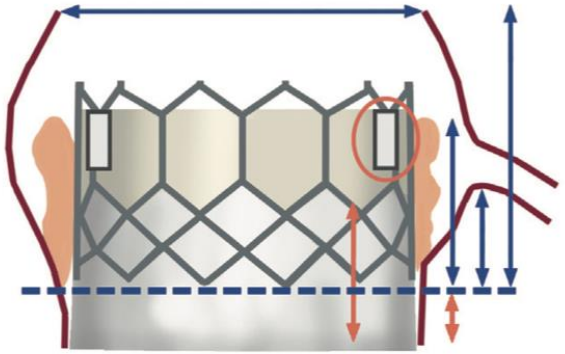
** PCI success rates calculated for those patients in which PCI was attempted.

Factors influencing coronary access post TAVI



Anatomical

1. Sinotubular junction dimensions
2. Sinus height
3. Leaflet length and bulkiness
4. Sinus of Valsalva width
5. Coronary height

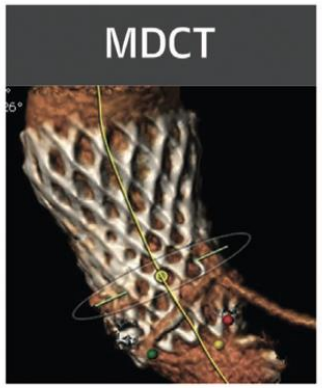


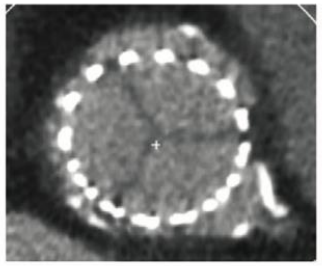
Device and Procedural

1. Commissural tab orientation
2. Sealing skirt height
3. Valve implant depth

Fluoroscopy

