

New Meta-analysis of RCTs in LM Revascularization

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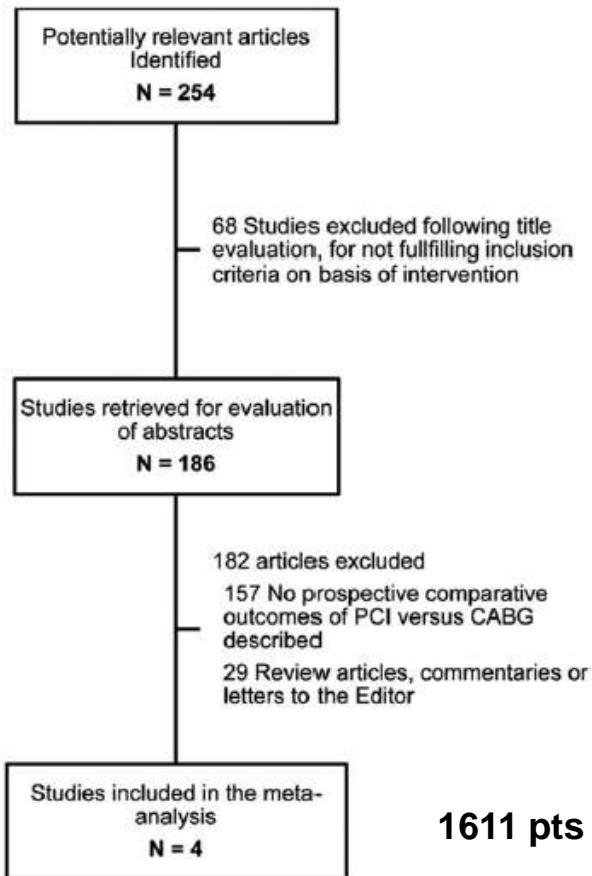
Disclosure

- **Speaker fee from Abbott**
- **Research grant from Eli Lilly**

Percutaneous Coronary Intervention Versus Coronary Artery Bypass Graft Surgery in Left Main Coronary Artery Disease

A Meta-Analysis of Randomized Clinical Data

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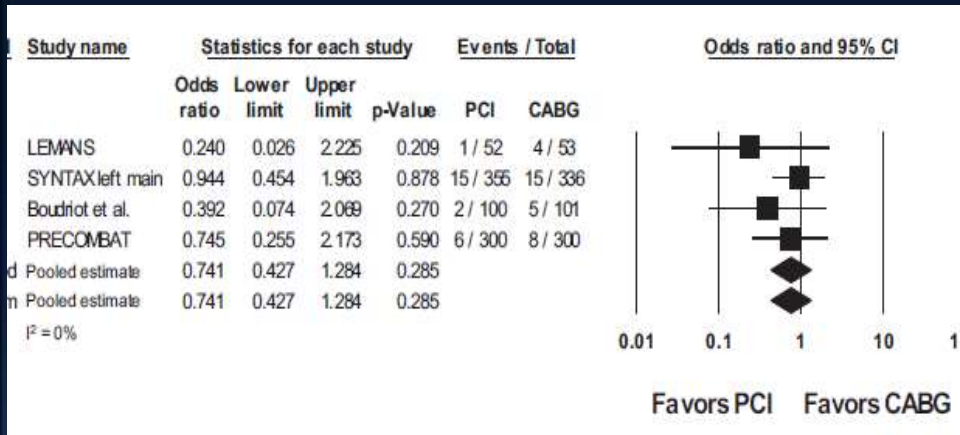
1611 pts

Study/First Author (Ref. #)	Year	Design	N
LEMANS (4)	2008	RCT	105
SYNTAX Left Main (5)	2009	Pre-specified subanalysis from RCT	705
Boudriot et al. (8)	2010	RCT	201
PRECOMBAT (9)	2011	RCT	600

