13th Annual Angioplasty Summit TCT Asia Pacific
3rd APSIC Fellowship Convocation

DES for Left Main Intervention

Marco Valgimigli, MD, PhD
University of Ferrara, ITALY

Current Recommendation for unprotected LMCA Stenosis

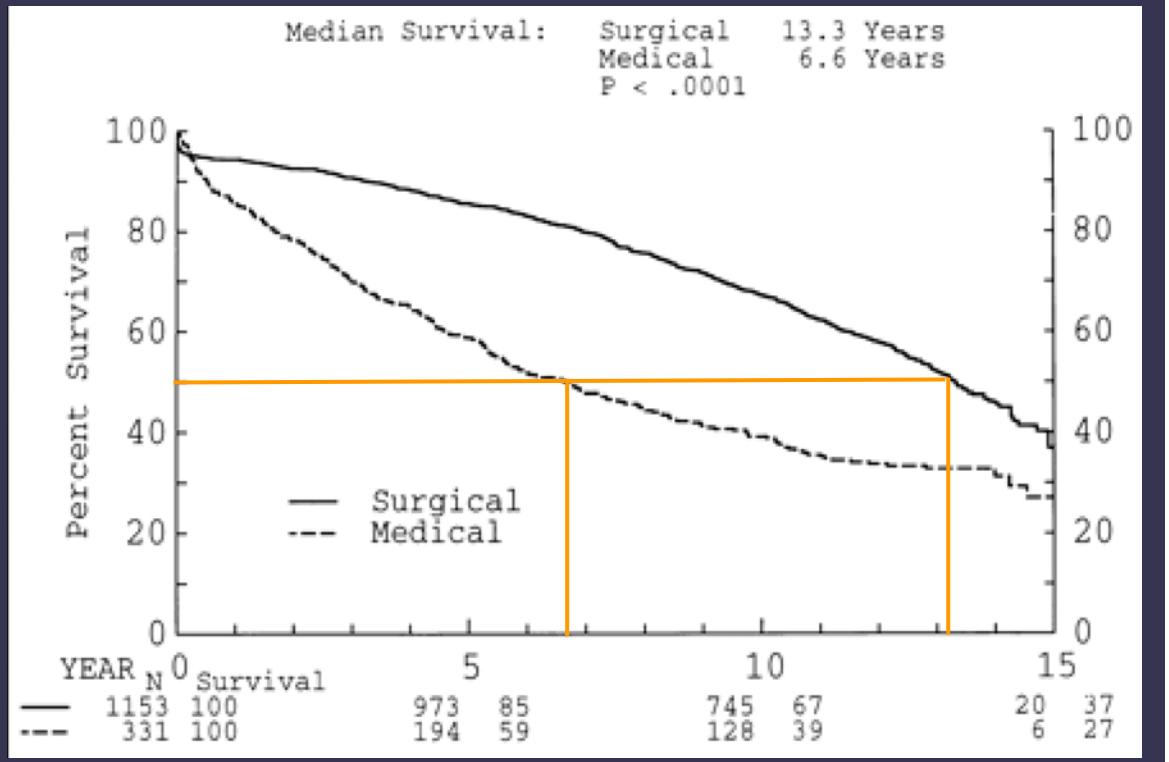
- Class **IIb C** in ESC guideline (2005) and Class **III** in ACC guideline (2006) in patients eligible for CABG

- Class III is the conditions for which there is evidence and/or general agreement that a procedure/treatment is not useful/ effective and in some cases may be harmful.

Left Main Disease

Long-term CASS Experience

Cumulative survival estimates In 1484 CASS Registry patients with 50% LM coronary artery stenosis who were initially treated with CABG surgery or non surgical therapy.

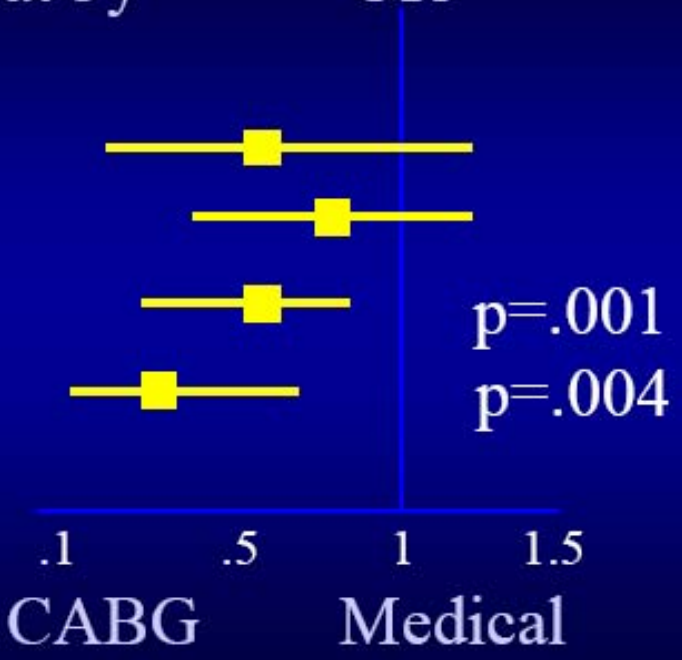


Caracciolo et al. Circulation 1995; 91: 2325

CABG versus Medical therapy

Coronary Artery Bypass Graft Surgery Trialists Collaboration (7 Randomized trials*)

Disease	N	med mortality at 5y
Single vessel	271	9.9%
Double vessel	859	11.7%
Triple vessel	1341	17.6%
Left main	150	36.5%



*VA, ECS, CASS, Texas, Oregon, NZ, NZ

Yusuf Lancet 344:563 '94

Long-Term Clinical Outcomes After Unprotected Left Main Trunk Percutaneous Revascularization in 279 Patients

Walter A. Tan, MD, MS; Hideo Tamai, MD; Seung-Jung Park, MD, PhD;
H.W. Thijs Plokker, MD, PhD; Masakiyo Nobuyoshi, MD; Takahiko Suzuki, MD;
Antonio Colombo, MD; Carlos Macaya, MD; David R. Holmes, Jr, MD; David J. Cohen, MD;
Patrick L. Whitlow, MD; Stephen G. Ellis, MD; for the ULTIMA Investigators*

Background—Percutaneous coronary revascularization (PCI) has been increasingly applied to unprotected left main trunk (LMT) lesions, with varied long-term success. This study attempts to define the predictors of outcome in this population.

Methods and Results—Two hundred seventy-nine consecutive patients who had LMT PCI at 1 of 25 sites between 1993 and 1998 were studied. Forty-six percent of these patients were deemed inoperable or at high surgical risk. Thirty-eight patients (13.7%) died in hospital, and the rest were followed up for a mean of 19 months. The 1-year incidence was 24.2% for all-cause mortality, 20.2% for cardiac mortality, 9.8% for myocardial infarction, and 9.4% for CABG. Independent correlates of all-cause mortality were left ventricular ejection fraction ≤30%, mitral regurgitation grade 3 or 4, presentation with myocardial infarction and shock, creatinine ≥2.0 mg/dL, and severe lesion calcification. For the 32% of patients <65 years old with left ventricular ejection fraction >30% and without shock, the prevalence of these adverse risk factors was low. No periprocedural deaths were observed in this low-risk subset, and the 1-year mortality was only 3.4%.

Conclusions—Patients undergoing unprotected LMT PCI have frequent serious comorbidities and consequently have high event rates. PCI may be an alternative to CABG for a select proportion of elective patients and may also be appropriate for highly symptomatic inoperable patients. Meticulous follow-up of hospital survivors is required because of the rather high mortality during the first few months after treatment. **(*Circulation*. 2001;104:1609-1614.)**

- **279 patients who underwent ULMCA PCI from 25 centres 1993-1998**
- **15% acute MI (13% shock)**

