CABG vs PCI – 2017
Multivessel Coronary Disease

Better CABGs vs Better PCI Devices

ACC New York, Dec 8, 2017

No Disclosures

CABG vs PCI – 2017
Stable Multivessel Coronary Disease

1. Are These The two Critical Questions ?

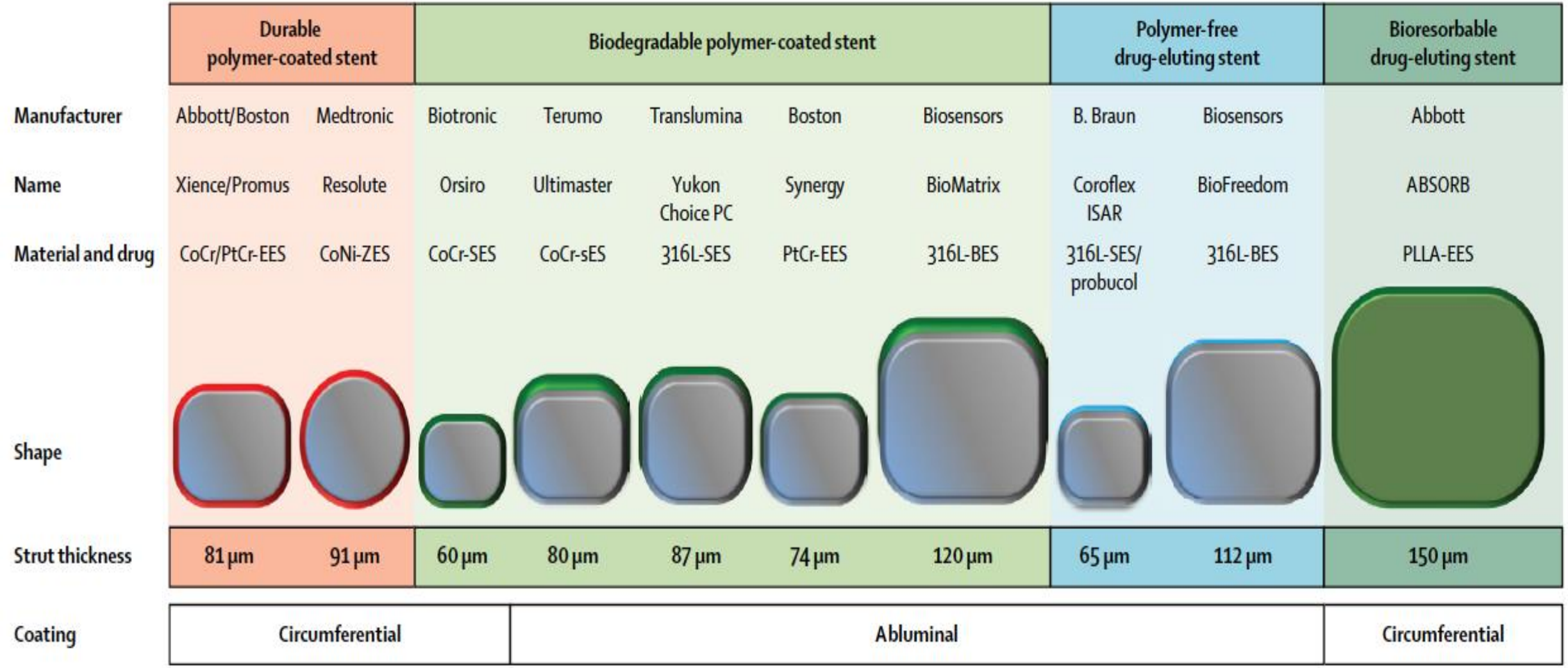
2. Two Questions are Ignored or Forgotten !

3. Review of the Present Four Observations

4. Readdressing the Four Questions

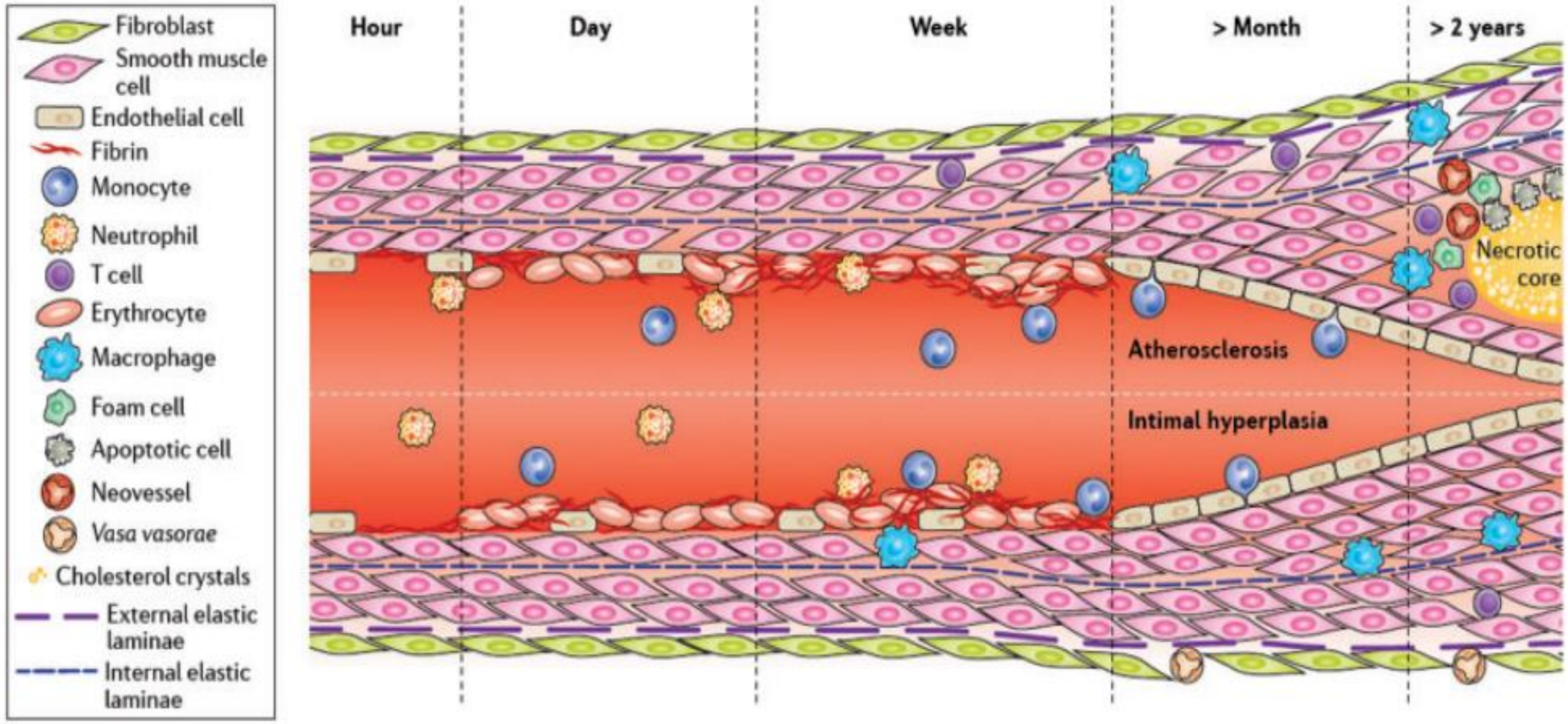
5. Mortality Reality & Managements Trends.

1). Selected Drug-eluting Stents And Scaffolds Going too Far ?



RA Byrne et. al. Lancet 2017; 390: 781

2). VG Failure – Question to Address?



MY Emmert. Eur Heart J. 2017;38:2029

CABG vs PCI – 2017
Stable Multivessel Coronary Disease

1. Are These The two Critical Questions ?

2. Two Questions are Ignored or Forgotten !

3. Review of the Present Four Observations

4. Readdressing the Four Questions

5. Mortality Reality & Managements Trends.

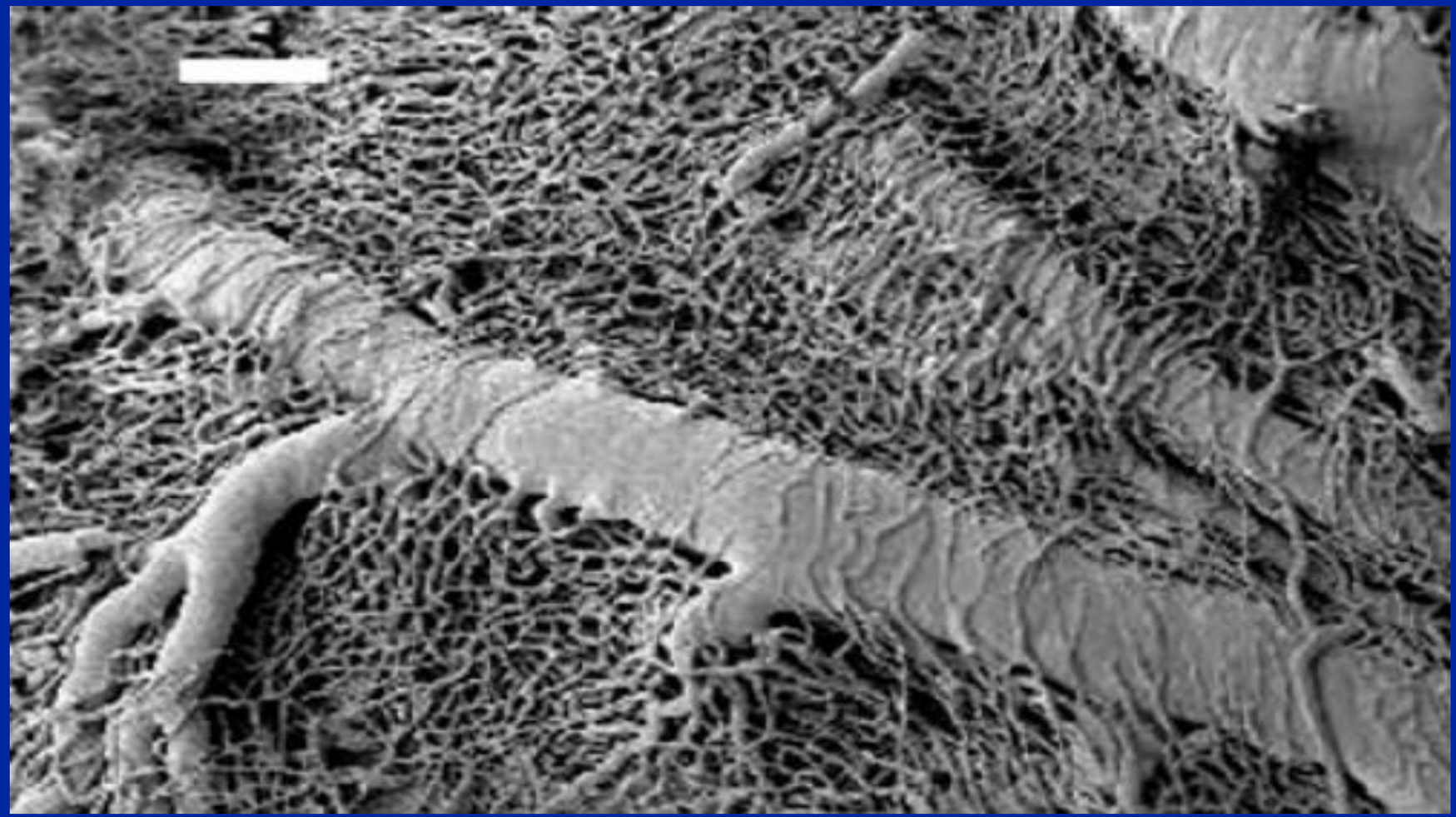
3). ADHERENCE FOR RISK FACTOR CONTROL?

