29ο Πανελλήνιο Καρδιολογικό Συνέδριο (29th Panhellenic Cardiological Congress)

Στρογγυλό τραπέζι: Έμφραγμα μυοκαρδίου: Αντιμετώπιση σε νοσοκομείο με ή χωρίς αιμοδυναμικό εργαστήριο
(Round Table: Myocardial infarction: Treatment in a hospital with or without catheterization laboratory)

Πέμπτη 30ης Οκτωβρίου 2008 (Thursday, October 30th, 2008)

Πρωτογενής αγγειοπλαστική στο έμφραγμα μυοκαρδίου με ανάσπαση του ST

Primary angioplasty of ST elevation myocardial infarction

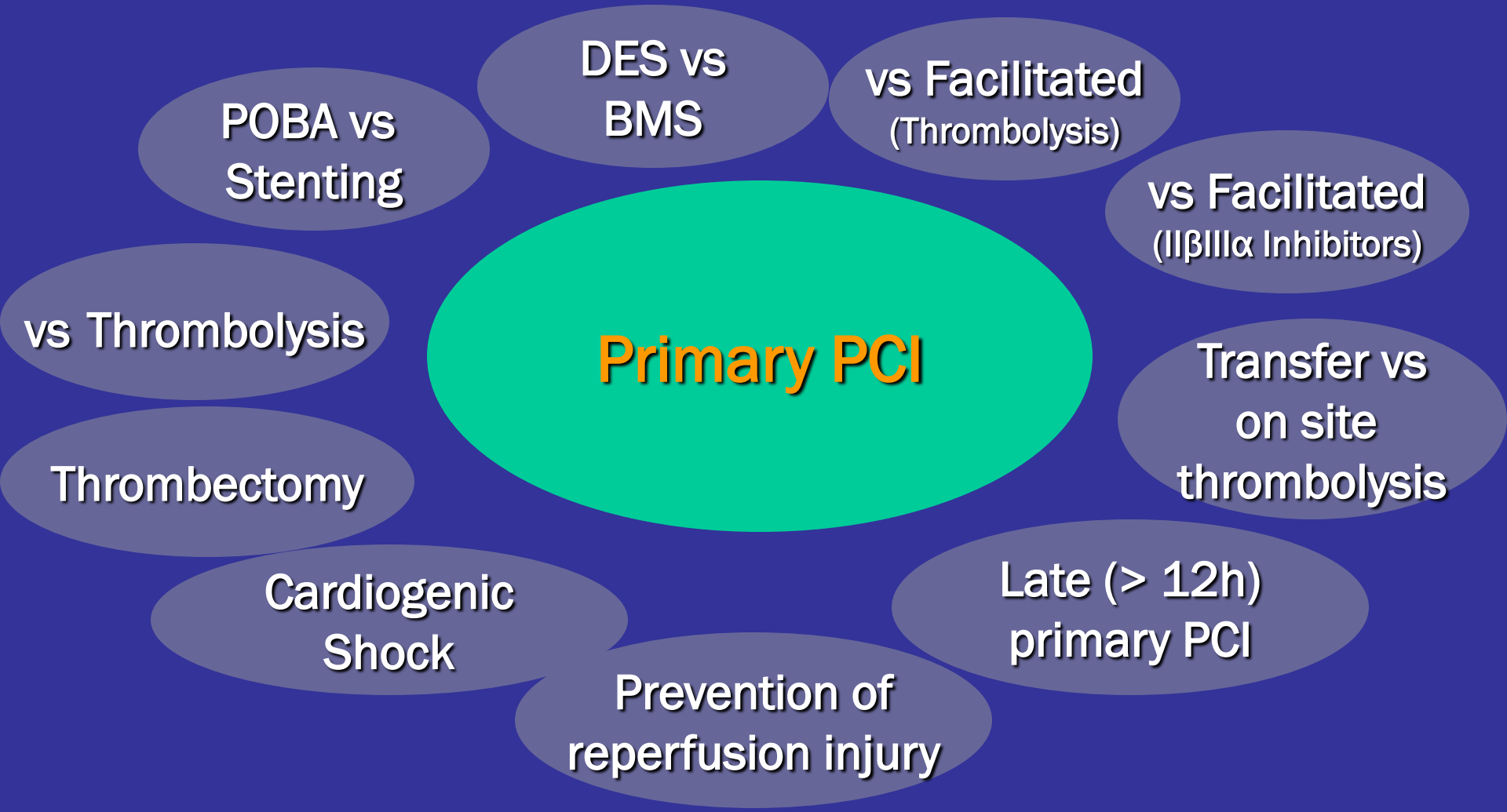
Γεώργιος Χάχαλης

Επίκουρος Καθηγητής Καρδιολογίας Πανεπιστημίου Πατρών

George Hahalis

Assistant Professor of Cardiology, University of Patras

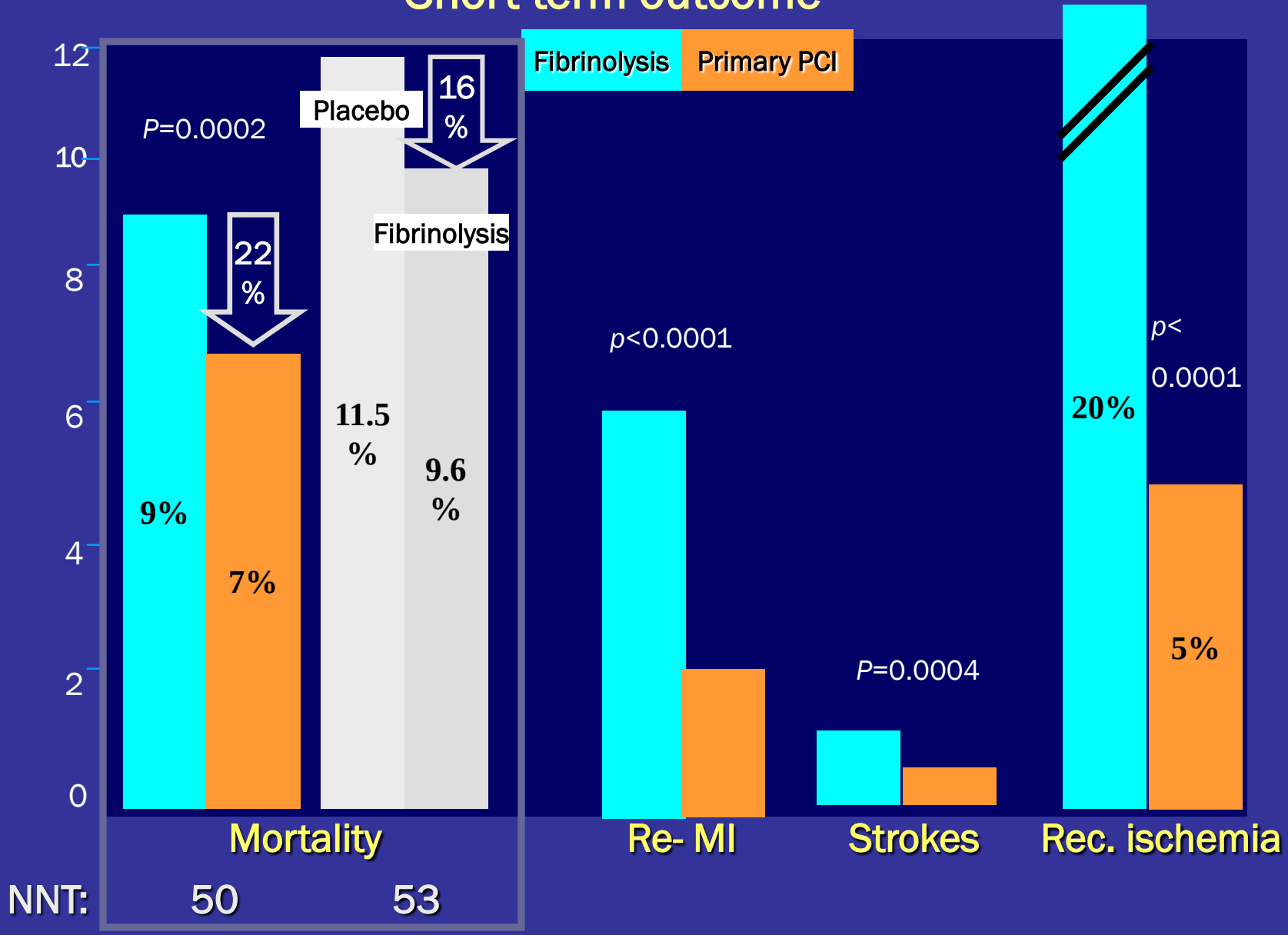
Overview of primary PCI (pPCI)-related issues



Primary PCI vs thrombolysis...

