

FFR Utilization in LM PCI

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Left Main Disease

Meta-analysis of 1,611 Patients in 4 RCTs

- LEMANS
- SYNTAX left main
- Boudriot et al.
- PRECOMBAT

How to treat

PCI

Vs.

CABG

1 Year

Death/MI/Stroke

0.77

0.26

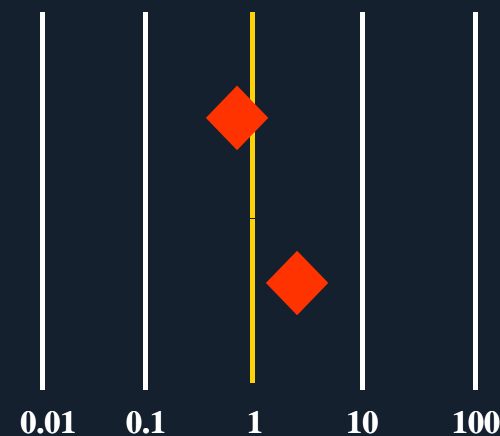
(0.48-1.22)

TVR

2.25

<0.01

(1.54-3.28)



Favors PCI

Favors CABG

Current Guideline Recommendations for UPLM Revascularization

ACC/AHA¹

IIa	Class III angina and >50% LM stenosis who are not eligible for CABG
IIb	Alternative to CABG may be considered in pts with anatomic conditions that are associated with a low risk of PCI procedural complications and clinical conditions that predict an increased risk of adverse surgical outcomes

ESC²

IIa	Left main (isolated or 1-vessel disease ostium/shaft)
IIb	Left main (isolated or 1-vessel disease distal bifurcation)
IIb	Left main plus 2- or 3-vessel disease, SYNTAX score <32
III	Left main plus 2- or 3-vessel disease, SYNTAX score >33

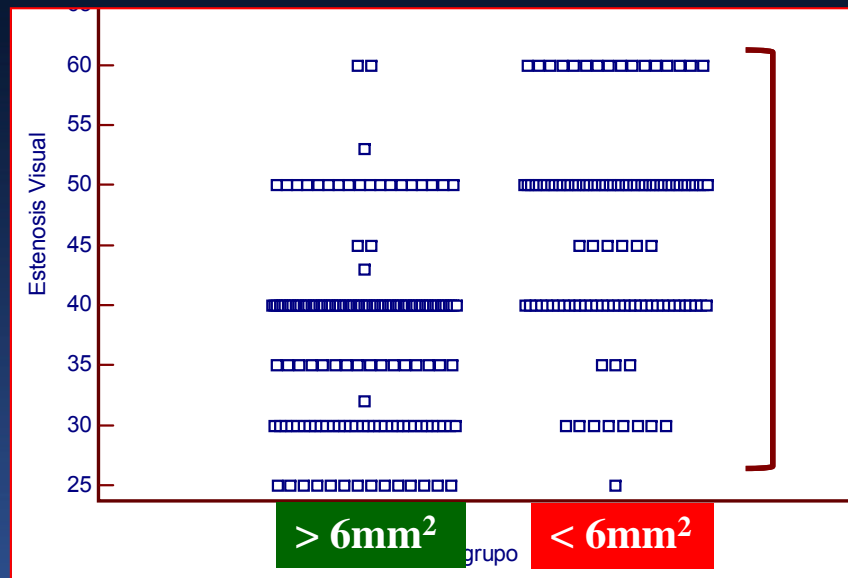
1 ACC/AHA 2009 Focused Updates for STEMI and PCI. Circulation 2009;120:2271–2306

2 Wijns W, Kolh P, et al. Eur Heart J 2010;31:2501-55

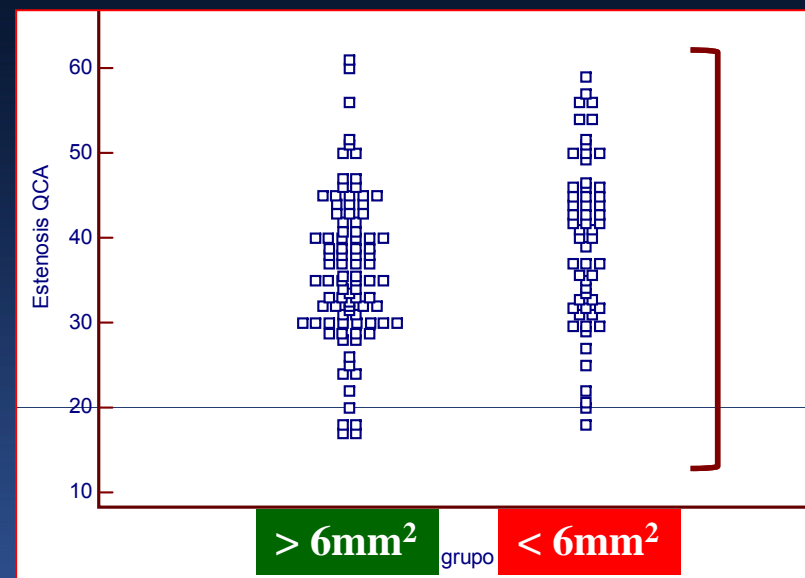
Left Main Lesion Assessment

Angiographic measurements are unreliable in the assessment of intermediate LMCA lesions

