Chest pain in the night …….

ACCA 2017 London
P Goldstein
Lille university hospital

Patrick GOLDSTEIN
Conflicts of interest

Speakers and Consultant

boehringer Ingelheim
astra zeneca,

Receiving the call

A true medical decision

Presenting history

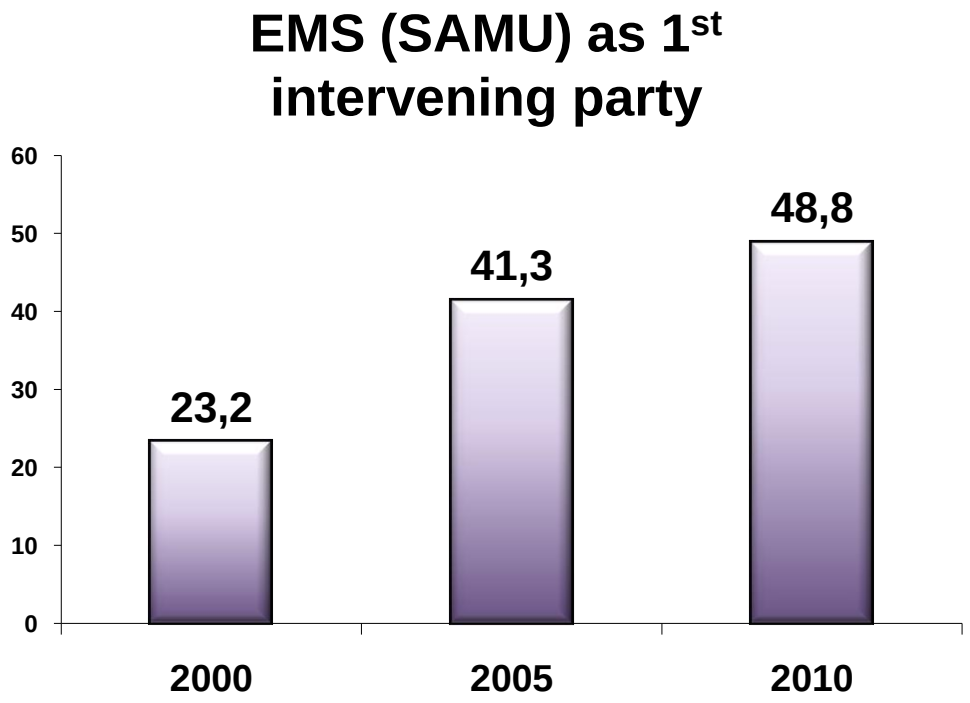
- Mr S., 54 years old, call our SAMU at 3H30
- Since 2:30 am, he has been suffering from chest pain
- He was awakened by this dolor
- He feels something like a dyspnea
- The pain is nitrate-resistant (patient has his own medication)
- What are the first criteria needed in the dispatching centre for a correct emergency decision?

Call to a dispatch center

Numerous media campaigns since the early 2000s, supported by regional and national health authorities

Impact of media campaigns on time to first call in STEMI patients
France 2000-2010

	2000	2005	2010
Median time from onset to 1st call (min)	**120** [41; 360]	90 [30; 295]	**74** [30; 240]



M.I.C.U.

ARRIVAL MICU 3:50 am

EVALUATION:

1. Evaluate breathing; is he able to speak?
   - Life emergency?
2. Characteristics of the pain
3. Research history of CVD or a family history
4. Current treatment
5. Hyperthermia

ATCD / FR / TT

- **History:** unstable angina, pulmonary oedema
- **Risks factors:** hypertension, hypercholesterolaemia, moderately overweight, diabetes, current smoker
- **TT:** molsidomine, furosemide, ramipril metoprolol, glimepiridine, insulin NPH profile 40
- Patient treated by a cardiologist
- Now, what decision for this patient

Important delays and treatment goals in the management of acute STEMI

Delay	Target
Preferred for FMC to ECG and diagnosis	≤**10 min**
Preferred for FMC to fibrinolysis ('FMC to needle')	≤**30 min**
Preferred for FMC to primary PCI ('door to balloon') in primary PCI hospitals	≤**60 min**
Preferred for FMC to primary PCI	≤**90 min** (≤60 min if early presenter with large area at risk)
Acceptable for primary PCI rather than fibrinolysis	≤**120 min** (≤90 min if early presenter with large area at risk) if this target cannot be met, consider fibrinolysis.
Preferred for successful fibrinolysis to angiography	**3–24 h**

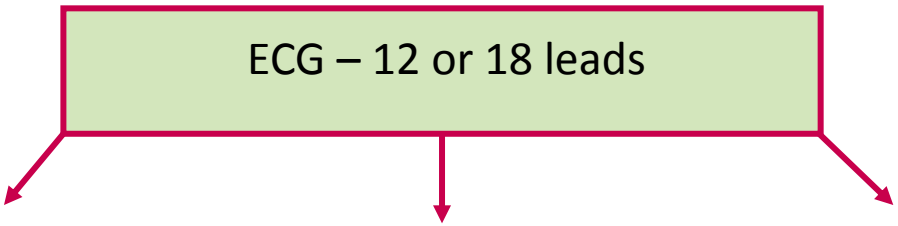
FMC = first medical contact; PCI = percutaneous coronary intervention.

MICU: 4.00 am

- AP: 200/90 mmHg - R, 190/92 mmHg - L
- HR: 55/min
- Killip 1
- $Sp0_2$: 93%
- Glycaemia: 1.7g/l
- Pain estimate: 70/100
- ECG 18 leads and compared to previous

STEMI diagnosis: Triage on scene

- **General organisation**
  - **Chest pain characteristics**
  - **Clinical examination**



- Analysis of ECG
- Clinical check list
- No medical validation

+/-

- Clinical examination
- Analysis by the internal software

+

- Medical validation

+++

Physicians on board
or
Teletransmission to cardiology center

Courtesy P. Goldstein

Pre-hospital diagnosis of AMI – Tele-ECG

MD ambulance

12-lead ECG
LIFEPAK 12
Medtronic

CCU

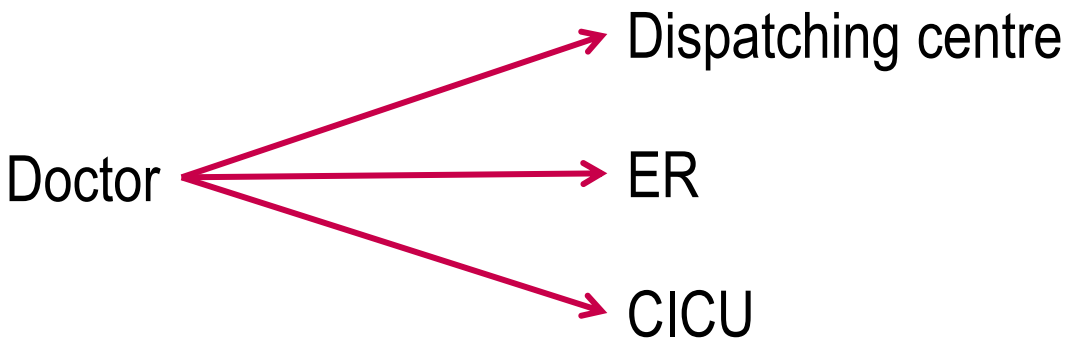
GSM

Attending cardiologist

ER

EASY !!

- **The doctor must be available 24 h / 24 h for analysis and validation online**



- **Transmission must not be an indirect factor prolonging the delay to reperfusion**

Management of AMI in the field or ED

Diagnostic criteria

Typical (80%)

- Typical chest pain
- ECG: ST elevation >1 mm in 2 or more limb leads or >2 mm in 2 or more chest leads
- Non-relief of pain and ECG alterations by sublingual nitrates

Atypical (20%)

- Atypical pain
- ECG: ST depression, non Q-waves or quite normal, LBBB ...

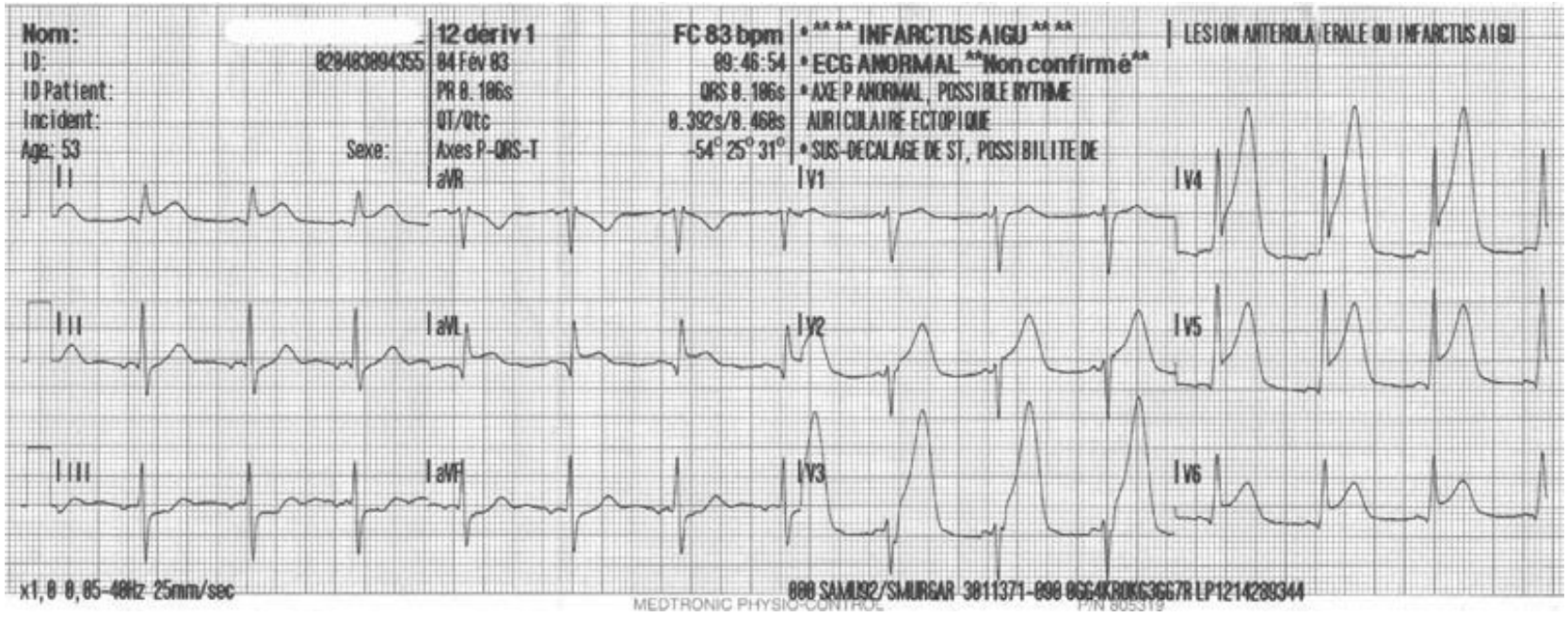
⇨ Unstable angina or AMI, pericarditis...

⇨ Medical transportation

⇨ CPK, echocardio, angiography

Biomarkers in pre H setting ?

Here is the ECG



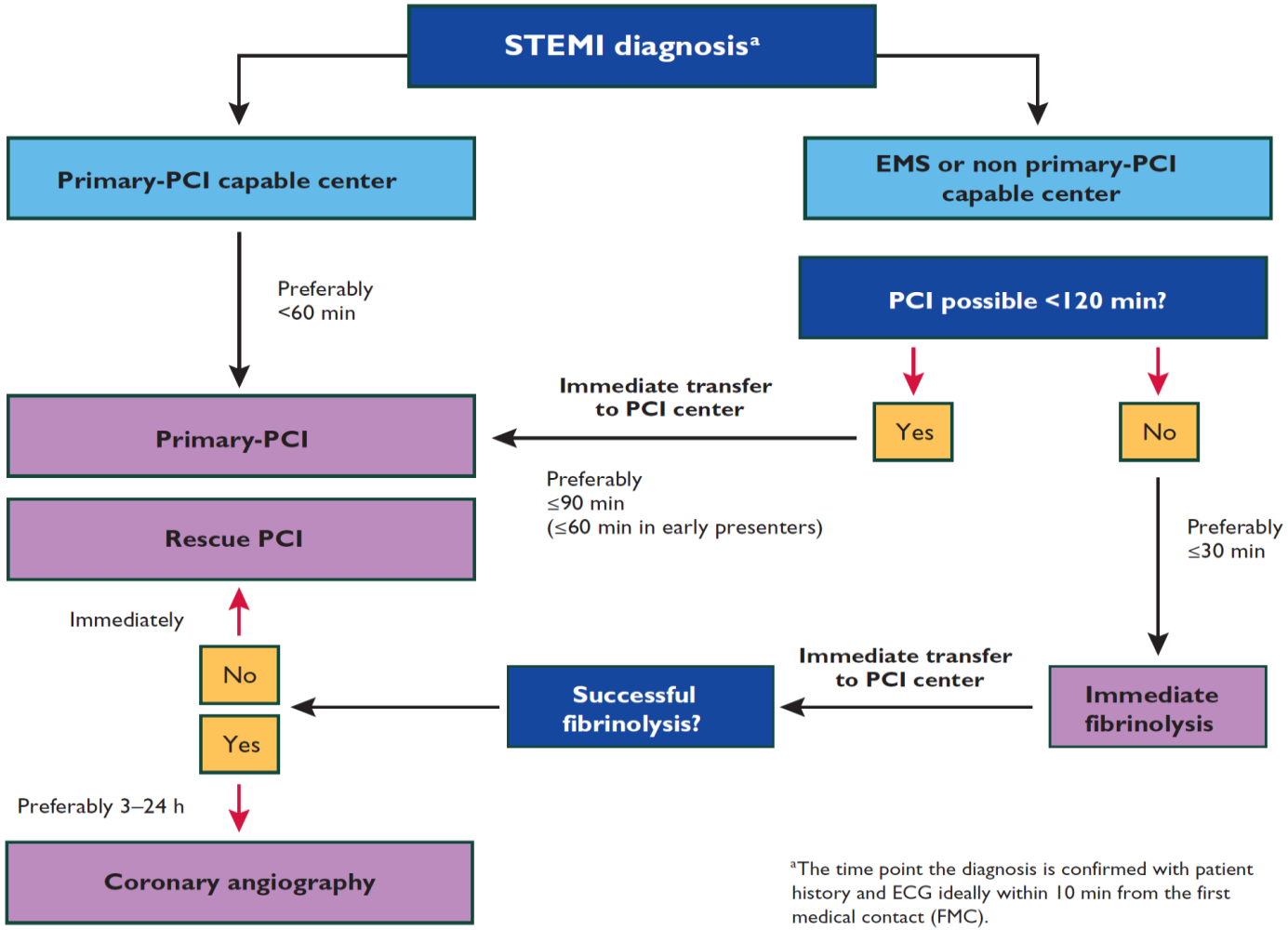
It’s an acute extensive anterior myocardial infarction

You are close t the nearest cath lab

less than 90 minutes

Strategy ?

Prehospital and in-hospital management, and reperfusion strategies within 24 h of FMC



Cath = catheterization laboratory; EMS = emergency medical system; FMC = first medical contact; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction.

Following the guidelines

- Go to CATH
- But
  - Focus on DAP and asap DAP
  - Anti thrombin therapy
  - Pain treatment and some more little things …

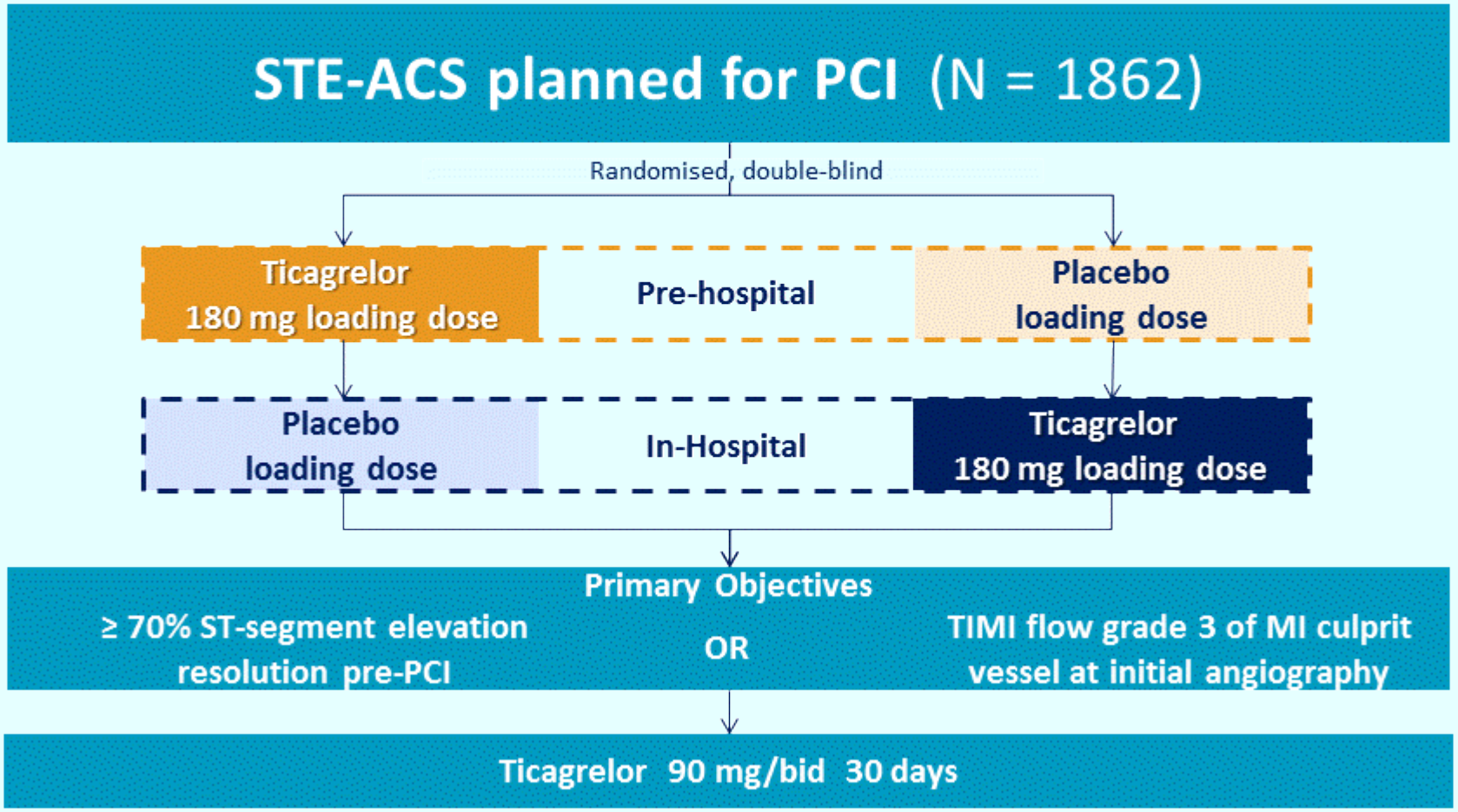

UNE SAIGNÉE!
TROPONINE!
PAS DU TOUT
VENTOUSES!
ECG!
COURBE DE TEMPÉRATURE!
DES SANGSUES QUE DIABLE!
JE VEUX VOIR SES URINES
PITIÉ! APPELEZ MON CARDIOLOGUE!
CHANNU

AAP ?

Study population and design

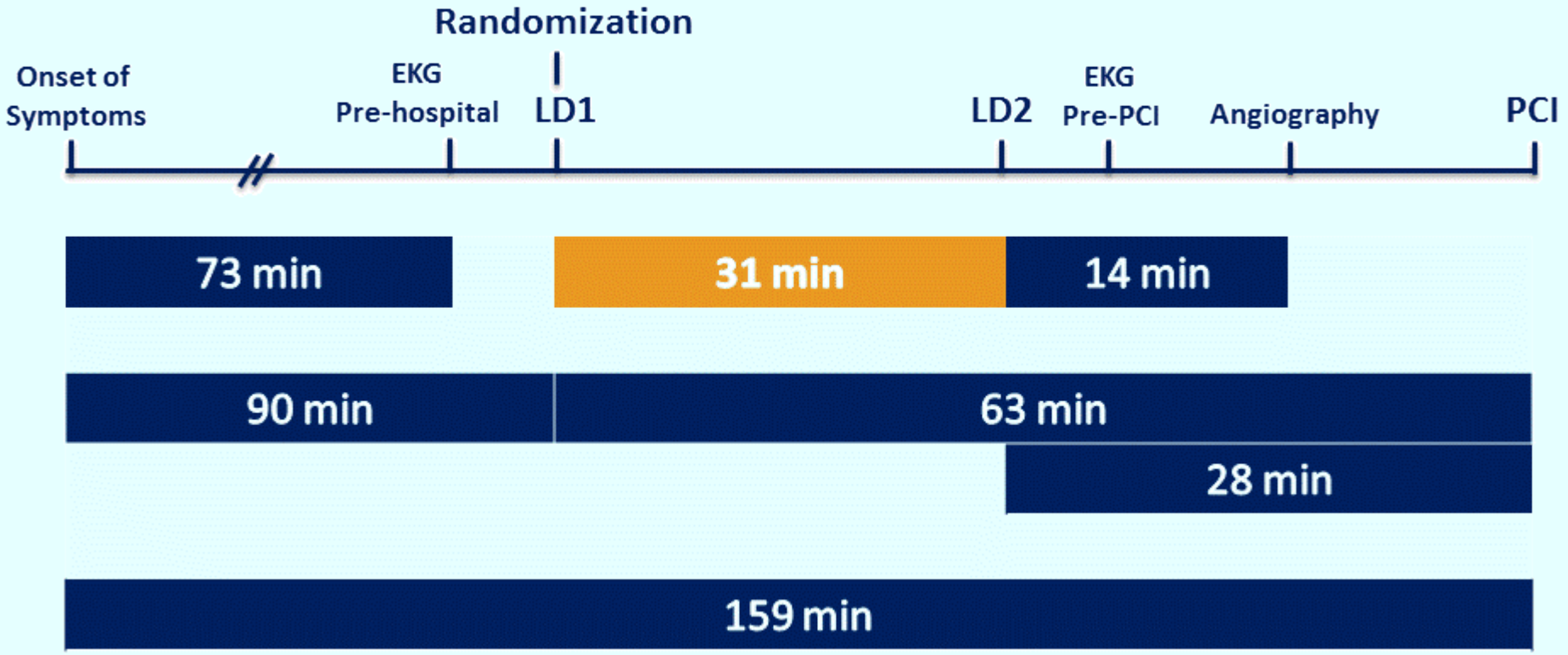
Atlantic Population

- Documented evidence of **STEMI**
- Planned for **angioplasty (PCI)**
- **onset of ischaemic symptoms within 6 h**
- **initially managed by ambulance physician/personnel**; also concerning patients not pre-treated for STEMI in **emergency rooms of non-PCI hospitals**



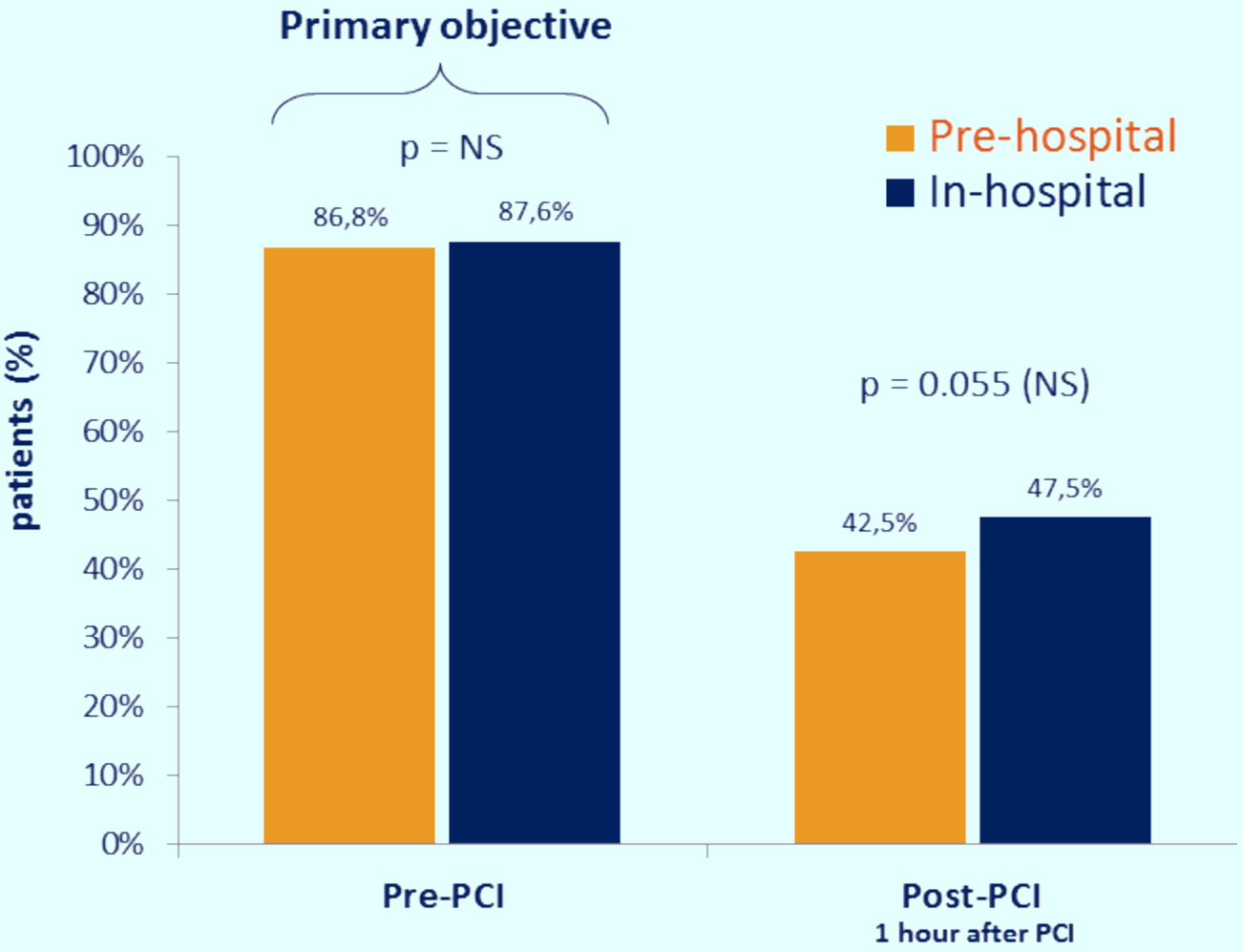
Montalescot G et al. *Am Heart J.* 2013;165:515–522.