46% non eligible to CABG

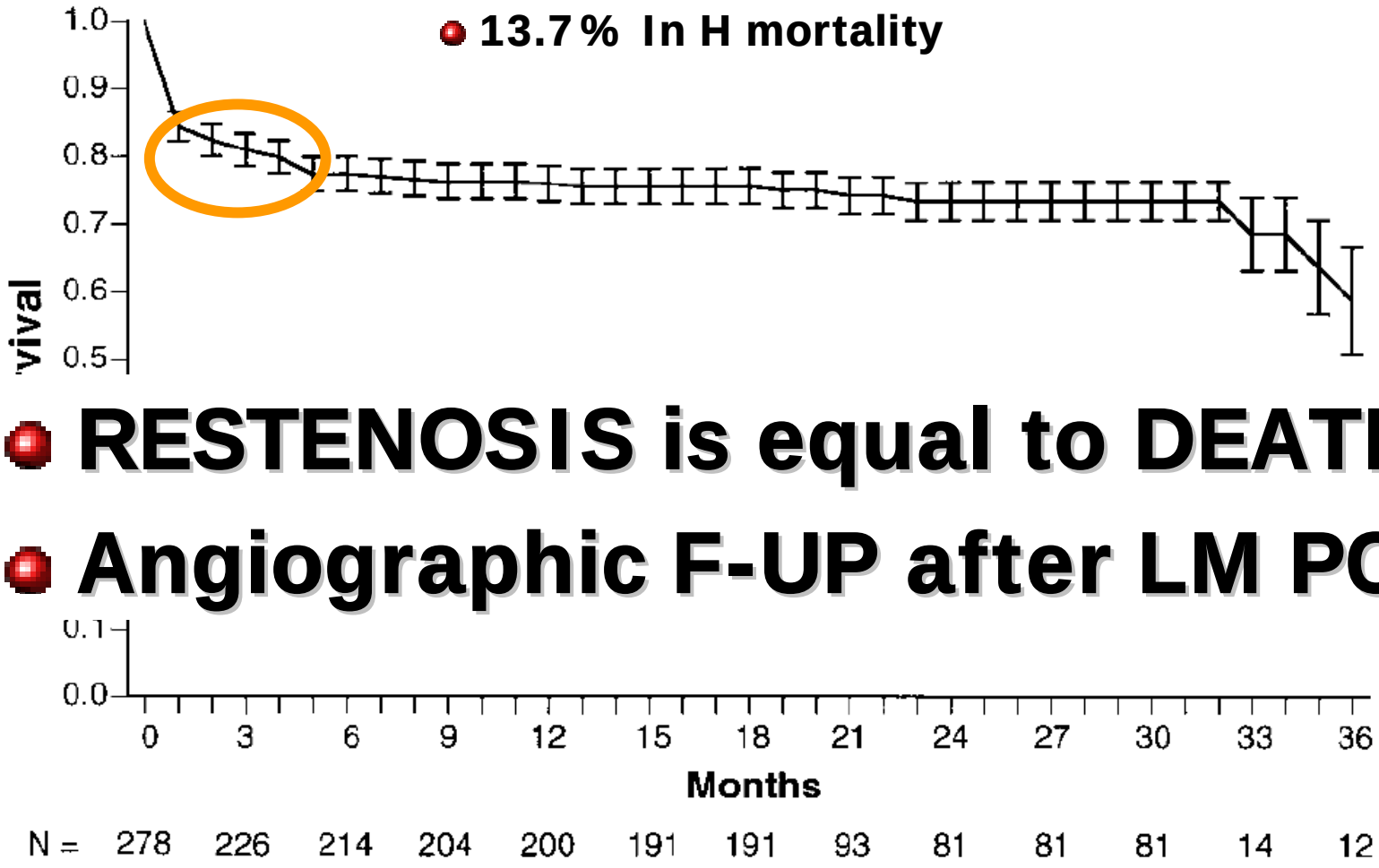
...Not really COURAGE-like Tx

TABLE 3. In-Hospital Treatment

	All Patients (n=279), %	Low-Risk Subset (n=89), %
Aspirin	90.9	96.6
Ticlopidine	41.7	57.3
β-Blockers	28.4	28.4
Abciximab	4.3	1.1
Balloon only	15.1	4.5
Stent	68.8	76.4
Rotablator as 1° treatment	9.3	8.9
Directional coronary atherectomy	17.1	19.1
Ablation followed by stenting	11.2	11.2
Pulmonary artery catheter	16.8	3.9
Temporary pacer	31.6	20.5
Intra-aortic balloon counterpulsation	46.0	26.4
Prophylactic percutaneous cardiopulmonary support	5.9	0

The ULTIMA registry

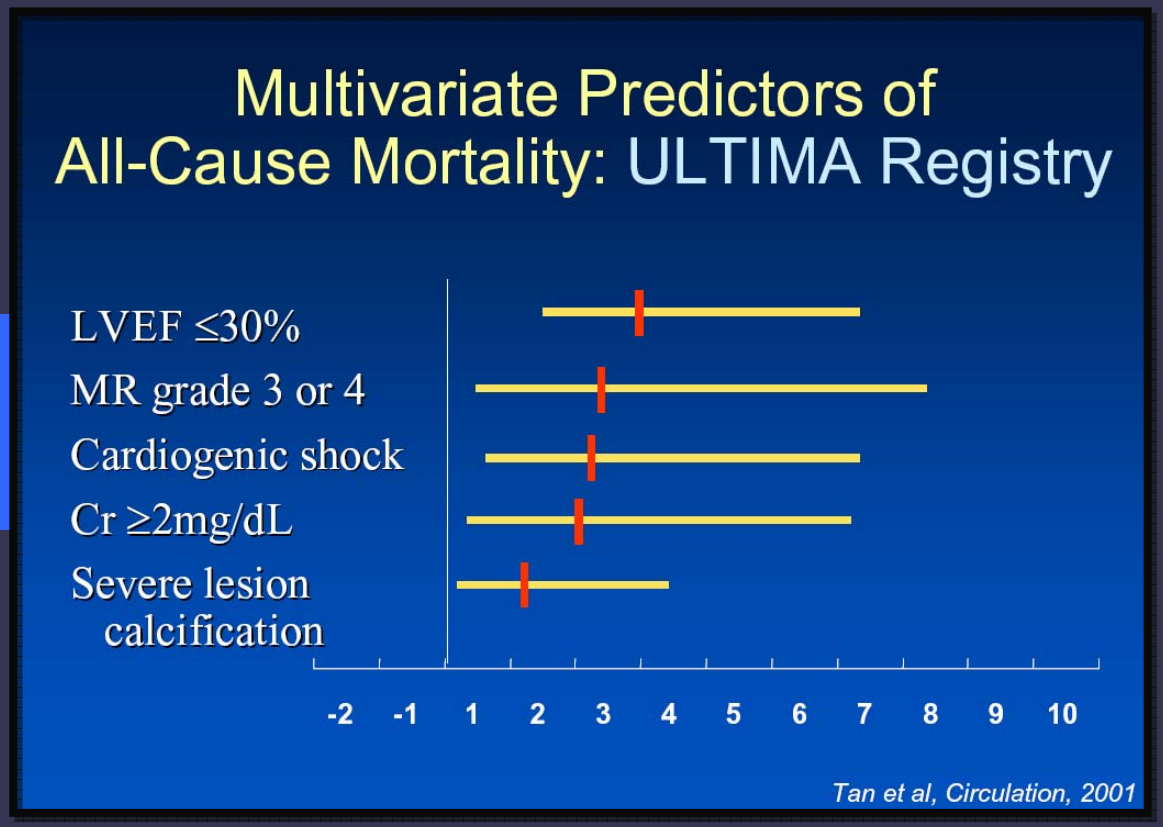
Urgent and elective treatment



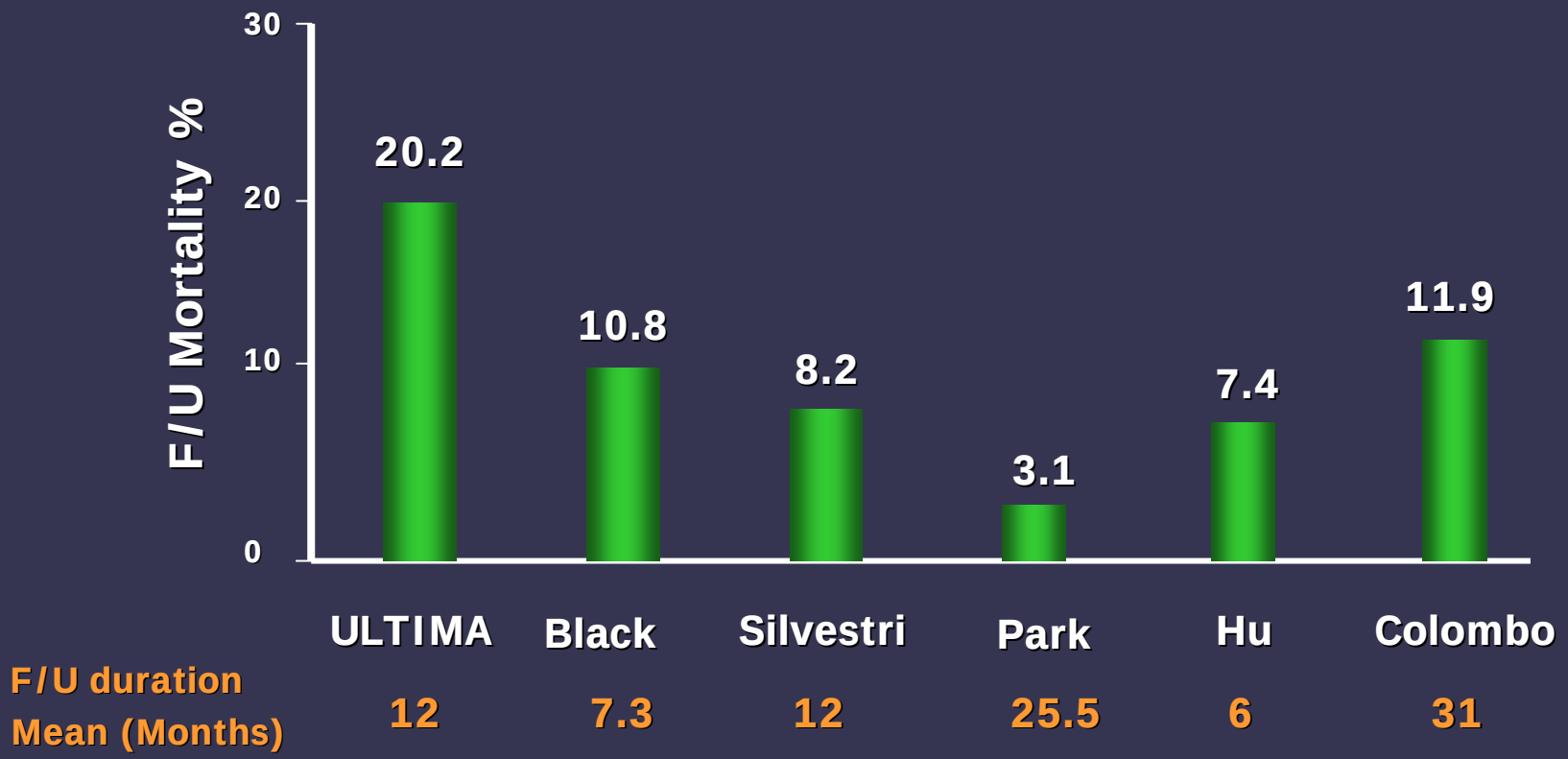
- **RESTENOSIS is equal to DEATH**
- **Angiographic F-UP after LM PCI**

Restenosis = Death ?