Visual stenosis

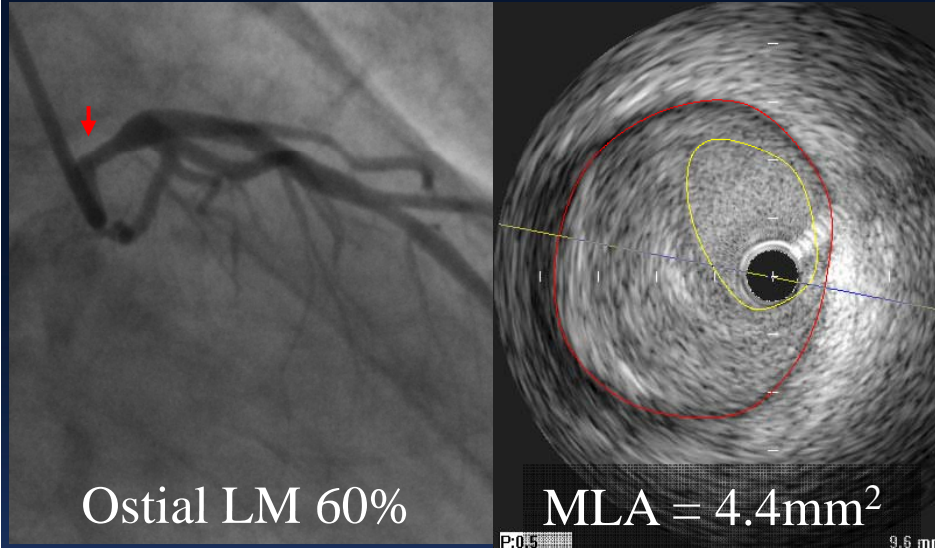


QCA stenosis

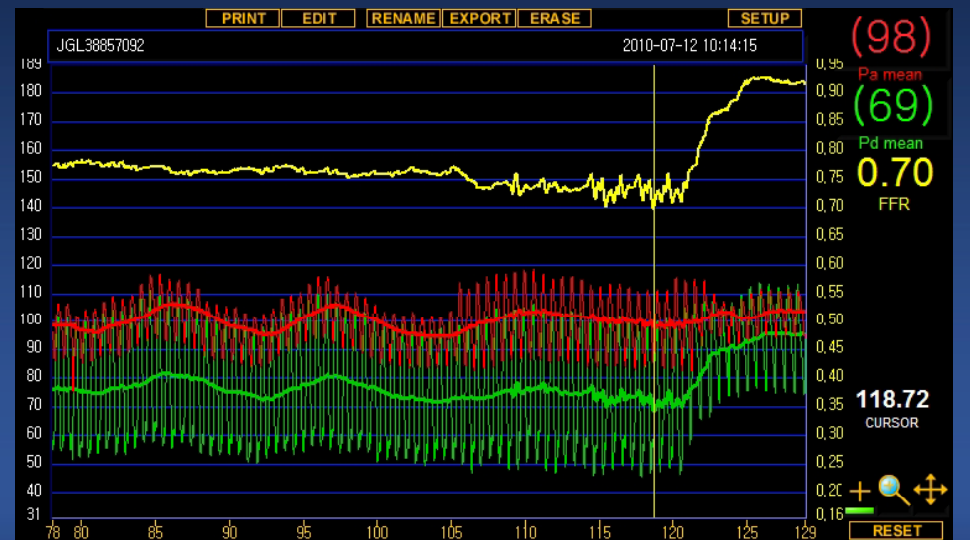
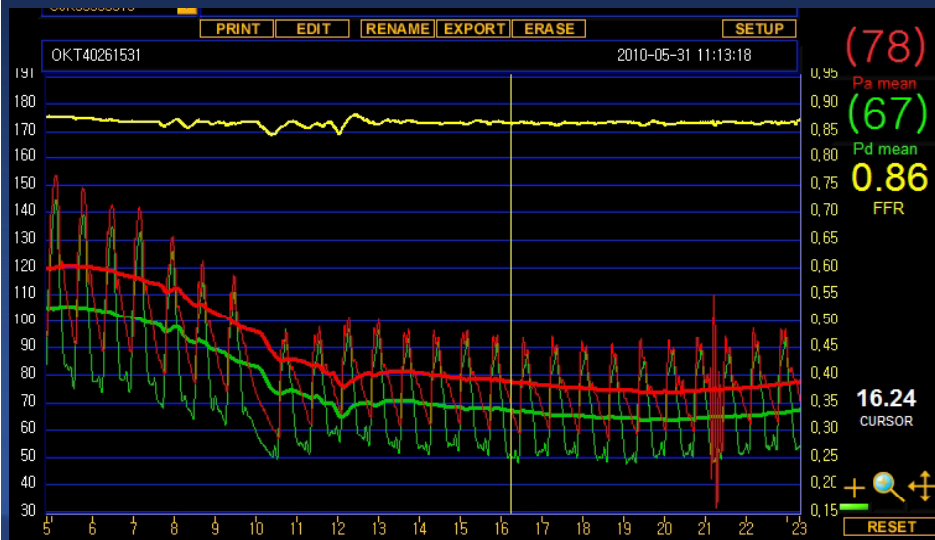
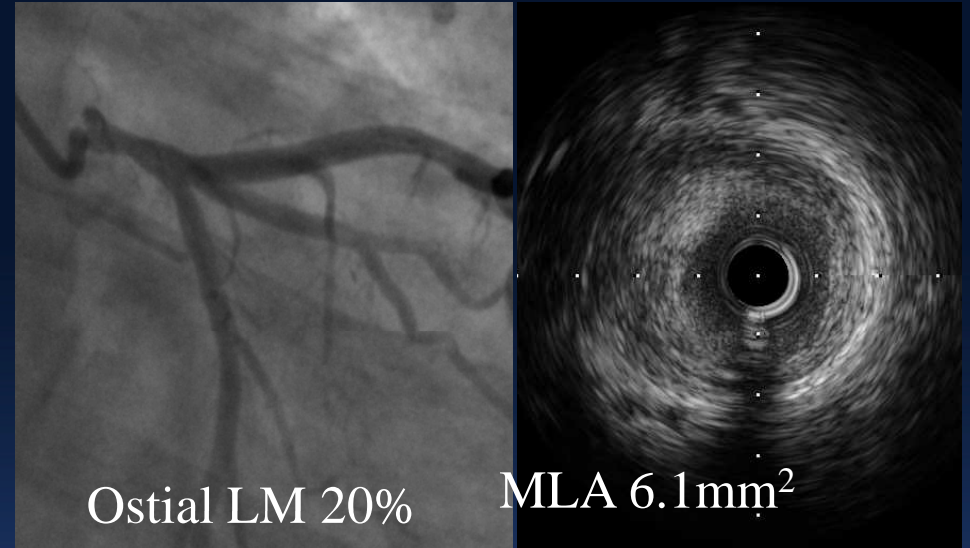


Wide variability in visual and quantitative angiographic assessment of LMCA lesions with MLA <6 mm²

