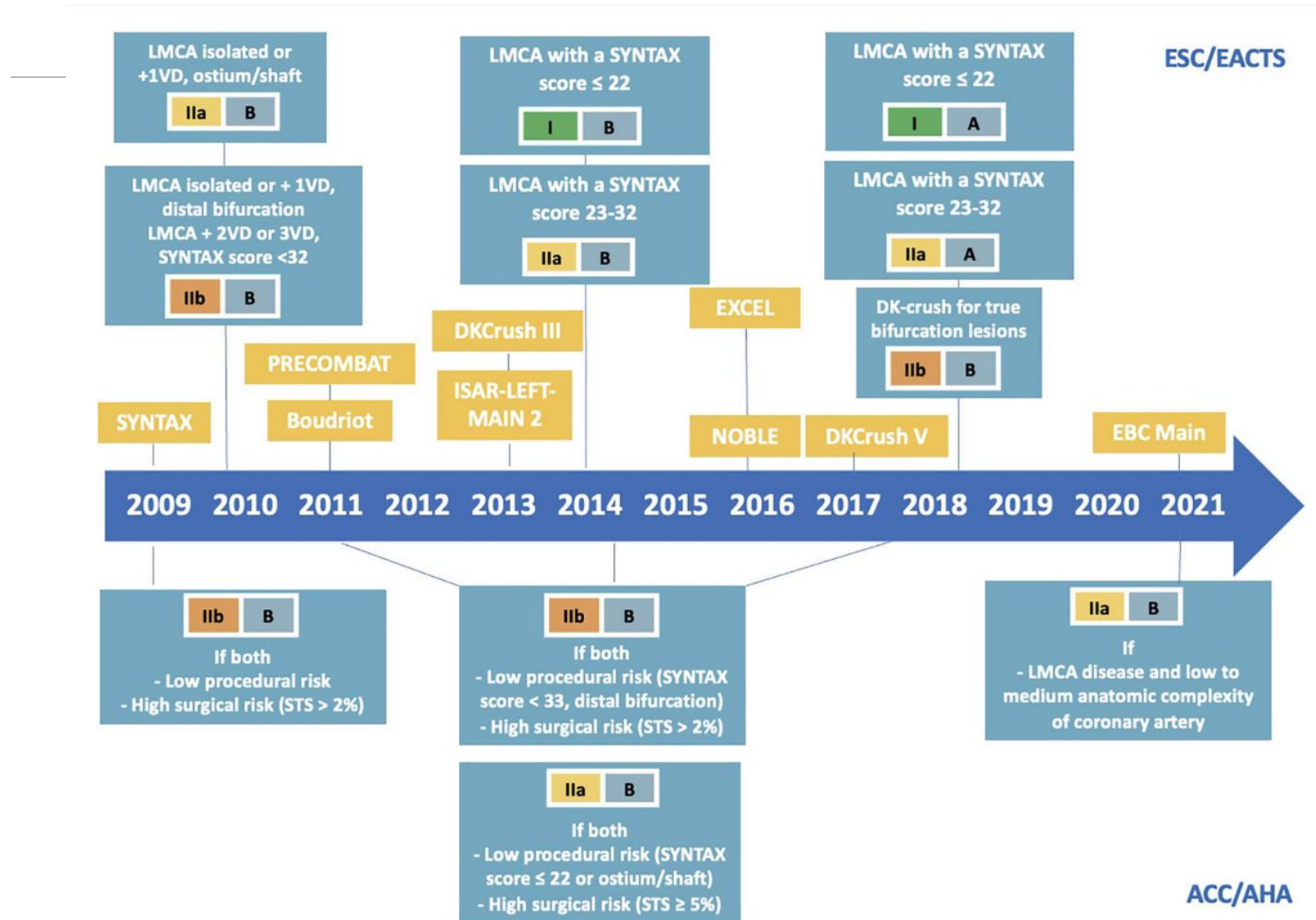


# Left main PCI New insights on technique and results

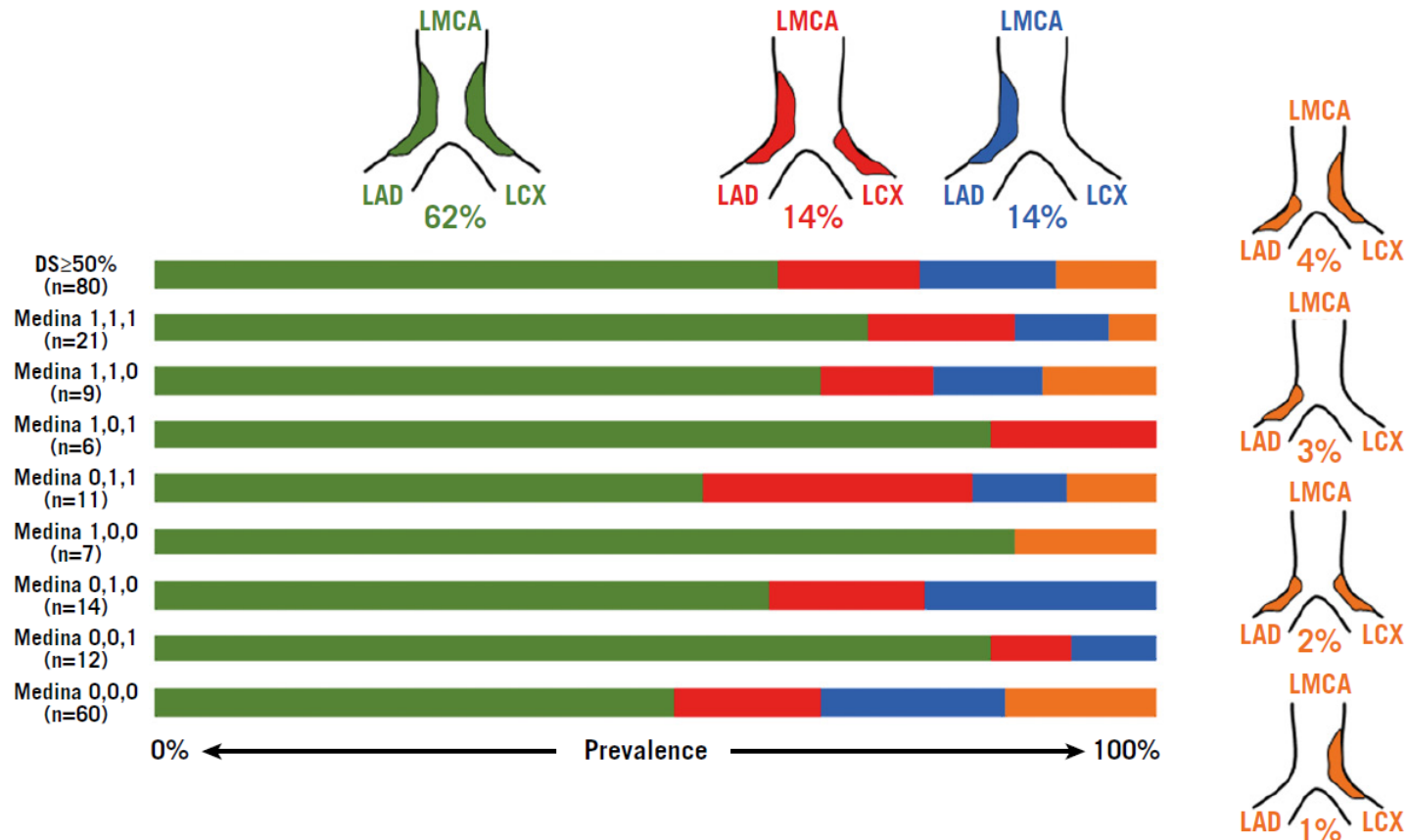
Dr. Pieter C. Smits  
Head of Interventional  
Cardiology Department  
Maasstad Ziekenhuis;  
Rotterdam, the Netherlands





# Left main disease - background

## Extent of LM disease



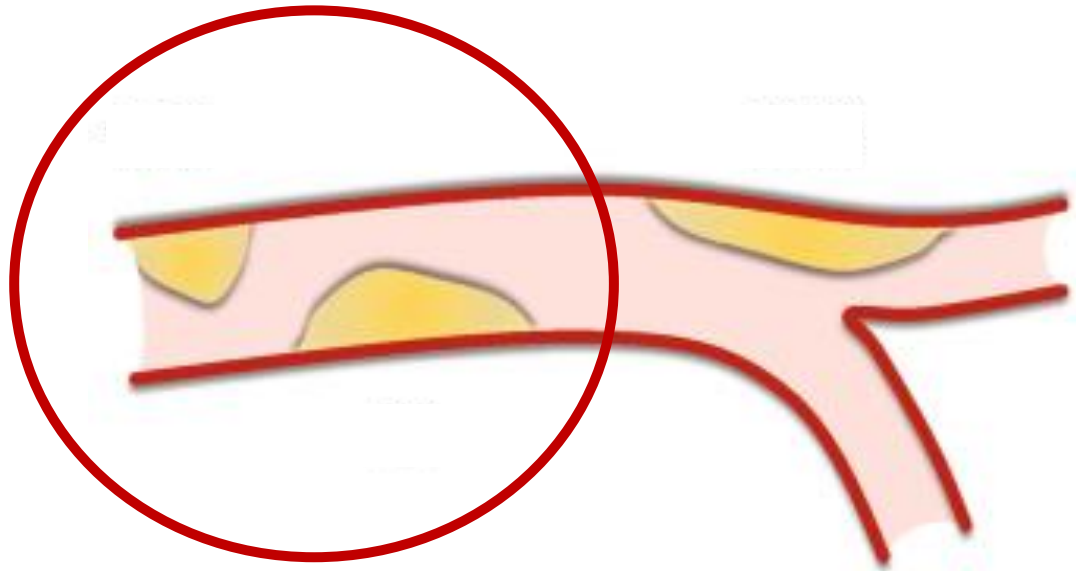
### LM disease is rarely isolated!

IVUS analysis suggests that **plaque in the distal LM continues into the ostium of both LAD and LCX in 62%**, irrespective of the Medina.