Thrombolysis vs. primary PCI in 23 randomized trials

Short-term outcome

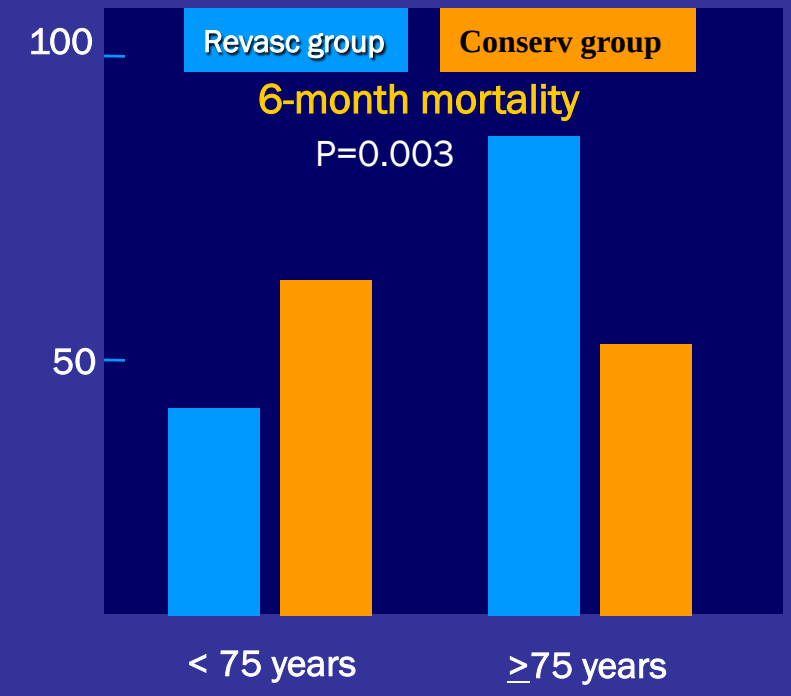


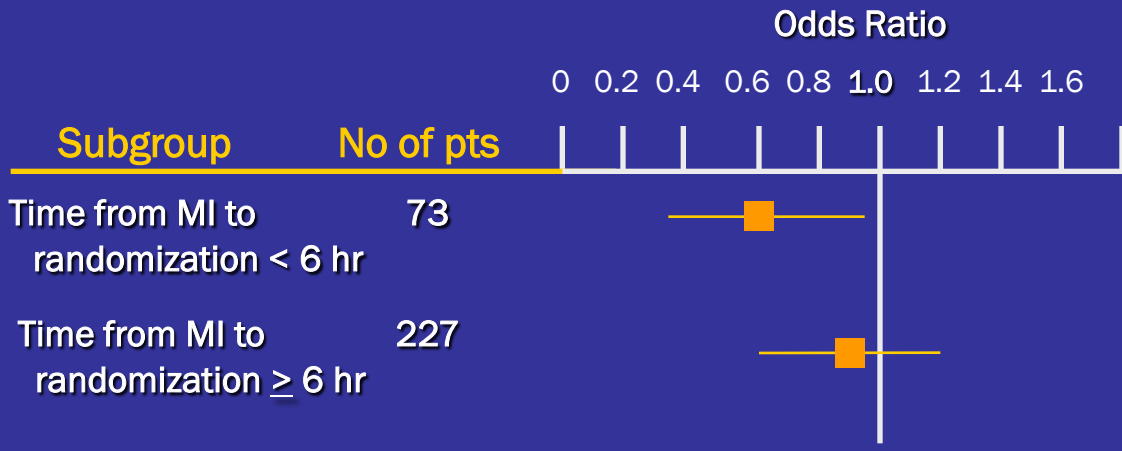
(FTT coll group, Lancet 1994;343:311 & Keeley E et al, Lancet 2003;361:13)

The SHOCK trial

(NEJM 1999)

- Randomized to emergency revascularization (n=152, 87% revascularized, 55% with PCI) , or medical stabilization (n=150, 2.7% revascularized)
- Intraaortic balloon counterpulsation in 86%
- Median time to the onset of shock: 5.6 hours
- Mean EF: 30%; LM-disease: 20%





Primary PCI vs pre-hospital thrombolysis ...

Primary angioplasty versus prehospital fibrinolysis in acute myocardial infarction: a randomised study

*Eric Bonnefoy, Frédéric Lapostolle, Alain Leizorovicz, Gabriel Steg, Eugène P McFadden, Pierre Yves Dubien, Simon Cattan, Eric Boullenger, Jacques Machecourt, Jean-Michel Lacroute, Jean Cassagnes, François Dissait, Paul Touboul, on behalf of the Comparison of Angioplasty and Prehospital Thrombolysis in Acute Myocardial Infarction (CAPTIM) study group**

	Prehospital fibrinolysis (n=419)	Primary angioplasty (n=421)
Any angioplasty up to day 30 (not scheduled by protocol)	295 (70·4%)	60 (14·3%)
Urgent angioplasty	134 (33·0%)	16 (4·0%)
Persistent ischaemia (rescue)	106 (26·0%)	7 (1·7%)
Recurrent ischaemia	28 (6·7%)	9 (2·1%)
CABG surgery	6 (1·5%)	3 (0·7%)
Intra-aortic balloon pump	7 (1·7%)	14 (3·4%)

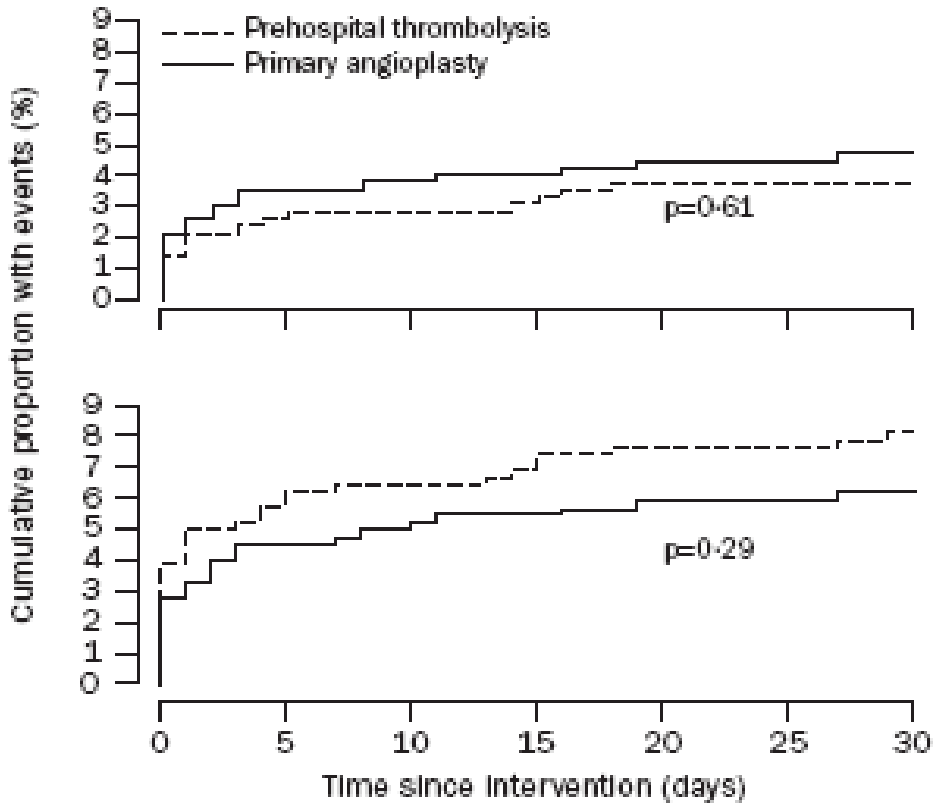


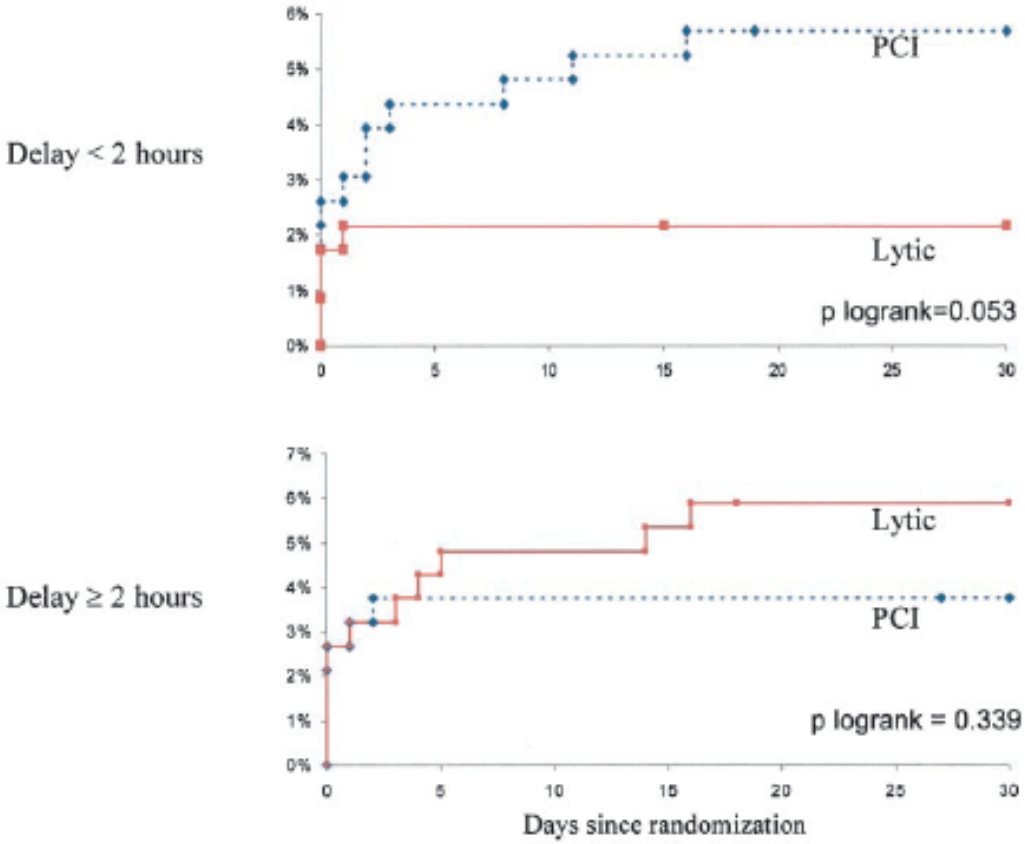
Figure 2: **Kaplan-Meier curves for deaths and cumulative rate of composite endpoint of death, reinfarction, and disabling stroke in the study patients within the 30 days after randomisation, according to treatment group**

(CAPTIM study, Lancet, 2002)

Impact of Time to Treatment on Mortality After Prehospital Fibrinolysis or Primary Angioplasty

Data From the CAPTIM Randomized Clinical Trial

Philippe Gabriel Steg, MD; Eric Bonnefoy, MD; Sylvie Chabaud, MSc; Frédéric Lapostolle, MD; Pierre-Yves Dubien, MD; Pascal Cristofini, MD; Alain Leizorovicz, MD; Paul Touboul, MD; for the Comparison of Angioplasty and Prehospital Thrombolysis In acute Myocardial infarction (CAPTIM) Investigators*



Log-rank analysis of mortality according to randomized treatment assignment and delay to randomization.