Median times to pre- and in-hospital steps

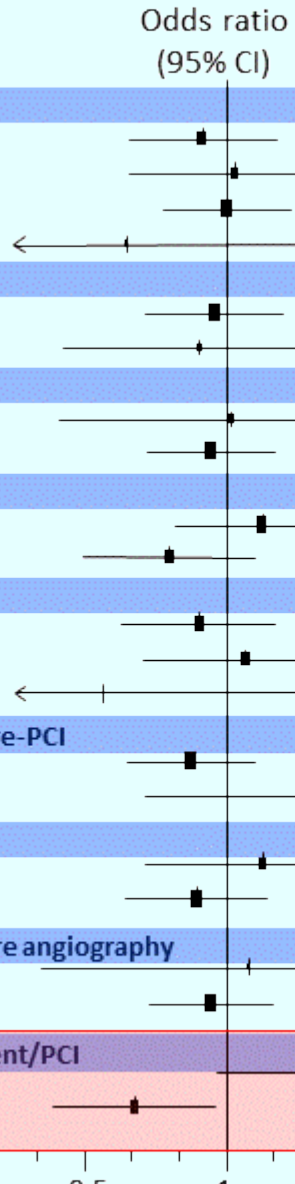


1st Co-primary endpoint

No ST-segment resolution (≥70%)

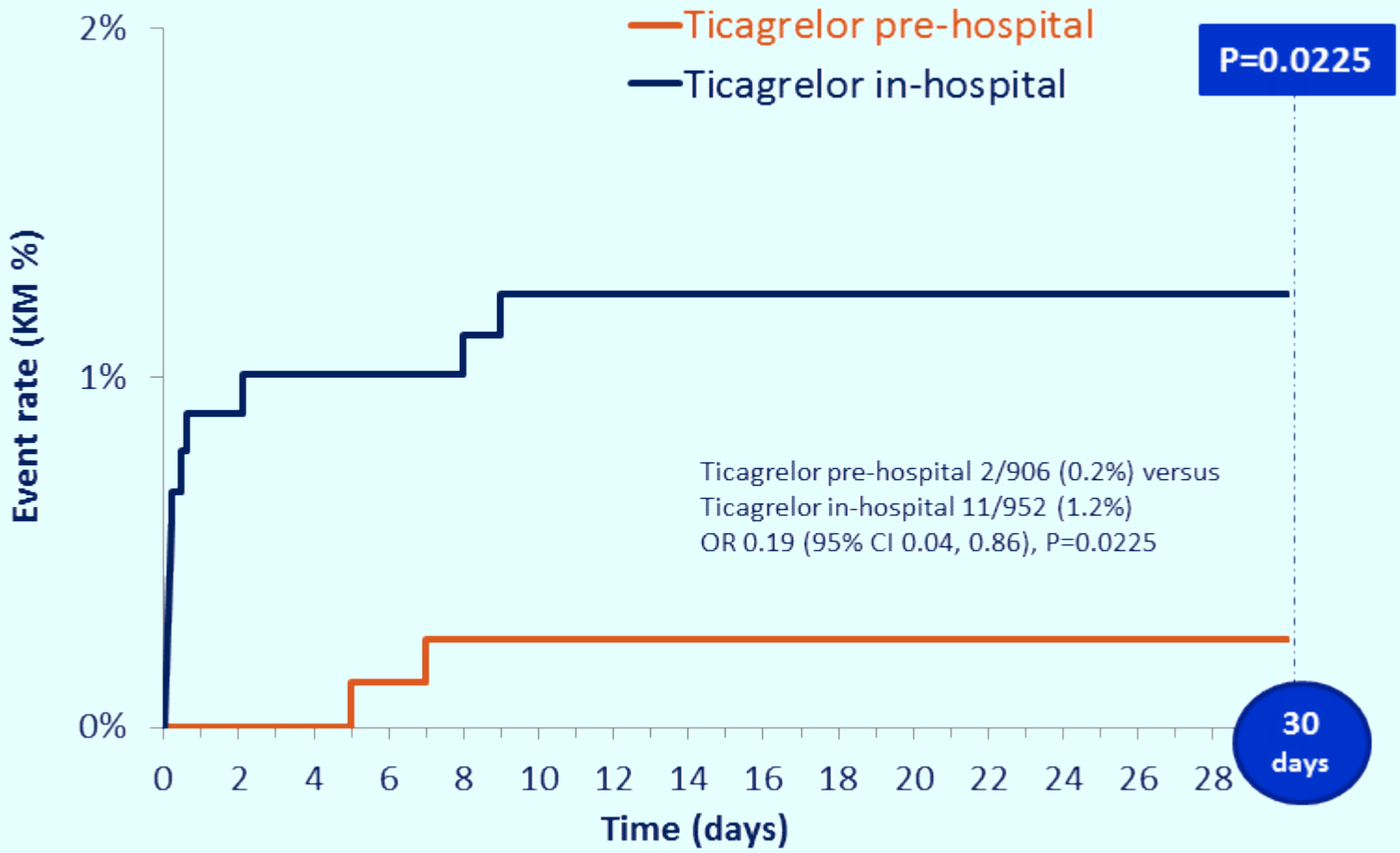


Absence of ST-segment resolution by patient characteristics

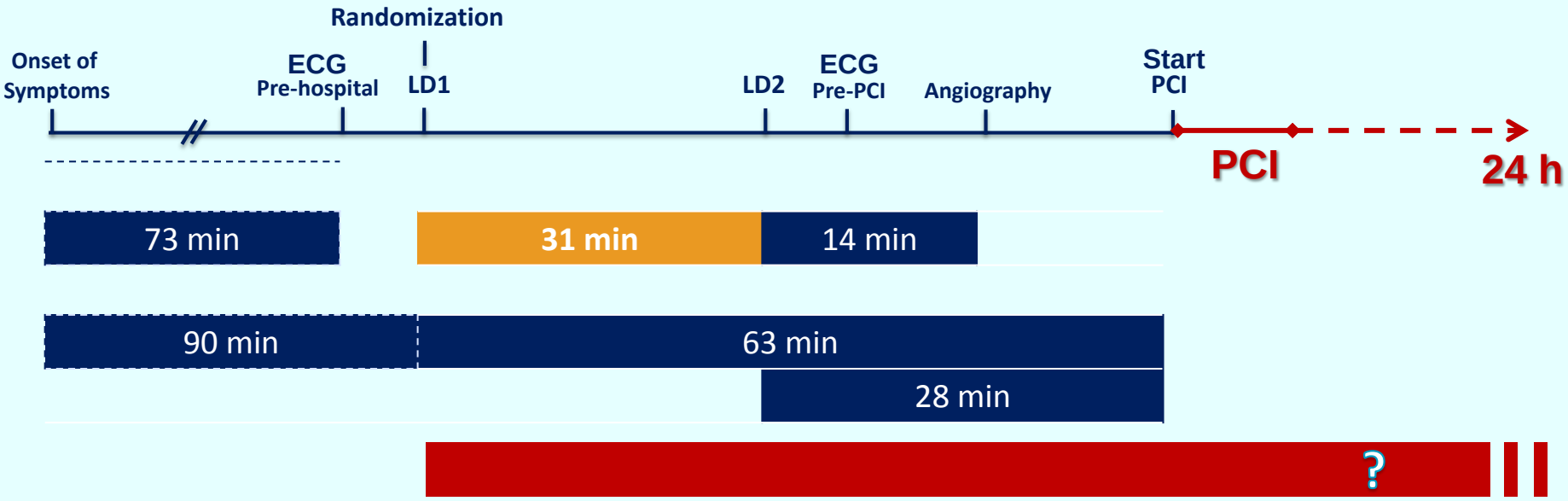


Characteristic	Total patients	Endpoint rate			P Value
		Pre-hospital	In-hospital	OR (95% CI)	(Int.)
Age					
<65 years	1014	85.9%	87.3%	0.887 (0.618, 1.272)	**0.6207**
≥65 years	584	88.6%	88.2%	1.037 (0.625, 1.724)	
<75 years	1348	86.7%	86.8%	0.994 (0.726, 1.362)	**0.2940**
≥75 years	250	87.6%	92.0%	0.617 (0.269, 1.418)	
Sex					
Male	1288	87.0%	87.7%	0.945 (0.680, 1.312)	**0.8292**
Female	310	85.9%	87.5%	0.871 (0.451, 1.684)	
Diabetes					
Yes	212	88.3%	88.1%	1.015 (0.438, 2.353)	**0.8319**
No	1386	86.6%	87.5%	0.922 (0.673, 1.261)	
Location of MI					
Anterior	831	89.0%	87.3%	1.183 (0.775, 1.808)	**0.1320**
Non-anterior	767	84.7%	88.0%	0.750 (0.495, 1.136)	
TIMI risk score					
0–2	971	86.0%	87.6%	0.867 (0.597, 1.256)	**0.7129**
3–6	599	88.3%	87.4%	1.081 (0.661, 1.767)	
>6	28	86.7%	92.3%	0.542 (0.043, 6.757)	
Highest Killip Classifiation pre-PCI					
I	1458	86.1%	88.2%	0.833 (0.612, 1.133)	**0.1049**
>I	82	93.5%	83.3%	2.865 (0.664, 12.236)	
Prior ASA use					
Yes	476	88.8%	87.1%	1.178 (0.670, 2.075)	**0.3455**
No	1122	86.1%	87.9%	0.856 (0.604, 1.214)	
GPIIb/IIIa inhibitor use before angiography					
Yes	117	85.2%	83.9%	1.106 (0.405, 3.021)	**0.7281**
No	1481	87.0%	87.9%	0.918 (0.675, 1.248)	
Morphine use for index event/PCI					
Yes	800	90.8%	86.8%	1.493 (0.954, 2.331)	**0.0050**
No	798	82.8%	88.4%	0.632 (0.423, 0.943)	

Definite stent thrombosis up to 30 days



Hypothesis



Hypothesis of the present analysis

- It was hypothesized that the effect of earlier, pre-hospital ticagrelor may not have manifested until after PCI

ECG, electrocardiogram; LD, loading dose.

1. Montalescot G et al. *N Engl J Med* 2014;371:1016–1027.

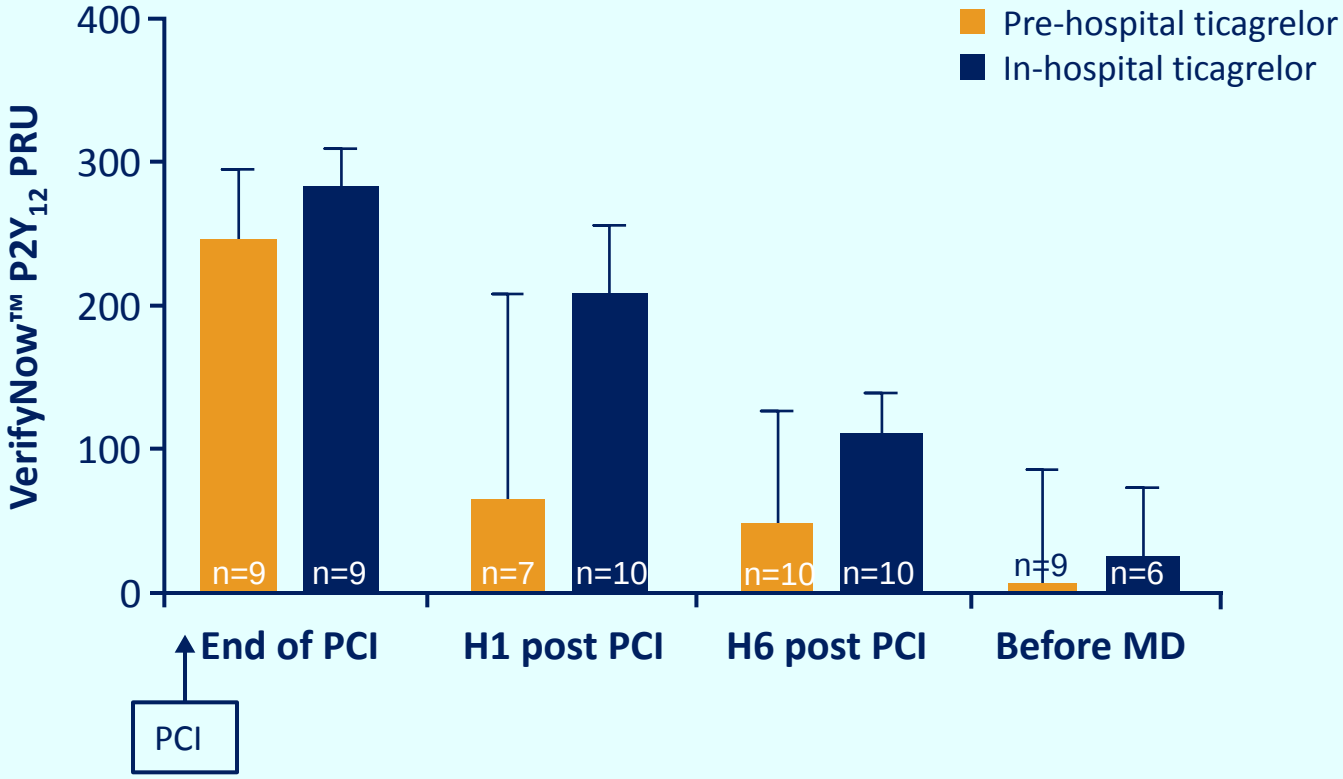
Post-PCI coronary reperfusion

Endpoint	Pre-hospital ticagrelor	In-hospital ticagrelor	Odds ratio (95% CI)	p-value
TIMI flow grade 3 of MI culprit vessel post-PCI				
Number of subjects[a]	760	784		
n (%)	625 (**82.2**)	630 (**80.4**)	1.132 (0.876–1.462)	0.34
ST-segment elevation resolution ≥70% post-PCI				
Number of subjects[a]	713	743		
n (%)	410 (**57.5**)	390 (**52.5**)	1.225 (0.996–1.506)	0.054
Degree of ST-segment elevation resolution post-PCI (%)				
Number of subjects[a]	713	743		
Mean (SD)	66.7 (**36.8**)	63.9 (**34.3**)	–	0.049[b]
Median	75.0	71.4		

[a]Subjects with a PCI performed for the index event and available data on TIMI flow or ST-segment elevation.
[b]p-value from non-parametric Wilcoxon test, comparing median degree of resolution.

Platelet function

- Pre-hospital ticagrelor effect on platelet function appears after PCI
- Largest between-group difference observed 1–6 h after PCI



Values are median (IQR); MD, maintenance dose
p-values were all NS

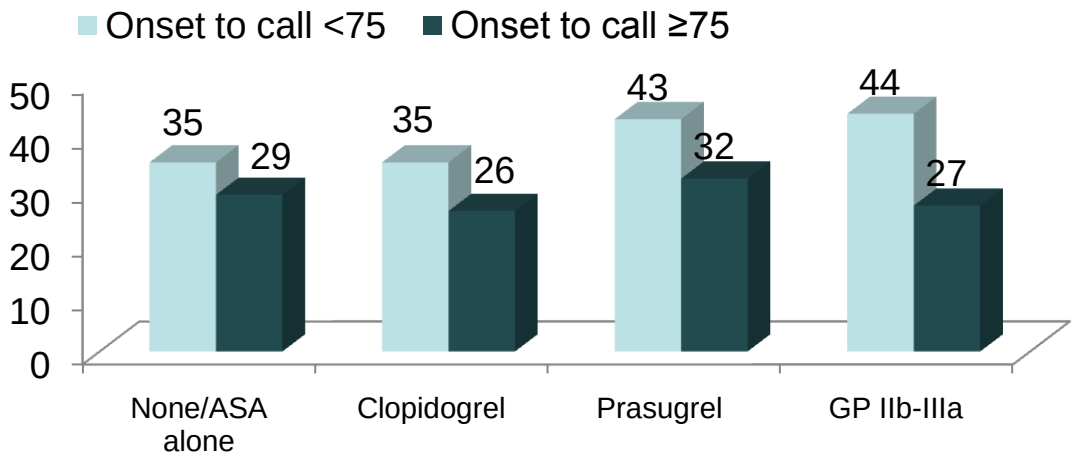
Factors associated with infarct-related artery patency before primary PCI for STEMI

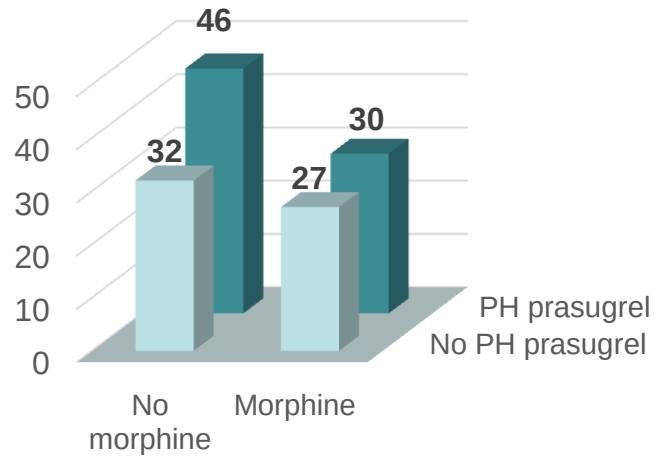
Results from the FAST-MI 2010 registry

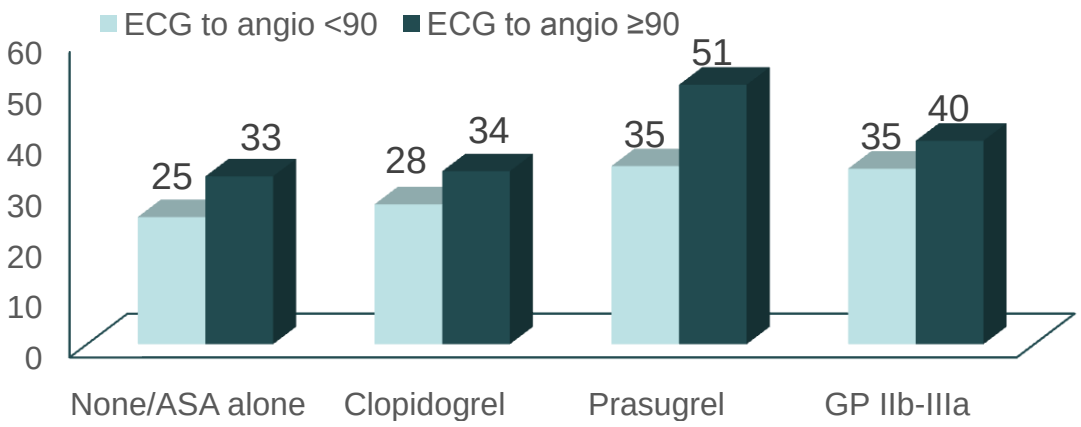
E. Puymirat[1], P. Coste[2], S.Cattan[3], D. Blanchard[4], C. Brasselet[5], M. Elbaz[6], PG. Steg[7], F.Schiele[8], T. Simon[9], N. Danchin[1]

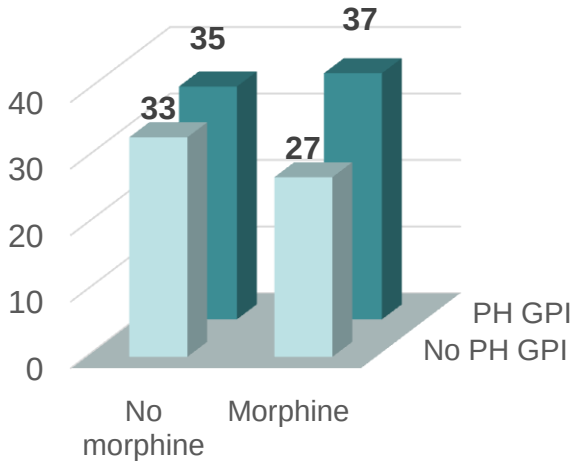
(1) Hôpital Européen Georges Pompidou, Paris, (3) CHU de Bordeaux, Pessac, (4) Clinique St Gatien, Tours, (5) Clinique de Courlancy, Reims, (6) CHU Rangueil, Toulouse, (7) Hôpital Bichat, Paris, (8) Hôpital Jean Minjoz, Besançon, (9) CHU St Antoine, Paris, France

IRA patency and pre-hospital antiplatelet agents according to time delays and PH morphine use