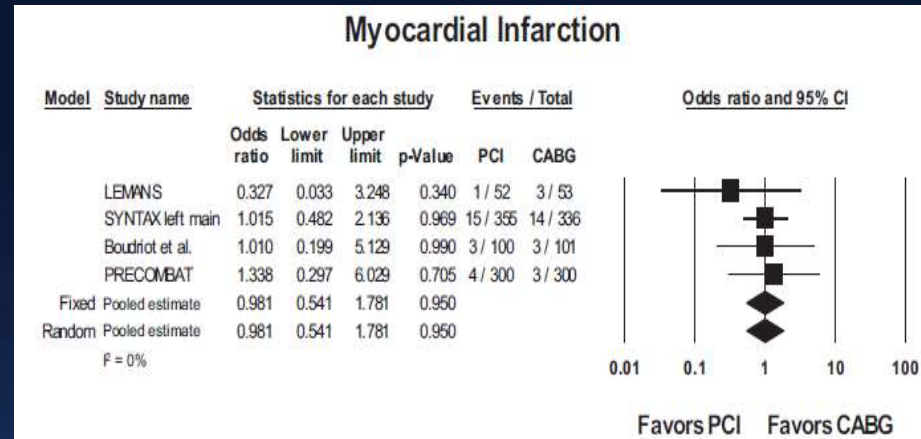
JACC 2011

1-year clinical outcomes

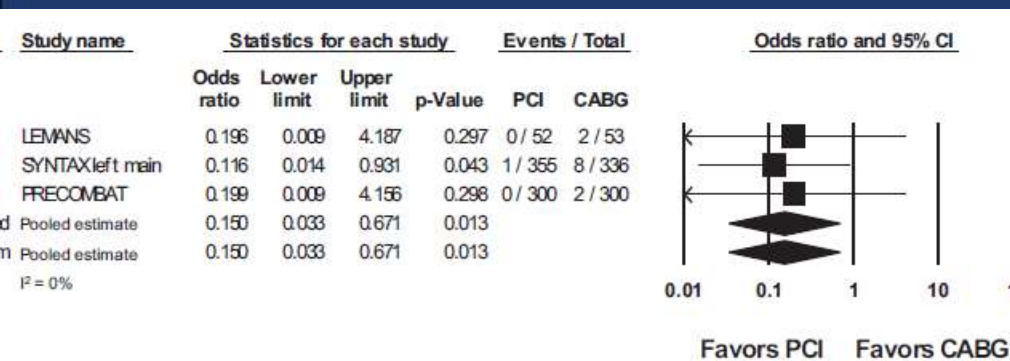
Death



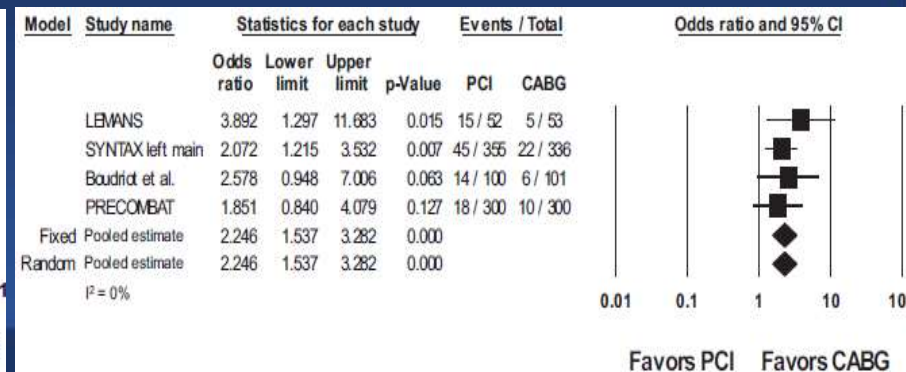
Myocardial infarction



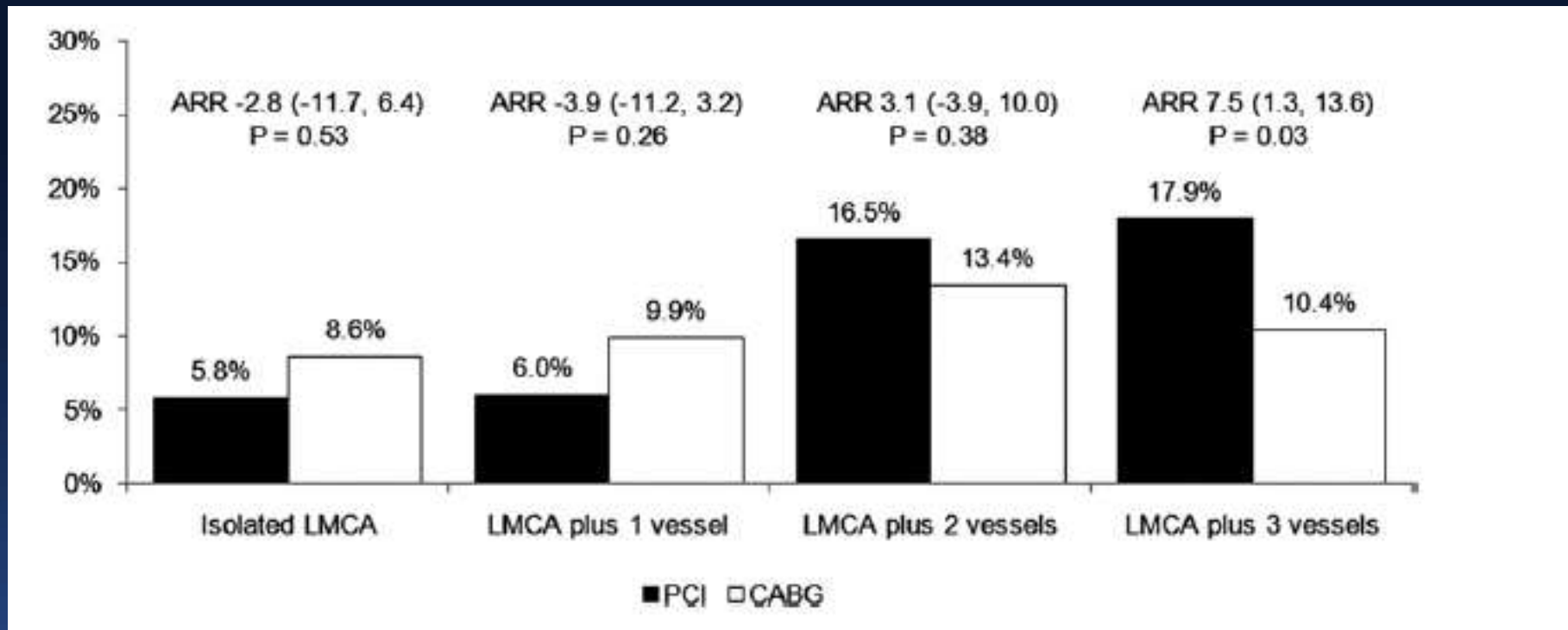
Stroke



TVR



Clinical outcomes in relation to CAD



Limits

- **Relatively small RCTs**
- **Clinical endpoints determined at 1 year**
- **Composite endpoint of death, MI, TVR**
- **Underpowered for clinically relevant endpoint such as death, MI or stroke**
- **First generation DES**

Everolimus-Eluting Stents or Bypass Surgery for Left Main Coronary Artery Disease