Plaque in LM-LAD: > 90%

Plaque in isolated SB ostium: <10%

### Ostial/midshaft disease



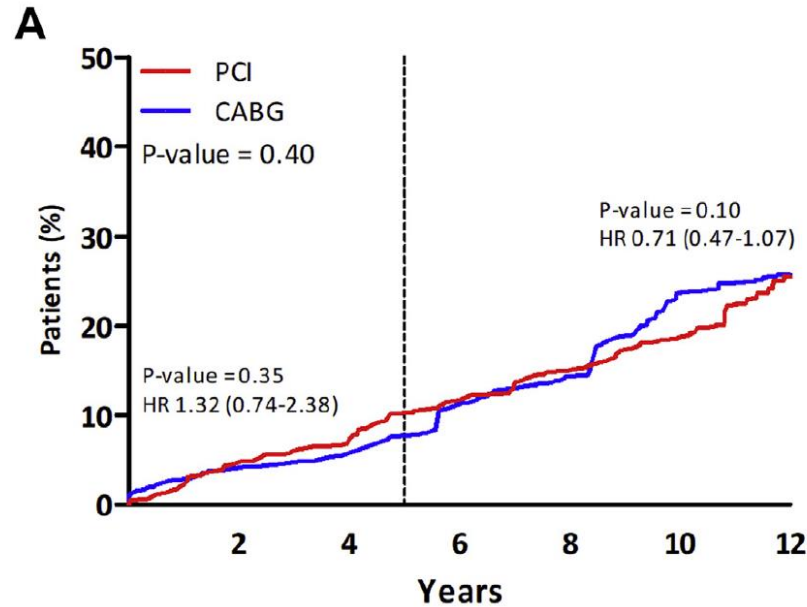
- Use IVUS for sizing and exclude SB disease.
- Stent in the LM only if possible (depends on length).
- Confirm ostium coverage with multiple projections before deploying the stent (LAO caudal + LAO cranial).
- Stent protrusion in the aorta 1-2 mm.
- Flare the stent.

