

# Coronary Artery Bypass Graft surgery versus Percutaneous Coronary Intervention: patient selection

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**Stroke Rates Following Surgical Versus Percutaneous Coronary Revascularization**

Published

Head, S. J. , Milojevic, M. , Daemen, J. , Ahn, J-M. , Boersma, E. , Booth, J. , Christiansen, E. H. , Domanski, M. J. , Farkouh, M. E. , Fuster, V. , [Flather, M.](#) , Papageorgiou, G. , Holm, N. R. , Hlatky, M. , Hueb, W. A. , Kamalesh, M. , Kim, Y-H. , Mäkikallio, T. , Mohr, F. W. , Park, S-J. & [6 others](#) 24 Jul 2018 In : Journal of the American College of Cardiology. 72, 4, p. 386-398

Contribution to journal · Article

**Incidence and clinical implications of intraoperative BITA grafts conversion. Insights from the Arterial Revascularization Trial**

Published

Benedetto, U., Altman, D. G., [Flather, M.](#), Gerry, S., Gray, A., Lees, B., Taggart, D. P. & ART Investigators Jun 2018 In : Journal of Thoracic and Cardiovascular Surgery. 155, 6, p. 2346-2355.e6

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**Mortality after coronary artery bypass grafting versus percutaneous coronary intervention with stenting for coronary artery disease: a pooled analysis of individual patient data**



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Contribution to journal · Article

# CABG versus PCI – patient selection

Articles

## Mortality after coronary artery bypass grafting versus percutaneous coronary intervention with stenting for coronary artery disease: a pooled analysis of individual patient data



Stuart J Head, Milan Milojevic, Joost Daemen, Jung-Min Ahn, Eric Boersma, Ewald H Christiansen, Michael J Domanski, Michael E Farkouh, Marcus Flather, Valentin Fuster, Mark A Hlatky, Niels R Holm, Whady A Hueb, Masoor Kamalesh, Young-Hak Kim, Timo Mäkikallio, Friedrich W Mohr, Grigorios Papageorgiou, Seung-Jung Park, Alfredo E Rodriguez, Joseph F Sabik 3rd, Rodney H Stables, Gregg W Stone, Patrick W Serruys, Arie Pieter Kappetein

**Head et al, Lancet 2018; 939-48**

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## Stroke Rates Following Surgical Versus Percutaneous Coronary Revascularization



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**Head et al. JACC 2018;72:386-398**

# PCI versus CABG: Results

- 11 RCTs – 11518 patients. PCI arm: BMS: 26.6%; first gen DES: 39.2%; newer gen DES: 34.2%

		PCI	CABG
Age		64 ± 9.8	64 ± 9.9
Female sex		24%	24%
Diabetes		39%	38%
Previous MI		28%	28%
Moderate/poor LVEF		16%	15%
Vessels	Any LM	39%	39%
	3VD	59%	62%
SYNTAX	Mean	26 ± 9.3	26 ± 9.8
	≥33	21.3%	22.8%
DES used		73.4%	-
Number of stents		3.1 ± 2.0	-
BIMA use		-	18.7%
Off-pump CABG		-	27.5%

Included trials (n=11):

- **ERACI II** (n=450)
- **ARTS** (n=1205)
- **MASS II** (n=408)
- **SoS** (n=988)
- **SYNTAX** (n=1800)
- **PRECOMBAT** (n=600)
- **FREEDOM** (n=1900)
- **VA CARDS** (n=198)
- **BEST** (n=880)
- **NOBLE** (n=1184)
- **EXCEL** (n=1905)