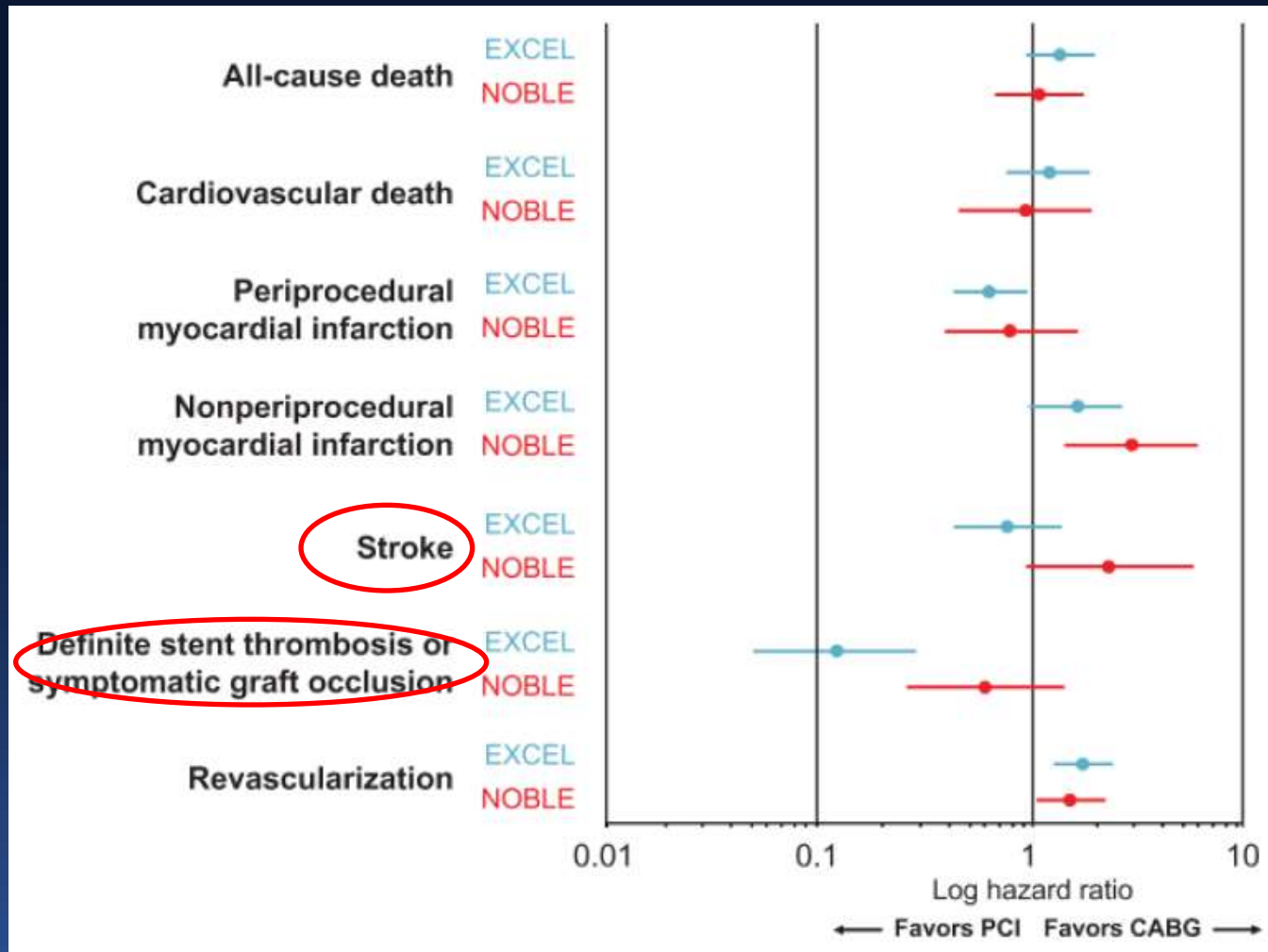
G.W. Stone, J.F. Sabik, P.W. Serruys, C.A. Simonton, P. Généreux, J. Puskas, D.E. Kandzari, M.-C. Morice, N. Lembo, W.M. Brown III, D.P. Taggart, A. Banning, B. Merkely, F. Horkay, P.W. Boonstra, A.J. van Boven, I. Ungi, G. Bogáts, S. Mansour, N. Noiseux, M. Sabaté, J. Pomar, M. Hickey, A. Gershlick, P. Buszman, A. Bochenek, E. Schampaert, P. Pagé, O. Dressler, I. Kosmidou, R. Mehran, S.J. Pocock, and A.P. Kappetein, for the EXCEL Trial Investigators*

VS

Percutaneous coronary angioplasty versus coronary artery bypass grafting in treatment of unprotected left main stenosis (NOBLE): a prospective, randomised, open-label, non-inferiority trial

*Timo Mäkikallio, Niels R Holm, Mitchell Lindsay, Mark S Spence, Andrejs Erglis, Ian BA Menown, Thor Trovik, Markku Eskola, Hannu Romppanen, Thomas Kellerth, Jan Ravkilde, Lisette O Jensen, Gintaras Kalinauskas, Rikard B A Linder, Markku Pentikainen, Anders Hervold, Adrian Banning, Azfar Zaman, Jamen Cotton, Erlend Eriksen, Sulev Margus, Henrik T Sørensen, Per H Nielsen, Matti Niemelä, Kari Kervinen, Jens F Lassen, Michael Maeng, Keith Oldroyd, Geoff Berg, Simon J Walsh, Colm G Hanratty, Indulis Kumsars, Peteris Stradins, Terje K Steigen, Ole Frøbert, Alastair N J Graham, Petter C Endresen, Matthias Corbascio, Olli Kajander, Uday Trivedi, Juha Hartikainen, Vesa Anttila, David Hildick-Smith, Leif Thuesen, Evald H Christiansen, for the NOBLE study investigators**