# Left main disease - clinical scenarios

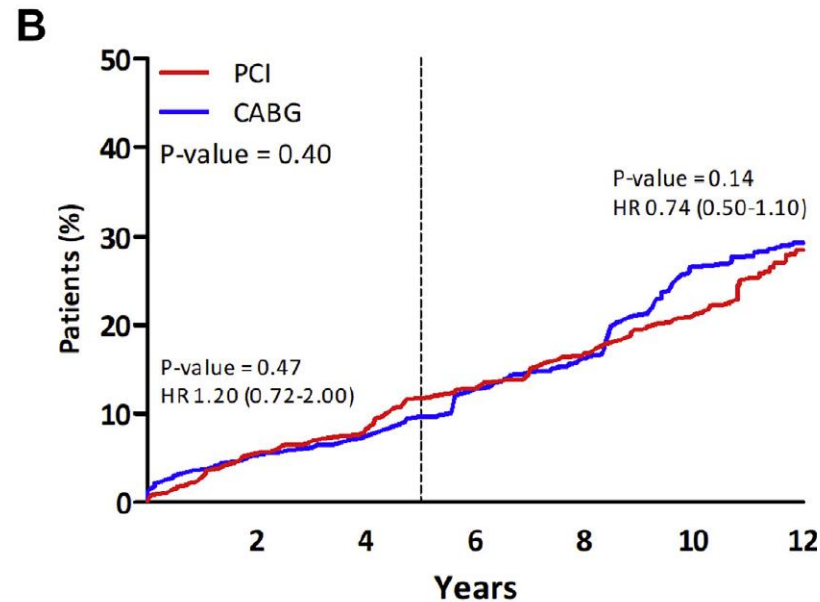
## Different conditions

### Ostial/midshaft disease

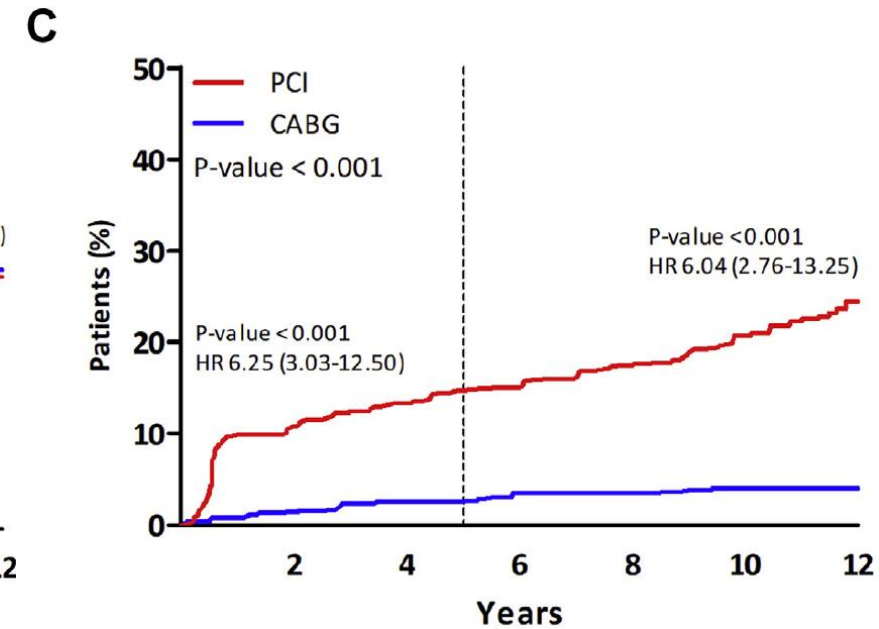
all-cause death



all-cause death, Q wave MI, stroke

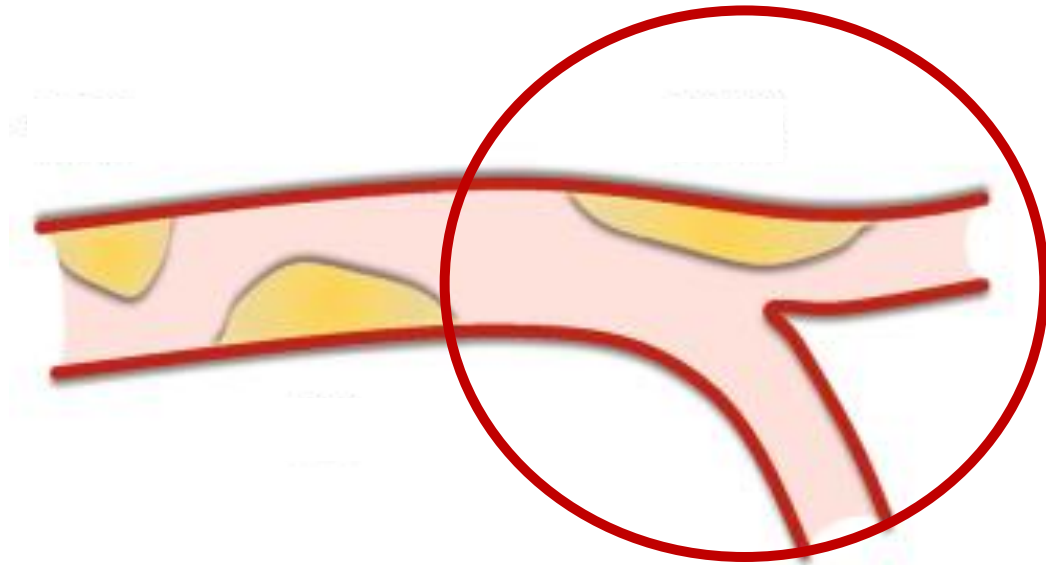


TVR



PCI for ostial/midshaft LM disease is associated with good outcomes (comparable to CABG), excepted for TVR at median 5 years follow-up.

### Distal/bifurcation disease

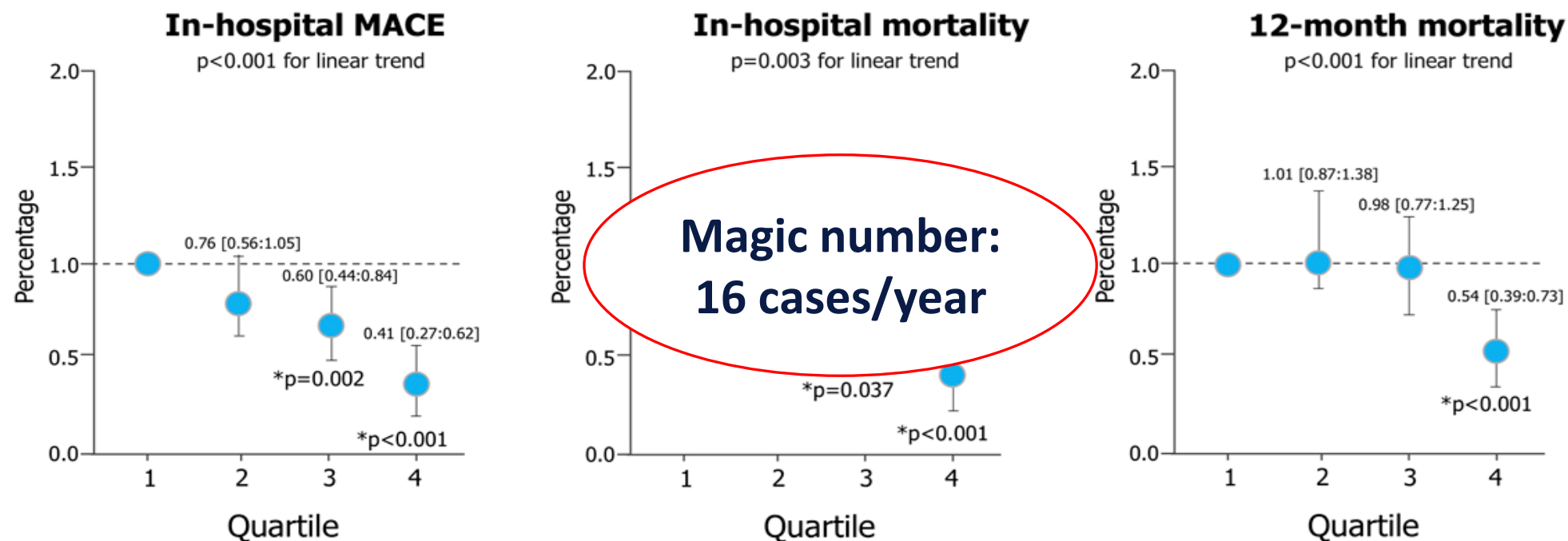