# PCI versus CABG: Results

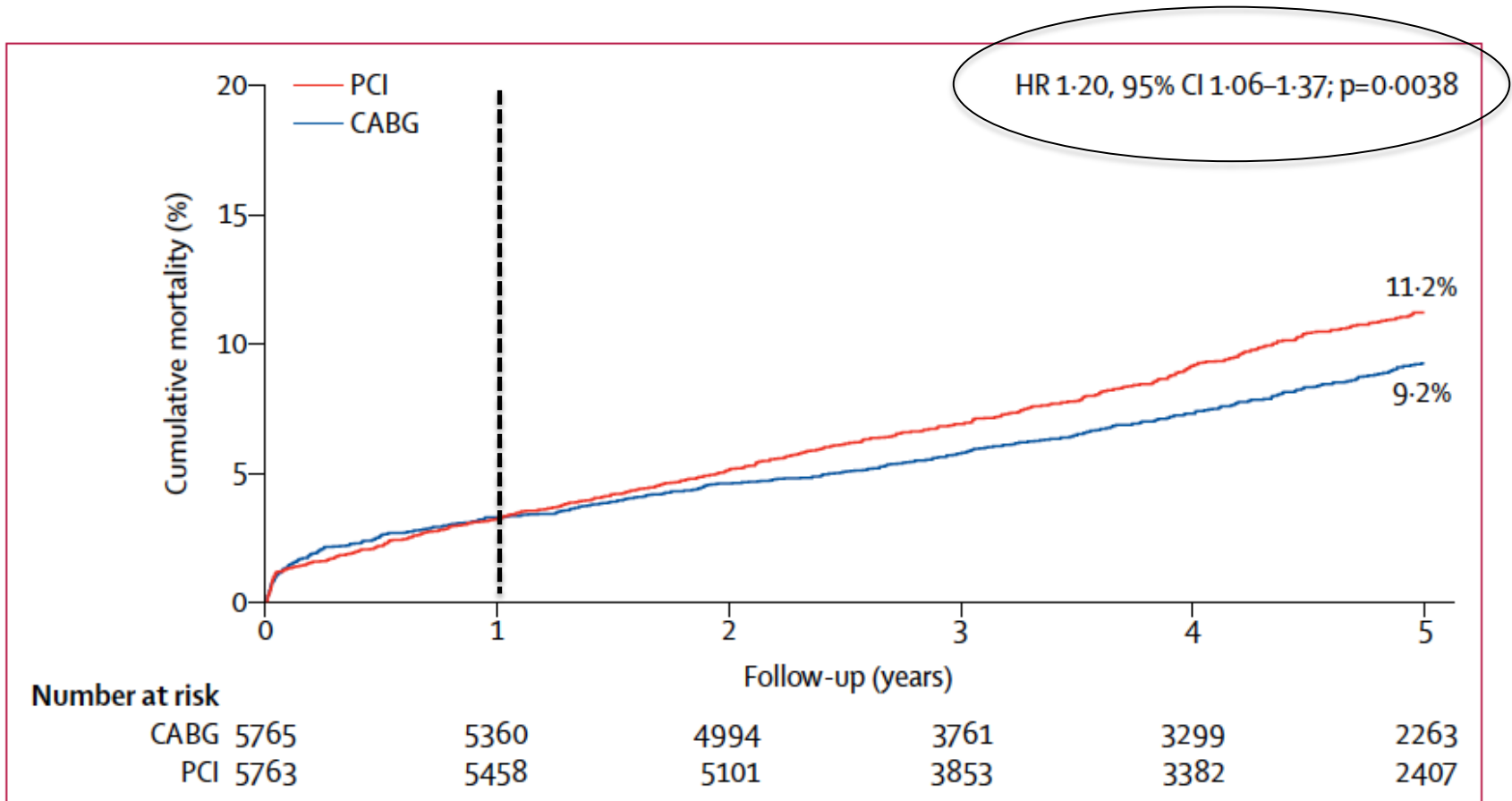


Figure 1: Mortality after CABG versus after PCI during 5 years' follow-up

Average follow-up: 3.8±1.4 years