EXCEL vs NOBLE



Definite or probable stent thrombosis

Excel

Noble

Definite stent thrombosis

3%

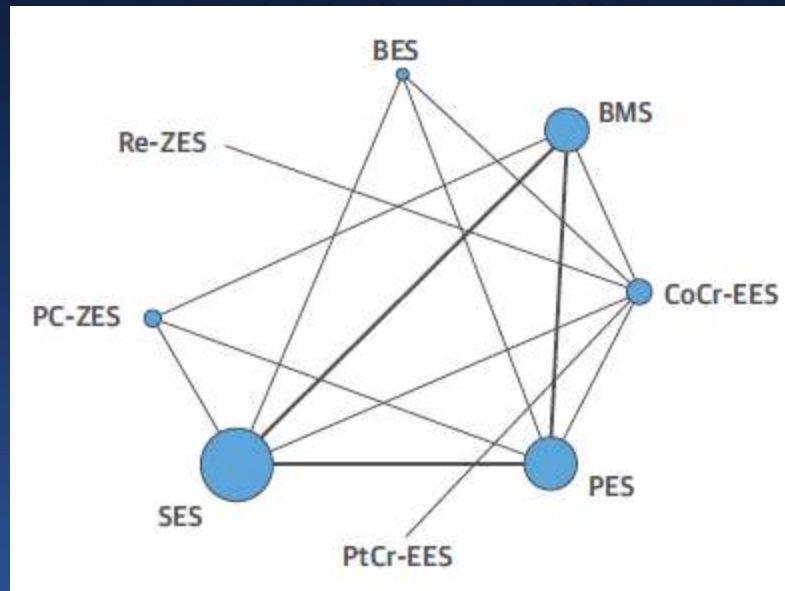
0.7%

Long-Term Safety of Drug-Eluting and Bare-Metal Stents



Evidence From a Comprehensive Network Meta-Analysis

Tullio Palmerini, MD,* Umberto Benedetto, MD,† Giuseppe Biondi-Zoccai, MD,‡ Diego Della Riva, MD,*
Letizia Bacchi-Reggiani, MSTAT,* Pieter C. Smits, MD, PhD,§ Georgios J. Vlachojannis, MD, PhD,§
Lisette Okkels Jensen, MD,|| Evald H. Christiansen, MD, PhD,¶ Klára Berencsi, MSTAT,|| Marco Valgimigli, MD,#
Carlotta Orlandi, MD,* Mario Petrou, MD,† Claudio Rapezzi, MD,* Gregg W. Stone, MD**

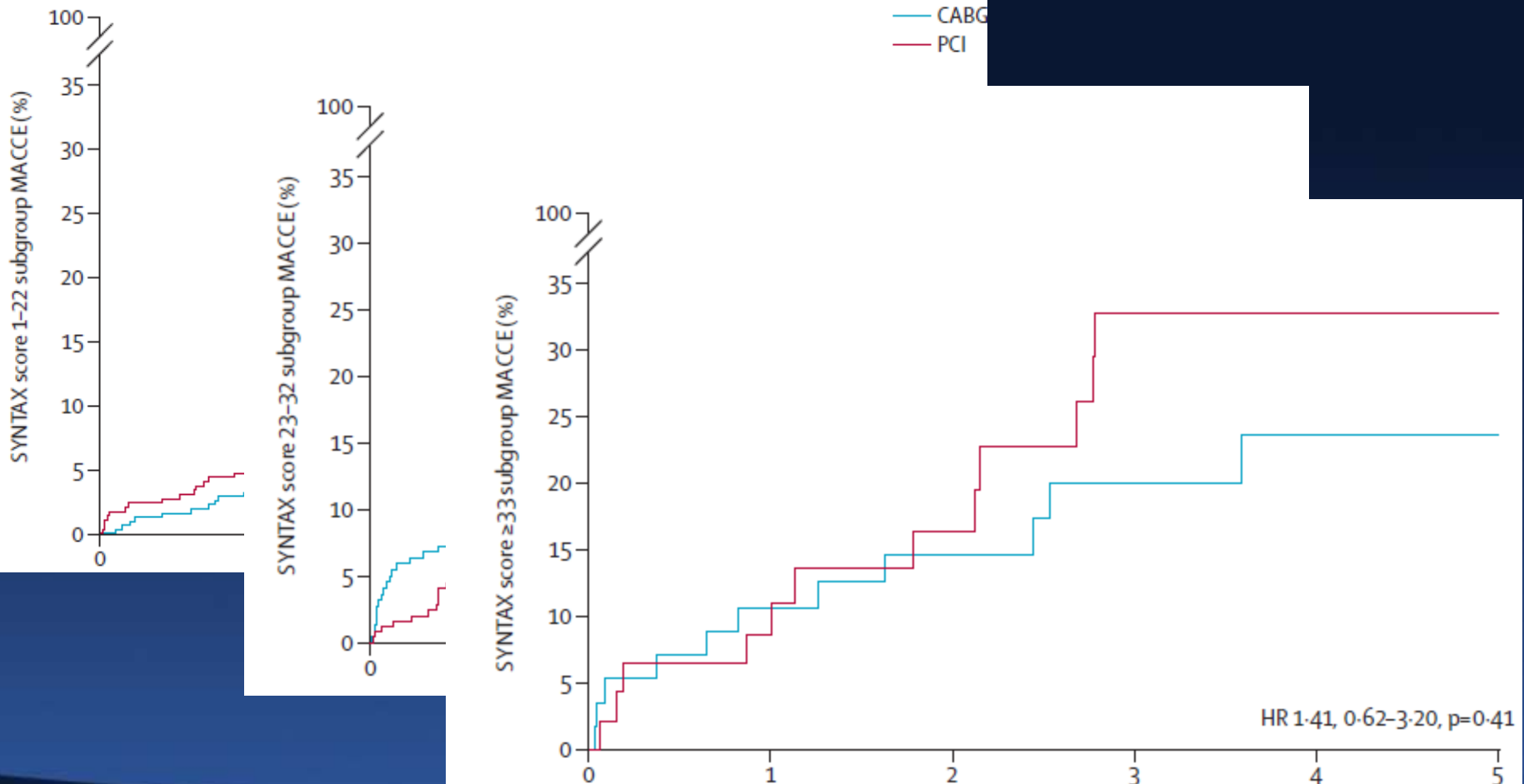


***RCT with at least 3-year fup
51 RCTs with 52,158 patients
Mean follow up 4 years***

What do we expect from a new meta-analysis?

- More power to address difference in mortality
- More power to address time related differences in clinical outcomes
- More power to address differences in clinical outcomes related to the SYNTAX score