- **Excess of events confined To high surgical risk or those with Comorbodities**

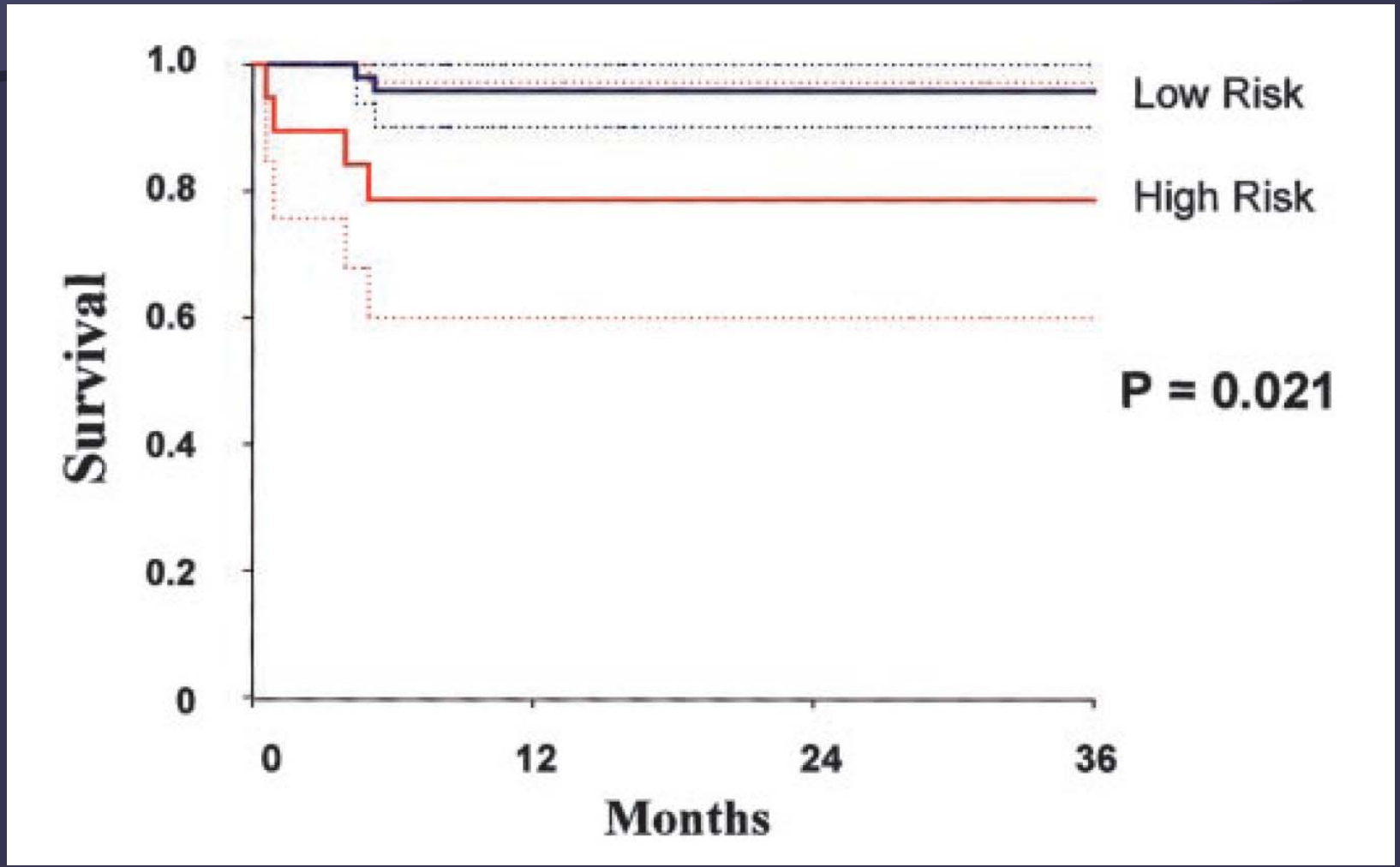


Long-term Mortality Rate at F/UP In PCI series of unprotected LM



Low Mortality for good surgical candidate

In-hospital death (%)

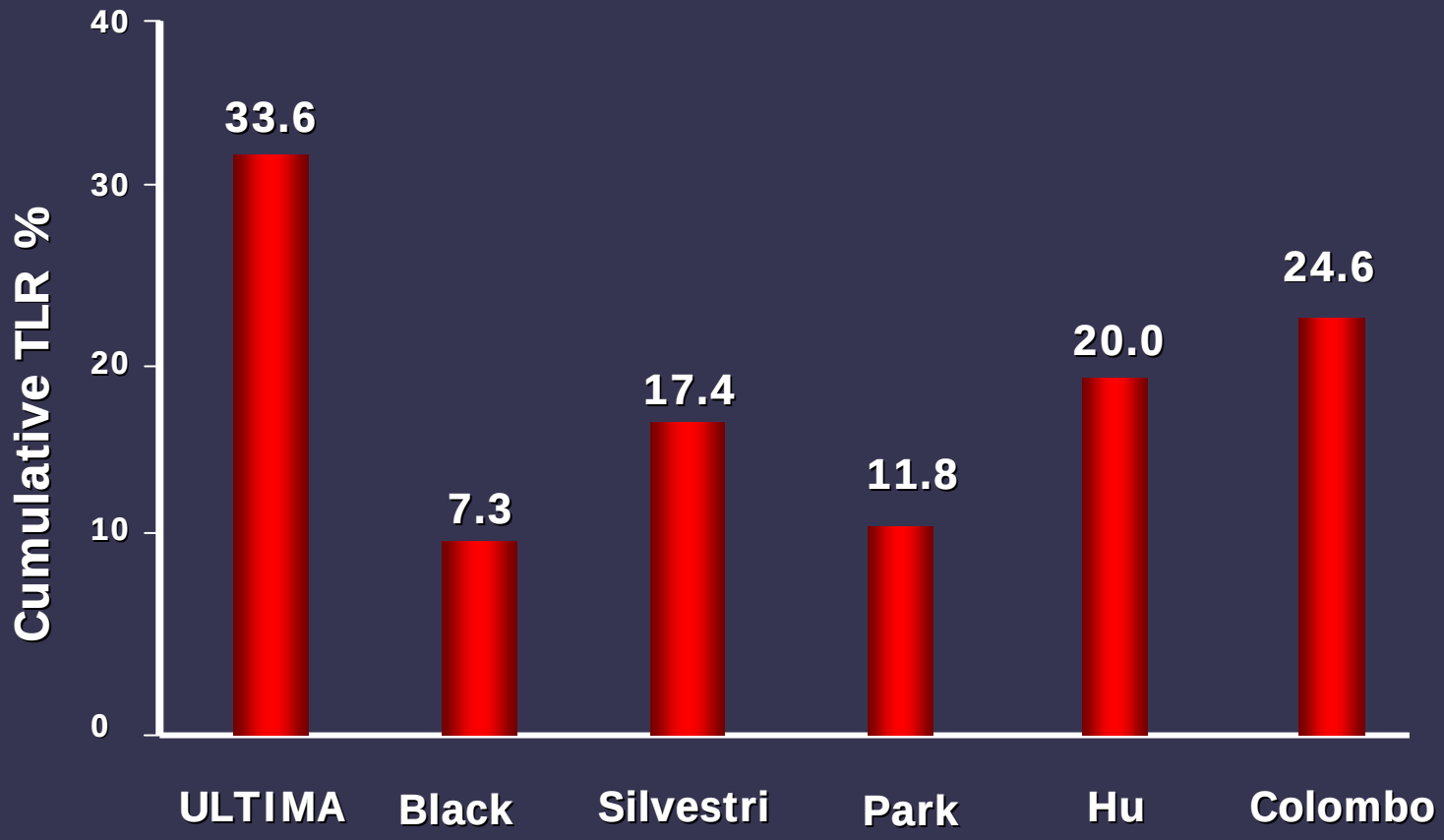


Takagi Circulation 2002

Unprotected LMCA stenting in the BMS era

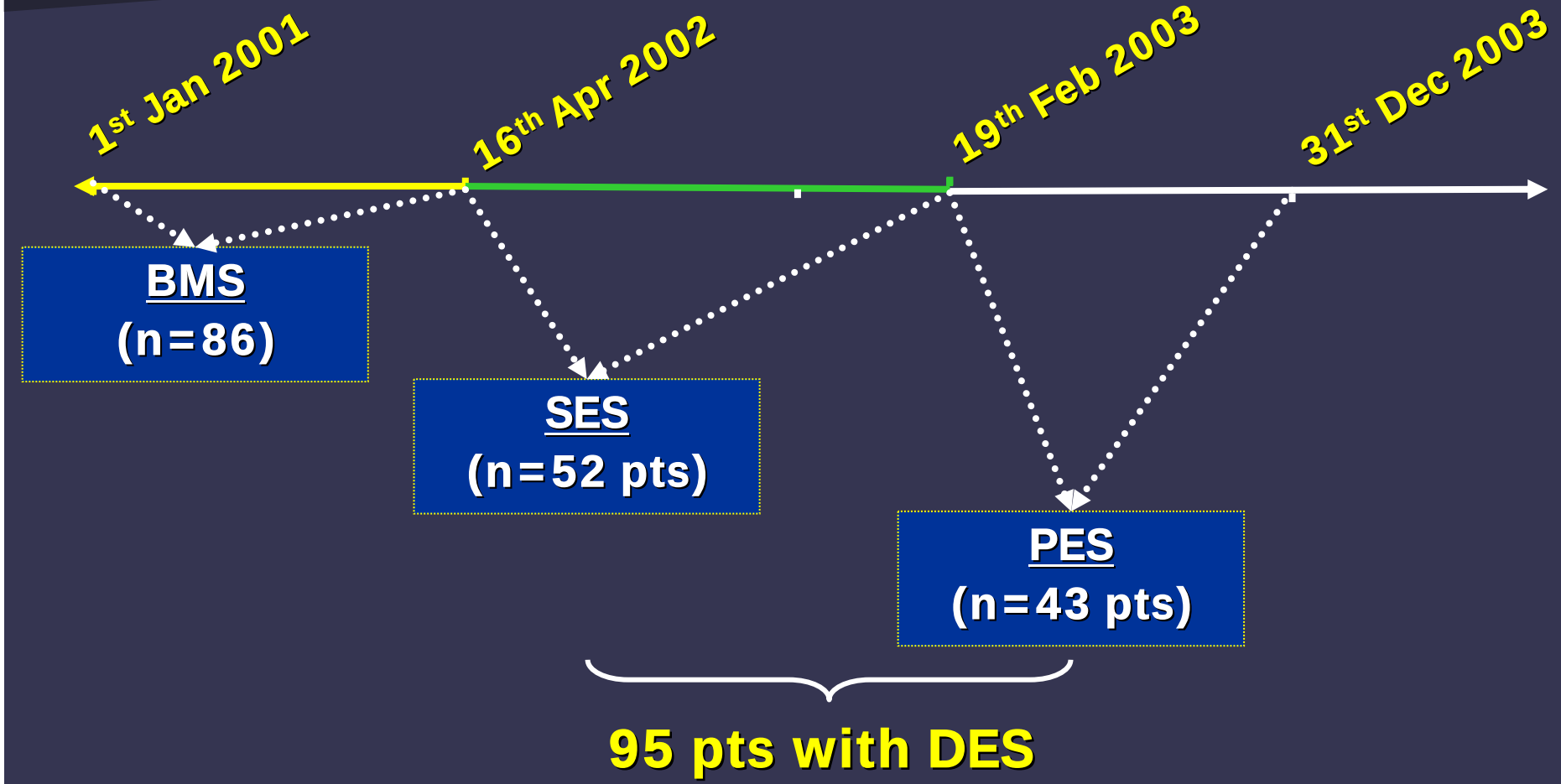
- PCI for unprotected LMCA stenosis is feasible
- Short and long-term mortality is extremely heterogeneous reflecting different patient selection
- Restenosis = death ?
- PCI should be reserved to very high surgical risk patients...i.e. PCI may just be better than medical TX

Six month TLR
In PCI series of unprotected LM



Left Main Coronary Artery

Left Main Substudy Population



Valgimigli et al, Circulation. 2005 Mar 22;111(11):1383-9.