Risk Factors - Proportion of Participants at Goal % – 1 year

Trials	LDL	SBP	DBP	Hb A1C	Meet Goals Base	Meet Goals FU
BARI-2D	75	56	70	52	14	20
COURAGE	51	55	55	59	12	19
FREEDOM	55	63	53	55	12	20

Freedom, Bari-2D, Courage Investigators, JACC 2013;61:1607
PURE (S Yusuf et al.) Lancet 2011; Aug 28 - Poor Countries,7% !!!
NHANES, AHA, NHLBI-JNC-7, NHLBI-NCEP – Significant < Adherence
P Muntner, V Fuster et al., AHJ 2011; 161: 719 – 49 seconds !!!!

4). Coronary Microvascular Remodeling, Collateralization



AR Pries et. al. Eur Heart J. 2015;36:3134

Working Group On Coronary Pathophysiology And Microcirculation

CABG vs PCI – 2017
Stable Multivessel Coronary Disease

1. Are These The two Critical Questions ?

2. Two Questions are Ignored or Forgotten !

3. Review of the Present Four Observations

4. Readdressing the Four Questions

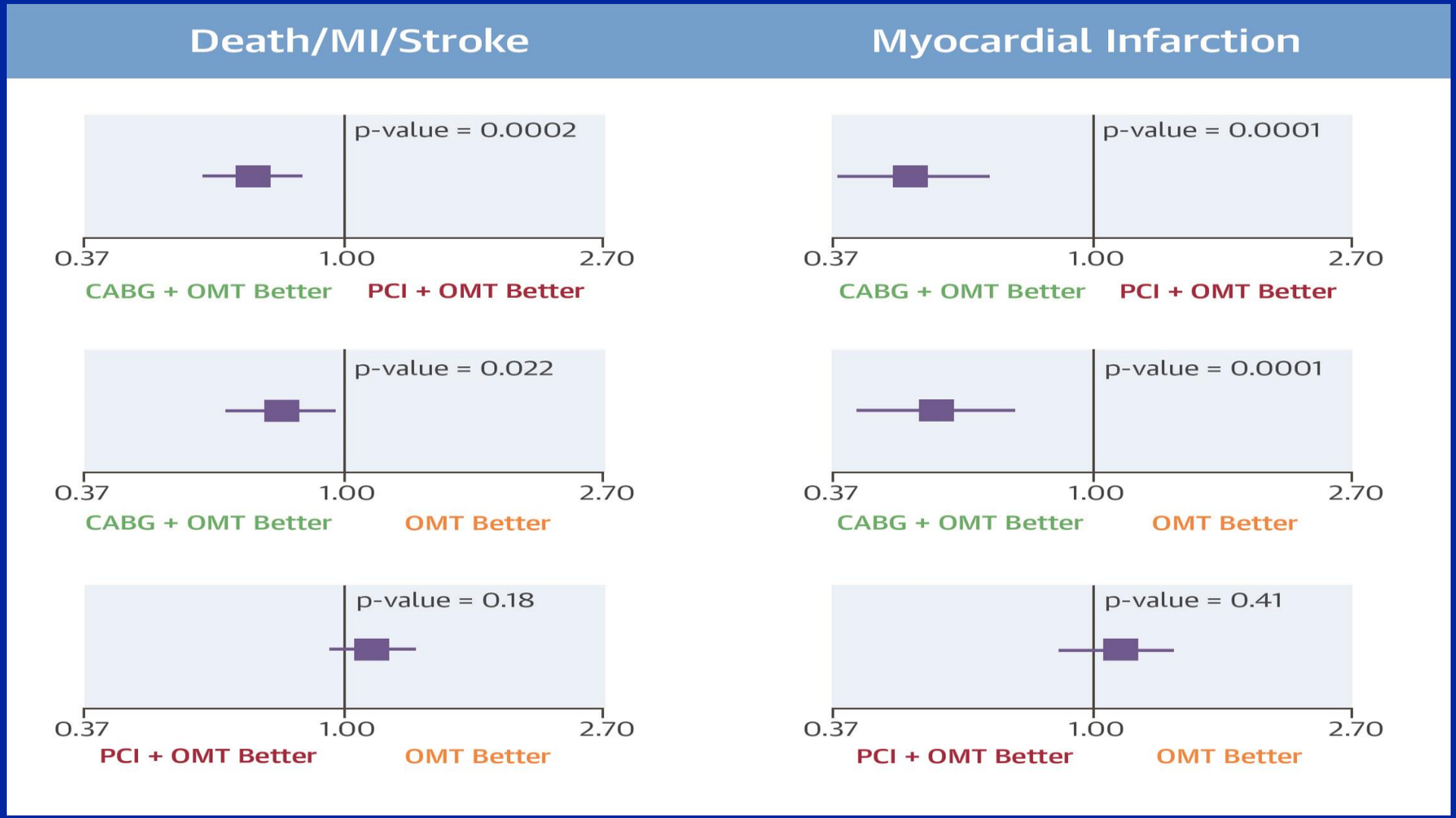
5. Mortality Reality & Managements Trends.

1a). COMPLEX, STABLE CORONARY DISEASE

TRIAL	MVD	DM	INTERV.	MT.	EP.-R	Data
SYNTAX	+	-	++	-	++	CABG > PCI SYNTAX Score
FAME	-	-	+	-	+	PCI "ISCHEMIA" Score
BARI	-	+	+	+	+	CABG / PCI = MT X.OV.ER 42%
COURAGE	-	-	+	+	+	PCI = MT - X.OVER "ISCHEMIA">10%-Events
FREEDOM	+	+	++	(+)	+	CABG > PCI No Freedom of Choice?

Conditions Methods-Interests Conclusions

CABG vs Stents
For Diabetic MVD FU 5 yrs.



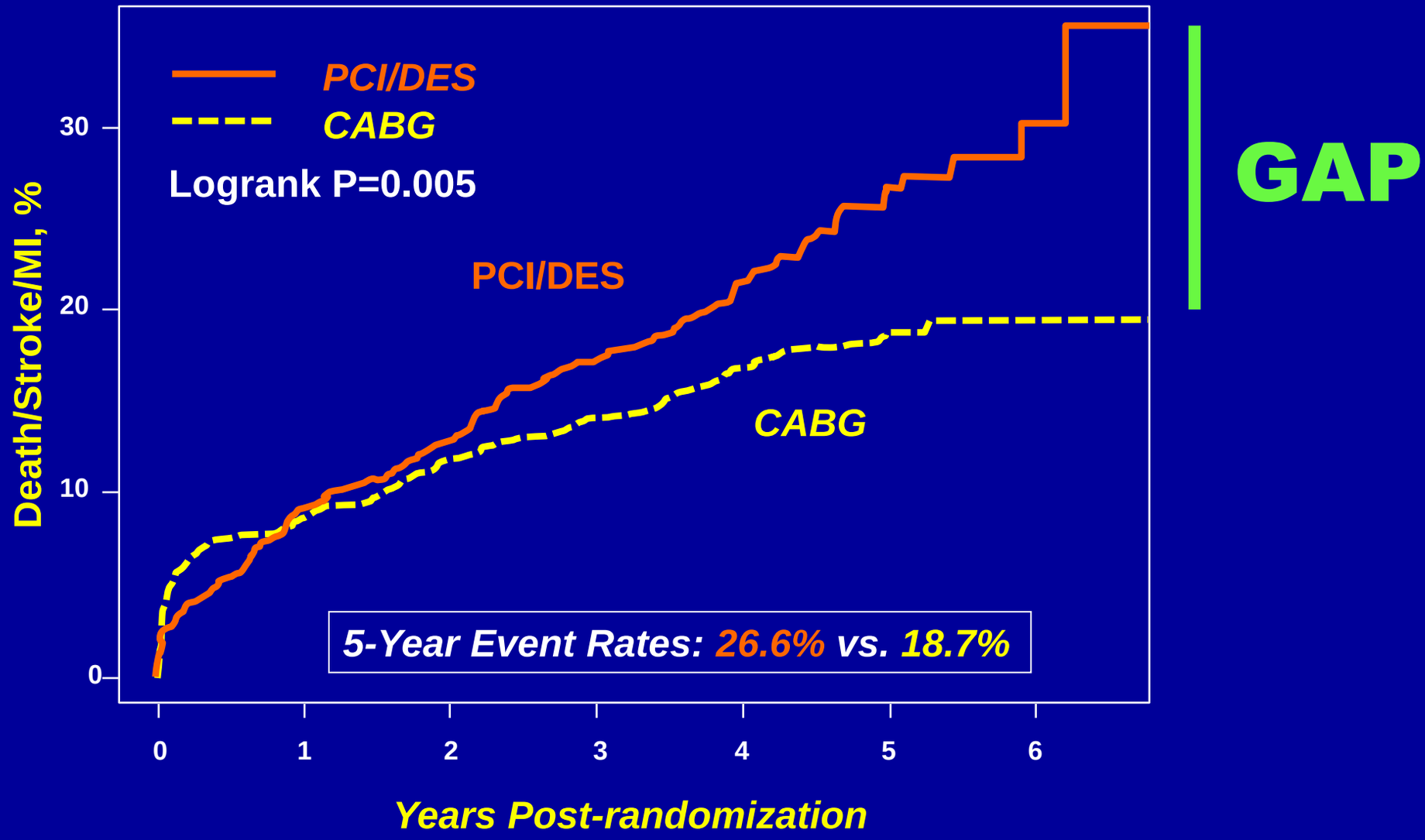
J Mancini, V Fuster et al. J Am Coll Cardiol 2016; 68:985 - Mortality

1b). COMPLEX, STABLE CORONARY DISEASE

TRIAL	MVD	DM	INTERV.	MT.	EP.-R	Data
SYNTAX	+	-	++	-	++	CABG > PCI SYNTAX Score
FAME	-	-	+	-	+	PCI "ISCHEMIA" Score
BARI	-	+	+	+	+	CABG / PCI = MT X.OV.ER 42%
COURAGE	-	-	+	+	+	PCI = MT "ISCHEMIA">10%-Events
FREEDOM	+	+	++	(+)	+	CABG > PCI No Freedom of Choice?

Conditions Methods-Interests Conclusions

FREEDOM TRIAL – MI / MORTALITY / STROKE



New Engl. J. Med . 2012; 367: 2375 – All Subgroups (Syntax etc)
(Circ Cardiovasc Interv. 2014;7:518 – Newer Generation DES, Still Gap)

FREEDOM TRIAL – MORTALITY 8 YRS !