47/M Stable angina



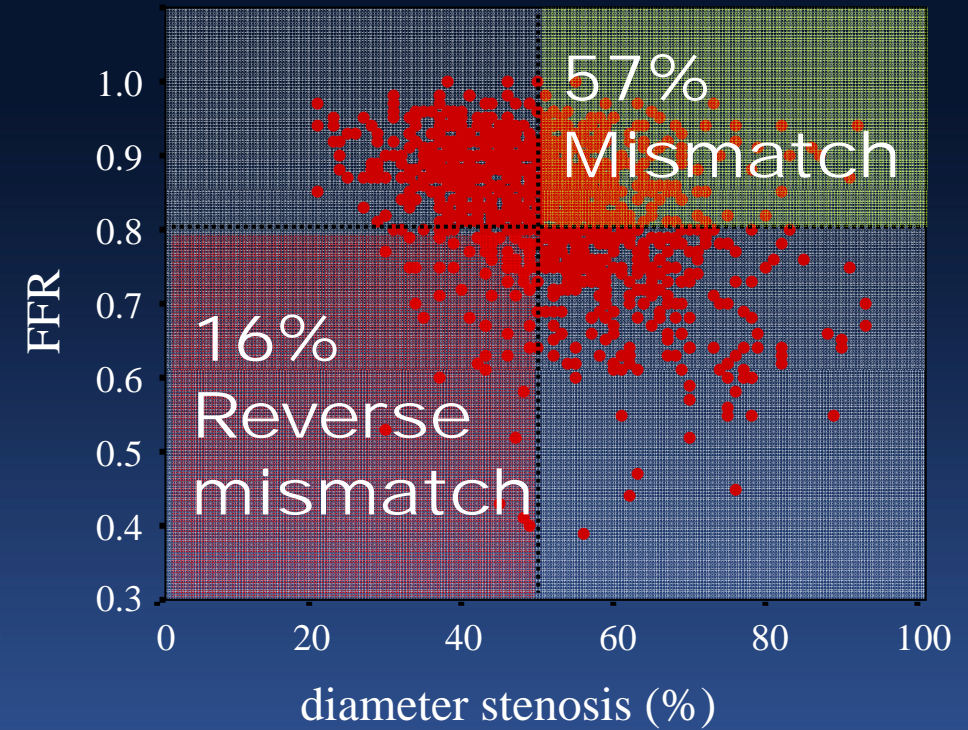
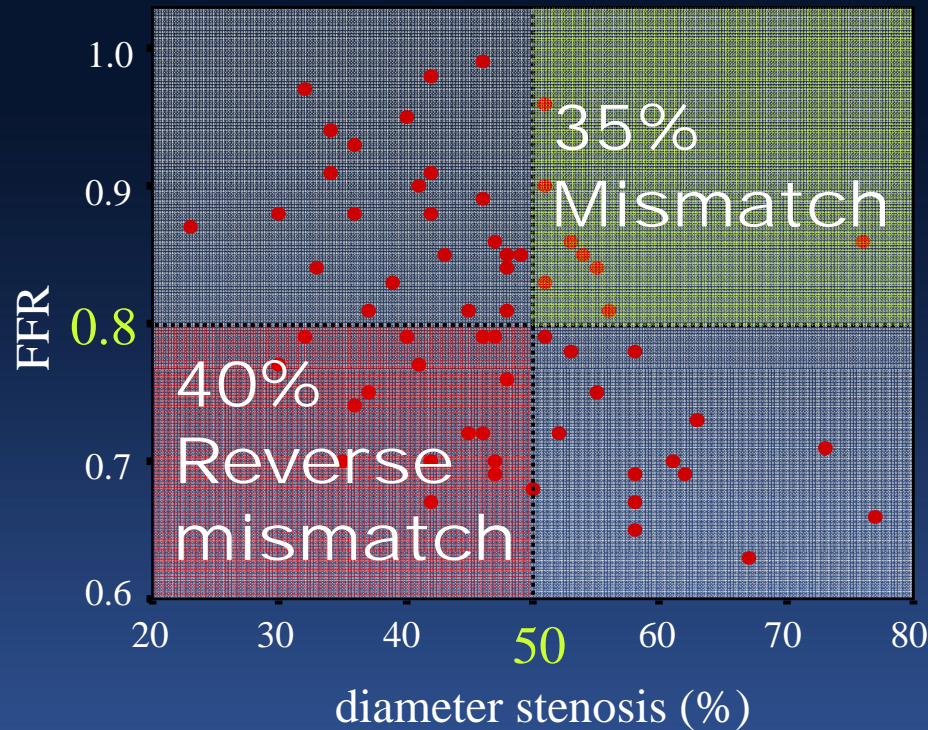
50/M Stable angina



QCA-FFR Discordance: LM vs. Non-LM

63 LM lesions

1066 Non-LM lesions



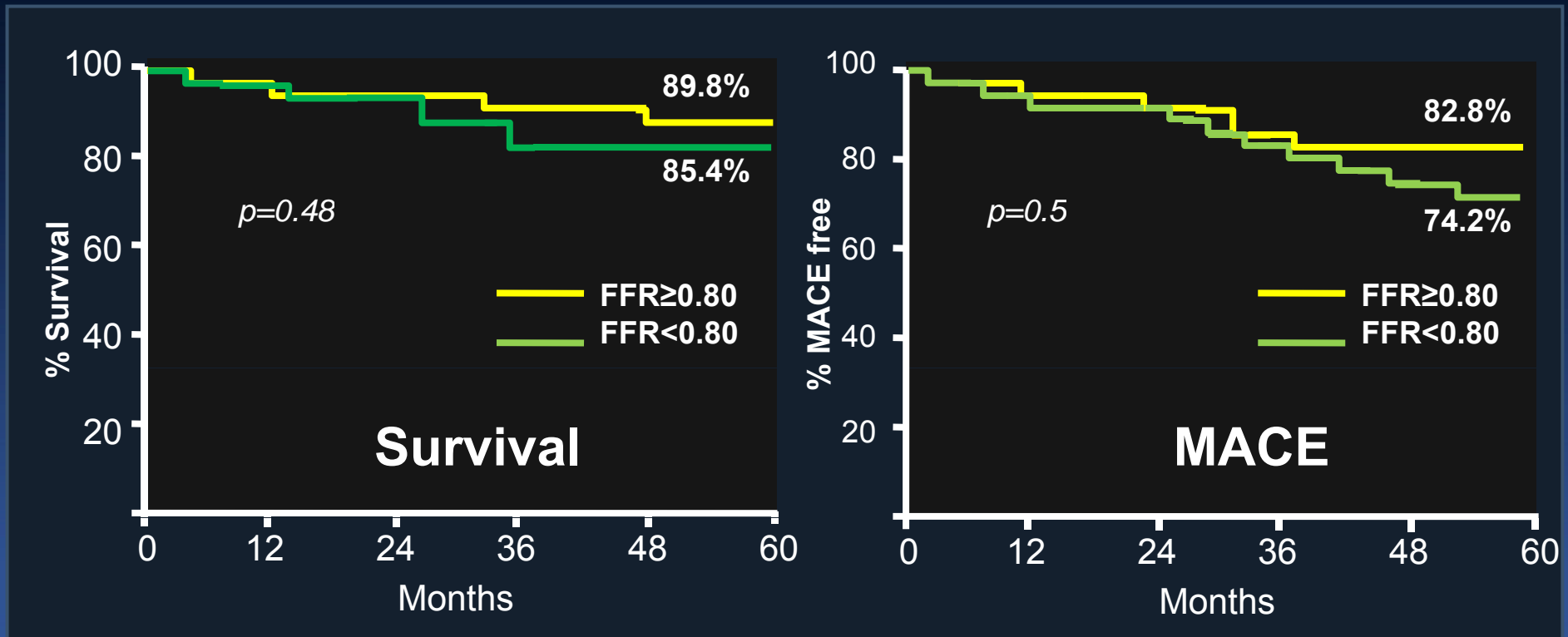
Angiographic underestimation of stenosis degree
Relatively large myocardial territory of LM

AMC data

Decision Making of LM treatment

FFR guided PCI in Equivocal LMCA

- In 213 patients with an equivocal LMCA stenosis
- FFR ≥ 0.80 : Medication (n=138) vs. FFR < 0.80 : CABG (n=75)



An FFR-guided strategy showed the favorable outcome.

