

CABG versus PCI

Left Main or Multivessel CAD

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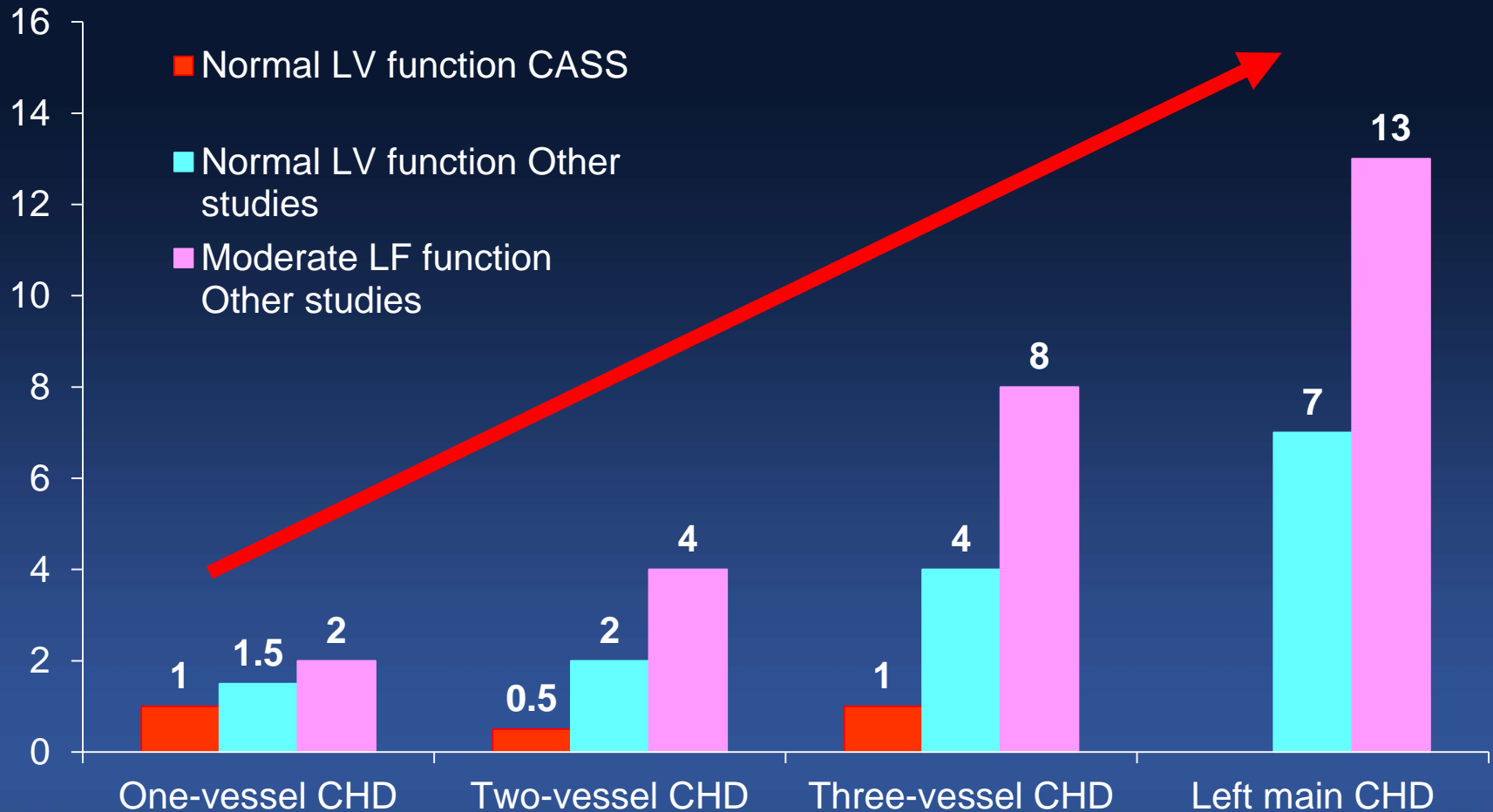
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Presentation

- **Brief History**
- **CABG vs PCI: LMD**
- **CABG vs PCI: MVD**
- **On My Watch ...**

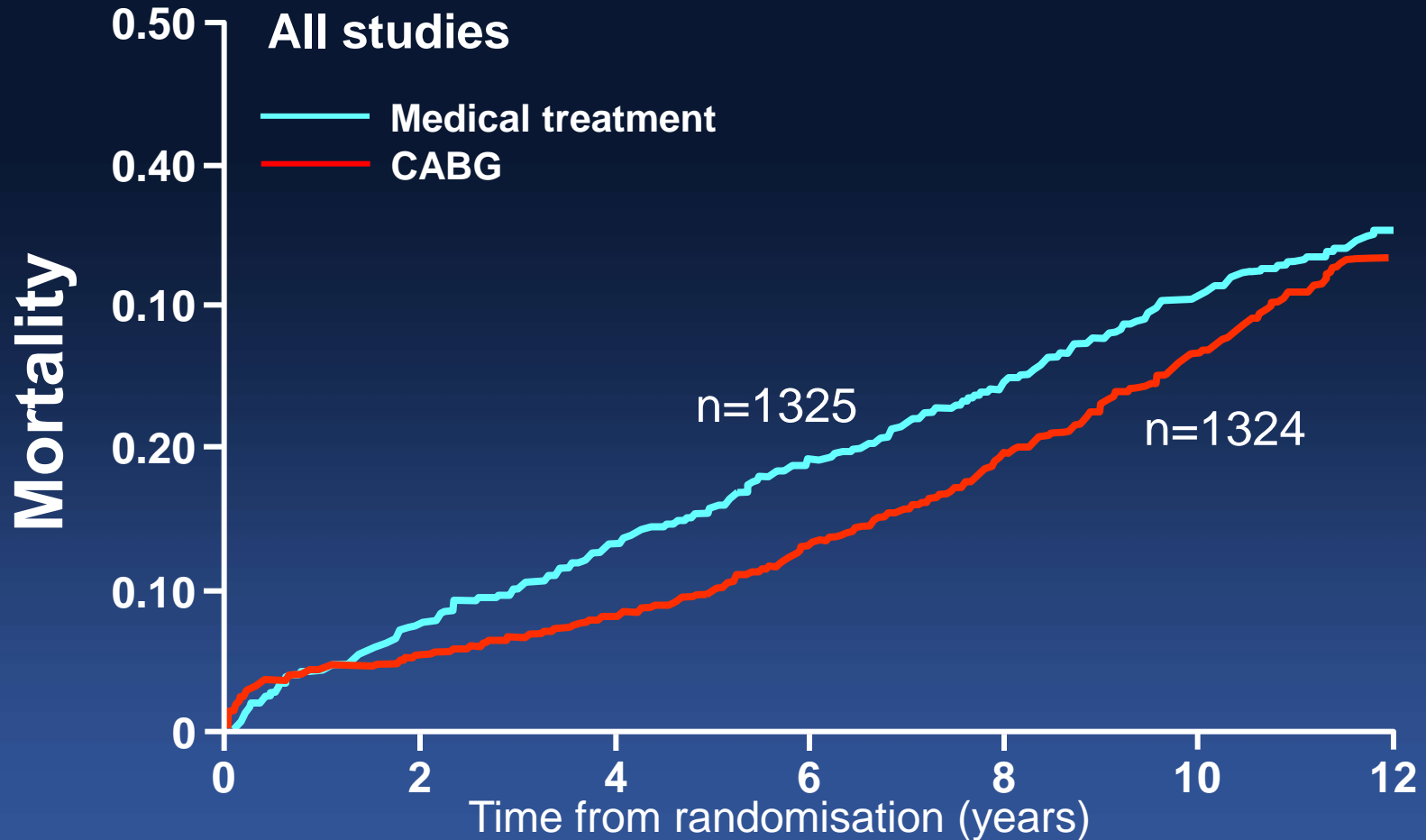
Extent & Severity of CAD and LV function

Annual mortality (%)



CABG vs. Medication

10-Year Results from 7 RCTs



A strategy of initial CABG is associated with lower mortality than medical management with delayed surgery, especially in high-risk & medium-risk patients with stable CAD