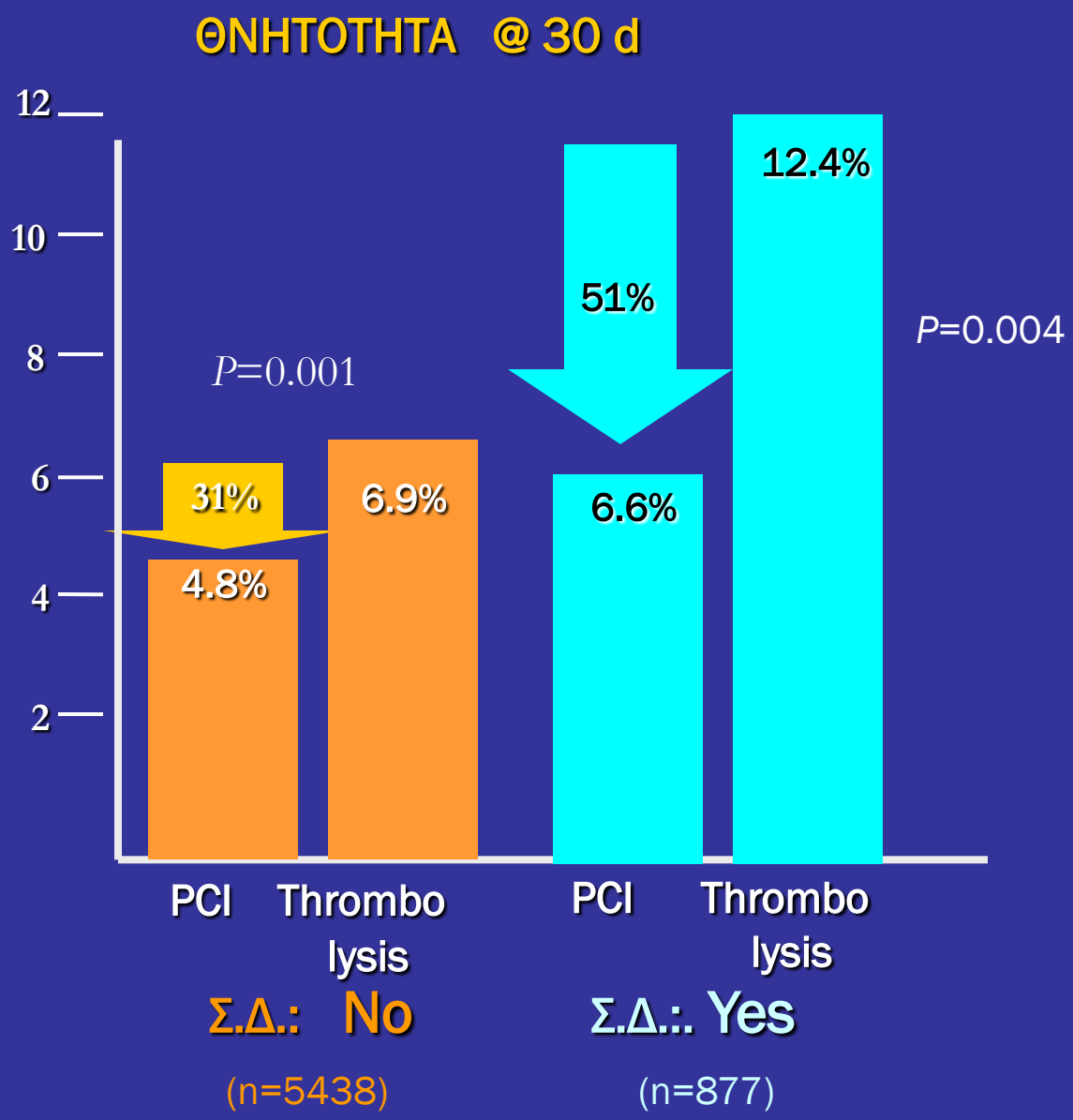
(CAPTIM study, Circulation 2003)

Primary PCI in high risk subgroups…

Primary PCI vs thrombolysis in STEMI according to diabetes status

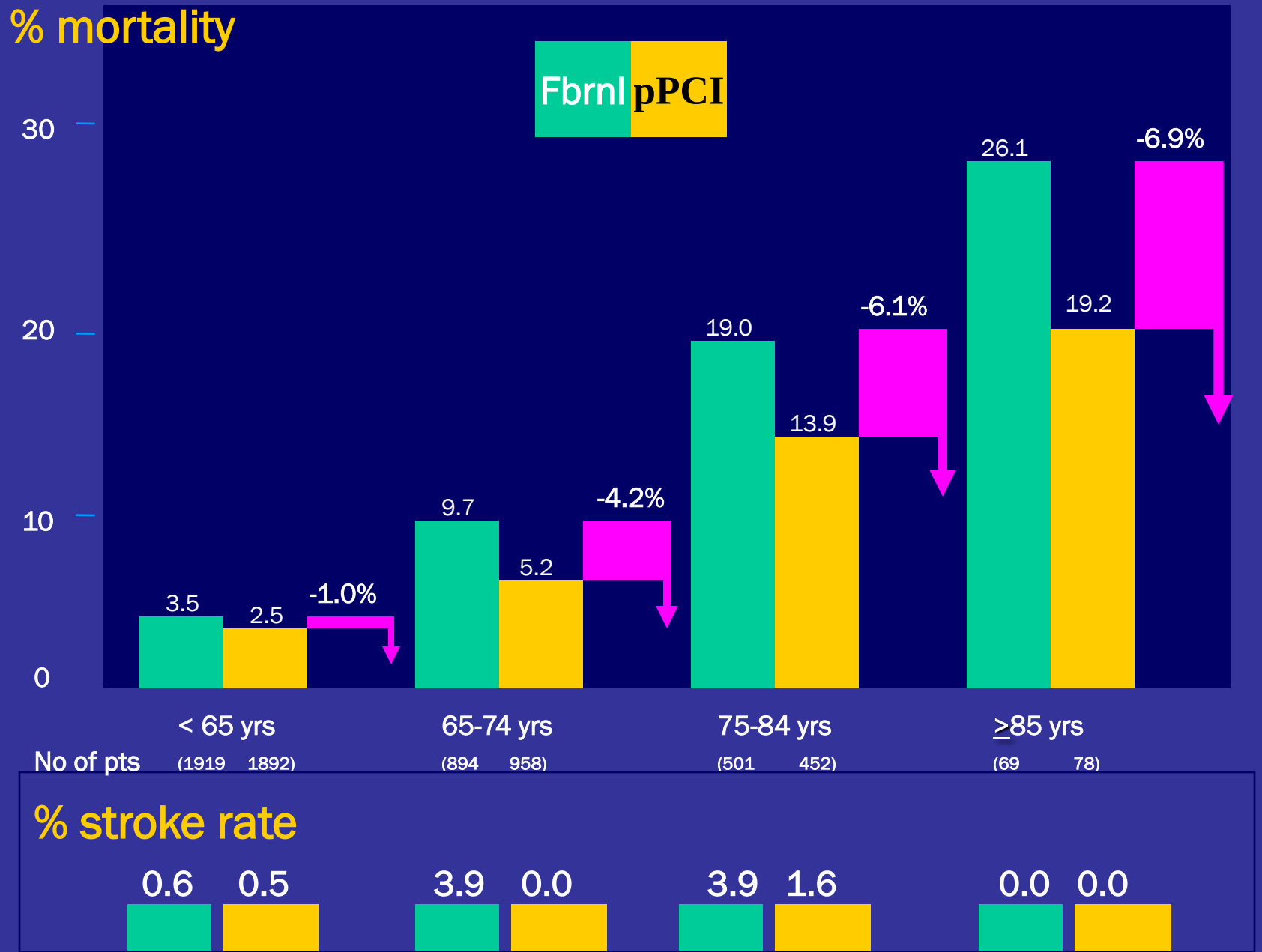
Timmer JR, Ottervanger JP, de Boer MJ, Boersma E, Grines CL, Westerhout CM, Simes RJ, Granger CB, Zijlstra F, Primary Coronary Angioplasty vs Thrombolysis-2 Trialists Collaborators Group

Arch Intern Med. 2007 Jul 9;167(13):1353-9



Primary PCI vs. thrombolysis in the elderly

PCAT-2: EHJ 2006;27:779



Late primary PCI ...