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# PCI versus CABG: Results

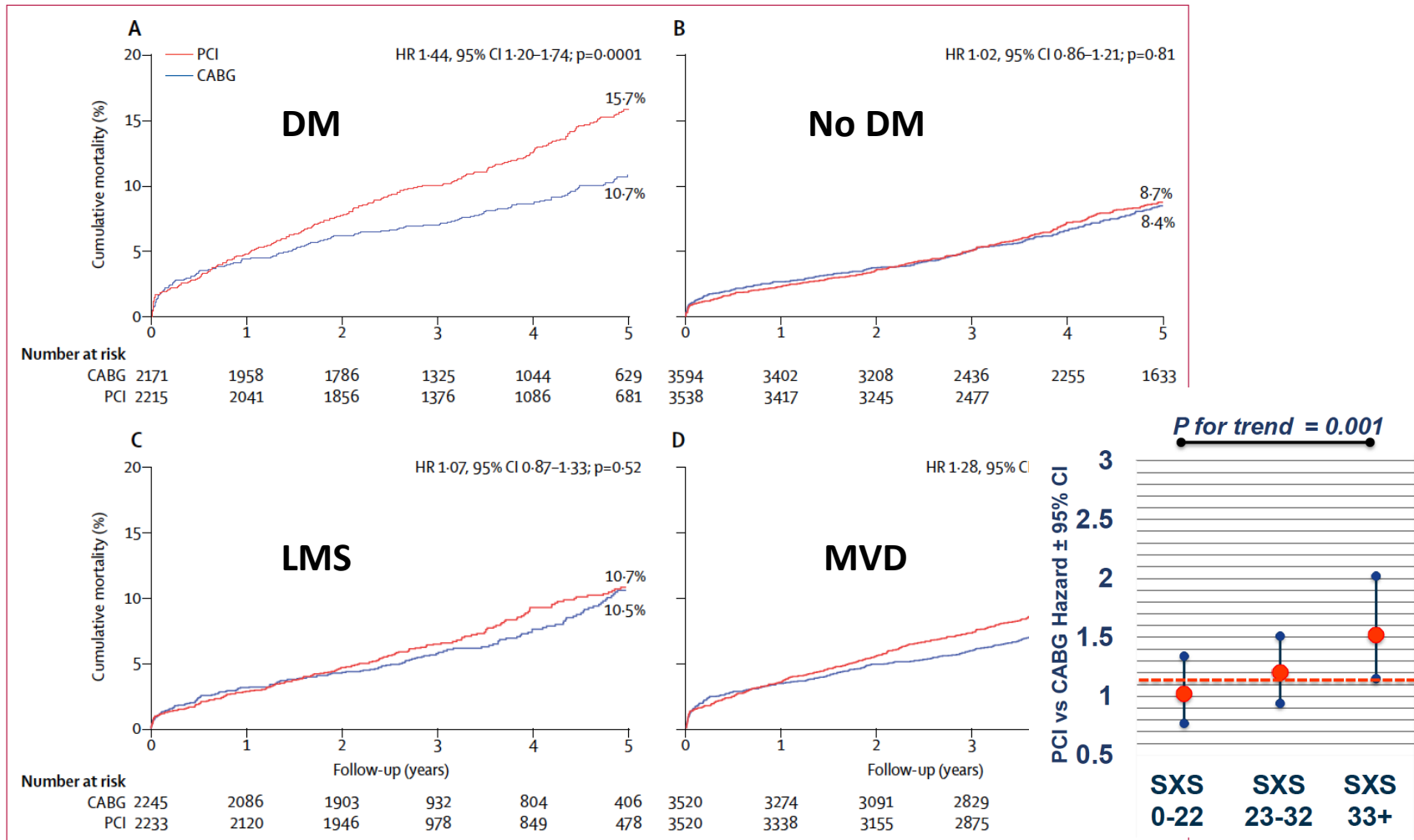
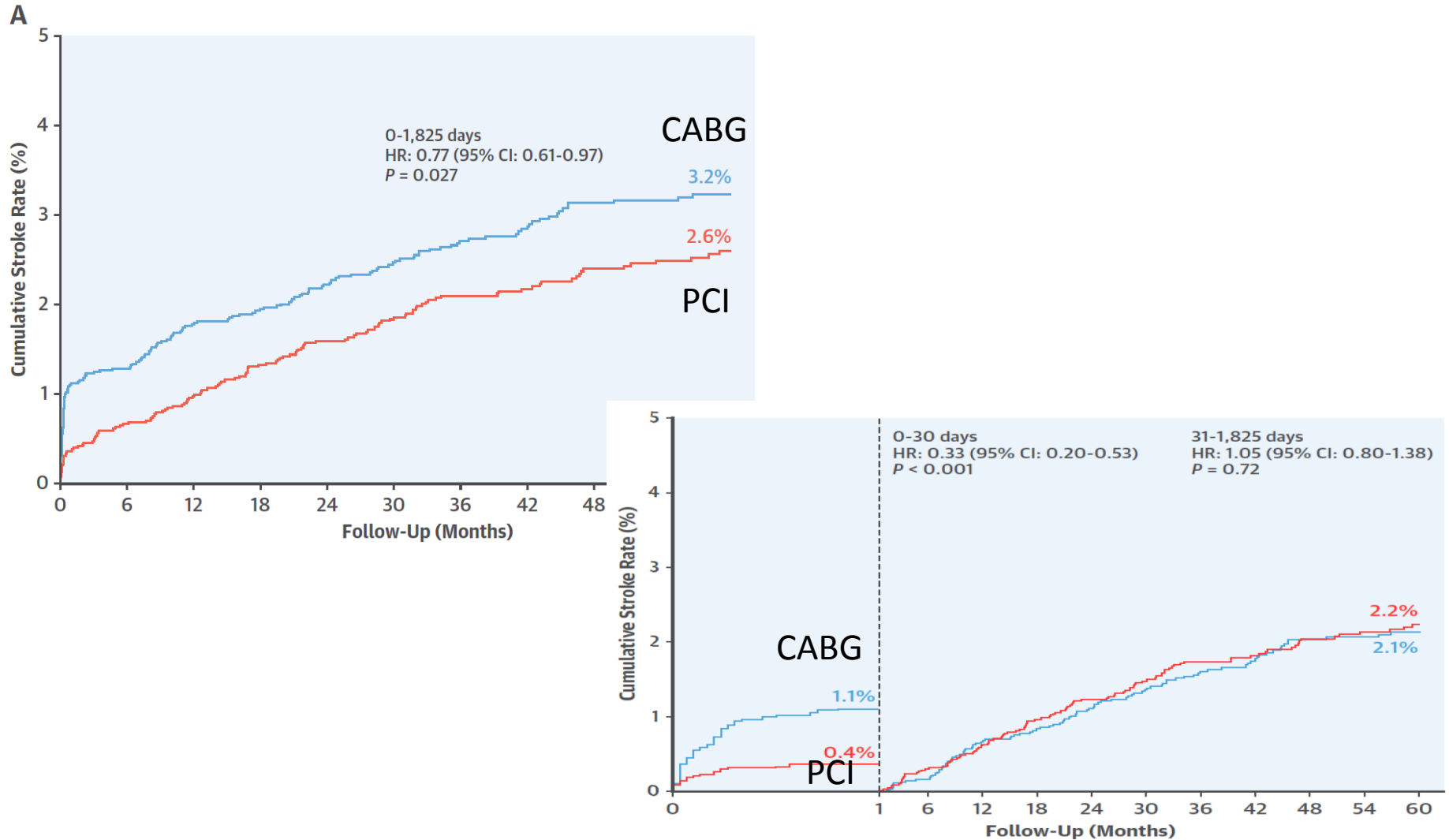