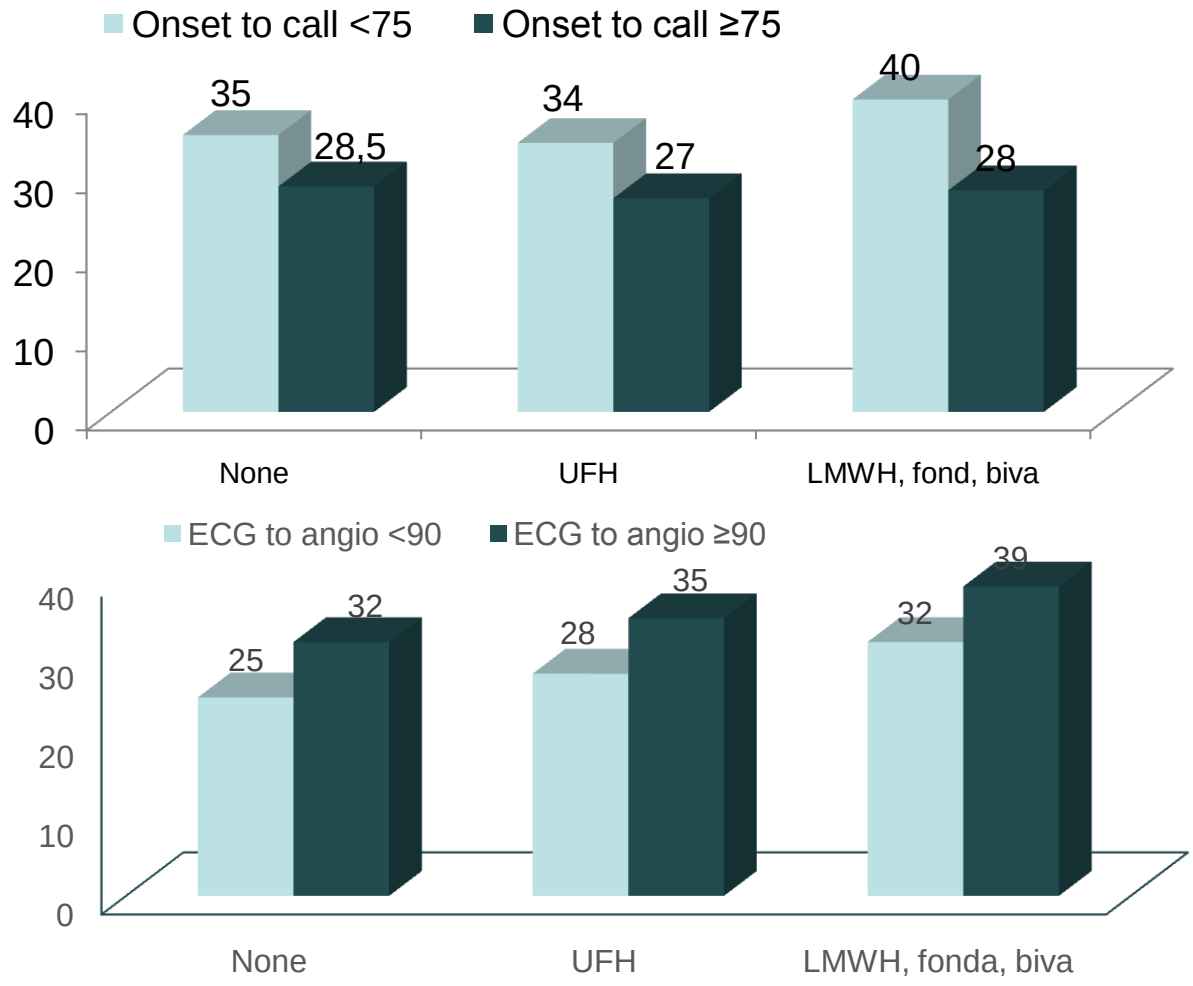








IRA patency according to time and pre-hospital anticoagulant agents



Independent correlates of IRA patency

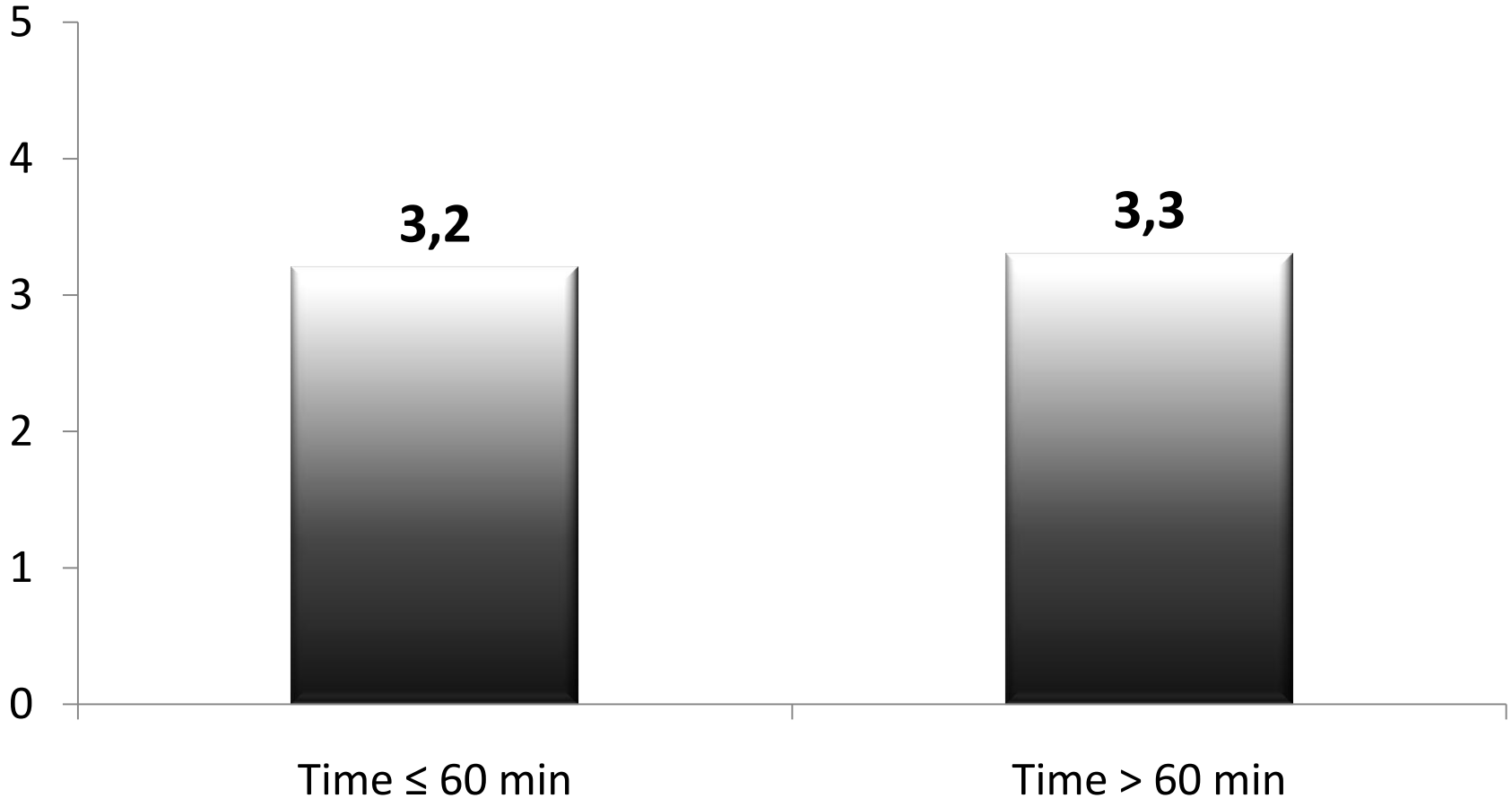
	OR (95% CI)	P value
Symptom onset to call < 75 min	1.60 (1.26-2.03)	<0.001
ECG to angio > 90 min	1.38 (1.08-1.77)	0.009
Pre-hospital - clopidogrel - prasugrel	 1.19 (0.91-1.56) 1.80 (1.19-2.72)	 0.20 0.005
Admission SBP (per mm Hg)	1.005 (1.001-1.010)	0.01
Pre-hospital morphine	0.69 (0.50-0.95)	0.02

In-hospital complications in relation with use and timing of pre-hospital antithrombotic medications in STEMI patients. The FAST-MI 2010 registry

P. Goldstein, D. Carrie, Y. Cottin, S. Charpentier, P. Motreff, G. Leurent, Y. Valy, V. Probst, T. Simon, N. Danchin, for the FAST-MI investigators

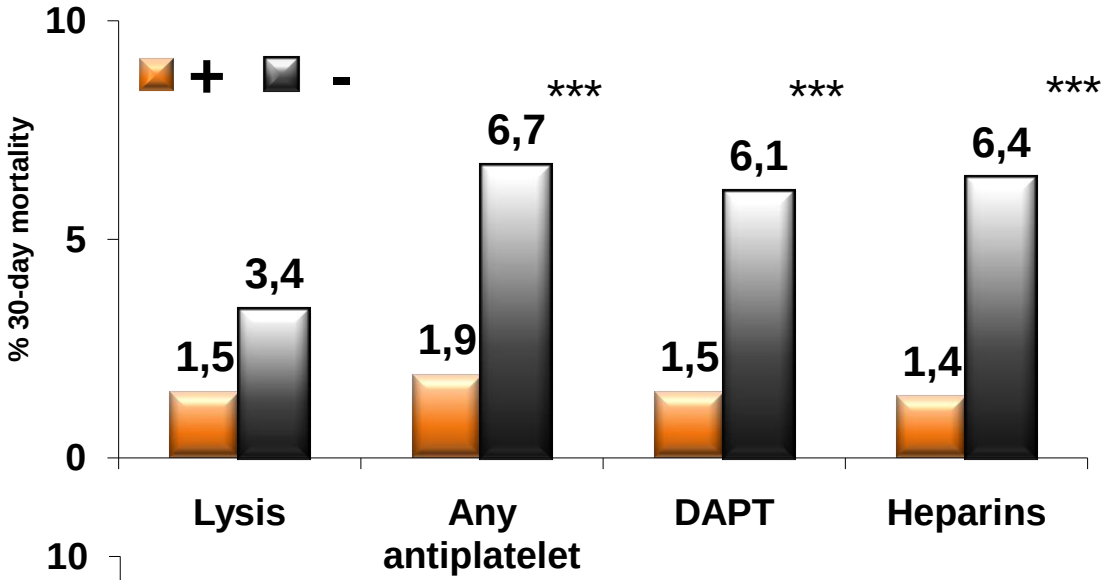
Hospital Regional University of Lille, Department of Emergency , Lille, France, University Hospital of Toulouse-Rangueil, France, University Hospital of Bocage, Dijon, France, University Hospital of Clermont-Ferrand, France, University Hospital of Rennes -Pontchaillou, France, Hospital of La Rochelle, France, University Hospital of Nantes, France, AP-HP - Hospital Saint-Antoine, Paris, France, AP-HP - European Hospital Georges Pompidou, Paris, France

Thirty-day mortality according to time from onset to call

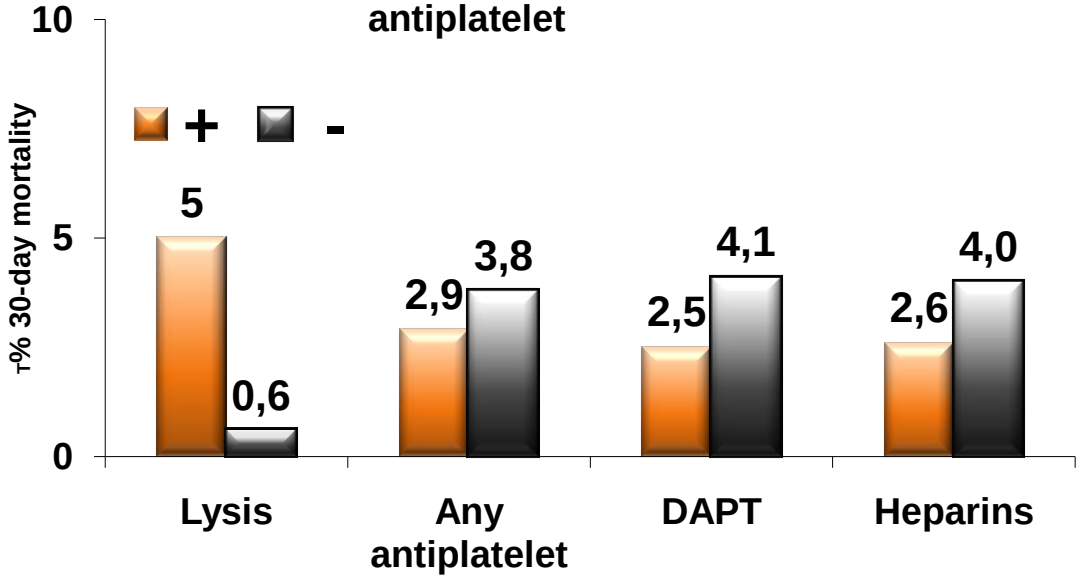


Prehospital medications are correlated with survival in patients seen early

Time onset to call ≤ 60 minutes



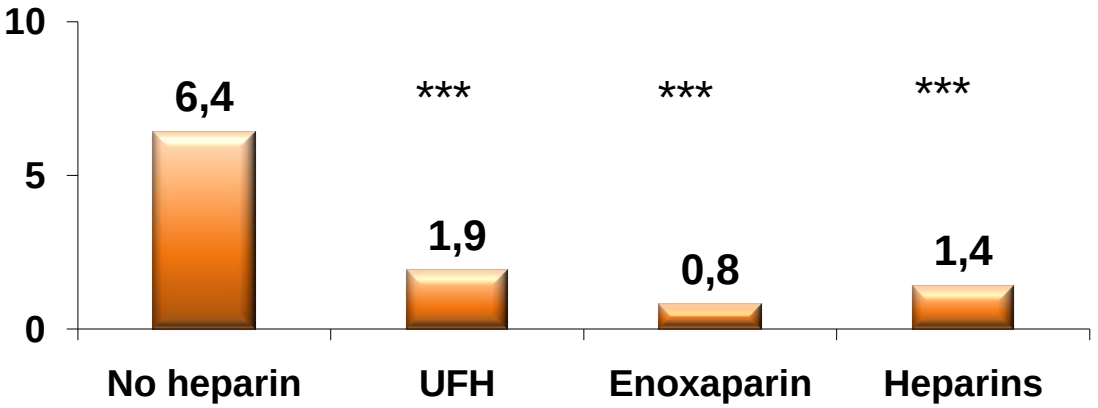
Time onset to call > 60 minutes



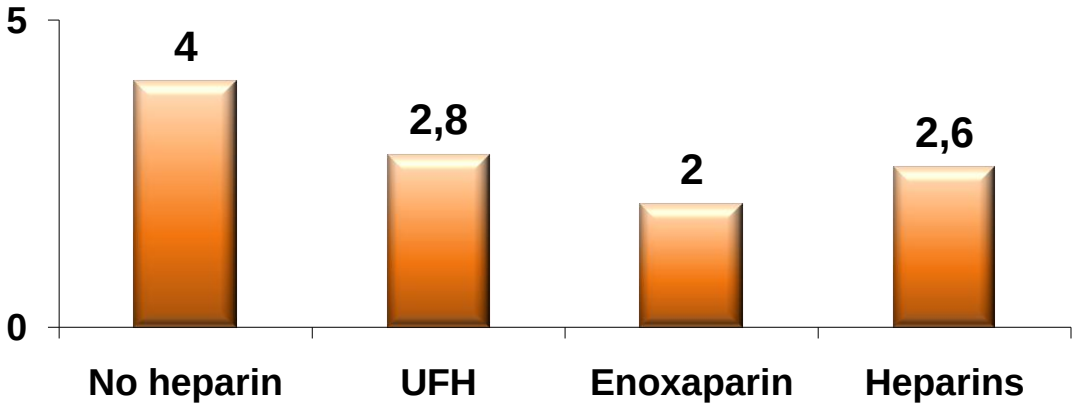
***: P <0.001

Prehospital anticoagulants

Time onset to call ≤ 60 minutes



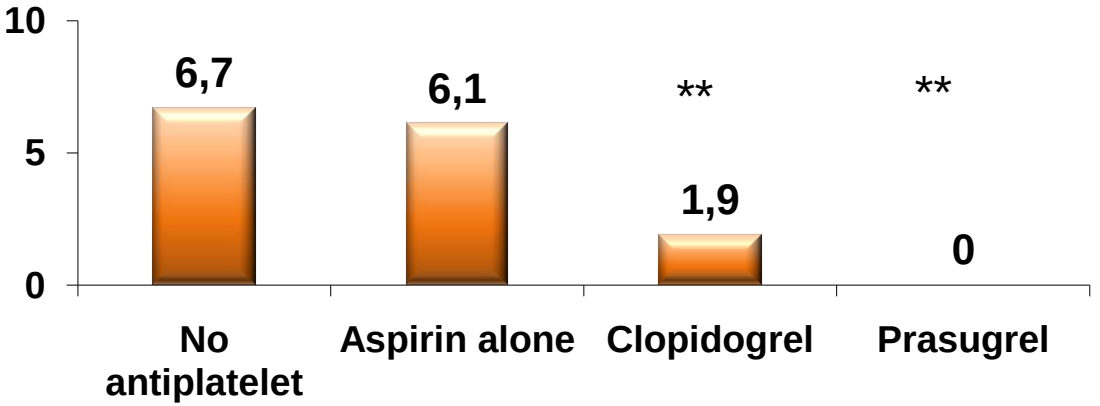
Time onset to call > 60 minutes



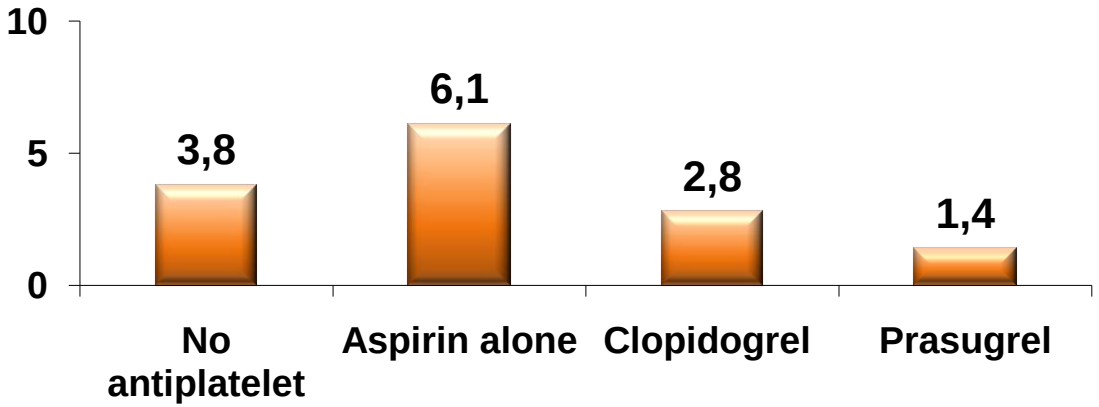
***: P <0.001

Prehospital antiplatelet agents

Time onset to call ≤ 60 minutes



Time onset to call > 60 minutes



**: P =0.001

This extemely rapid access to PCI in ATLANTIC contrasts with real-life observations : in patients following an optimal pathway in the French Registry of Acute ST-Elevation and Non-ST-Elevation Myocardial Infarction 2010 registry, time from symptom onset to PCI was still 43 minutes longer than what was observed in the ATLANTIC trial. In this registry, prehospital administration of prasugrel in patients with STEMI treated with primary PCI was associated with a higher likelihood of infarct-related artery patency, defined as TIMI 2 ou 3 flow before the procedure. **Such observational data suggest that administration of a potent P2Y12 inhibitor before coronary angiography may improve early infract-related artery patency when time delays are longer than what was observed in the ATLANTIC trial.**

In conclusion, further studies are needed to determine the clinical impact of pretreatment with DAPT in the seetting of ACS. Meanwhile, early admnistration of DAPT seems to be a reasonable therapeutic strategy in daily clinical practice.

L De Luca, N Danchin, M Valgimini, P Goldstein
Am J Cardiology 2015;116:660-668

Anti GP 2B3A

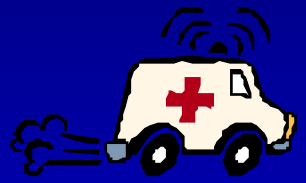
?

ON-TIME -2

Acute myocardial infarction
diagnosed in ambulance or referral center
ASA + 600 mg Clopidogrel + UFH

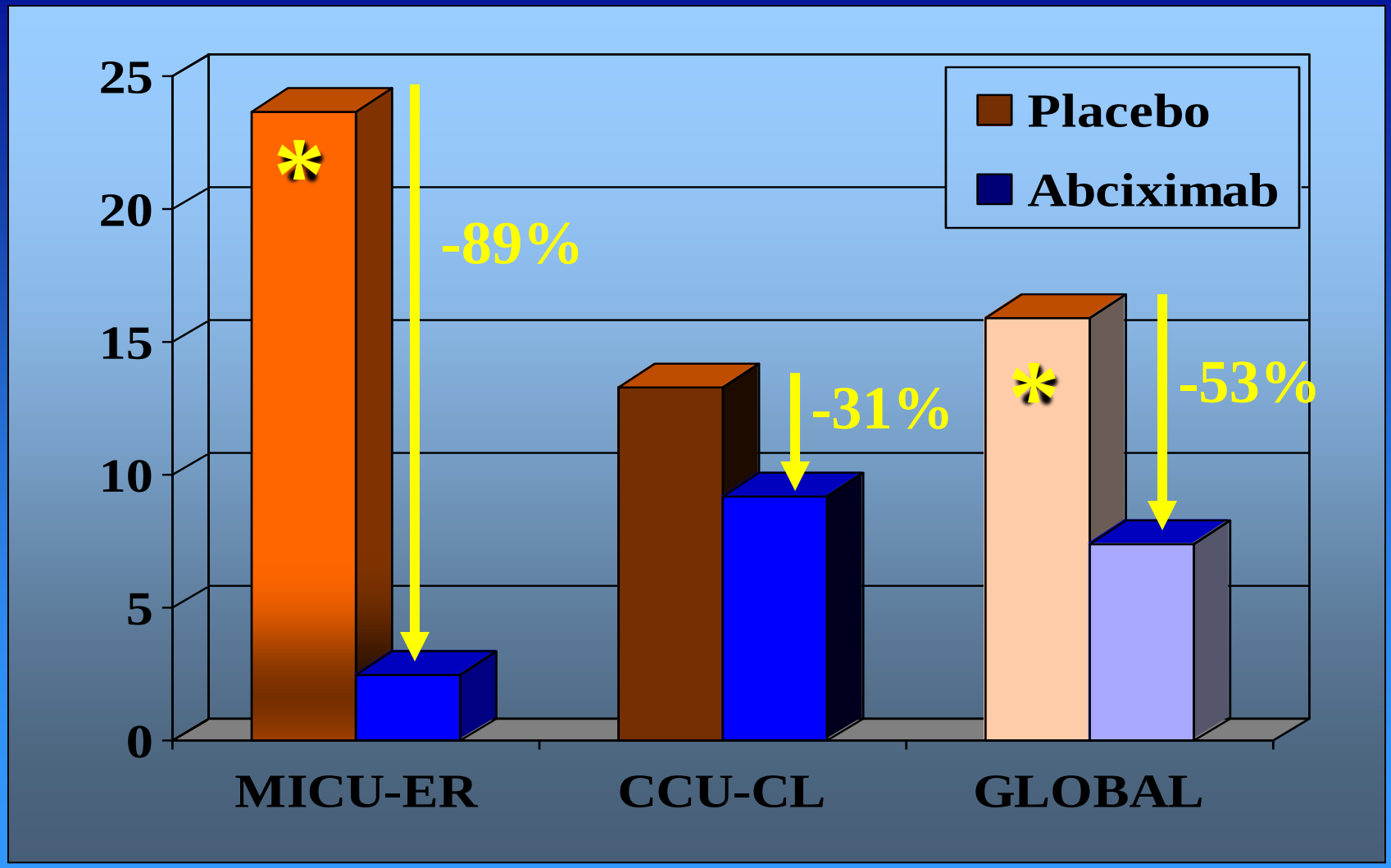
N=984

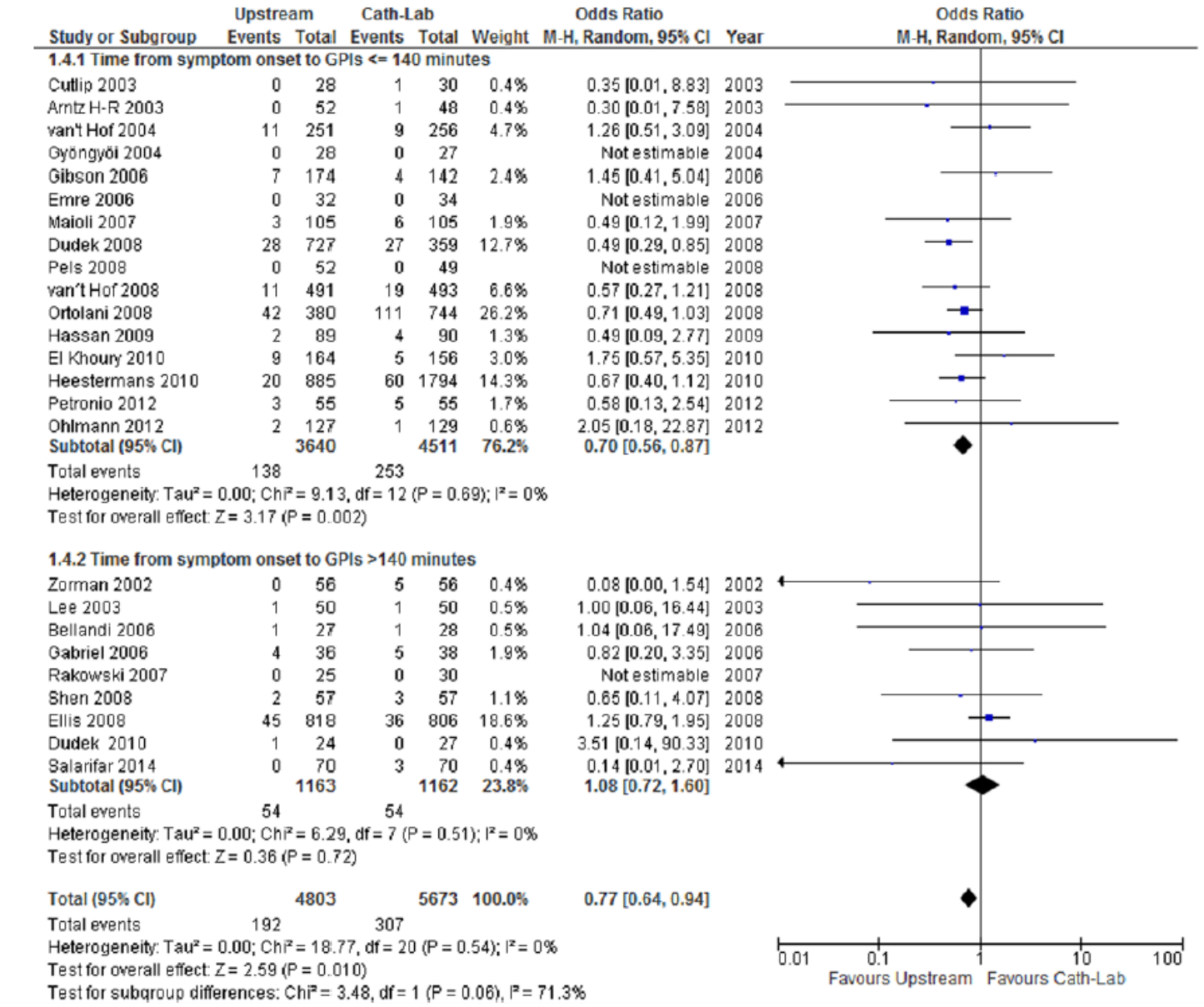
6/2006-11/2007

Placebo		Tirofiban *
	Transportation	
Angiogram	PCI center	Angiogram
Tirofiban provisional	PCI	Tirofiban cont'd

**Bolus: 25 µg/kg & 0.15 µg/kg/min infusion*

ADMIRAL6-month primary EP





Antithrombic therapy befor , during and after emergency angioplasty for STEMI patients
S Savonitto, Giuseppe De Luca, P Goldstein
European Heart Journan ACCare, 2015 1-18

The effect of cangrelor versus clopidogrel on periprocedural outcomes in a pooled analysis of patient-level data

Christian W. Hamm

for the CHAMPION Executive Committees and Investigators

ANTICOAGULATION ?????