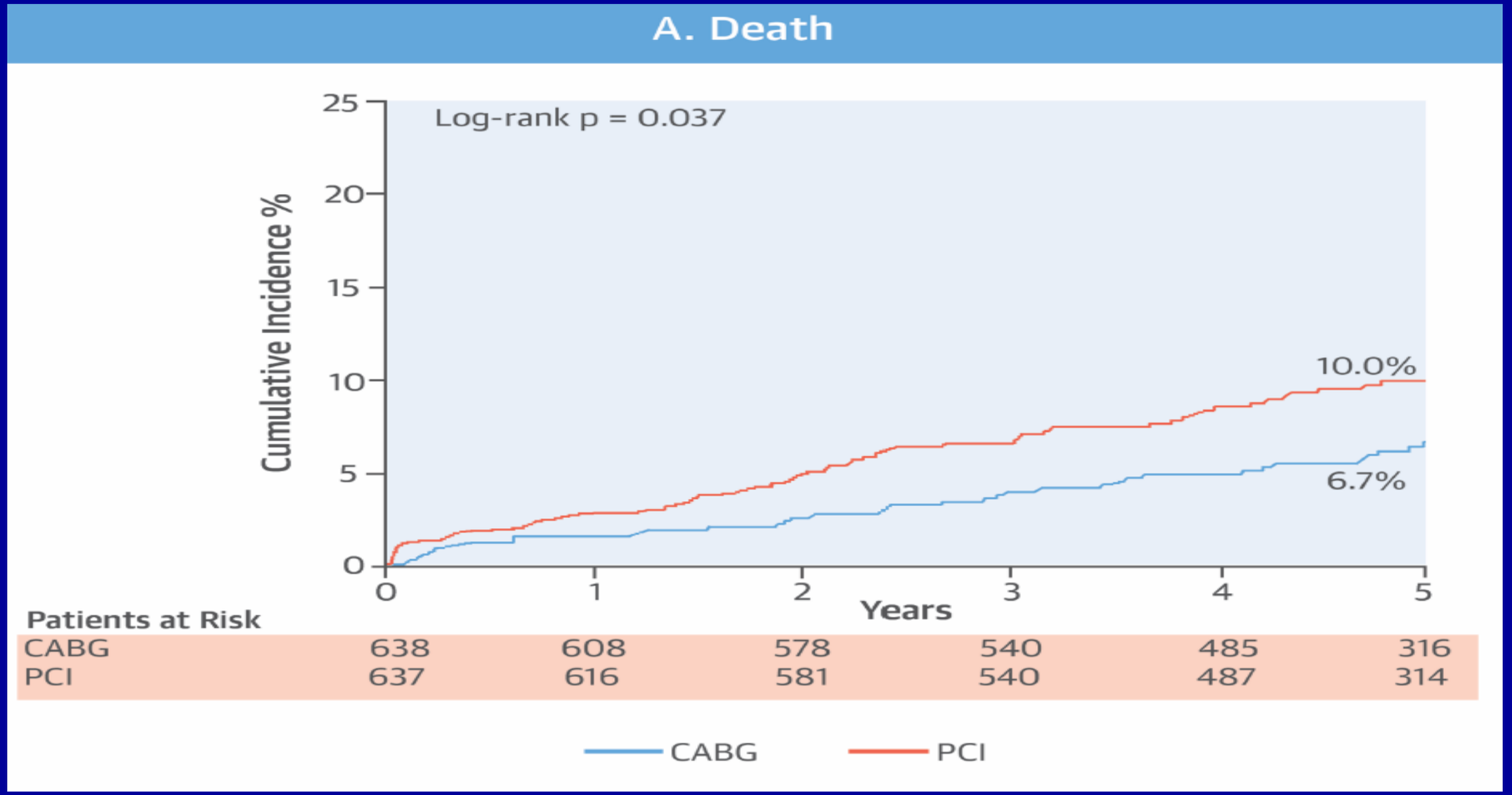
2017 !

2). COMPLEX, STABLE CORONARY DISEASE

TRIAL	MVD	DM	INTERV.	MT.	EP.-R	Data
SYNTAX	+	-	++	-	++	CABG > PCI SYNTAX Score
FAME	-	-	+	-	+	PCI "ISCHEMIA" Score
BARI	-	+	+	+	+	CABG / PCI = MT X.OV.ER 42%
COURAGE	-	-	+	+	+	PCI = MT – X-OVER "ISCHEMIA">10%-Events
FREEDOM	+	+	++	(+)	+	CABG > PCI No Freedom of Choice?

Conditions Methods-Interests Conclusions

Mortality – SYNTAX / BEST For Non-diabetic MVD FU 5 yrs.



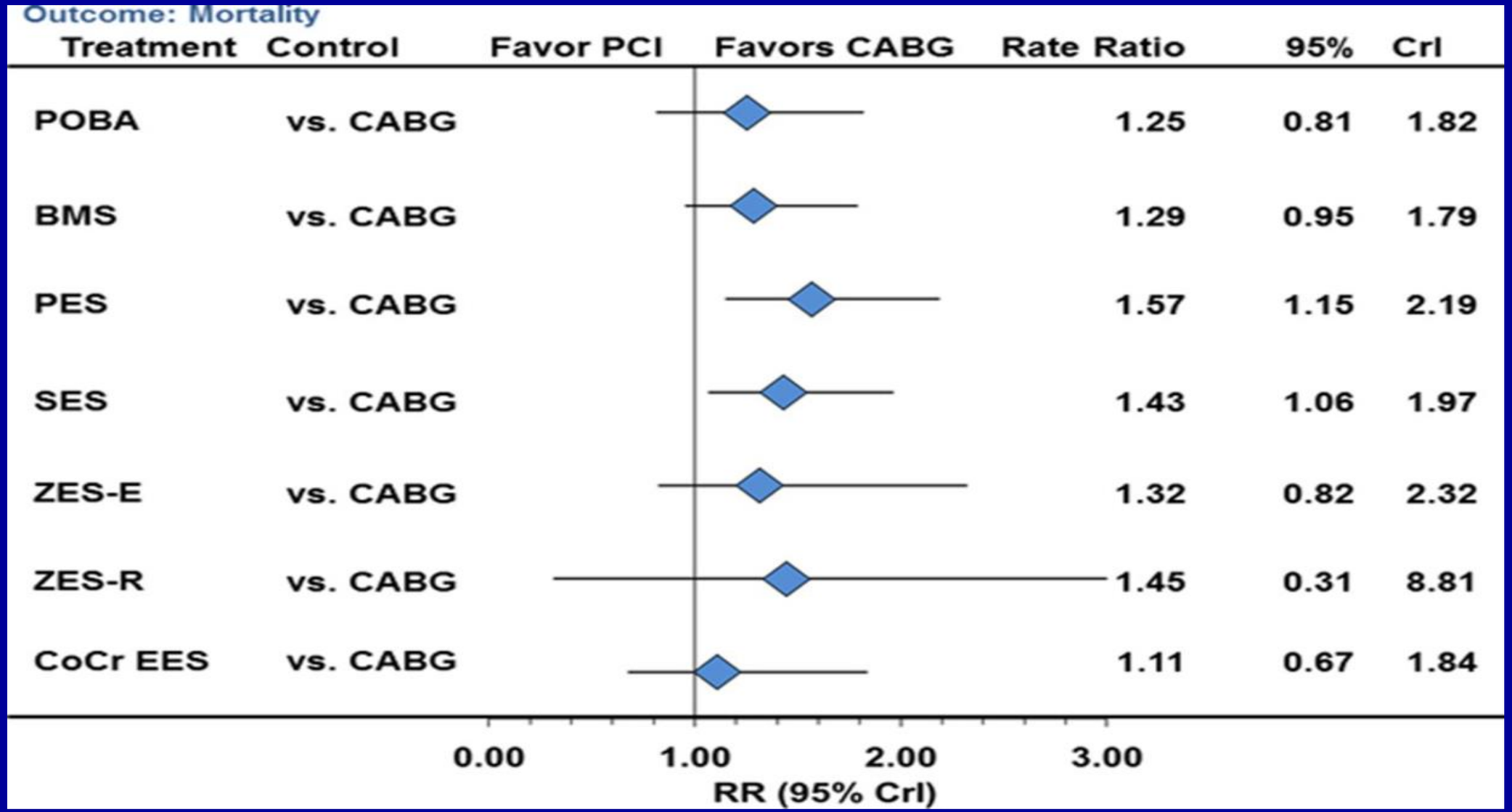
M Chang et.al. JACC 2016; 68: 29 – SYNTAX: Intermediate & High Sc.

CABG in the era of modern PCI - 3)

How to optimize coronary artery bypass grafting (CABG) to remain the gold-standard for multivessel disease?

