

Prise en charge du tronc commun par chirurgie

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Chirurgie cardio-vasculaire et thoracique

CHU de Liège

Conflit d'intérêt

- Aucun

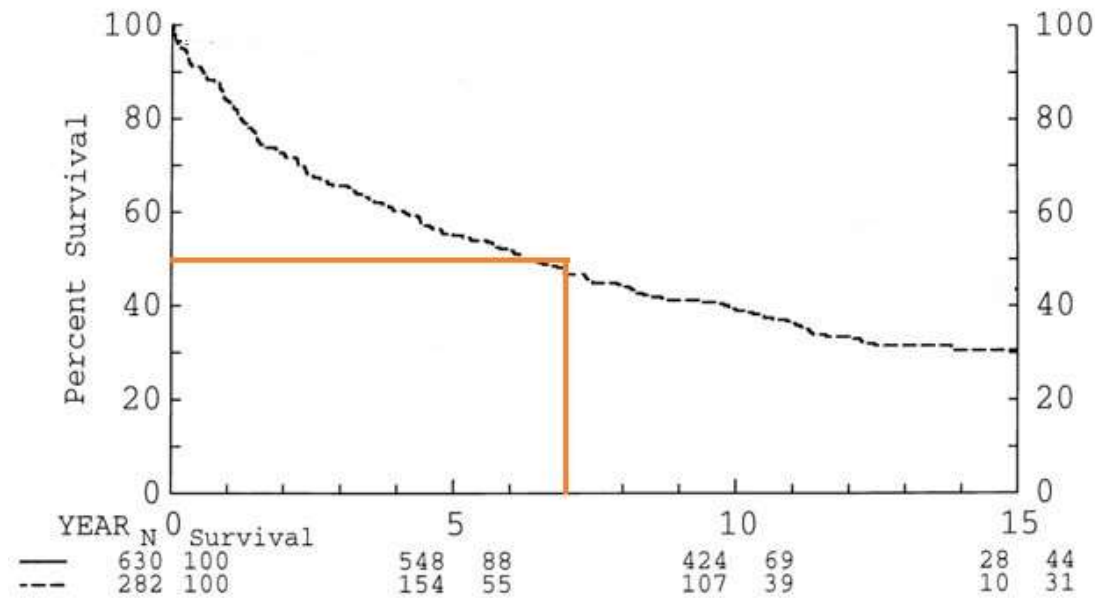
Chirurgien cardiaque

Tronc commun

- Maladie décrite par James Herrick en 1912
- Assure $\geq 75\%$ de l'apport artériel du VG
- Bifurcation ou trifurcation
- Occlusion aiguë souvent fatale



Tronc commun : pronostic en l'absence de TT



Carocciolo E. et al
Circulation 1995

Tronc commun : prévalence?

- Lésion significative du TC identifiée dans $\leq 5\%$ des angiographies coronaires diagnostiques

Original Article

Incidence, predictors, clinical profile, management and outcome of patients with isolated left main coronary artery ostial disease

[Sunil Kumar Srinivas](#)^{a c}  , [Bharathi Sunil](#)^b , [Prabhavathi Bhat](#)^a ,
[Cholenahally Nanjappa Manjunath](#)^a 

15,553 patients who underwent coronary angiogram in a single tertiary care cardiac hospital were analyzed for LMCA disease.

351(2.2%) patients were found to have significant LMCA disease

28(0.18%) had isolated LMCA ostial disease.

Srinivas et al. Indian Heart Journal 2018

Tronc commun : prise en charge

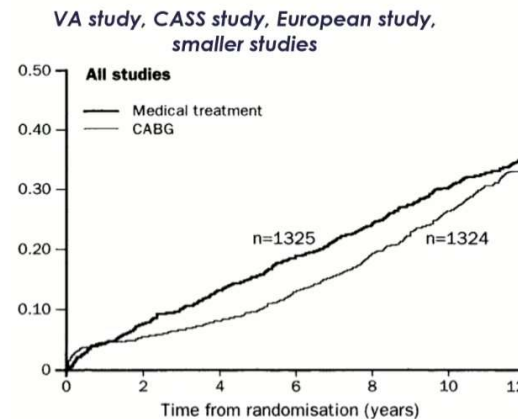
- Depuis plusieurs décennies, de nombreuses études se sont focalisées sur la prise en charge de la sténose du tronc commun dans la maladie coronarienne stable

Controverse

Gold Standard : CABG

- Méta-analyse (7 études randomisées) incluant 2649 patients

	CABG	Traitement médical optimal	Différence de risque absolue	
Décès @ 5 ans	10.2 %	15.8 %	5.6%	95% IC: 3.0 – 8.2

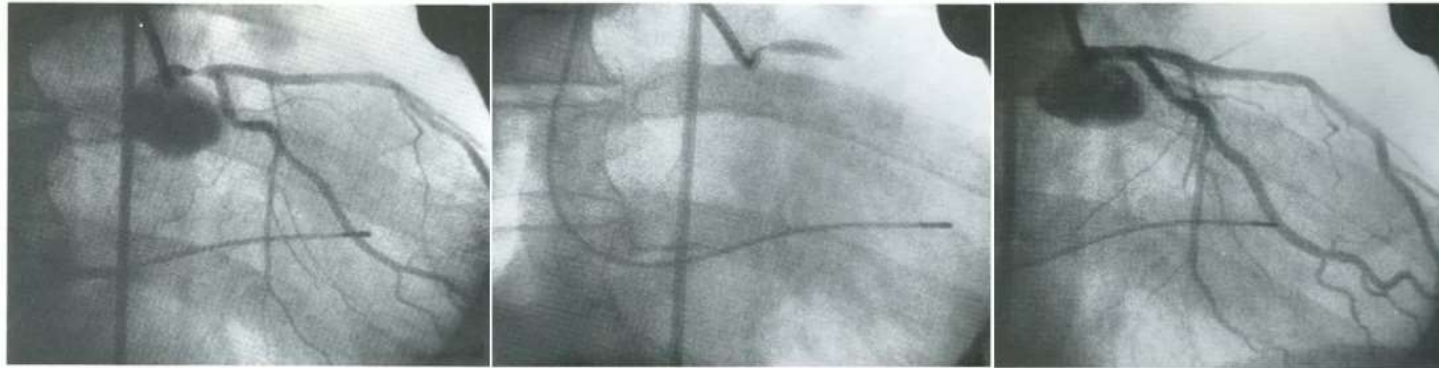


Disease	OR (95% CI)	CABG vs Medical Rx <i>P</i>
One vessel	0.54 (0.22-1.33)	0.18
Two vessels	0.84 (0.54-1.32)	0.45
Three vessels	0.58 (0.42-0.80)	<0.001
Left main	0.32 (0.15-.70)	0.004

Yusuf S. et al *Lancet* 1994

Tronc commun : PCI

*Patient #4 undergoing PTCA of the left main
University Hospital, Frankfurt, on November 24, 1977*



Baseline

Balloon angioplasty

Final result

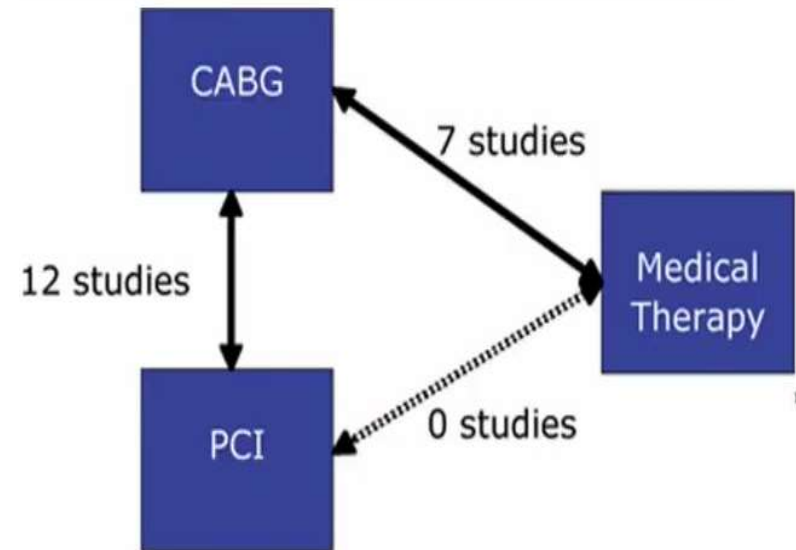
Grüntzig Lancet 1978

“[...] We have not been too successful in dilating stenotic main stems of left coronary arteries. It has been difficult to estimate the extent of disease in this area and the presence of concomitant spasm. We feel that these factors contributed to the death of one patient two months after dilatation”. Grüntzig NEJM 1979

ESC Guidelines - 2010

Subset of CAD by anatomy	Favours CABG	Favours PCI	Ref.
Left main (isolated or IVD, ostium/shaft)	IA	IIa B	4, 54
Left main (isolated or IVD, distal bifurcation)	IA	IIb B	4, 54
Left main + 2VD or 3VD, SYNTAX score ≤ 32	IA	IIb B	4, 54
Left main + 2VD or 3VD, SYNTAX score ≥ 33	IA	III B	4, 54

PCI : nouveau gold standard?