Left Main Coronary Artery

Clinical Presentation (%)

Variables	BMS Group (N=86)	DES Group (N=95)	P-value
Stable Angina	50	48	0.8
Unstable Angina	33	33	1
Acute Myocardial Infarction*	17	20	0.70
Cardiogenic Shock at Entry*	9	12	0.66

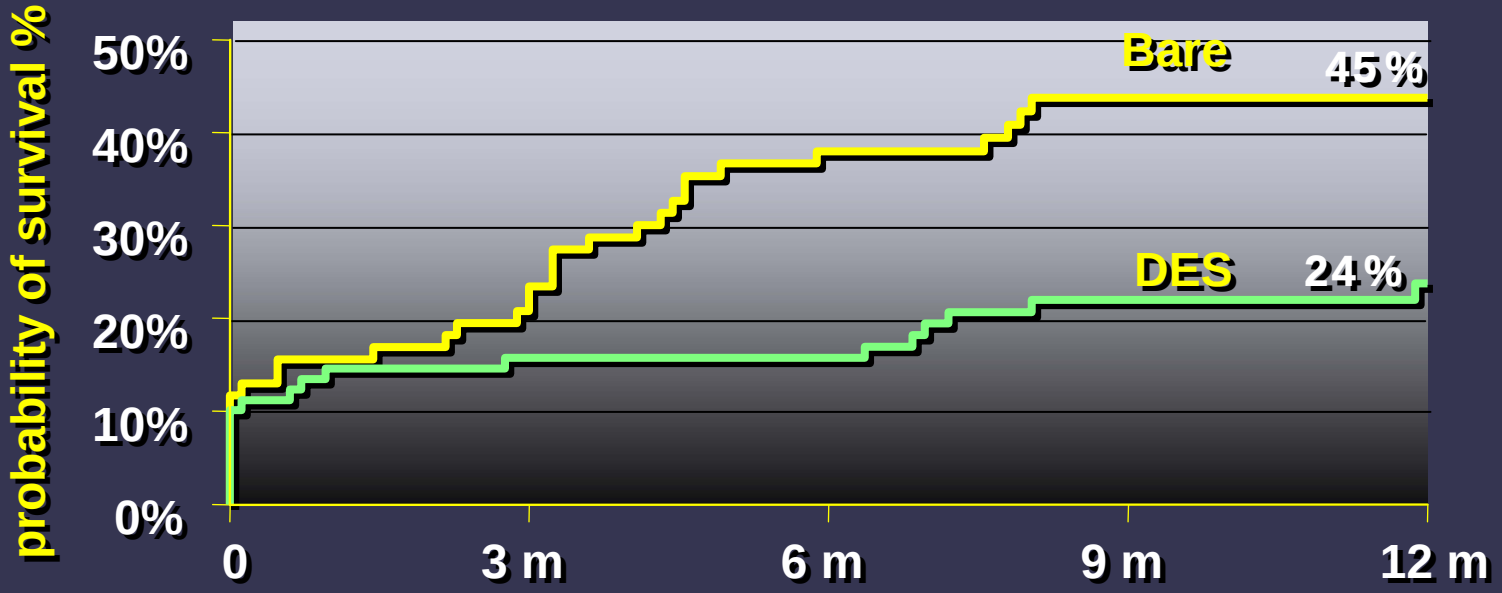
*: Parameters included n the Parsonnet classification

Left Main Coronary Artery

1-year MACE Rate

Whole Population

HR 0.54 [95% CI: 0.31-0.87]; p=0.01)



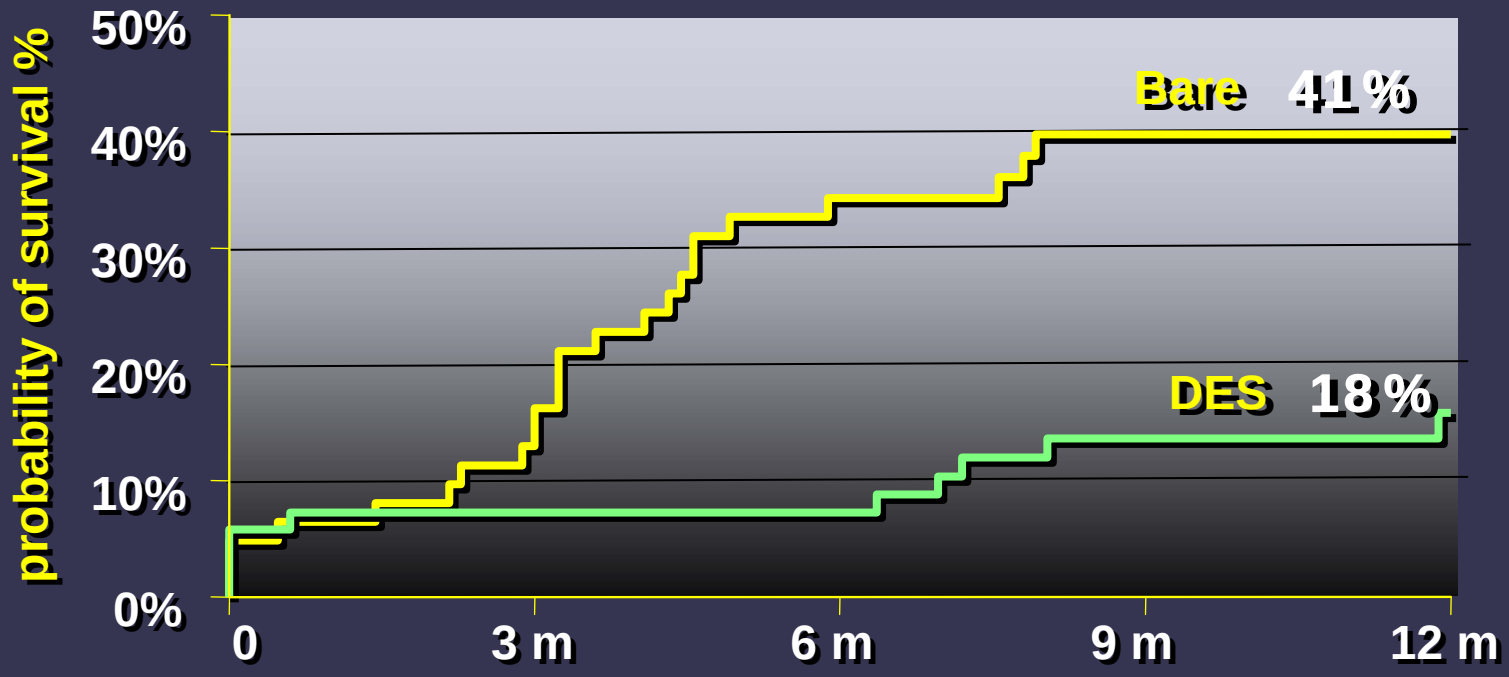
Valgimigli et al, Circulation. 2005 Mar 22;111(11):1383-9.

Left Main Coronary Artery

1-year MACE Rate

Elective Population

HR 0.40 [95% CI: 0.21-0.78]; p=0.007)

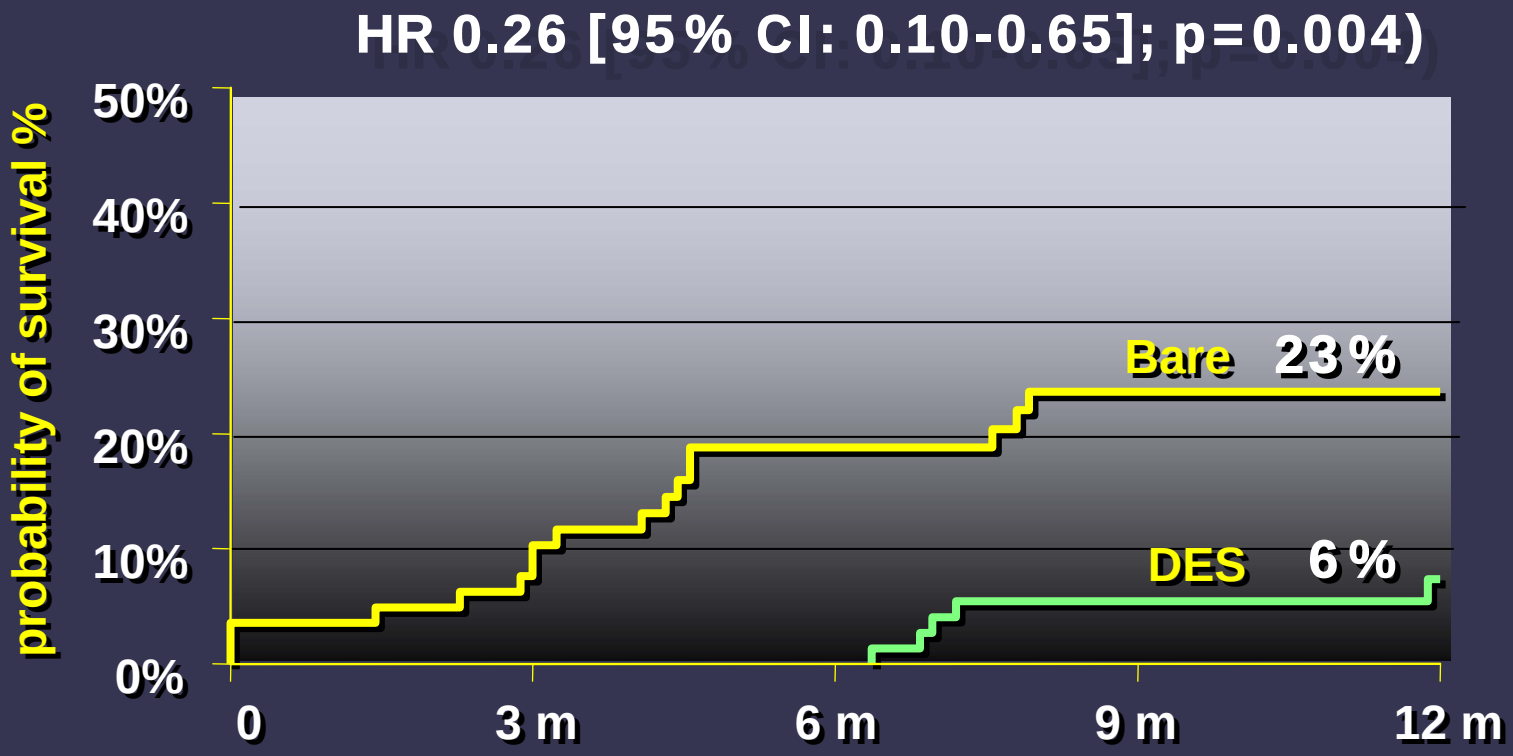


Elective and unprotected (n=104) 38% vs. 15%
(HR 0.37 [95% CI: 0.17-0.84]; p=0.01)