ESC, Stockholm - August 30, 2010 – Hotline session

ATOLL

An international randomized study comparing IV enoxaparin to IV UFH in primary PCI

G. Montalescot, M. Cohen, P. Goldstein,

K. Huber, C. Pollack, U. Zeymer, E. Vicaut

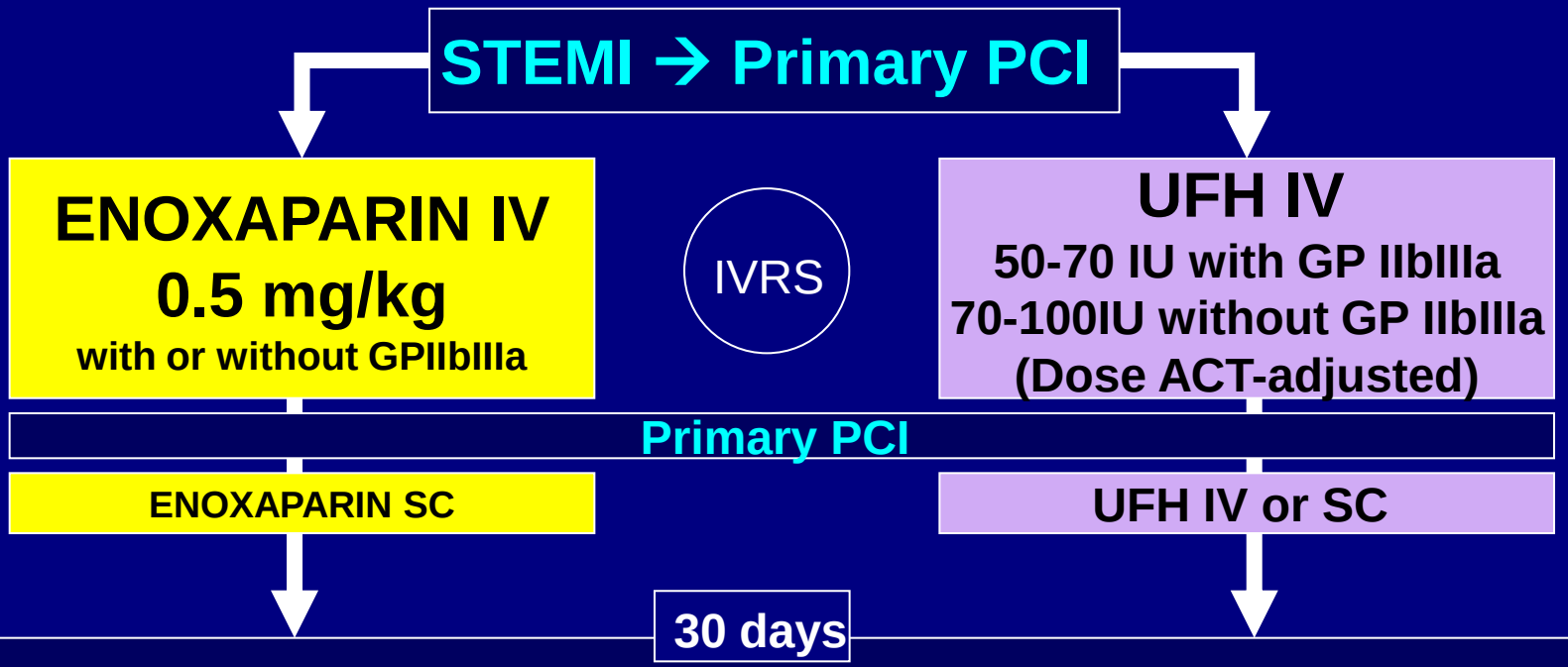
for the ATOLL investigators

ATOLL: **A**cute STEMI **T**reated with primary PCI and intravenous enoxaparin **O**r UFH to **L**ower ischemic and bleeding events at short- and **L**ong-term follow-up (Investigator-driven study)

G. MONTALESCOT, DISCLOSURE: **Research Grants (to the Institution)** from Abbott Vascular, Bristol Myers Squibb, Boston Scientific, Centocor, Cordis, Eli-Lilly, Fédération Française de Cardiologie, Fondation de France, Guerbet Medical, INSERM, Medtronic, Pfizer, Sanofi-Aventis Group, Société Française de Cardiologie; **Consulting or Lecture Fees** from Accumetrics, Astra-Zeneca, Bayer, Biotronik, Boehringer-Ingelheim, Bristol-Myers Squibb, Daichi-Sankyo, Eisai, Eli-Lilly, Menarini, MSD, Novartis, Pfizer, Portola, Sanofi-Aventis Group, Schering-Plough , Servier and The Medicines Company.

ATOLL Trial design

Randomization as *early* as possible (MICU +++)
Real life population (shock, cardiac arrest included)
No anticoagulation and no lytic **before** Rx
Similar antiplatelet therapy in both groups

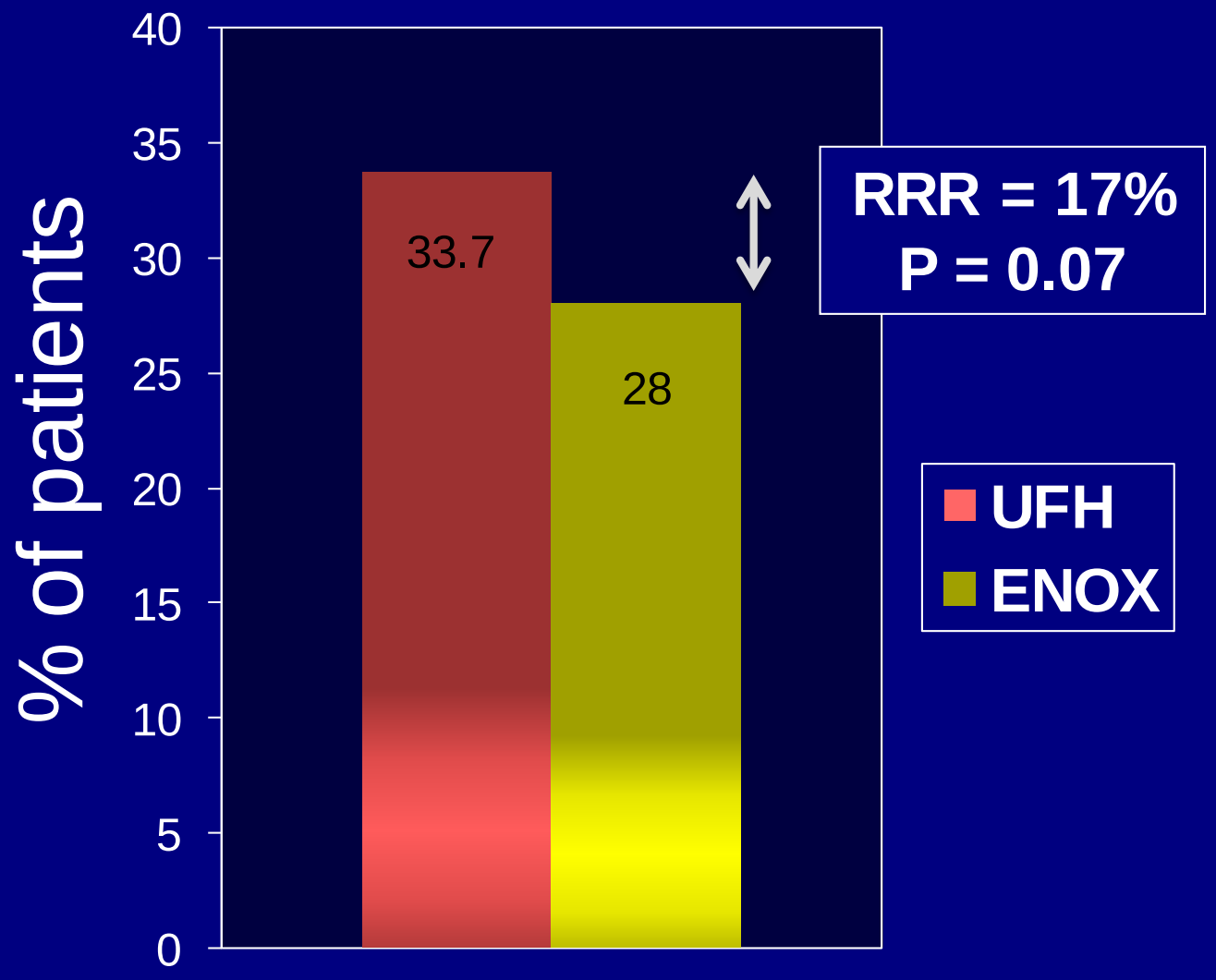


1° EP: **Death, Complication of MI, Procedure Failure, Major Bleeding**

Main 2° EP: **Death, recurrent MI/ACS, Urgent Revascularization**

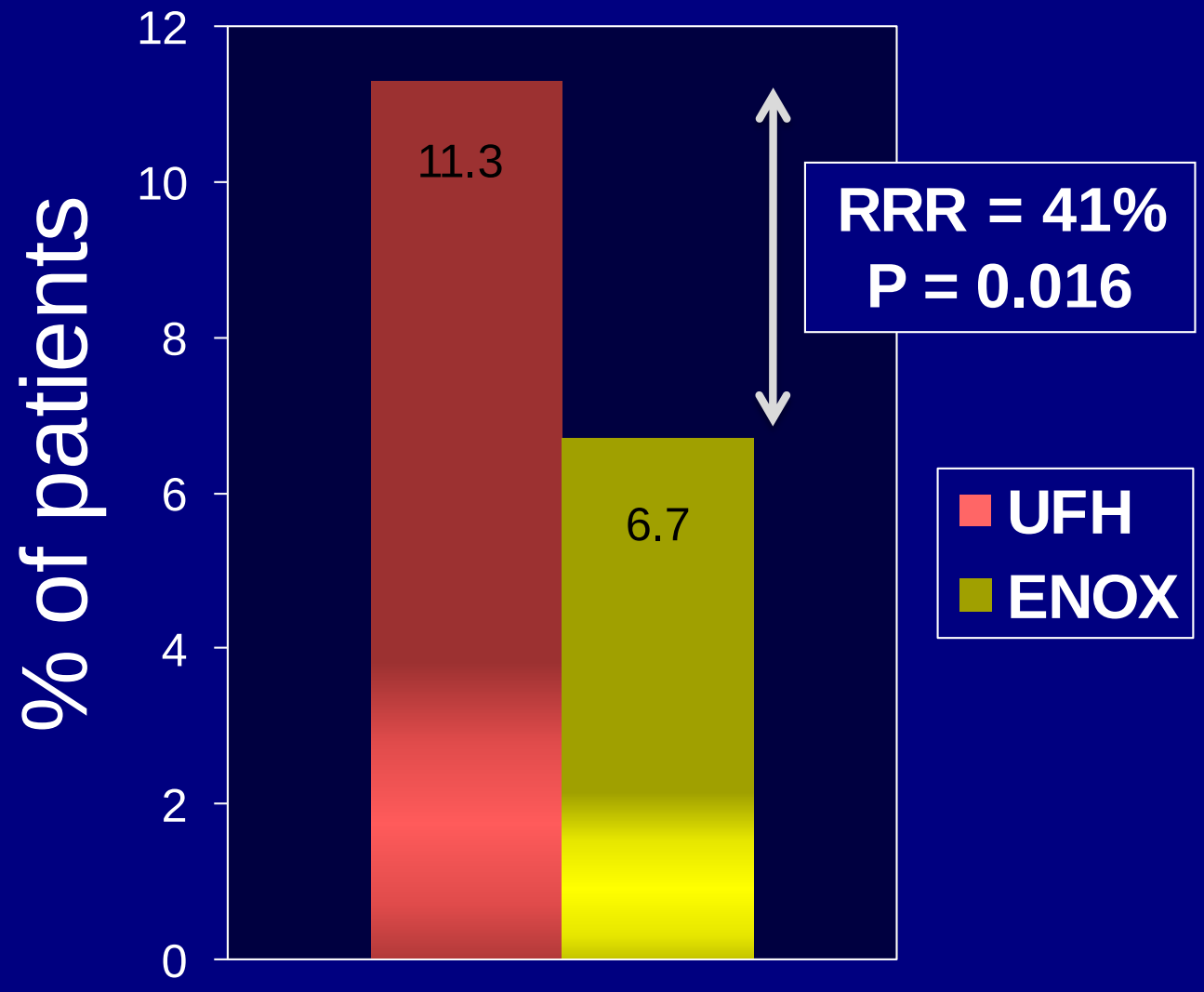
Primary Endpoint

Death, Complication of MI, Procedure Failure or Major Bleeding



Main Secondary Endpoint

Death, Recurrent MI/ACS or Urgent Revascularization



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Results of the EUROMAX trial

Philippe Gabriel Steg*, Arnoud van 't Hof, Christian W. Hamm, Peter Clemmensen, Frédéric Lapostolle, Pierre Coste, Jurrien Ten Berg, Pierre Van Grunsven, Gerrit Jan Eggink, Lutz Nibbe, Uwe Zeymer, Marco Campo dell' Orto, Holger Nef, Jacob Steinmetz, Louis Soulat, Kurt Huber, Efthymios N. Deliargyris, Debra Bernstein, Diana Schuette, Jayne Prats, Tim Clayton, Stuart Pocock, Martial Hamon**, Patrick Goldstein**, for the EUROMAX Investigators**

*

Outcomes, 30 days, con't

	Bivalirudin (N=1089)	Heparins with optional GPI (N=1109)	Relative risk [95% CI]	P Value
Reinfarction	19 (1.7)	10 (0.9)	1.93 (0.90–4.14)	0.08
Q-wave	3 (0.3)	2 (0.2)	1.53 (0.26–9.12)	0.68
Non-Q-wave	16 (1.5)	8 (0.7)	2.04 (0.88–4.74)	0.09
Stent thrombosis (ARC definition[9])	**17 (1.6)**	**6 (0.5)**	**2.89 (1.14–7.29)**	**0.02**
Definite	17 (1.6)	6 (0.5)	2.89 (1.14–7.29)	0.02
Probable	0 (0)	0 (0)	–	n/a
Acute (≤24 hours)	12 (1.1)	2 (0.2)	6.11 (1.37, 27.24)	0.007
Subacute (>24 hours to 30 days)	5 (0.5)	4 (0.4)	1.27 (0.34–4.73)	0.75
Ischemia-driven revascularization	24 (2.2)	17 (1.5)	1.44 (0.78–2.66)	0.25
Reinfarction, ischemia-driven revascularization or stent thrombosis	29 (2.7)	21 (1.9)	1.41 (0.81–2.45)	0.23
Any stroke*	6 (0.6)	11 (1.0)	0.56 (0.21–1.50)	0.24
Ischemic	6 (0.6)	9 (0.8)	0.68 (0.24–1.9)	0.46
Hemorrhagic	0	2 (0.2)	Not applicable	0.50
Acquired thrombocytopenia	7 (0.7)	14 (1.4)	0.50 (0.20–1.24)	0.13

n/a: not applicable.

Determinants of prehospital use of opioids in AMI patients and association with early outcomes.

The FAST-MI 2010 registry

N. Bonnet[1], A. Lafont[1], N. Danchin[1], L. Lamhaut[2], L. Mock[3], N. Dos Santos Teixeira[1], P. Goldstein[4], F. Schiele[5],T. Simon[6], E. Puymirat[1]

(1) Hôpital Européen Georges Pompidou, Paris, (2) SAMU de Paris, (3) Clinique de Fontaine, Fontaine lès Dijon, (4) SAMU de Lille, (5) Hôpital Jean Minjoz, Besançon, (6) CHU St Antoine, Paris, France

Independent correlates of pre-hospital use of morphine

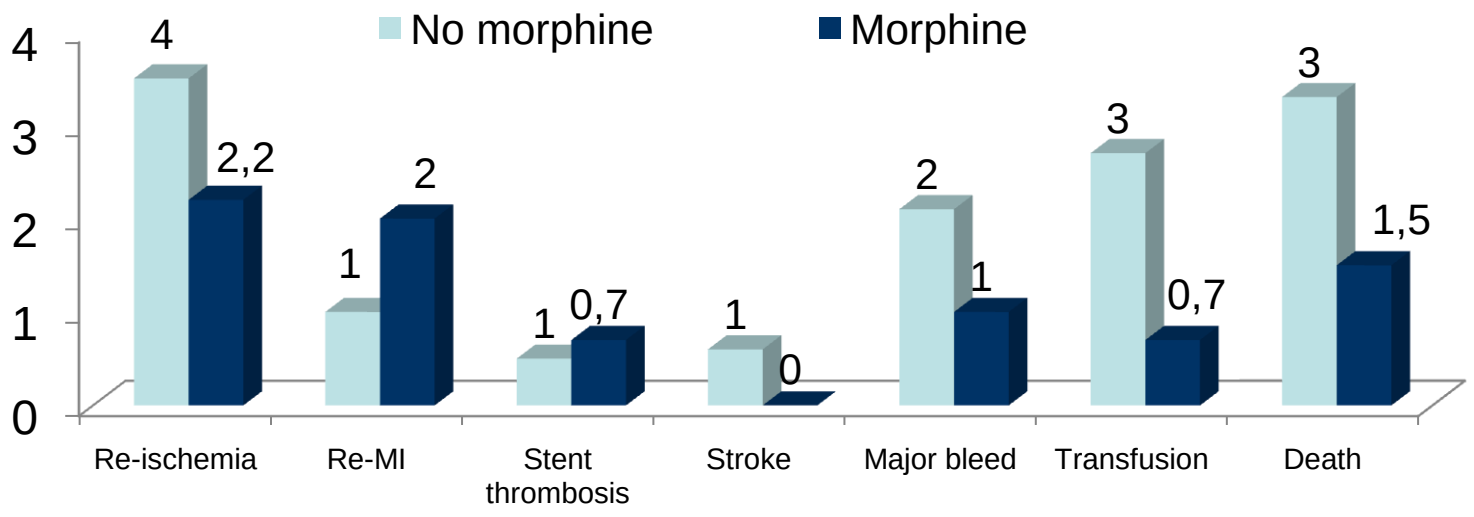
	Adjusted OR (95%CI)	**P value**
Age < 60 years	2.82 (1.78-4.46)	<0.001
STEMI (vs NSTEMI)	4.66 (3.32-6.53)	<0.001
Chest pain score ≥ 7	2.88 (2.00-4.14)	<0.001
Typical chest pain	2.17 (1.37-3.45)	0.001
Female sex	*0.74 (0.54-1.02)*	*0.06*

Hemodynamic correlates of morphine use

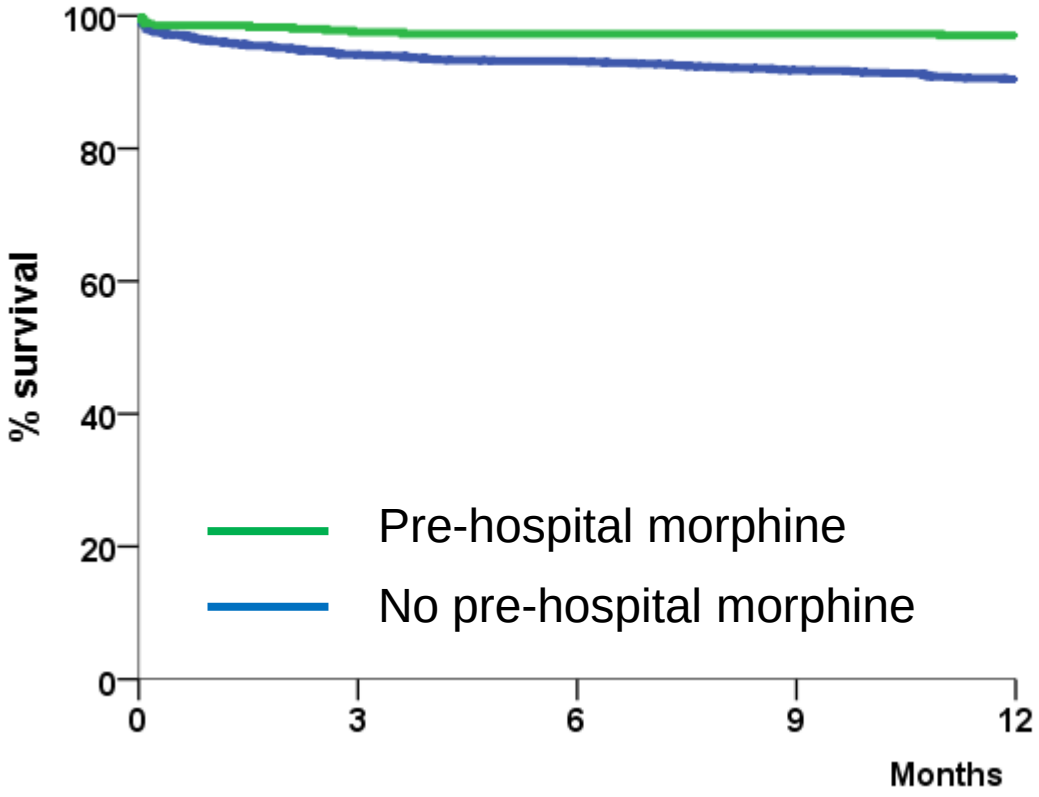
	No P-H morphine	P-H morphine	P value
Initial heart rate (bpm)	80.6 ± 21.2	74.5 ± 19.9	<0.001
Initial SBP (mm Hg)	147.3 ± 29.3	140.0 ± 28.6	<0.001
Change in HR	+ 4.3 ± 19.6	- 1.9 ± 19.1	<0.001
Change in SBP	10.5 ± 28.6	13.7 ± 28.0	0.06
Change in Killip class	0.077 ± 0.355	0.080 ± 0.366	0.87

Results: in-hospital complications

	Adjusted OR (95%CI)
Recurrent ischemia	0.70 (0.33-1.49)
Re-MI	2.53 (1.01-6.33)
Stent thrombosis	1.26 (0.27-5.97)
Death	1.32 (0.46-3.82)



One-year survival



Adjusted HR (95%CI)