PCI = nouveau Gold Standard ?

- Condition :

Etude randomisée qui démontre une supériorité de la PCI par rapport au gold standard actuel

PCI = Equivalent au CABG ?

- Condition :

Etude randomisée qui démontre une **non infériorité** de la PCI par rapport au gold standard actuel

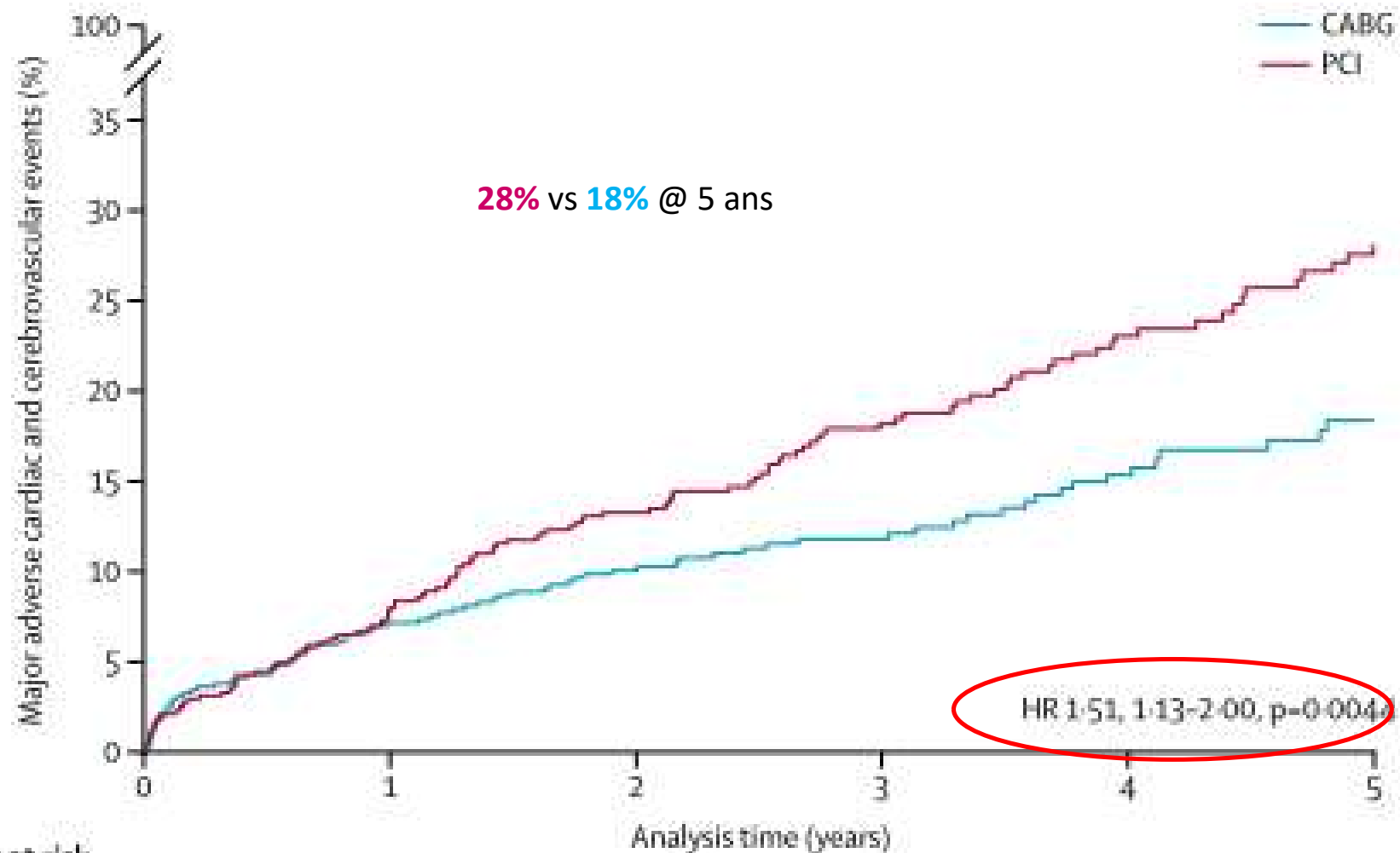
NOBLE

EXCEL

Etude NOBLE

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

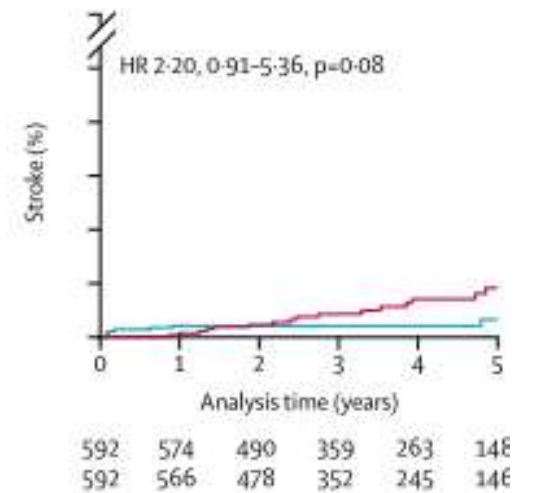
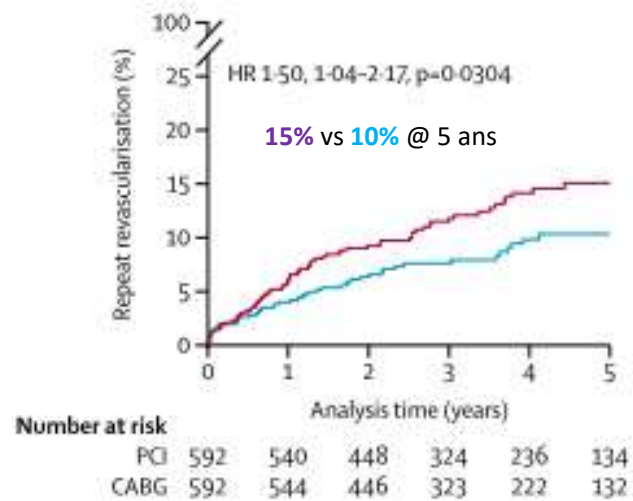
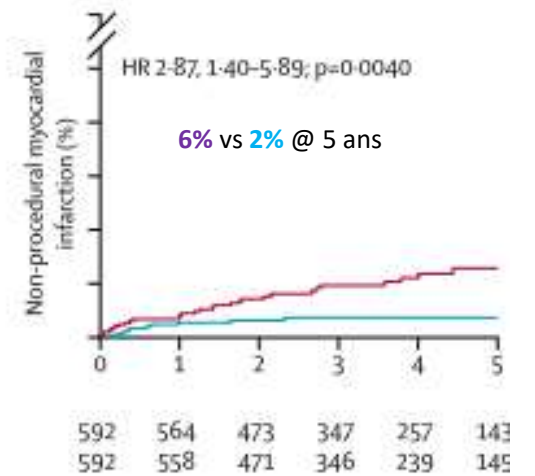
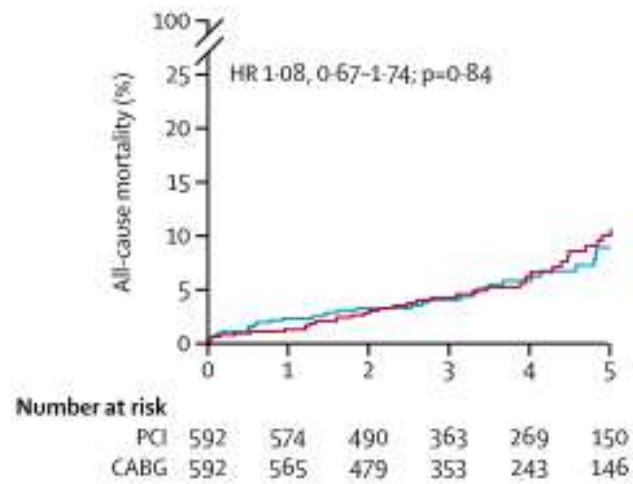
- Etude multicentrique prospective randomisée, open label
- Intention-to-treat
- Non-infériorité
- Compare CABG à PCI avec DES (Biomatrix Flex).
- Lésion du TC
- Maladie coronarienne stable ou instable mais pas STEMI < 24H
- Endpoint primaire : MACCE (combinaison des décès, IM non procéduraux, revascularisation répétée et AVC) à 5 ans