BRAVE-2 Trial ("late" is better than never)

365 patients with MI presenting >12 hours after symptom onset
Without ongoing chest pain or Killip class 3/4

Invasive
Angiography, then PCI if necessary
Mean randomization to PCI time: 1.5 hrs

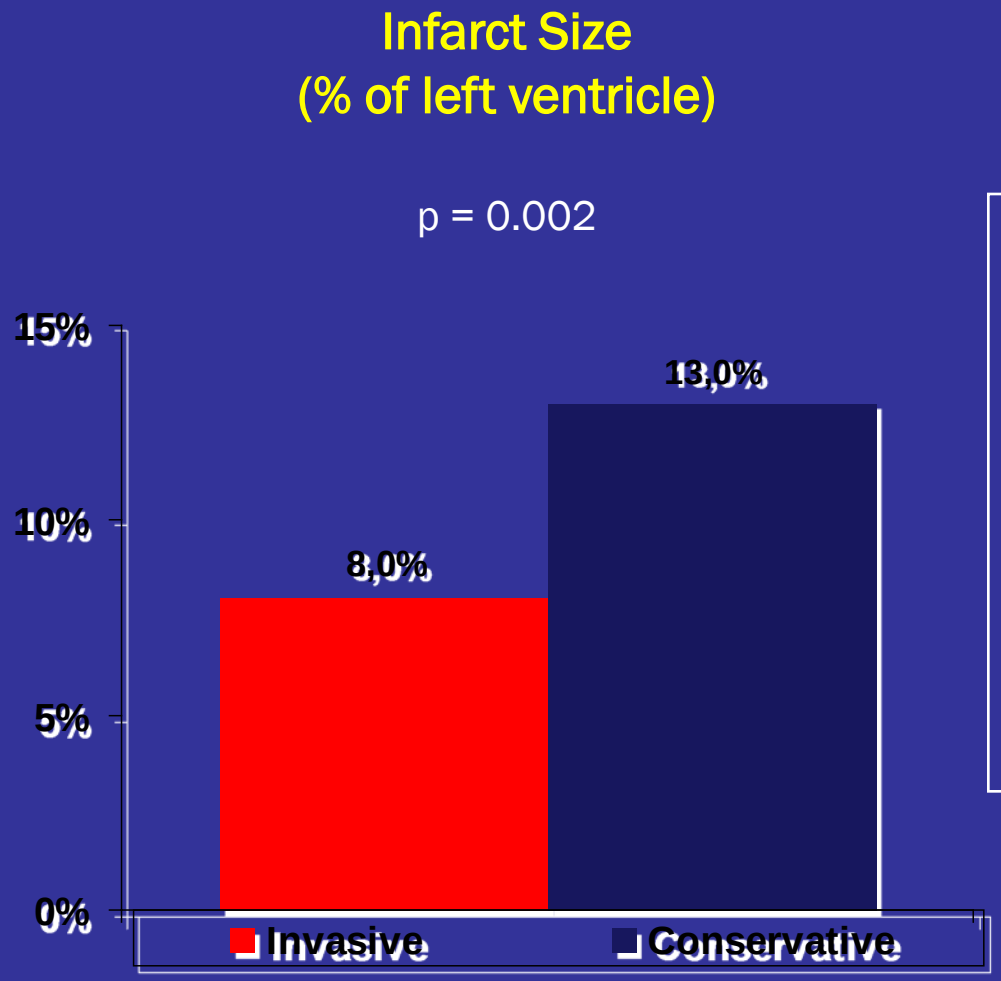
Conservative
Conventional medical therapy

Endpoints:

- Primary – Infarct size determined by SPECT at 5-10 days
- Secondary – Death, MI, stroke, at 30 days

JAMA 2005

BRAVE-2: Primary endpoint



- The primary endpoint of infarct size determined by SPECT at 5-10 days was significantly lower in the invasive arm compared to the conservative arm
- No diferrences in rates of death/MI/Strokes @ 30 days

JAMA 2005

Stenting versus POBA ...

DES versus BMSs...

The impact of stenting (vs. POBA) in pPCI

The Cadillac Trial (pPCI in 2082 STEMI pts)

Median D2B-time: 120 min

Stents (gr 1,2 vs 3,4): 16% & 98%

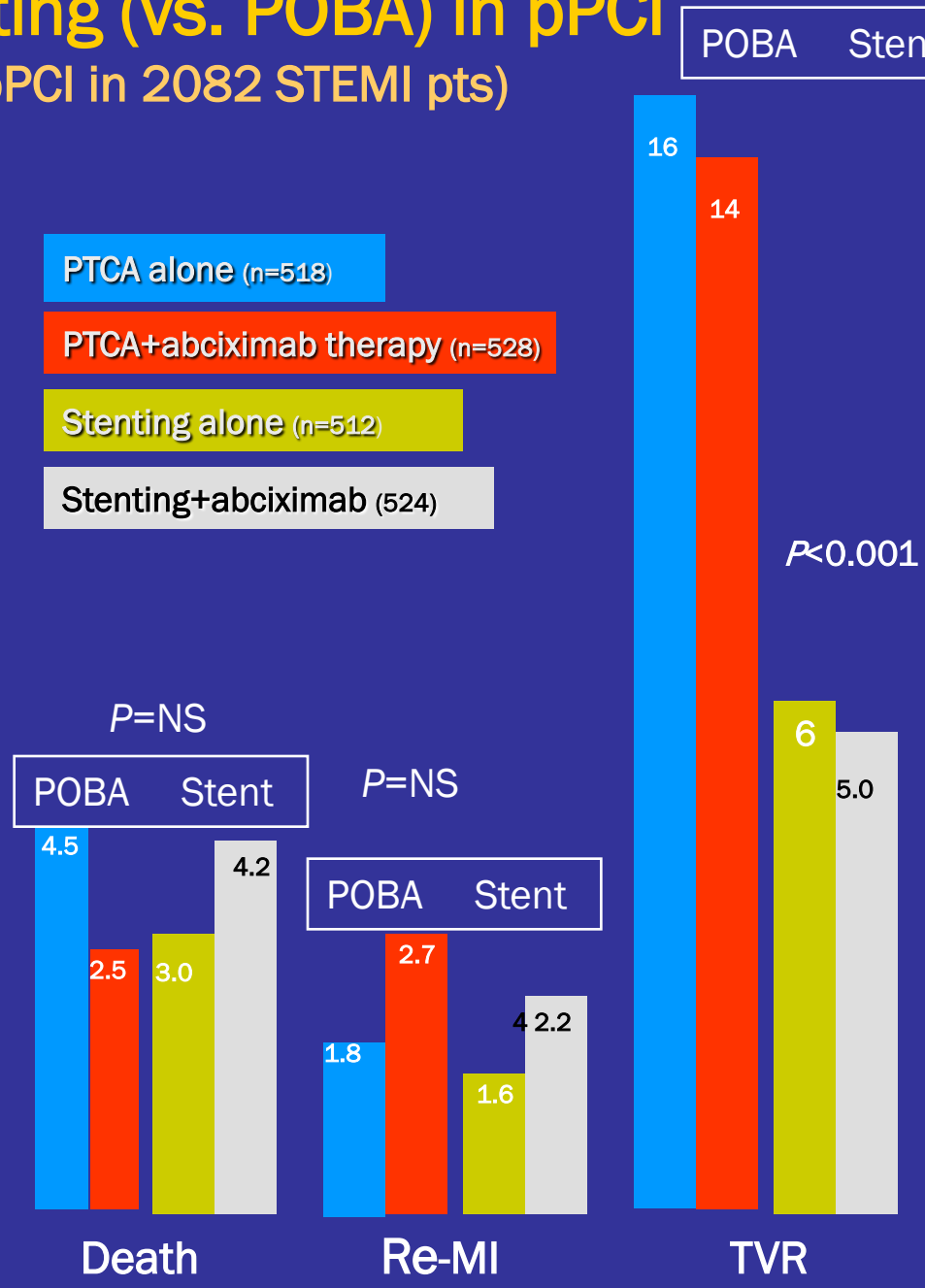
Abciximab (gr 1,3 vs 2,4): 6% & 99%

Final TIMI 3 flow: 96%

Stroke rate : 0.2-0.4%

Restenosis rate (gr 1,2 vs 3,4)**: 41 vs 22%**

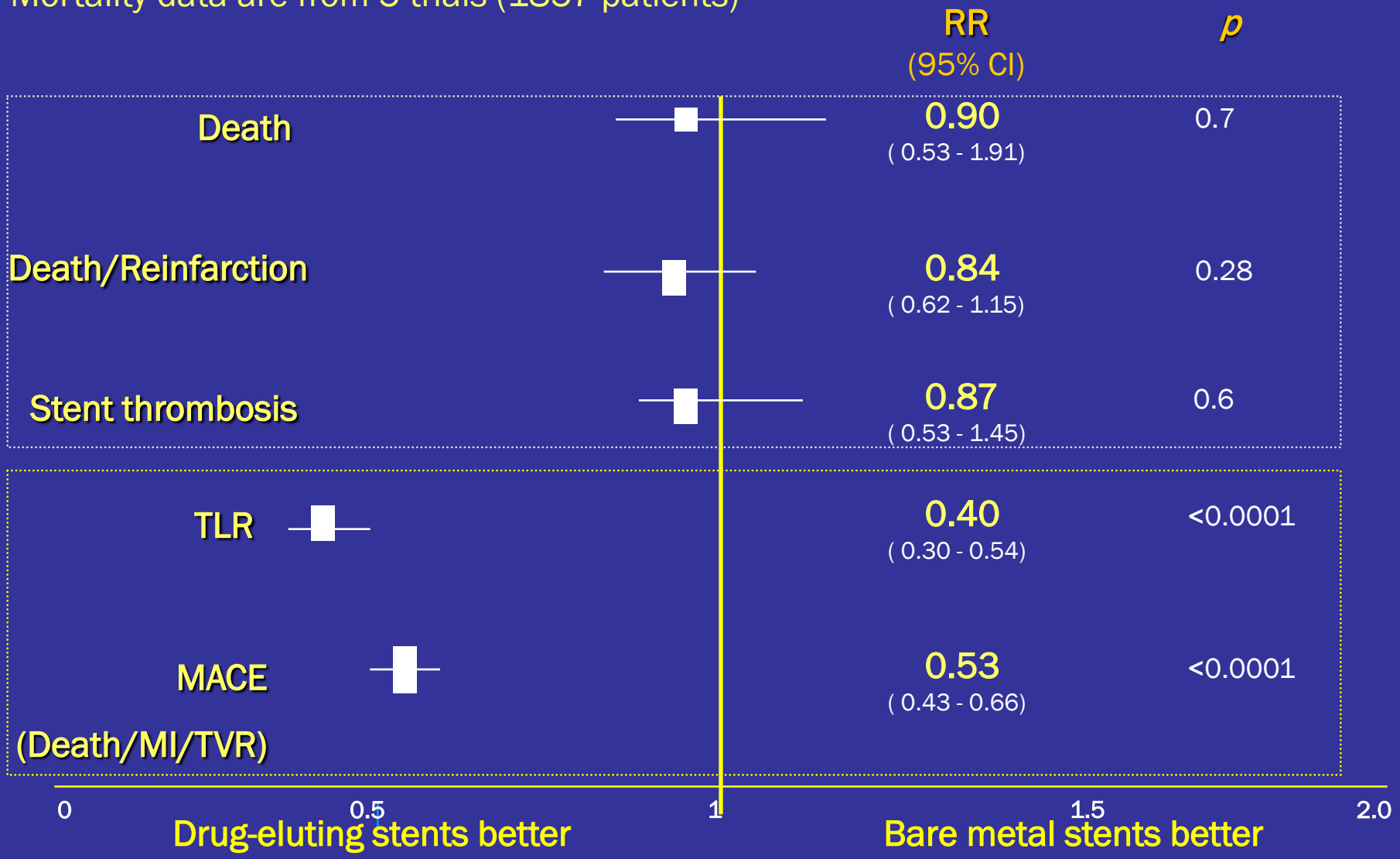
Stent thrombosis (gr 1,3 vs 2,4)**:0.4 vs 1.4%**
(p<0.001)