- Most frequent condition.
- Despite a negative angiography, IVUS shows that the disease often extends towards side branches.
- Many (technical) aspects to consider:
  - Lesion length
  - Side branch size and angulation
  - Clinical setting (acute/stable CAD/LVEF)
  - Operator experience

# Left main disease PCI

## Operator volume and LM PCI outcomes

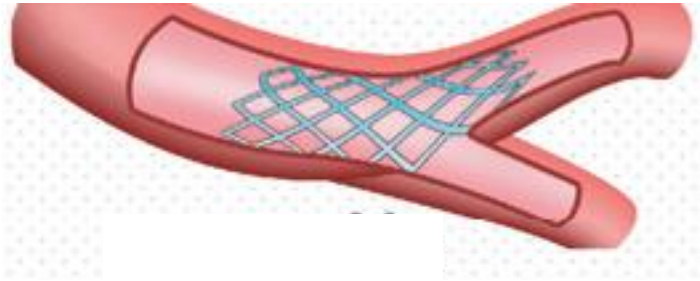
### 6724 uLMS-PCI, England and Wales



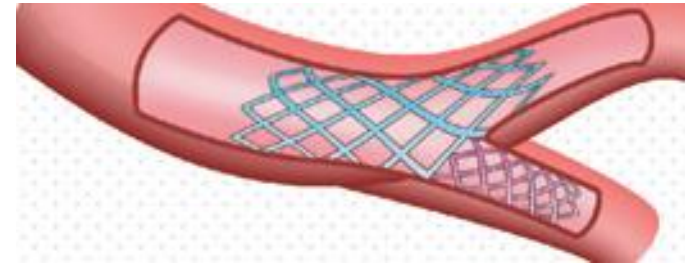
Quartiles: procedures/year  
2, 5, 10, 21