Number at risk

	0	1	2	3	4	5
PCI	592	535	438	310	225	127
CABG	592	536	440	319	219	129

Etude NOBLE



Etude EXCEL

- Etude randomisée de non-infériorité incluant 1905 patients avec atteinte du TC
- maladie coronarienne de sévérité faible ou intermédiaire (Syntax score ≤ 32)
- PCI avec Xience stents de seconde génération
- Endpoint primaire : combinaison des décès de toute cause, AVC ou IM @ 3 et 5 ans
- Endpoints secondaires :
 - combinaison des décès de toute cause, AVC ou IM @ 30 jours
 - combinaison des décès de toute cause, AVC, IM ou revascularisation guidée par l'ischémie @ 3 et 5ans

ORIGINAL ARTICLE

Five-Year Outcomes after PCI or CABG for Left Main Coronary Disease

G.W. Stone, A.P. Kappetein, J.F. Sabik, S.J. Pocock, M.-C. Morice, J. Puskas, D.E. Kandzari, D. Karpaliotis, W.M. Brown III, N.J. Lembo, 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.E. Buszman, A. Bochenek, E. Schampaert, P. Pagé, R. Modolo, J. Gregson, C.A. Simonton, R. Mehran, I. Kosmidou, P. Généreux, A. Crowley, O. Dressler, and P.W. Serruys, for the EXCEL Trial Investigators^a

ABSTRACT

BACKGROUND

Long-term outcomes after percutaneous coronary intervention (PCI) with contemporary drug-eluting stents, as compared with coronary-artery bypass grafting (CABG), in patients with left main coronary artery disease are not clearly established.

METHODS

We randomly assigned 1905 patients with left main coronary artery disease of low or intermediate anatomical complexity (according to assessment at the participating centers) to undergo either PCI with fluoropolymer-based cobalt-chromium everolimus-eluting stents (PCI group, 948 patients) or CABG (CABG group, 957 patients). The primary outcome was a composite of death, stroke, or myocardial infarction.

RESULTS

At 5 years, a primary outcome event had occurred in 22.0% of the patients in the PCI group and in 19.2% of the patients in the CABG group (difference, 2.8 percentage points; 95% confidence interval [CI], -0.9 to 6.5; $P=0.13$). Death from any cause occurred more frequently in the PCI group than in the CABG group (in 13.0% vs. 9.9%; difference, 3.1 percentage points; 95% CI, 0.2 to 6.1). In the PCI and CABG groups, the incidences of definite cardiovascular death (5.0% and 4.5%, respectively; difference, 0.5 percentage points; 95% CI, -1.4 to 2.5) and myocardial infarction (10.6% and 9.1%; difference, 1.4 percentage points; 95% CI, -1.3 to 4.2) were not significantly different. All cerebrovascular events were less frequent after PCI than after CABG (3.3% vs. 5.2%; difference, -1.9 percentage points; 95% CI, -3.8 to 0), although the incidence of stroke was not significantly different between the two groups (2.9% and 3.7%; difference, -0.8 percentage points; 95% CI, -2.4 to 0.9). Ischemia-driven revascularization was more frequent after PCI than after CABG (16.9% vs. 10.0%; difference, 6.9 percentage points; 95% CI, 3.7 to 10.0).

CONCLUSIONS

In patients with left main coronary artery disease of low or intermediate anatomical complexity, there was no significant difference between PCI and CABG with respect to the rate of the composite outcome of death, stroke, or myocardial infarction at 5 years. (Funded by Abbott Vascular; EXCEL ClinicalTrials.gov number, NCT01205776.)

Chez les patients porteurs d'une lésion du tronc commun de complexité faible ou intermédiaire, pas de différence significative entre PCI et CABG en ce qui concerne l'endpoint primaire

ESC Guidelines - 2018

Recommendation for the type of revascularization in patients with stable coronary artery disease with suitable coronary anatomy for both procedures and low predicted surgical mortality^d

Recommendations according to extent of CAD	CABG		PCI	
	Class ^a	Level ^b	Class ^a	Level ^b
Left main CAD				
Left main disease with low SYNTAX score (0 - 22). ^{69,121,122,124,145-148}	I	A	I	A
Left main disease with intermediate SYNTAX score (23 - 32). ^{69,121,122,124,145-148}	I	A	IIa	A
Left main disease with high SYNTAX score (≥ 33). ^{c 69,121,122,124,146-148}	I	A	III	B



Retrait du soutien de l'EACTS aux guidelines sur la revascularisation des lésions du TC



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[ANNUAL MEETING >](#)

[MEMBERSHIP >](#)

Article from the Secretary General on behalf of the EACTS Council

Changing Evidence, Changing Practice

In December 2019 the EACTS Council withdrew its support for the recommendations on left main coronary artery disease of the 2018 joint ESC-EACTS Myocardial Revascularization Guidelines.

Professor Domenico Pagano, Secretary General of EACTS, has published a new article to explain why.

The pursuit of new innovations and techniques to provide optimal care to patients is both welcome and vital. Without advances in practice, we would not improve quality of life and save as many lives as we do. However, patient safety is paramount and that is why there are well established practices to assess the results of clinical trials that support the preparation of clinical guidelines which provide the advice on which clinicians depend to identify optimal treatment. Withdrawing support from guidelines in this fashion is unprecedented for our Association. It was a decision taken by the whole Council with considerable care. This article explains what we did and why.

The guideline in question was prepared in 2018 by representatives from both the European Society of Cardiology (ESC) and the European Association for Cardiothoracic Surgery (EACTS), who had considered a range of evidence including the reported outcomes from the EXCEL trial to develop the recommendations for the treatment of patients with left main coronary artery disease (LMCAD) and stable angina which form part of the joint 2018 ESC-EACTS Myocardial Revascularization Guidelines.

[Read the full article here](#)

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STAY CONNECTED



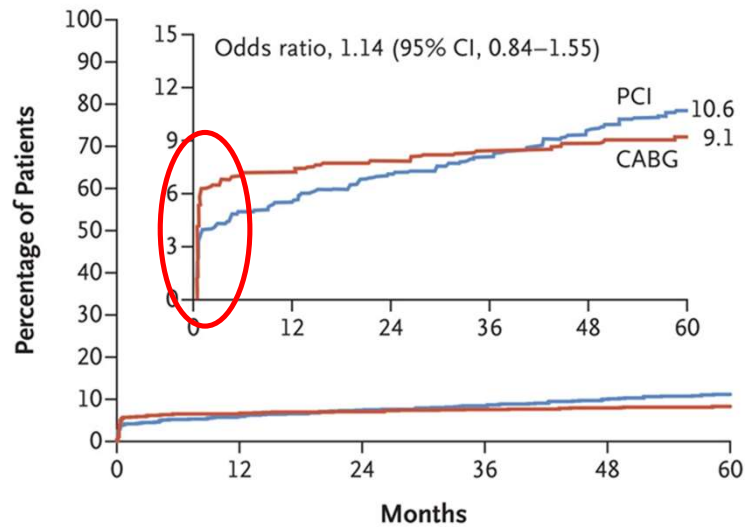
Problèmes EXCEL

- Mortalité toute cause significativement moindre @ 5 ans dans le groupe CABG versus PCI
- Définition de l'infarctus myocardique et résultats en tenant compte de la définition universelle de l'infarctus myocardique non publiés