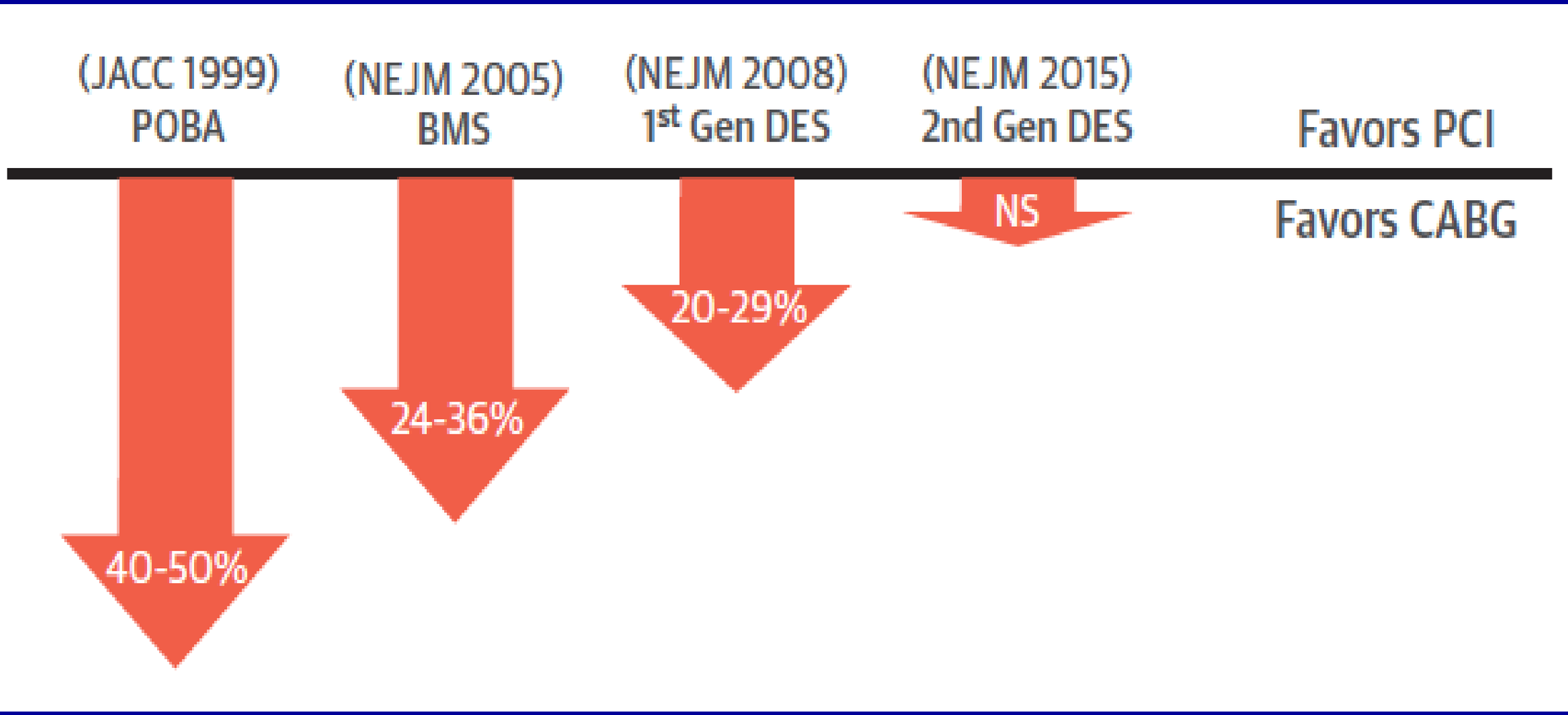
MY Emmert. Eur Heart J. 2017;38:2029

3a).Mixed Treatment For All-cause Mortality



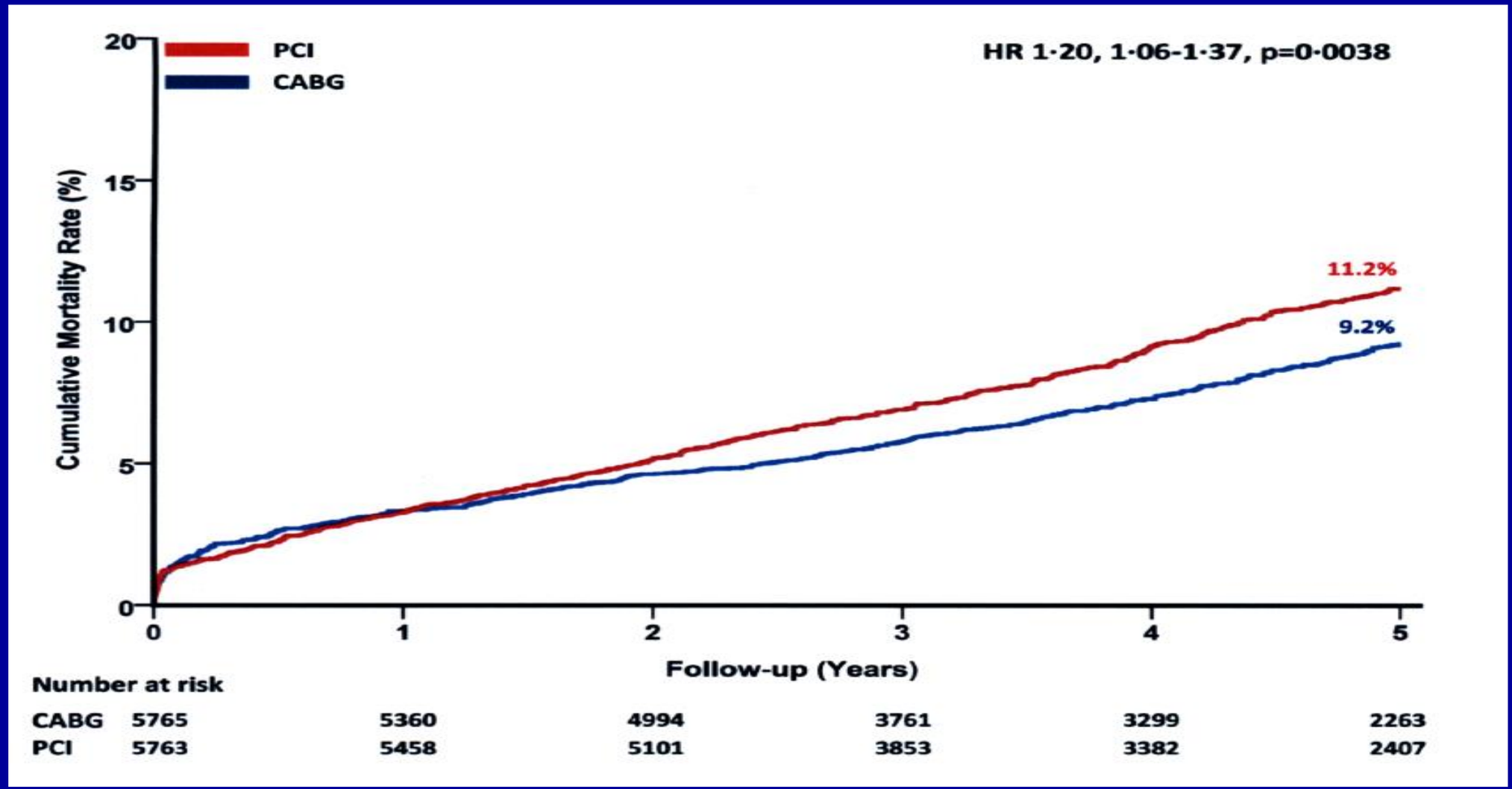
Bangalore S et al. Circ Cardiovasc Interv. 2014;7:518-525

3b). Diminishing Mortality Gap Between PCI and CABG For Multivessel Disease From the NY State Registries



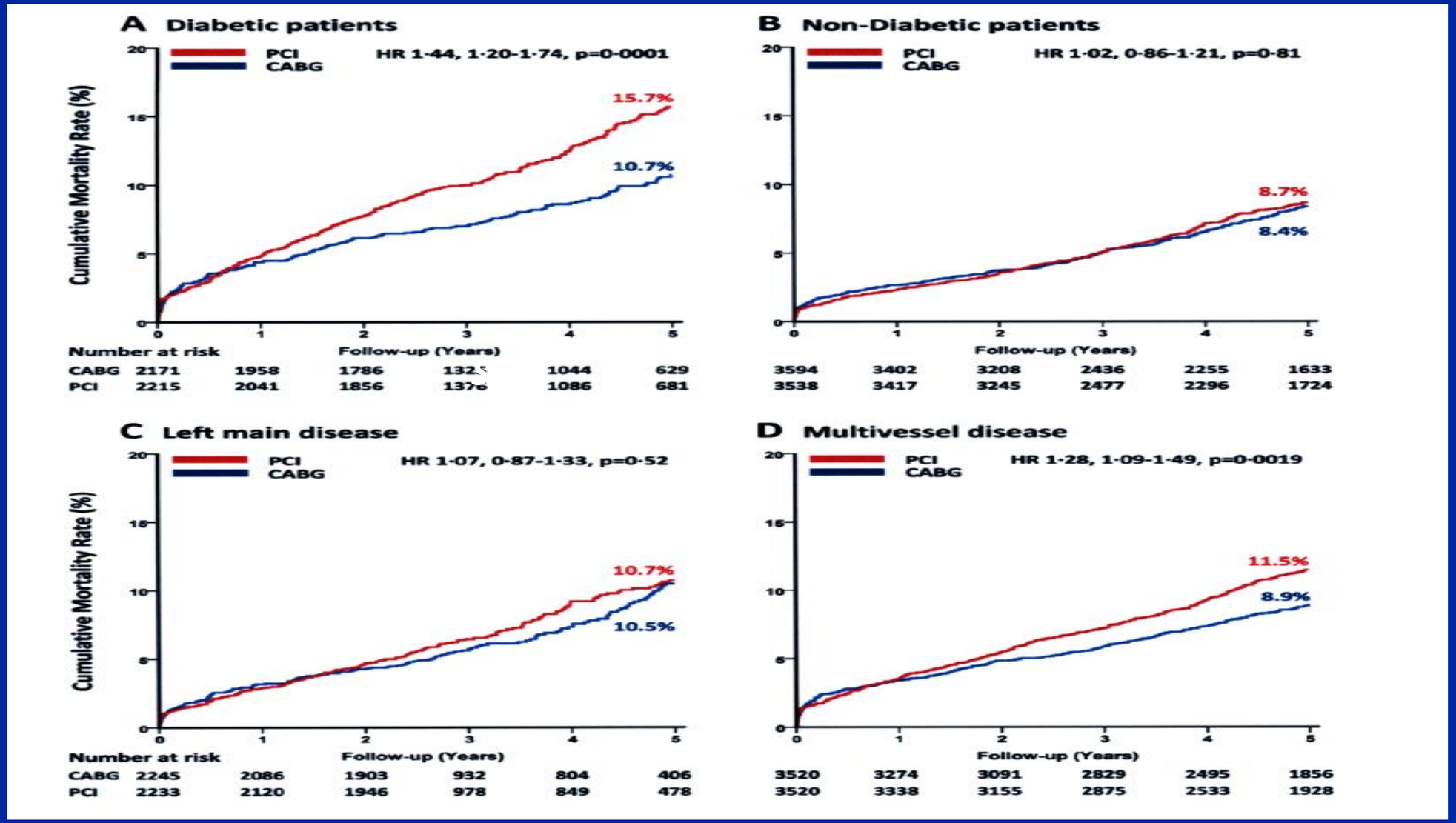
S Bangalore. J Am Coll Cardiol 2016;68:996

4a). Mortality After CABG Vs PCI During 5y FU With and Without DM and With LM or MVD



SJ Head et. al. 2017 (Subm) 11 Trials, 11,518 Pts, Indiv. Data

4b). Mortality After CABG Vs PCI During 5y FU With and Without DM and With LM or MVD