Model 1

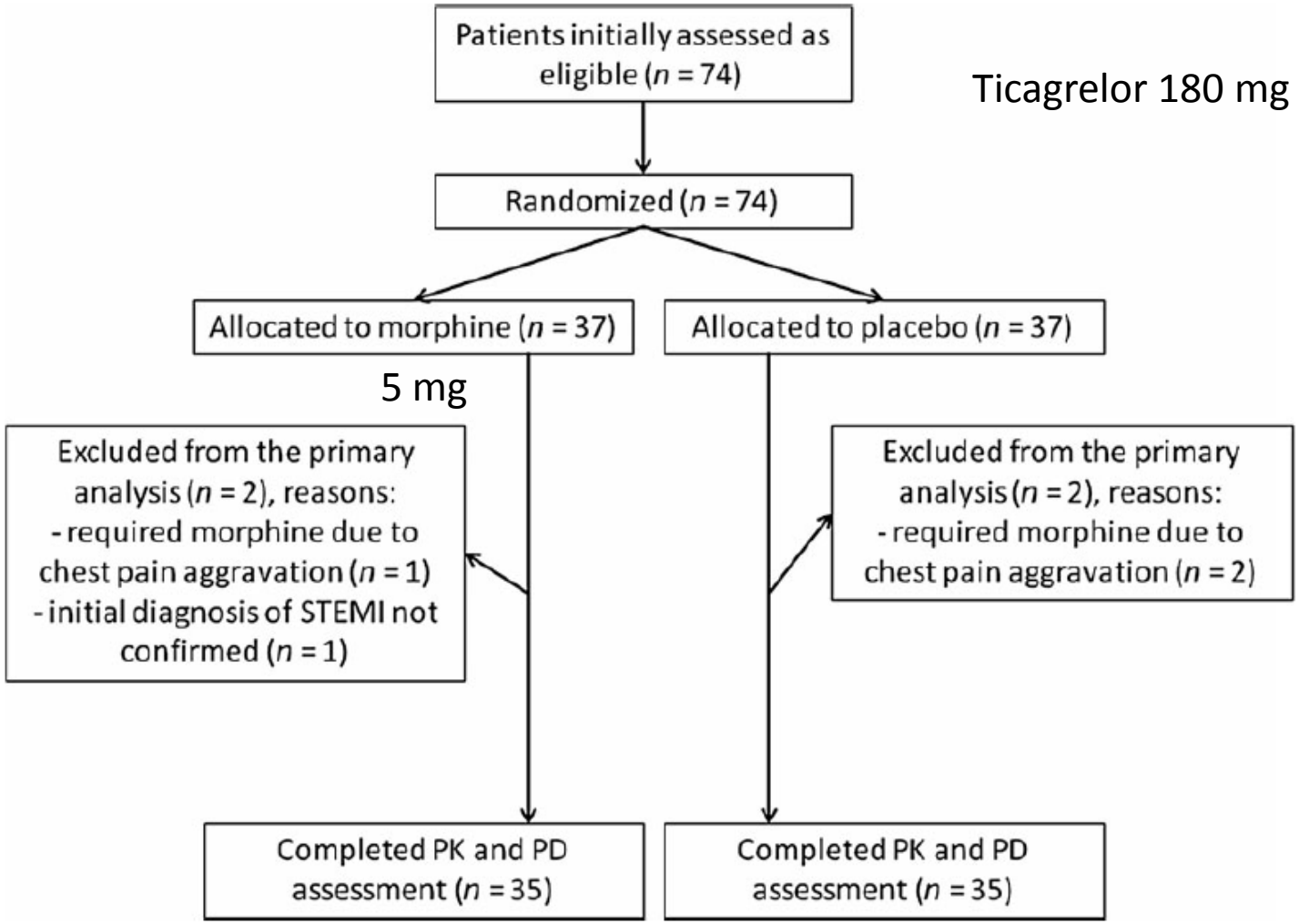
0.46 (0.25-0.83), P=0.01

Model 2

0.53 (0.29-0.97), P=0.04

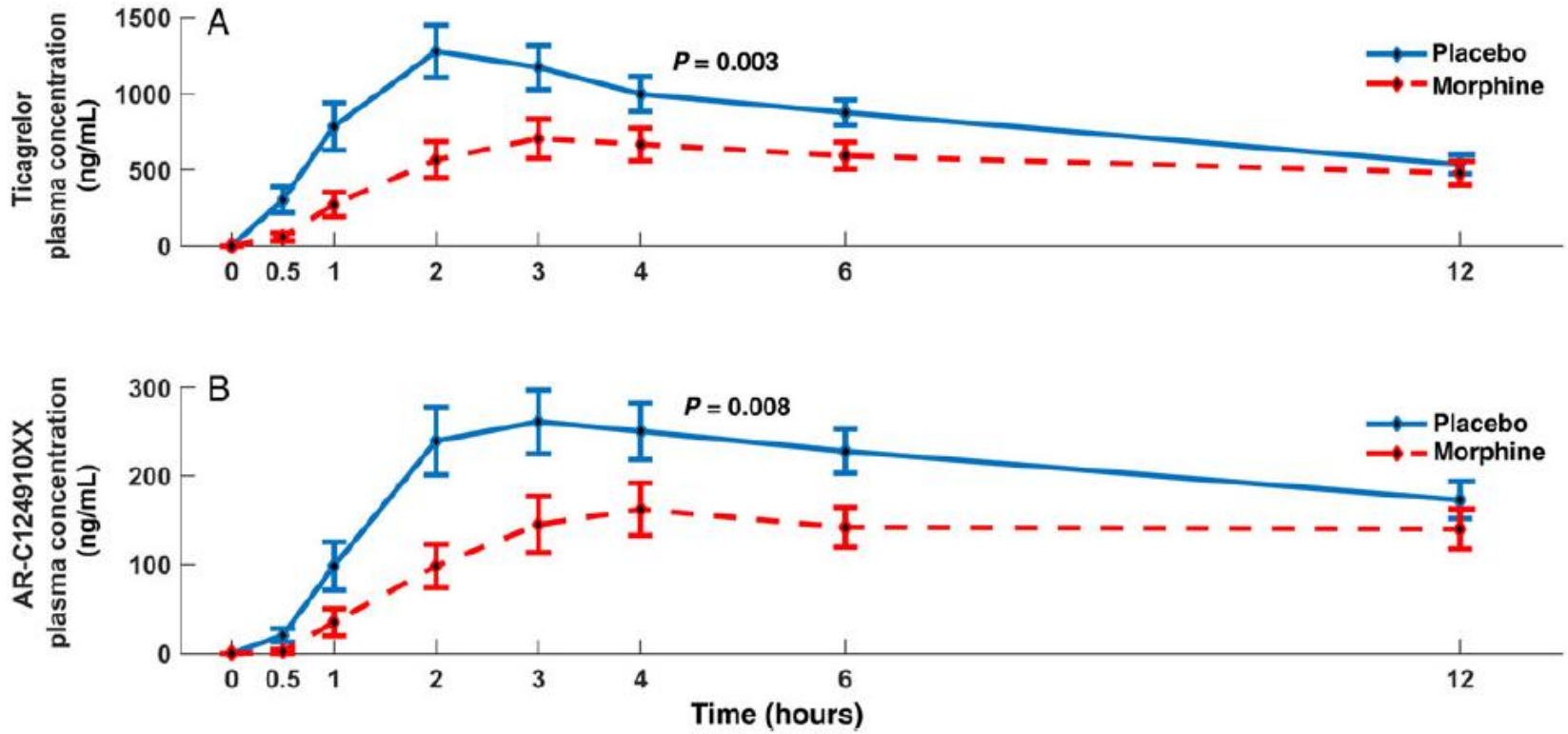
Adjusted for
Model 1: GRACE score
Model 2: age, sex, region, type of centre, clinical profile, medical history, GRACE score, early in-hospital medications, PCI

Morphine delays and attenuates ticagrelor exposure and action in patients with myocardial infarction: the randomized, double-blind, placebo-controlled IMPRESSION trial



Ticagrelor 180 mg

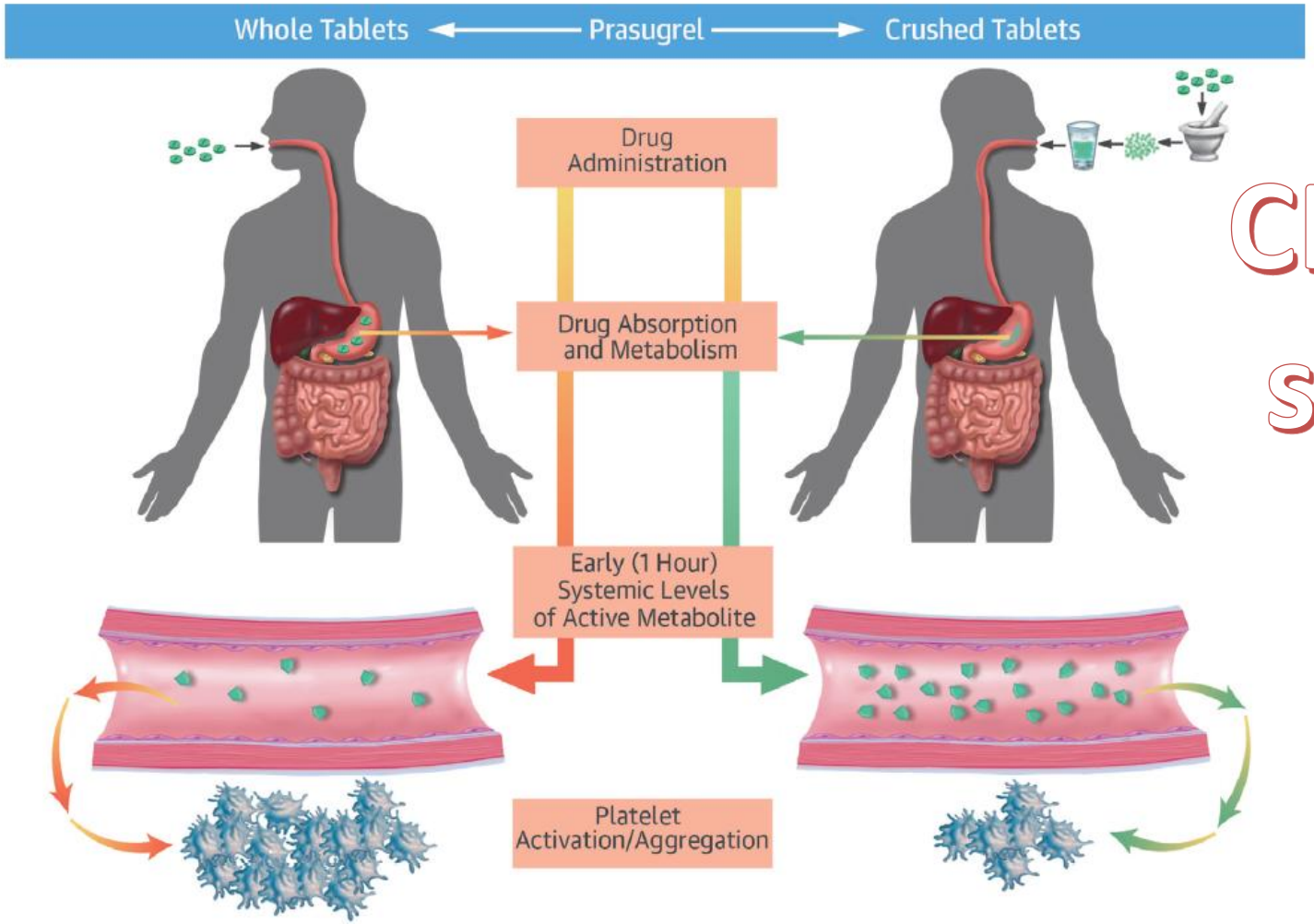
Kubica Eur Heart J 2015



Réduction de l'exposition de 36% du ticagrelor et de son métabolite actif. Augmentation du délai d'obtention d'une concentration maximale (4H vs 2h)

Kubica Eur Heart J 2015

CENTRAL ILLUSTRATION Crushed Prasugrel in STEMI



Rollini, F. et al. J Am Coll Cardiol. 2016;67(17):1994-2004.

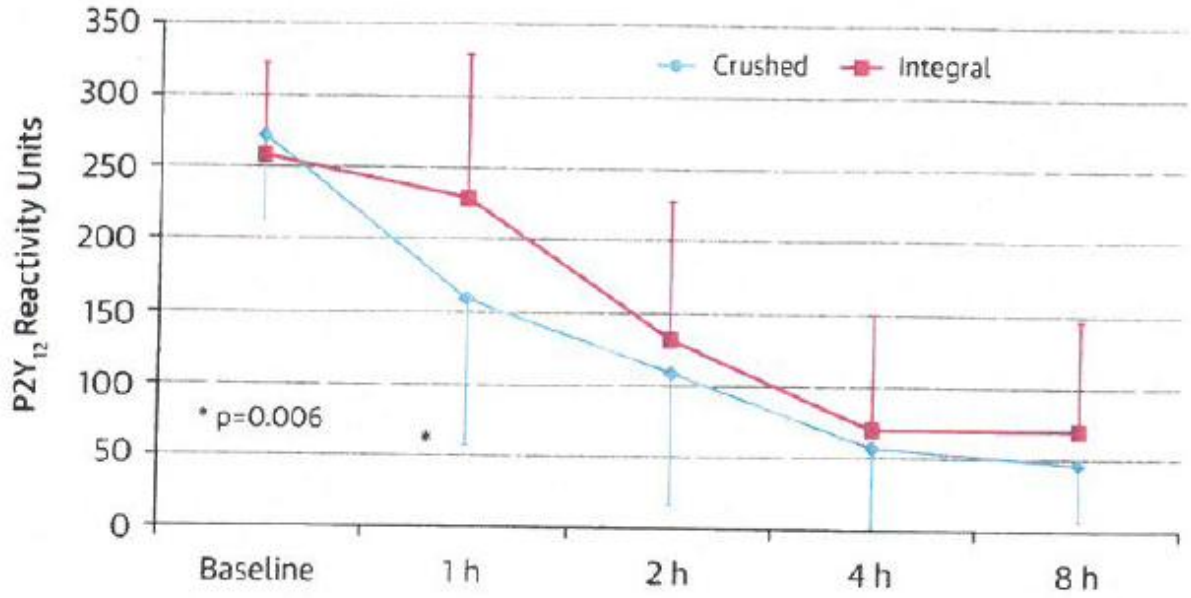
The effect of crushing prasugrel on pharmacokinetic and pharmacodynamic profiles. STEMI = ST-segment elevation myocardial infarction.

CRUSH study

F.Rollini . JACC 2016, 67-1994-2004

MOJITO STUDY

FIGURE 1 Platelet Inhibition Over Time

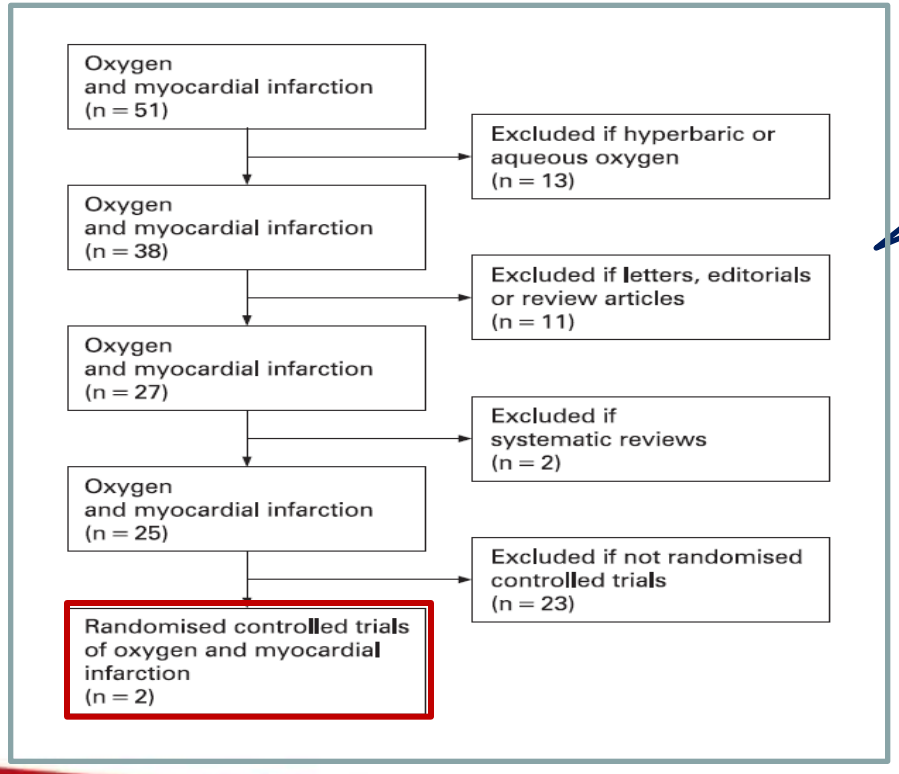


Platelet reactivity was assessed at baseline, 1, 2, 4, and 8 h after a 180-mg ticagrelor loading dose in patients treated by crushed tablets **(diamonds)** or integral tablets **(squares)**. Data are expressed as mean ± SD.

JACC 2015

Treatments that can be initiated in early ACS
(2) No routine MONA – Example Oxygen

OXYGEN «The first cause of surprise is …..the extraordinary paucity of scientific data on one of its (myocardial infarction) most widely used methods of treatment. The second disturbing finding is that oxygen therapy, far from having been proved to be efficacious, might even be deleterious… » [1]



Systematic review (2009) [2]
Only 2 randomized clinical trials, N< 250 patients

Results in the largest trial, N~200 (1976):

	Oxygen	Air	P value
Death	11.3%	3.9%	*0.08*
ASAT* (mean)	99.9 IU/ml	80.7 IU/ml	*0.05*
Ventricular tachycardia	13.8%	6.5%	*0.13*

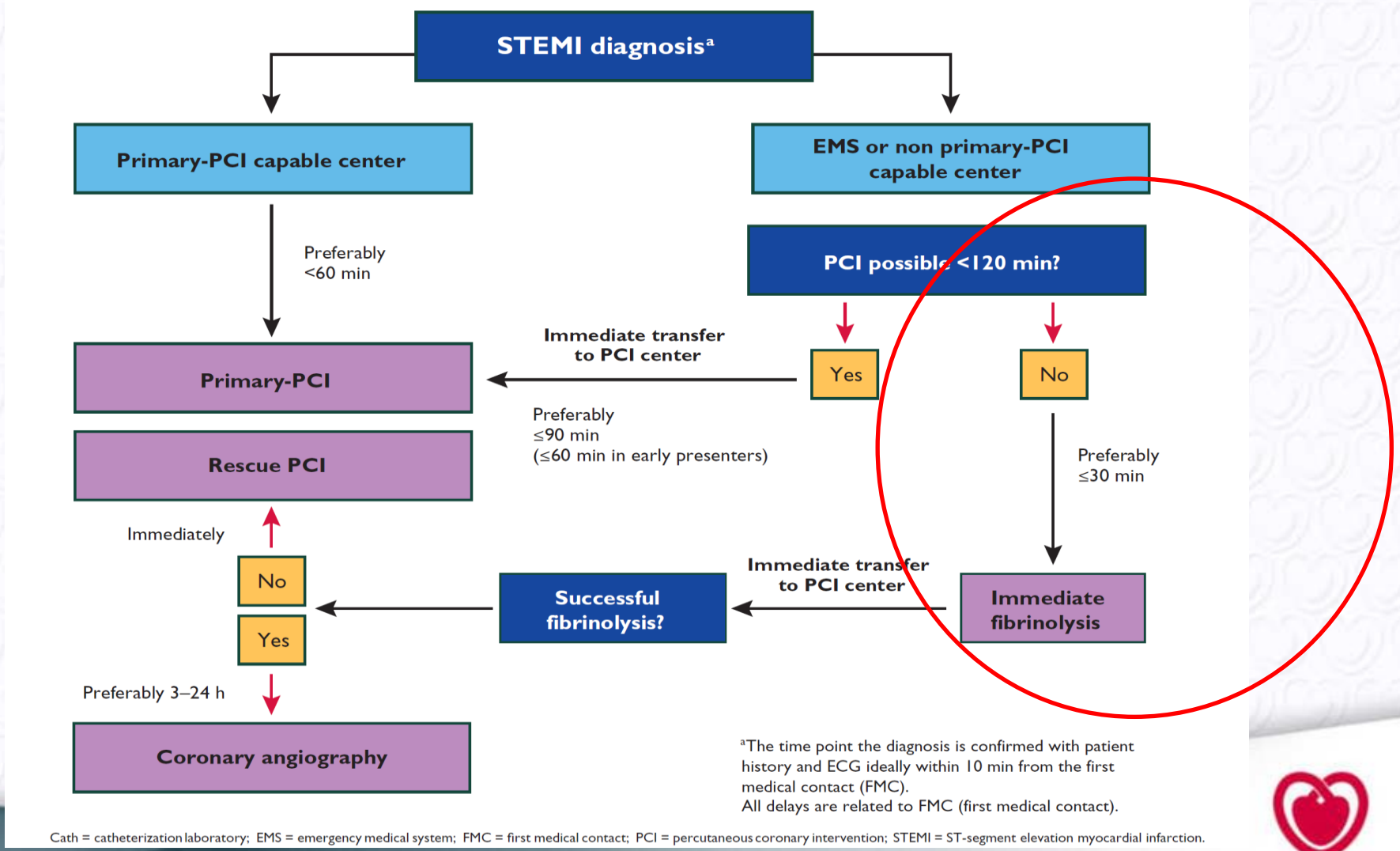
*Used as a surrogate for infarct size

1 Danchin N et al. Heart 2009;95:176–7
2 Wijesinghe M et al Heart 2009;95:198–202

You are far away from the nearest cathlab - more than 90 minutes after this ECG.

What is your therapeutic strategy?

Prehospital and in-hospital management, and reperfusion strategies within 24 h of FMC



Cath = catheterization laboratory; EMS = emergency medical system; FMC = first medical contact; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction.

European Heart Journal 2012 - doi:10.1093/eurheartj/ehs215

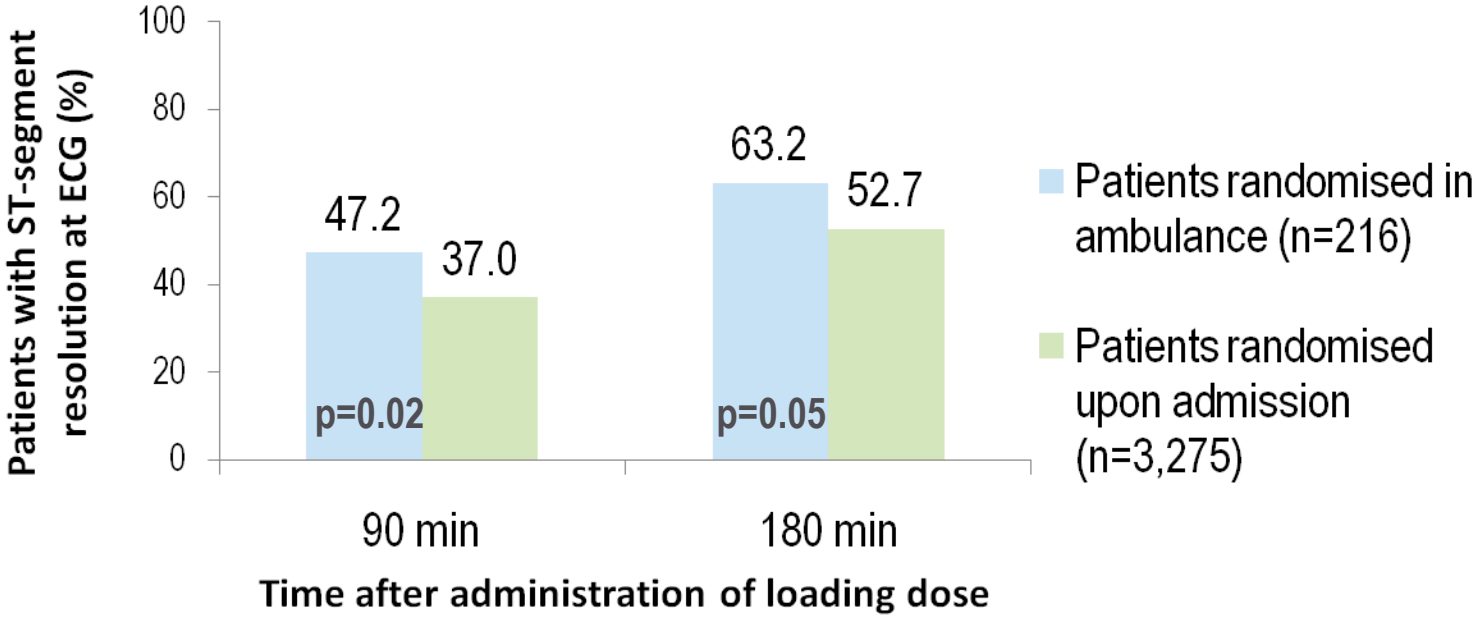
What kind of medication you start with?