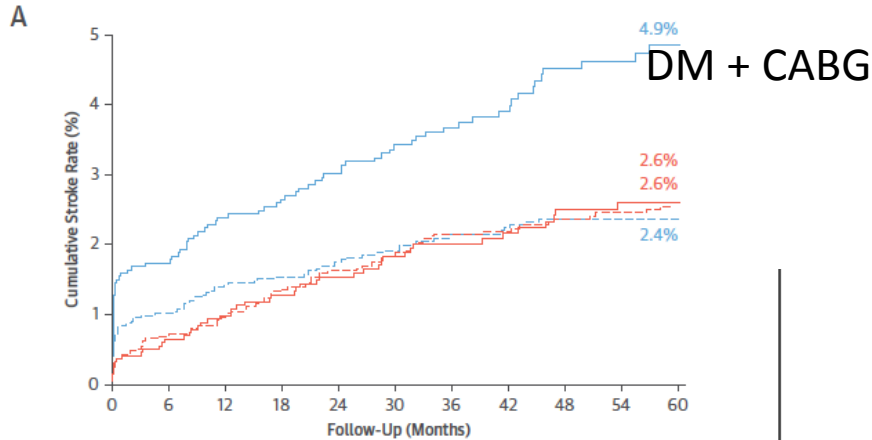
Figure 3: Mortality after CABG versus after PCI during 5 years' follow-up of patients with (A) or without (B) diabetes and with left main disease (C) or multivessel disease (D)