Survival Benefit of CABG over Medication

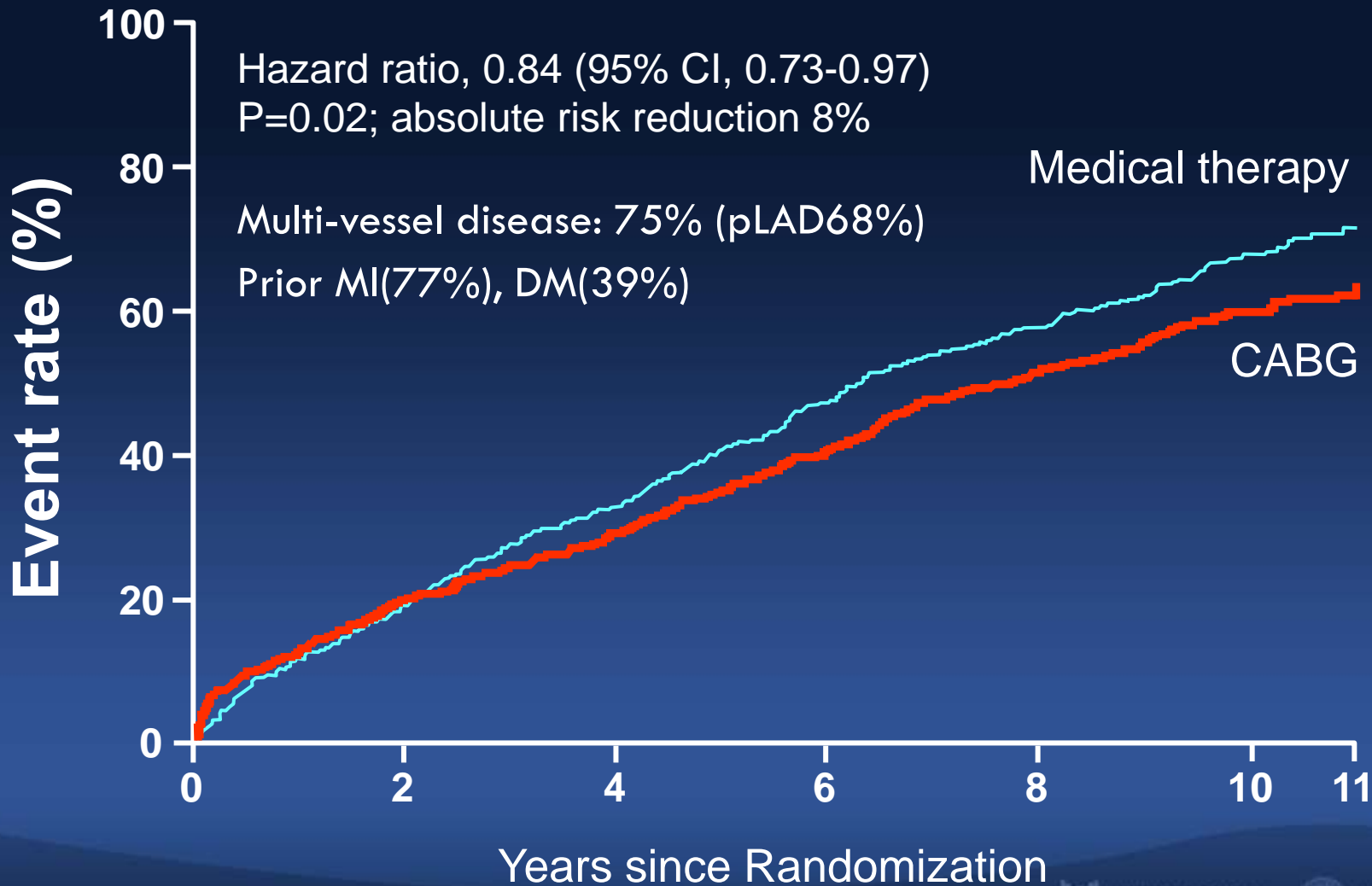
Subgroup Analysis in Stable CAD

1. Left Main CAD
2. Multivessel CAD
with LV dysfunction (**LVEF<50%**)

They were class I indication for CABG!

STICH Trial

LVEF <35% and graftable CAD, N=1212



Hazard ratio, 0.84 (95% CI, 0.73-0.97)

P=0.02; absolute risk reduction 8%

Multi-vessel disease: 75% (pLAD68%)

Prior MI(77%), DM(39%)

Medical therapy

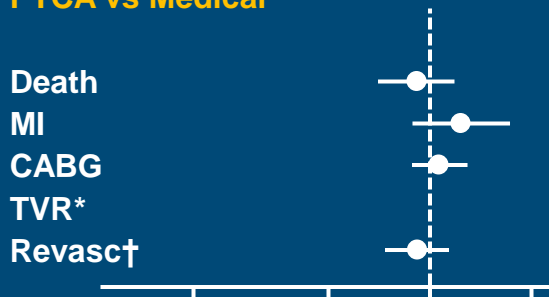
CABG

Years since Randomization

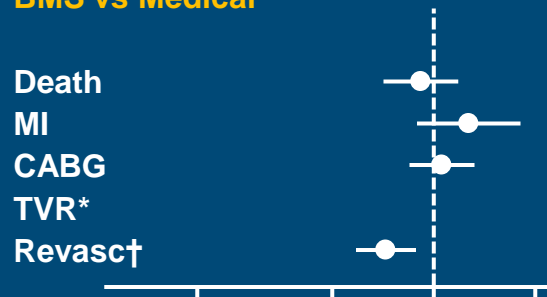
PCI vs. Medications

61 RCT (25,388 patients)

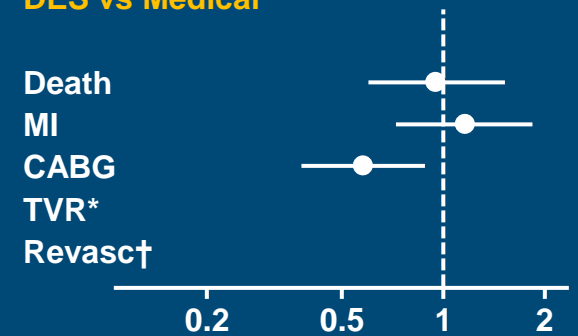
PTCA vs Medical



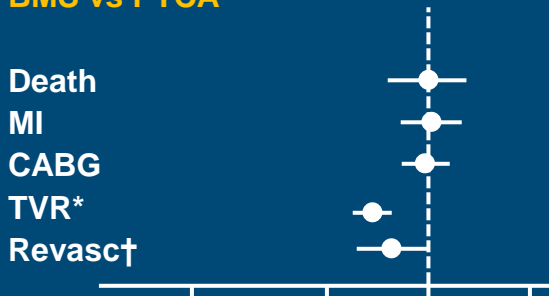
BMS vs Medical



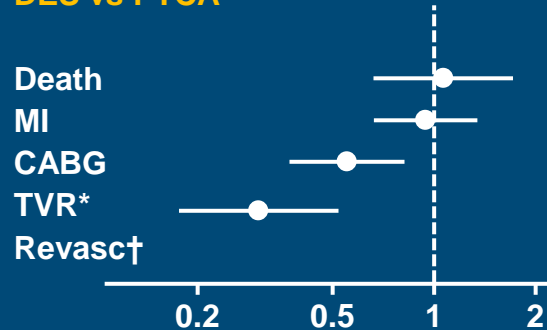
DES vs Medical



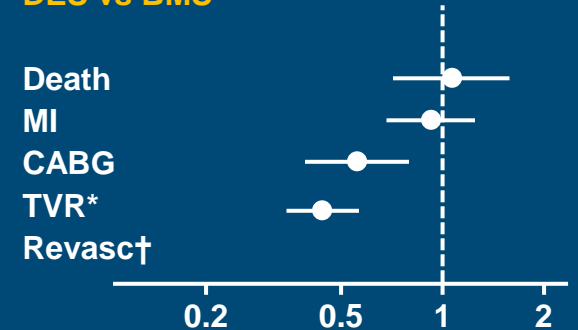
BMS vs PTCA



DES vs PTCA



DES vs BMS



Sequential innovations in the catheter-based treatment of non-acute CAD yielded improvement in reducing restenosis but showed no evidence of an effect on death/MI

Summary

Why CABG/PCI in Stable CAD?

	CABG	PCI
Symptoms (ischemia)	Yes	Yes
Prognosis (death)	No, except 1. Significant LM disease 2. MVD with LV dysfunction	No, except 1. Significant LM disease

CABG/PCI vs. medical therapy: not competitive but complementary.
LM: left main disease; MVD, multi-vessel disease.