Left Main Coronary Artery

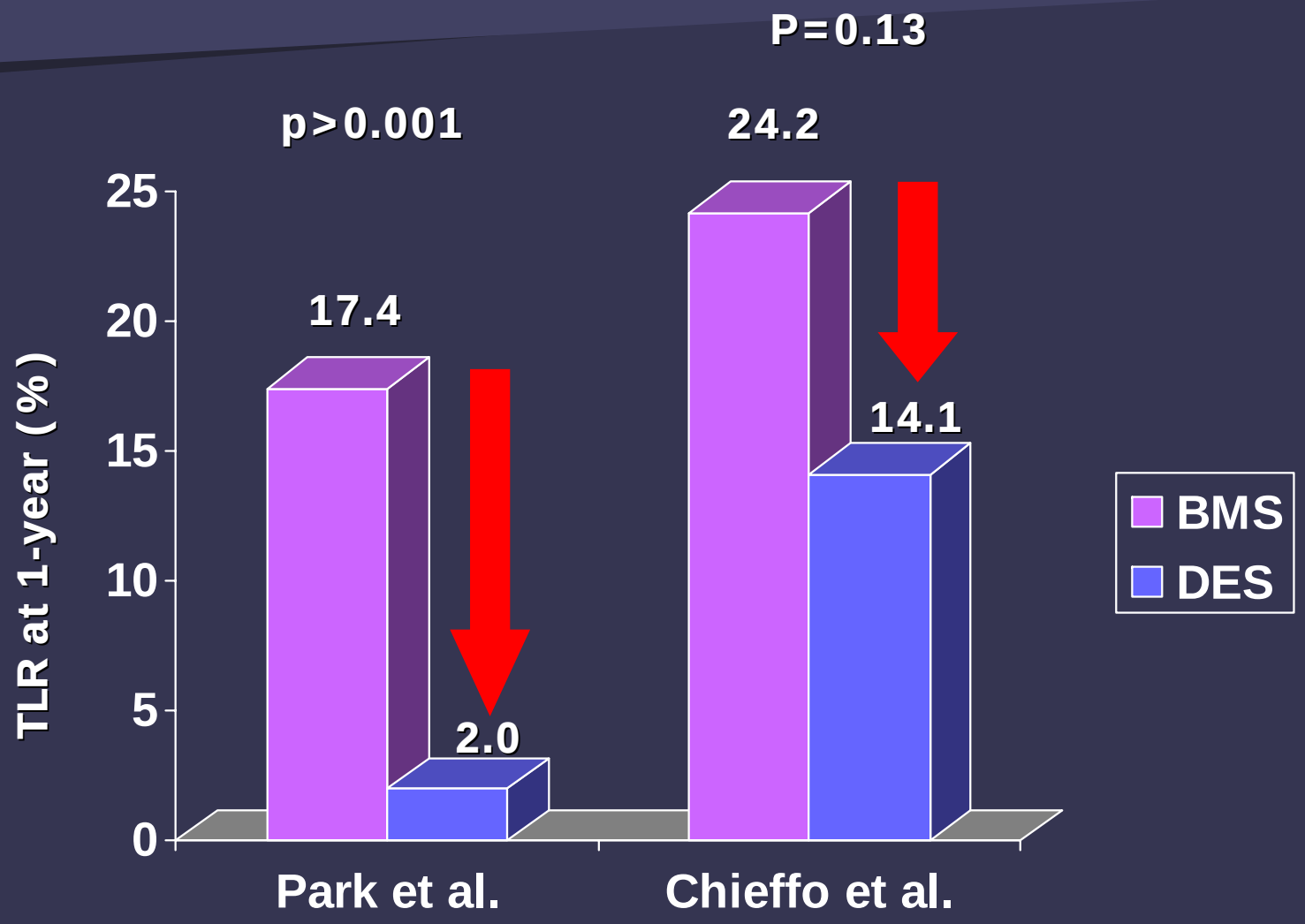
1-year TVR

Whole Population



- Use of DES adjusted HR 0.33 [95% CI: 0.19-0.57]; p=0.00009

Re-Intervention Rates



A COLLABORATIVE SYSTEMATIC REVIEW AND META-ANALYSIS ON 1,203 PATIENTS UNDERGOING PERCUTANEOUS DRUG-ELUTING STENTING FOR UNPROTECTED LMCA DISEASE

- At longest available F-up
  - MACE:16.3% (11.4-21.2),
  - Death:4.9% (2.8-7.0)
  - TVR: 6.5% (3.7-9.4)

66%

- DES versus BMS
  - HR for MACE 0.34 (0.16-0.71, p=0.004)

Biondi Zoccai et al. Am Heart J. 2008 Feb;155(2):274-83

LMCA DES Stenting...and so what?

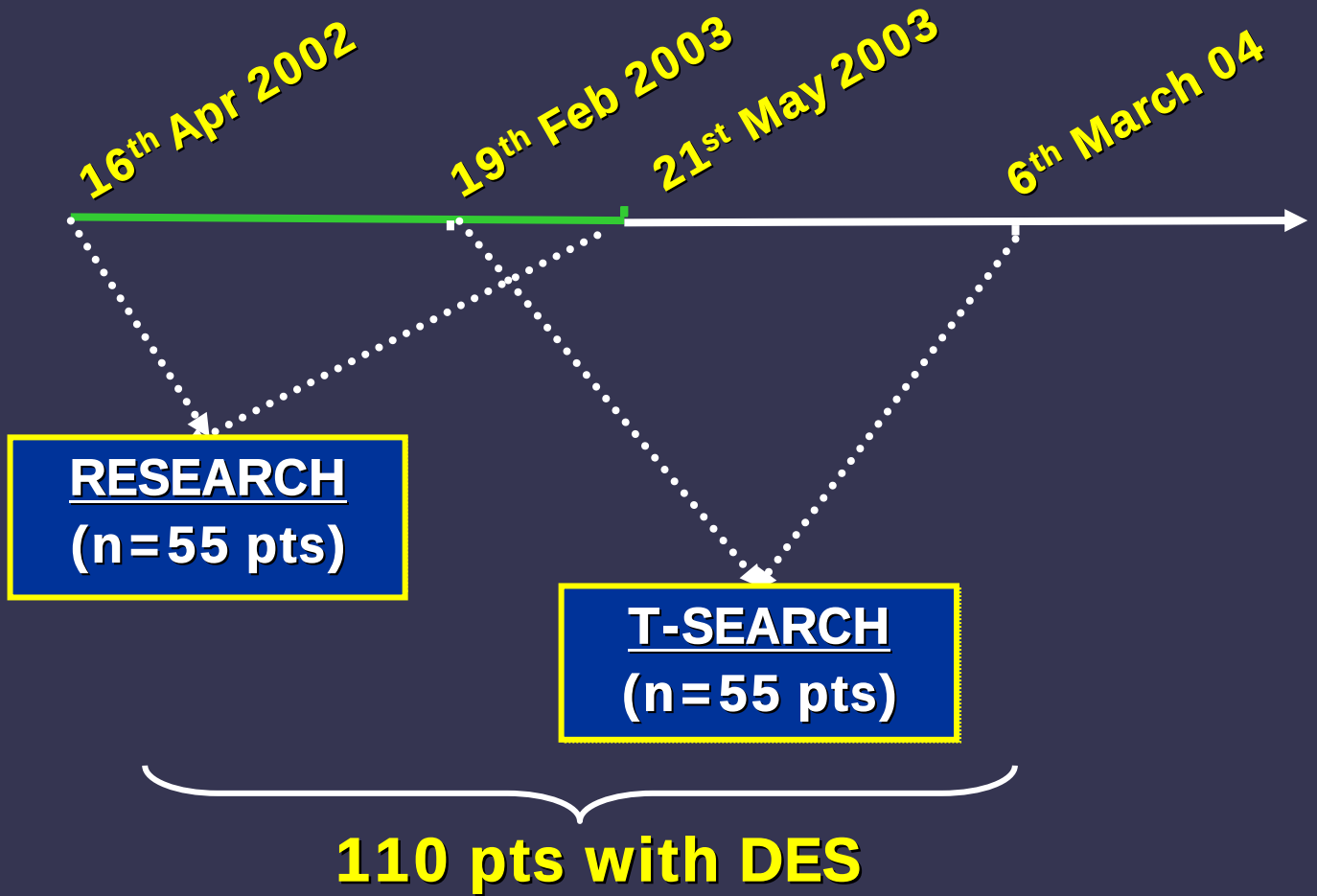
- How to maximaze DES performance?
  - Which DES?
  - IVUS guidance?
  - Single or systematic bifurcation stenting?
- What about Stent thrombosis?
- Should we start to DES LMCA *BEFORE* awaiting for RCT?

LMCA DES Stenting...and so what?

- How to maximaze DES performance?
  - Which DES?
  - IVUS guidance?
  - Single or systematic bifurcation stenting?
- What about Stent thrombosis?
- Should we start to DES LMCA ***BEFORE*** awaiting for RCT?