Treatment strategy (deferral vs. revascularization) should be based on “**Functional significance**”

Author	Comparison	Results	p
Lindstaedt¹	CABG (FFR<0.75) vs. Medical (≥0.80)	4-year Survival 81% vs. 100% MACE-free 66% vs. 69%	NS
Jasti²	CABG (FFR<0.75) vs. Medical (≥0.75)	38-month Survival 100% vs. 100% MACE-free 100% vs. 90%	NS
Courtis³	Revasc (FFR<0.75) vs. Medical (≥0.80)	14-month MACE 7% vs. 13%	NS
Bech⁴	Revasc (FFR<0.75) vs. Medical (≥0.75)	29-month Survival 100% vs. 97% MACE-free 83% vs. 76%	NS
Hamilos⁵	CABG (FFR<0.80) vs. Medical (≥0.80)	5-year Survival 85% vs. 90% MACE-free 74% vs. 82%	NS

¹Am Heart J 2006;152:156,

⁴Heart 2001;86:547-52,

²Circulation 2004;110:2831-6, ³Am J Cardiol 2009;103:943-9

⁵Circulation 2009;120:1505-12

Clinical Outcomes After Deferral of Revascularization

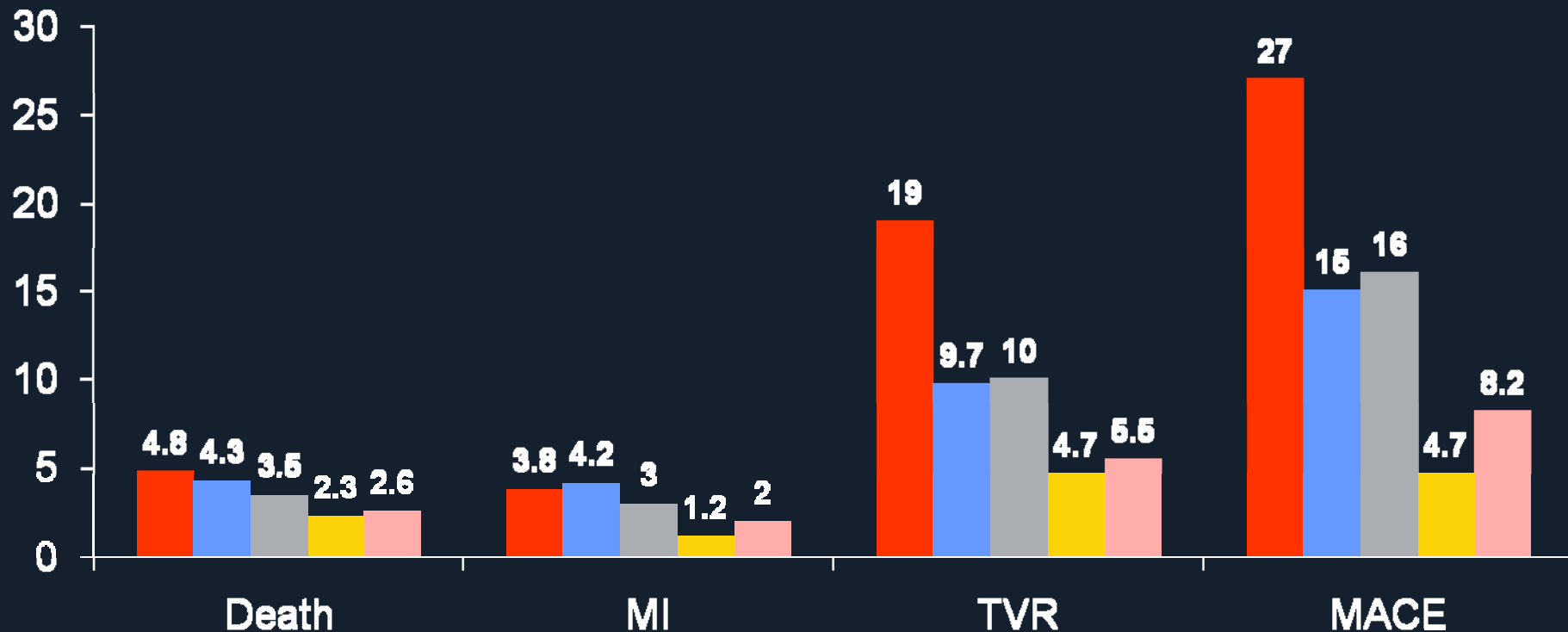
Left Main Coronary Artery (6 studies, 296 patients)

Outcomes	Incidence (%/year)
All Death	2.6 (1.3-5.2)
Cardiac Death	2.6 (1.3-5.2)
Myocardial Infarction	2.0 (0.7-5.1)
TVR	5.5 (3.3-8.8)
MACE	8.2 (5.5-12.1)

Clinical Outcomes After Deferral of Revascularization

LM Coronary Artery

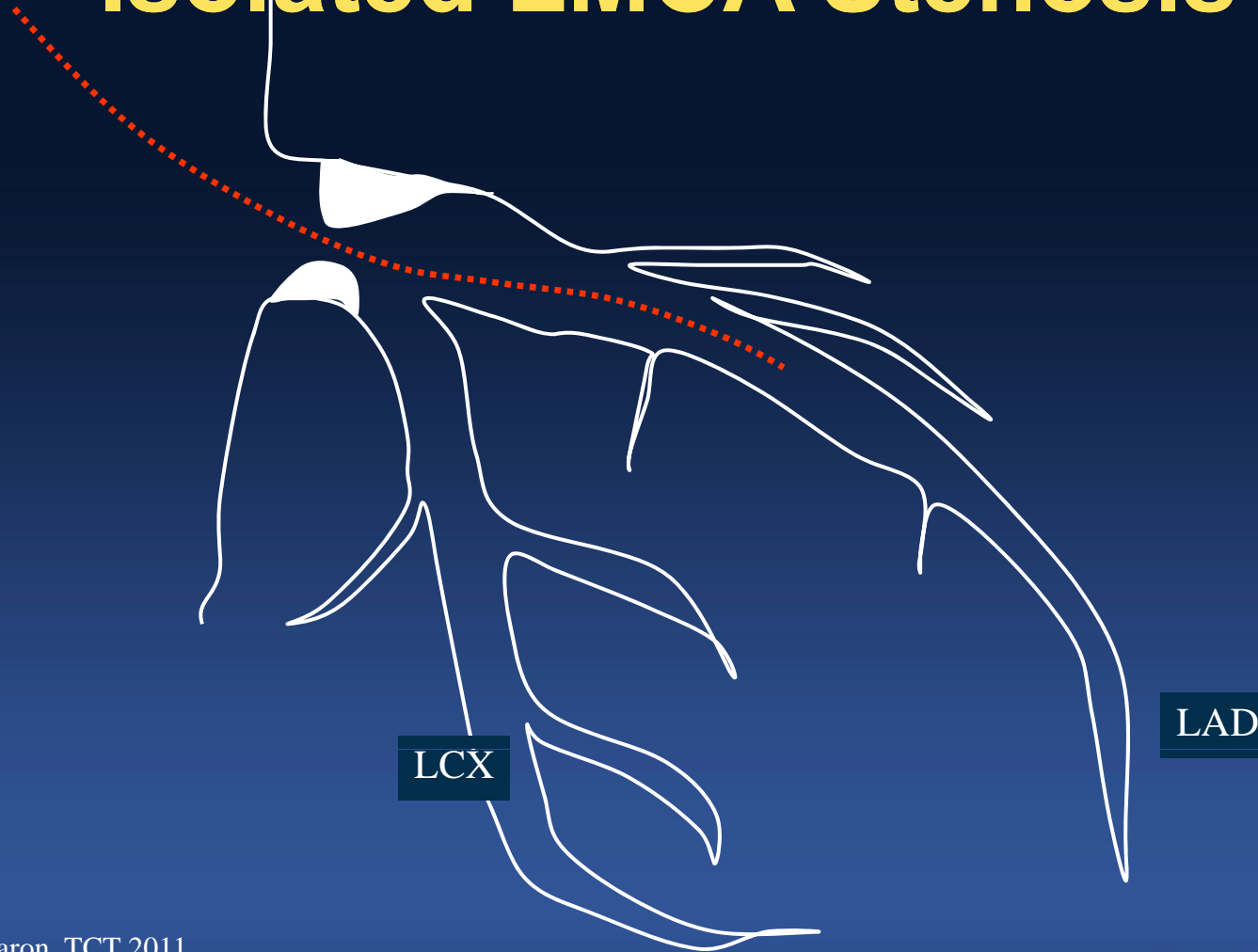
■ LEMANS (N=105) ■ SYNTAX-LM (N=691) ■ Boudriot et al. (N=201) ■ PRECOMBAT (N=600) ■ DEFER-LM (N=2955)