Operator volume is an important factor in determining outcome after uLMS-PCI

## Which approach for the distal LM PCI?



Provisional strategy



Two-stent strategy

DK crush

Culotte

T- / TAP



# Distal Left Main Disease PCI Which approach should I choose upfront?

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## STATE-OF-THE-ART REVIEW

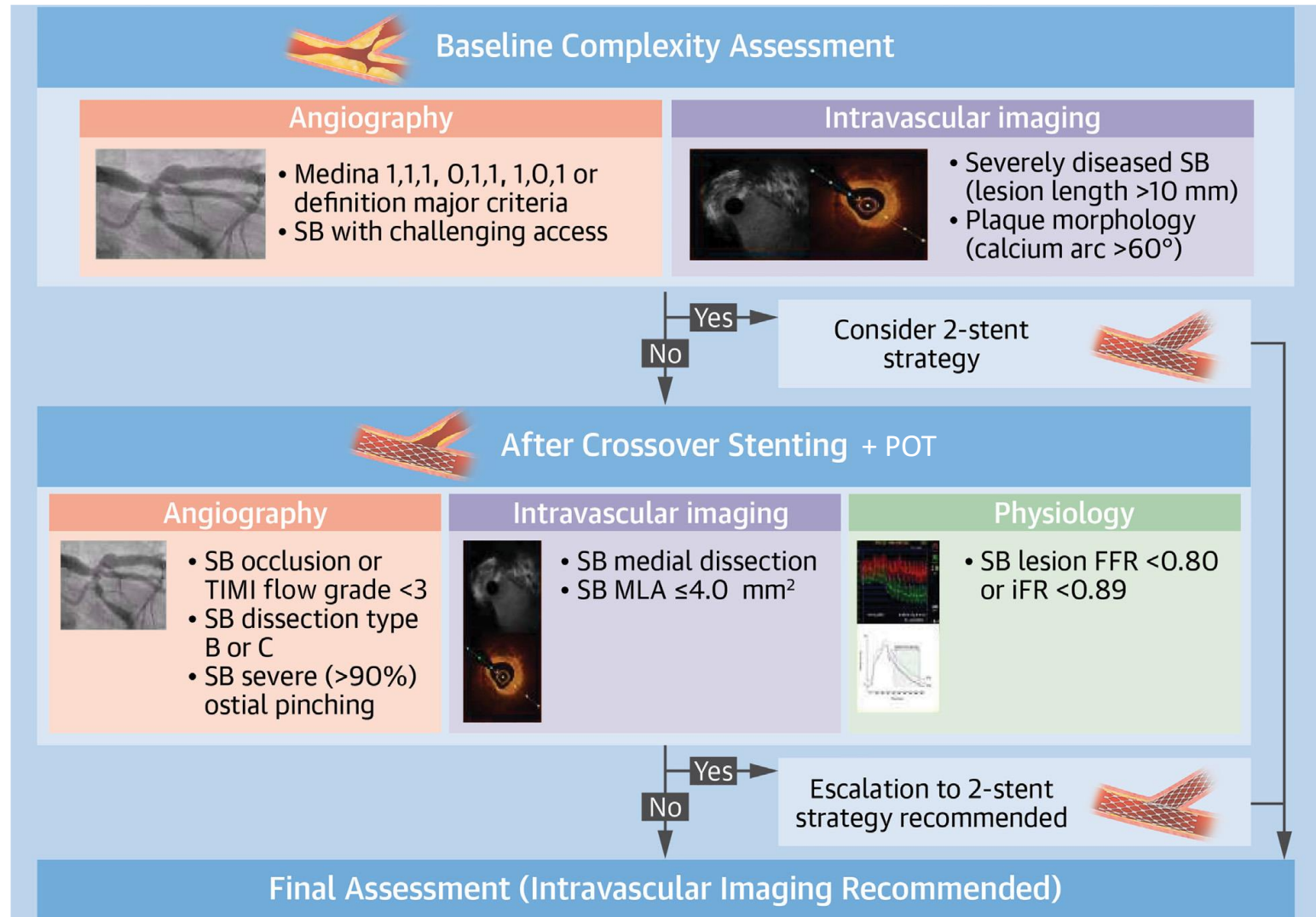
## Provisional Strategy for Left Main Stem Bifurcation Disease