Left Main Coronary Artery

LMCA stenting at the Thoraxcenter

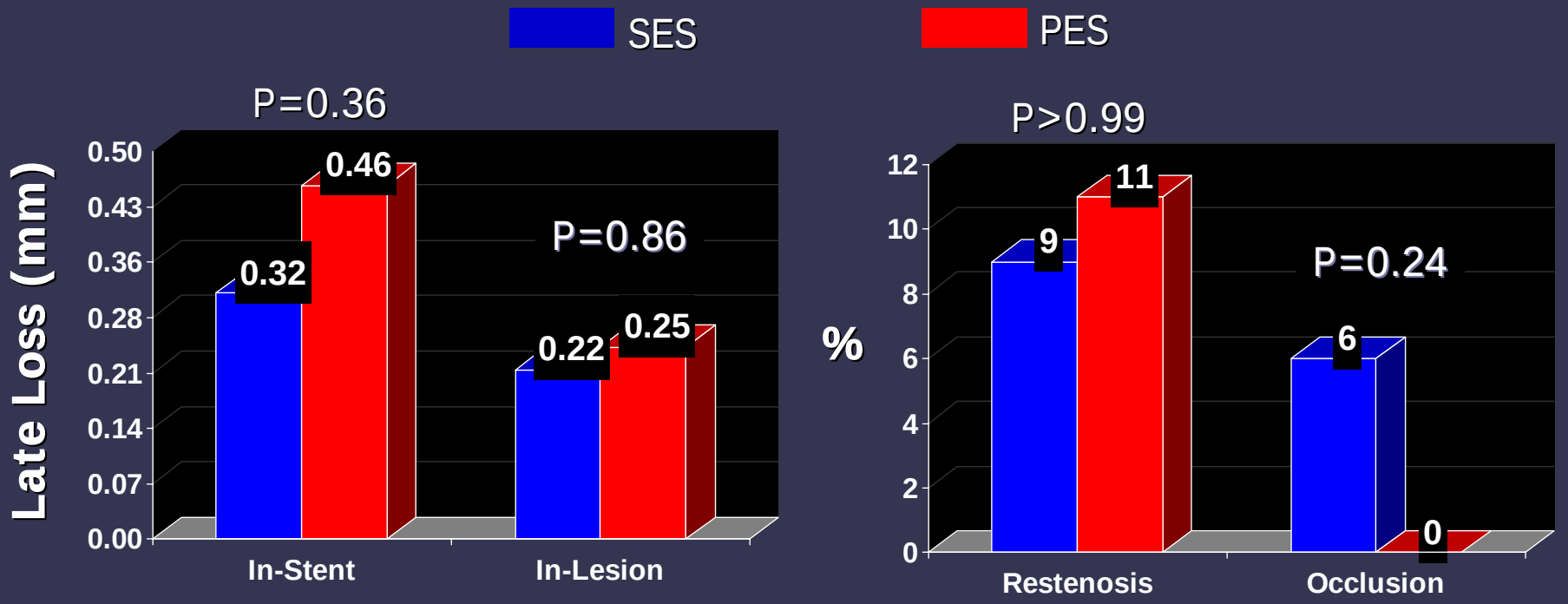


Valgimigli et al. J Am Coll Cardiol. 2006;47:507

Left Main Coronary Artery

SES vs. PES

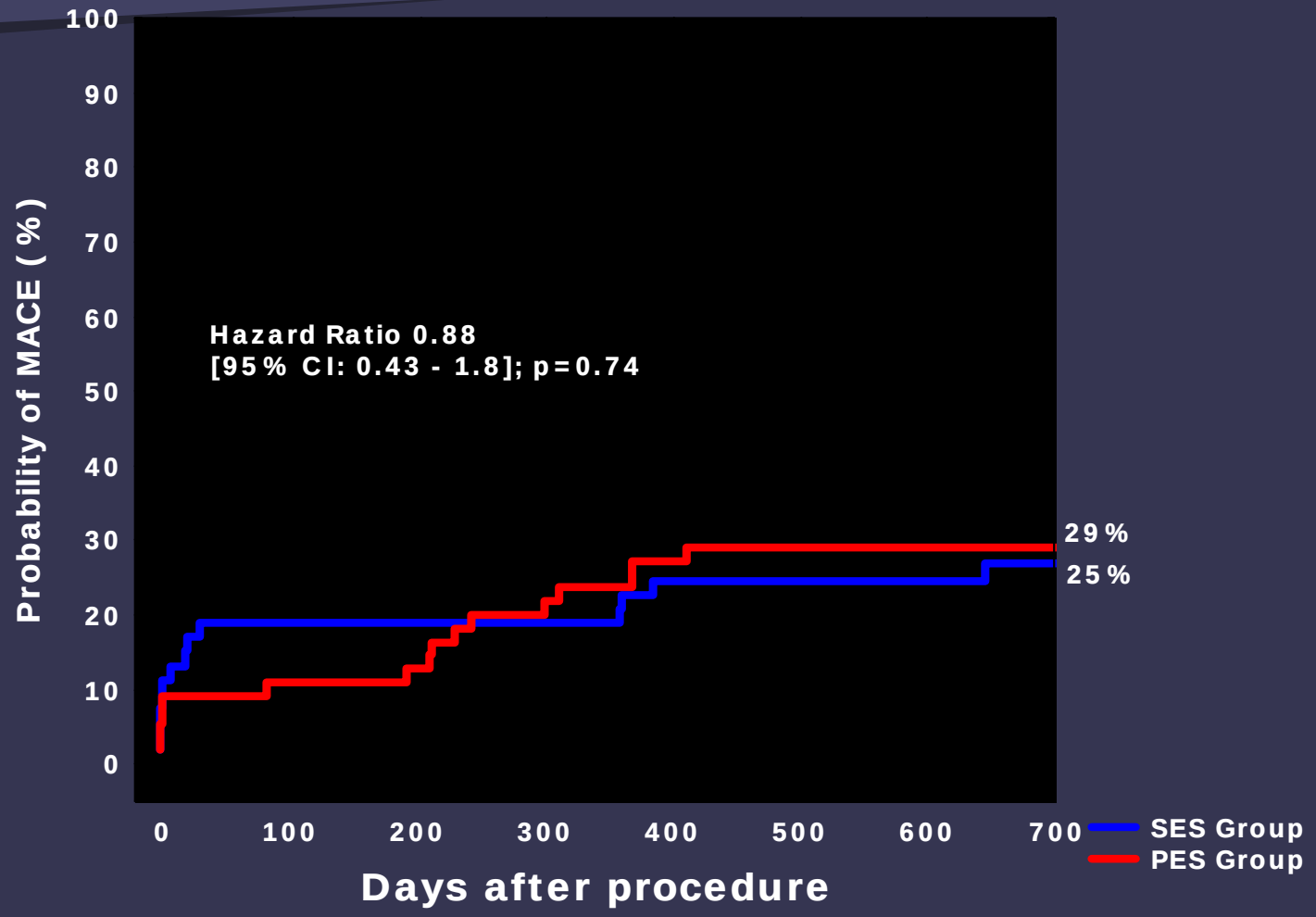
Angiographic outcome



Valgimigli et al. J Am Coll Cardiol. 2006;47:507

Left Main Coronary Artery

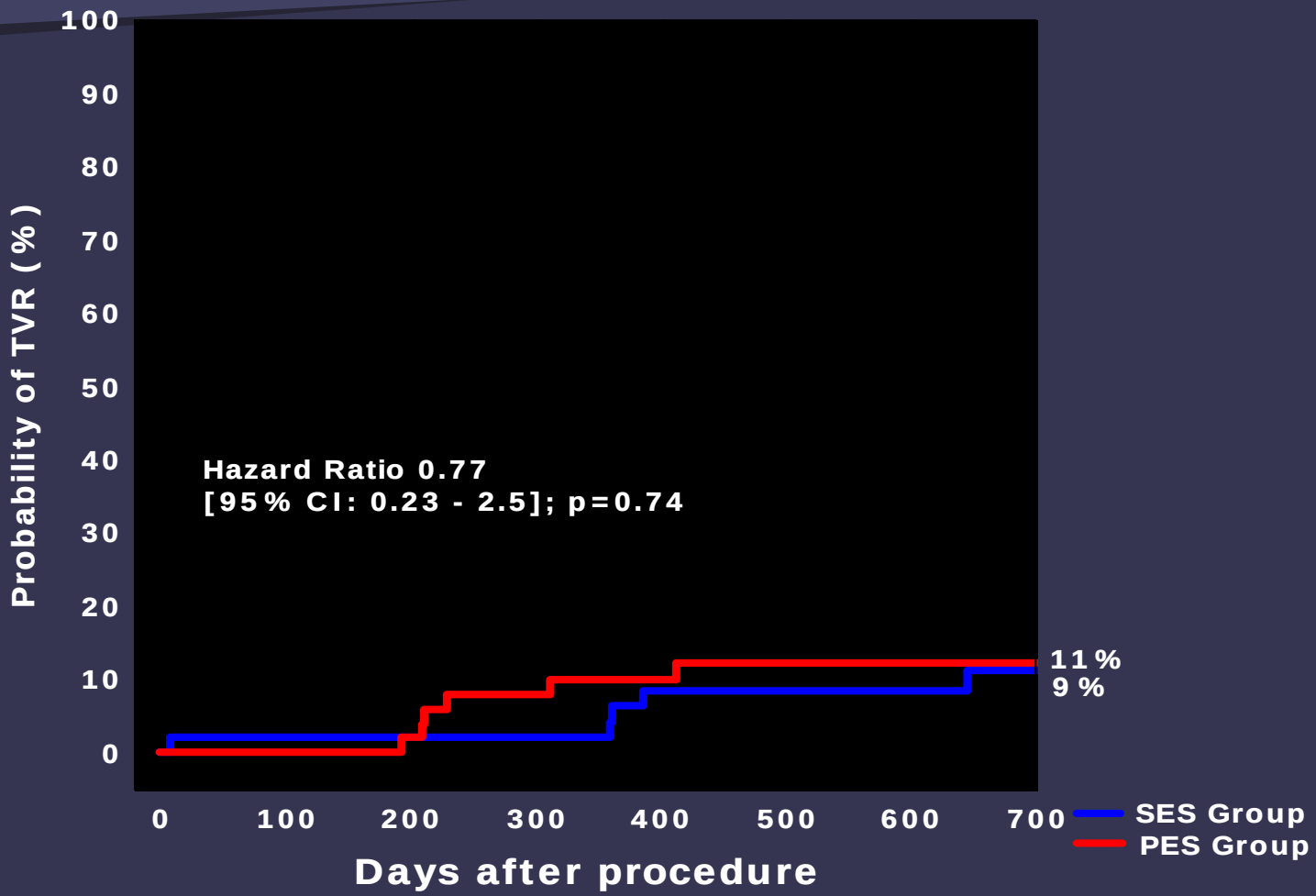
SES vs. PES



J Am Coll Cardiol. 2006;47:507

Left Main Coronary Artery

SES vs. PES

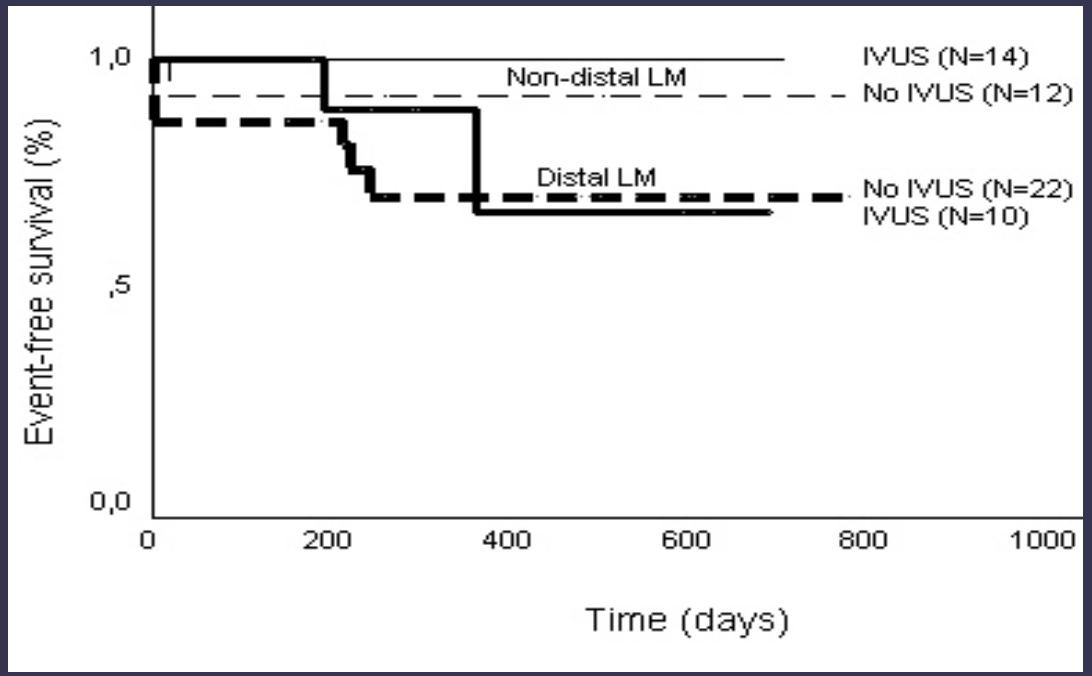


J Am Coll Cardiol. 2006;47:507

Left Main Coronary Artery

Role of IVUS

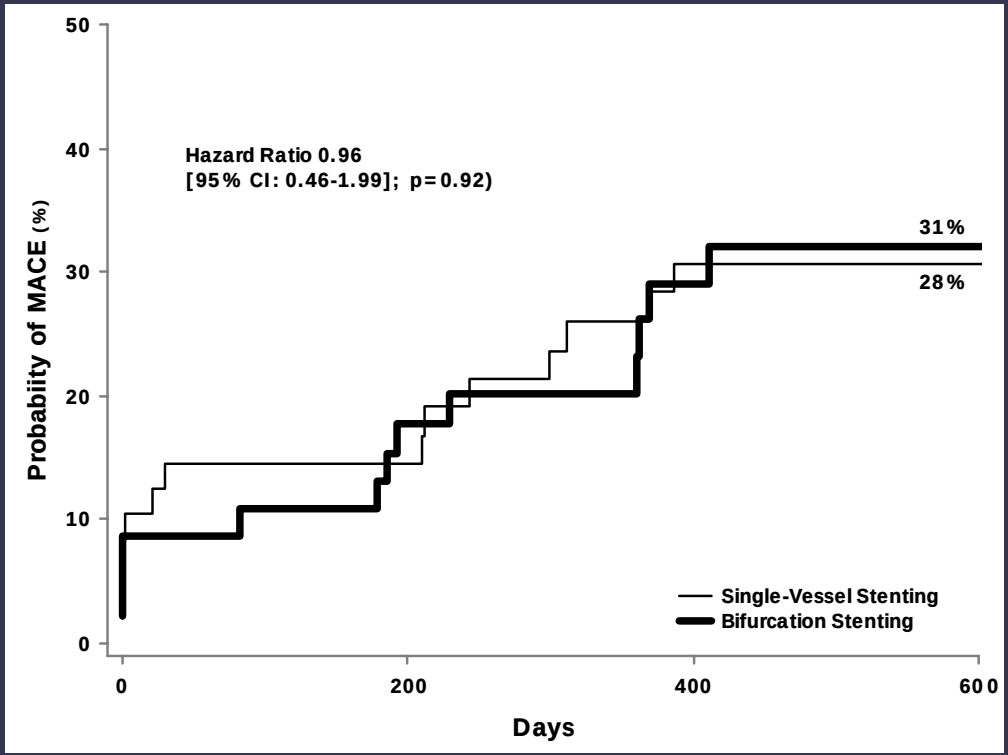
- 58 pts undergoing elective and unprotected intervention at LMCA
- 24 (41%) had Stent deployment under IVUS guidance



Am J Cardiol. 2005 Mar 1;95(5):644-7.

Role of Stenting technique

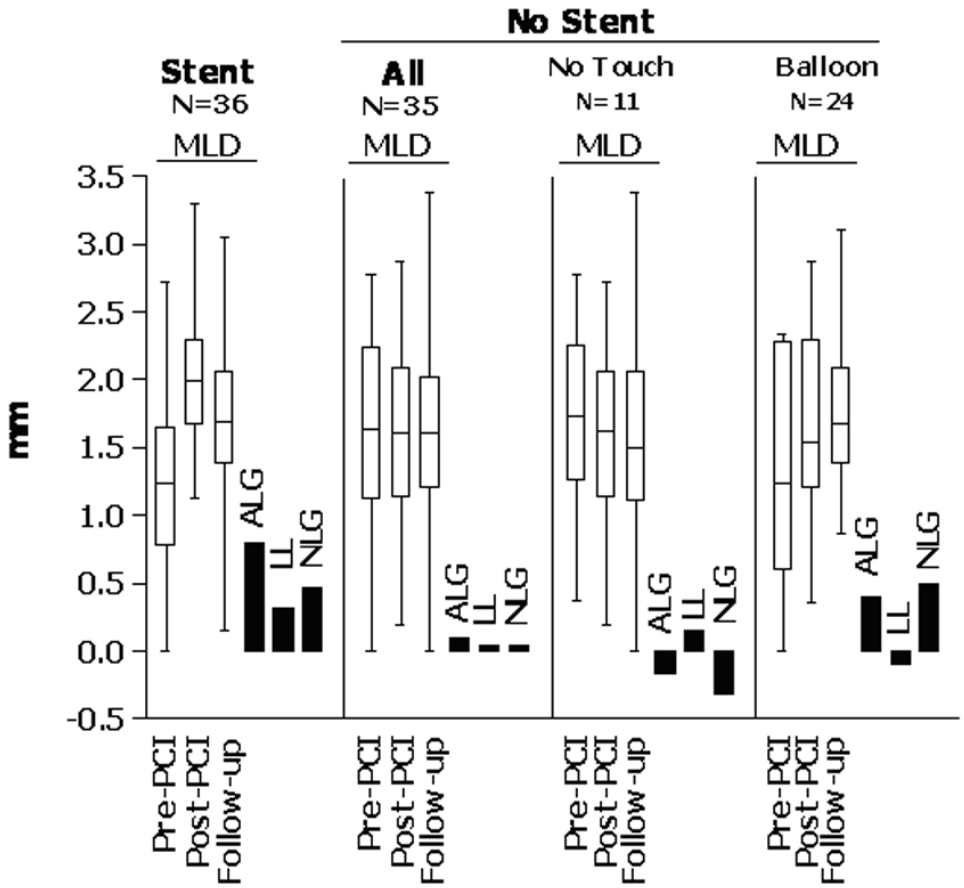