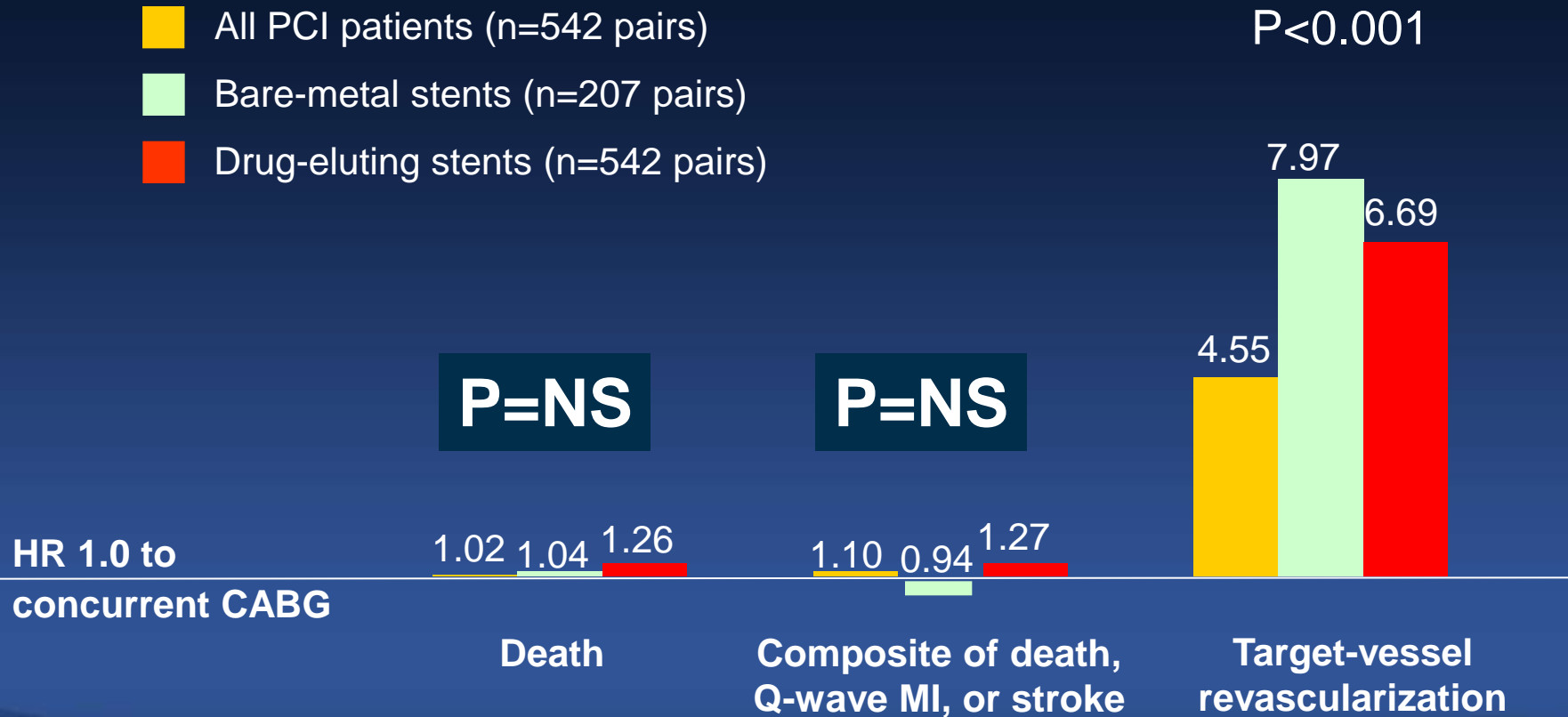
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MAIN COMPARE, 5 Years

Death /MI /Stroke

- All PCI patients (n=542 pairs)
- Bare-metal stents (n=207 pairs)
- Drug-eluting stents (n=542 pairs)

