European Heart Journal
doi:10.1093/eurheartj/ehu282

ESC/ESA GUIDELINES

2014 ESC/ESA Guidelines on non-cardiac surgery: cardiovascular assessment and management

The Joint Task Force on non-cardiac surgery: cardiovascular assessment and management of the European Society of Cardiology (ESC) and the European Society of Anaesthesiology (ESA)

Authors/Task Force Members: Steen Dalby Kristensen* (Chairperson) (Denmark), Juhani Knuuti* (Chairperson) (Finland), Antti Saraste (Finland), Stefan Anker (Germany), Hans Erik Bøtker (Denmark), Stefan De Hert (Belgium), Ian Ford (UK), Jose Ramón Gonzalez-Juanatey (Spain), Bulent Gorenek (Turkey), Guy Robert Heyndrickx (Belgium), Andreas Hoeft (Germany), Kurt Huber (Austria), Bernard Iung (France), Keld Per Kjeldsen (Denmark), Dan Longrois (France), Thomas F. Lüscher (Switzerland), Luc Pierard (Belgium), Stuart Pocock (UK), Susanna Price (UK), Marco Roffi (Switzerland), Per Anton Sirnes (Norway), Miguel Sousa-Uva (Portugal), Vasilis Voudris (Greece), Christian Funck-Brentano (France).

ESC Committee for Practice Guidelines: Jose Luis Zamorano (Chairperson) (Spain), Stephan Achenbach (Germany), Helmut Baumgartner (Germany), Jeroen J. Bax (Netherlands), Héctor Bueno (Spain), Veronica Dean (France), Christi Deaton (UK), Cetin Erol (Turkey), Robert Fagard (Belgium), Roberto Ferrari (Italy), David Hasdai (Israel), Arno W. Hoes (Netherlands), Paulus Kirchhof (Germany/UK), Juhani Knuuti (Finland), Philippe Kolh (Belgium), Patrizio Lancellotti (Belgium), Ales Linhart (Czech Republic), Petros Nihoyannopoulos (UK), Massimo F. Piepoli (Italy), Piotr Ponikowski (Poland), Per Anton Sirnes (Norway), Juan Luis Tamargo (Spain), Michal Tendera (Poland), Adam Torbicki (Poland), William Wijns (Belgium), Stephan Windecker (Switzerland).

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION
American Heart Association. Learn and Live.

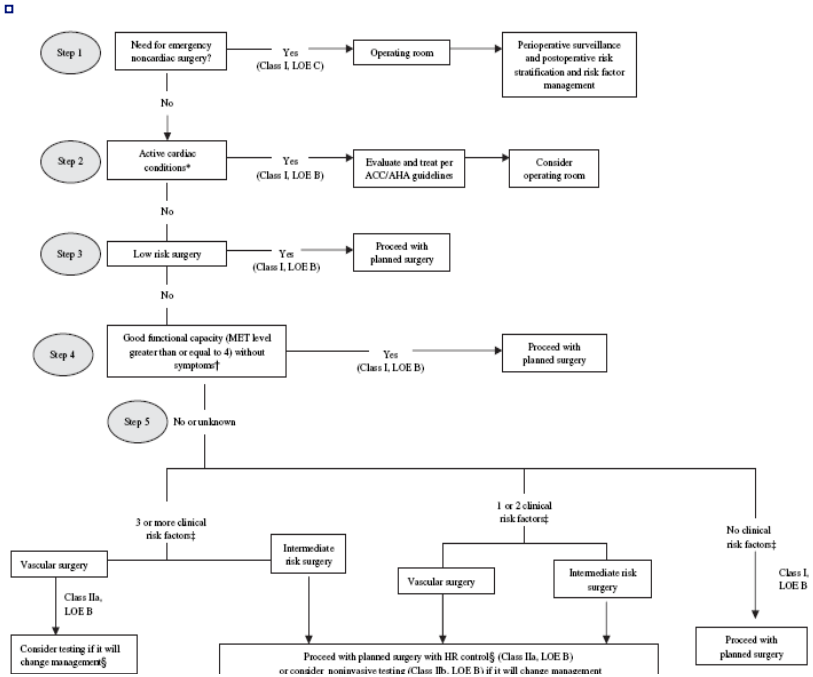
ACC/AHA Guideline

ACC/AHA 2007 Guidelines on Perioperative Cardiovascular Evaluation and Care for Noncardiac Surgery: Executive Summary

A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines on Perioperative Cardiovascular Evaluation for Noncardiac Surgery)

Lee A. Fleisher, Joshua A. Beckman, Kenneth A. Brown, Hugh Calkins, Elliott Chaikof, Kirsten E. Fleischmann, William K. Freeman, James B. Froehlich, Edward K. Kasper, Judy R. Kersten, Barbara Riegel and John F. Robb

Circulation 2007;116;1971-1996; originally published online Sep 27, 2007;



2007

European Heart Journal Advance Access published August 27, 2009
European Heart Journal
doi:10.1093/eurheartj/ehp337
ESC GUIDELINES

Guidelines for pre-operative cardiac risk assessment and perioperative cardiac management in non-cardiac surgery

The Task Force for Preoperative Cardiac Risk Assessment and Perioperative Cardiac Management in Non-cardiac Surgery of the European Society of Cardiology (ESC) and endorsed by the European Society of Anaesthesiology (ESA)

Authors/Task Force Members: Don Poldermans; (Chairperson) (The Netherlands)*; Jeroen J. Bax (The Netherlands); Eric Boersma (The Netherlands); Stefan De Hert (The Netherlands); Er
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(Denmark); Jose Lope
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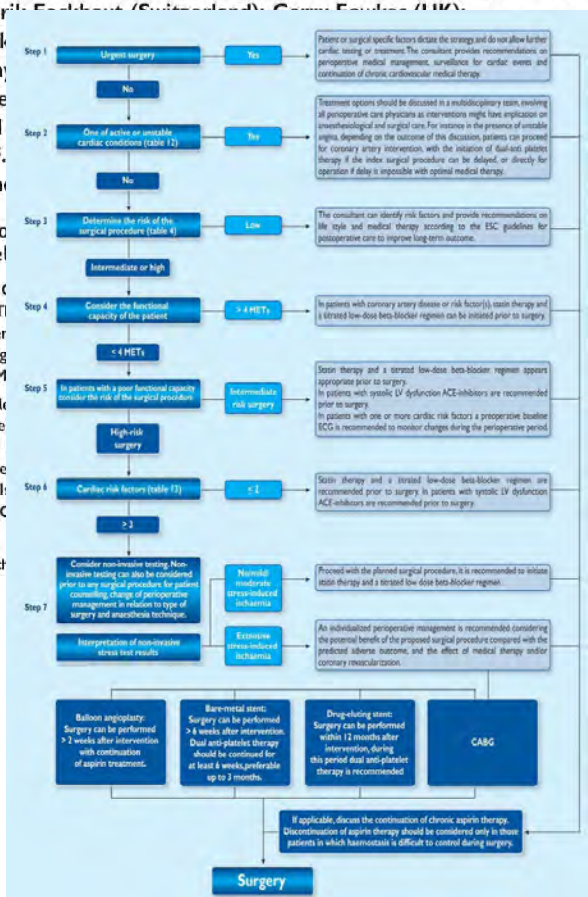
Marco Tubaro (Italy)

The disclosure forms of all the auth



2009

Le Pr Poldermans est remercié par le Centre Erasmus et quitte ses responsabilités à l'ESC

NOV 24, 2011 Vincent Bargoin

Rotterdam, Pays-Bas - Le **Pr Don Poldermans**, internationalement connu pour ses travaux sur le risque cardiaque en chirurgie, a été renvoyé voici quelques jours du prestigieux **Erasmus Medical Center** de Rotterdam. Cette sanction, **officialisée par le centre néerlandais le 17 novembre dernier**, est due à une succession de manquements et d'erreurs dans la conduite du programme **DECREASE** (Dutch Echocardiographic Cardiac Risk Evaluation Applying Stress Echography), que dirigeait le Pr Poldermans [**1**].

La chute de Don Poldermans

Posted on 20/11/2011

@ErasmusMC_Press
press

Erasmus MC zegt hoogleraar ontslag aan: Het Erasmus MC heeft op 16 november prof.dr. D. Poldermans ontslag aange…
bit.ly/rl4vkY

Erasmus MC dismisses professor

Erasmus MC dismissed Prof. D. Poldermans on 16 November because of violation of academic integrity. Research carried out under his leadership was not always performed in accordance with current scientific standards.

An inquiry committee on Academic Integrity concluded that the professor was careless in collecting the data for his research. In one study it was found that he used patient data without written permission, used fictitious data and that two reports were submitted to conferences which included knowingly unreliable data.

Regret
The professor agrees with the committee's conclusions and expressed his regret for his actions. Poldermans feels that as experienced researcher he should have been more accurate but states that his actions were unintentional.

Les études DECREASE : études pivot (?)

Table 2 Grounds on which the DECREASE family of trials are considered discredited

DECREASE VI	Fictitious methods. 97% of the patients did not undergo a stress echo and the surgery as specified. No consent forms. Falsified description of method of outcome adjudication Fictitious database.
DECREASE V	Falsified methods of patient assessment (myocardial infarction and renal failure) Fictitious adjudication committee No record of the stress echo images or of the '5-member panel' said to have evaluated them No research patient records No evidence of written informed consent
DECREASE IV	Fictitious 'adjudication committee' of cardiologist, anaesthiologist and surgeon (in reality adjudications made by surgeon alone). Fictitious events that did not match hospital records or clinical discharge reports
DECREASE III	Not investigated in detail because: No source data could be found to investigate No written consent forms. No contemporaneous documentation, only current verbal assurances
DECREASE II	Fictitious method of establishing outcome
(DECREASE I	Not investigated as it was more than 10 years old)

Bouri S, et al. Heart 2013;0:1–9. doi:10.1136/heartjnl-2013-304262

European Heart Journal Advance Access published August 4, 2014

European Heart Journal
doi:10.1093/eurheartj/ehu282

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Poldermans

Annales Françaises d'Anesthésie et de Réanimation 30 (2011) e5–e29

SFAR
Société Française d'Anesthésie et de Réanimation

Société Française de Cardiologie

RECOMMANDATIONS FORMALISÉES D'EXPERTS

Prise en charge du coronarien opéré en chirurgie non cardiaque

Perioperative assessment of cardiac risk patient in non-cardiac surgery

Société française d'anesthésie et de réanimation (Sfar)[1]

Société française de cardiologie (SFC)

information formation

Preop BB= Quality of care

Preop BB !!!

Preop BB ????

Maintain BB

Stop BB

BB vs Placebo=ns

BB dangerous?

Where is the evidence !?!?

POISE

Preop BB= Quality of care

Preop BB !!!

Preop BB ????