Etude Excel – Endpoint primaire

SYNTAX
Tronc commun

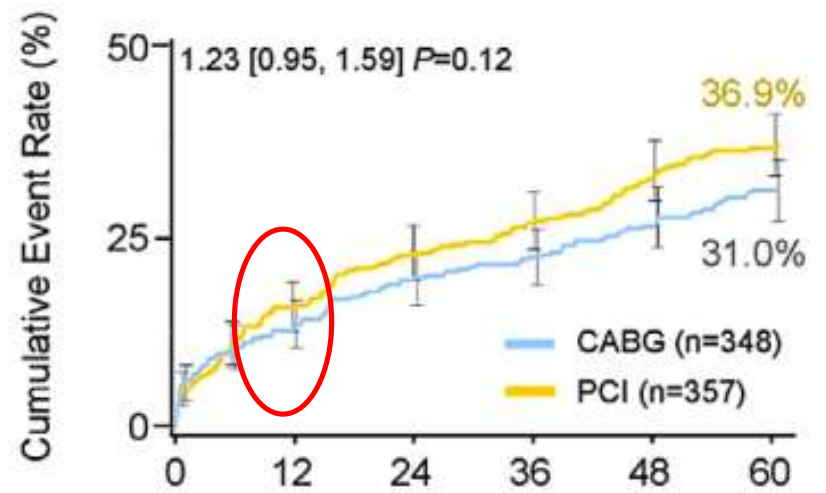
C Myocardial Infarction



No. at Risk

PCI	948	860	819	788	750	496
CABG	957	827	801	778	749	543

A MACCE



Définition de l'infarctus myocardique

- Définition universelle de l'infarctus myocardique (3rd UDIM) :

↗ biomarqueurs cardiaques > 10X la limite supérieure de la normale
+ signes ECG (onde Q ou BBG), angiographique ou échographique

↗ cTn > 5X la limite supérieure de la normale
+ symptômes d'IM ou signes angiographique, ECG ou échographique

CABG

PCI

- Définition utilisée dans EXCEL : SCAI (Society for Coronary Angiography and Intervention)

↗ CKMB > 5X ou troponine I US > 35 X la limite supérieure de la normale
+ apparition onde Q ou BBG

ou

élévation enzymatique isolée (↗ CKMB > 10X la limite supérieure de la normale ou ↗ Troponines I US > 70X la limite supérieure de la normale)

Impact d'une élévation enzymatique isolée après CABG sur la mortalité @ 30 jours

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

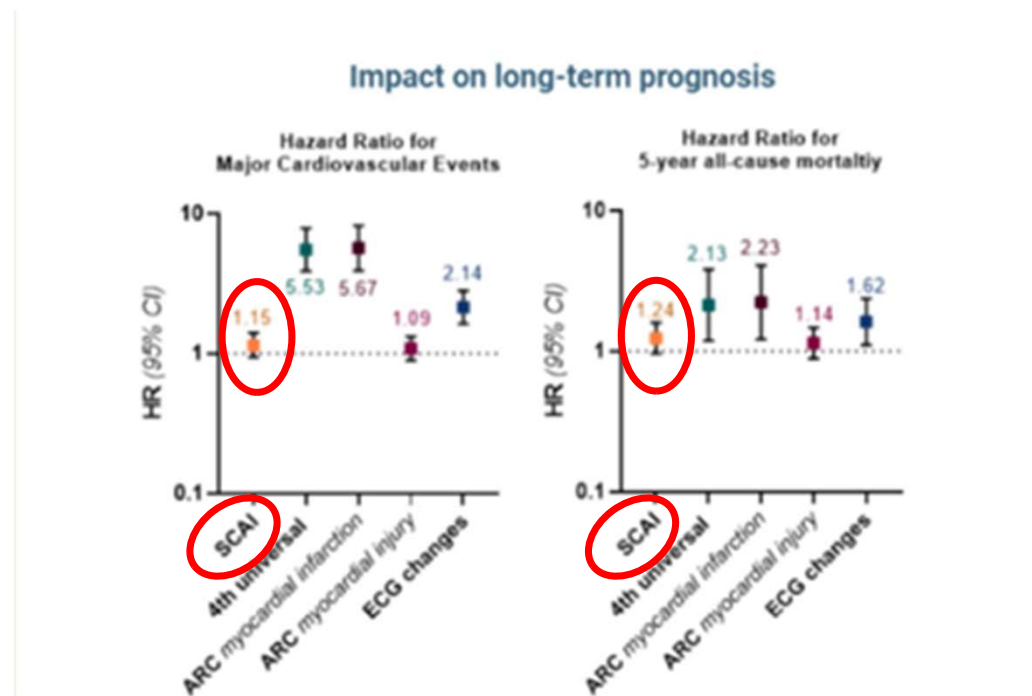
High-Sensitivity Troponin I after Cardiac Surgery and 30-Day Mortality

Devereaux et al. *N Engl J Med* 2022 ;386:827-36.

Le taux le plus bas du pic de troponine I US mesuré au premier jour post-opératoire et associé à un Hazard Ratio > 1.00 de décès @ 30 jours est de 5670 ng/L, ce qui correspond à un niveau 218 X plus élevé que la limite supérieure de la normale

Dans le protocole d' EXCEL, une élévation isolée des troponines I US > 70X la limite supérieure de la normale définissait l'IM périprocédural

Impact à long terme d'une élévation enzymatique isolée après CABG



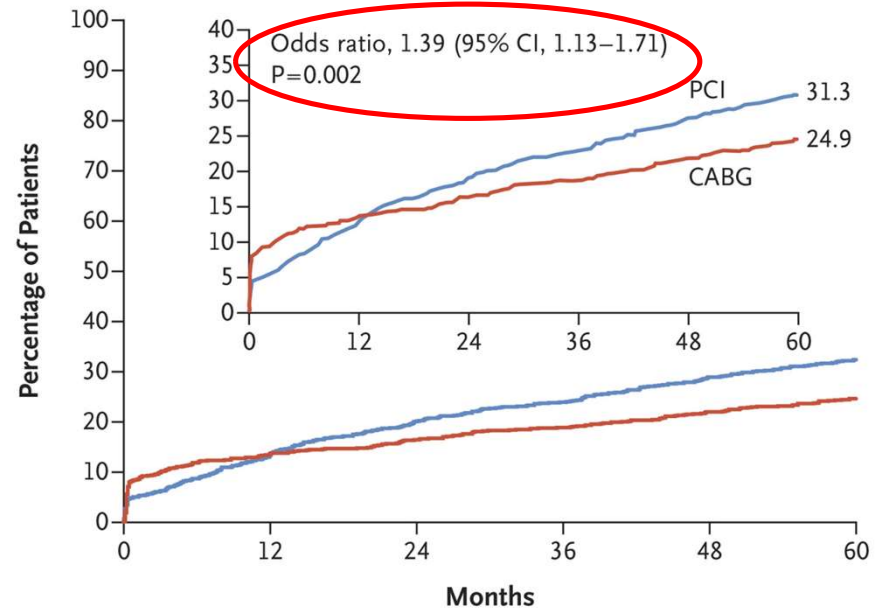
Pözl et al. *European Heart Journal*, Volume 43, Issue 25, 1 July 2022, Pages 2407–2417

EXCEL : Infarctus myocardiques péri-procéduraux en fonction de la définition

Définition IM	PCI	CABG	
EXCEL	3.6 %	6.1 %	$P = 0.015$
Internationale	4 %	2.2 %	$P = 0.025$