# Stroke early post-CABG



# Stroke early post-CABG

**FIGURE 3** Stroke After PCI Versus CABG During 5-Year Follow-Up of Patients With and Without DM, LM, or MVD

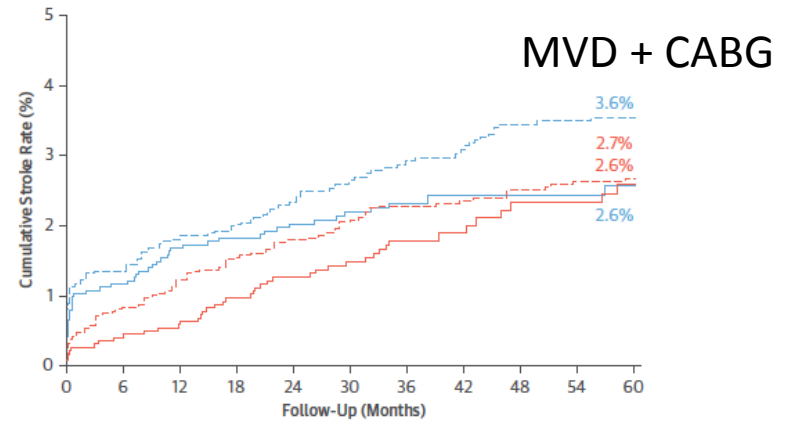


**Number at Risk**

CABG (DM)	2,171	1,986	1,921	1,862	1,744	1,579	1,287	1,141	1,007	846	604
PCI (DM)	2,215	2,097	2,025	1,955	1,842	1,647	1,354	1,209	1,068	890	671
CABG (Non-DM)	3,594	3,435	3,361	3,276	3,157	2,971	2,390	2,305	2,206	2,111	1,599
PCI (Non-DM)	3,538	3,448	3,390	3,310	3,202	3,006	2,434	2,345	2,252	2,148	1,690

— PCI-DM > HR: 0.52 (95% CI: 0.37-0.75,  $P < 0.001$ )    - - - PCI-Non DM > HR: 1.04 (95% CI: 0.77-1.42,  $P = 0.61$ )  
 — CABG-DM > HR: 0.52 (95% CI: 0.37-0.75,  $P < 0.001$ )    - - - CABG-Non DM > HR: 1.04 (95% CI: 0.77-1.42,  $P = 0.61$ )

**B**



**Number at Risk**

CABG (LM)	2,245	2,132	2,061	1,985	1,875	1,659	917	856	788	714	398
PCI (LM)	2,233	2,175	2,111	2,033	1,938	1,700	968	903	838	769	476
CABG (MVD)	3,520	3,289	3,221	3,153	3,026	2,891	2,760	2,590	2,425	2,243	1,805
PCI (MVD)	3,520	3,370	3,304	3,232	3,106	2,953	2,820	2,651	2,482	2,269	1,885