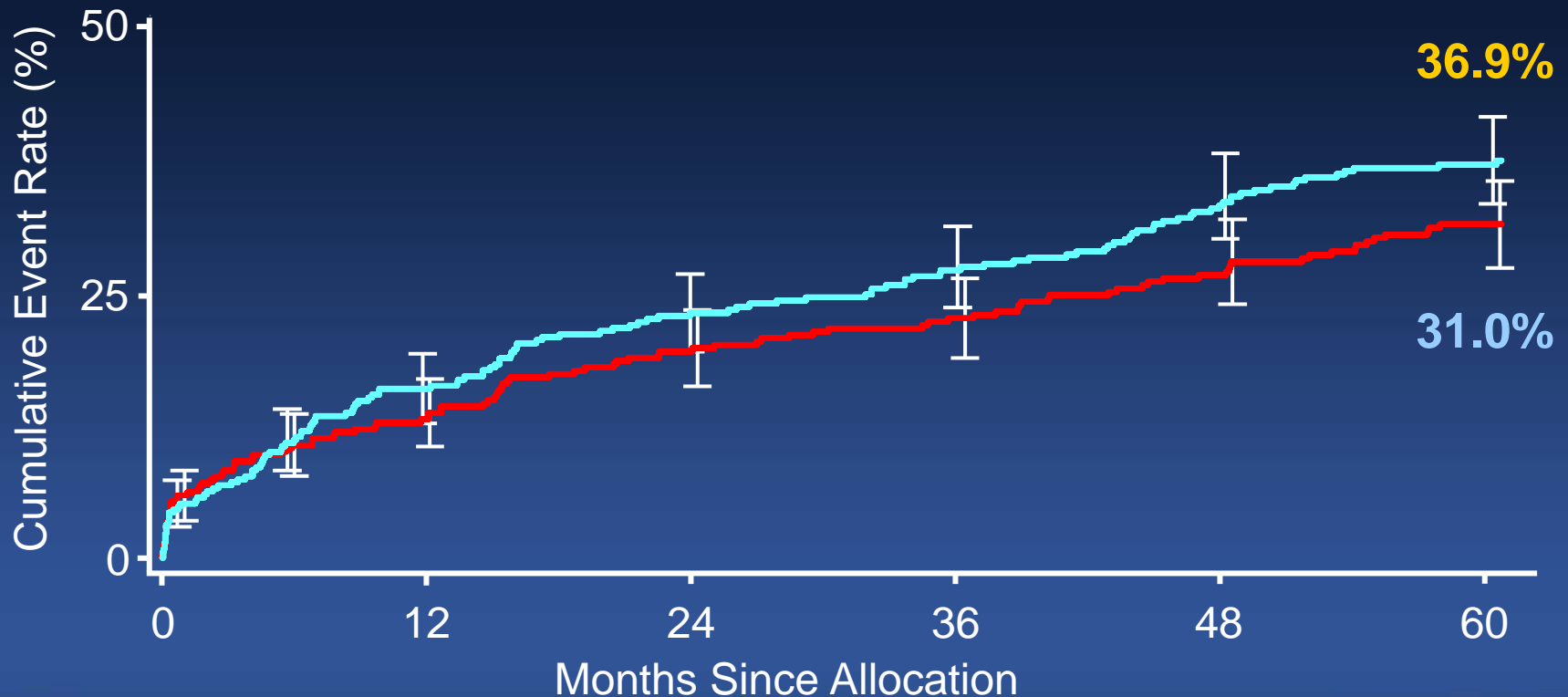


SYNTAX (LM Subset), 5 Years

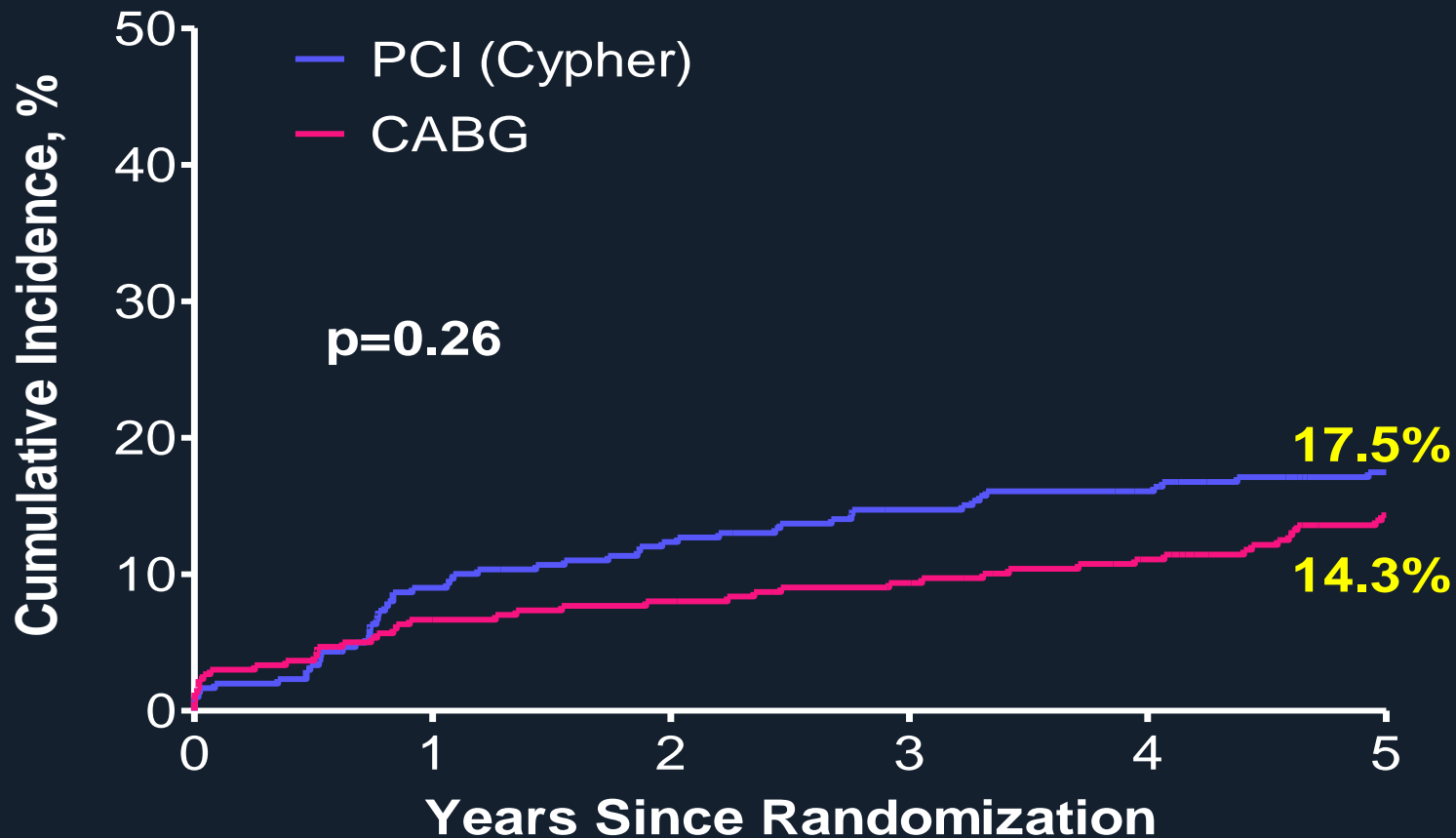
Death /MI /Stroke /Repeat Revascularization

— CABG (N=3.48) — TAXUS (N=357)

$P=0.12$



PRECOMBAT, 5 Years Death, MI, Stroke or iTVR



Patient at risk

PCI	300	272	261	252	246	231
CABG	300	279	274	267	256	235

Summary

CABG vs. DES for LM Disease

1. A similar rate of death/MI/stroke
2. A small increase of stroke after CABG
3. A higher rate of TVR after PCI

ESC Guidelines 2014

Elective PCI for LM Disease

	CABG		PCI	
Recommendation according to extent of CAD	Class	Level	Class	Level
LM disease a SYNTAX score ≤ 22	I	B	I	B
LM disease a SYNTAX score 23 -32	I	B	IIa	B
LM disease a SYNTAX score > 32	I	B	III	B

ACC/AHA Guideline 2011

Elective PCI for LM Disease

Low risk PCI, *SYNTAX* score ≤ 22
or Ostial / shaft LM

IIaB

Intermediate-risk PCI, *SYNTAX* score < 33
or Bifurcation LM

IIbB

Unfavorable anatomy for PCI,
but good CABG candidate

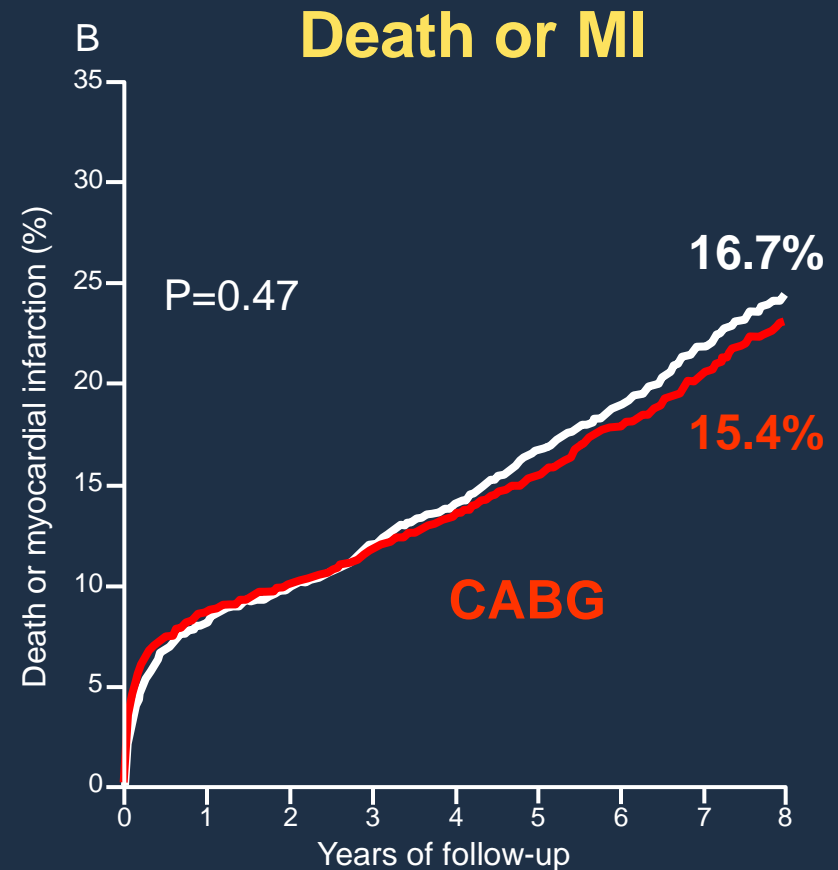
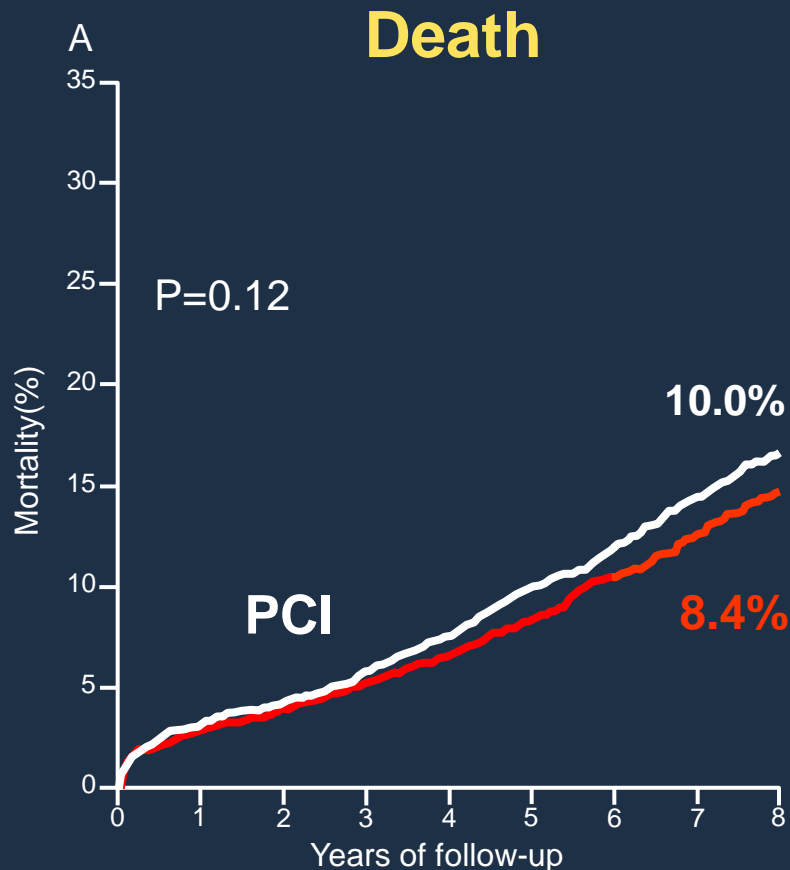
III B