Etude Excel – Endpoint secondaire

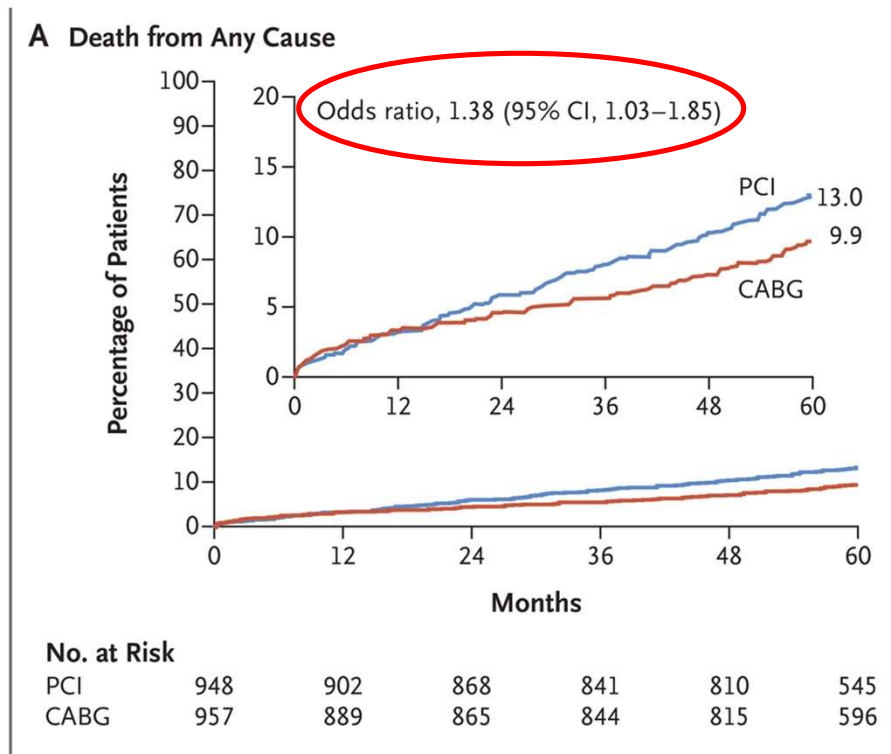
B Death, Stroke, Myocardial Infarction, or Ischemia-Driven Revascularization



No. at Risk

PCI	948	813	746	706	653	428
CABG	957	795	757	725	686	494

Etude Excel – Mortalité



Etude EXCEL – technique chirurgicale

- Génération actuelle de stents : everolimus eluted stents
- Techniques contemporaines de CABG



24% de patients avec BIMA
< 7% de patients avec artère radiale

Décès de toute cause @ 3 ans
8.8% après off-pump CABG
4.5% après on-pump CABG

2021 ACC/AHA Guidelines

Tronc commun

CABG

1

B-R

Chez les patients porteurs d'une maladie coronarienne stable et d'une sténose significative du tronc commun, la chirurgie est recommandée pour améliorer la survie

PCI

2a

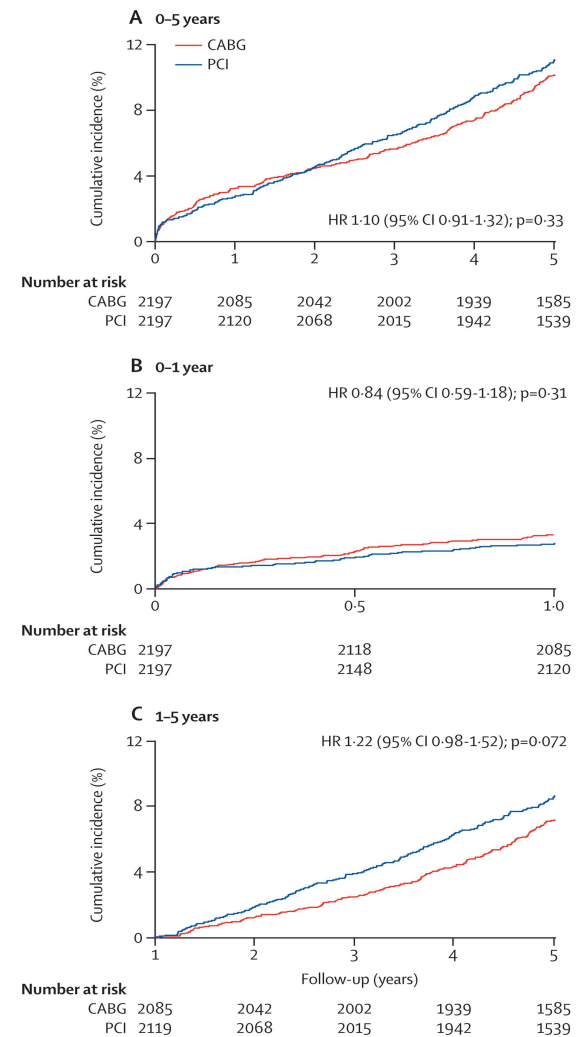
B-NR

Chez des patients sélectionnés porteurs d'une maladie coronarienne stable et d'une sténose significative du tronc commun et chez qui la PCI est susceptible de fournir une revascularisation équivalente à celle attendue par chirurgie, la PCI est envisageable pour augmenter la survie

Méta-analyse Lancet

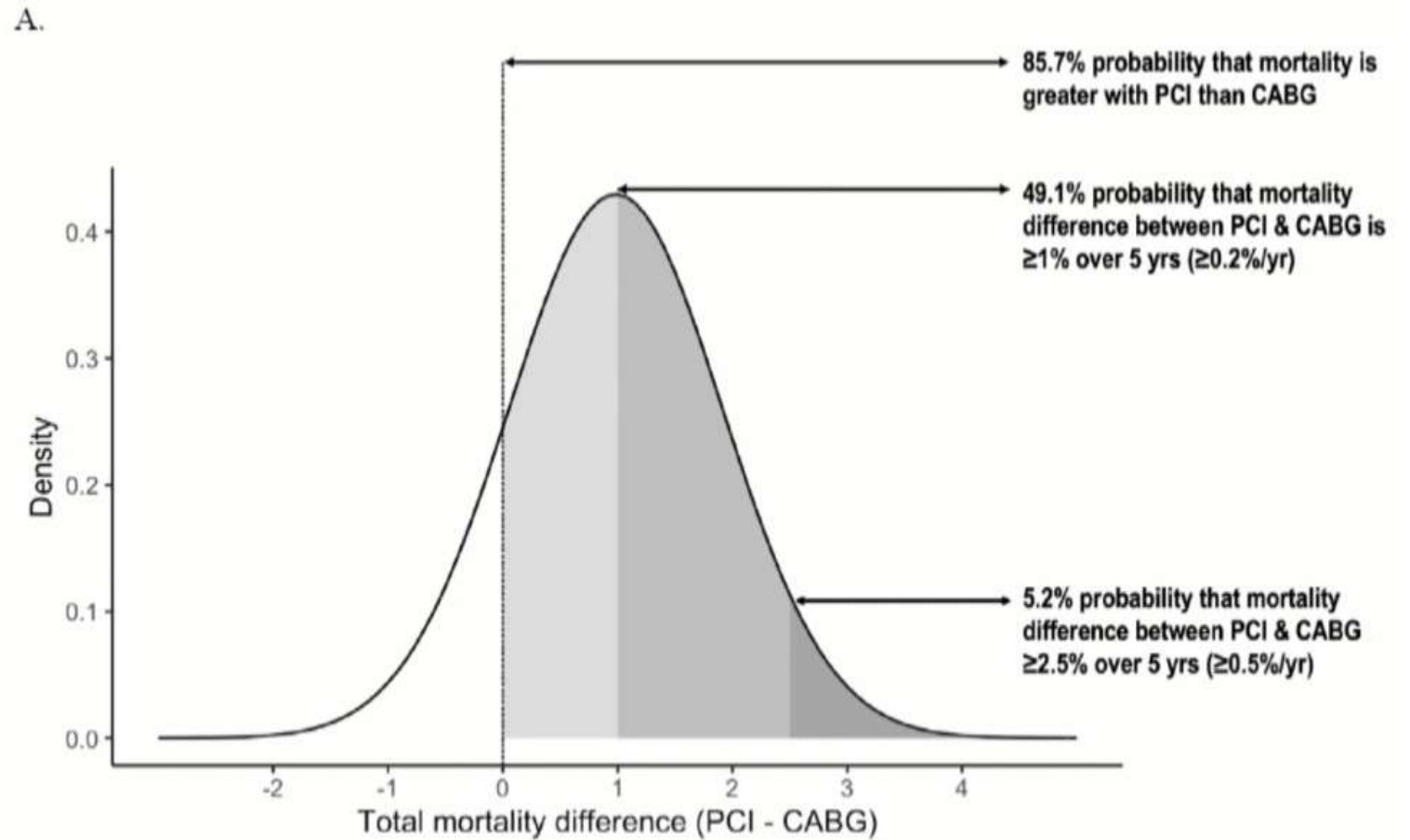
Percutaneous coronary intervention with drug-eluting stents versus coronary artery bypass grafting in left main coronary artery disease: an individual patient data meta-analysis