- Heparin: 60 IU/kg bolus i.v. (max 4,000 IU) followed by 12 IU/kg/h (max 1,000IU/h) or enoxaparin (Extract)
- Aspirin: 250 mg i.v.
- Clopidogrel: loading dose of 300 mg

Extract-TIMI 25: World Congress of Cardiology - Barcelona 2006
Enoxaparin results in less death than unfractionated heparin
10.7 vs 13.8 (p=0.001) (M GIBSON, USA)

CLARITY ambulance substudy: pre-hospital clopidogrel vs. placebo (plus fibrinolytic therapy)

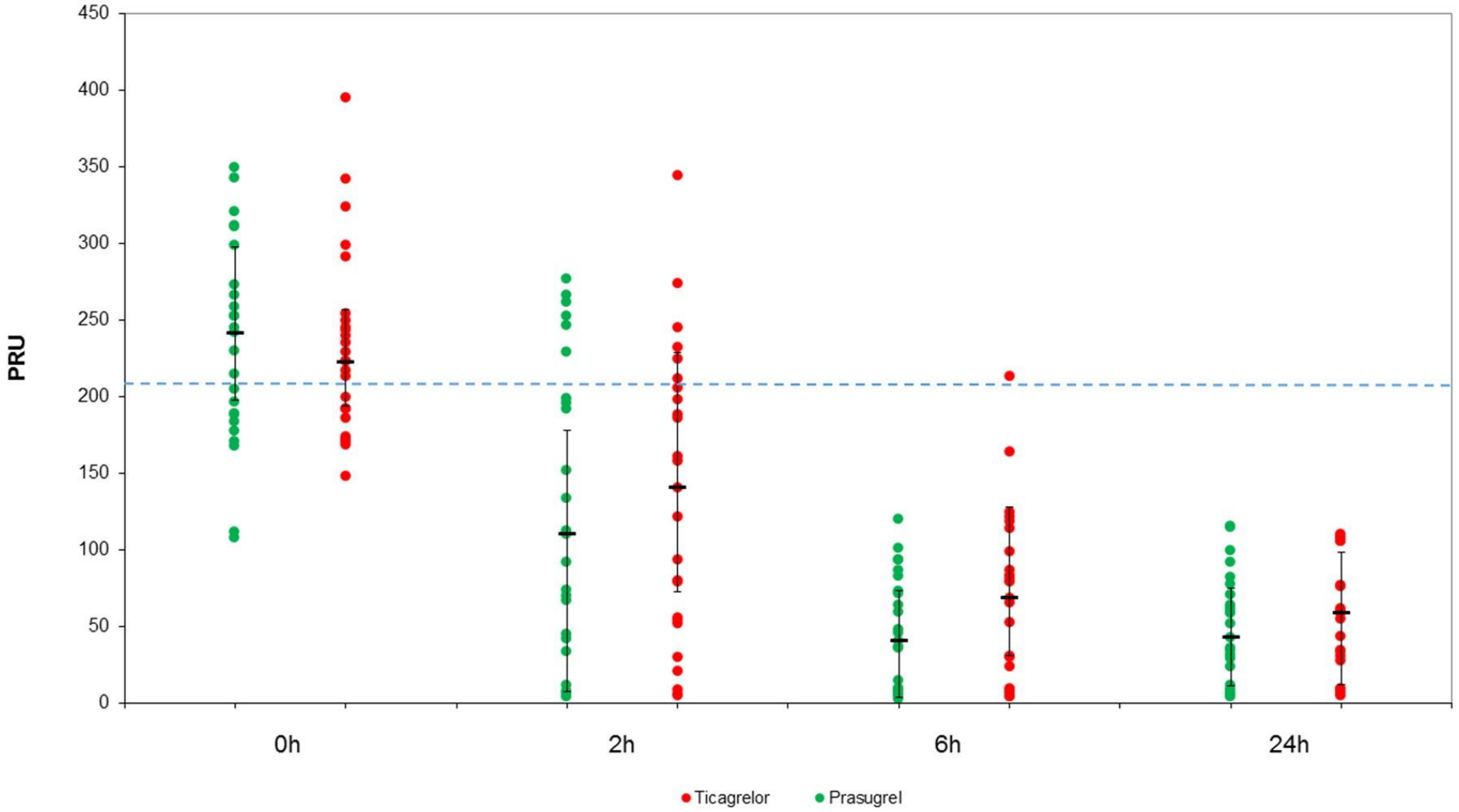
- 3,491 patients aged <76 years with STEMI, receiving fibrinolytic therapy
- Randomised to clopidogrel or placebo in the ambulance or on admission



STEMI, ST-elevated myocardial infarction; ECG, electrocardiogram

Clopidogrel given in the ambulance is associated with ST-segment resolution

Verheugt F et al. *J Thromb Thrombolysis* 2007;23:173-179.



P2Y12 receptor inhibitor with prasugrel and ticagrelor in STEMI patients after fibrinolytic therapy
Results from the SAMPA randomized trial
International Journal of cardiology 2017,230, 204-208

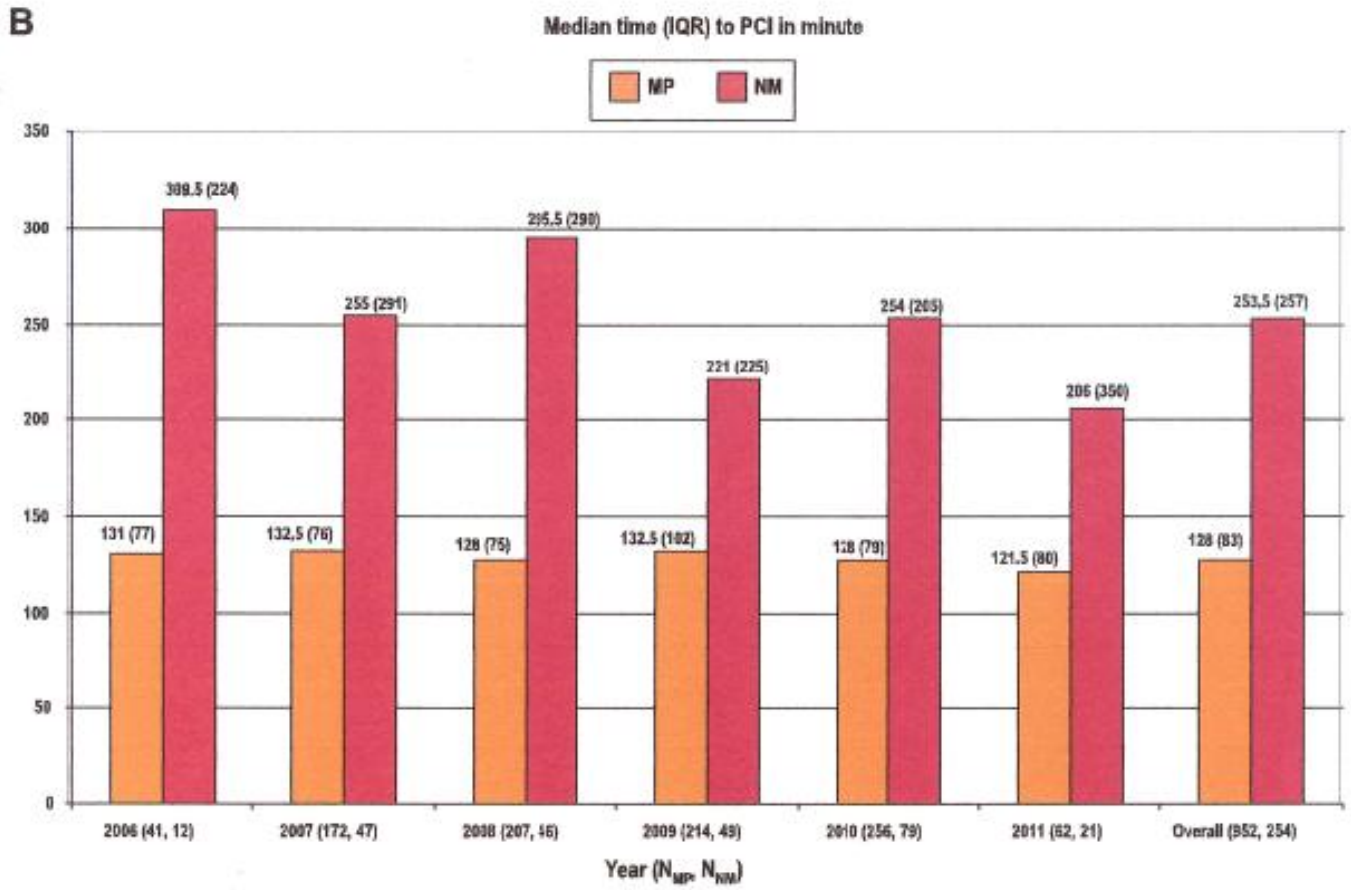
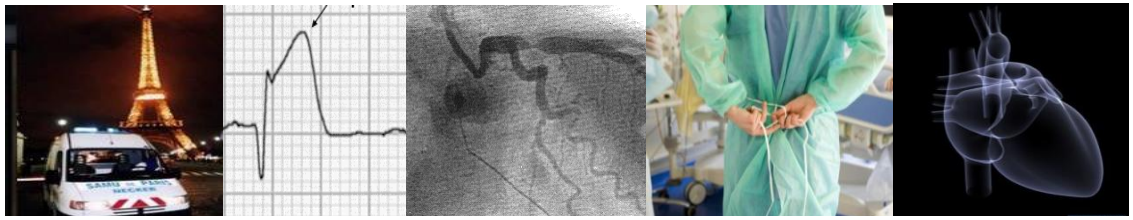


Figure 1. (**A**) Temporal trends in first medical contact to fibrinolytic therapy. (**B**) Temporal trends in first medical contact to PCI. IQR, interquartile range; MP, metropolitan; NM, nonmetropolitan; PCI, percutaneous coronary intervention.

Canadian journal of cardiology ;,2013:951_959



Method (1)

Registry e-MUST, ***For the e-MUST investigators***

www.cardio-arsif.org

- **Data from an ongoing prospective registry that includes all STEMI managed by MICUs in the Greater Paris Area.**

- **Prehospital System:**
  - **8 SAMU, 40 SMUR, Dispatching Center « 15 »**
- **STEMI < 12h**
- **2008 -2012**
- **All patients: from scene to cath-lab hospital)**

Results (2):« Real Life » vs ESC guidelines

P City of Paris

Small ring only

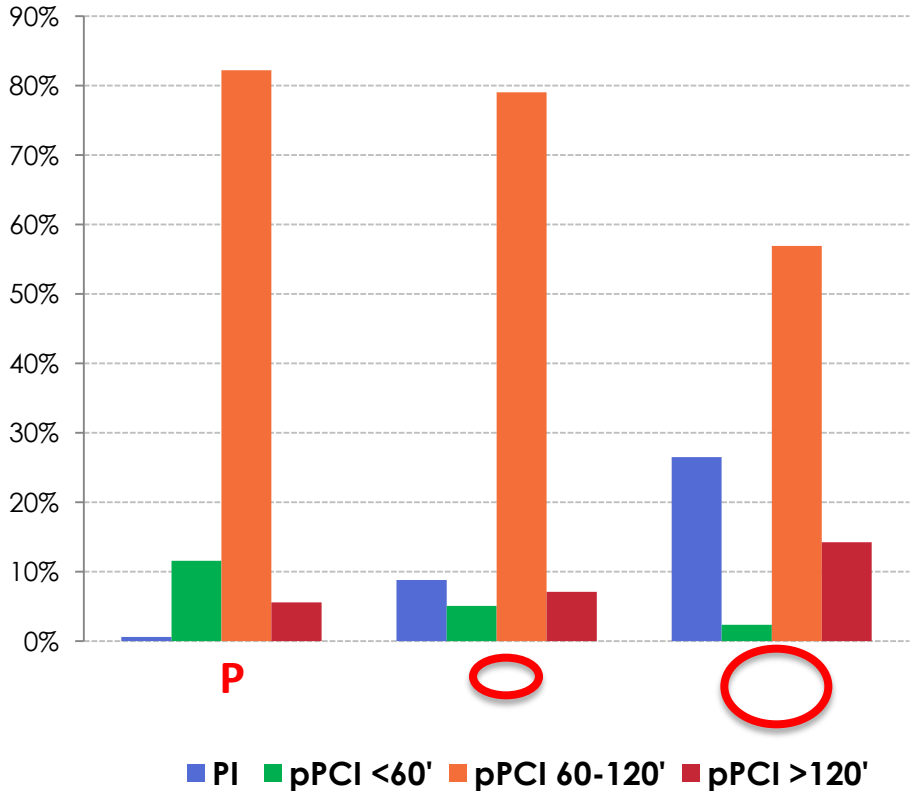
Large ring only

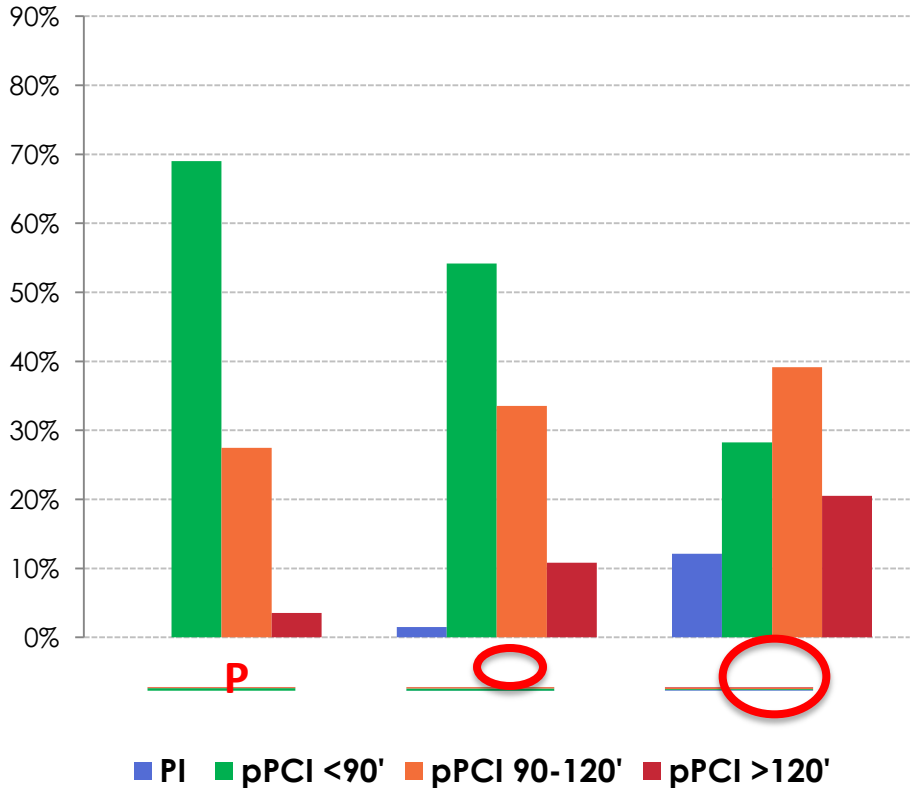
Great Paris Area

2008-2012

STEMI <2h
(66% STEMI <12h)

STEMI 2-12h
(34% STEMI <12h)





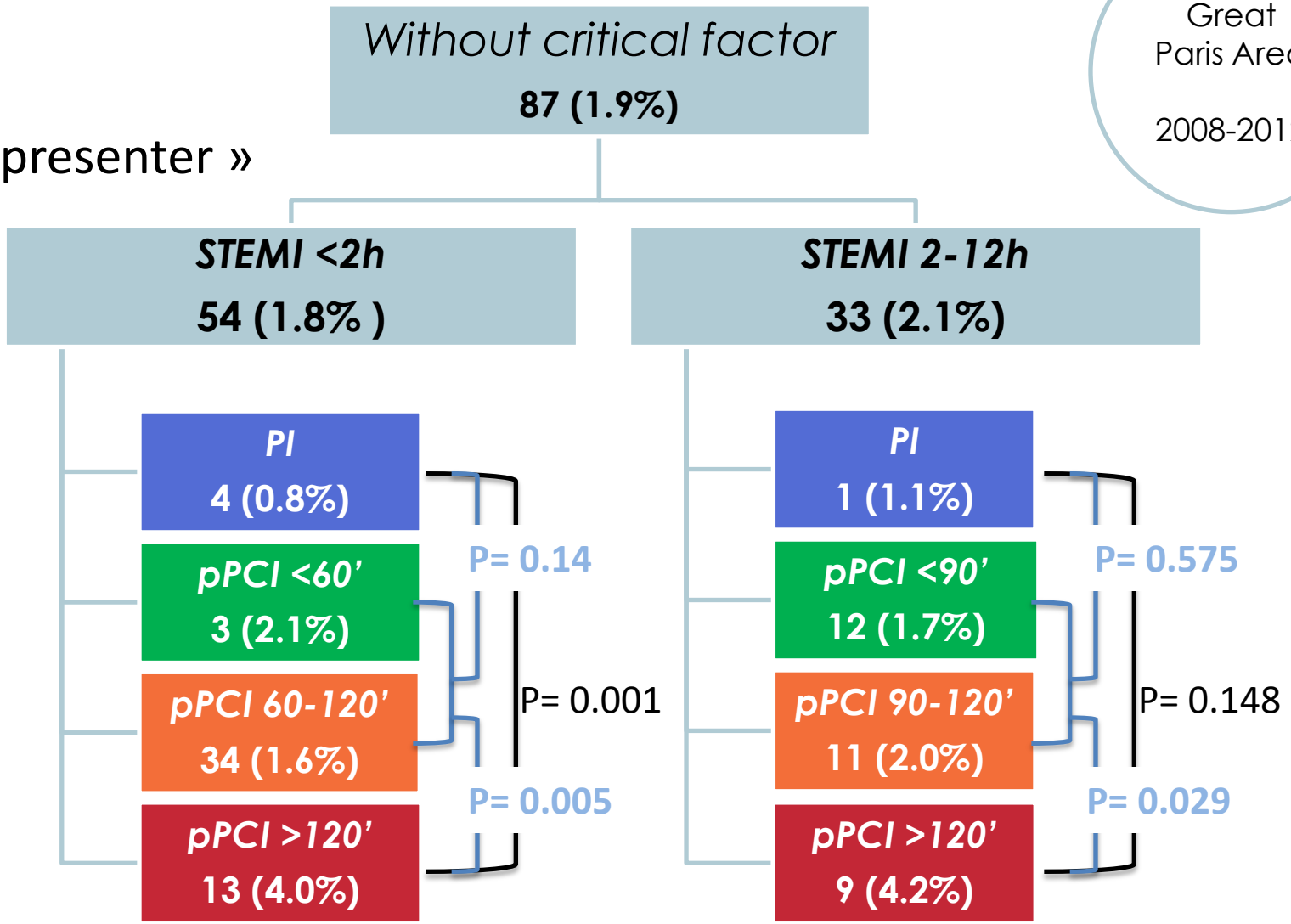
Y. Lambert & e-MUST study group, unpublished data

Results (4): **Hospital mortality**

Great Paris Area

2008-2012

« early presenter »



Y. Lambert & e-MUST study group, unpublished data

The NEW ENGLAND JOURNAL of MEDICINE

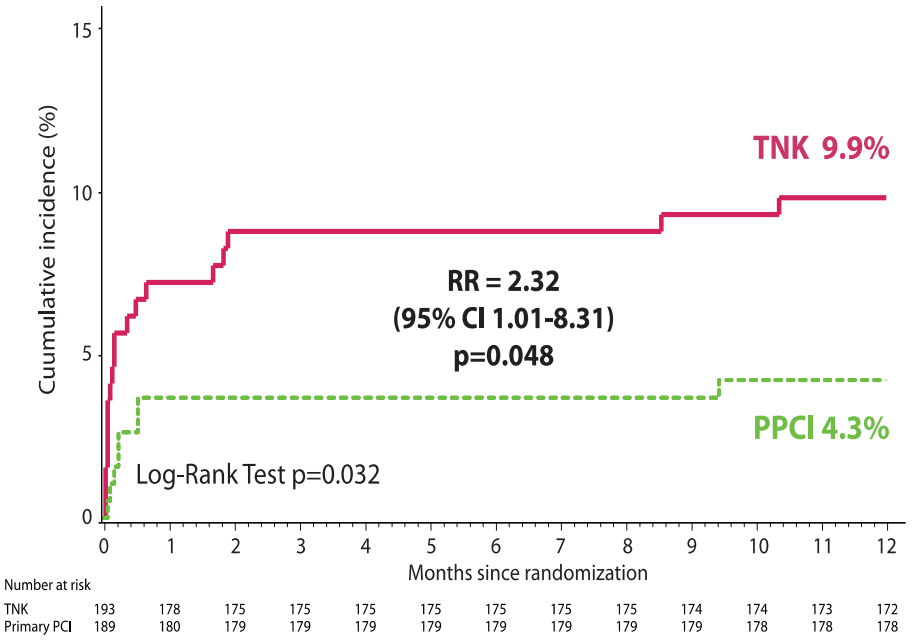
ORIGINAL ARTICLE

Fibrinolysis or Primary PCI in ST-Segment Elevation Myocardial Infarction

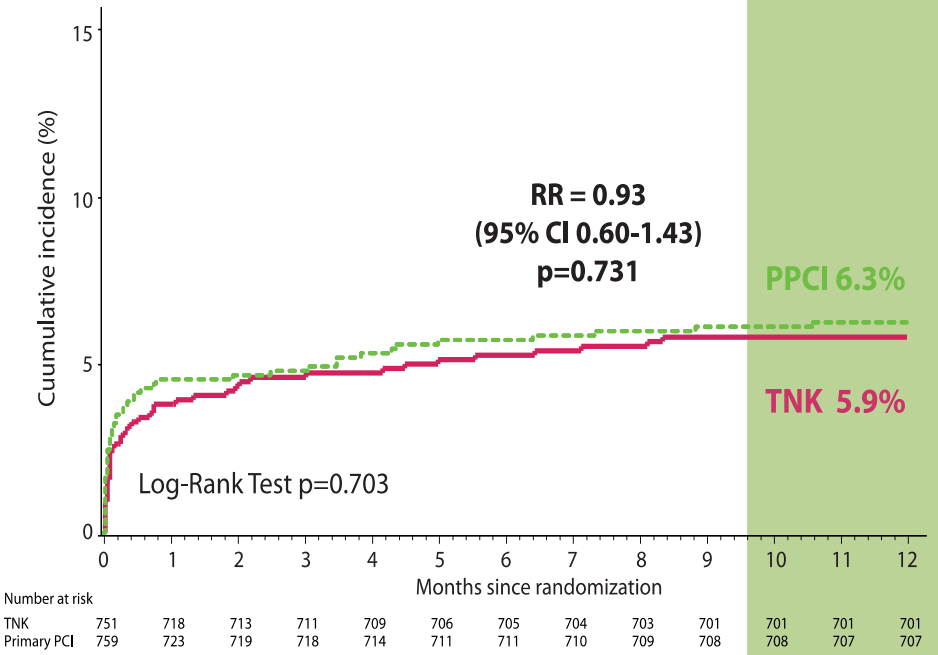
Paul W. Armstrong, M.D., Anthony H. Gershlick, M.D., Patrick Goldstein, M.D., Robert Wilcox, M.D., Thierry Danays, M.D., Yves Lambert, M.D., Vitaly Sulimov, M.D., Ph.D., Fernando Rosell Ortiz, M.D., Ph.D., Miodrag Ostojic, M.D., Ph.D., Robert C. Welsh, M.D., Antonio C. Carvalho, M.D., Ph.D., John Nanas, M.D., Ph.D., Hans-Richard Arntz, M.D., Ph.D., Sigrun Halvorsen, M.D., Ph.D., Kurt Huber, M.D., Stefan Grajek, M.D., Ph.D., Claudio Fresco, M.D., Erich Bluhmki, M.D., Ph.D., Anne Regelin, Ph.D., Katleen Vandenberghe, Ph.D., Kris Bogaerts, Ph.D., and Frans Van de Werf, M.D., Ph.D., for the STREAM Investigative Team*

All-cause mortality before & after amendment

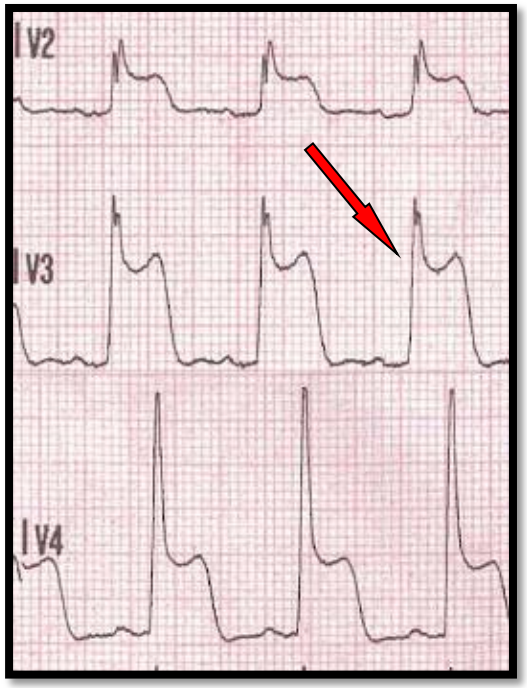
Patients randomized before Am. (n=382)



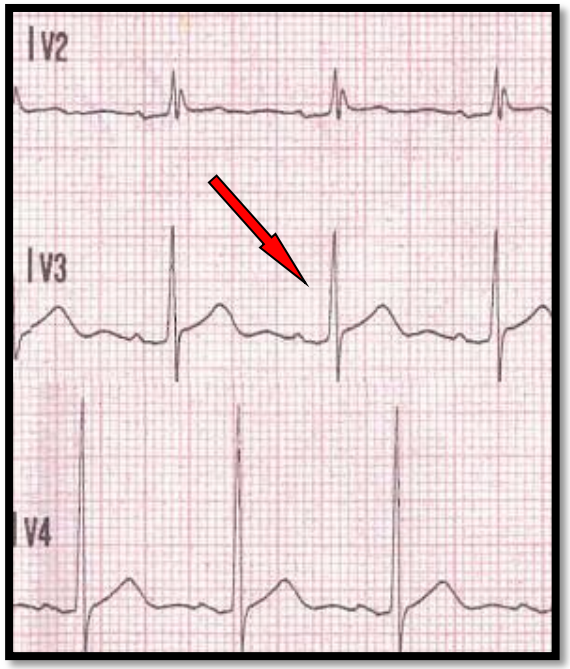
Patients randomized after Am. (n=1,510)