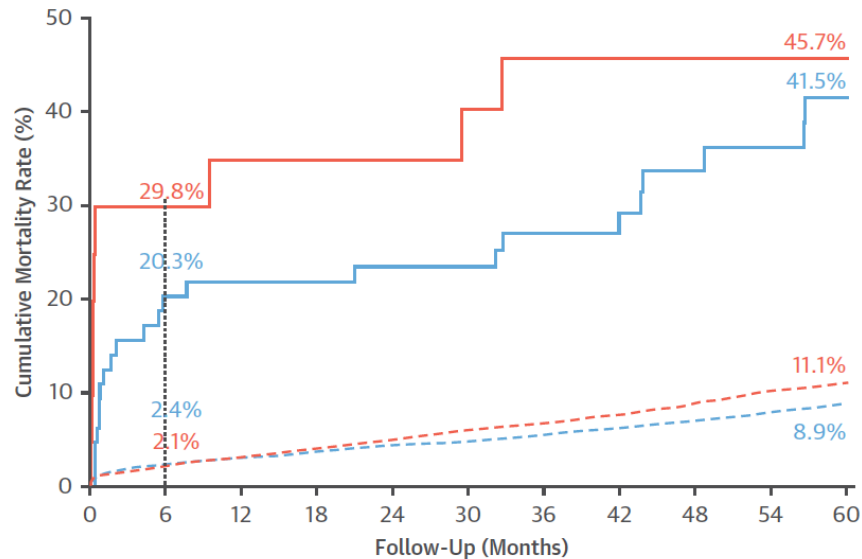
— PCI-LM > HR: 0.83 (95% CI: 0.55-1.24,  $P = 0.36$ )    - - - PCI-MVD > HR: 0.74 (95% CI: 0.56-0.99,  $P = 0.039$ )  
 — CABG-LM > HR: 0.83 (95% CI: 0.55-1.24,  $P = 0.36$ )    - - - CABG-MVD > HR: 0.74 (95% CI: 0.56-0.99,  $P = 0.039$ )

Stroke after PCI (percutaneous coronary intervention) versus CABG (coronary artery bypass grafting) during 5-year follow-up of patients with and without diabetes mellitus (DM) (**A**) and patients with left main (LM) or multivessel disease (MVD) (**B**). There was significant diabetes-by-treatment interaction ( $p$  for interaction = 0.004). No interaction was explored for LM and MVD, because these groups are not mutually exclusive. Abbreviations as in Figure 1.