Clinical outcomes stratified by SYNTAX score in NOBLE



Data collected from principal investigators

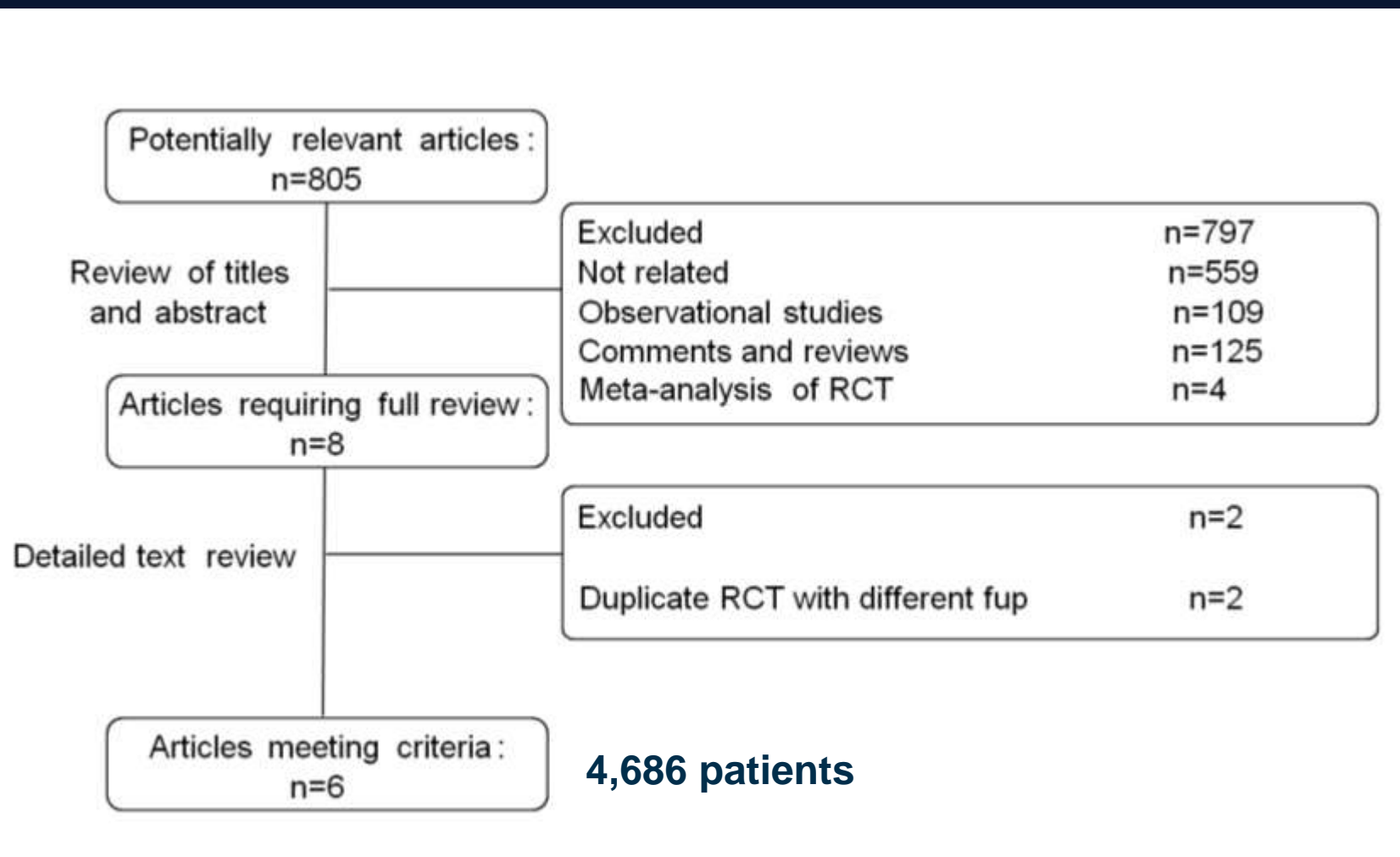
Study	30 days	Latest follow up available
BUDRIOT et al	Stroke Death/MI/stroke Death/MI/stroke/UR	Stroke Death/MI/stroke Death/MI/stroke/UR
PRECOMBAT	All cause death Cardiac death MI Stroke TVR All cause death/MI All cause death/MI/stroke All cause death/MI/stroke/UR	All cause death/MI All cause death stratified by Syntax score Cardiac death stratified by Syntax score MI stratified by Syntax score Stroke stratified by Syntax score UR stratified by Syntax score All cause death/MI stratified by Syntax score All cause death/MI/stroke stratified by Syntax score All cause death/MI/stroke/UR stratified by Syntax score
SYNTAX LEFT MAIN	All cause death Cardiac death MI Stroke All cause death/MI All cause death/MI/stroke All cause death/MI/stroke/UR	All cause death/MI
NOBLE	All cause death/MI All cause death/MI/stroke All cause death/MI/stroke/UR	All cause death/MI All cause death/MI/stroke
EXCEL	All cause death/MI	All cause death/MI All cause death/MI/UR All cause death stratified by Syntax score Cardiac death stratified by Syntax score MI stratified by Syntax score Stroke stratified by Syntax score UR stratified by Syntax score All cause death/MI stratified by Syntax score All cause death/MI/stroke stratified by Syntax score All cause death/MI/stroke/UR stratified by Syntax score

Clinical Outcomes with Percutaneous Coronary Revascularization versus Coronary Artery Bypass Grafting Surgery in Patients with Unprotected Left Main Coronary Artery Disease: A Meta-Analysis of Six Randomized Trials and 4,686 Patients

Tullio Palmerini, Patrick Serruys, Arie Pieter Kappetein, Philippe Genereux, Diego Della Riva, MD; Letizia Bacchi Reggiani, Evald Christiansen, Niels R Holm, Leif Thuesen, Timo Makikallio, Marie Claude Morice, Jung-Min Ahn, Seung-Jung Park, Holger Thiele, Enno Boudriot, Mario Sabatino, Mattia Romanello, Giuseppe Biondi-Zoccai, Raphael Cavalcante, Joseph F. Sabik, Gregg W. Stone