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CABG vs. PCI for MVD

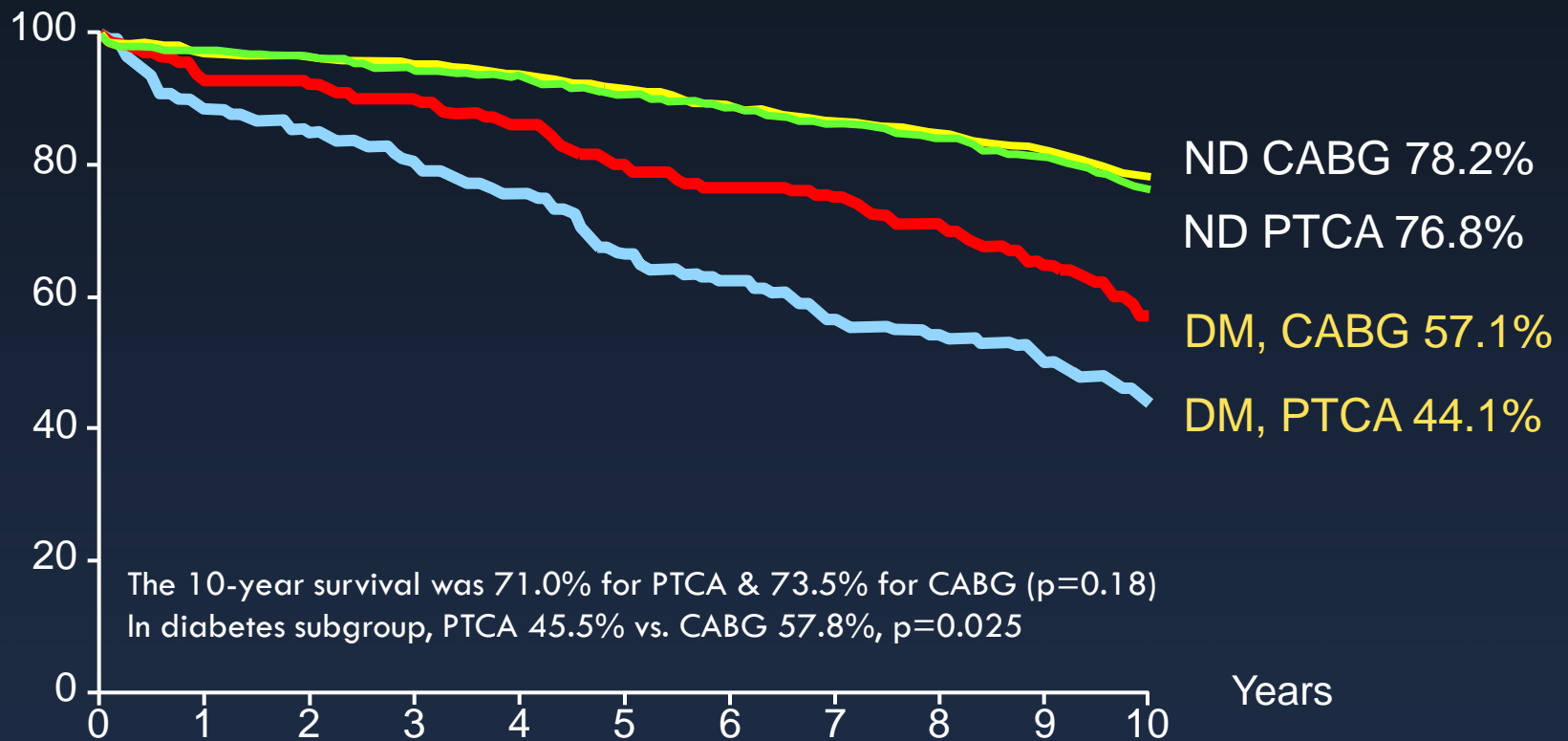
7,812 patients, Meta-analysis of 10 RCTs



Long-term mortality is similar after CABG & PCI in most patient with multivessel CAD. CABG might be a better option for patients with **diabetes (HR0.70)** or patients **≥ 65 years (HR0.82)** because of lower mortality in these subgroups.

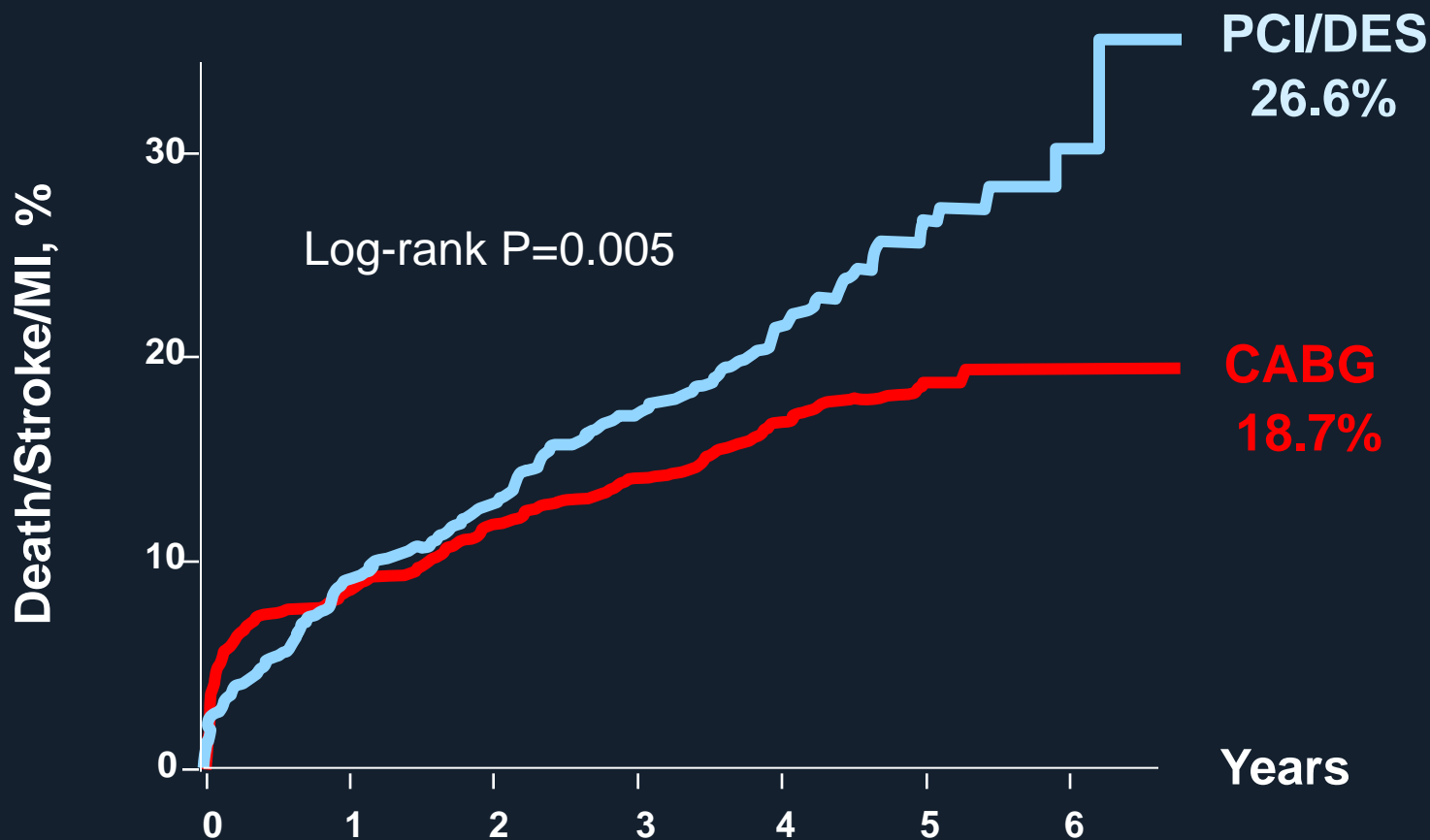
BARI 10-Year Survival

POBA vs. CABG in MVD
From 1988 to 1991 (n=1,829)



FREEDOM Trial (Diabetics & MVD)