Sabatine et al. **Lancet**. 2021 Dec 18;398(10318):2247-2257

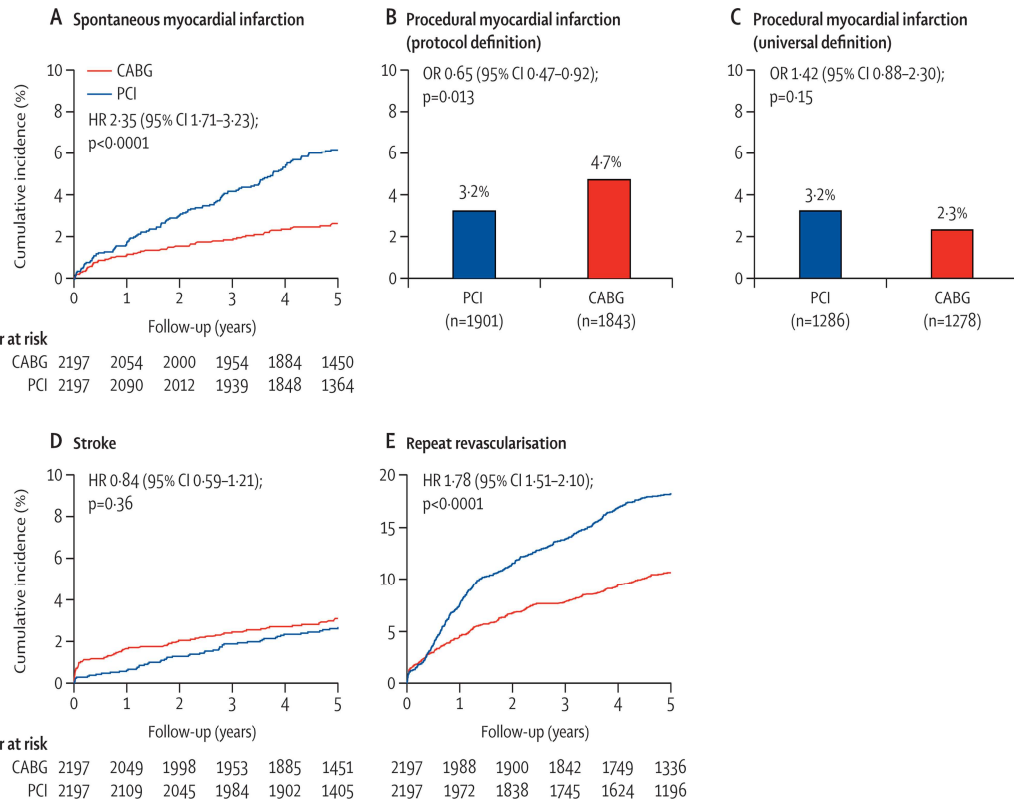


Analyse bayésienne mortalité @ 5 ans

Sabatine et al. **Lancet.** 2021 Dec 18;398(10318):2247-2257



Méta-analyse Lancet

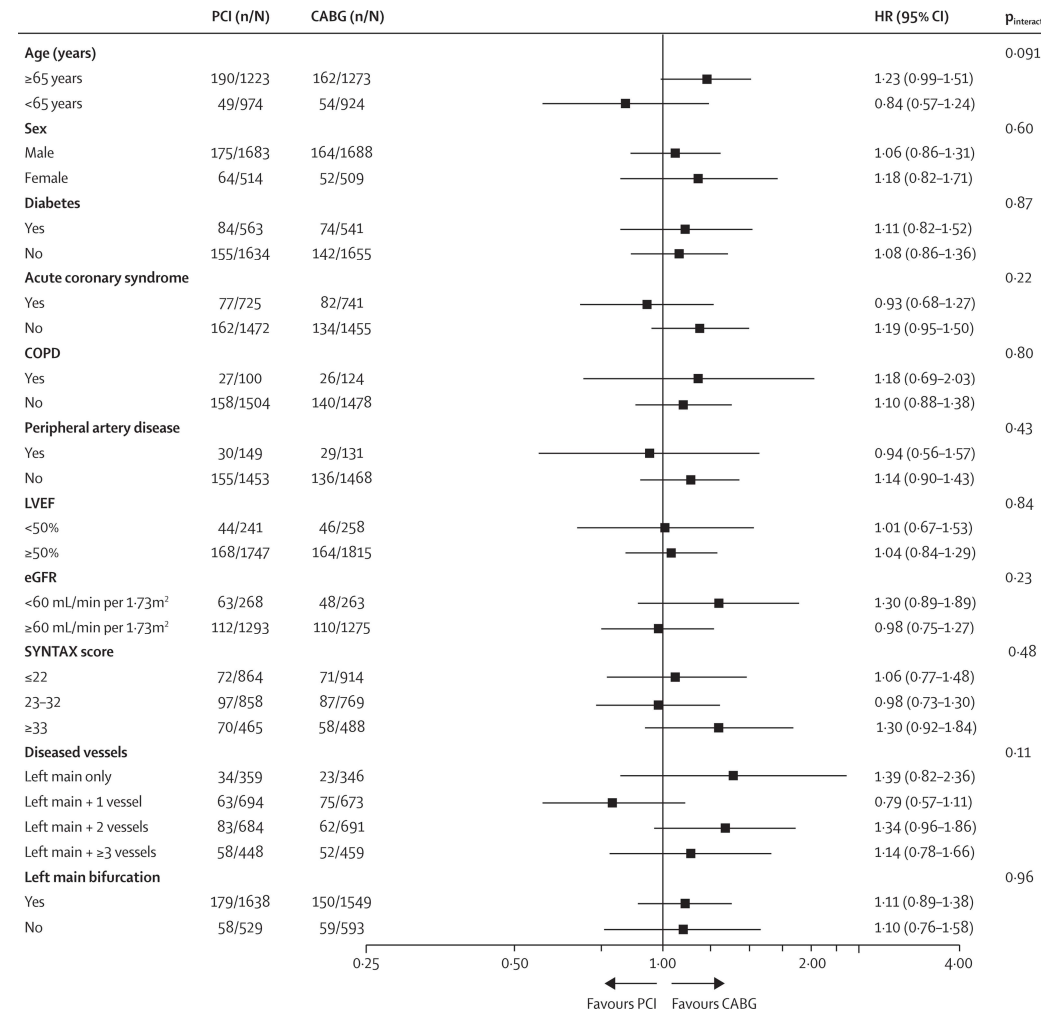


Sabatine et al. **Lancet**. 2021 Dec 18;398(10318):2247-2257

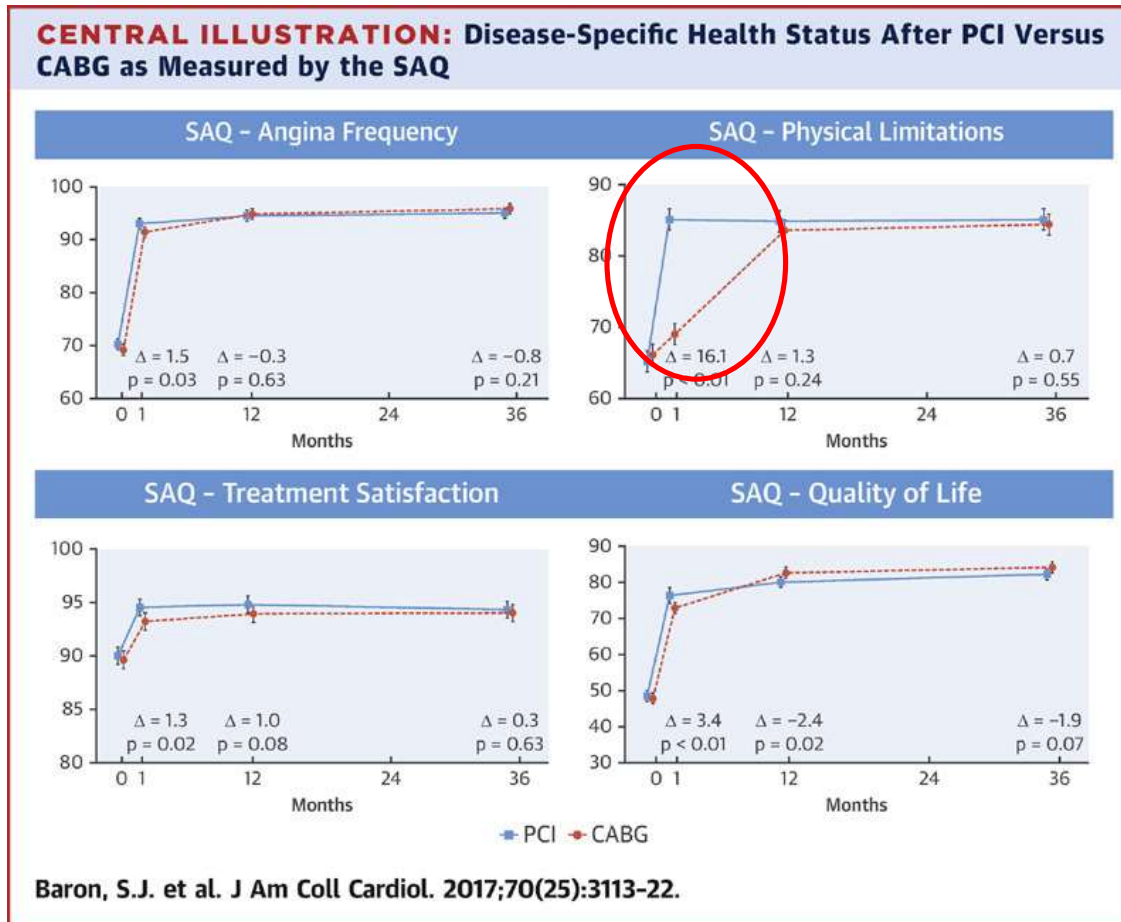
Méta-analyse Lancet

Mortalité @ 5 ans : analyse de sous-groupes

Sabatine et al. **Lancet**. 2021 Dec
18;398(10318):2247-2257



Qualité de vie après PCI vs CABG



PCI vs CABG : dysfonction VG

2018 ESC/EACTS Guidelines on myocardial revascularization

Recommendations on revascularizations in patients with chronic heart failure and systolic left ventricular dysfunction (ejection fraction $\leq 35\%$)

Recommendations	Class ^a	Level ^b
In patients with severe LV systolic dysfunction and coronary artery disease suitable for intervention, myocardial revascularization is recommended. ^{81,250}	I	B
CABG is recommended as the first revascularization strategy choice in patients with multivessel disease and acceptable surgical risk. ^{68,81,248,255}	I	B
In patients with one- or two-vessel disease, PCI should be considered as an alternative to CABG when complete revascularization can be achieved.	IIa	C

PCI vs CABG : dysfonction VG

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VOL. 76, NO. 12, 2020

ORIGINAL INVESTIGATIONS