### A State-of-the-Art Review of Technique and Outcomes

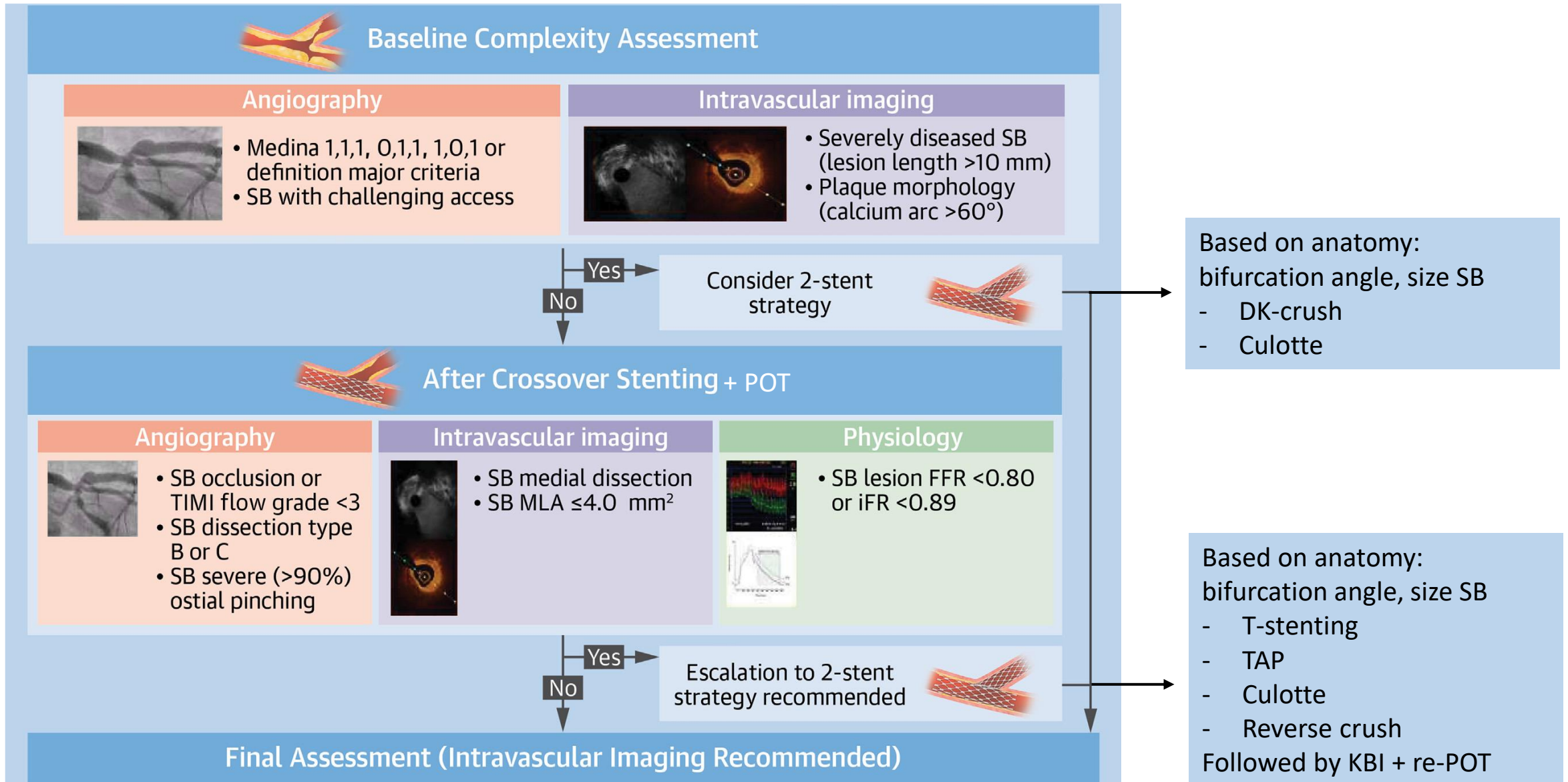
Valeria Paradies, MD,<sup>a,b</sup> Adrian Banning, MD, PhD,<sup>c,d</sup> Davide Cao, MD,<sup>e,f</sup> Alaide Chieffo, MD,<sup>g</sup> Joost Daemen, MD, PhD,<sup>b</sup> Roberto Diletti, MD, PhD,<sup>b</sup> David Hildick-Smith, MD, PhD,<sup>h</sup> David E. Kandzari, MD,<sup>i</sup> Ajay J. Kirtane, MD, SM,<sup>j,k</sup> Roxana Mehran, MD, PhD,<sup>c</sup> Duk-Woo Park, MD,<sup>l</sup> Giuseppe Tarantini, MD, PhD,<sup>m</sup> Pieter C. Smits, MD, PhD,<sup>a</sup> Nicolas M. Van Mieghem, MD, PhD<sup>b</sup>

#### ABSTRACT

Left main coronary artery (LMA) disease jeopardizes a large area of myocardium and increases the risk of major adverse cardiovascular events. LMCA disease is found in 5% to 7% of all diagnostic coronary angiographies, and more than 80% of the patients enrolled in recent large randomized controlled left main trials had distal left main bifurcation or trifurcation disease. Emerging clinical evidence from prospective all-comer registries and randomized trials has provided a solid basis for percutaneous coronary intervention as a treatment option in selected patients with unprotected LMCA disease; however, to date, no uniform recommendations as to optimal stenting strategy for LMCA bifurcation lesions exist. This review provides an overview of provisional stenting technique and escalation to 2-stent strategies in LMCA bifurcation lesions. Data from randomized controlled trials and registries are reviewed. Technical characteristics of optimal provisional LMCA stenting technique and angiographic and intravascular determinants of escalation are also summarized. (J Am Coll Cardiol Intv 2023;16:743-758) © 2023 by the American College of Cardiology Foundation.



# Distal Left Main Disease PCI Which approach should I choose upfront?



## Provisional approach for LM - New concepts

DCBs are a novel strategy for PCI.  
Currently, their application in bifurcations is unknown.  
Small studies investigated their application in hybrid PCI.