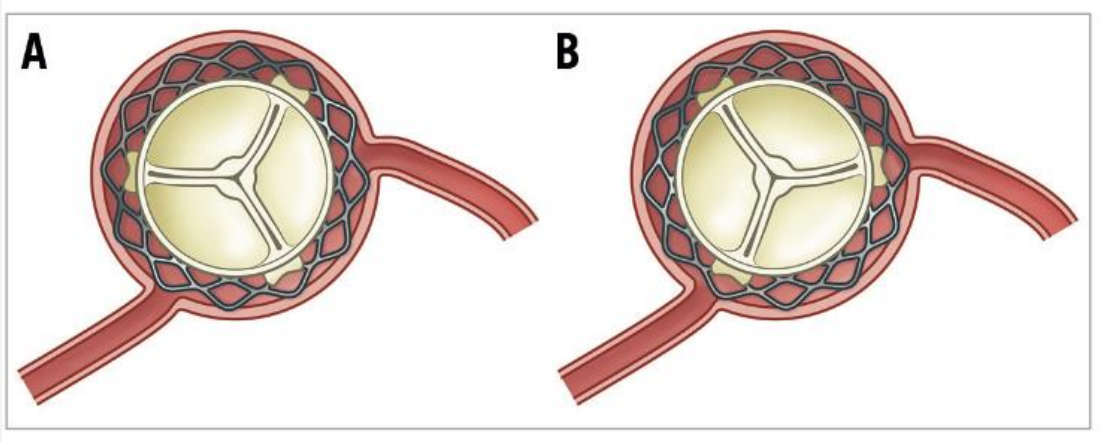
MDCT

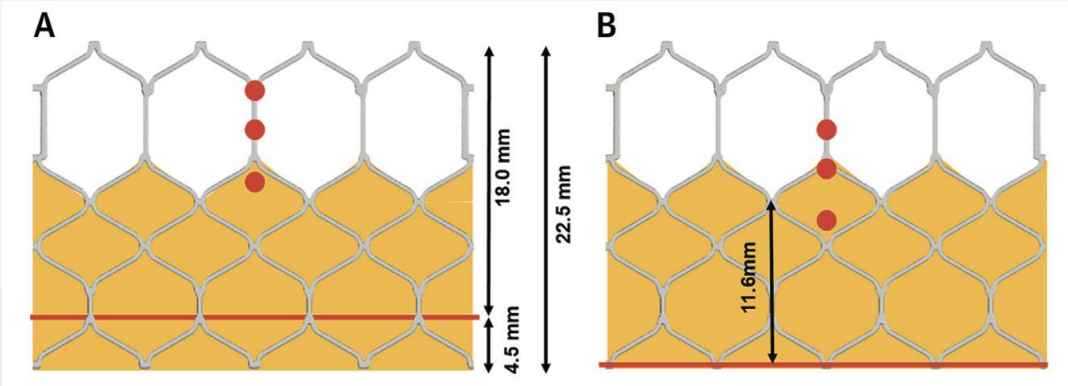




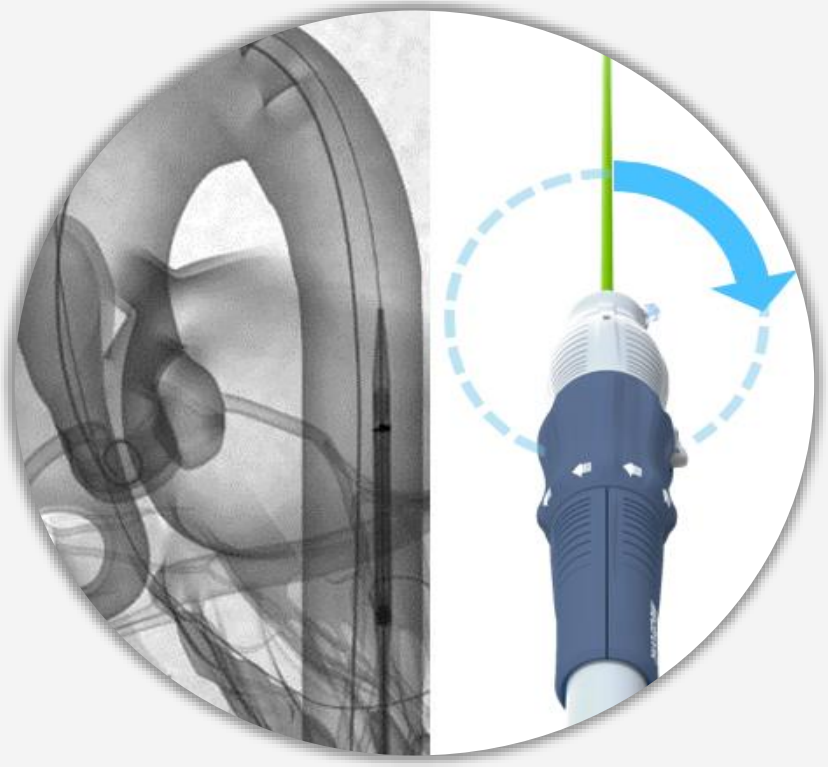
Faroux L et al., JACC 2019

Commissural alignment

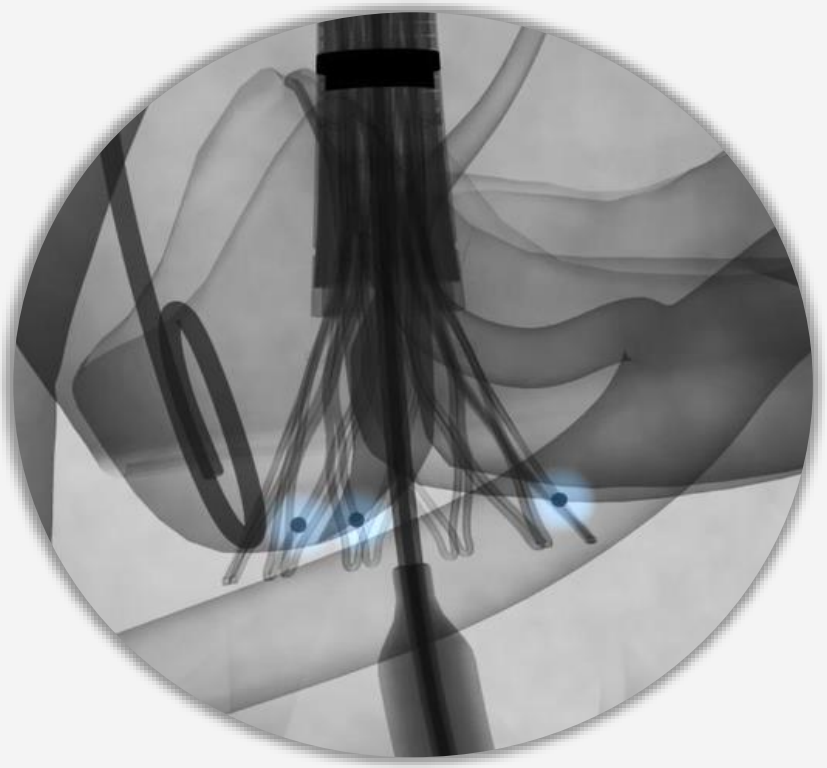




Commissure Alignment



The Evolut FX system delivery system is designed to be adjustable[1] during insertion in order to better achieve commissure alignment.



The radiopaque markers on the Evolut FX system are designed to improve visualization of prosthetic commissure position.