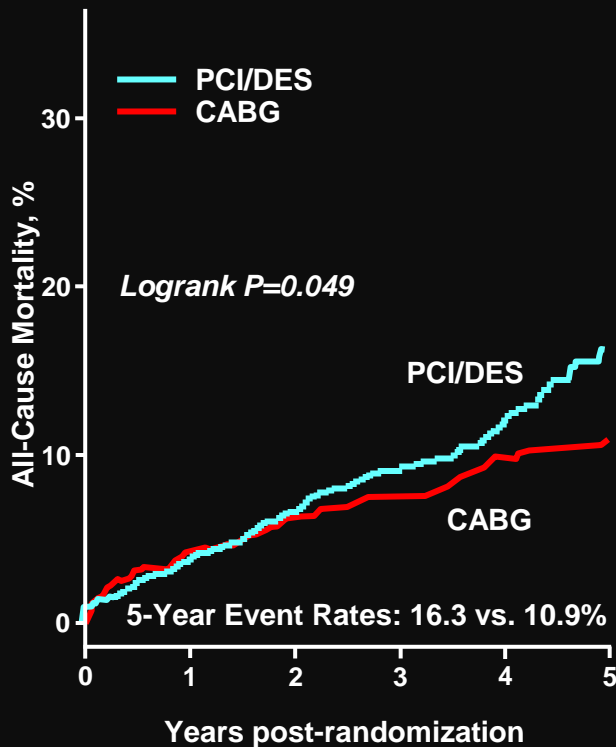
Death / MI / Stroke at 5 Years



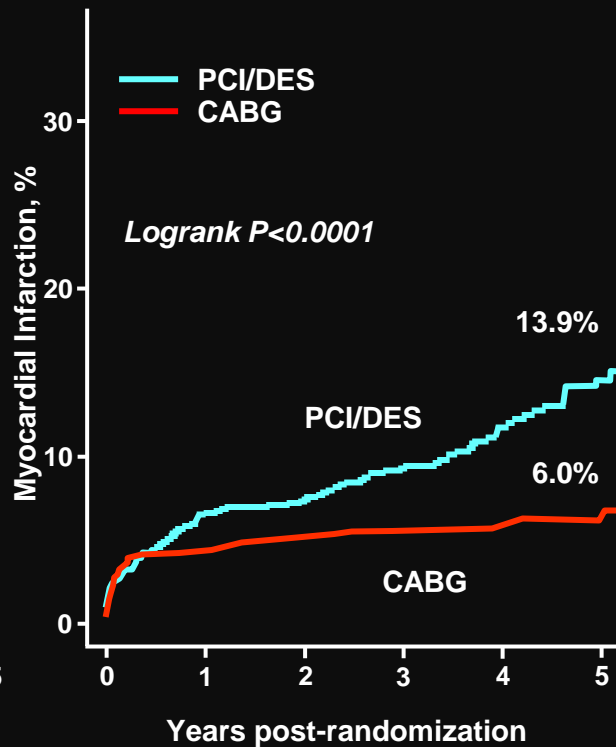
PCI/DES N	953	848	788	625	416	219	40
CABG N	943	814	758	613	422	221	44

FREEDOM Trial: Hard Outcomes

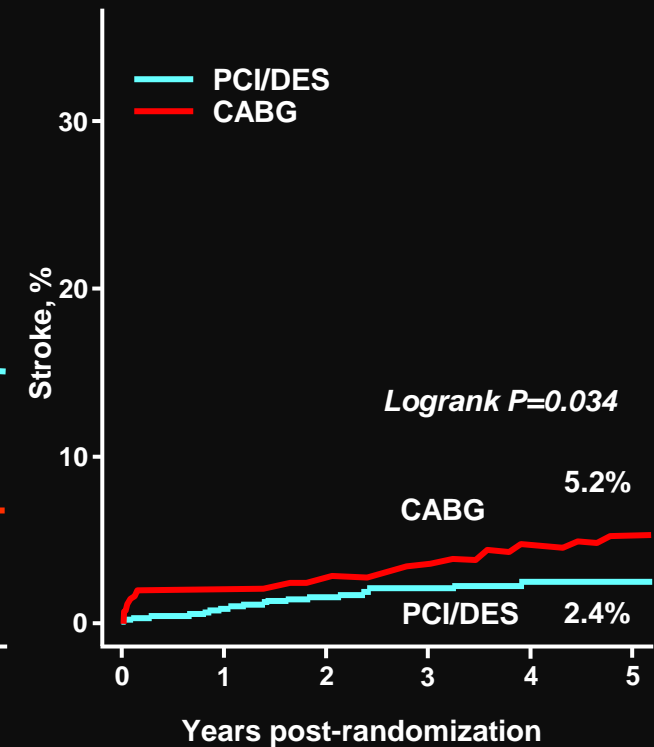
Death



MI



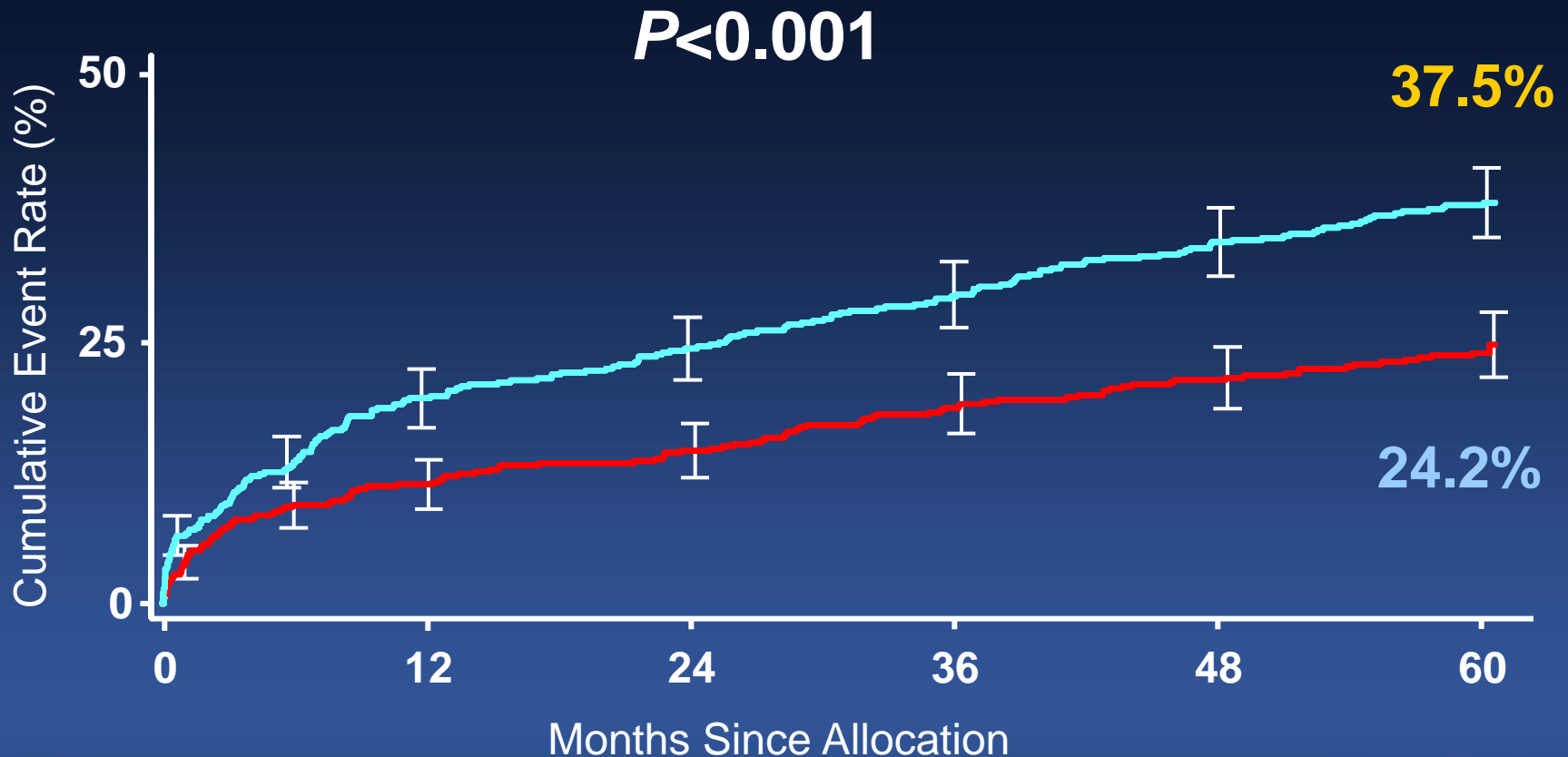
Stroke



SYNTAX Trial (3VD Subset)