SJ Head et.al. 2017 (Submited) 11 Trials, 11,518 Pts

CABG vs PCI – 2017
Stable Multivessel Coronary Disease

1. Are These The two Critical Questions ?

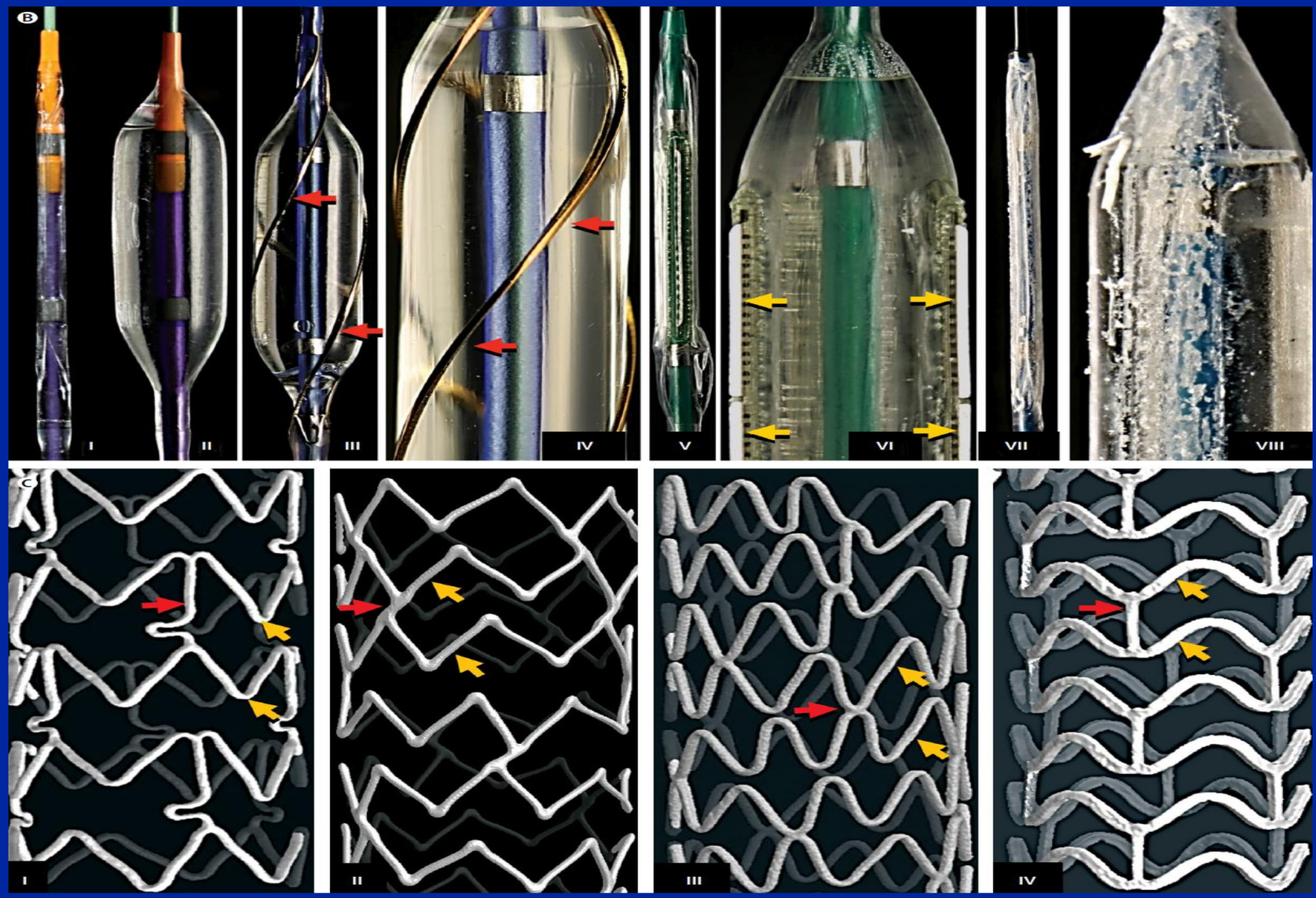
2. Two Questions are Ignored or Forgotten !

3. Review of the Present Four Observations

4. Readdressing the Four Questions

5. Mortality Reality & Managements Trends.

1). Evolution of Devices – Reaching Limit?



RA Byrne et. al. Lancet 2017; 390: 781

2). Evolution of CABG – Room to Improve

a. Multiple Arterial Grafts – Why Only 6%

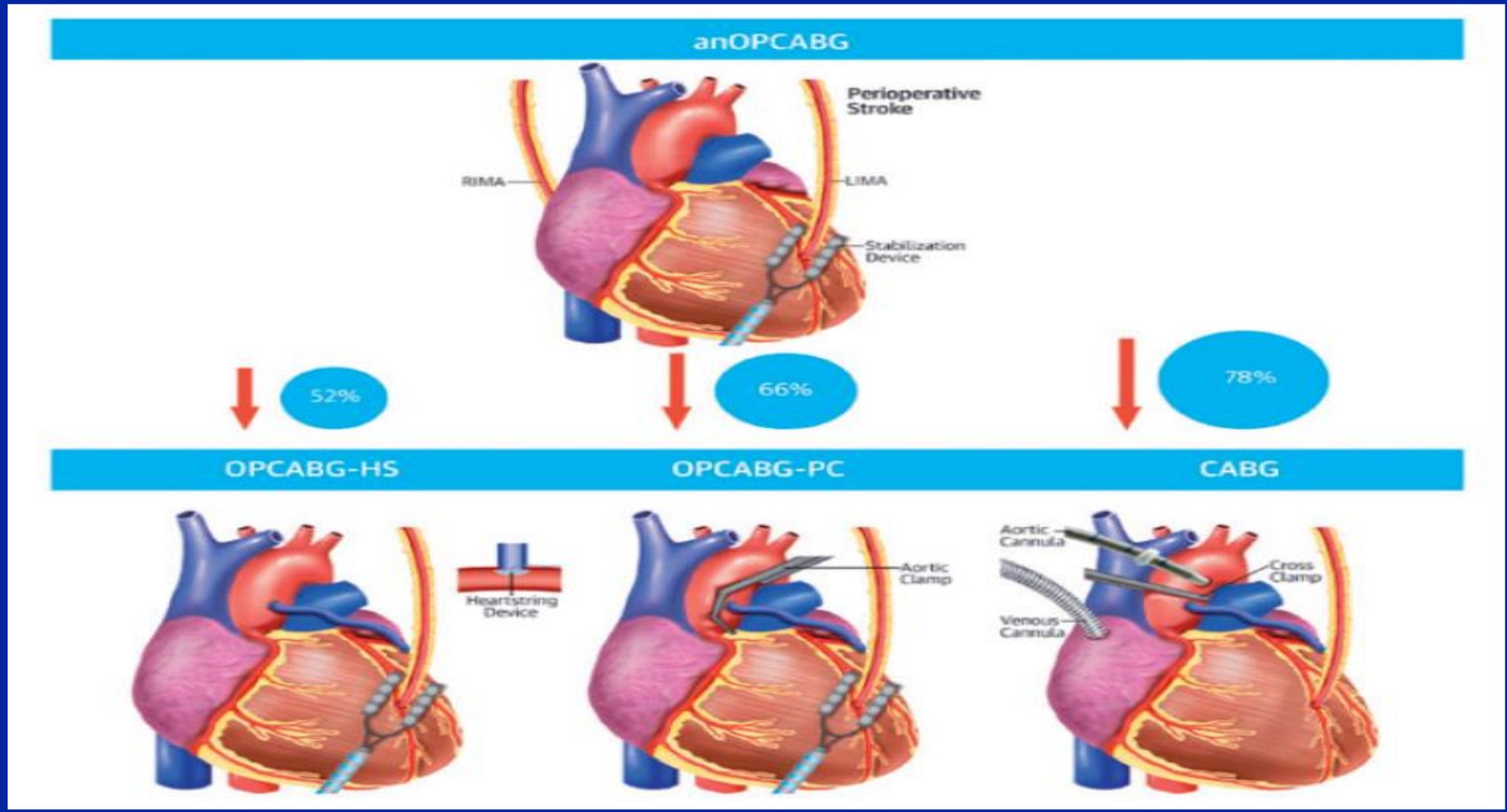
b. Clampless and No-aortic-touch OPCAB

c. Dual Antiplatelet Therapy

d. Hybrid Coronary Revascularization

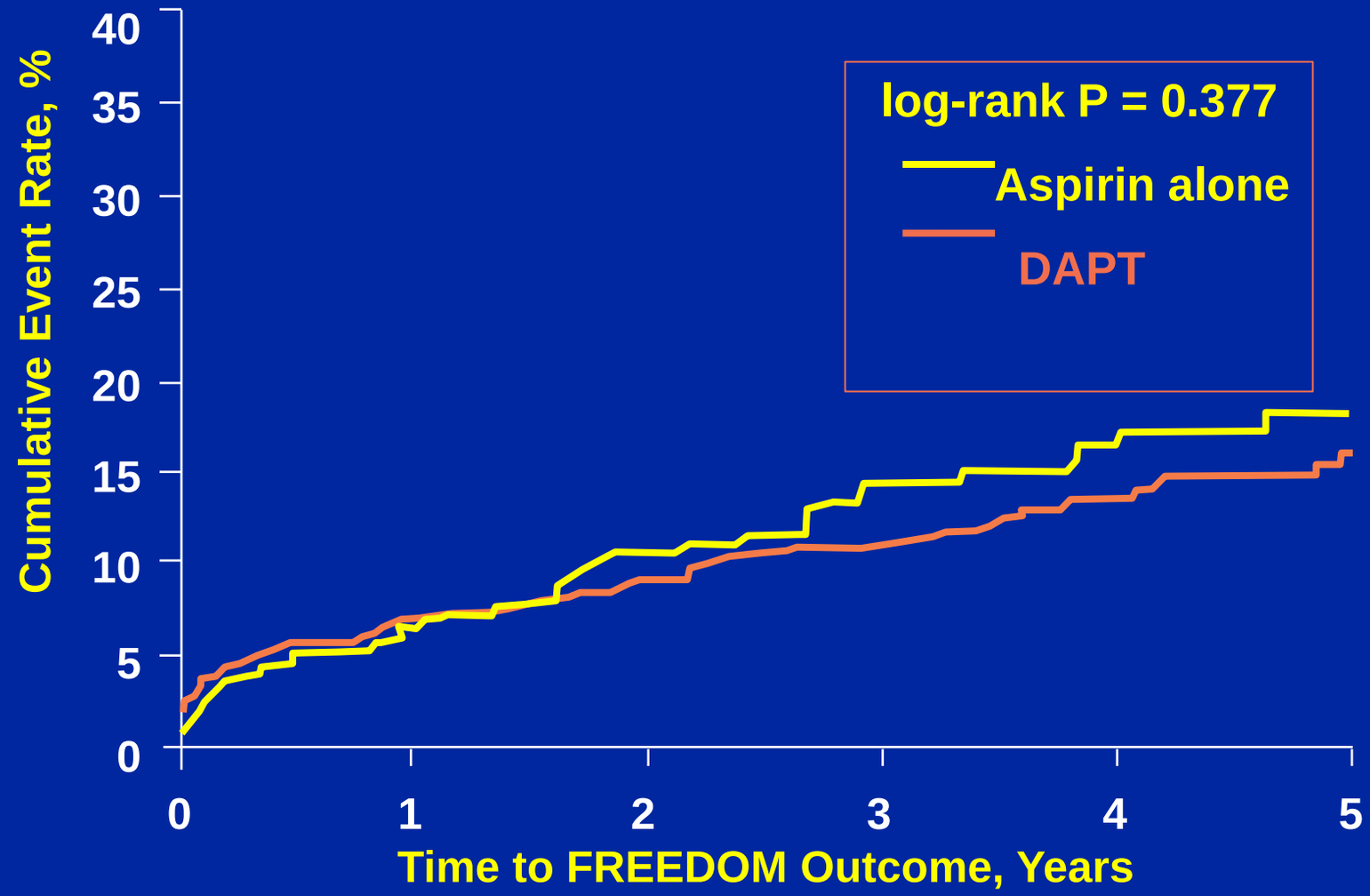
e. CABG and FFR

2b. Four Surgical Methods Of CABG With > Degrees of Aortic Manipulation



MY Emmert. Eur Heart J. 2017;38:2029

2c. DAPVs. Aspirin Alone After CABG In Diabetics With MVD: FREEDOM Trial Insights