Maintain BB

Stop BB

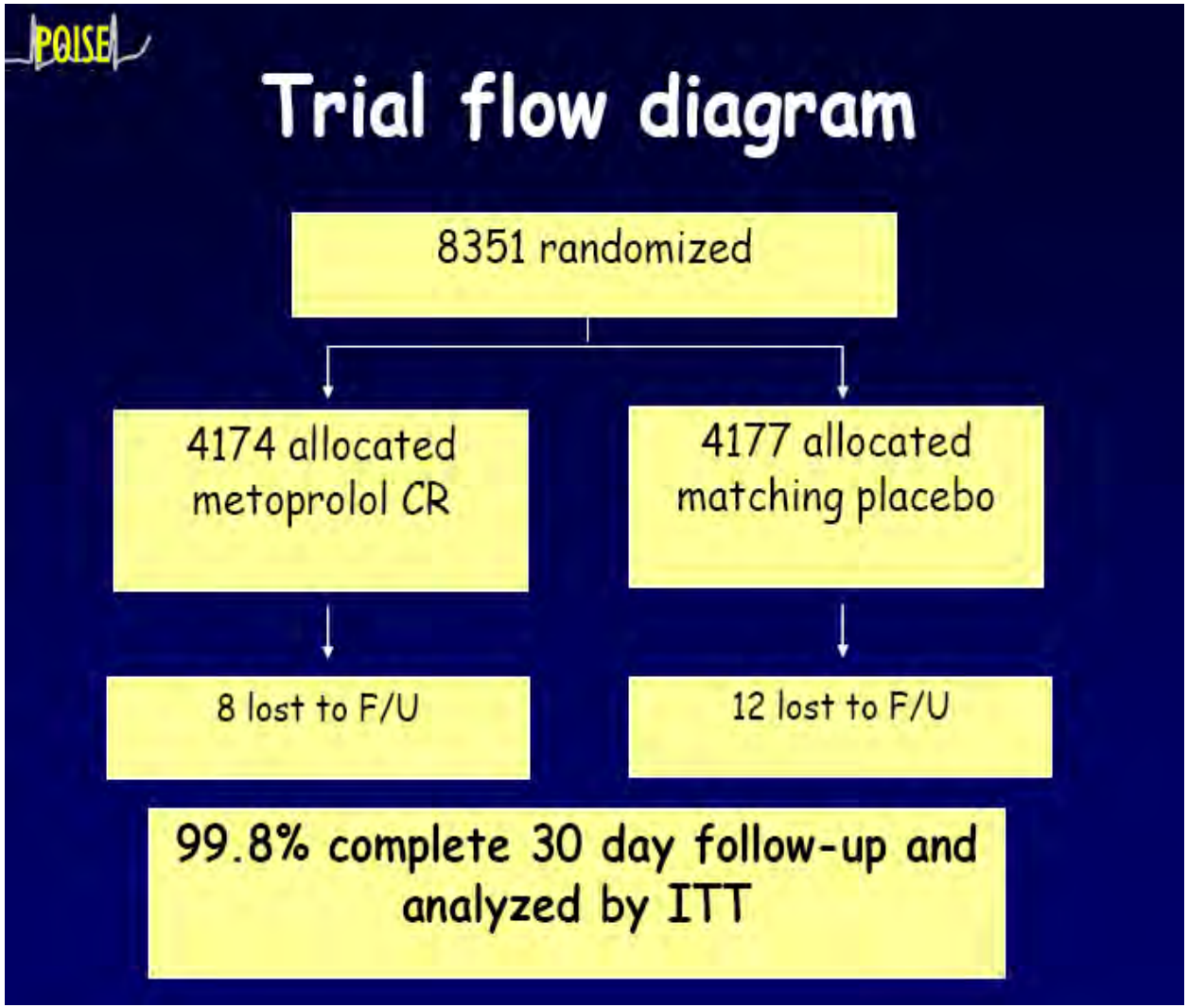
BB vs Placebo=ns

BB dangerous?

Where is the evidence !?!?

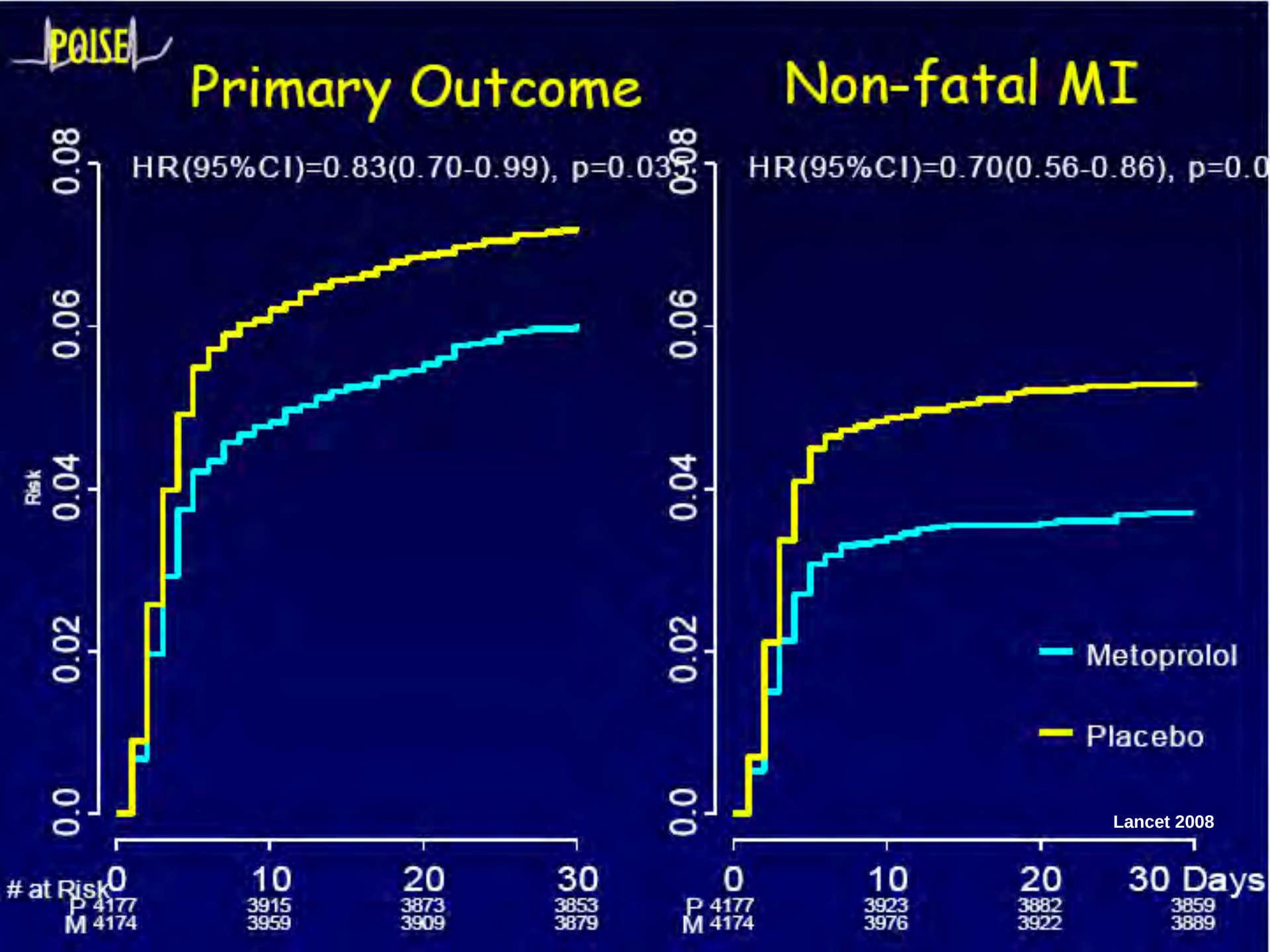
POISE

Where is Don Poldermans ?



Effects of extended-release metoprolol succinate in patients undergoing non-cardiac surgery (POISE trial): a randomised controlled trial

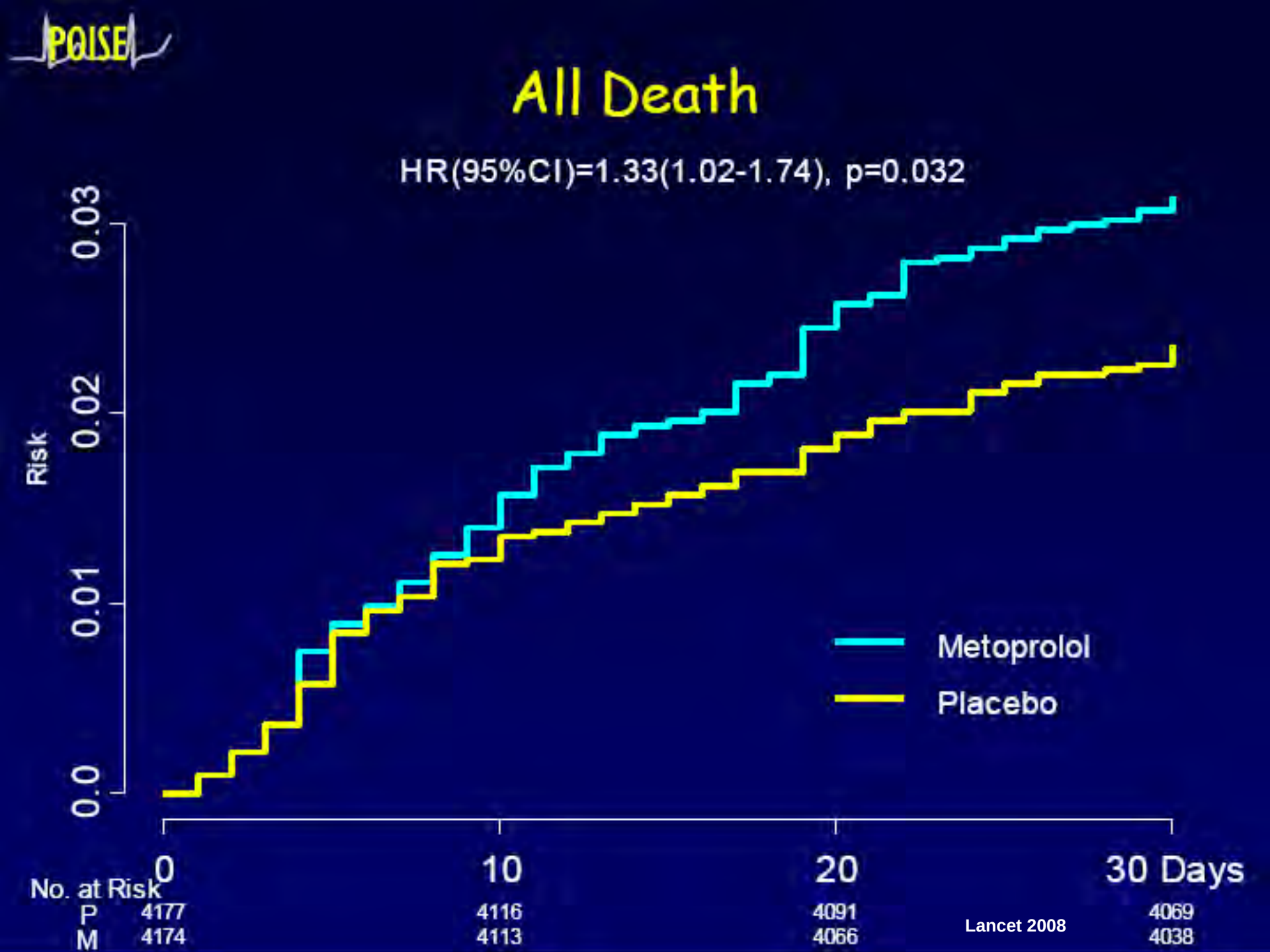
Lancet 2008


POISE
Primary Outcome
HR(95%CI)=0.83(0.70-0.99), p=0.03
Risk
0.0
0.02
0.04
0.06
0.08
at Risk
0
10
20
30
P 4177
M 4174
3915
3959
3873
3909
3853
3879
Non-fatal MI
HR(95%CI)=0.70(0.56-0.86), p=0.0
Metoprolol
Placebo
Lancet 2008
0
10
20
30 Days
P 4177
M 4174
3923
3976
3882
3922
3859
3889