Revascularization in Patients With Left Main Coronary Artery Disease and Left Ventricular Dysfunction

Sangwoo Park, MD,^a Jung-Min Ahn, MD,^b Tae Oh Kim, MD,^b Hanbit Park, MD,^b Do-Yoon Kang, MD,^b
Pil Hyung Lee, MD,^b Yeong Jin Jeong, MD,^b Junho Hyun, MD,^b Junghoon Lee, MD,^b Ju Hyeon Kim, MD,^b
Yujin Yang, MD,^b Kyungjin Choe, MD,^b Seung-Jung Park, MD,^b Duk-Woo Park, MD,^b
for the IRIS-MAIN Registry Investigators

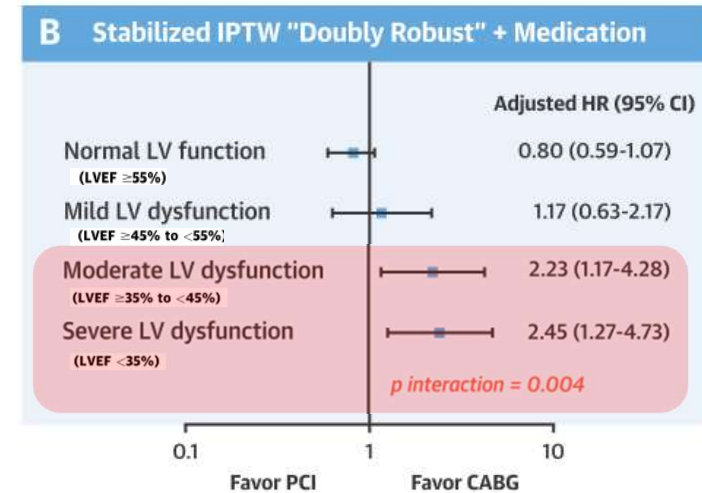
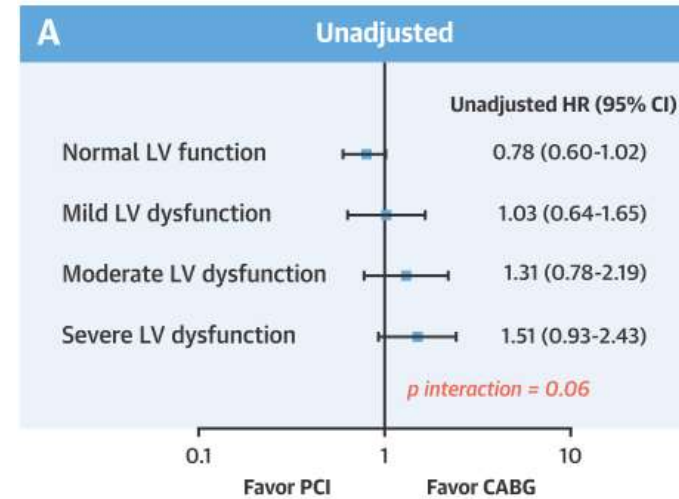
JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

VOL. 76, NO. 12, 2020



Endpoint
primaire :

Combinaison
décès, IM et
AVC
(follow-up
moyen de 3.8
ans)



PCI vs CABG : Patients diabétiques

2021 ACC/AHA
guidelines

Patients With Diabetes Mellitus

2b

B-R

3. In patients with diabetes who have left main stenosis and low- or intermediate-complexity CAD in the rest of the coronary anatomy, PCI may be considered an alternative to CABG to reduce major adverse cardiovascular outcomes (5,11).
-

PCI vs CABG : femmes



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Contents lists available at ScienceDirect

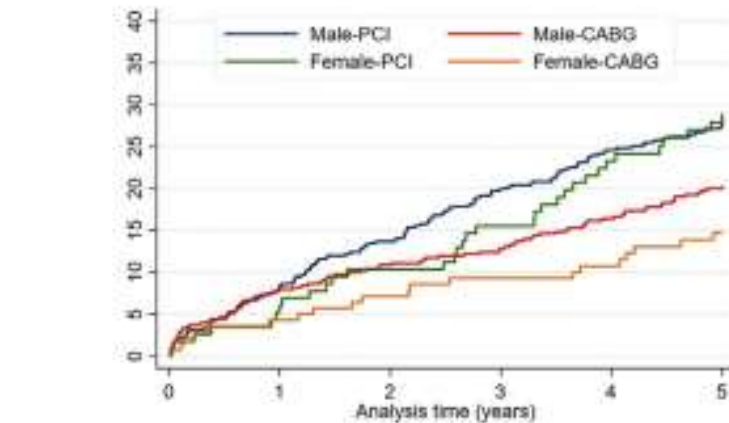
Journal of the Society for Cardiovascular
Angiography & Interventions

journal homepage: www.jsc.ai.org

Original Research

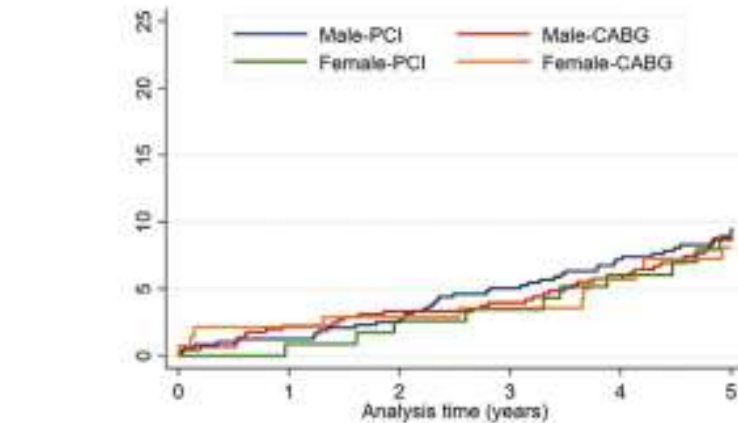
Sex-Specific Clinical Outcomes After Treatment of Left Main Coronary Artery Disease. A NOBLE Substudy