DAPT (Yes/No) / Number of patients at risk

Yes	540	492	449	349	233	111
No	251	231	207	166	107	43

S van Diepen, V Fuster, ME Farkouh et al., JACC 2017;69:119

2c. Dual Ticagralor Plus Aspirin After CABG

The Primary Outcome, SVG Patency at one year on CTA

- For ASA alone (100 mg daily, n=168) – 76%
- For Ticagralor Alone (90 mg BID, n=160) – 83% (p 0.09)
- For ASA Plus Ticagralor (n=168) -- 89% (p 0.0006)

The Secondary Outcomes

MACE - 5.4%,	Major Bleeding – 0%,
- 2.4%,	-- 1.2%
- 1.8%	-- 1.2%

DACAB (DJ Kumbhani) – AHA, Nov. 2017

2d. Hybrid Study–Objectives & Targets

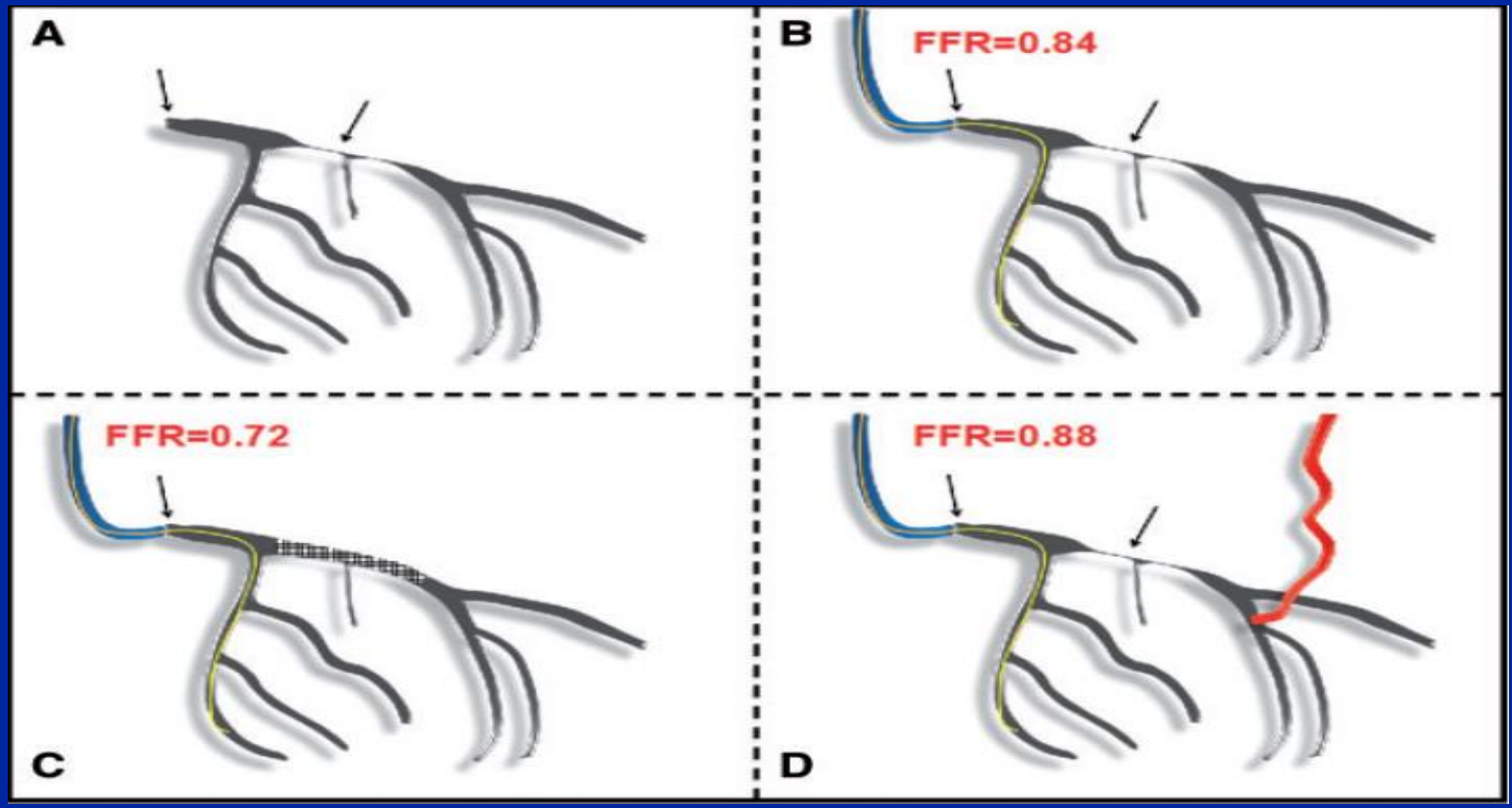
- ***In patients** with multi-vessel coronary artery disease -**MV-CAD-** involving the Left Anterior Descending –**LAD-** and/or Left Main –**LM- arteries**.*

- ***2354 patients will be randomized:***
  - ***HCR** with Left Internal Mammary Artery – LIMA- to LAD + PCI of non-LAD vessels*
  - ***Multi-vessel PCI** with DES, **including LAD***

Hybrid Study – Primary Endpoint

The occurrence of MACCE, defined as all-cause mortality, myocardial infarction (MI), stroke, and repeat revascularization over a minimum of 5 year follow-up after randomization

2e. FFR & Sequential Stenosis of The Ostial LM And Proximal LAD



M Pellicano et. al. Eur Heart J. 2017;38:1959

Use of the Instantaneous Wave-free Ratio or Fractional Flow Reserve in PCI

J.E. Davies, S. Sen, H.-M. Dehbi, R. Al-Lamee, R. Petraco, S.S. Nijjer, R. Bhindi, S.J. Lehman, D. Walters, J. Sapontis, L. Janssens, C.J. Vrints, A. Khashaba, M. Laine, E. Van Belle, F. Krackhardt, W. Bojara, O. Going, T. Härle, C. Indolfi, G. Niccoli, F. Ribichini, N. Tanaka, H. Yokoi, H. Takashima, Y. Kikuta, A. Erglis, H. Vinhas, P. Canas Silva, S.B. Baptista, A. Alghamdi, F. Hellig, B.-K. Koo, C.-W. Nam, E.-S. Shin, J.-H. Doh, S. Brugaletta, E. Alegria-Barrero, M. Meuwissen, J.J. Piek, N. van Royen, M. Sezer, C. Di Mario, R.T. Gerber, I.S. Malik, A.S.P. Sharp, S. Talwar, K. Tang, H. Samady, J. Altman, A.H. Seto, J. Singh, A. Jeremias, H. Matsuo, R.K. Kharbanda, M.R. Patel, P. Serruys, and J. Escaned

N Engl J Med 2017;376:1824

Instantaneous Wave-free Ratio versus Fractional Flow Reserve to Guide PCI

M. Götberg, E.H. Christiansen, I.J. Gudmundsdottir, L. Sandhall, M. Danielewicz, L. Jakobsen, S.-E. Olsson, P. Öhagen, H. Olsson, E. Omerovic, F. Calais, P. Lindroos, M. Maeng, T. Tödt, D. Venetsanos, S.K. James, A. Kåregren, M. Nilsson, J. Carlsson, D. Hauer, J. Jensen, A.-C. Karlsson, G. Panayi, D. Erlinge, and O. Fröbert, for the iFR-SWEDEHEART Investigators*

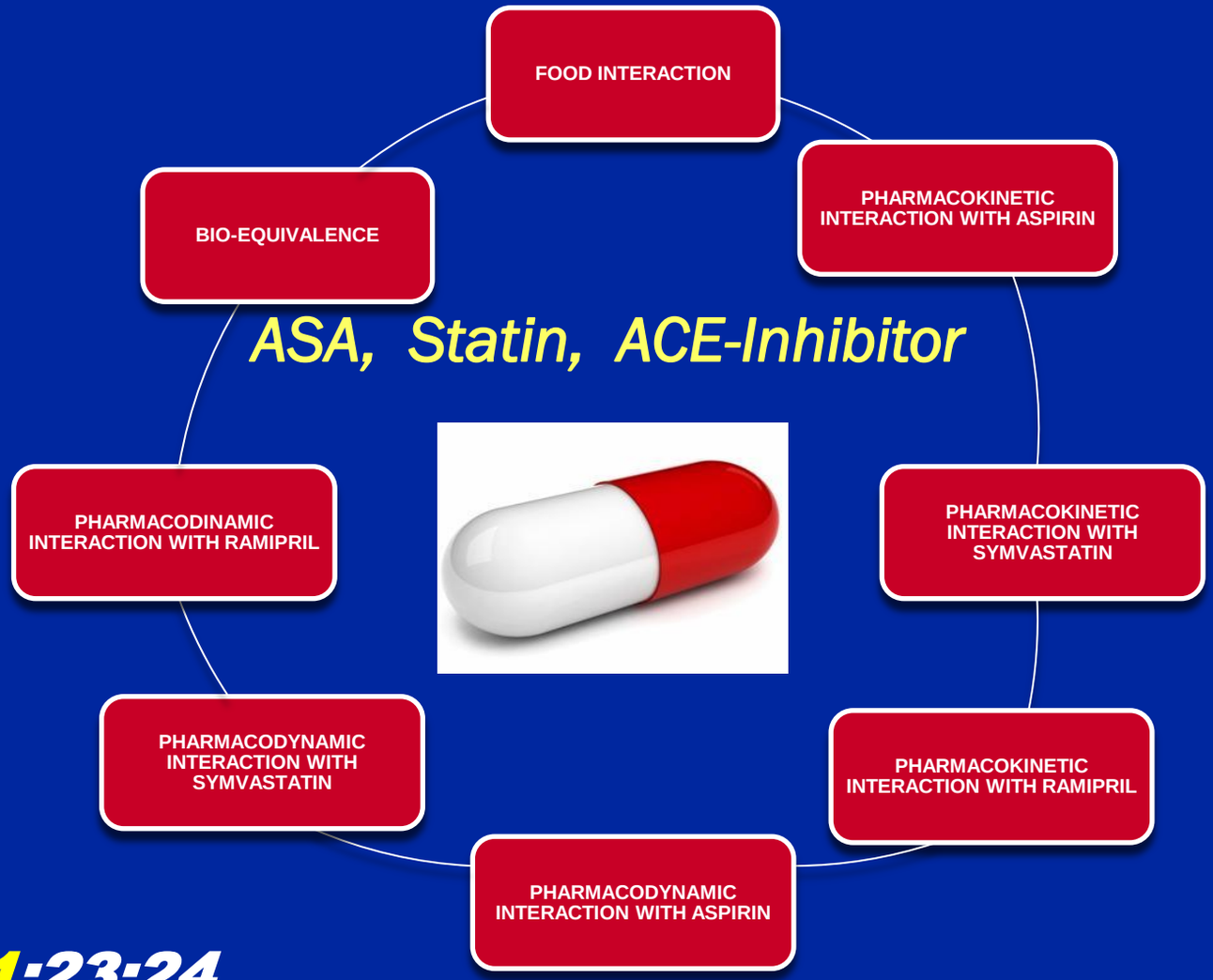
N Engl J Med 2017;376:1813

3a. Fuster- Polypill, 2ary Prevention.