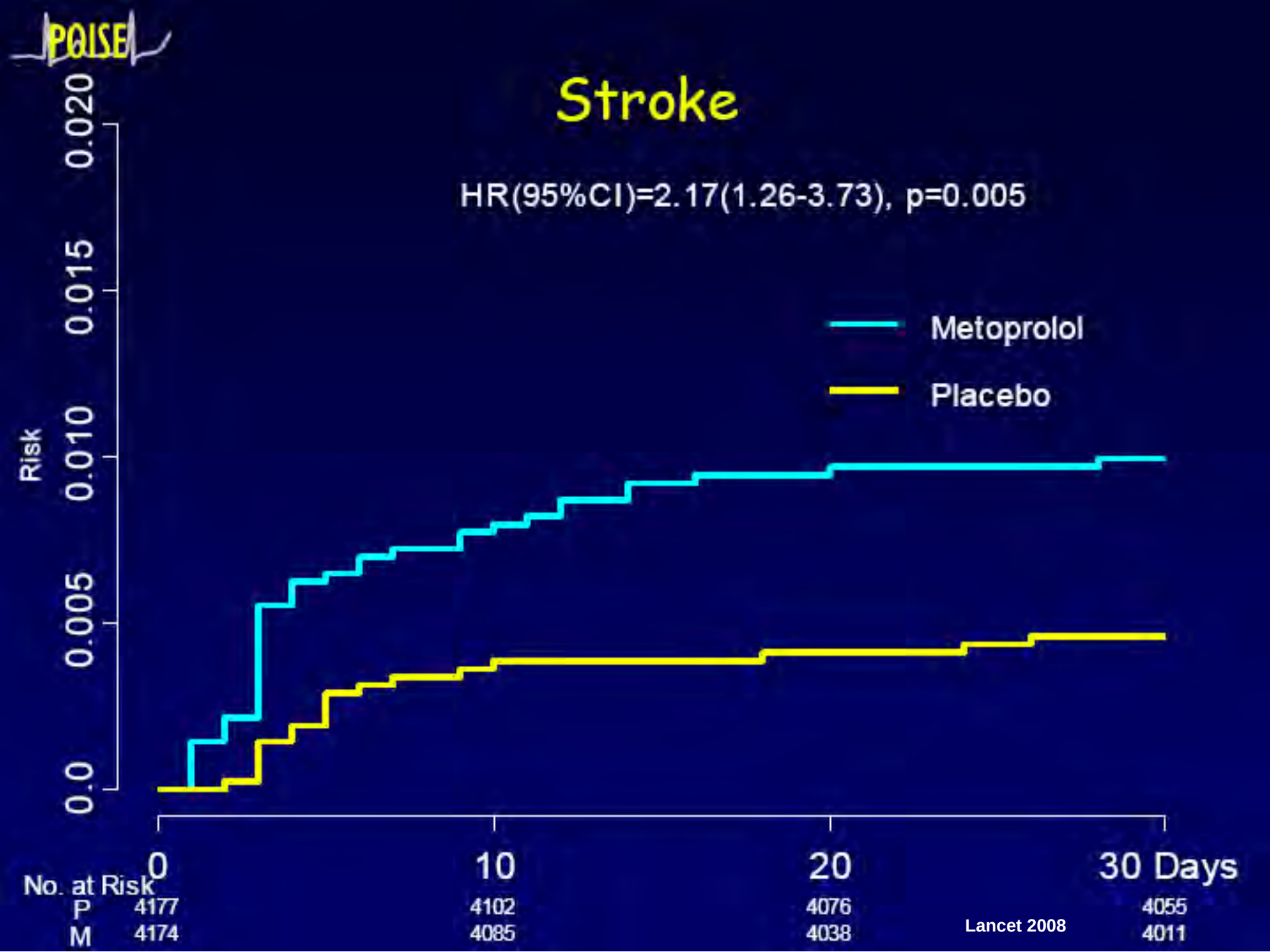
POISE

All Death

HR(95%CI)=1.33(1.02-1.74), p=0.032



Lancet 2008


POISE
Stroke
HR(95%CI)=2.17(1.26-3.73), p=0.005
Metoprolol
Placebo
Risk
0.0
0.005
0.010
0.015
0.020
0
10
20
30 Days
No. at Risk
P 4177 4102 4076 4055
M 4174 4085 4038 4011
Lancet 2008

POISE

stroke

- 60 strokes – 49 ischemic, 3 hemorrhagic, 8 uncertain

Preoperative predictor	HR	95% CI
clopidogrel	3.10	1.44-6.66
stroke/TIA	2.80	1.66-4.70
Postoperative predictors		
bleeding	3.48	1.46-8.30
AFIB	2.19	1.19-4.04
hypotension	2.18	1.07-4.45

- Nonfatal strokes
  - 59% needed help with everyday activities or incapacitated

Lancet 2008

Stroke

:

Study		Treatment regimen	BB	No BB	P
COMITT	AMI	+/-Metoprolol +/- Clopidogrel Dosage ≈ POISE	1,1%	1%	0.21
CIBIS II	NYHA III/IV	Bisoprolol vs placebo	31	16	0.04
ASCOT-BPLA	HTA	Atenolol + Diuretics vs Amlodipine + Perindopril	422	327	<0.001

Risk Associated with Preoperative Anemia in Noncardiac Surgery

A Single-center Cohort Study

W. Scott Beattie, M.D., Ph.D., F.R.C.P.C., Keyvan Karkouti, M.D., M.Sc., F.R.C.P.C.,† Duminda N. Wijeysundera, M.D., F.R.C.P.C.,‡ Gordon Tait, Ph.D.§*

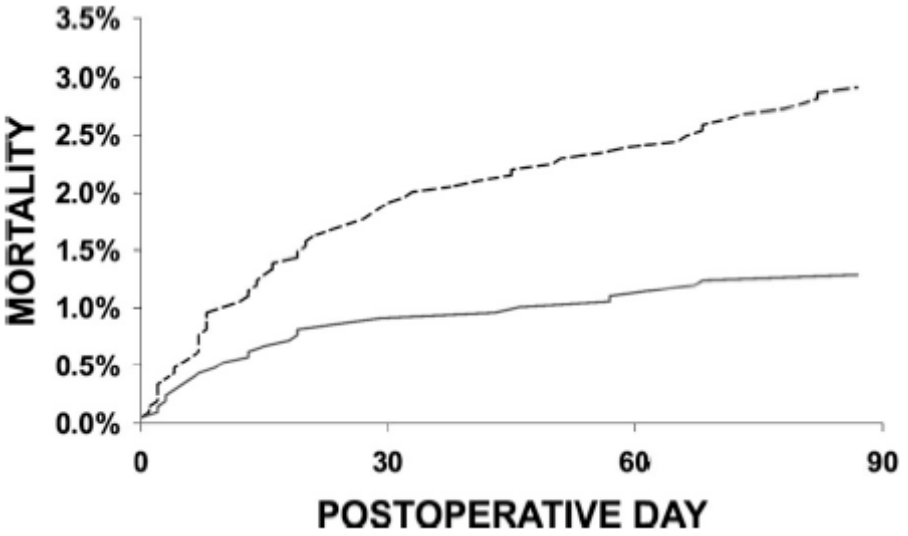


Fig. 2. The risk adjusted effect of anemia on postoperative mortality. This figure represents the time to event comparing anemic to nonanemic patients in the propensity-matched cohorts. *x axis* = postoperative day; *y axis* = percent mortality; *broken line* = patients with preoperative anemia; *solid line* = nonanemic patients.

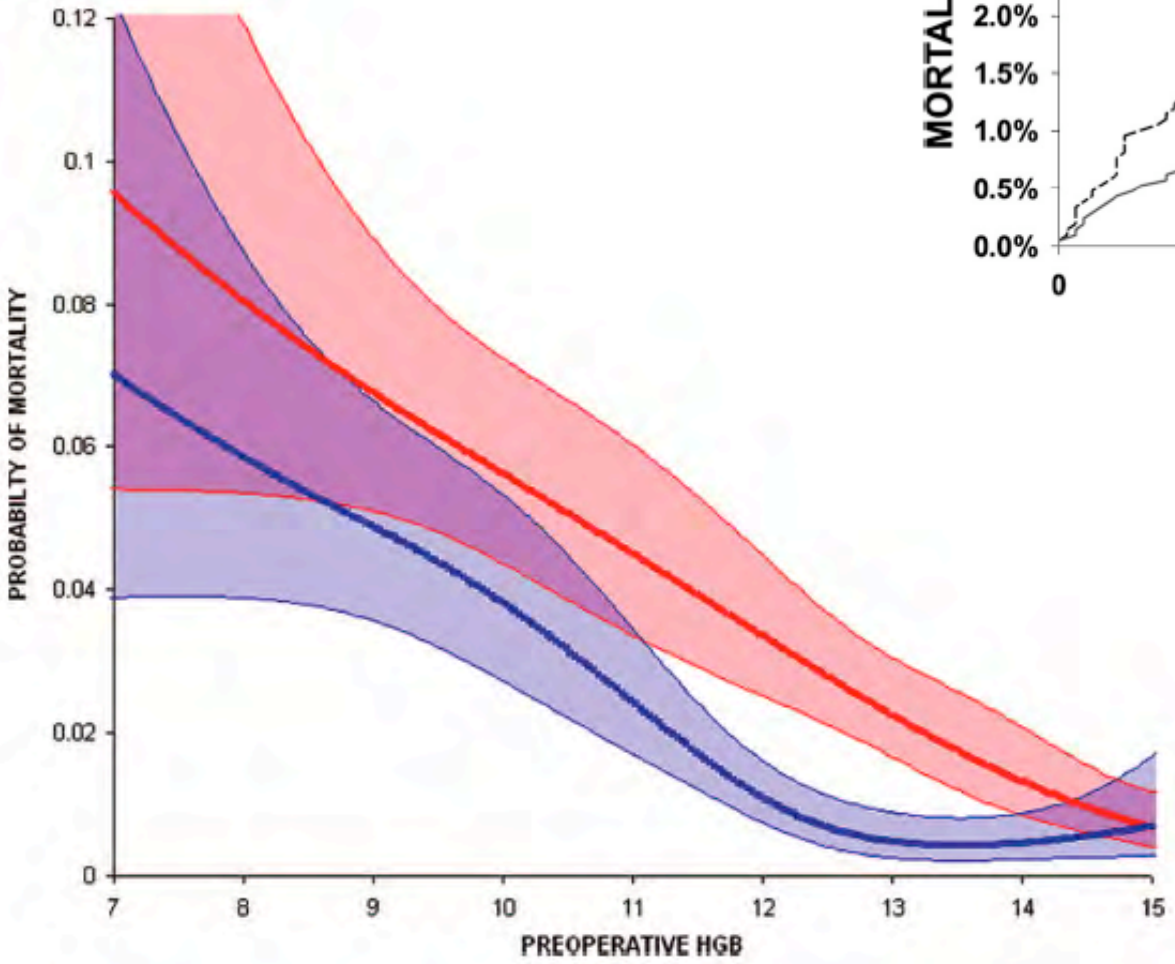
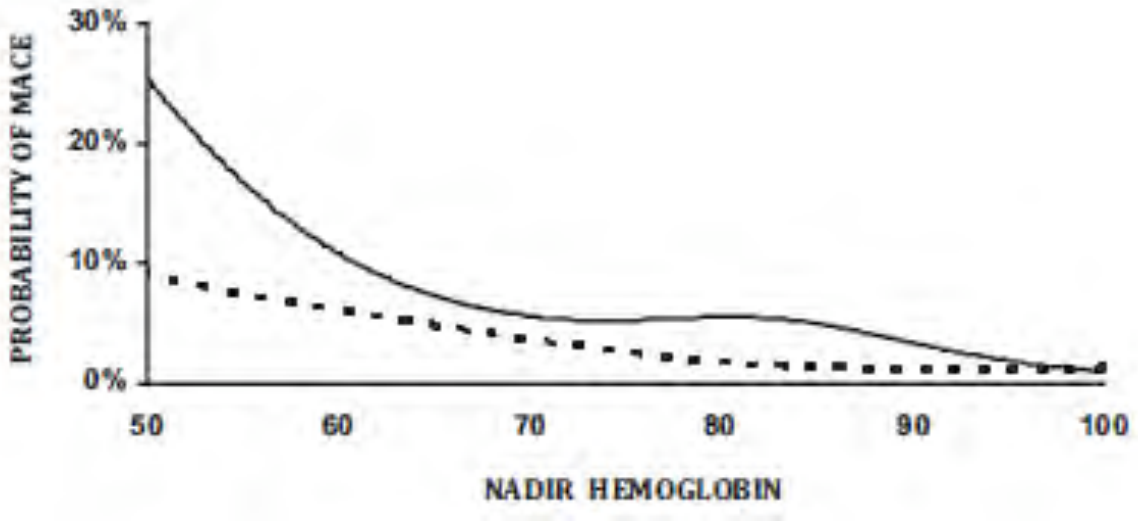


Fig. 1. Unadjusted cubic spline relationship for men and women (95% confidence intervals are indicated by the shaded areas) showing the relationship between preoperative anemia and 90-day mortality. The x axis represents the preoperative hemoglobin level in g/dl, and the y axis represents the probability of death.