(Stone GW et al: NEJM;2002)

Primary PCI with DES vs BMSs

- Pooled analysis of 7 randomized trials comparing DES and BMS in 2357 STEMI pts Follow-up rates are at 12 months in 6 trials and 8 months in 1 trial
- Mortality data are from 5 trials (1857 patients)



(Pasceri V et al:G: Am Heart J. 2007;153::749)

HORIZONS-AMI: DES vs BMSs study

End point	Taxus, n=2257 (%)	Express BMS, n=749 (%)	Hazard ratio (95% CI)
Ischemic TLR	4.5	7.5	0.59 (0.43–0.83)
• Safety MACE	8.1	8.0	1.02 (0.76–1.36)
• All-cause mortality	3.5	3.5	0.99 (0.64–1.55)
• MI	3.7	4.5	0.81 (0.54–3.22)
• Stroke	1.0	0.7	1.52 (0.58–4.00)
• Stent thrombosis	3.1	3.4	0.92 (0.58–1.45)
Binary restenosis, per lesion, at 13 mo	10.0	22.9	0.44 (0.33–0.57)
Binary restenosis, per patient, at 13 mo	10.9	24.9	0.40 (0.33–0.57)

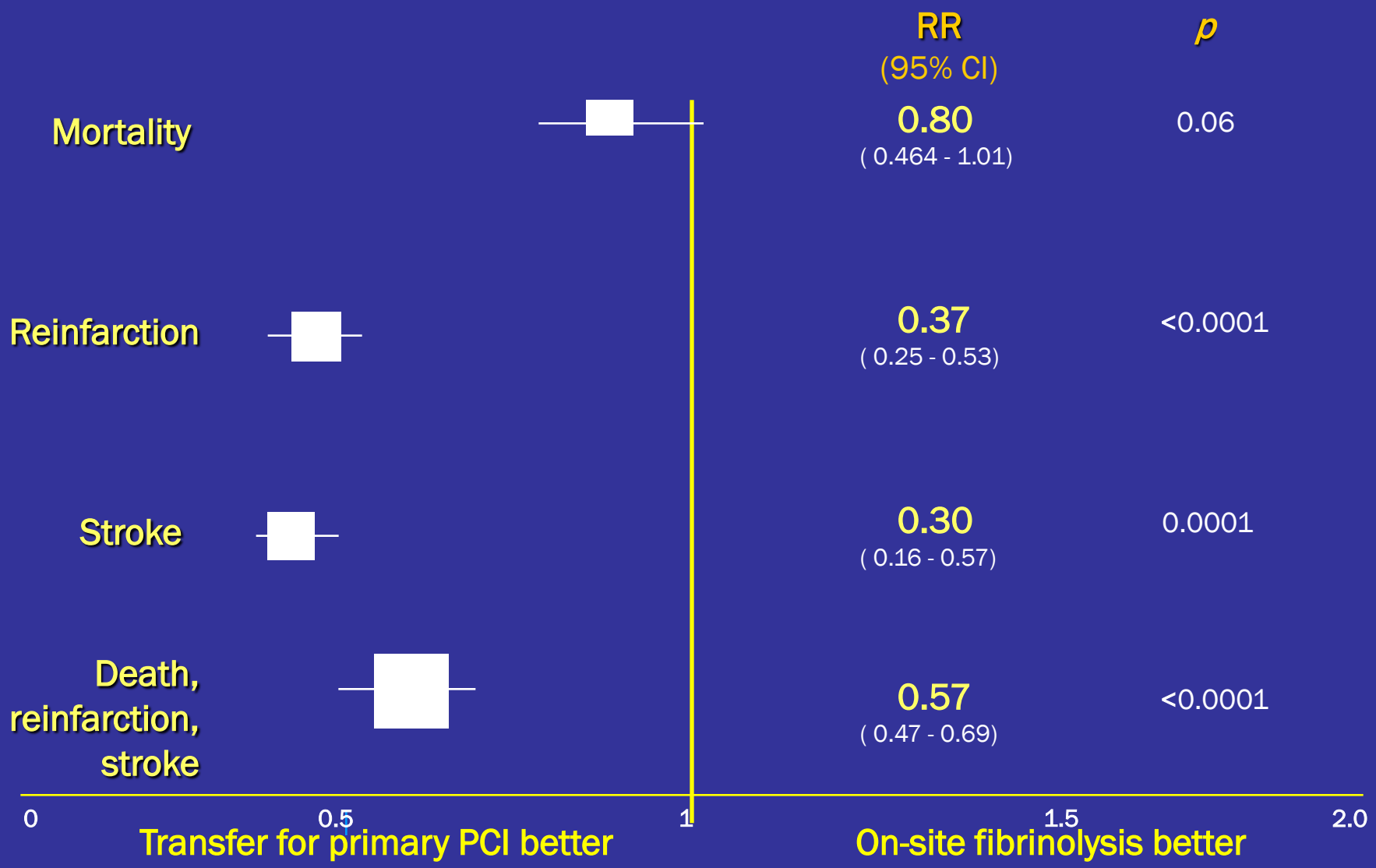
(Stone G. TCT 2008; October 15, 2008; Washington, DC)

Transfer primary PCI, Door-to-balloon-times (D2B)

& PCI-related delays…

Transfer primary PCI vs On-site thrombolysis

- 8 prospective trials in which 4155 STEMI pts presenting at noninvasive centers were randomized to fibrinolytic therapy or ambulance transfer for primary PCI

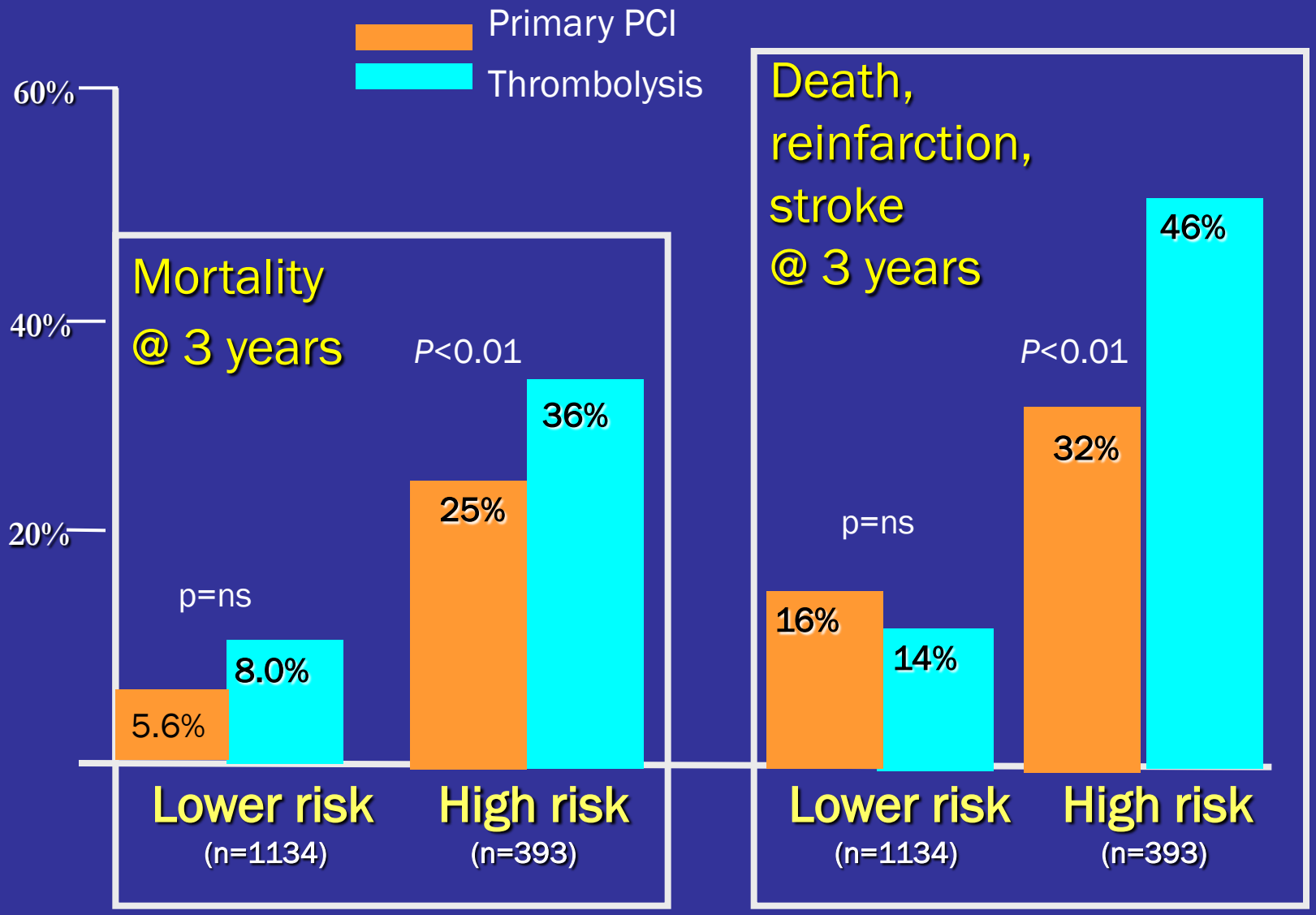


(Stone G: Circulation. 2008;118:538-551)