MACCE



	0	1	2	3	4	5
Male-PCI	478	436	411	380	351	282
Female-PCI	116	110	104	98	88	85
Male-CABG	452	416	403	394	368	289
Female-CABG	140	134	130	127	125	91

Décès



	0	1	2	3	4	5
Male-PCI	478	470	464	451	433	333
Female-PCI	116	115	113	112	108	76
Male-CABG	452	442	437	434	415	333
Female-CABG	140	137	136	135	132	99

PCI vs CABG : femmes

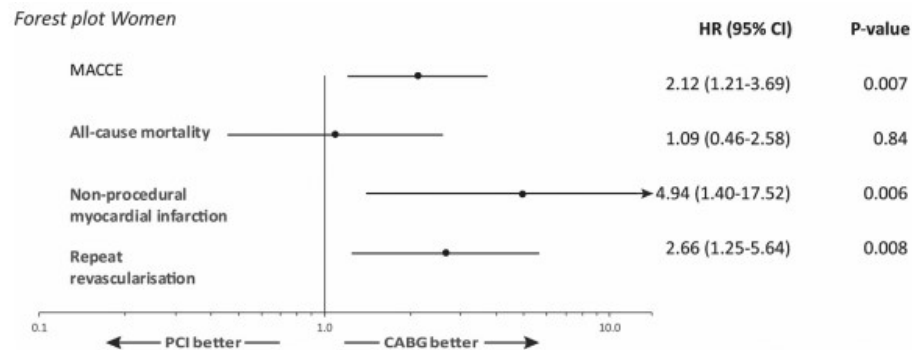
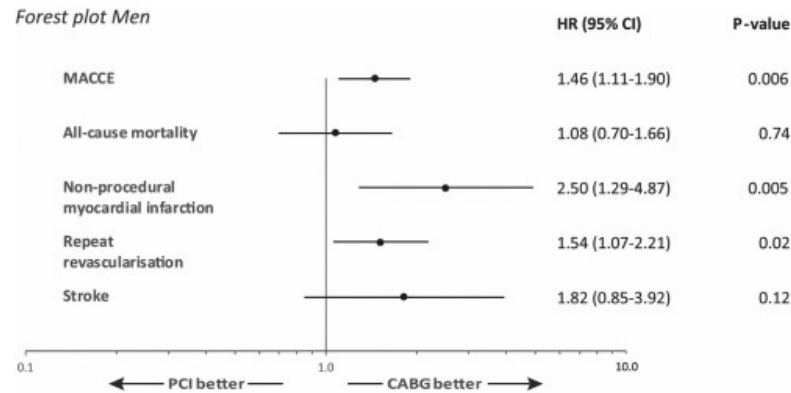
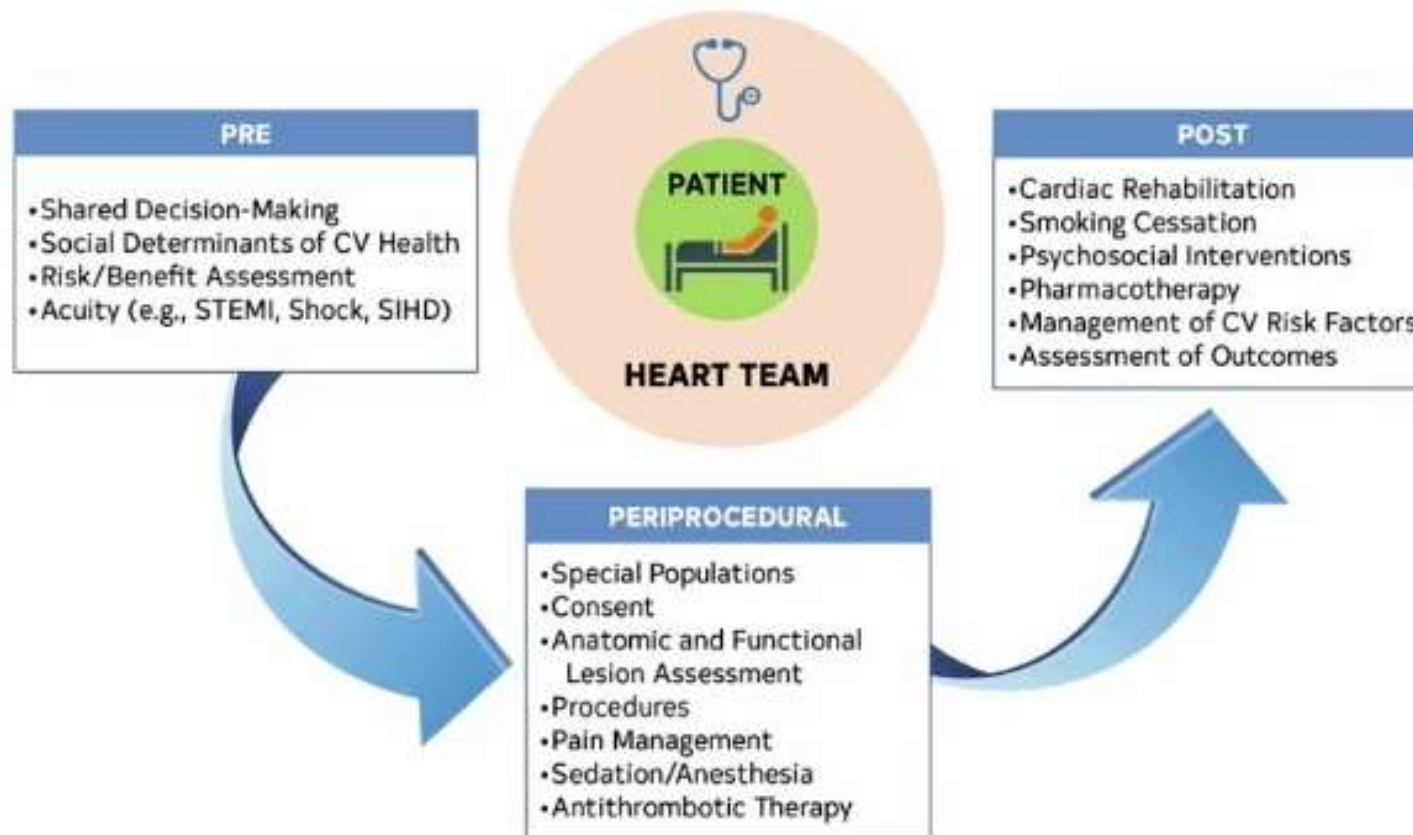


Table 3. Multivariable analyses for MACCE composite endpoint and non-procedural myocardial infarction.

	HR (95% CI)	P value
MACCE composite endpoint		
PCI (vs CABG)	1.58 (1.24-2.00)	<.0001
Age (per year)	1.03 (1.01-1.04)	<.0001
Diabetes (vs no diabetes)	1.64 (1.23-2.19)	.001
SYNTAX score (per 1 unit)	1.02 (1.00-1.04)	.014
Female (vs men)	0.81 (0.60-1.09)	.17
Nonprocedural myocardial infarction		
PCI (vs CABG)	2.95 (1.64-5.31)	<.0001
Age (per year)	1.04 (1.01-1.08)	.004
SYNTAX score (per 1 unit)	1.04 (1.01-1.07)	.017
Female (vs men)	1.30 (0.72-2.35)	.38

Heart Team



Conclusions

- La chirurgie reste la modalité de revascularisation préférentielle pour le traitement des patients porteurs d'une lésion du TC afin de réduire sur le long terme le risque d'évènements cardiovasculaires défavorables
- Concernant la mortalité , la chirurgie est la modalité qui offre la meilleure survie à long terme mais le gain est probablement modeste à 5 ans.
- Une discussion en Heart Team est fortement recommandée pour optimaliser les décisions de traitement sur une base individuelle