Anesthesiology 2009; 110:574–81

Acute Surgical Anemia Influences the Cardioprotective Effects of β-Blockade

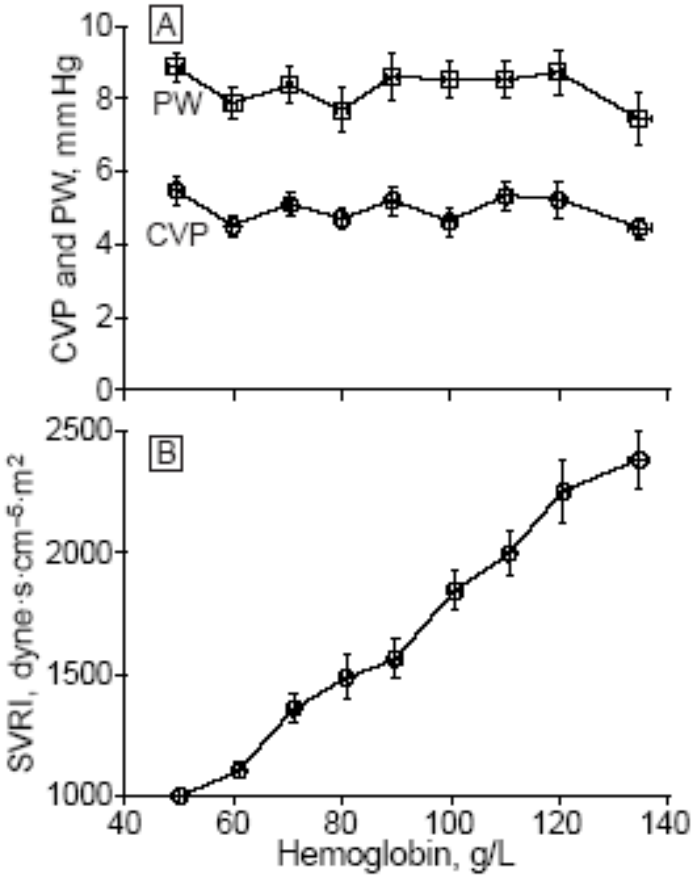
Anesthesiology, V 112 • No 1 • January 2010

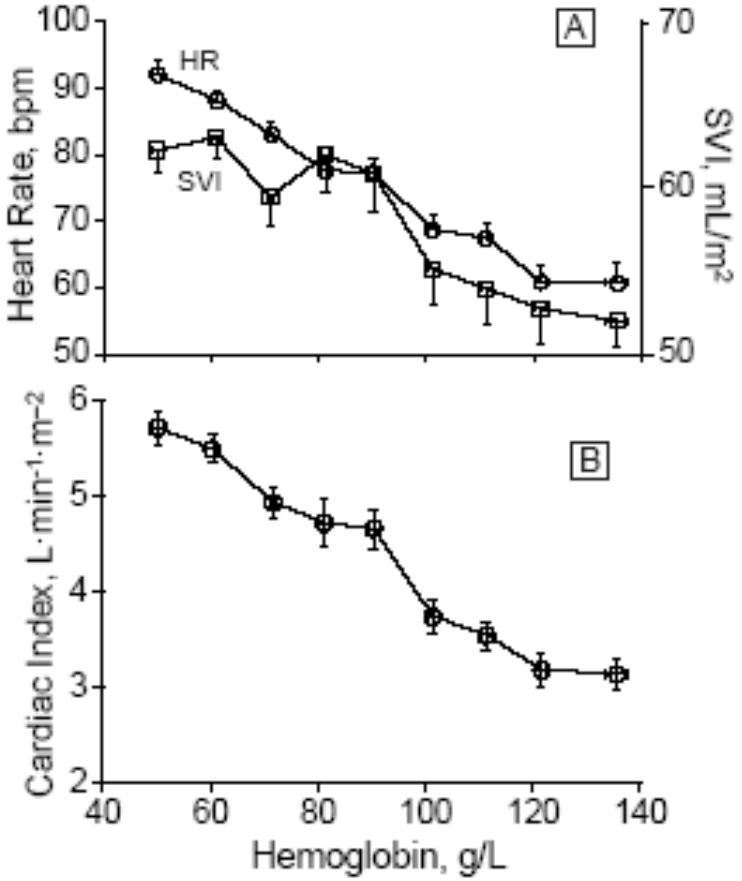


Une diminution **> à 35%** de l'Hb préopératoire
est associée à une augmentation
des complications cardiovasculaires
(quel que soit le niveau d'Hb préopératoire)

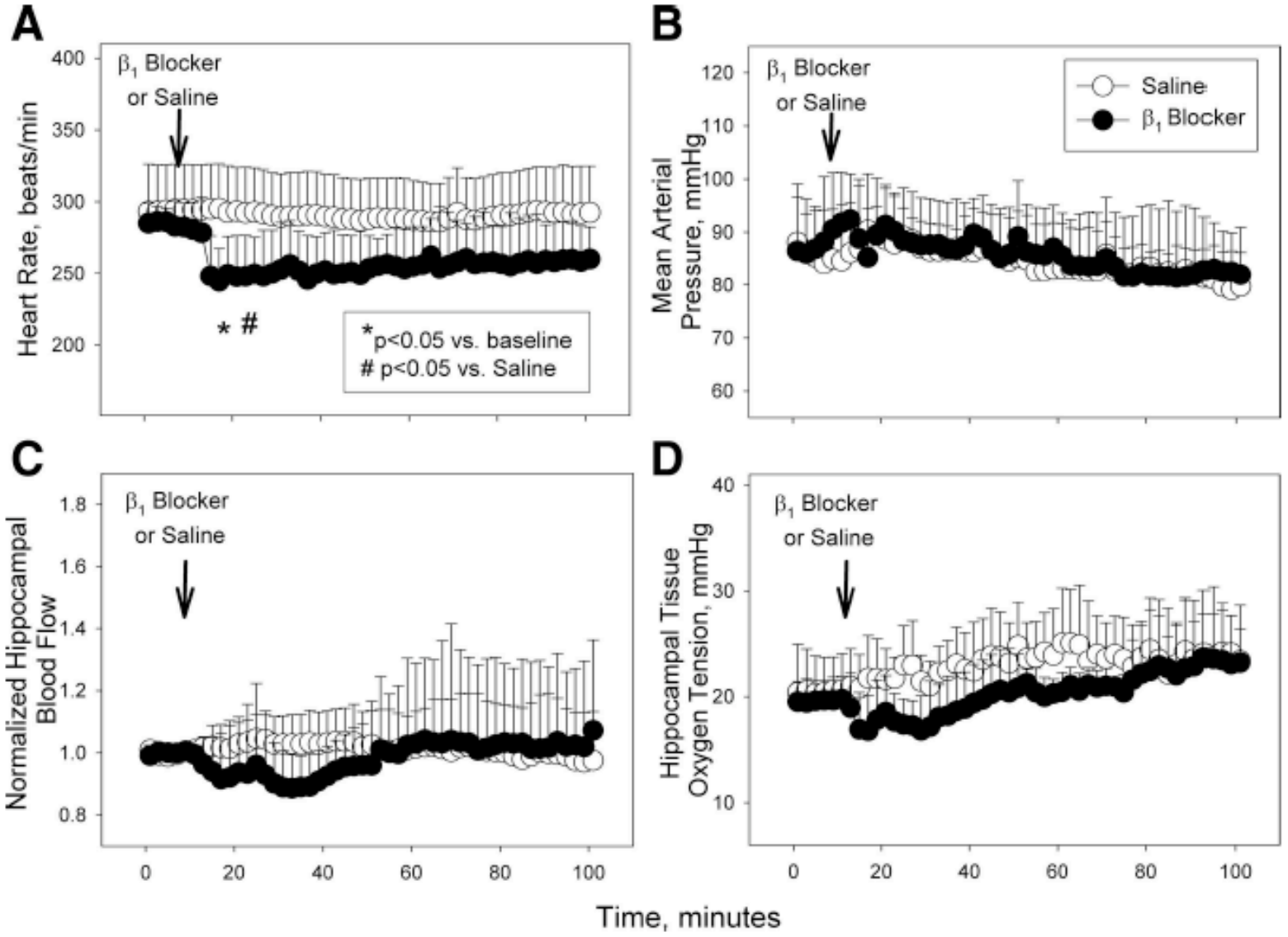
Bêta-bloquants-Anémie: le chainon manquant ?

Weiskopf et al, JAMA 1998



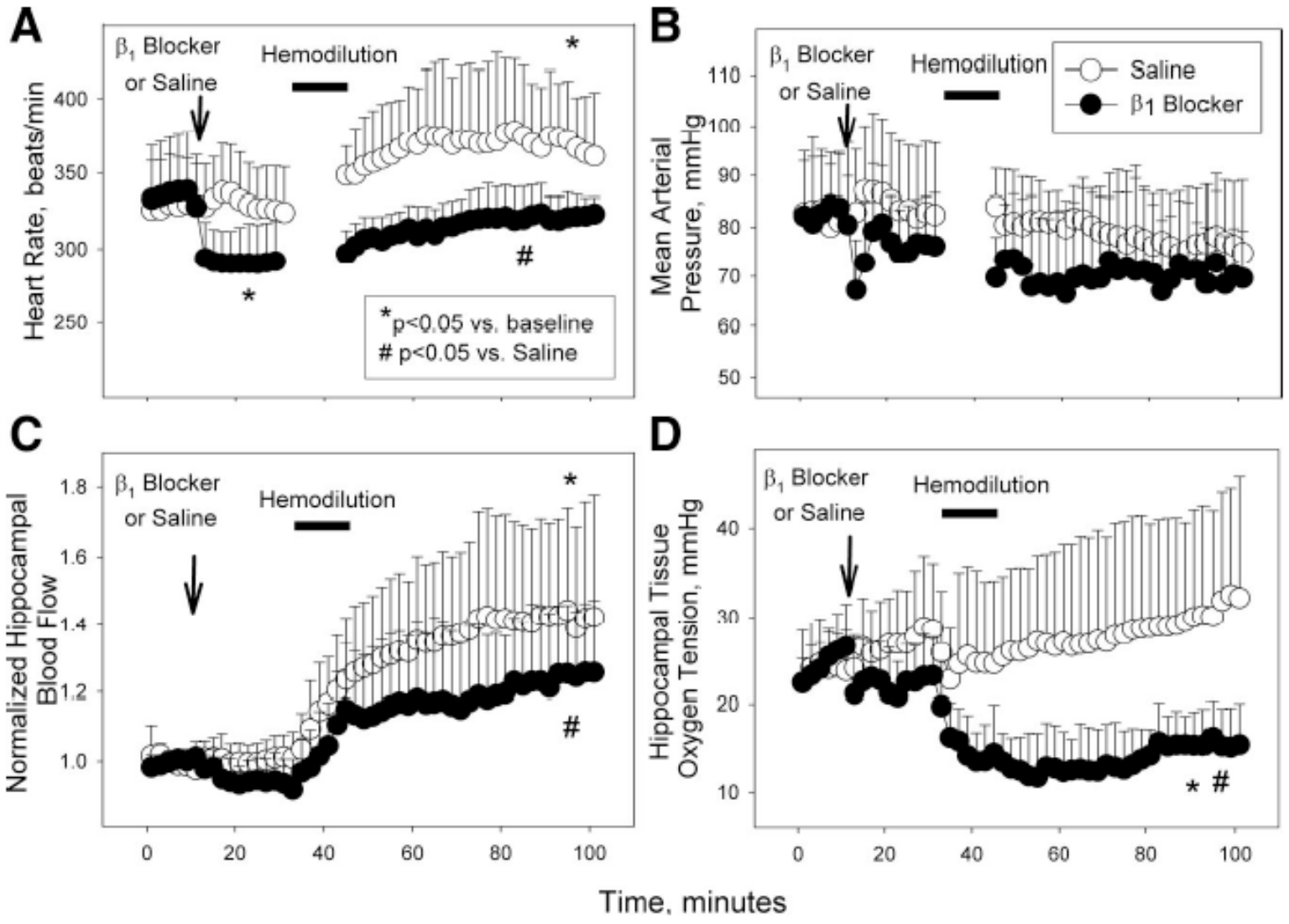


Metoprolol Reduces Cerebral Tissue Oxygen Tension after Acute Hemodilution in Rats



Ragoonannan et al, Anesthesiology 2009; 111: 988-1000

Metoprolol Reduces Cerebral Tissue Oxygen Tension after Acute Hemodilution in Rats



Ragoonannan et al, Anesthesiology 2009; 111: 988-1000

« Messages à emporter à la maison »

- L’anémie (y compris modérée) est une facteur de risque de mortalité postopératoire.