### DANUBIO - a new drug-eluting balloon for the treatment of side branches in bifurcation lesions: six-month angiographic follow-up results of the DEBSIDE trial

Jacques Berland<sup>1\*</sup>, MD; Thierry Lefèvre<sup>2</sup>, MD, FESC, FSCAI; Philippe Brenot<sup>3</sup>, MD; Jean Fajadet<sup>4</sup>, MD; Pascal Motreff<sup>5</sup>, MD, PhD; Patrice Guerin<sup>6</sup>, MD, PhD; Patrick Dupouy<sup>7</sup>, MD; Christian Schandrin<sup>8</sup>, MD; DEBSIDE trial investigators

DCB in side branch after provisional stenting

Low LLL, no restenosis at 6-month follow-up.

Paclitaxel-eluting balloon and everolimus-eluting stent for provisional stenting of coronary bifurcations: 12-month results of the multicenter BIOLUX-I study<sup>☆.☆☆.★.★★</sup>

Stephen Worthley<sup>a,\*</sup>, Randall Hendriks<sup>b</sup>, Matthew Worthley<sup>a</sup>, Alan Whelan<sup>b</sup>, Darren L. Walters<sup>c</sup>, Robert Whitbourn<sup>d</sup>, Ian Meredith<sup>e</sup>

DCB in side branch after provisional stenting

Low LLL, no restenosis at 12-month follow-up.

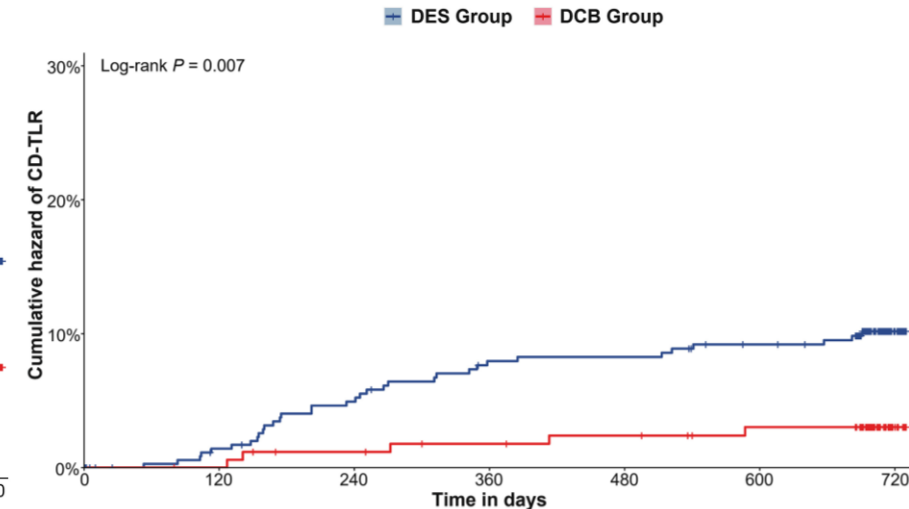
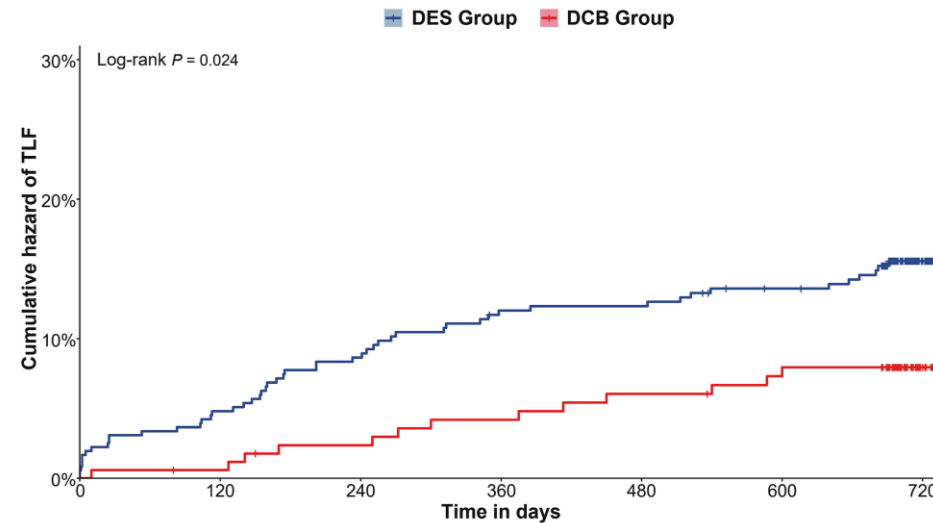
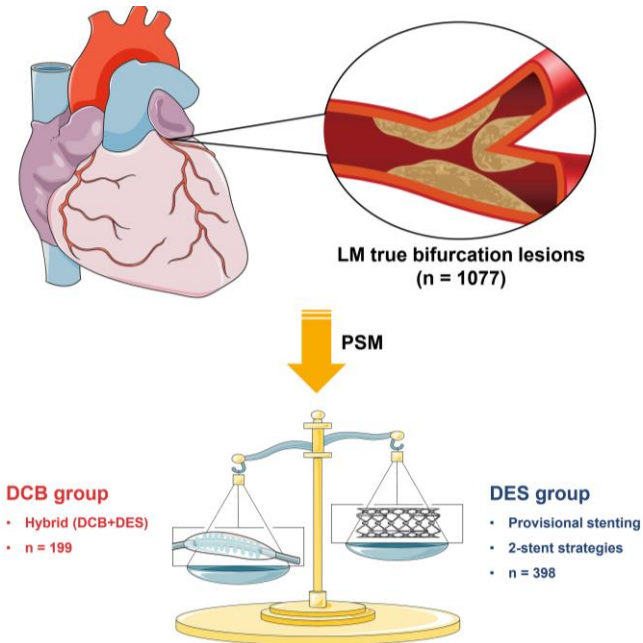
1. Berland et al. "6-month angiographic follow-up results of the DEBSIDE trial." EuroIntervention (2015)
2. Worthley et al. "12-month results of the multicenter BIOLUX-I study." Cardiovascular revascularization medicine (2015)

# Left main disease PCI

## Provisional pattern – new concepts

## Provisional approach for LM - New concepts

No RCTs on hybrid PCI in LM bifurcation lesions.