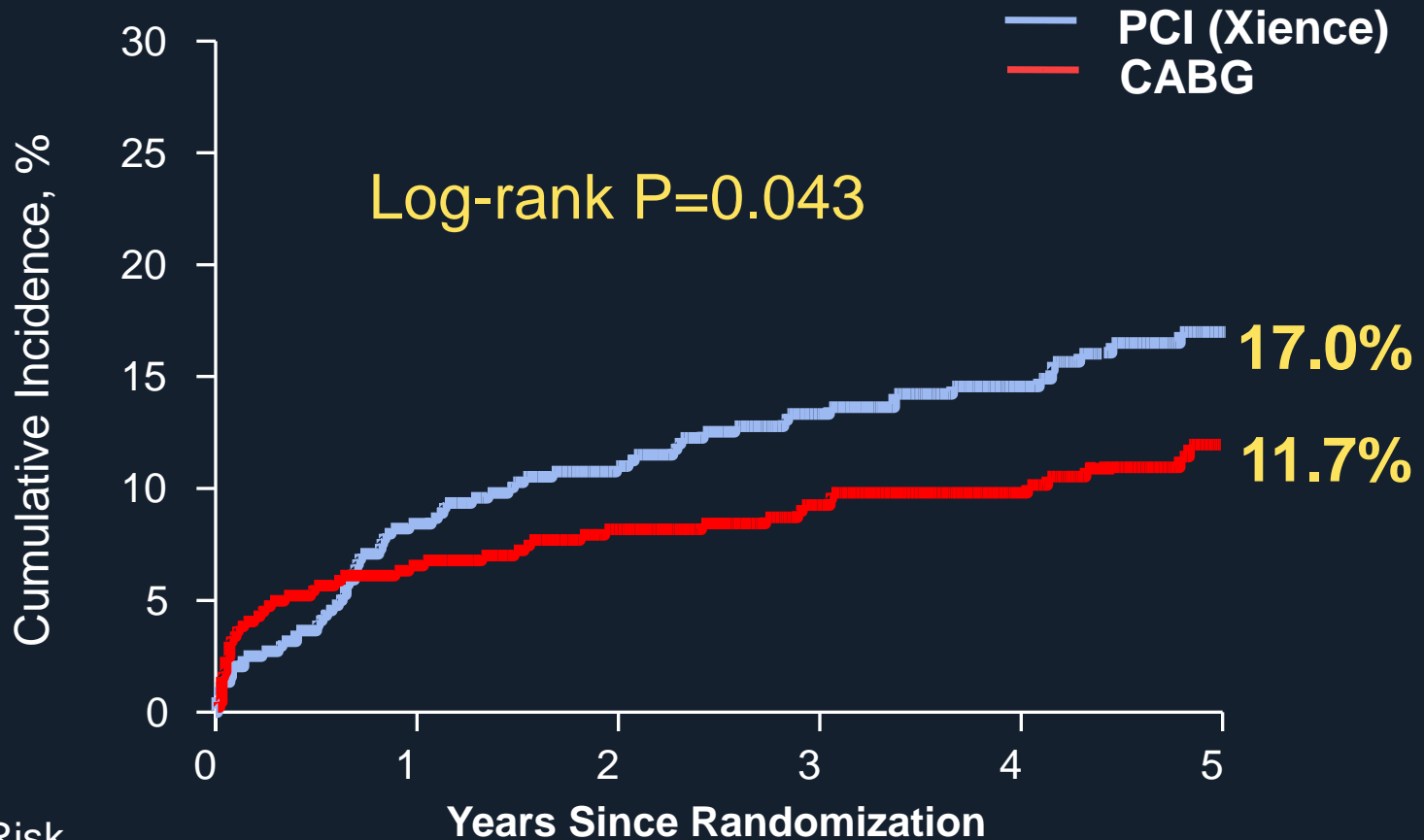
MACCE to 5 Years

— CABG (N=549) — TAXUS (N=546)



BEST Trial

Death/MI/TVR to 5 Years

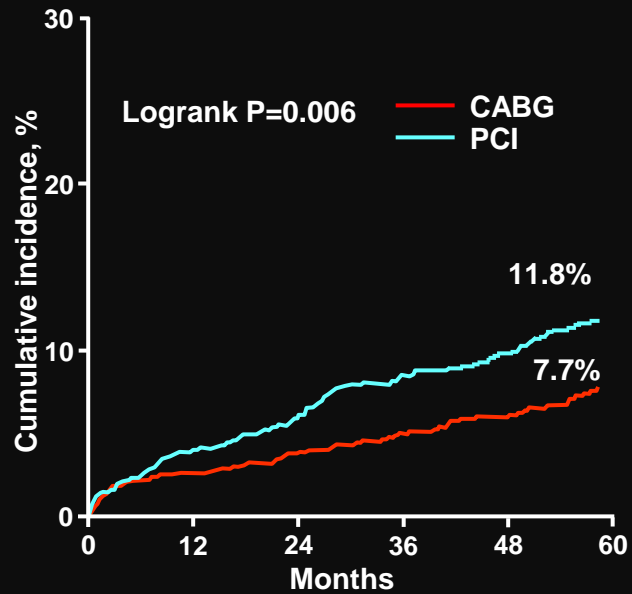


No. at Risk

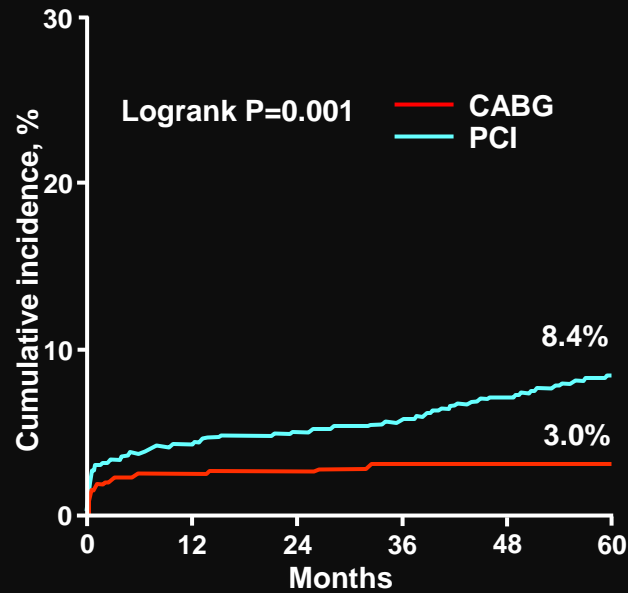
	0	1	2	3	4	5
PCI	438	402	362	305	242	126
CABG	442	415	377	326	262	145

BEST and SYNTAX: Hard Outcomes

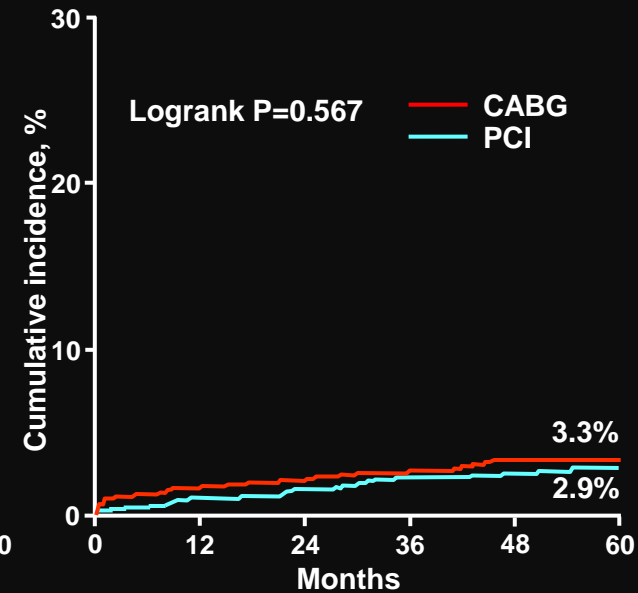
Death



MI



Stroke



Summary

CABG vs. DES for MVD

1. A higher risk of death after PCI
2. A higher risk of MI after PCI
3. A small increase of stroke after CABG
4. A higher rate of TVR after PCI

ESC Guidelines 2014

Elective PCI for 3-Vessel Disease

	CABG		PCI	
Recommendation according to extent of CAD	Class	Level	Class	Level
3 VD with a SYNTAX score ≤ 22	I	A	I	B
3 VD with a SYNTAX score 23 -32	I	A	III	B
3 VD with a SYNTAX score > 32	I	A	III	B

ACC/AHA Guideline 2014

Elective PCI for MVD (focused update)