Limitations of FFR measurement in LMCA stenosis

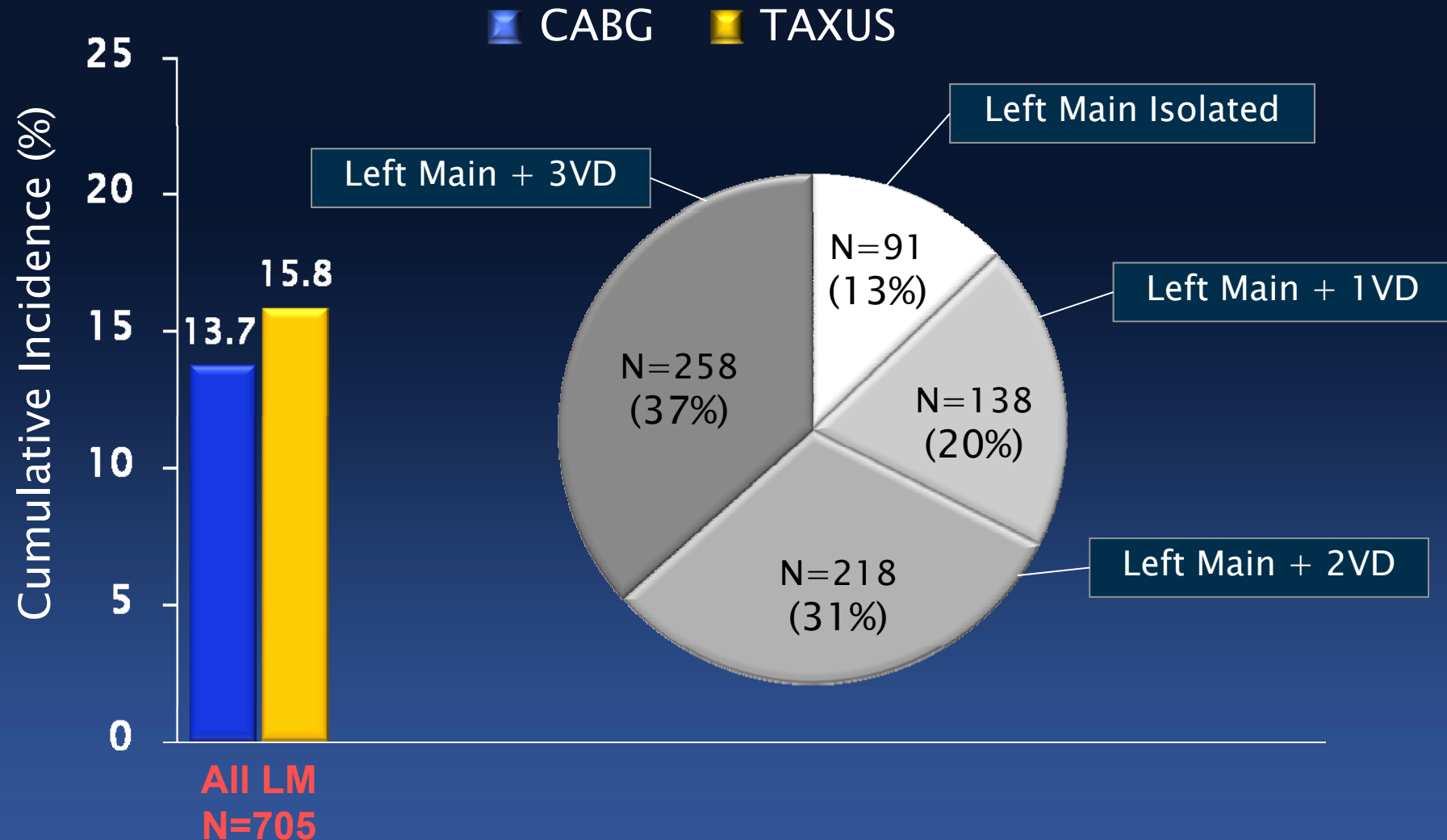
True FFR of LM disease

Isolated LMCA Stenosis



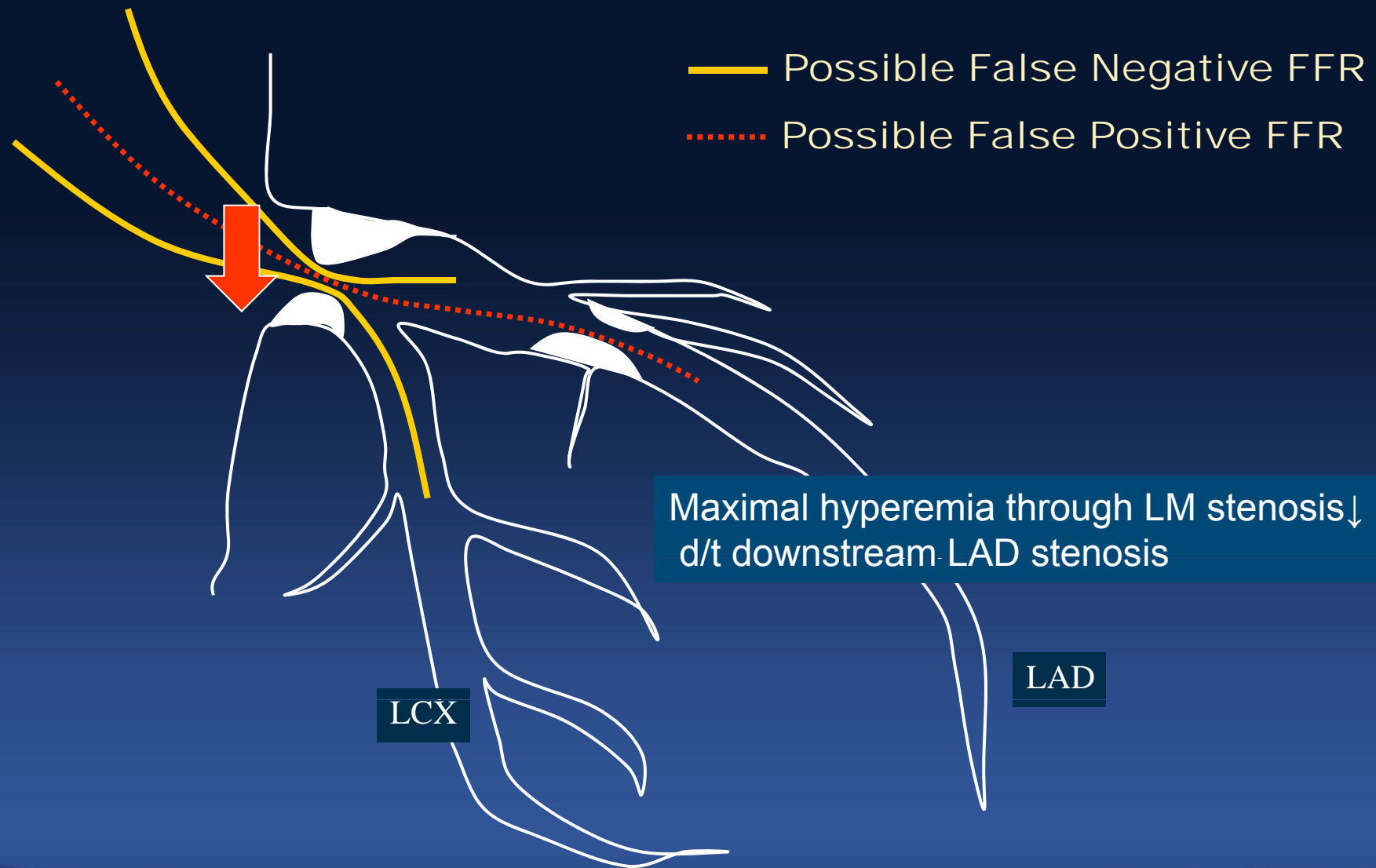