FOCUS 1 & 2

Argentina
Brazil
Paraguay
Italy
Spain

FREEDOM
AETNA-DIABETES
SECURE-EC 2015

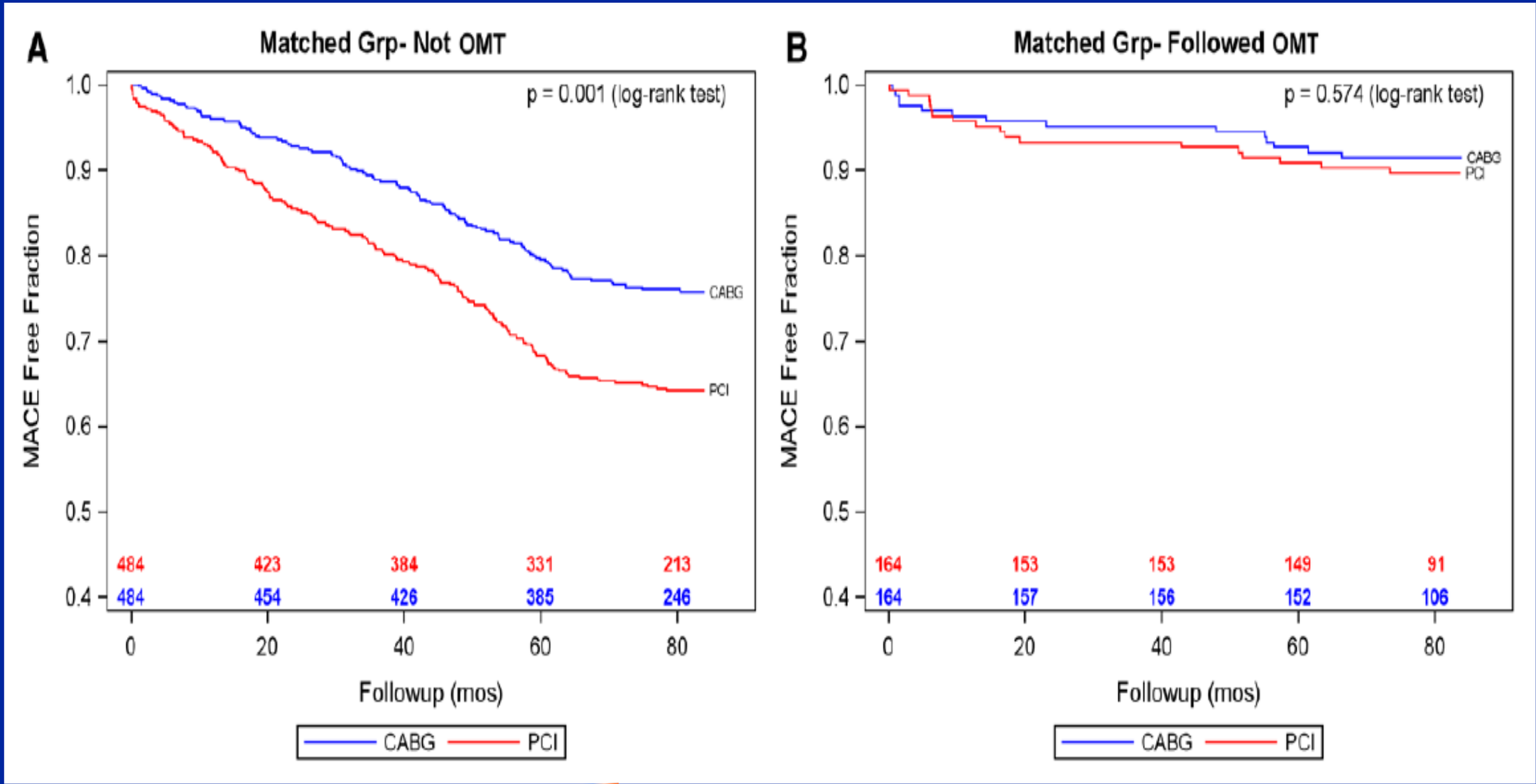


Am. H J 2011;162:811
Semin.Thor.Cardiov.Surg 2011;23:24
JACC, 2014; 64:2071

Approved in 45 Countries

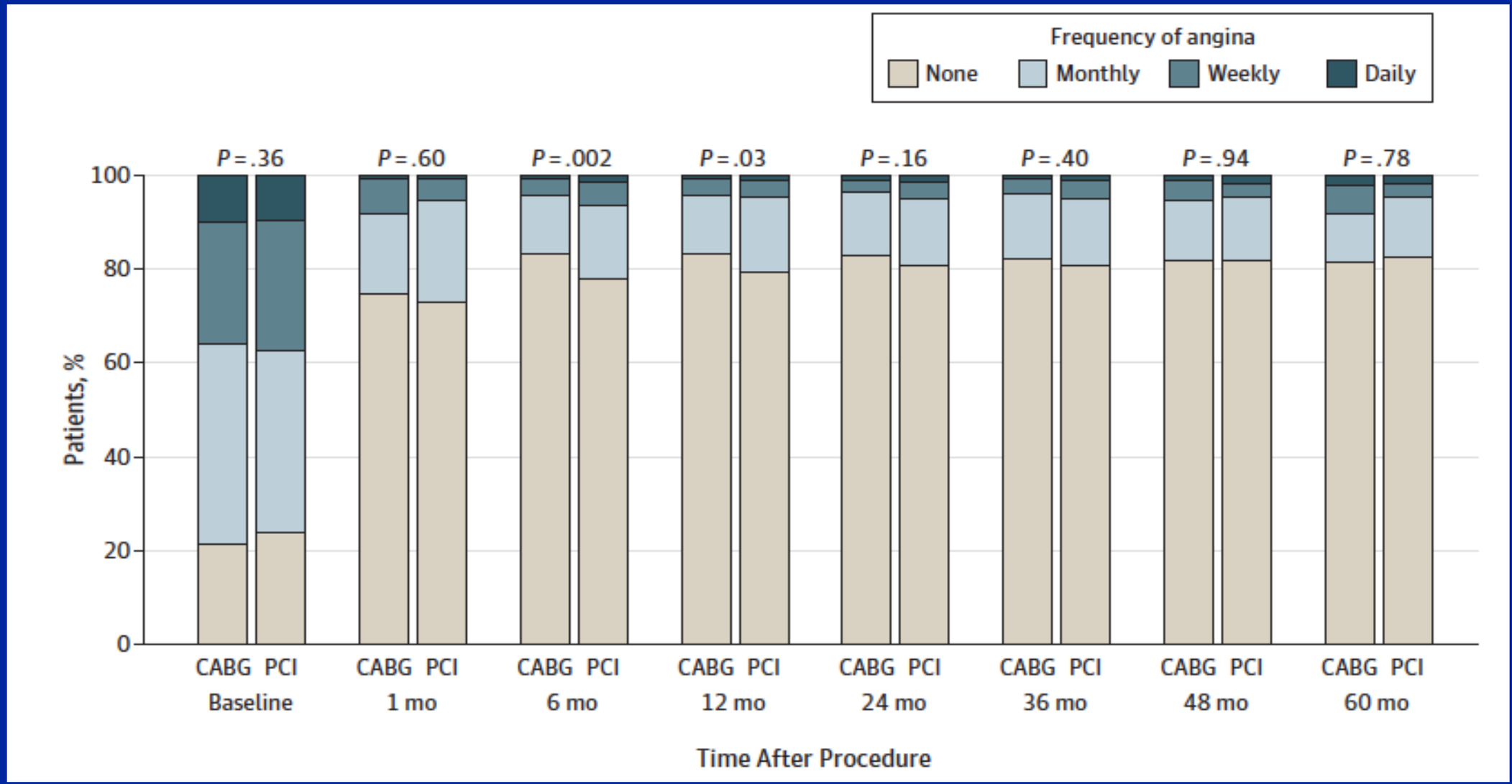
HOPE-3-NEJM 2016;374:2032 – Polypill for 1ary Prevention ?

3b. Survival Free From MACE In Matched Patients And Optimal Antiplatelet And Lipid-lowering Regimen