- 94 pts undergoing treatment for distal LMCA stenosis
- 48 (51%) pts received single vessel; 46 pts bifurcation stenting



Valgimigli et al. Am Heart 2006 Nov;152(5):896-902

Left Main Coronary Artery

Role of Stenting technique



Valgimigli et al. Am Heart 2006 Nov;152(5):896-902

LMCA DES Stenting...and so what?

- How to maximaze DES performance?
  - Which DES? **SES or PES**
  - IVUS guidance? **No data to recommend systematic IVUS**
  - Single or systematic bifurcation stenting?

    The easiest the better
- What about Stent thrombosis?
- Should we start to DES LMCA ***BEFORE*** awaiting for RCT?

LMCA DES Stenting...and so what?

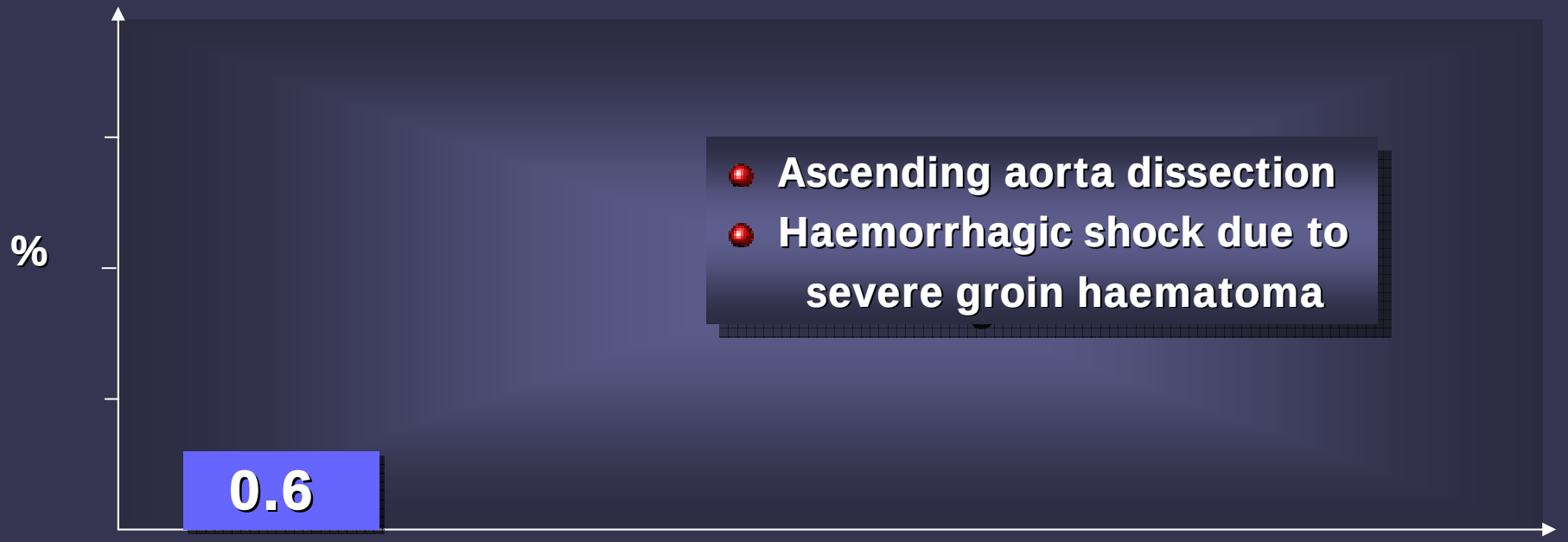
- How to maximaze DES performance?
  - Which DES?
  - IVUS guidance?
  - Single or systematic bifurcation stenting?
- What about Stent thrombosis?
- Should we start to DES LMCA ***BEFORE*** awaiting for RCT?