Daniels, Fearon, TCT 2011

SYNTAX Left Main Subgroup

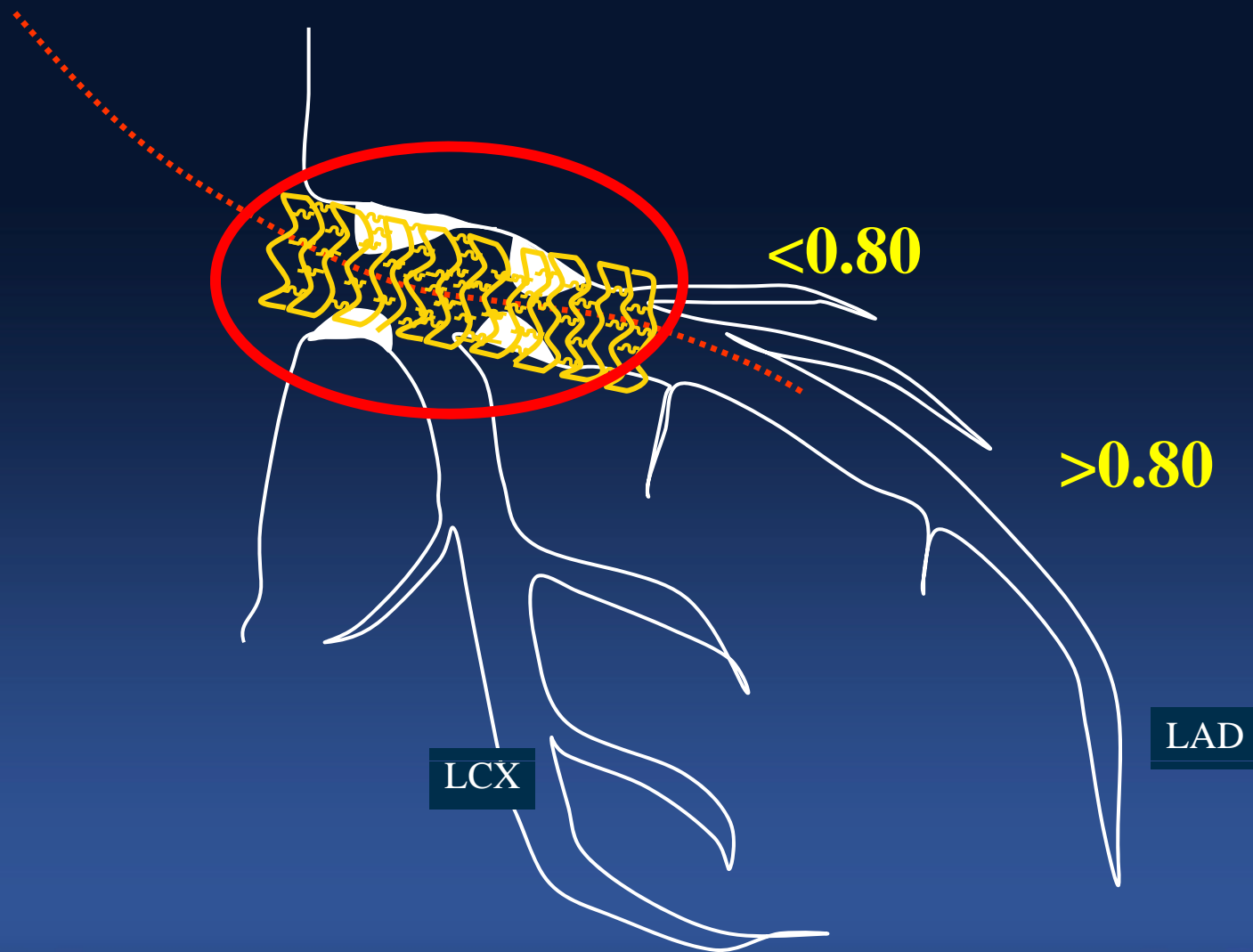


Comparisons for the LM and 3VD subgroups are observational only and hypothesis generating