1. In the descending aorta prior to crossing the aortic arch

Coronary Cannulation, Commissure and Coronary Alignment post-TAVR with Evolut FX System

CANNULATE TAVR Study

Guilherme Attizzani, MD

Director, Valve and Structural Heart Disease Center, Harrington HVI, University Hospitals, Cleveland OH

Alexander and Marianna McAfee Endowed Chair in Innovative Cardiac Interventions

Full Professor of Medicine, CWRU School of Medicine, Cleveland, OH

Visiting Professor of Medicine Osaka University, Osaka, Japan

CRF TCT

Methods

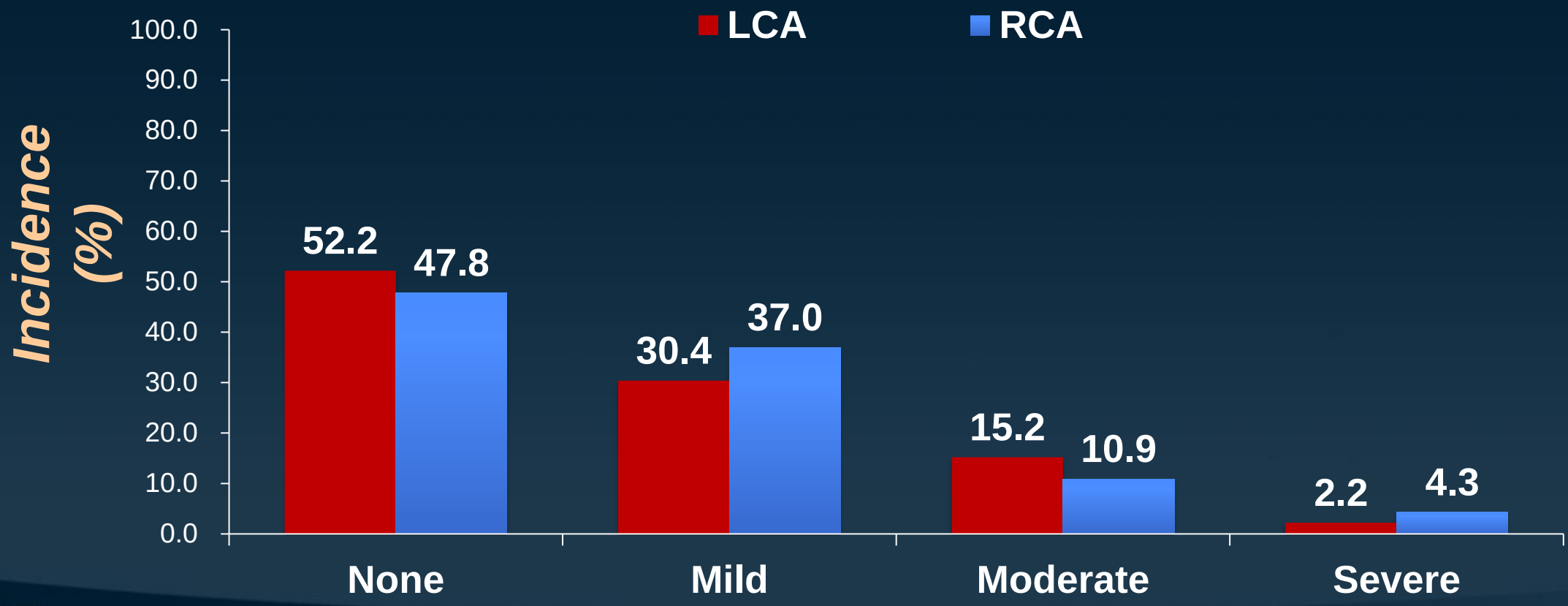
Definition of Misalignment of Commissure and Coronary Arteries

	Alignment	Mild Misalignment	Moderate Misalignment	Severe Misalignment
Commissure	0 - 15°	15.1 - 30°	30.1 - 45°	45.1 - 60°
Coronary Artery	45.1 - 60°	30.1 - 45°	15.1 - 30°	0 - 15°

Tang et al, JACC: Card Intv 2022.

Results

Coronary Misalignment Based on Post-Procedure CT



CRF TCT

Coronary alignment by CT → 83.7%

Results

- 100% of successful coronary cannulation (65% selective)
- Valve depth was NCC: 2.9 ± 0.7 mm LCC: 3.7 ± 0.7 mm
- JL 3.5 led to successful cannulation in 82% of LCA (remaining 18% cannulated with JL 4) while RCA cannulation with JR 4 was successful in 100% of patients.
- We were unable to indentify predictors of delayed cannulation post-TAVR likely due to our limited sample size