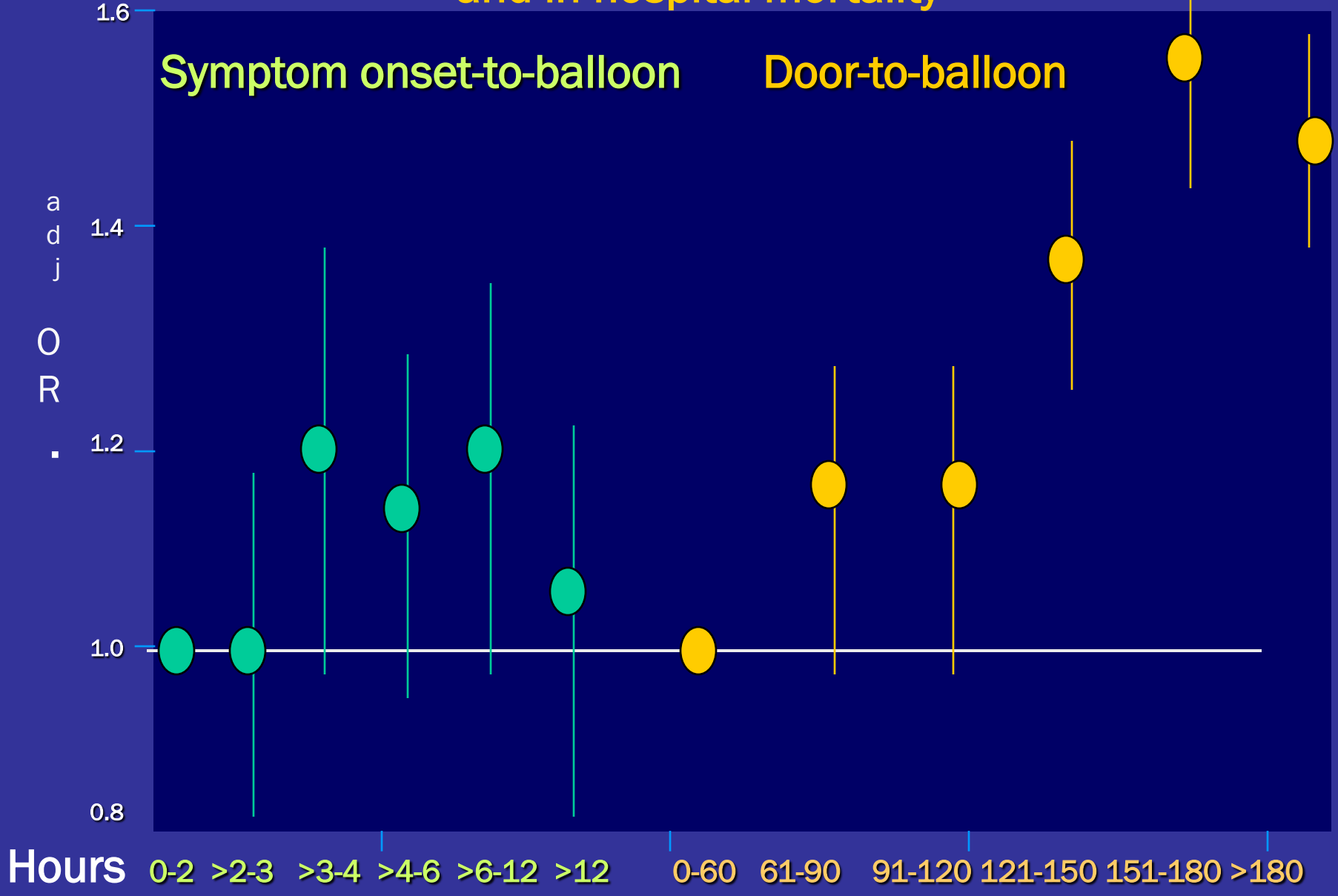
Thrombolysis vs. Transfer-primary PCI in DANAMI-2

(low risk –TIMI<5- vs high risk groups-TIMI≥5)

(Thune JJ et al :Circulation 2005;112:2017)