CABG is recommended for patients with diabetes and MVD for which revascularization is likely to improve survival (3-VD or complex 2-VD involving the proximal LAD)

CABG (IB)

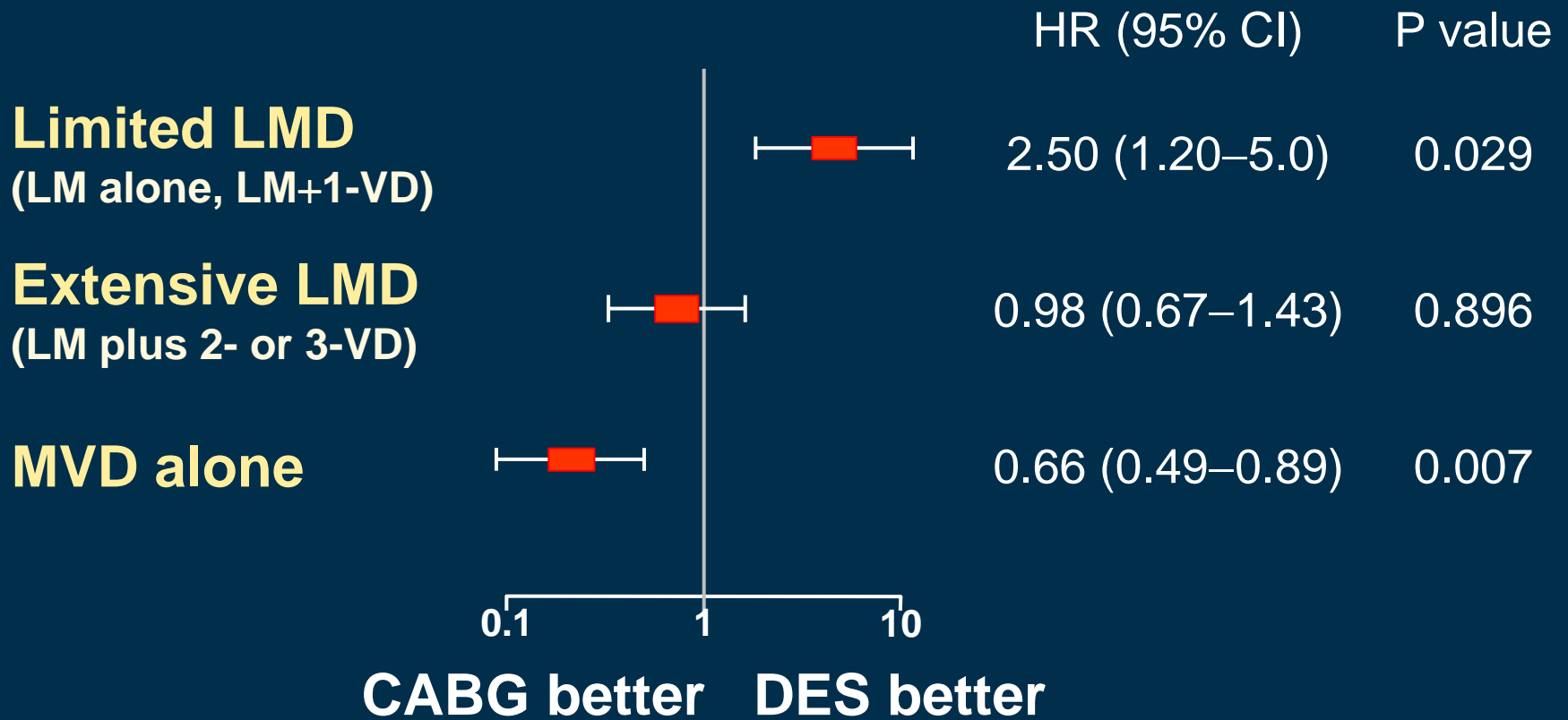
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BEST, PRECOMBAT and SYNTAX Trial

All-Cause Mortality

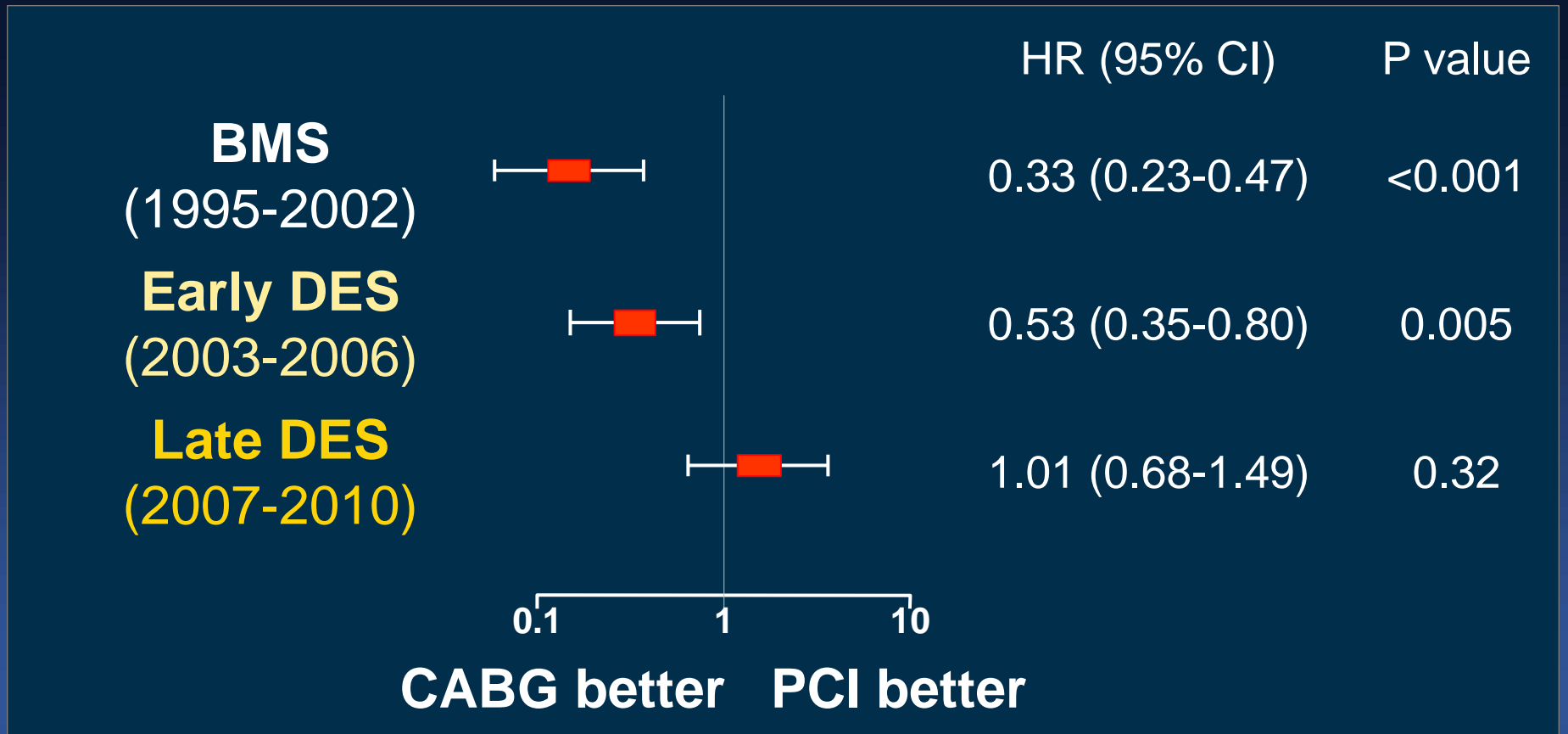
P for Interaction <0.001



Temporal Trends (n=2,360), 2015

Asan MAIN Registry, MACCE after LM Revascularization

P for Interaction = 0.002



A big mystery,
what's different?

Possible Explanations

Left Main versus Multivessel CAD

- The left main coronary artery is large and short, leading to a lower rate of target lesion failure.
- The advantage of CABG over PCI seems to be attenuated in the presence of concomitant left main CAD (LM total: a large ischemic island, graft dependent).

Ongoing Trials

EXCEL (NCT01205776; LM, n=1905): CABG vs. EES

NOBLE (NCT01496651; LM, n=1200): CABG vs. DES

FAME 3 (NCT02100722; MVD, n=1500):

CABG vs. FFR-guided ZES

More PCI or More CABG?

The final winner here will be
a simple, effective & durable treatment!

Thanks.