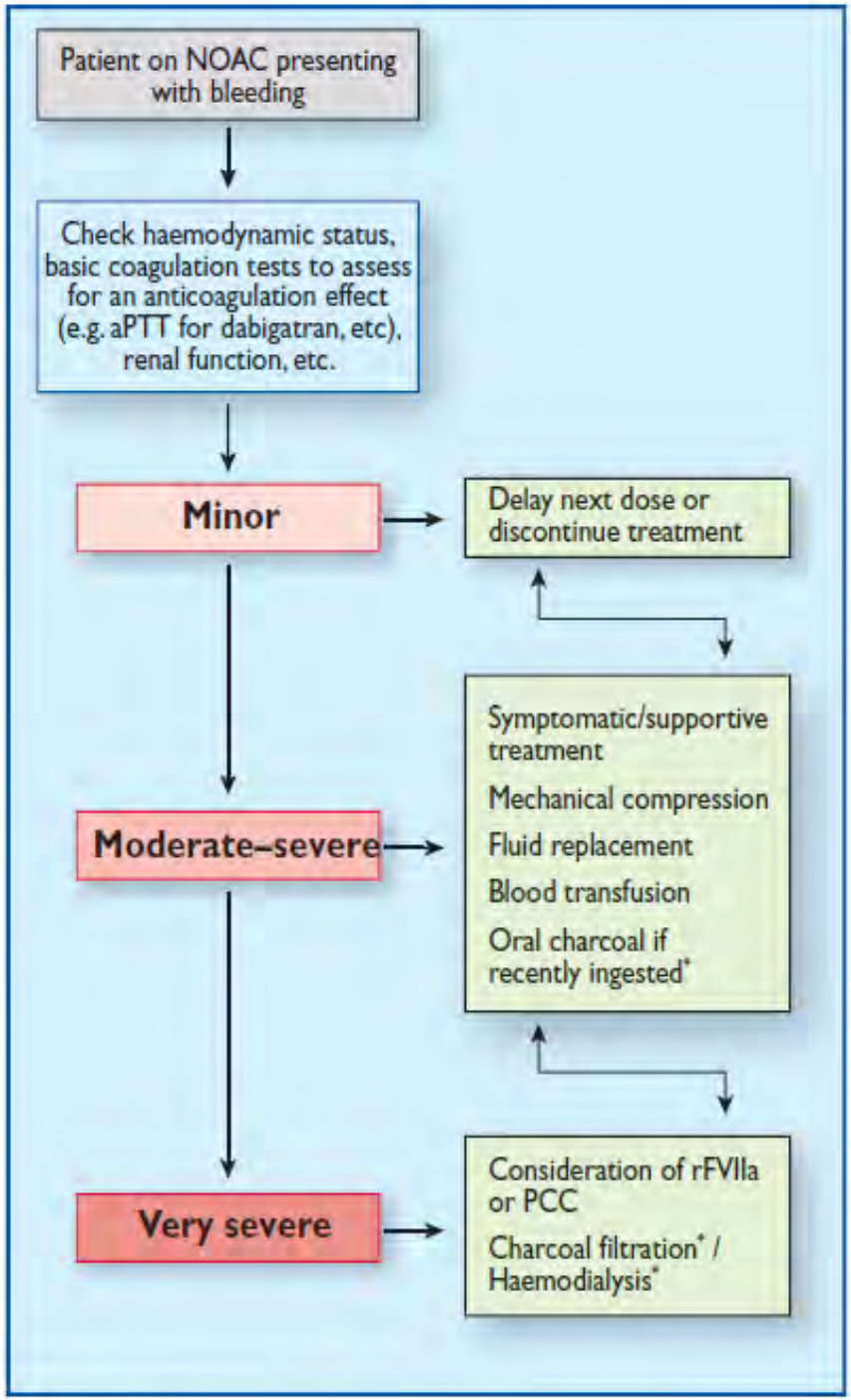
- Les bêta-bloquants diminuent la fréquence des événements cardio-vasculaires postopératoires.

- En cas d’hypotension, de bradycardie ou d’anémie, les bêta-bloquants aggravent le risque d’événements cardiovasculaires postopératoires.

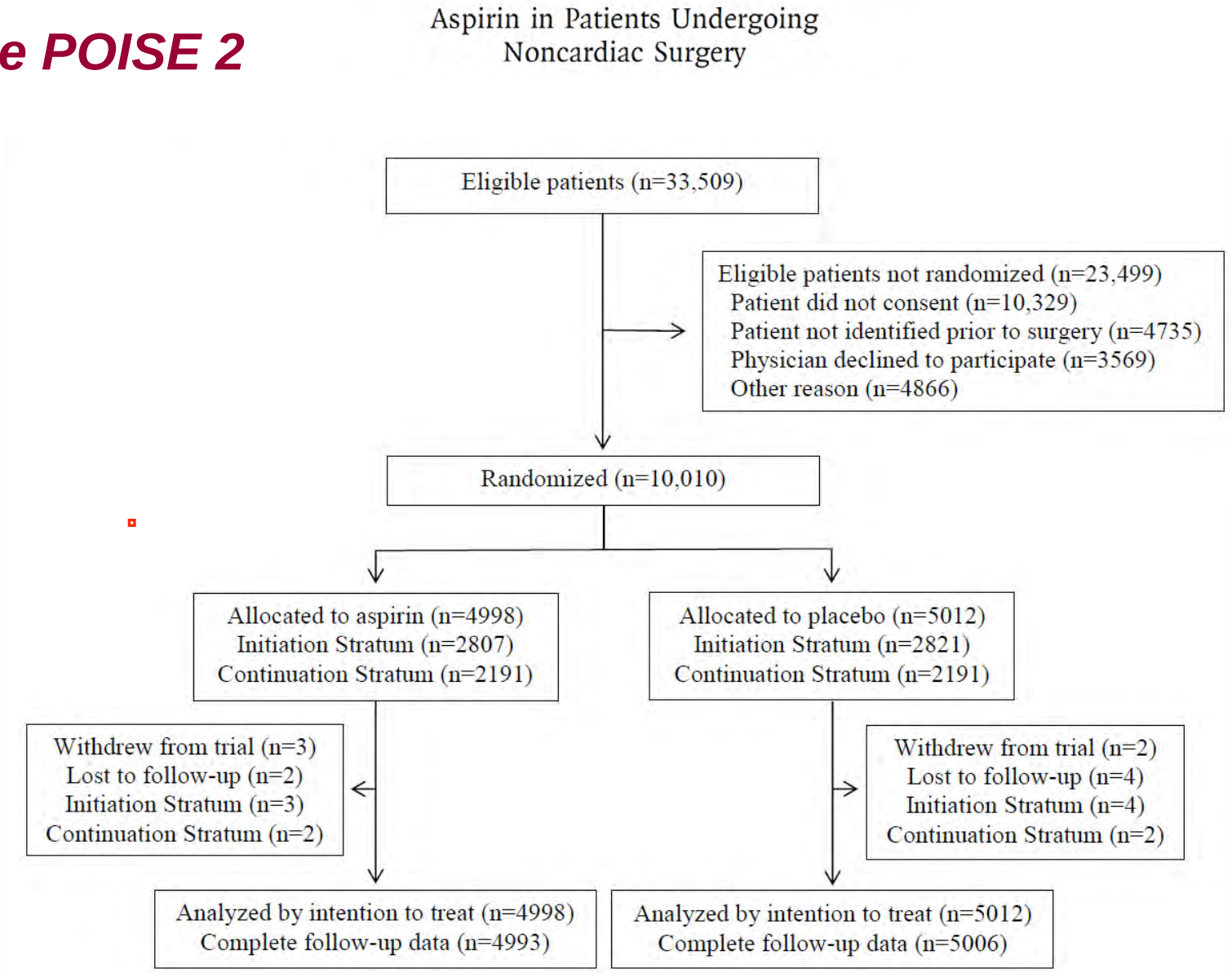
Recommendations on beta-blockers

Recommendations	Class[a]	Level[b]	Ref.[c]
Peri-operative continuation of beta-blockers is recommended in patients currently receiving this medication.	I	B	96–99
Pre-operative initiation of beta-blockers may be considered in patients scheduled for high-risk surgery and who have ≥2 clinical risk factors or ASA status ≥3.[d]	IIb	B	86,95, 97
Pre-operative initiation of beta-blockers may be considered in patients who have known IHD or myocardial ischaemia.[d]	IIb	B	83,88, 106
When oral beta-blockade is initiated in patients who undergo non-cardiac surgery, the use of atenolol or bisoprolol as a first choice may be considered.	IIb	B	97,100 –102
Initiation of peri-operative high-dose beta-blockers without titration is not recommended.	III	B	78
Pre-operative initiation of beta-blockers is not recommended in patients scheduled for low-risk surgery.	III	B	86,97

« The story of perioperative beta-blockers is certainly interesting. After several oscillations falling in and out of favour it seems that, like many things in medicine and life, we have landed somewhere in the middle. »


Patient on NOAC presenting with bleeding
Check haemodynamic status, basic coagulation tests to assess for an anticoagulation effect (e.g. aPTT for dabigatran, etc), renal function, etc.
Minor
Delay next dose or discontinue treatment
Moderate–severe
Symptomatic/supportive treatment
Mechanical compression
Fluid replacement
Blood transfusion
Oral charcoal if recently ingested*
Very severe
Consideration of rFVIIa or PCC
Charcoal filtration* / Haemodialysis*

Etude POISE 2



Devereaux et al, NEJM 2014 (appendix)