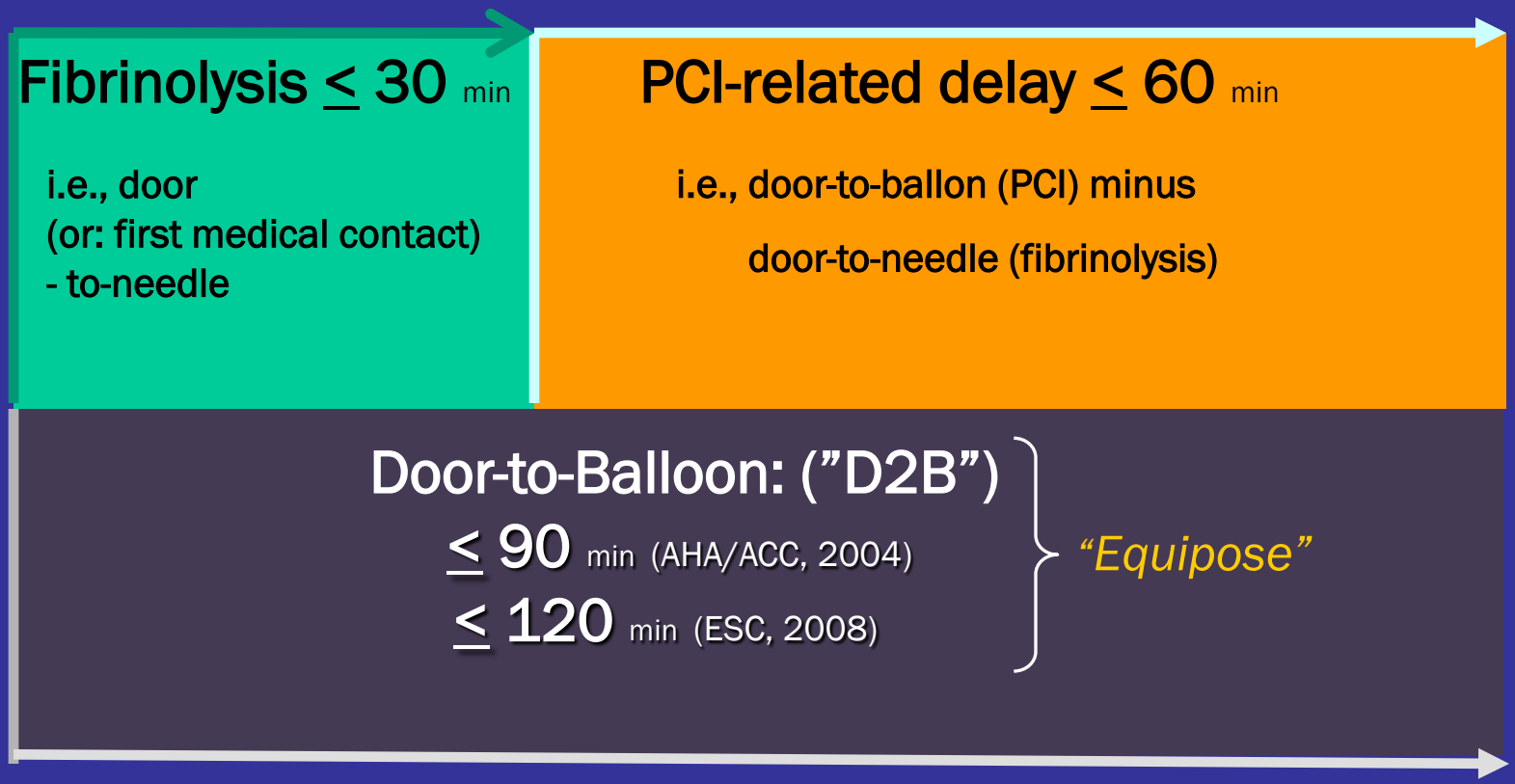


Relationship between time-to-treatment interval and in-hospital mortality



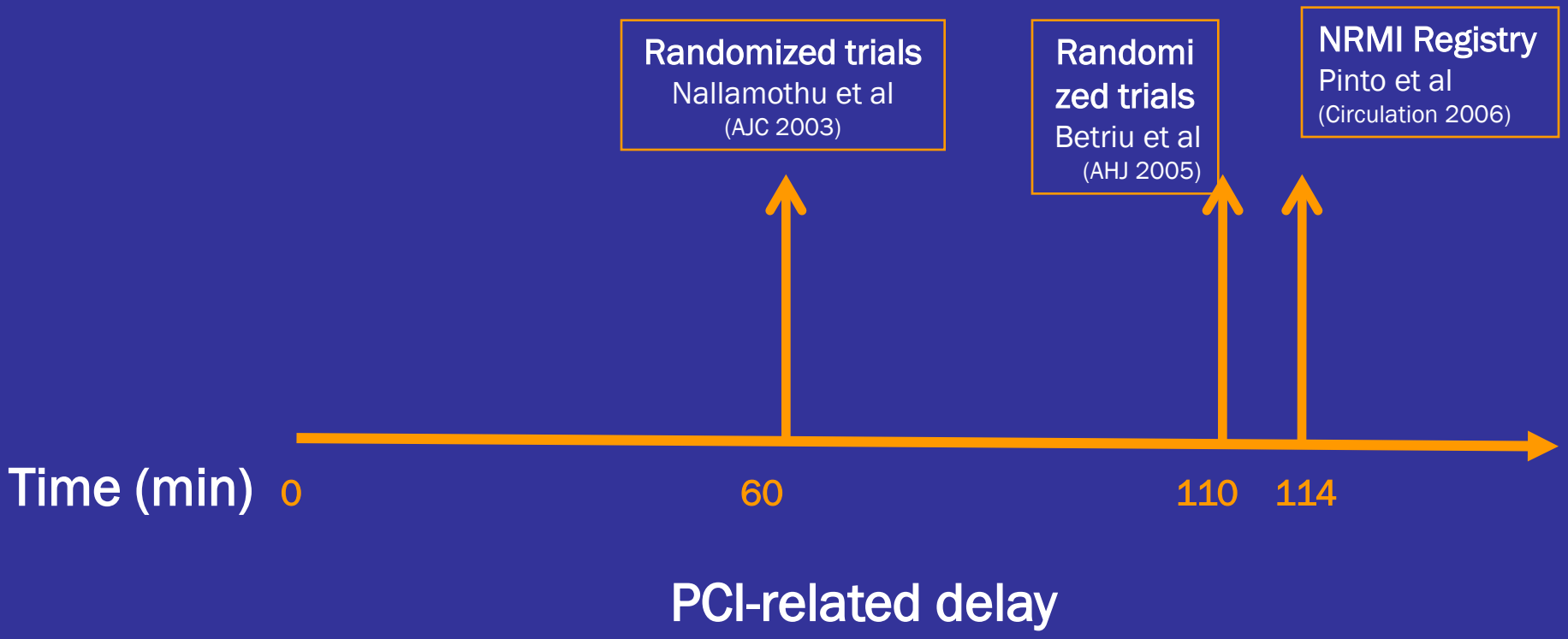
(Cannon C et al: JAMA 2000:283:2941)

Recommended upper delay limits in primary PCI*



* Time limits are thought as a “system of care” goal

"Equipose"* varies depending on patient characteristics…



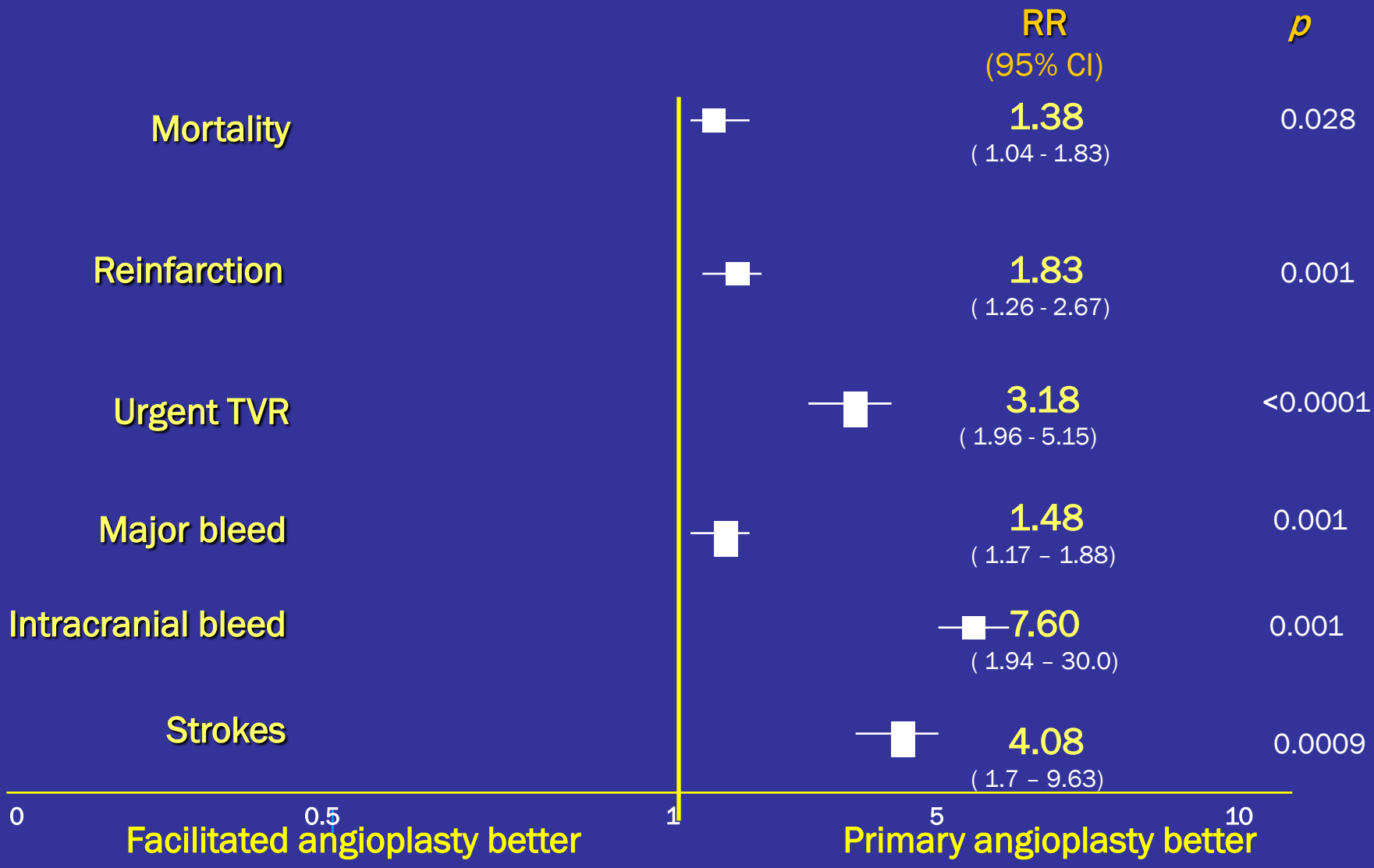
*PCI-related time delay is associated with similar mortality rates to those of fibrinolysis; longer delays are linked with higher mortality

- Longer delays are linked with higher pPCI mortality over fibrinolysis

Primary PCI versus facilitated PCI…

Primary PCI vs fibrinolysis-facilitated PCI

- Pooled analysis of the shortterm results from 17 randomized trials comparing facilitated PCI post fibrinolysis and primary PCI without antecedent pharmacological therapy in 4504 pts

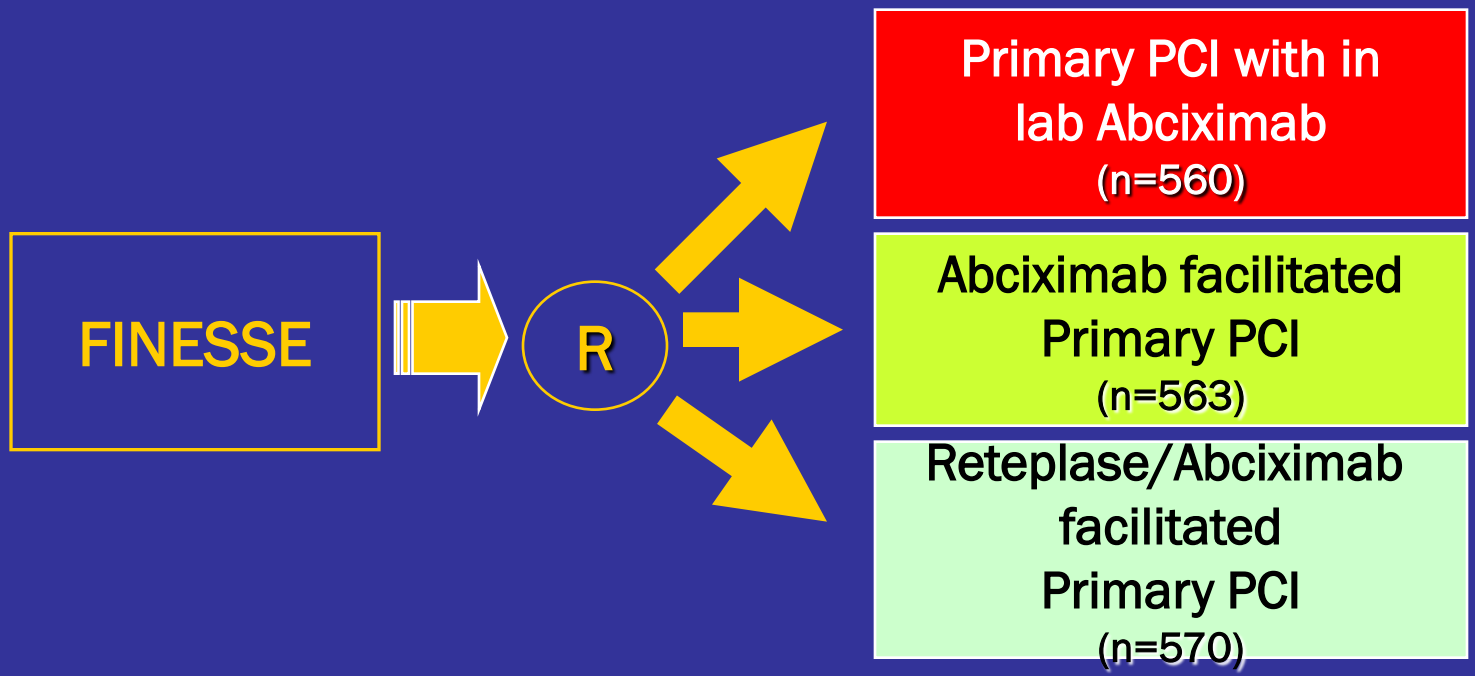


(De Luca GV et al:G: JACC. 2004;43:1363)

Primary PCI is very efficacious...