Submitted

Flow diagram

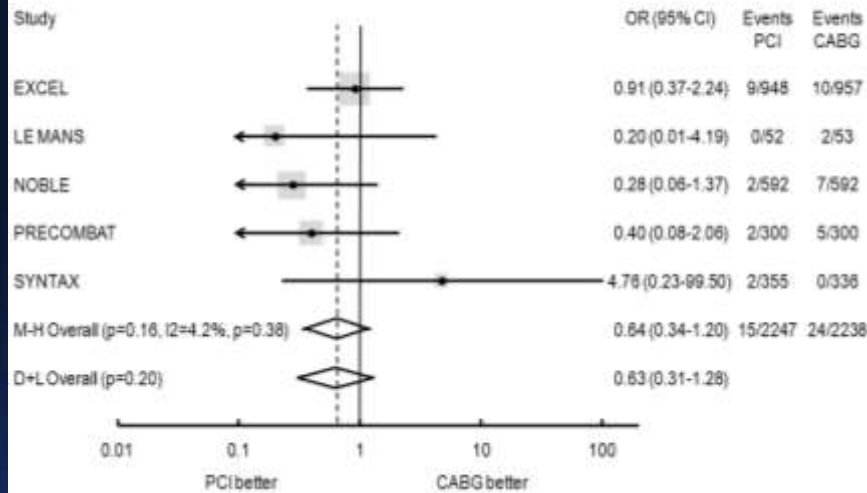


Angiographic and procedural characteristics

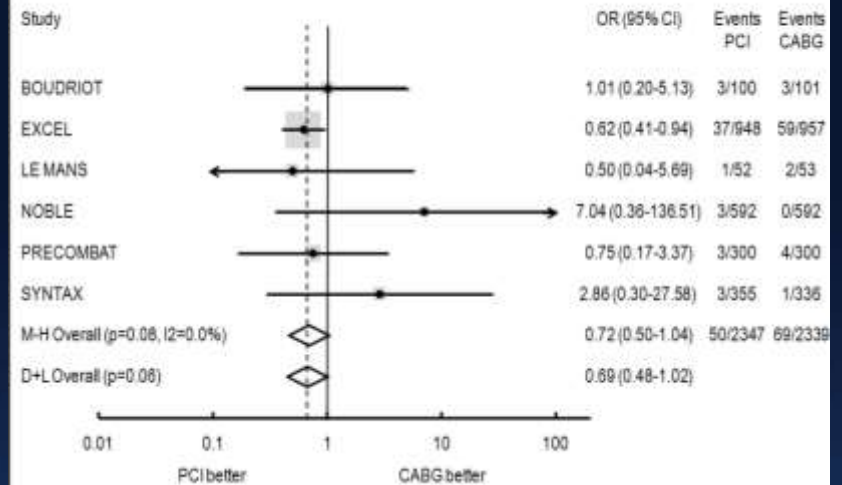
Study	PCI vs CABG	Isolated LM	LM + 1 vessel	LM + 2 vessels	LM + 3 vessels	Distal LM	Mean Syntax score	CR	Type of stent/LIMA to LAD
BOUDRIOT et al	PCI	28%	35%	26%	11%	74%	24.0	98%	SES 98%
	CABG	29%	27%	28%	17%	69%	23.0	97%	99%
EXCEL	PCI	17%	31%	35%	17%	82%	20.6	NA	EES 100%
	CABG	18%	31%	32%	19%	79%	20.5	NA	98.8%
LE MANS	PCI	0	13%	27%	60%	56%	25.2	79%	DES 35%
	CABG	0	6%	19%	75%	60%	24.7	89%	81%
NOBLE	PCI	NA	NA	NA	NA	81%	22.5	NA	DES 100%
	CABG	NA	NA	NA	NA	81%	22.4	NA	93%
PRECOMBAT	PCI	9%	8%	16%	25%	67%	24.4	68%	DES 100%
	CABG	11%	8%	19%	13%	62%	25.8	70%	94%
SYNTAX LEFT MAIN	PCI	12%	19%	31%	38%	56%	29.6	64%	PES 100%
	CABG	14%	20%	30%	35%	52%	30.2	72%	97%