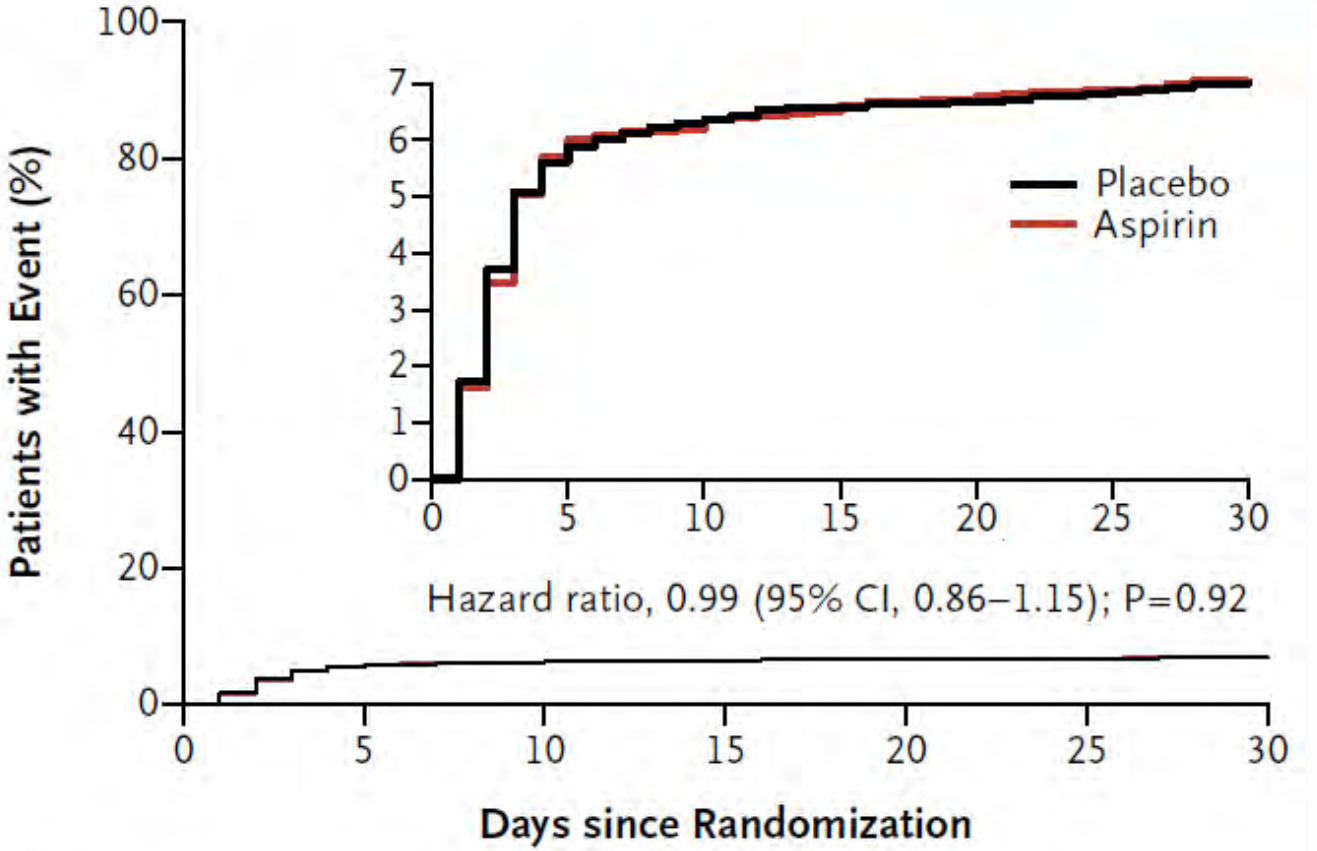
Devereaux et al, NEJM 2014

Characteristic	Aspirin (N=4998)	Placebo (N=5012)
Age — yr	68.6±10.3	68.6±10.3
Male sex — no. (%)	2597 (52.0)	2686 (53.6)
Eligibility criteria met — no. (%)		
History of vascular disease	1636 (32.7)	1635 (32.6)
Coronary artery disease	1153 (23.1)	1115 (22.2)
Peripheral arterial disease	438 (8.8)	427 (8.5)
Stroke	250 (5.0)	292 (5.8)
Undergoing major vascular surgery	244 (4.9)	245 (4.9)
Risk criteria†	4161 (83.3)	4139 (82.6)
Undergoing major surgery‡	3906 (78.2)	3896 (77.7)
Requiring emergency surgery	357 (7.1)	366 (7.3)
Age ≥70 yr	2638 (52.8)	2603 (51.9)
Diabetes requiring medication	1874 (37.5)	1911 (38.1)
Preoperative serum creatinine >2.0 mg/dl (175 μmol/liter)	164 (3.3)	156 (3.1)
History of congestive heart failure	183 (3.7)	154 (3.1)
History of transient ischemic attack	181 (3.6)	182 (3.6)
History of hypertension	4280 (85.6)	4355 (86.9)
History of smoking within 2 yr before surgery	1295 (25.9)	1262 (25.2)
Other medical history — no. (%)		
History of coronary-artery bypass grafting	241 (4.8)	240 (4.8)
History of percutaneous coronary intervention	234 (4.7)	236 (4.7)
Bare-metal stent	128 (2.6)	127 (2.5)
Drug-eluting stent	54 (1.1)	65 (1.3)
Unknown stent type	29 (0.6)	24 (0.5)
No stent	22 (0.4)	19 (0.4)
Missing data	1 (<0.1)	1 (<0.1)
Dialysis in week before randomization	69 (1.4)	58 (1.2)
Median preoperative hemoglobin (IQR) — g/liter	133 (121–144)	133 (120–144)
Time from randomization to surgery — no. (%)		
≤24 hr	4777 (95.6)	4795 (95.7)
>24–48 hr	45 (0.9)	49 (1.0)
≥48 hr	176 (3.5)	168 (3.4)

Characteristic	Aspirin (N=4998)	Placebo (N=5012)
Surgery — no./total no. (%)§		
Any procedure	4953/4998 (99.1)	4979/5012 (99.3)
Orthopedic	1891/4953 (38.2)	1953/4979 (39.2)
General	1327/4953 (26.8)	1337/4979 (26.9)
Urologic or gynecologic	827/4953 (16.7)	835/4979 (16.8)
Vascular	309/4953 (6.2)	296/4979 (5.9)
Thoracic	293/4953 (5.9)	298/4979 (6.0)
Other	428/4953 (8.6)	392/4979 (7.9)
No procedure performed	42/4998 (0.8)	31/5012 (0.6)
Missing data	3/4998 (0.1)	2/5012 (<0.1)
Medications taken within 24 hr before surgery — no./total no. (%)		
Prophylactic-dose anticoagulant	626/4952 (12.6)	650/4978 (13.1)
Nonsteroidal antiinflammatory drug	470/4952 (9.5)	468/4978 (9.4)
COX-2 inhibitor	162/4951 (3.3)	165/4978 (3.3)
Statin	1815/4952 (36.7)	1842/4978 (37.0)
Beta-blocker	1153/4951 (23.3)	1206/4977 (24.2)
$P2Y_{12}$ inhibitor	3/4952 (0.1)	1/4978 (<0.1)
Perioperative antifibrinolytic agent — no./total no. (%)	73/4951 (1.5)	80/4977 (1.6)
Medications taken during first 3 days after surgery — no./total no. (%)		
Prophylactic-dose anticoagulant	3230/4948 (65.3)	3220/4976 (64.7)
Therapeutic-dose anticoagulant	225/4947 (4.5)	206/4976 (4.1)
Nonsteroidal antiinflammatory drug	1581/4947 (32.0)	1590/4976 (32.0)
COX-2 inhibitor	263/4947 (5.3)	270/4976 (5.4)
Statin	2071/4948 (41.9)	2100/4975 (42.2)
Beta-blocker	1428/4947 (28.9)	1498/4976 (30.1)
$P2Y_{12}$ inhibitor	59/4947 (1.2)	60/4976 (1.2)

Devereaux et al, NEJM 2014

Devereaux et al, NEJM 2014

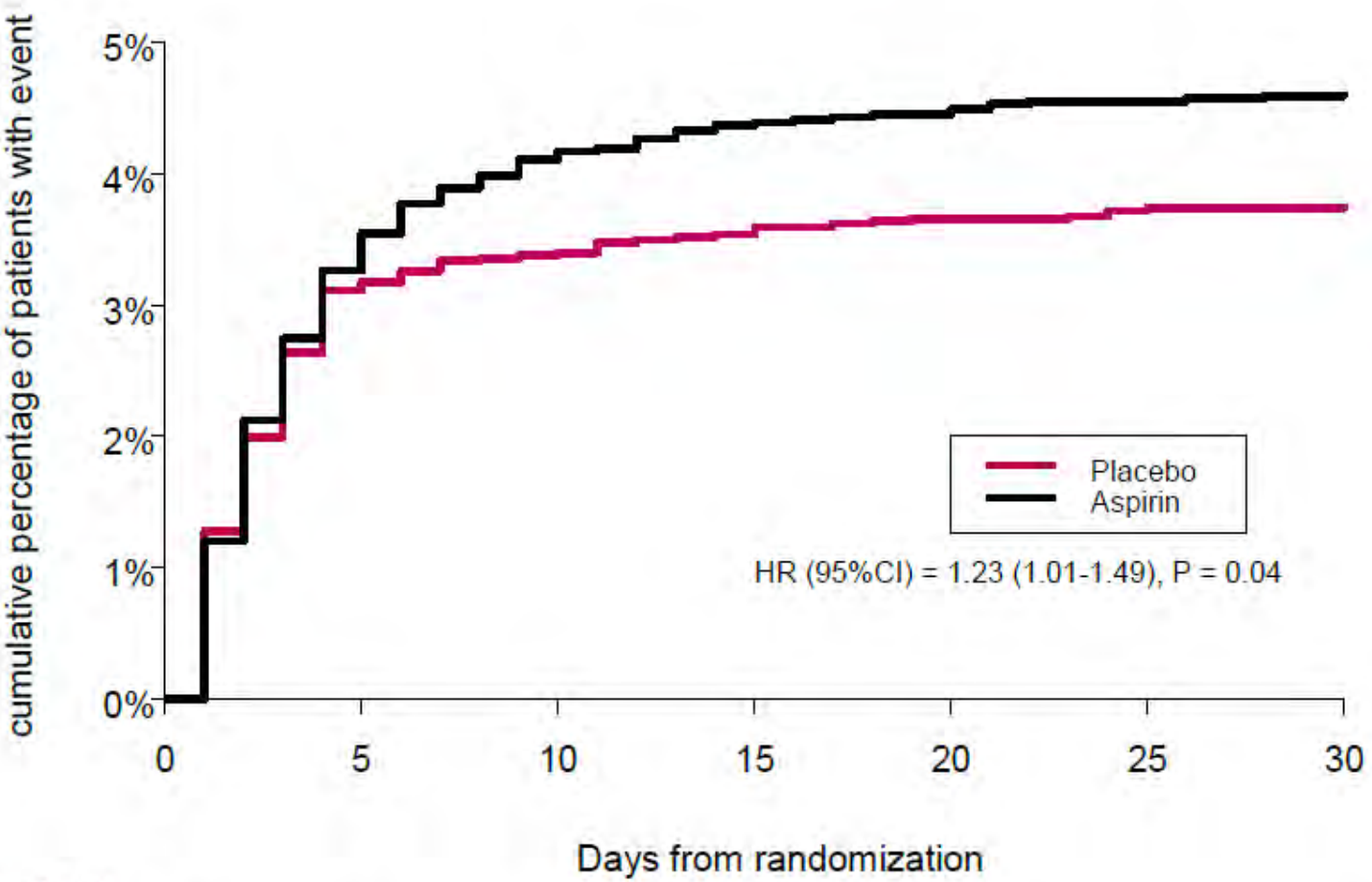


No. at Risk							
Placebo	5012	4724	4696	4680	4669	4662	4652
Aspirin	4998	4713	4678	4665	4660	4653	4643

Figure 1. Kaplan–Meier Estimates of the Primary Composite Outcome of Death or Nonfatal Myocardial Infarction at 30 Days.

The inset shows the same data on an enlarged y axis.

Supplemental Figure 2: Kaplan-Meier estimates of major bleed



No. at Risk							
Placebo	5012	4842	4817	4798	4782	4773	4766
Aspirin	4998	4823	4764	4743	4734	4722	4710

Devereaux et al, NEJM 2014

Aspirin in Patients Undergoing Noncardiac Surgery

Supplemental Table 2: Effects of Aspirin on the 30-day outcomes in the Initiation Stratum

Outcome	Aspirin (N=2807)	Placebo (N=2821)	Hazard Ratio (95% CI)	P Value
Primary outcome – no. (%)				
mortality or nonfatal myocardial infarction	182 (6.5)	185 (6.6)	0.99 (0.81-1.21)	0.92
Secondary outcomes – no. (%)				
mortality, nonfatal myocardial infarction, or nonfatal stroke	185 (6.6)	195 (6.9)	0.95 (0.78-1.17)	0.64
second composite outcome*	206 (7.3)	214 (7.6)	0.97 (0.80-1.17)	0.73
Tertiary outcomes – no. (%)				
total mortality	38 (1.4)	38 (1.3)	1.01 (0.64-1.58)	0.98
vascular mortality	19 (0.7)	19 (0.7)	1.01 (0.53-1.90)	0.99
myocardial infarction	158 (5.6)	162 (5.7)	0.98 (0.79-1.22)	0.86
nonfatal cardiac arrest	4 (0.1)	8 (0.3)	0.50 (0.15-1.67)	0.26
cardiac revascularization	3 (0.1)	7 (0.2)	0.43 (0.11-1.67)	0.22
pulmonary embolism	15 (0.5)	19 (0.7)	0.79 (0.40-1.56)	0.50
deep venous thrombosis	15 (0.5)	21 (0.7)	0.72 (0.37-1.39)	0.33
new clinically important atrial fibrillation	51 (1.8)	53 (1.9)	0.97 (0.66-1.42)	0.87
peripheral arterial thrombosis	5 (0.2)	8 (0.3)	0.63 (0.21-1.92)	0.41
amputation	5 (0.2)	8 (0.3)	0.63 (0.21-1.92)	0.41
re-hospitalization for vascular reasons	38 (1.4)	35 (1.3)	1.09 (0.69-1.73)	0.71
acute kidney injury with receipt of dialysis†	14 (0.5)	11 (0.4)	1.28 (0.58-2.83)	0.54
Safety outcomes – no. (%)				
life-threatening bleeding	49 (1.7)	47 (1.7)	1.05 (0.70-1.56)	0.82
major bleeding	130 (4.6)	98 (3.5)	1.34 (1.03-1.74)	0.03
clinically important hypotension	1207 (43.0)	1175 (41.7)	1.04 (0.96-1.12)	0.38
stroke	3 (0.1)	12 (0.4)	0.25 (0.07-0.89)	0.03
congestive heart failure	21 (0.8)	21 (0.7)	1.00 (0.55-1.84)	0.99
infection	291 (10.4)	289 (10.3)	1.01 (0.86-1.19)	0.89
sepsis	144 (5.1)	156 (5.6)	0.93 (0.74-1.16)	0.51

Devereaux et al, NEJM 2014

Aspirin in Patients Undergoing Noncardiac Surgery

Supplemental Table 3: Effects of Aspirin on the 30-day outcomes in the Continuation Stratum