CARE Reg. (P Kurlansky, M Mack et. al.) Circulation. 2016;134:1238

4a. Angina in Diabetes - Follow-up

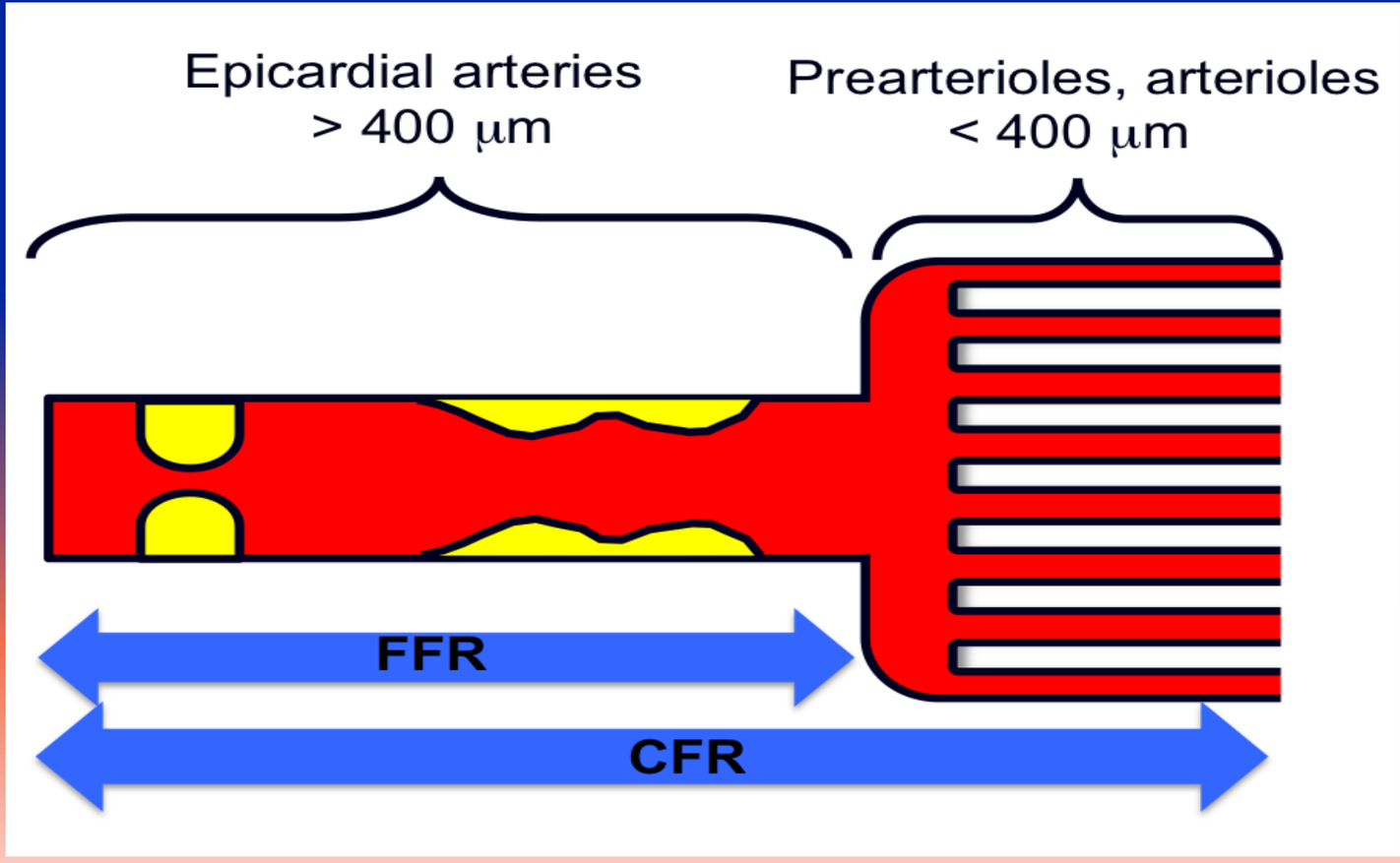


FREEDOM (MS Abdallah, V Fuster et. al.) JAMA. 2013;310(15):1581

SJ Head et. al. EHJ. 2014;35:2821 – **Usually, Angina in PCI > CABG**

4b. Coronary Flow Reserve (CFR)

➔ Measures *integrated* hemodynamic effects of epicardial CAD, diffuse atherosclerosis, vessel remodeling and microvascular dysfunction on myocardial tissue perfusion



$$CFR = \frac{MBF_{\text{peak hyperemia}}}{MBF_{\text{rest}}}$$

VR Taqueti and MF Di Carli 2014

CABG vs PCI – 2017
Stable Multivessel Coronary Disease

1. Are These The two Critical Questions ?

2. Two Questions are Ignored or Forgotten !

3. Review of the Present Four Observations

4. Readdressing the Four Questions

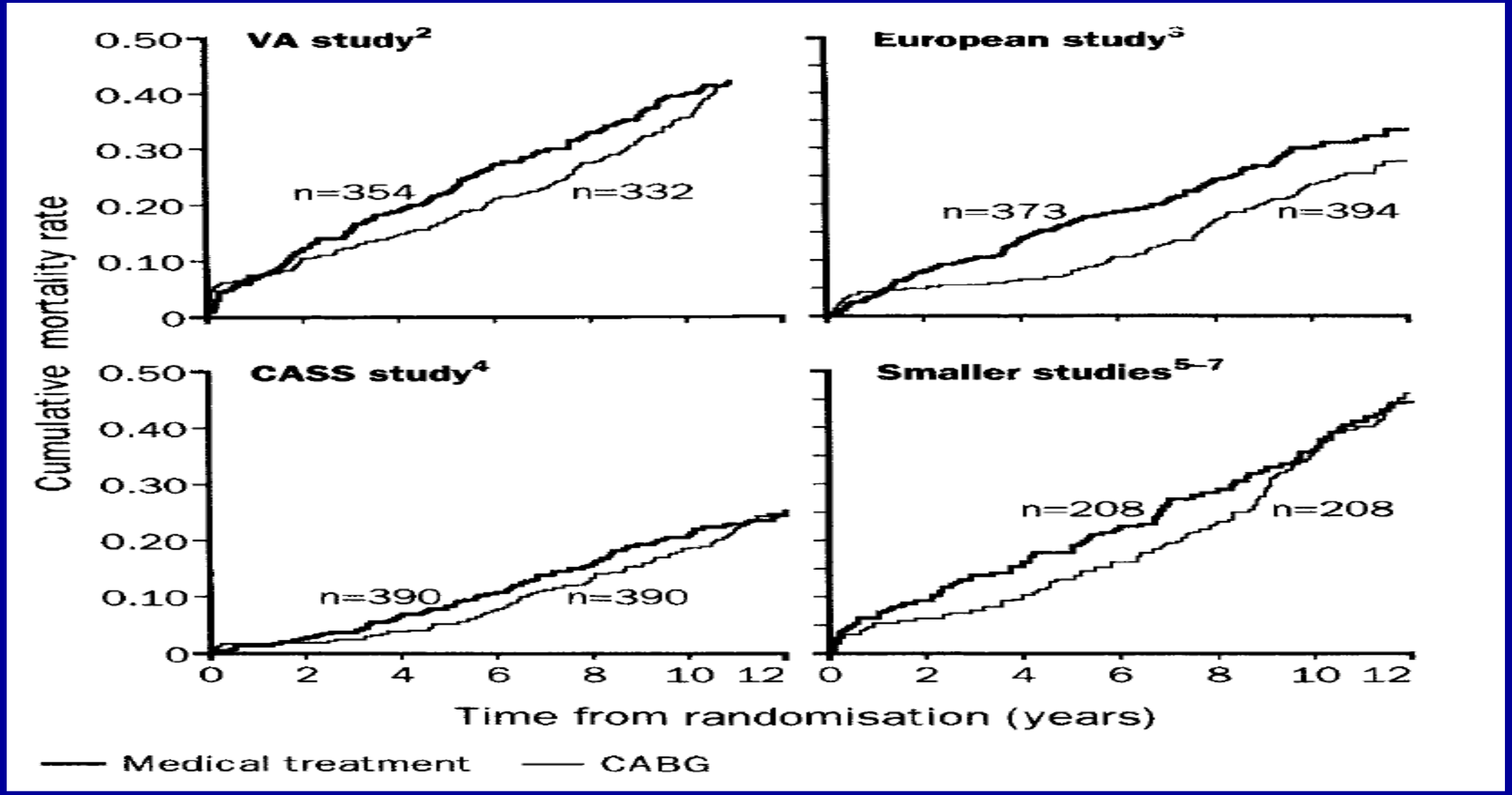
5. Mortality Reality & Managements Trends.

Effect of coronary artery bypass graft surgery on survival: overview of 10-year results from randomised trials by the Coronary Artery Bypass Graft Surgery Trialists Collaboration*

Salim Yusuf, David Zucker, Peter Peduzzi, Lloyd D Fisher, Timothy Takaro, J Ward Kennedy, Kathryn Davis, Thomas Killip, Eugene Passamani, Robin Norris, Cynthia Morris, Virendra Mathur, Ed Varnauskas, Thomas C Chalmers

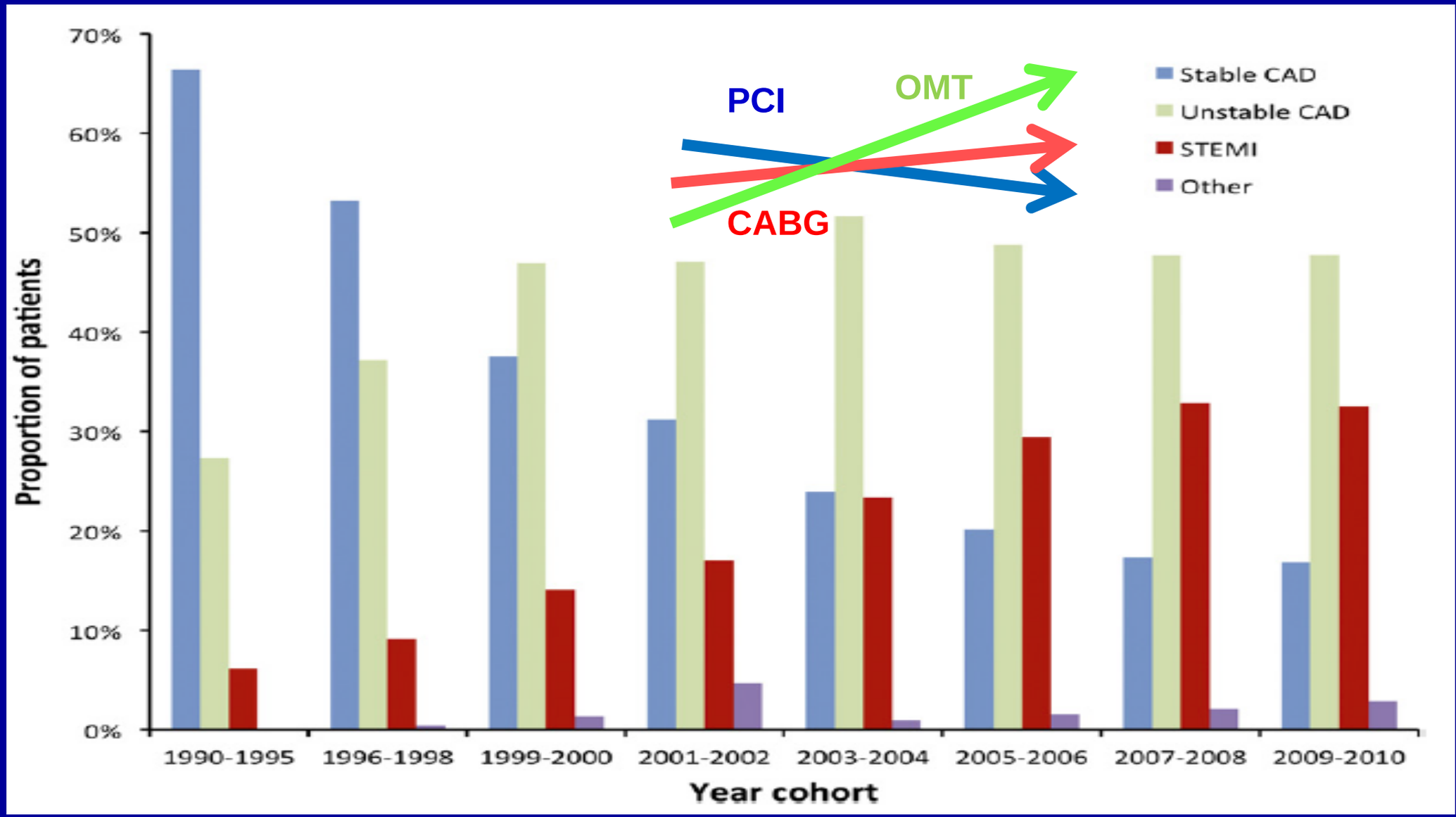
Lancet. 1994; 344: 563

Survival Curves Of The Three Large Studies And The Four Small Studies Combined



S Yusuf et. al. Lancet. 1994;344:563

Future For PCI / CABG – OMT ADHERENCE



SCAAR (ML Fokkema et.al.) JACC **2013**;61:1222 - **Swedish Registry**

Diab.Trialists' Collab. – 2015 - FREEDOM, BARI 2D, COURAGE

CABG vs PCI – 2017
Multivessel Coronary Disease

Better CABGs vs Better PCI Devices

ACC New York, Dec 8, 2017

No Disclosures