A pooled analysis on 340 patients treated at three European referral centers (Milan_Massy_Rotterdam)

Valgimigli et al, Eurointerv 07; 2: 435-443

A pooled analysis on 340 patients treated at three European referral centers (Milan_Massy_Rotterdam)

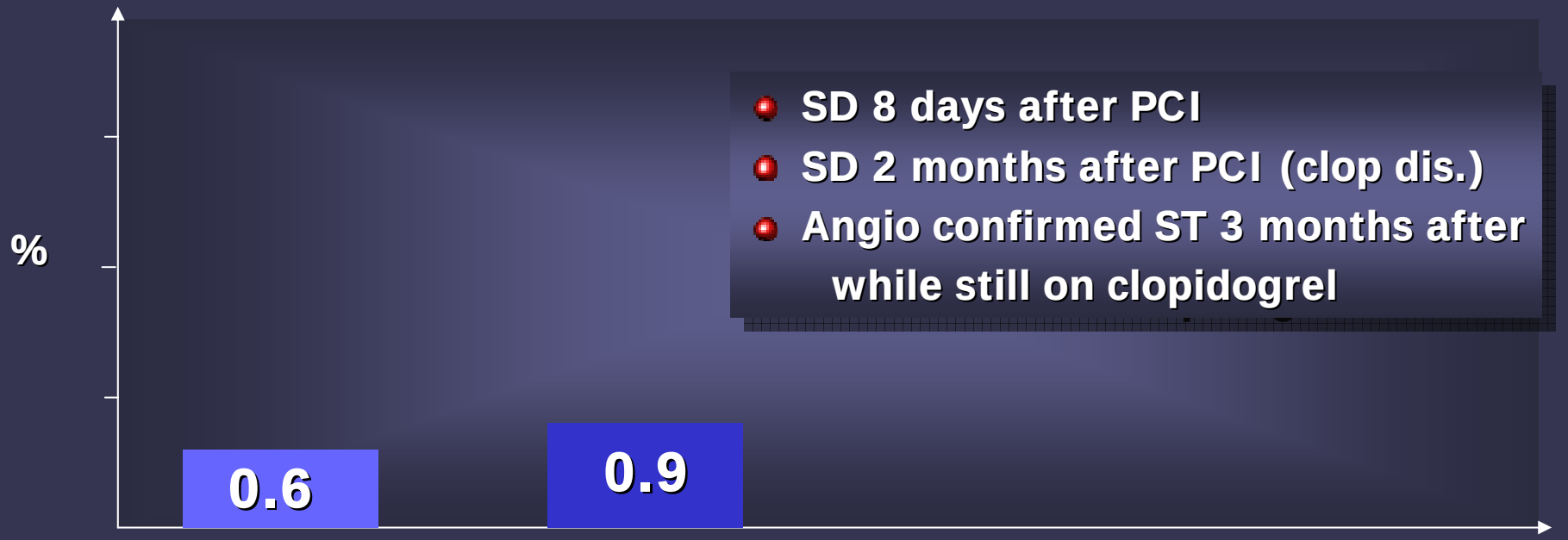
In-hospital mortality



Valgimigli et al, Eurointerv 07; 2: 435-443

A pooled analysis on 340 patients treated at three European referral centers (Milan_Massy_Rotterdam)

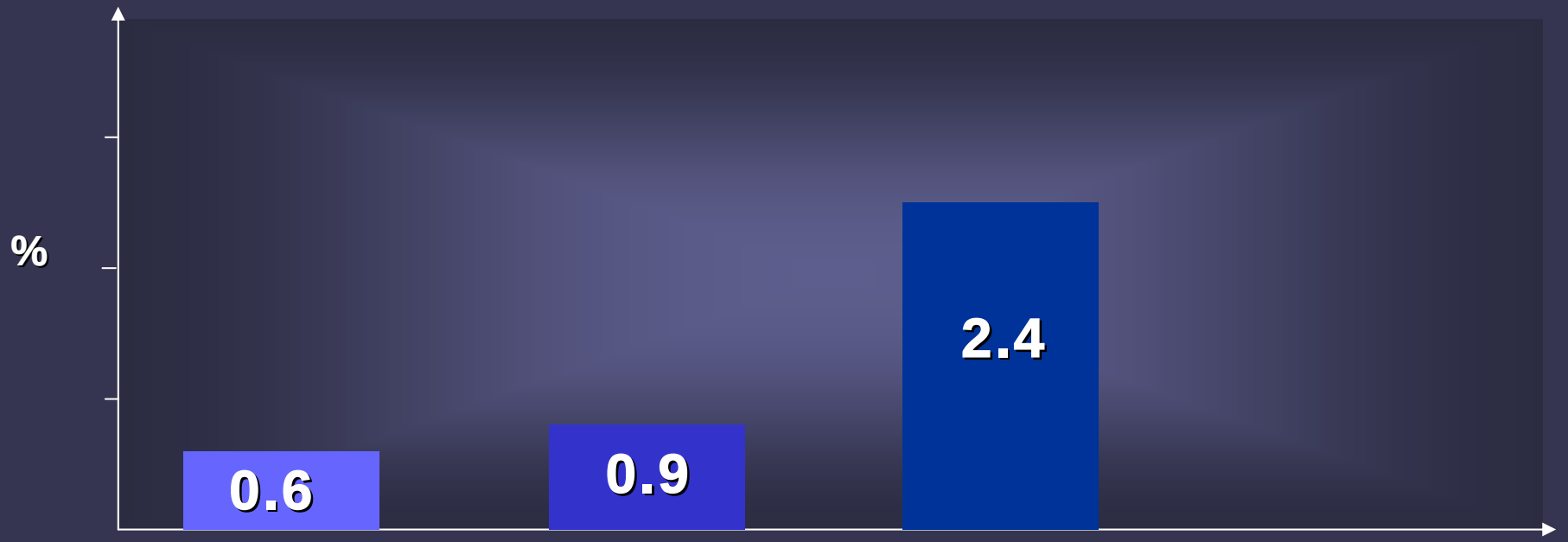
Stent thrombosis (ARC)



Valgimigli et al, Eurointerv 07; 2: 435-443

A pooled analysis on 340 patients treated at three European referral centers (Milan_Massy_Rotterdam)

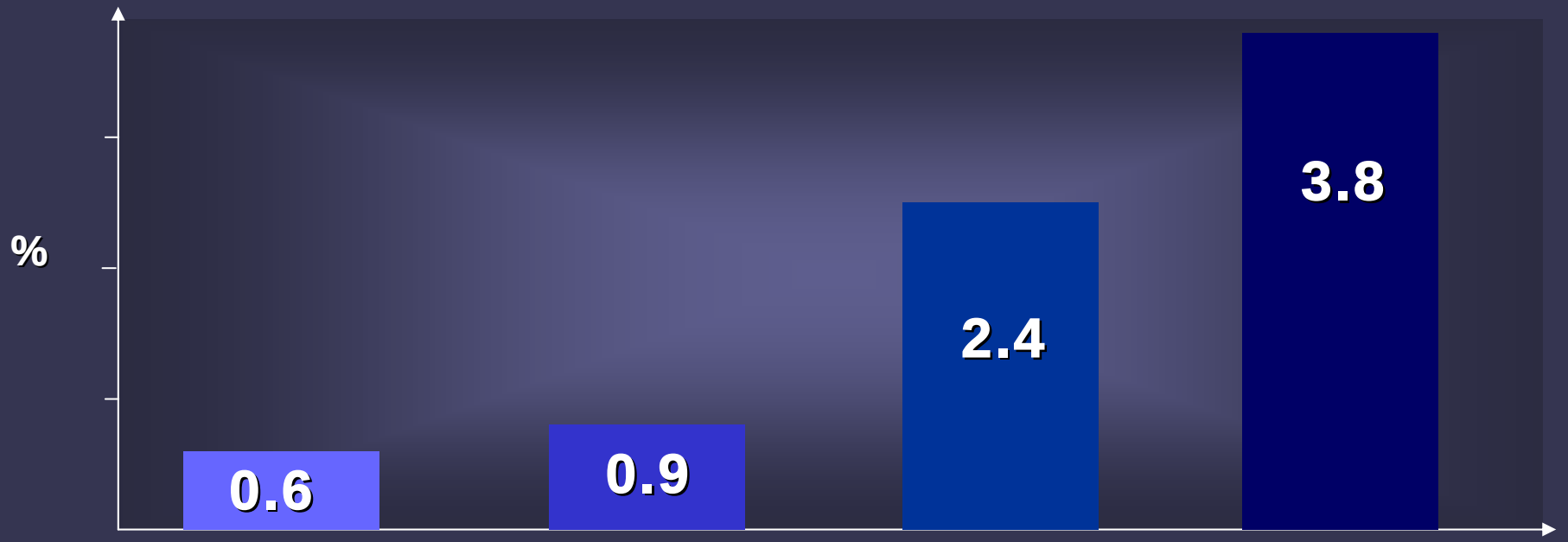
out of hospital cardiac death-MI at 1-year



Valgimigli et al, Eurointerv 07; 2: 435-443

A pooled analysis on 340 patients treated at three European referral centers (Milan_Massy_Rotterdam)

Overall mortality rate at 1-year



Valgimigli et al, Eurointerv 07; 2: 435-443

LMCA DES Stenting...and so what?

- How to maximaze DES performance?
  - Which DES?
  - IVUS guidance?
  - Single or systematic bifurcation stenting?

- What about Stent thrombosis?

Reassuring data...at 1-year!!

- Should we start to DES LMCA ***BEFORE*** awaiting for RCT?

LMCA DES Stenting...and so what?

- How to maximaze DES performance?
  - Which DES?
  - IVUS guidance?
  - Single or systematic bifurcation stenting?
- What about Stent thrombosis?
- Should we start to DES LMCA *BEFORE* awaiting for RCT?

CABG is the

Because it reduces l[illegible]term mortality compared to me[illegible]herapy

Gold Standard

100% Guaranteed Customer Satisfaction