Outcome	Aspirin (N=2191)	Placebo (N=2191)	Hazard Ratio (95% CI)	P Value
Primary outcome – no. (%)				
mortality or nonfatal myocardial infarction	169 (7.7)	170 (7.8)	1.00 (0.81-1.23)	0.97
Secondary outcomes – no. (%)				
mortality, nonfatal myocardial infarction, or nonfatal stroke	177 (8.1)	175 (8.0)	1.01 (0.82-1.25)	0.90
second composite outcome*	196 (9.0)	193 (8.8)	1.02 (0.83-1.24)	0.86
Tertiary outcomes – no. (%)				
total mortality	27 (1.2)	24 (1.1)	1.12 (0.65-1.95)	0.67
vascular mortality	16 (0.7)	16 (0.7)	1.00 (0.50-2.00)	1.00
myocardial infarction	151 (6.9)	153 (7.0)	0.99 (0.79-1.24)	0.93
nonfatal cardiac arrest	5 (0.2)	4 (0.2)	1.25 (0.34-4.66)	0.74
cardiac revascularization	10 (0.5)	10 (0.5)	1.00 (0.42-2.40)	1.00
pulmonary embolism	18 (0.8)	12 (0.6)	1.50 (0.72-3.12)	0.27
deep venous thrombosis	10 (0.5)	14 (0.6)	0.71 (0.32-1.61)	0.41
new clinically important atrial fibrillation	58 (2.7)	41 (1.9)	1.42 (0.95-2.11)	0.09
peripheral arterial thrombosis	8 (0.4)	7 (0.3)	1.14 (0.41-3.15)	0.80
amputation	5 (0.2)	5 (0.2)	1.00 (0.29-3.45)	1.00
re-hospitalization for vascular reasons	32 (1.5)	19 (0.9)	1.69 (0.96-2.98)	0.07
acute kidney injury with receipt of dialysis†	19 (0.9)	8 (0.4)	2.41 (1.05-5.51)	0.04
Safety outcomes – no. (%)				
life-threatening bleeding	38 (1.7)	26 (1.2)	1.46 (0.89-2.41)	0.13
major bleeding	100 (4.6)	90 (4.1)	1.11 (0.84-1.48)	0.47
clinically important hypotension	936 (42.7)	921 (42.0)	1.02 (0.93-1.11)	0.72
stroke	13 (0.6)	7 (0.3)	1.86 (0.74-4.66)	0.19
congestive heart failure	23 (1.1)	17 (0.8)	1.35 (0.72-2.54)	0.34
infection	197 (9.0)	206 (9.4)	0.96 (0.79-1.16)	0.66
sepsis	99 (4.5)	102 (4.7)	0.97 (0.74-1.28)	0.83

Devereaux et al, NEJM 2014

Bleeding complications in patients with coronary stents during non-cardiac surgery ☆

Pierre Albaladejo [a,b,1,*], Hélène Charbonneau [a,1], Charles-Marc Samama [c], Jean-Philippe Collet [d], Emmanuel Marret [e], Vincent Piriou [f], Celine Genty [b], Jean Luc Bosson [b]

Postoperative management of antiplatelet agents.

	All	No haemorrhagic Complication	Haemorrhagic Complication	p
	n = 1133	n = 1025	n = 108	
Number of days of antiplatelet therapy interruption (mean ± SD) (n = 929)	1.39 ± 2.9	1.35 ± 3.0	1.77 ± 2.6	0.188
Delay before resuming antiplatelet therapy ≥ 2 days (%) (n = 929)	101 (10.9)	85 (10.2)	16 (17.2)	0.039
Loading dose (%) (n = 742)				
Aspirin (n = 742)	17 (2.3)	14 (2.1)	3 (3.5)	0.431*
Clopidogrel (n = 498)	38 (7.6)	35 (7.8)	3 (6.4)	0.999*

* Fisher exact test.

Postoperative management of anticoagulants.

	All	No haemorrhagic Complication	Haemorrhagic Complication	p
	n = 1133	n = 1025	n = 108	
Type of anticoagulant (%)				0.262*
Low molecular weight heparin	476 (76.3)	407 (77.4)	69 (70.4)	
Unfractionated heparin	127 (20.3)	101 (19.2)	26 (26.5)	
Other	21 (3.4)	18 (3.4)	3 (3.1)	
Anticoagulant regimen (%)				<0.001
No anticoagulant	509 (44.9)	499 (48.7)	10 (9.3)	
Prophylactic	477 (42.1)	407 (39.7)	70 (64.8)	
Therapeutic	147 (13.0)	119 (11.6)	28 (25.9)	
First dose (%)				0.363
Low	89.1	89.5	85.5	
High	10.9	10.5	14.5	
Duration (%)				0.058
<8 days	42.1	40.8	56.4	
Between [8–30] days	49.2	50.1	40.0	
>30 days	8.7	9.1	3.6	

*Fisher exact test.

Thromb Res 2014

Bleeding complications in patients with coronary stents during non-cardiac surgery ☆

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Multivariate analysis of postoperative risk factors for haemorrhagic complications.

	OR	95%CI
Bleeding risk		
Low	1	
Intermediate	3.9	[2.15 – 7.20]
High	4.1	[2.10 – 7.94]
Anticoagulant regimen		
No anticoagulant	1	
Prophylactic	4.6	[2.24 – 9.38]
Therapeutic	7.2	[3.30 – 15.67]

Factors included in the multivariate analysis were: the 6 types of surgery, urgent/elective surgery, Lee score, bleeding risk score, postoperative days without any antiplatelet agent > 2, anticoagulant regimen and duration.

Thromb Res 2014

Guidelines on myocardial revascularization

The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

BMS in stable patients *DES in all patients* *ACS patients*

1 month **6-12 months** **1 year**

Data suggest that certain patient populations (e.g. high risk for thromboembolic events, patients after SES or PES implantation), may benefit from prolonged DAPT beyond 1 year. The downside of this strategy is the increased rate of severe bleeding complications over time. Recent data suggest that DAPT for 6 months might be sufficient because late and very late stent thrombosis correlate poorly with discontinuation of DAPT.

Eur Heart J. 2014 Oct 1;35(37):2541-619.

RECOMMANDATION DE BONNE PRATIQUE

Antiagrégants plaquettaires : prise en compte des risques thrombotique et hémorragique en cas de geste endoscopique chez le coronarien

RECOMMANDATIONS

Juin 2012

Risque hémorragique sans AAP	Acte endoscopique	Faisabilité	
		sous AAS	sous clopidogrel ou prasugrel
Risque faible à modéré	FOGD ou coloscopie +/- biopsie	OUI	OUI
	Entéroscopie +/- biopsie		
	Échoendoscopie sans ponction		
	Polypectomie colique < 1 cm		
	Coagulation plasma argon		
	CRPE sans SE		
	Échoendoscopie ponction de masse solide		NON
	Prothèse digestive		
	Dilatation sténose bénigne ou maligne		
	Ligature de varices oesophagiennes		
	Gastrostomie GPE		
	Sphinctérotomie endoscopique		
Risque élevé	Polypectomie colique (> 1 cm)	OUI*	
	Écho-ponction lésion kystique	NON	
	Sphinctéroclasie		
	Dissection sous-muqueuse		
	Mucosectomie		
	Ampullectomie		

HAS 2012

Risque hémorragique sans AAP	Acte endoscopique	Faisabilité	
		sous AAS	sous clopidogrel
Risque faible à modéré	Uréthrocystoscopie	OUI	OUI
	Urétéroscopie diagnostique +/- biopsie		NON
	Urétéroscopie rigide + extraction (+/- fragmentation) de calcul		
	Urétéroscopie souple + extraction (+/- fragmentation) de calcul		
	Montée d'une endoprothèse urétérale (type sonde JJ)		
	Dilatation urétérale +/- stent		
	Biopsies prostatiques		
	Uréthrotomie endoscopique		
Risque élevé	Résection transuréthrale de prostate	OUI*	
	Résection transuréthrale de vessie		
	Biopsies de vessie		

HAS 2012

Risque hémorragique sans AAP	Acte endoscopique	Faisabilité	
		sous AAS	sous clopidogrel ou prasugrel
Risque faible à modéré	Bronchoscopie sans prélèvement	OUI	OUI
	Bronchoscopie avec aspiration bronchique		
	Bronchoscopie avec lavage broncho-alvéolaire (LBA)		
	Bronchoscopie avec brosse à visée bactériologique		
	Bronchoscopie avec brosse à visée cytologique		NON
	Bronchoscopie avec biopsie(s) d'éperon(s)		
	Bronchoscopie avec ponction transbronchique à l'aiguille, avec ou sans échoguidage		
Risque élevé	Bronchoscopie avec biopsie(s) d'un bourgeon ou d'une masse endobronchique		
	Bronchoscopie avec biopsie(s) transbronchique(s)		

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Risque hémorragique sans AAP	Acte proctologique	Sous AAS	Sous clopidogrel ou prasugrel
Risque faible	Injections sclérosantes	OUI	NON
	Photocoagulation infrarouge		
	Ligature élastique		
	Cryothérapie		
	Coagulation bipolaire BICAP		
	Destruction de petites tumeurs ou de condylomes		
	Excision de fissure (fissurectomie avec ou sans anoplastie)		
	Fistulotomie		
	Obturation de fistule après 1er temps de drainage par séton (colle biologique, plug, lambeau rectal d'avancement)		
	Plasties cutanées		
Risque modéré	Mise à plat d'abcès ano-rectaux	OUI	OUI
	Excision de kyste pilonidal		NON
	HAL-Doppler et HAL-mucopexie		
	Hémorroïdectomie pédiculaire ouverte (type Milligan et Morgan)		
	Hémorroïdopexie agrafée (type Longo)		
	Résection agrafée transanale (STARR)		
	Tumorectomie par voie transanale		

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SFR
Société française de rhumatologie

RECOMMANDATION DE BONNE PRATIQUE

Antiagrégants plaquettaires : prise en compte des risques thrombotique et hémorragique pour les gestes percutanés chez le coronarien

Novembre 2013

Blocs superficiels / blocs profonds

blocks in the trunk	iliohypogastric nerve genitofemoral nerve ilioinguinal
	infiltration of lumbosacral ligaments and sacroiliac joint
blocks in the upper limb	brachial plexus – axillary access
	radial nerve ulnar nerve median nerve lateral cutaneous nerve of forearm
	suprascapular nerve
	intravenous regional anaesthesia
blocks in the lower limb	femoral nerve (3-in-1 block)
	lateral cutaneous femoral nerve
	obturator nerve
	common peroneal nerve tibial nerve saphenous nerve
	around the ankle joint (foot block)
blocks in the sympathetic nervous system	regional i.v. sympatholysis
	stellate ganglion (access C6 only)
blocks in the head	occipital nerve infraorbital nerve supraorbital nerve mental nerve facial nerve
other	myofascial trigger point infiltration, acupuncture

blocks in the trunk	epidural blocks
	epidural electrode stimulation
	trans-sacral blocks
	spinal blocks
	intrathecal administration of medication
	facet joint nerves
	spinal nerve root
	prevertebral somatic nerve block
	psoas compartment block
	intercostal nerve
	pudendal nerve
	interscalene block of the brachial plexus
	supra and infraclavicular brachial plexus blocks
blocks in the lower limb	ischial nerve
blocks in the sympathetic nervous system	coeliac plexus
	lumbar sympathetic chain
	opioid analgesia at superior cervical ganglion or sphenopalatine ganglion
blocks in the head	trigeminal nerve, Gasserian ganglion and distal branches
	maxillary nerve + pterygopalatine ganglion supratrochlear nerve glossopharyngeal nerve

S. Kozek-Langenecker. Hämostaseologie 2006

Epidural analgesia in vascular surgery patients actively taking clopidogrel

W. A. Osta*, H. Akbary and S. F. Fuleihan

The charts of 306 vascular surgical patients who received epidural analgesia without withholding clopidogrel perioperatively were reviewed for the presence of any postoperative complications related to the continued intake of clopidogrel. No postoperative neurological complications resulting from the use of epidural analgesia were found in any of these patients.