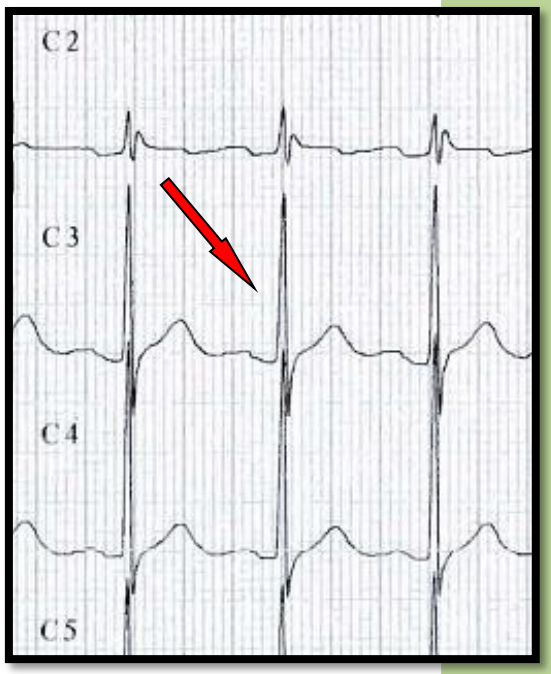
STREAM Group A Aborted MI



Baseline



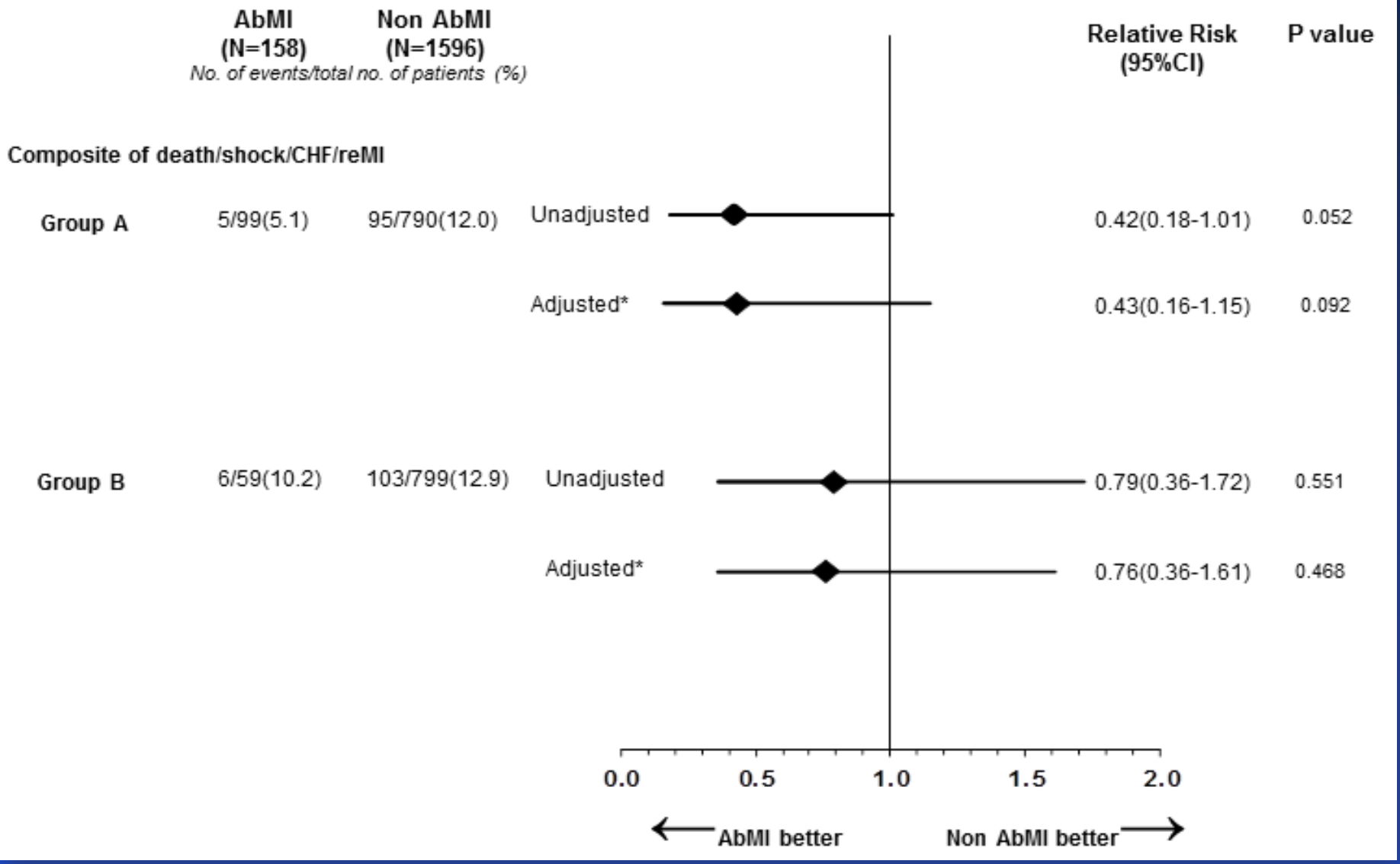
90-min post TNK



Pre-cath

Baseline ECG	Randomization	TNK	90min post T ECG		
- 18	- 7	0	91		
12:22	12:33	12:40	14:11		
11 July 2009					

AbMI Clinical Outcomes by Rx Group

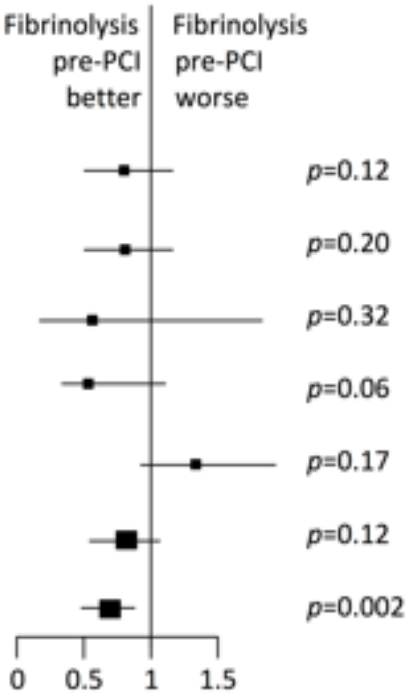


Maleki et al Heart 2014

Impact on Cardiogenic Shock of Fibrinolysis before PCI

Figure 1: Incidence of cardiogenic shock in fibrinolysis pre-PCI *vs*. primary PCI.

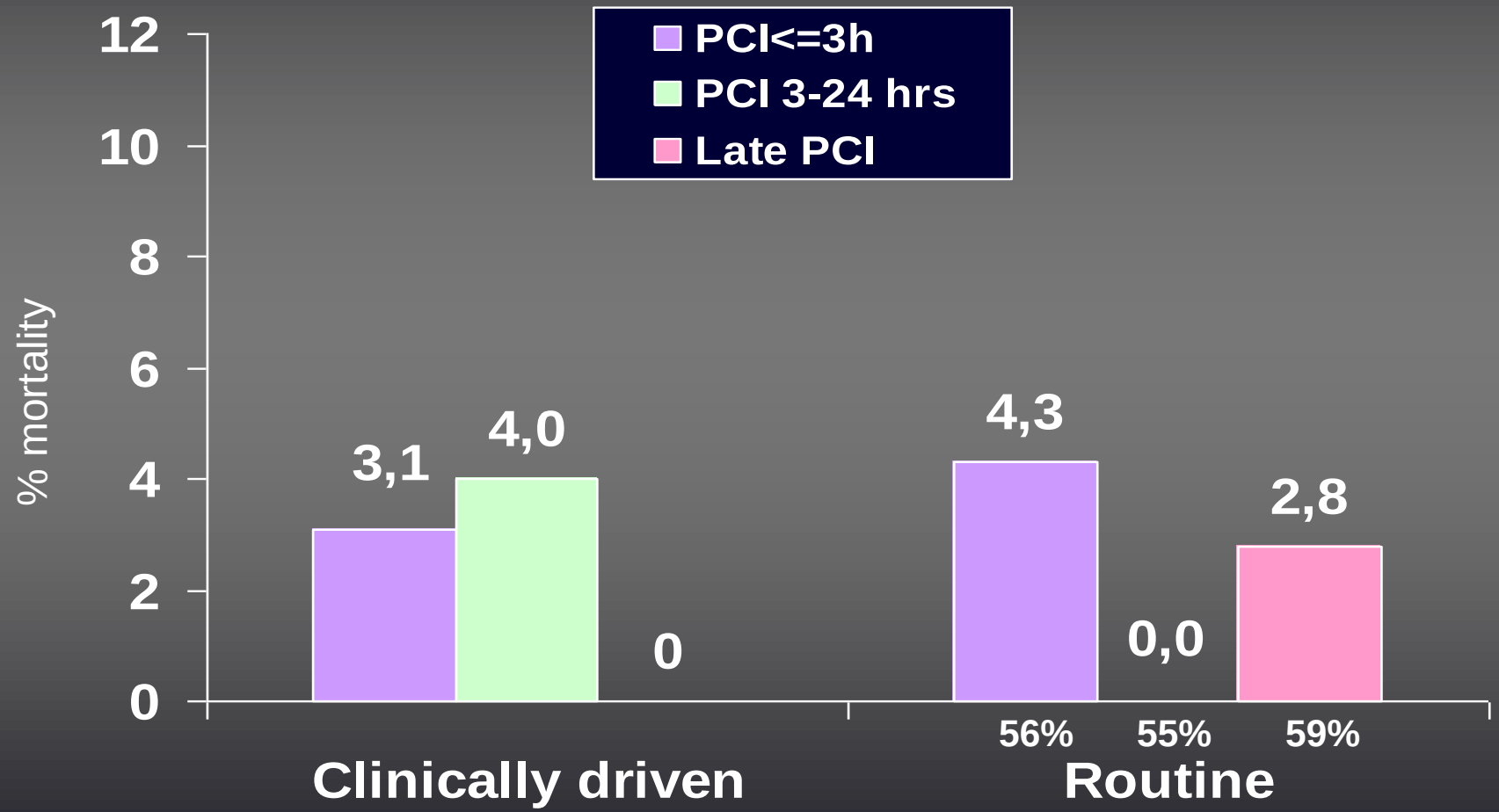
	Fibrinolysis pre-PCI (n)	Primary PCI (n)	Relative Risk (95% CI)	
STREAM	41/939	56/944	0.74 (0.50-1.09)	*p*=0.12
FINESSE	44/828	55/806	0.78 (0.53-1.14)	*p*=0.20
WEST	4/104	7/100	0.55 (0.17-1.82)	*p*=0.32
CAPTIM	10/419	20/421	0.50 (0.24-1.06)	*p*=0.06
ASSENT-4 PCI	51/807	39/817	1.32 (0.88-1.99)	*p*=0.17
All patients	150/3097	177/3088	0.84 (0.68-1.04)	*p*=0.12
Patients <3h	69/1678	106/1624	0.63 (0.47-0.84)	*p*=0.002



Other lessons learned from the French surveys

Role of PCI after PHT

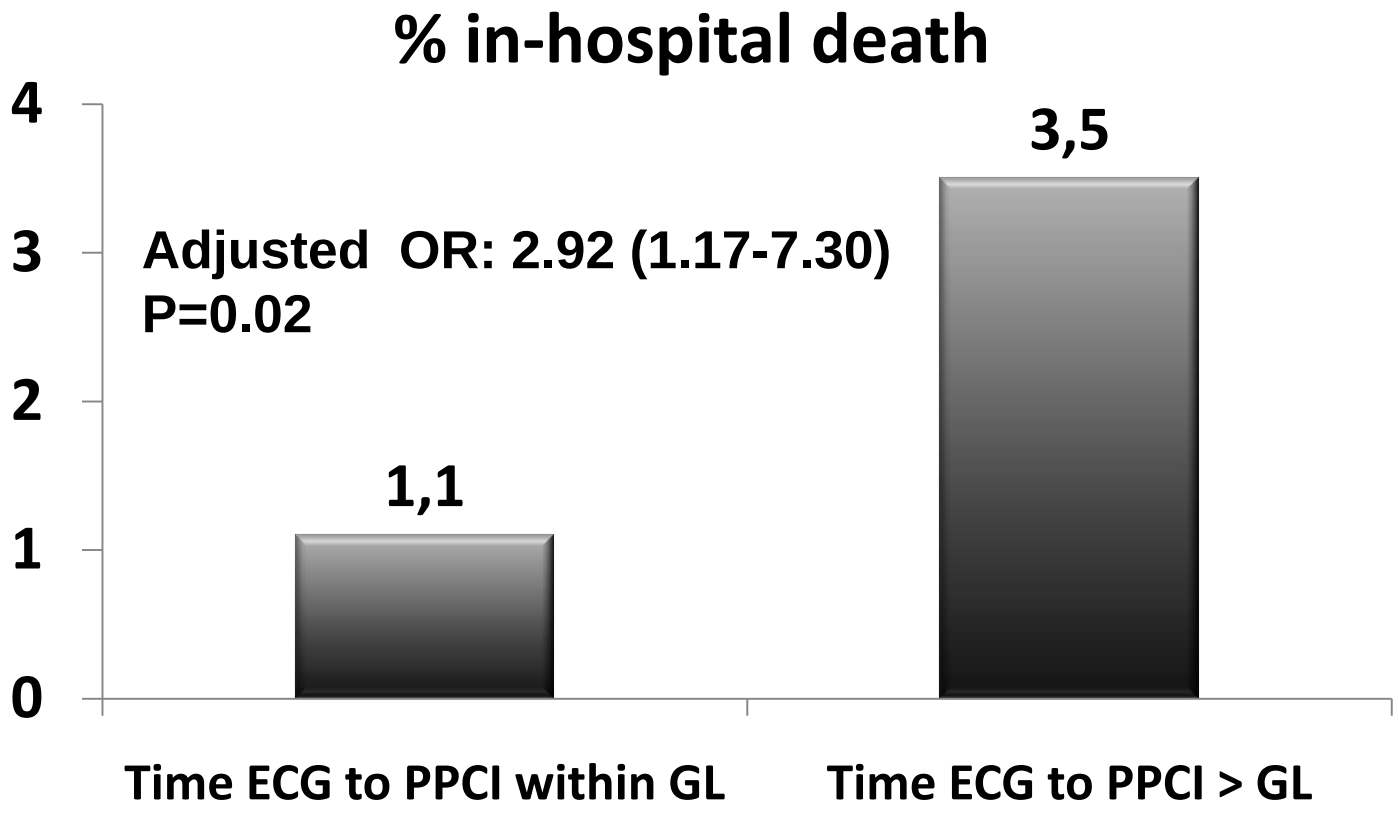
FAST-MI: 30-day mortality according to early PCI after pre-hospital lysis



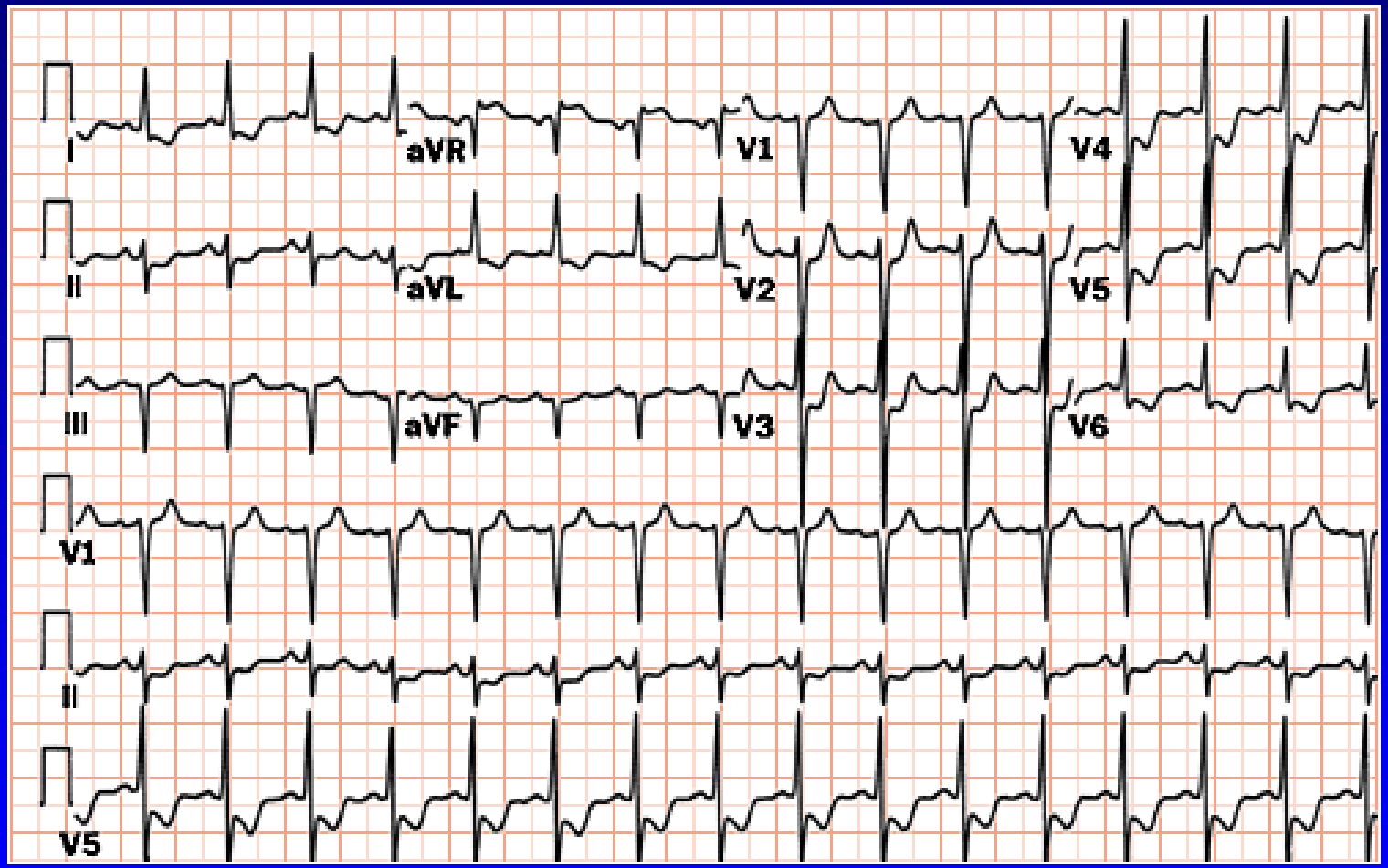
87 % of the patients with PCI during hospital stay

FAST-MI 2007

Meeting the requirements of the guidelines influences survival

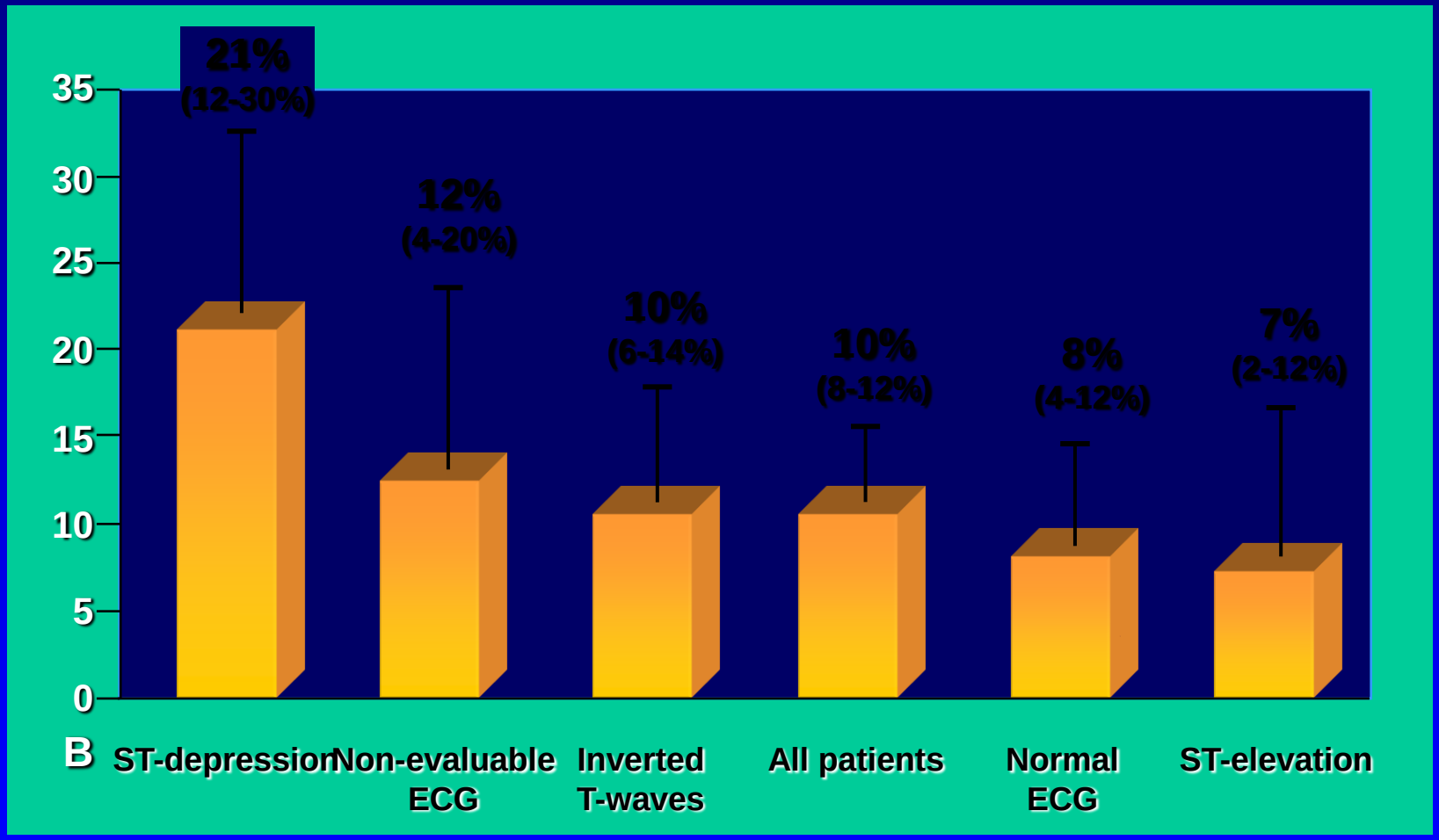


Median time from ECG to PCI: 110 min [78; 185]
Only 55% met the recommended timelines



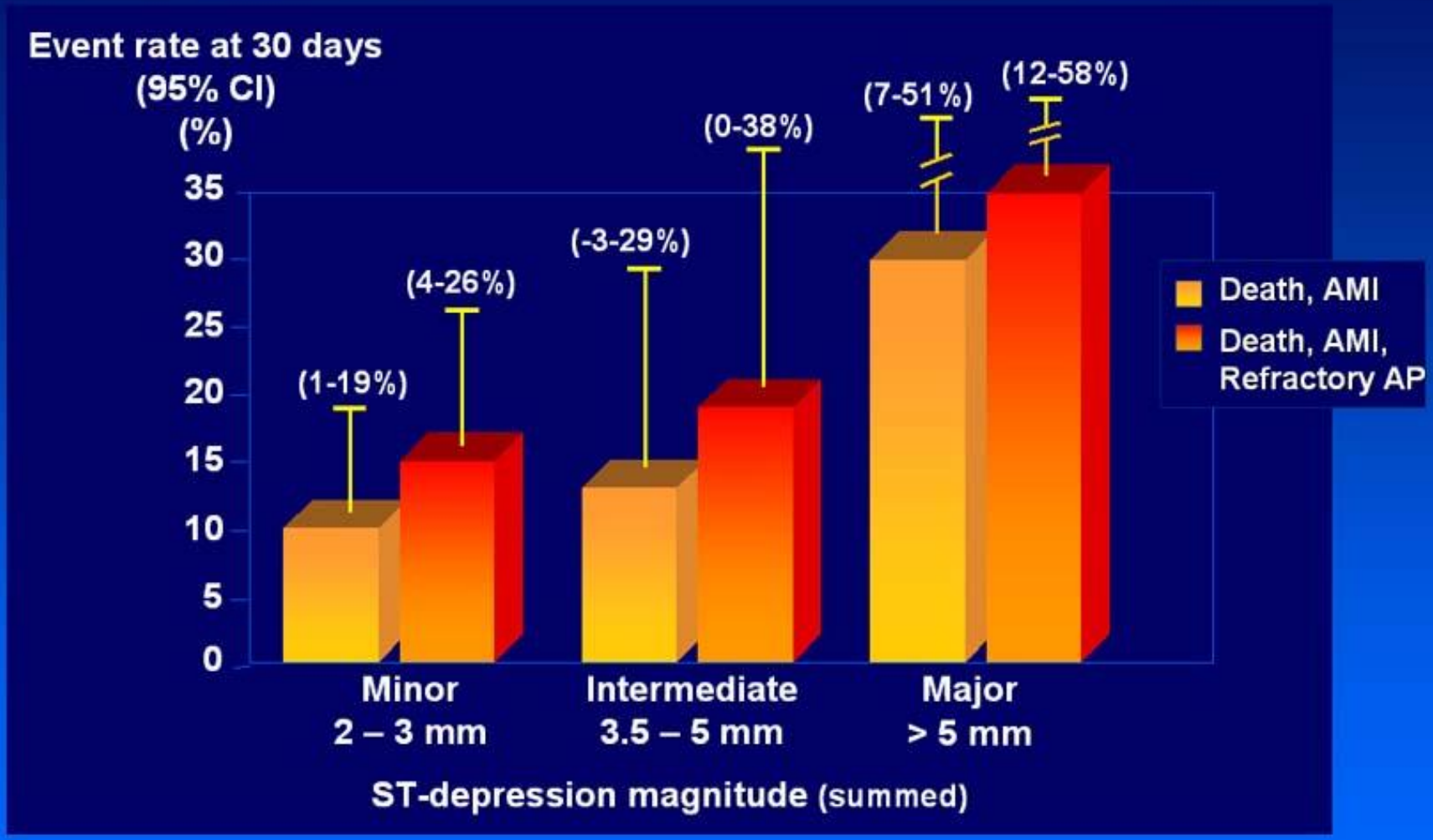
NON STEMI……really serious

Baseline ECG & MACE at 30 days



Holmvang et al. TRIM study *Am Heart J 1999;137:24-33*

Magnitude of ST-segment depression & Prognosis



Distribution of magnitude of ST-segment depression in relation to cardiac events at 30 days