# Stroke early post-CABG and mortality

**FIGURE 4** Mortality After PCI Versus CABG of Patients With and Without Stroke Within 30 Days After Revascularization



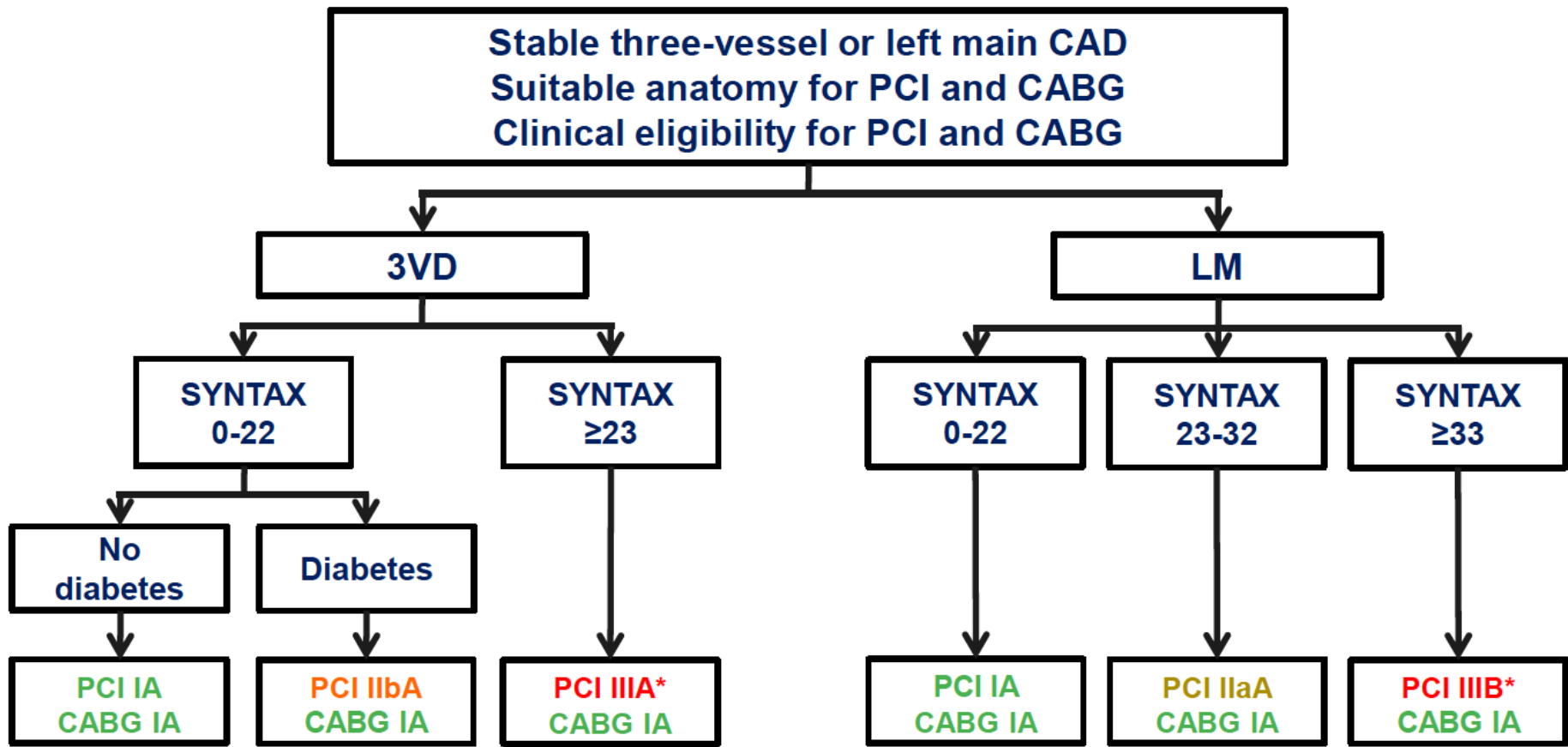
**Number at Risk**

CABG (Stroke)	64	51	50	49	48	43	34	32	27	25	16
PCI (Stroke)	21	14	13	13	13	11	10	9	7	7	5
CABG (No Stroke)	5,701	5,428	5,310	5,174	4,946	4,599	3,727	3,502	3,272	3,012	2,247
PCI (No Stroke)	5,732	5,559	5,445	5,305	5,088	4,708	3,843	3,607	3,375	3,086	2,400

— PCI-Stroke  $> P < 0.001$ 
- - - PCI-No Stroke  $> P < 0.001$   
— CABG-Stroke  $> P < 0.001$ 
- - - CABG-No Stroke  $> P < 0.001$

**Solid lines** indicate patients who experienced a stroke within the first 30 days of follow-up, and **dotted lines** indicate patients without a stroke. Follow-up starts at 30 days, indicated here as time 0. Abbreviations as in [Figures 1 and 3](#).

# Choice of revascularization strategy in MVD or LMS



# Take home message

- In patients with advanced CAD and with estimated clinical equipoise, consideration of **disease type** (multi-vessel or left main), **coronary complexity**, and **diabetes status** is crucial
- Higher risk of early stroke with CABG
- Longer follow-up of RCTs is needed to better define mortality differences in overall patients and specific subgroups

# Thank you

- Questions?



The image shows a Twitter profile card for the account @JCRBusan. The profile picture is a circular logo featuring a red heart shape with the letters 'JCR' inside, and the text 'Joint meeting of Coronary Revascularisation' below it. The header image of the profile is a scenic view of a city skyline with modern buildings and a body of water in the foreground. The profile name is 'Joint meeting of C...' and the handle is '@JCRBusan'. Below the name, there are three statistics: 'Tweets' with a count of 31, 'Following' with a count of 947, and 'Followers' with a count of 109.

Tweets	Following	Followers
31	947	109



@DrHBulluck