Br J Anaesth 2010; **104**: 429–32

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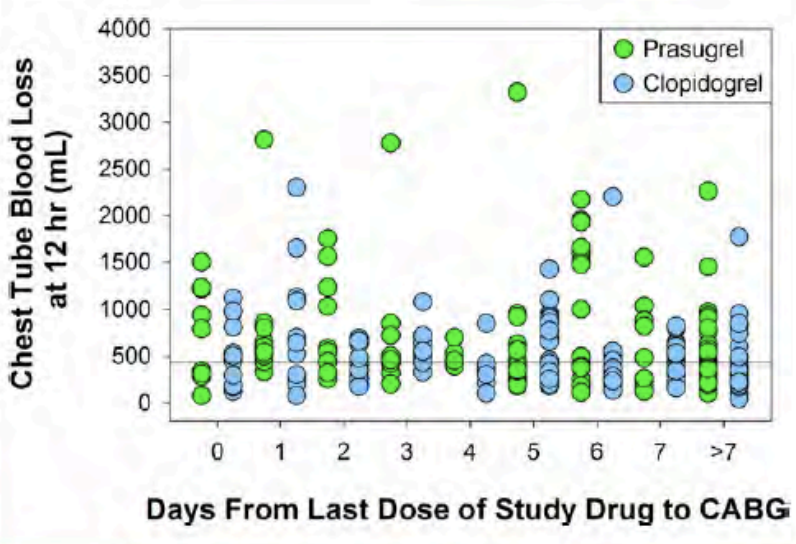
Br J Anaesth 2010; **104**: 429–32

Mortality Benefit With Prasugrel in the TRITON-TIMI 38 Coronary Artery Bypass Grafting Cohort

Risk-Adjusted Retrospective Data Analysis

Peter K. Smith, MD,* Lawrence T. Goodnough, MD,† Jerrold H. Levy, MD,‡ Robert S. Poston, MD,§ Mary A. Short, MSN,‖ Govinda J. Weerakkody, PHD,‖ LeRoy A. LeNarz, MD‖

Durham, North Carolina; Stanford, California; Atlanta, Georgia; Tucson, Arizona; and Indianapolis, Indiana



	Prasugrel	Clopidogrel	
Saignements	655 ± 580ml	503 ± 378 ml	P=0,05
Transfusion de plaquettes	18%	9,8%	P=0,033
n Unités	0,78	0,39	P=0,047

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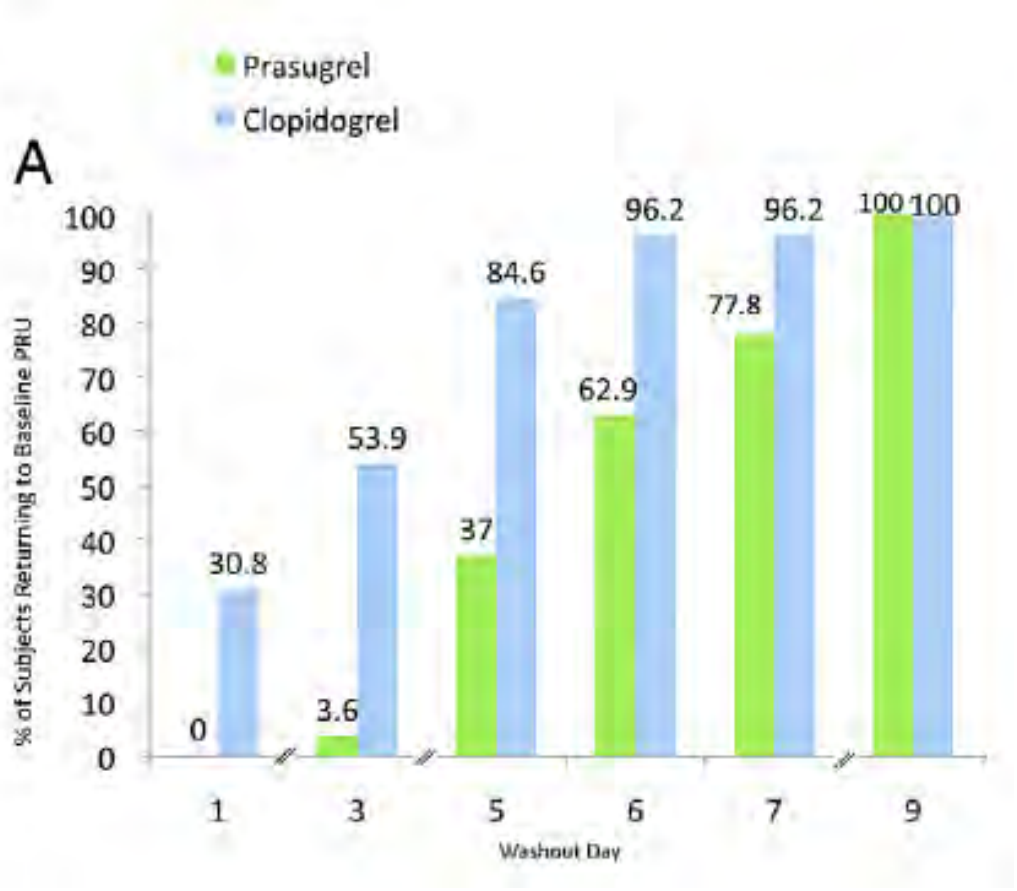
Recovery of Platelet Function After Discontinuation of Prasugrel or Clopidogrel Maintenance Dosing in Aspirin-Treated Patients With Stable Coronary Disease

The Recovery Trial

Matthew J. Price, MD,* James S. Walder, MD,† Brian A. Baker, PharmD,‡ Darell E. Heiselman, DO,§ Joseph A. Jakubowski, PhD,§ Douglas K. Logan, MD,‖ Kenneth J. Winters, MD,§ Wei Li, PhD,‡ Dominick J. Angiolillo, MD, PhD¶



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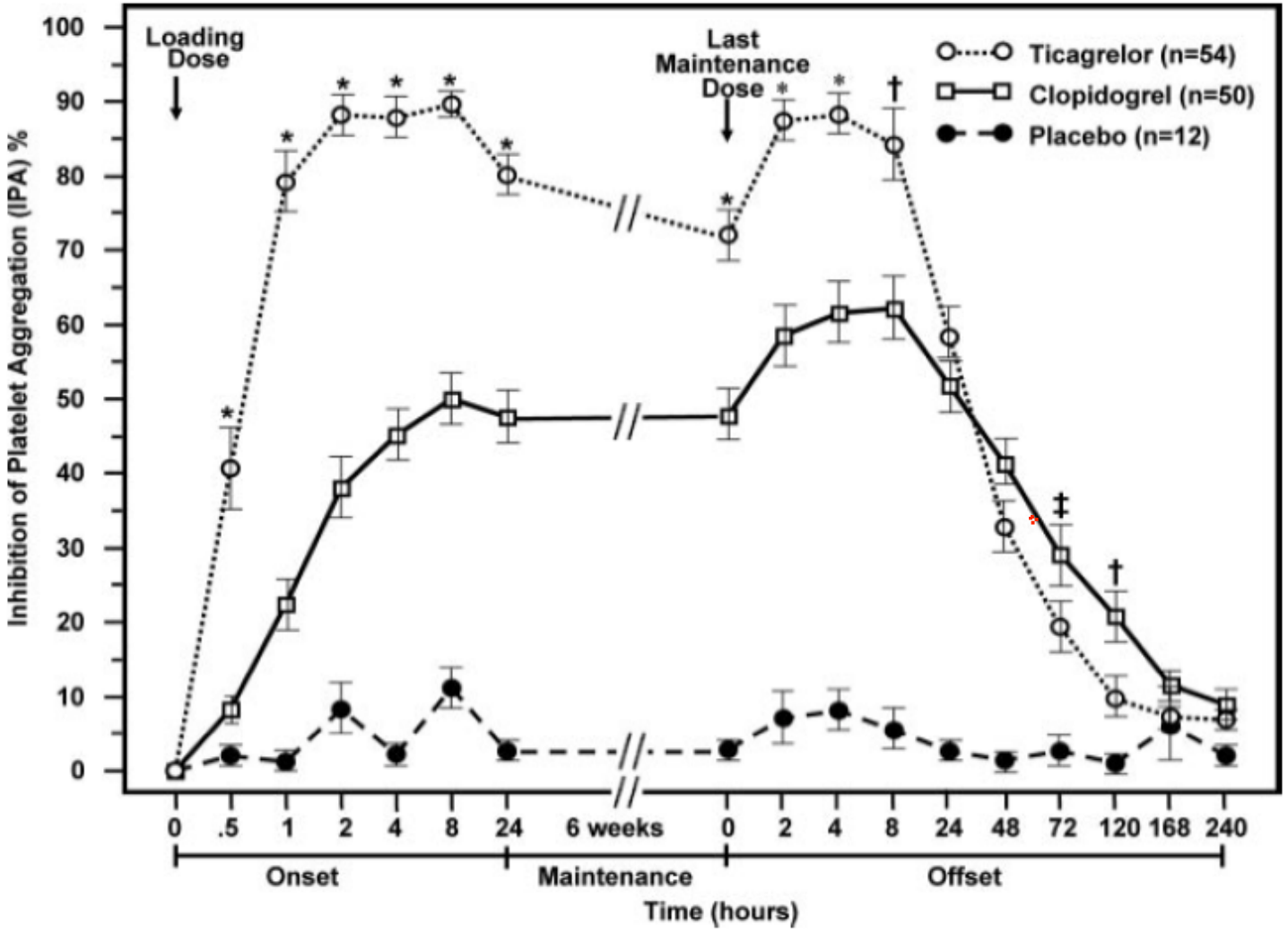
Randomized Double-Blind Assessment of the ONSET and OFFSET of the Antiplatelet Effects of Ticagrelor Versus Clopidogrel in Patients With Stable Coronary Artery Disease

The ONSET/OFFSET Study



IPA (%; 20µmol/l ADP, final extent)

Gurbel et al, Circulation 2009; 120:2577-2585

RECOMMANDATION DE BONNE PRATIQUE

Antiagrégants plaquettaires : prise en compte des risques thrombotique et hémorragique en cas de geste endoscopique chez le coronarien

RECOMMANDATIONS

Juin 2012

Tableau 1. Modalités d'arrêt.

Traitement	Arrêt envisagé	Délai entre l'arrêt et le geste
Aspirine	Aspirine	3 jours (si risque thrombotique majeur)
Clopidogrel	Clopidogrel	5 jours
Aspirine + clopidogrel	Clopidogrel	5 jours
Aspirine + prasugrel	Prasugrel	7 jours
Aspirine + ticagrelor	Ticagrelor	5 jours

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Recommendations on anti-platelet therapy

Recommendations	Class[a]	Level[b]	Ref.[c]
It is recommended that aspirin be continued for 4 weeks after BMS implantation and for 3–12 months after DES implantation, unless the risk of life-threatening surgical bleeding on aspirin is unacceptably high.	I	C	
Continuation of aspirin, in patients previously thus treated, may be considered in the peri-operative period, and should be based on an individual decision that depends on the peri-operative bleeding risk, weighed against the risk of thrombotic complications.	IIb	B	121,122
Discontinuation of aspirin therapy, in patients previously treated with it, should be considered in those in whom haemostasis is anticipated to be difficult to control during surgery.	IIa	B	121,122
Continuation of $P2Y_{12}$ inhibitor treatment should be considered for 4 weeks after BMS implantation and for 3–12 months after DES implantation, unless the risk of life-threatening surgical bleeding on this agent is unacceptably high.	IIa	C	
In patients treated with $P2Y_{12}$ inhibitors, who need to undergo surgery, postponing surgery for at least 5 days after cessation of ticagrelor and clopidogrel—and for 7 days in the case of prasugrel—if clinically feasible, should be considered unless the patient is at high risk of an ischaemic event.	IIa	C	

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European Society of Anaesthesiology
European Heart Journal doi:10.1093/eurheartj/ehu282

Recommendations on anaesthesia

Recommendations	Class[a]	Level[b]	Ref.[c]
Patients with high cardiac and surgical risk should be considered for goal-directed therapy.	IIa	B	261–264
The measurement of natriuretic peptides and high-sensitivity troponin after surgery may be considered in high-risk patients to improve risk stratification.	IIb	B	3,55,266, 268,272
Neuraxial anaesthesia (alone), in the absence of contra-indications and after estimation of the risk–benefit ratio, reduces the risk of peri-operative mortality and morbidity compared with general anaesthesia and may be considered.	IIb	B	10,252–257
Avoiding arterial hypotension (mean arterial pressure <60 mm Hg) for prolonged cumulative periods (>30 minutes) may be considered.	IIb	B	104,245,246
Neuraxial analgesia, in the absence of contra-indications, may be considered to provide post-operative analgesia.	IIb	B	272
Avoiding non-steroidal anti-inflammatory drugs (especially cyclo-oxygenase-2 inhibitors) as the first-line analgesics in patients with IHD or stroke may be considered.	IIb	B	279

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