Holmvang et al. TRIM study *Am Heart J 1999;137:24-33*

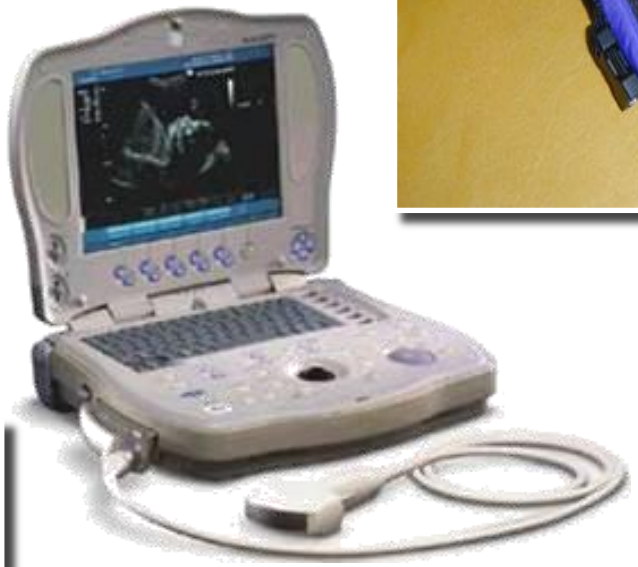
Troponin I Levels to Predict the Risk of Mortality in Acute Coronary Syndromes

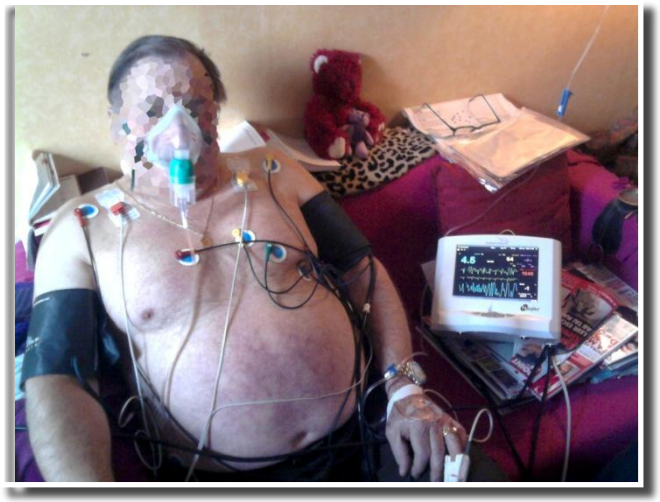
	0 to <0.4	0.4 to <1.0	1.0 to <2.0	2.0 to <5.0	5.0 to <9.0	≥9.0
Risk Ratio	1.0	1.8	3.5	3.9	6.2	7.8
95% Confidence Interval	—	0.5–6.7	1.2–10.6	1.3–11.7	1.7–22.3	2.6–23.0

Cardiac Troponin I (ng/ml)

Thrombolysis in Myocardial Ischemia (TIMI) trial
Patients presenting without ST-segment elevation on the electrocardiogram

To reduce diagnostic time…





The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

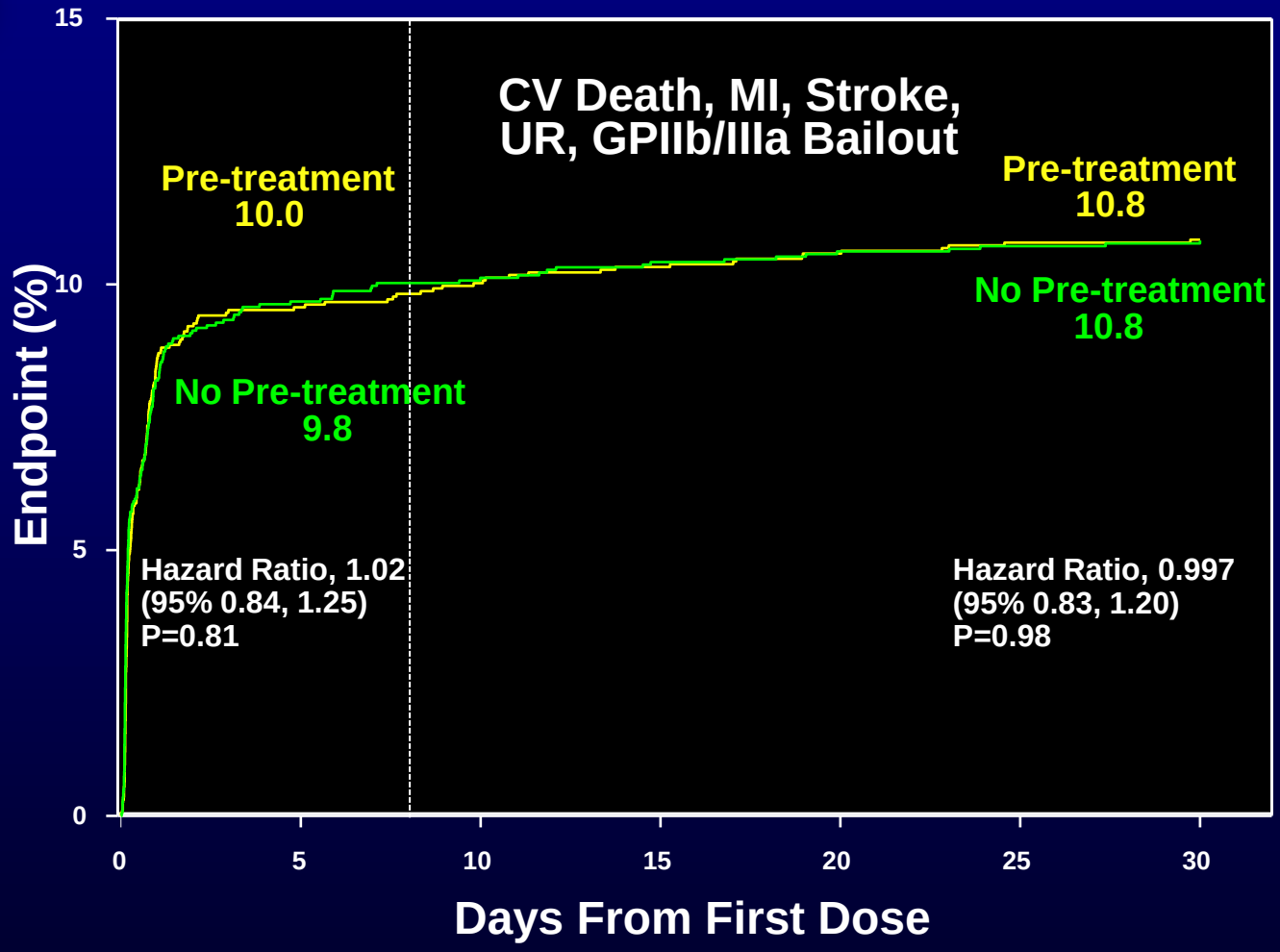
Pretreatment with Prasugrel in Non–ST-Segment Elevation Acute Coronary Syndromes

Gilles Montalescot, M.D., Ph.D., Leonardo Bolognese, M.D., Dariusz Dudek, M.D., Ph.D., Patrick Goldstein, M.D., Christian Hamm, M.D., Jean-Francois Tanguay, M.D., Jurrien M. ten Berg, M.D., Ph.D., Debra L. Miller, R.N., Timothy M. Costigan, Ph.D., Jochen Goedicke, M.D., Johanne Silvain, M.D., Ph.D., Paolo Angioli, M.D., Jacek Legutko, M.D., Ph.D., Margit Niethammer, M.D., Zuzana Motovska, M.D., Ph.D., Joseph A. Jakubowski, Ph.D., Guillaume Cayla, M.D., Ph.D., Luigi Oltrona Visconti, M.D., Eric Vicaut, M.D., Ph.D., and Petr Widimsky, M.D., D.Sc., for the ACCOAST Investigators*

From Institut de Cardiologie, Centre Hospitalier Universitaire Pitié-Salpêtrière (ACTION group, Assistance Publique–Hôpitaux de Paris [AP-HP], Université Paris 6) (G.M., J.S.) and Methodology and Statistical Unit, Centre Hospitalier Universitaire Laribcisière (ACTION group, AP-HP, Université Paris 7) (E.V.), Paris, and Ser-

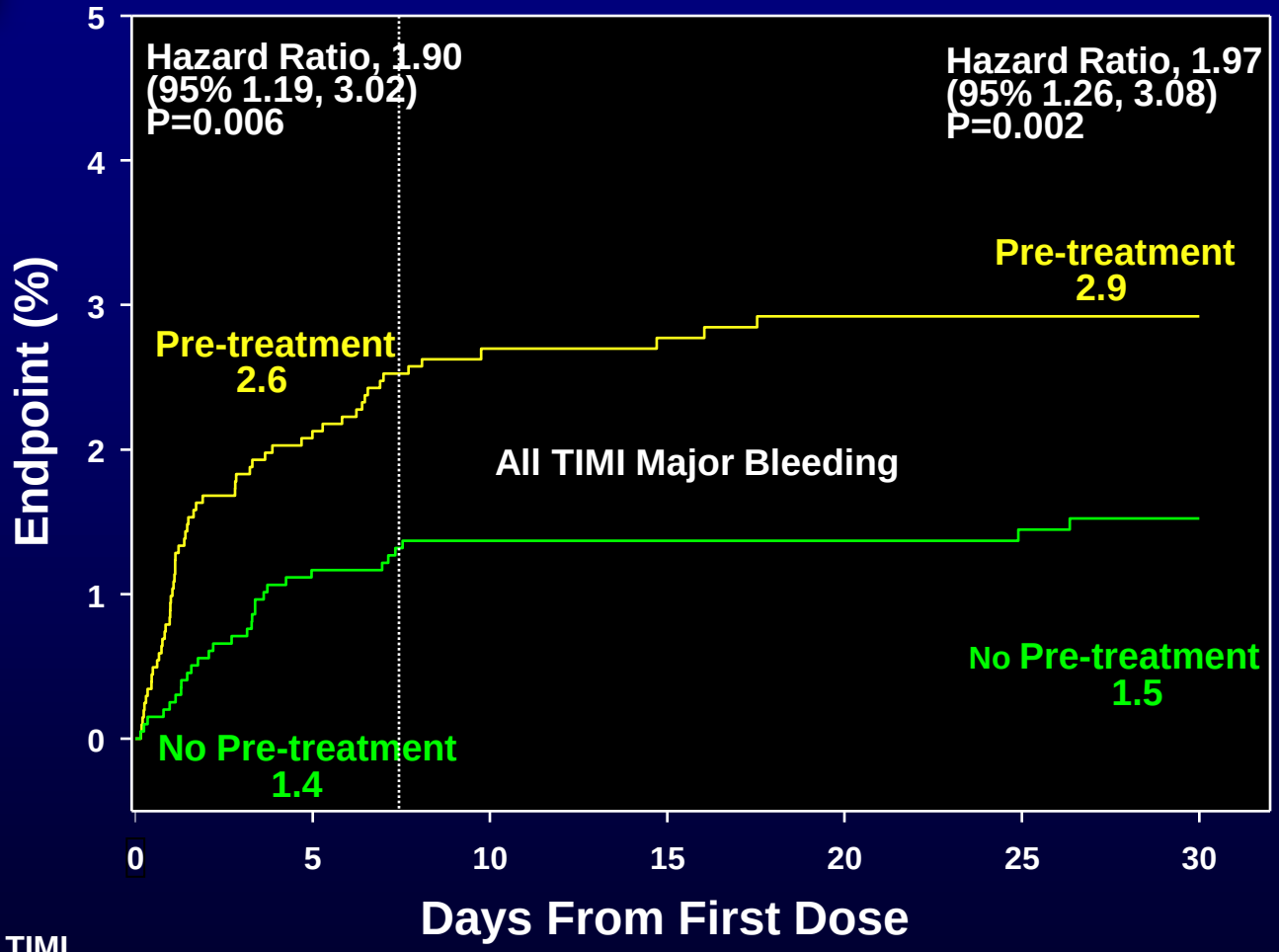
ABSTRACT

1° Efficacy End Point @ 7 + 30 days (All Patients)



No. at Risk, Primary Efficacy End Point:							
No pre-treatment	1996	1788	1775	1769	1762	1752	1621
Pre-treatment	2037	1821	1809	1802	1797	1791	1616

All TIMI (CABG or non-CABG) Major Bleeding (All Treated patients)



No. at Risk, All TIMI Major Bleeding:							
No pre-treatment	1996	1947	1328	1297	1288	1284	1263
Pre-treatment	2037	1972	1339	1310	1299	1297	1280

At this moment

Only one antiplatelet agent in the emergency area

- for STEMI?

- for high-risk NSTEMI?

- for all NSTEMI?????

And for inter-hospital transfer?

Recommendations for platelet inhibition in NSTE-ACS		
Recommendations	**Class[a]**	**Level[b]**
Oral antiplatelet therapy		
Aspirin is recommended for all patients without contraindications at an initial oral loading dose[c] of 150–300 mg (in aspirin-naive patients) and a maintenance dose of 75–100 mg/day long-term regardless of treatment strategy.	I	A
A $P2Y_{12}$ inhibitor is recommended, in addition to aspirin, for 12 months unless there are contraindications such as excessive risk of bleeds.	I	A
• Ticagrelor (180 mg loading dose, 90 mg twice daily) is recommended, in the absence of contraindications[d], for all patients at moderate- to high-risk of ischaemic events (e.g. elevated cardiac troponins), regardless of initial treatment strategy and including those pretreated with clopidogrel (which should be discontinued when ticagrelor is started).	I	B
• Prasugrel (60 mg loading dose, 10 mg daily dose) is recommended in patients who are proceeding to PCI if no contraindication.[d]	I	B
• Clopidogrel (300–600 mg loading dose, 75 mg daily dose) is recommended for patients who cannot receive ticagrelor or prasugrel or who require oral anticoagulation.	I	B
$P2Y_{12}$ inhibitor administration for a shorter duration of 3–6 months after DES implantation may be considered in patients deemed at high bleeding risk.	IIb	A
It is not recommended to administer prasugrel in patients in whom coronary anatomy is not known.	III	B
Intravenous antiplatelet therapy		
GPIIb/IIIa inhibitors during PCI should be considered for bailout situations or thrombotic complications.	IIa	C
Cangrelor may be considered in $P2Y_{12}$ inhibitor-naive patients undergoing PCI.	IIb	A
It is not recommended to administer GPIIb/IIIa inhibitors in patients in whom coronary anatomy is not known.	III	A

Non stemi Guidelines 2015

Recommendations for invasive coronary angiography and revascularization in NSTE-ACS		
Recommendations	**Class[a]**	**Level[b]**
An **immediate invasive strategy (<2h)** is recommended in patients with at least one of the following very-high-risk criteria: • haemodynamic instability or cardiogenic shock • recurrent or ongoing chest pain refractory to medical treatment • life-threatening arrhythmias or cardiac arrest • mechanical complications of MI • acute heart failure with refractory angina or ST deviation • recurrent dynamic ST- or T-wave changes, particularly with intermittent ST-elevation.	I	C
An **early invasive strategy (<24h)** is recommended in patients with at least one of the following high-risk criteria: • rise or fall in cardiac troponin compatible with MI • dynamic ST- or T-wave changes (symptomatic or silent) • GRACE score >140.	I	A
An **invasive strategy (<72h)** is recommended in patients with: • at least one of the following intermediate-risk criteria: o diabetes mellitus o renal insufficiency (eGFR <60 mL/min/1.73 m²) o LVEF <40% or congestive heart failure o early post-infarction angina o recent PCI o prior CABG o GRACE risk score >109 and <140 or • recurrent symptoms or ischaemia on non-invasive testing.	I	A
In patients with none of the mentioned risk criteria and no recurrent symptoms, non-invasive testing for ischaemia (preferably with imaging) is recommended before deciding on invasive evaluation.	I	A
In centres experienced with radial access, a radial approach is recommended for coronary angiography and PCI.	I	A
In patients undergoing PCI, new-generation DESs are recommended.	I	A

Non stemi

Guidelines

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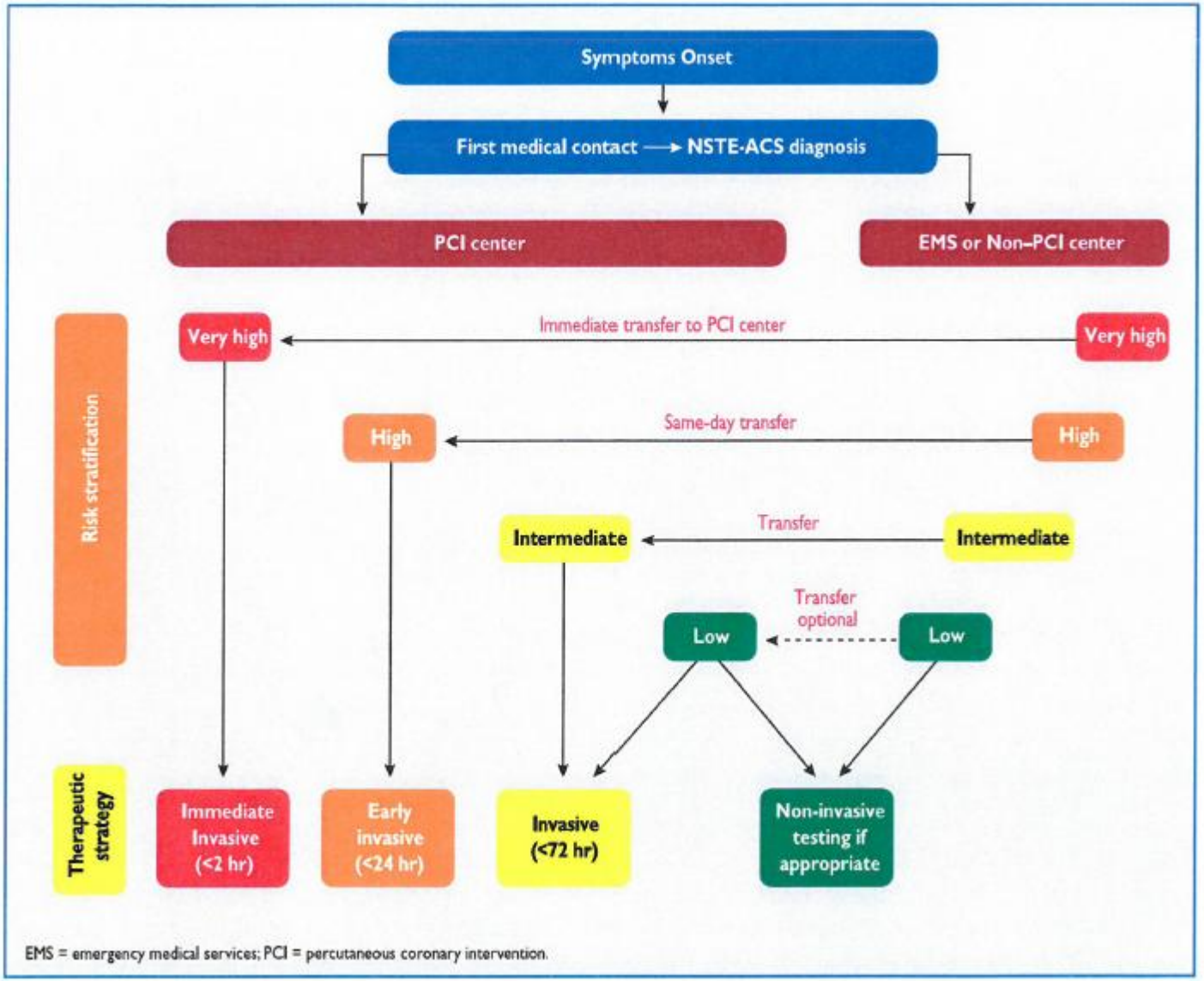
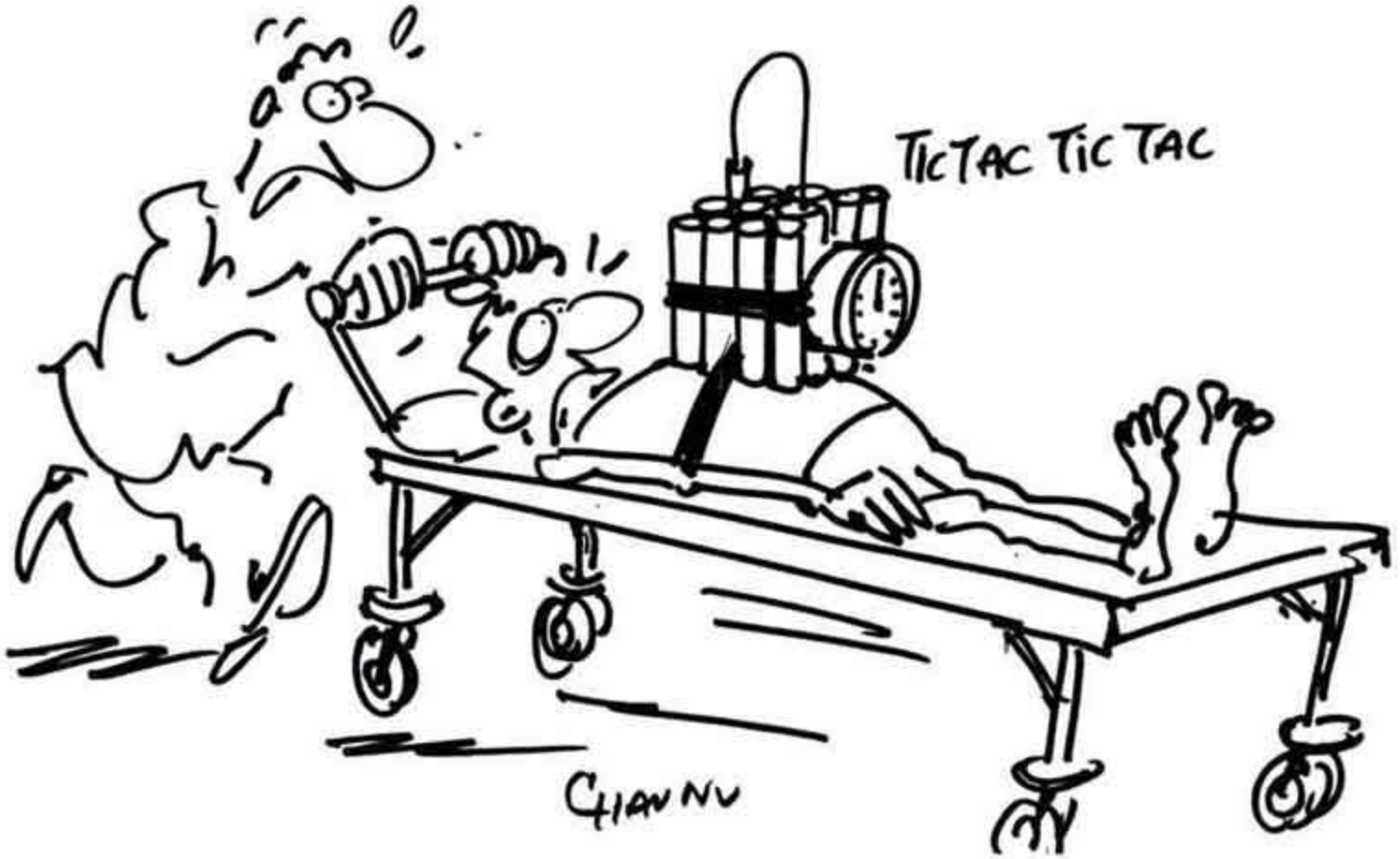


Non STEMI guidelines ESC 2015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