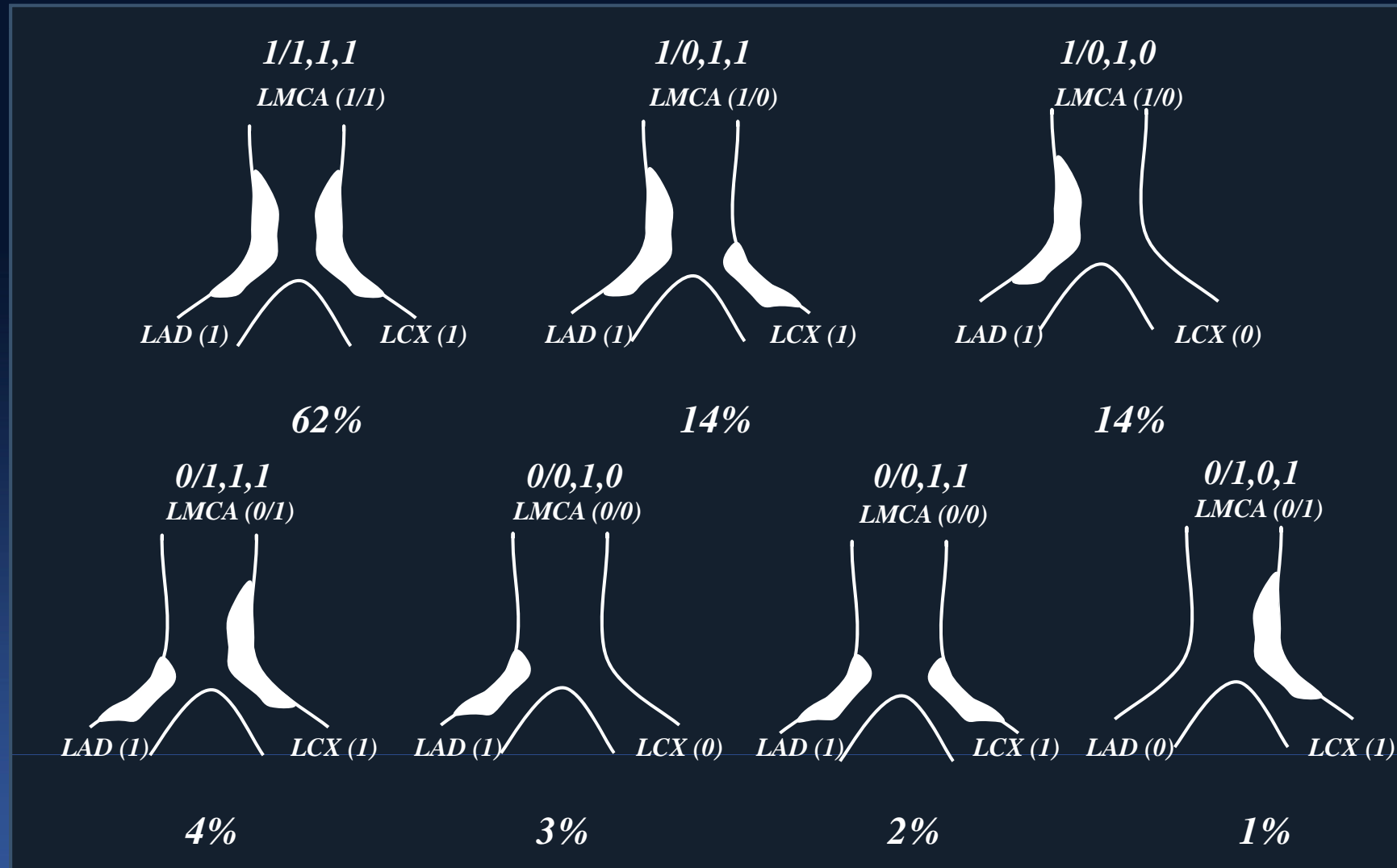
Conceptual Limitations of FFR for LM Disease



Limitations of FFR Assessment for LM Disease

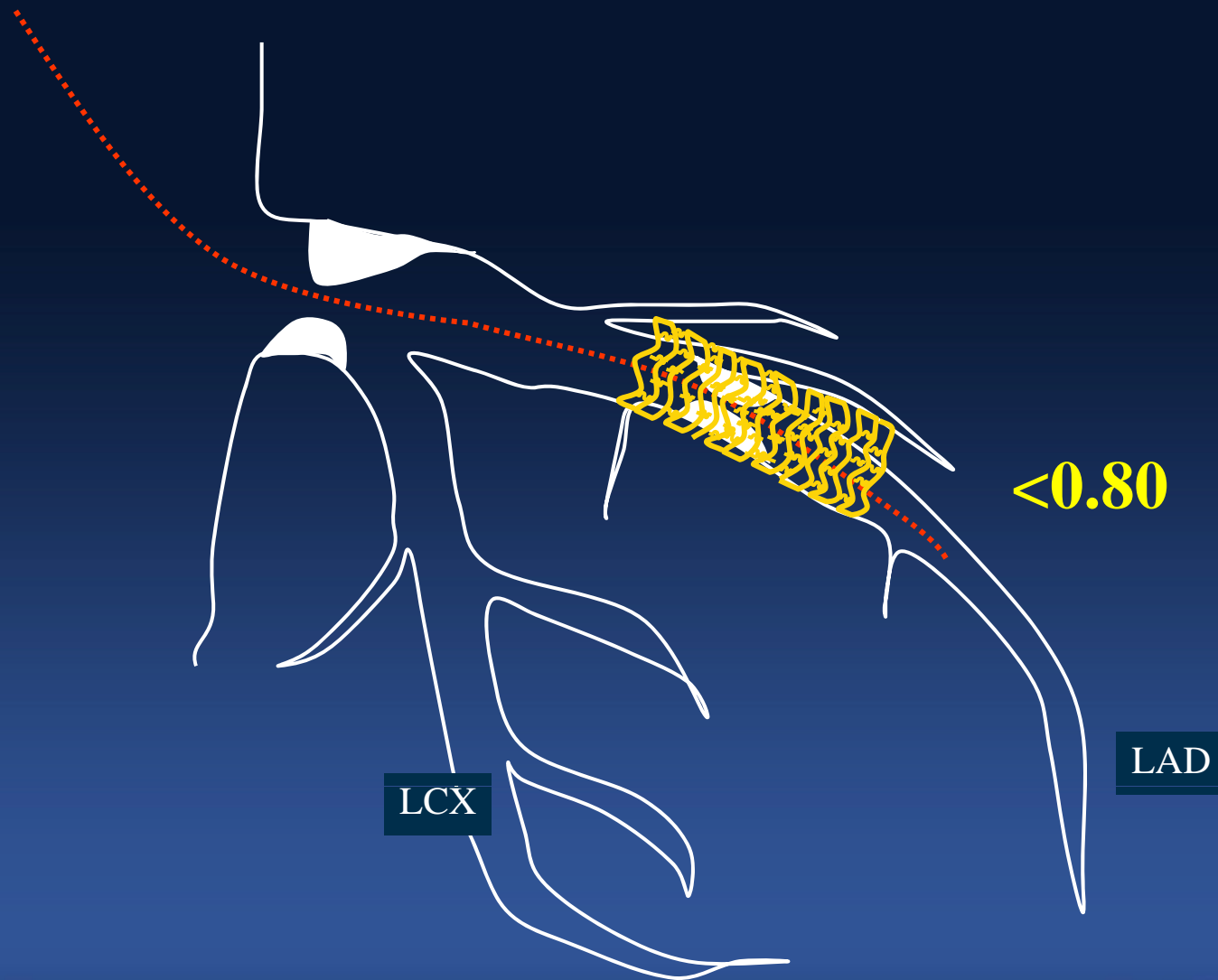


Plaque Distribution by IVUS (n=140)