30-day outcomes

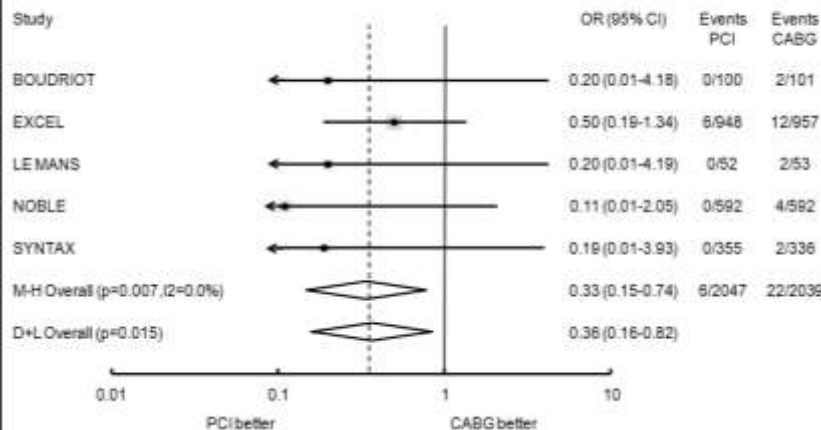
All cause death



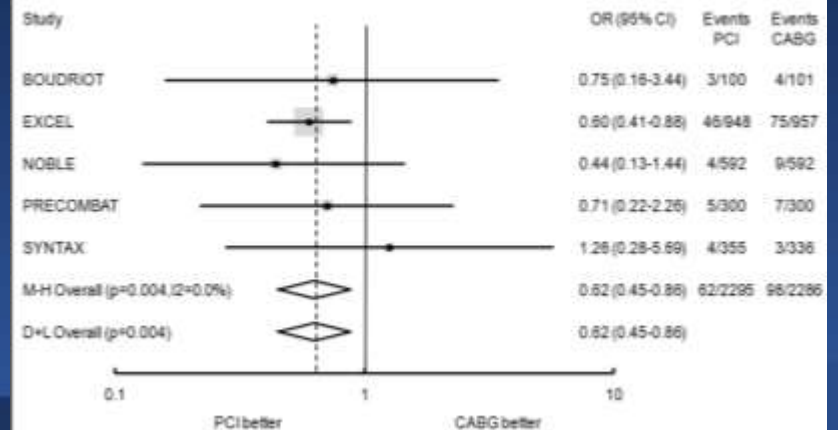
Myocardial infarction



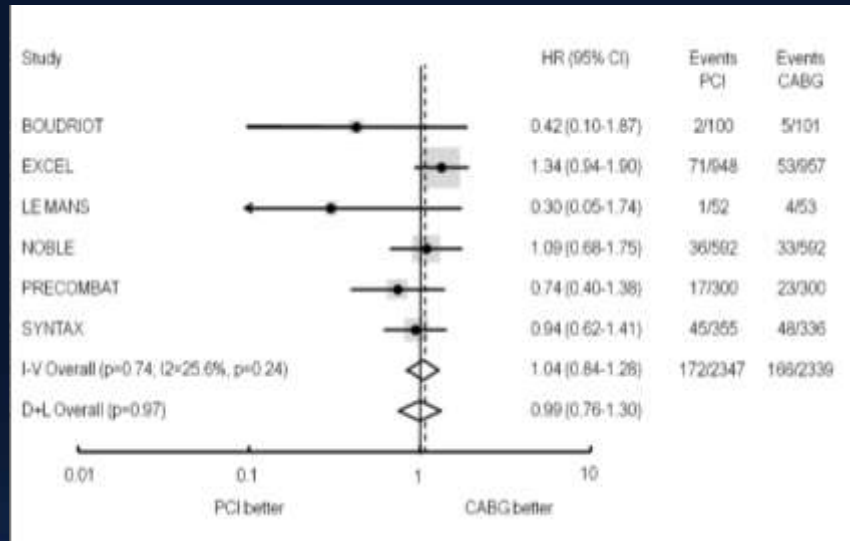
Stroke



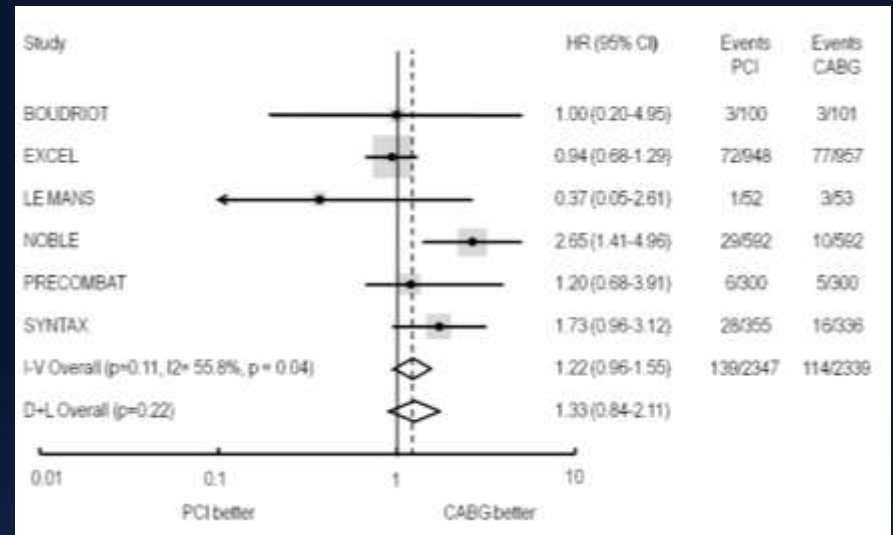
All cause death, MI, stroke



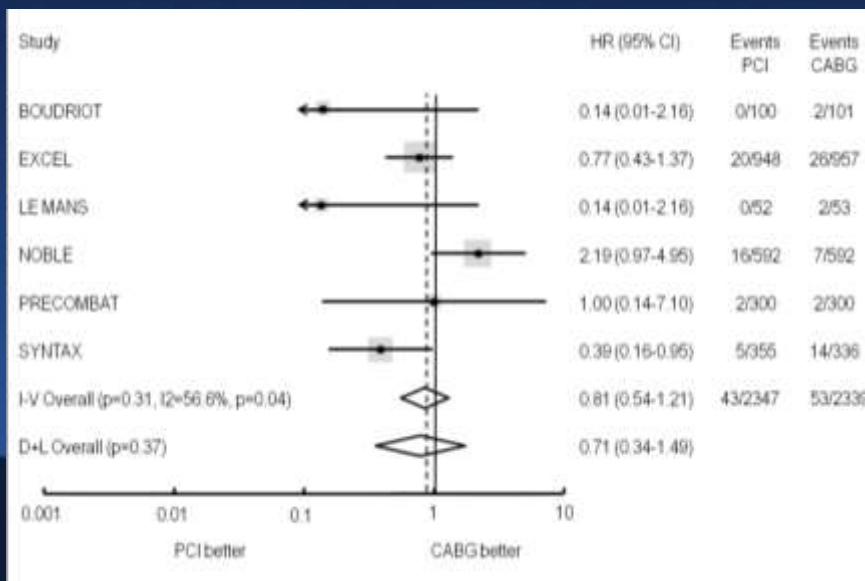
All cause mortality



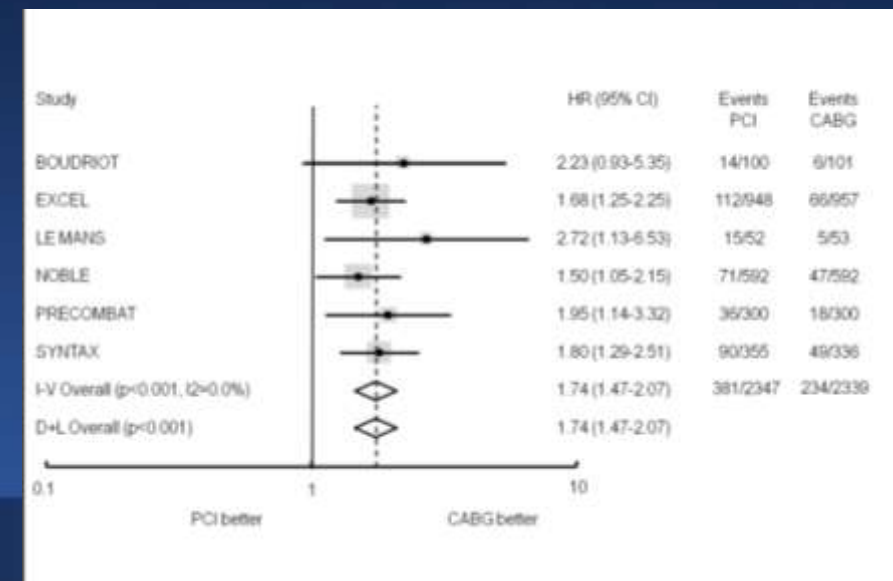
Myocardial infarction



Stroke



Repeat revascularization



Effect of removing individual trials on the estimate of mortality at long-term follow up

Study omitted

OR (95% CI)

Boudriot et al.