A recent metanalysis suggest lower rates of TLF and TLR with hybrid rather than 2-stent approach in LM bifurcations.

## Provisional approach for LM - New concepts



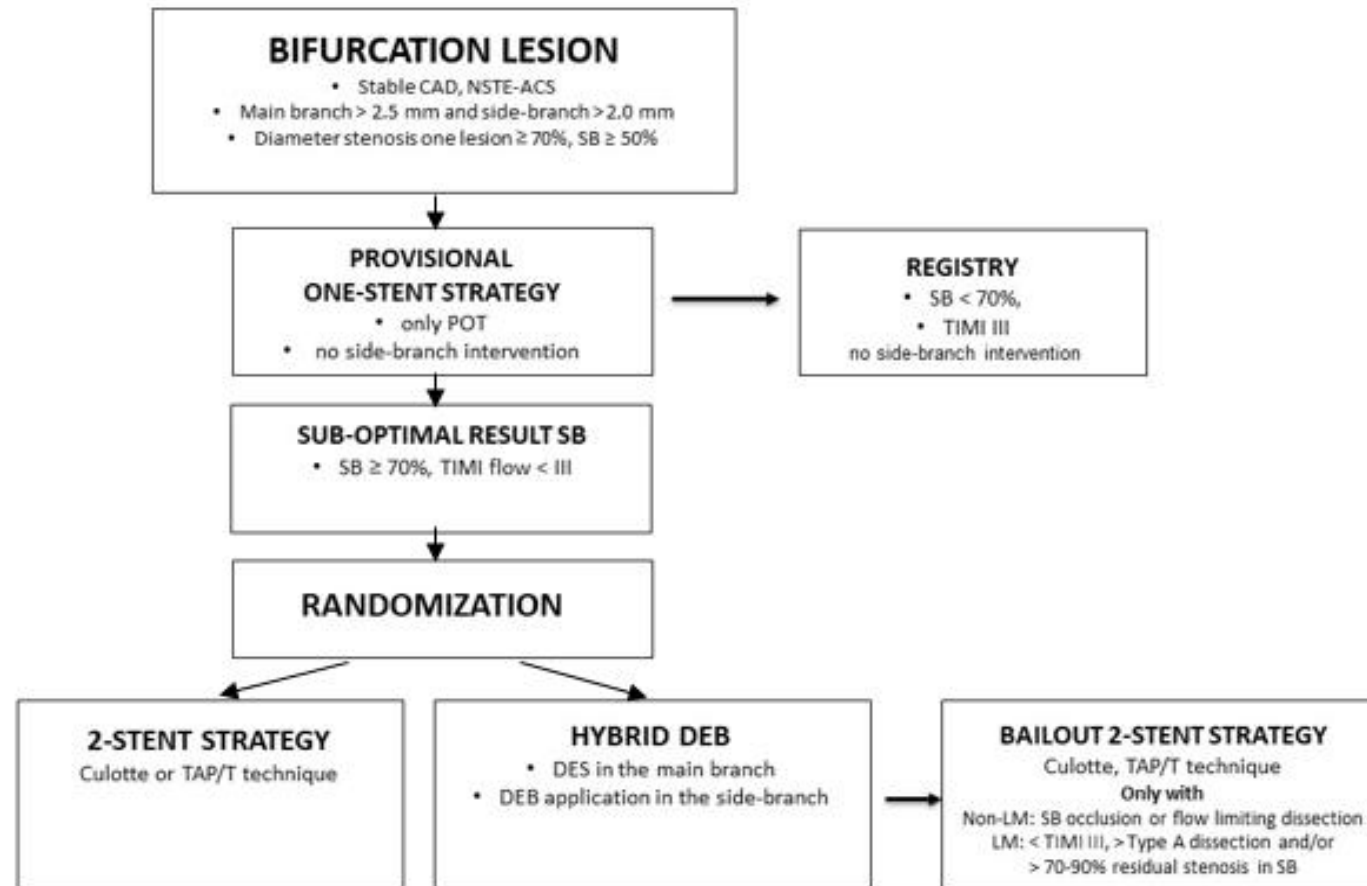
Patients with bifurcation lesions, **including LM.**



Provisional approach, then **randomization** to bailout 2-stent or **hybrid DEB if suboptimal result** in SB



**Primary EP:** 2-y all-cause death, MI, TVR  
**Other EP:** procedural success, TVF, MACE, safety



# Left main disease PCI

Upcoming results from RCTs

## LM/bifurcation disease – upcoming results from RCTs

The following results are expected



- 5-year outcomes of EBC II
- 3-year outcomes of EBC main
- Residual ischemia after LM stenting
  - 30-day outcomes of KISS



## KISS trial

Should we do ostial SB intervention after provisional stenting?

**Aim:** to evaluate the non-inferiority of no side branch intervention vs side branch ballooning, in the setting of single stenting with systematic POT.

**Study design:** 596 patients, 1:1 randomization after provisional stenting:  
No SB intervention *versus* SB kissing balloon + POT

### **Study endpoints:**

**Primary endpoint:** periprocedural myocardial infarction

**Secondary endpoints:** technical success, TLF, TLR, stent thrombosis, angina status