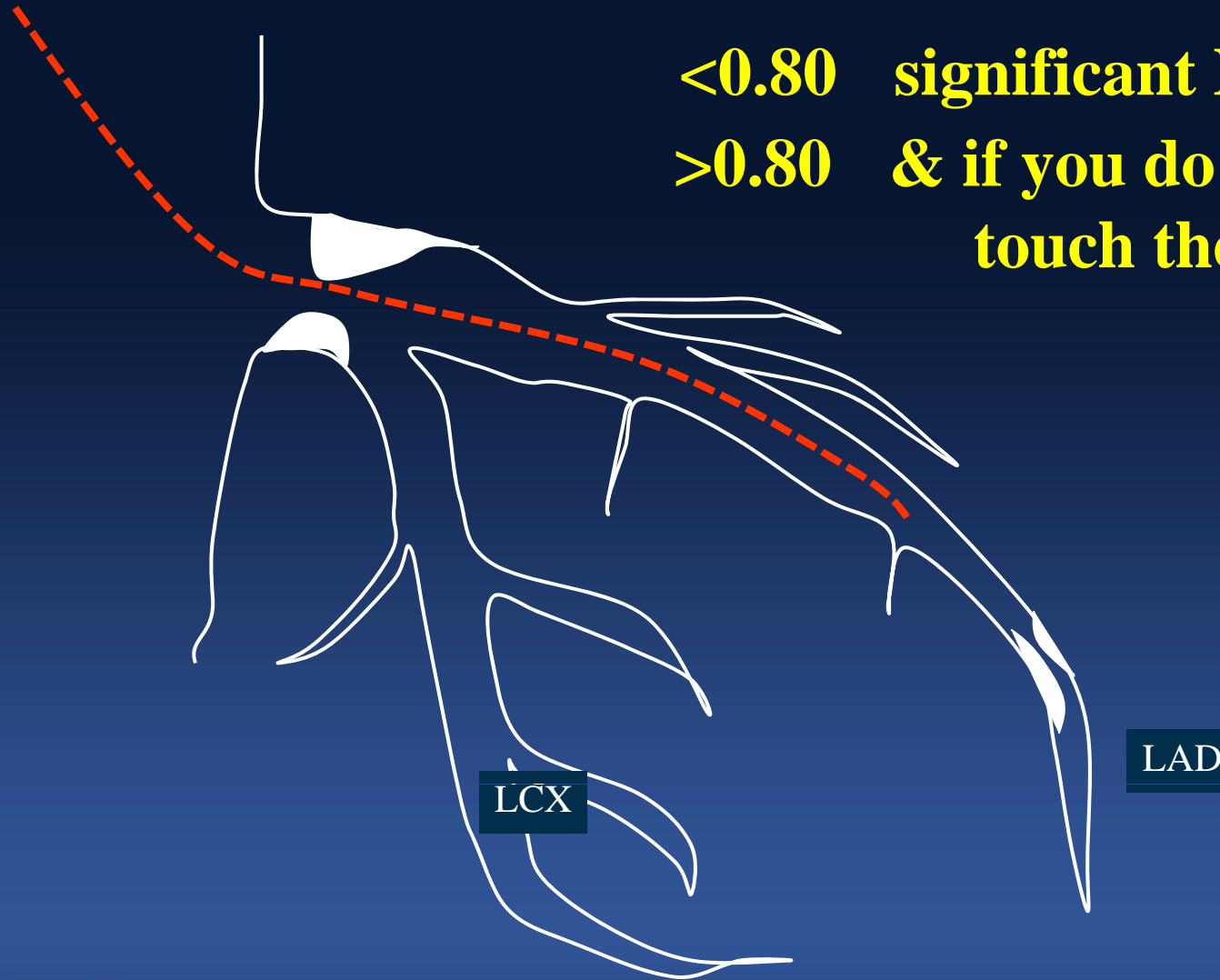
In 90% plaque extends from LMCA-LAD

Limitations of FFR Assessment for LM Disease



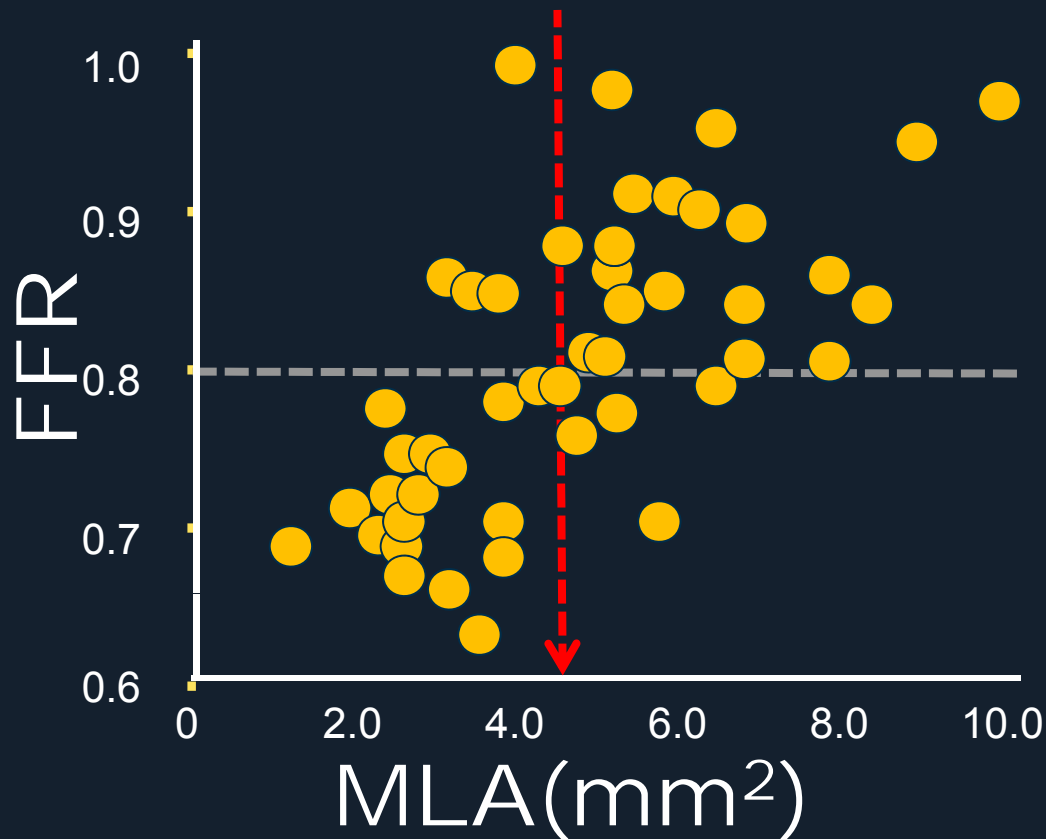
Limitations of FFR Assessment for LM Disease

<0.80 significant LM stenosis
>0.80 & if you do not want to touch the distal lesion



Significant LM Stenosis

MLA 4.8mm^2 New IVUS Criteria



Sensitivity 83%
 Specificity 83%
 PPV 83%
 NPV 83%
 Accuracy 83%

47 isolated LM disease
 With 30-80% stenosis

Summary

- Similarly to the non-LMCA stenosis, an FFR-guided strategy for LMCA stenosis showed the favorable clinical outcomes.
- Limitation of FFR measurement in LMCA stenosis, due to the downstream disease should be keep in mind.
- Contrary to the non-LMCA stenosis, IVUS MLA may be helpful to decide the ischemic potential of LMCA stenosis.