1.01 (0.76-1.36)

EXCEL

0.87 (0.65-1.15)

LE MANS

1.01 (0.77-1.35)

NOBLE

0.91 (0.61-1.36)

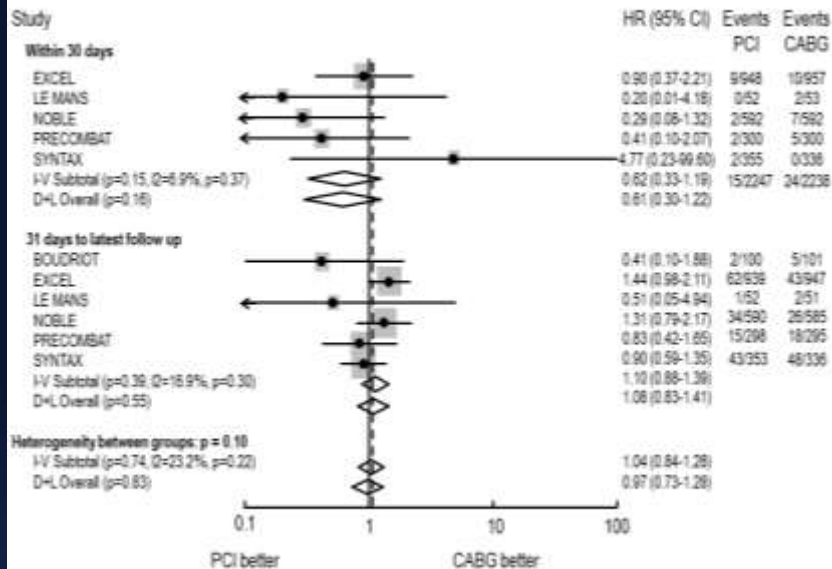
PRECOMBAT

1.03 (0.75-1.44)

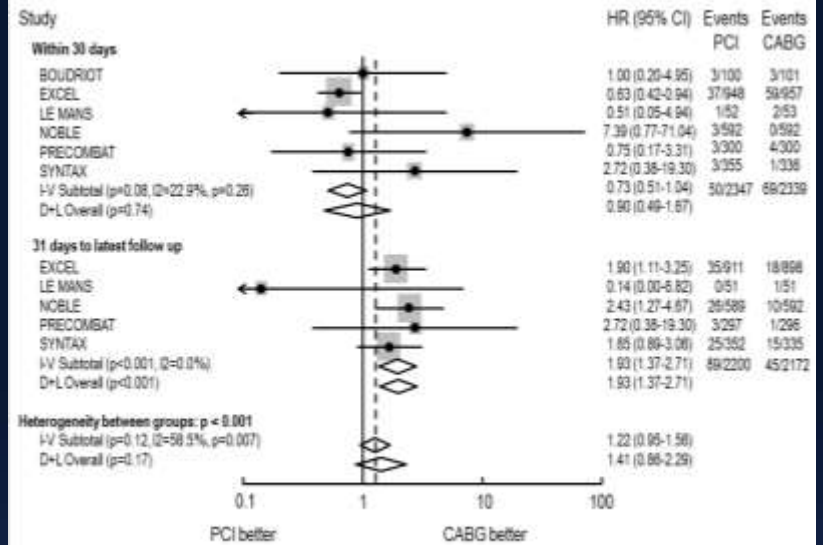
SYNTAX

0.99 (0.67-1.47)

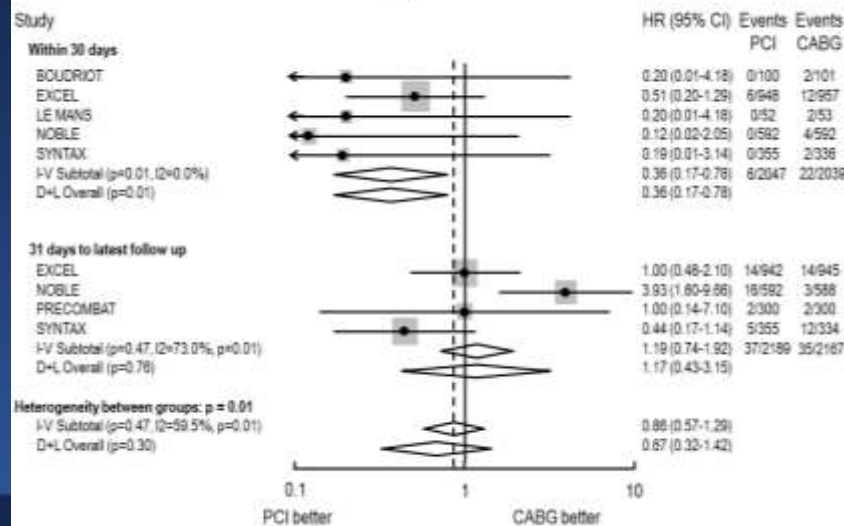
All cause death



Myocardial infarction



Stroke



Limits

- **Outcomes were analyzed from aggregate data and thus we cannot exclude effects from small differences in baseline characteristics.**
- **Definition of clinical endpoints differed slightly across trials, likely explaining the moderate inter-study heterogeneity which was present for the MI outcome measure.**
- **Median follow-up was only 39 months, and longer-term outcomes are required to determine whether additional differences between PCI and CABG emerge over time.**

Conclusions

- **Across 6 randomized trials and almost 5000 patients no significant difference in the risk of death, overall MI and stroke is apparent between PCI vs CABG in pts with ULMCA stenosis.**
- **PCI is associated with higher rates of repeat revascularization compared to CABG.**
- **A significant interaction was be present between treatment effect and the SYNTAX score for the risk of cardiac mortality.**

Conclusions II

- **Although longer-term follow up is needed, PCI can be considered an acceptable strategy of revascularization in selected patients with ULMCA stenosis as an alternative to CABG.**
- **Heart team discussion remains a fundamental step for the decision making of the optimal strategy of revascularization in this subset of patients.**