FINESSE: Design

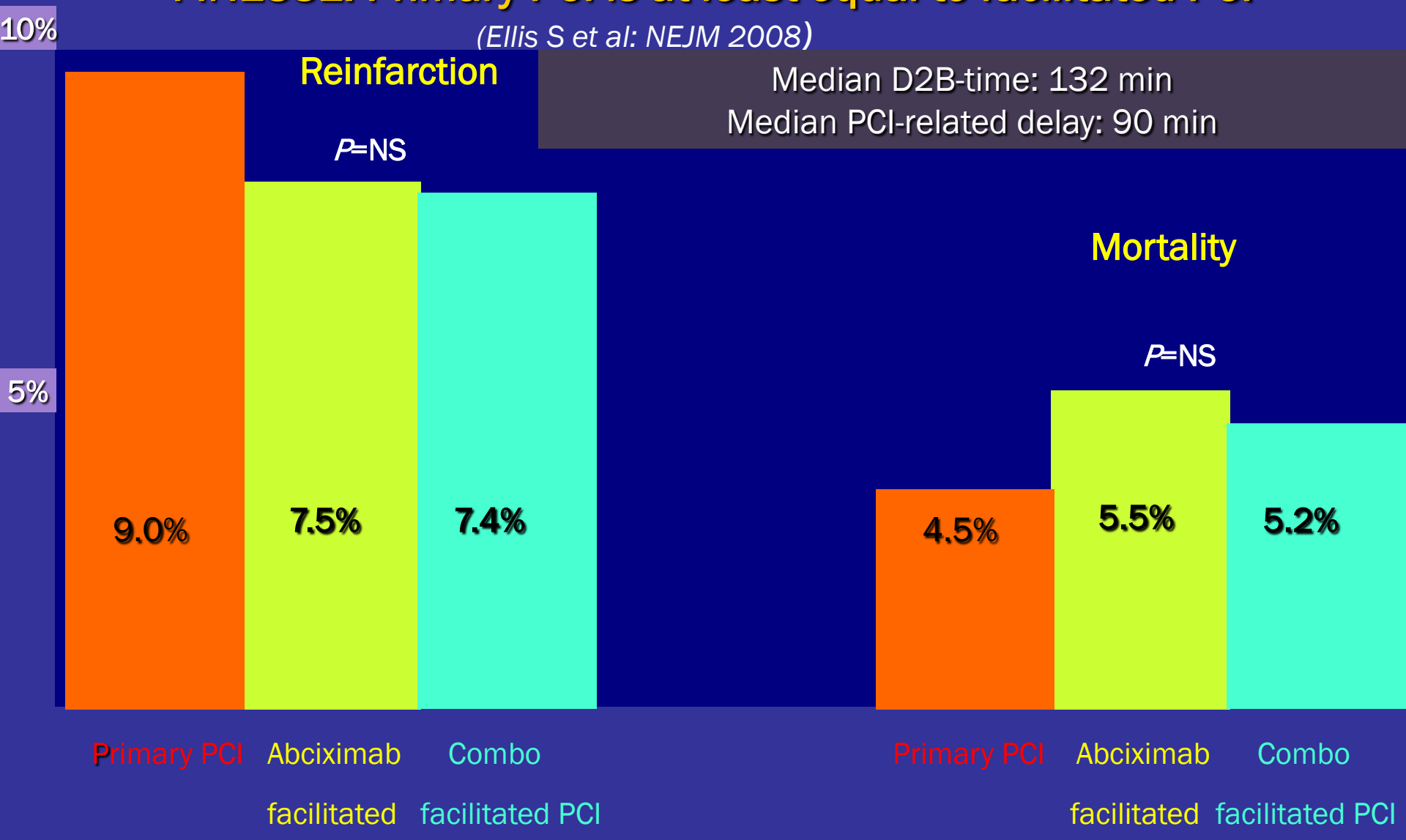
STEMI <6 h w/ a delay of > 90 min prior to PCI



(Ellis S et al: NEJM 2008)

FINESSE: Primary PCI is at least equal to facilitated PCI

(Ellis S et al: NEJM 2008)



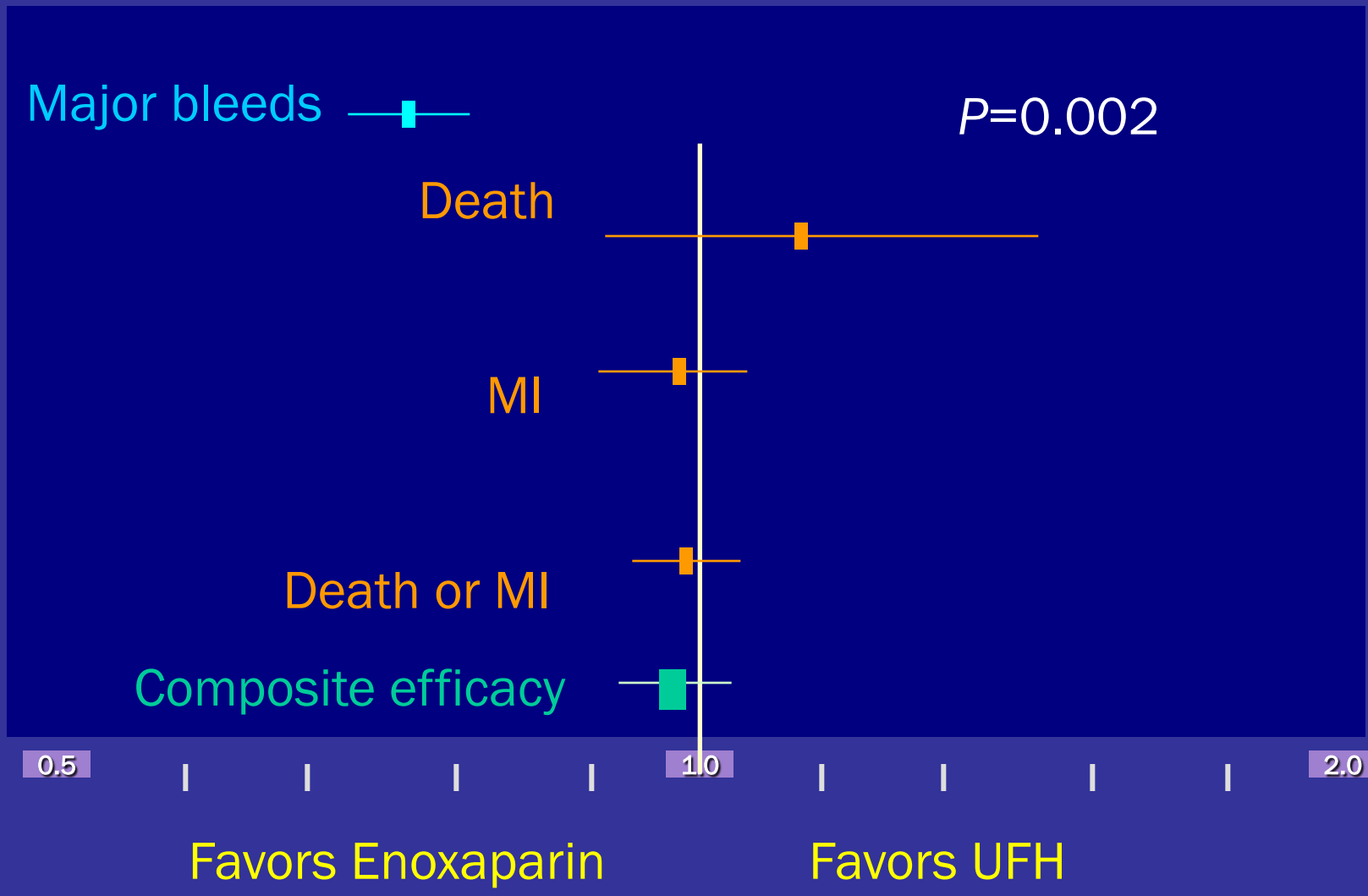
- More major (& minor) bleedings in the facilitated groups: 2.6% vs 4.1% vs 4.8% (p<0.05)

D2B-time difference of transfer-primary PCI (i.e., Spoke-Hub hospitals time delay): 35 min

Primary PCI & adjunctive pharmaco-mechanical therapy…

UFH vs ENOXAPARIN & primary PCI: Meta-Analysis

(N=7318, 13 studies)



(Montalescot G: Presented at TCT 2007)

(Arch Int Med: In press)

Outcomes for STEMI Subgroup of TRITON-TIMI 38

	Prasugrel n=1,767	Clopidogrel n=1,765	Unadjusted HR (95% CI)	*P* Value
Primary Endpoint[a]	10.0%	12.4%	0.79 (0.65-0.97)	0.02
Secondary Endpoint[b]	6.7%	8.8%	0.75 (0.59-0.96)	0.02
Bleeding Rate[c]	5.1%	4.7%	1.07 (0.79-1.47)	0.65

[a] Composite of **cardiovascular death, MI, and stroke at 15 months**

[b] Composite of cardiovascular death, MI, urgent target vessel revascularization @ 30 days

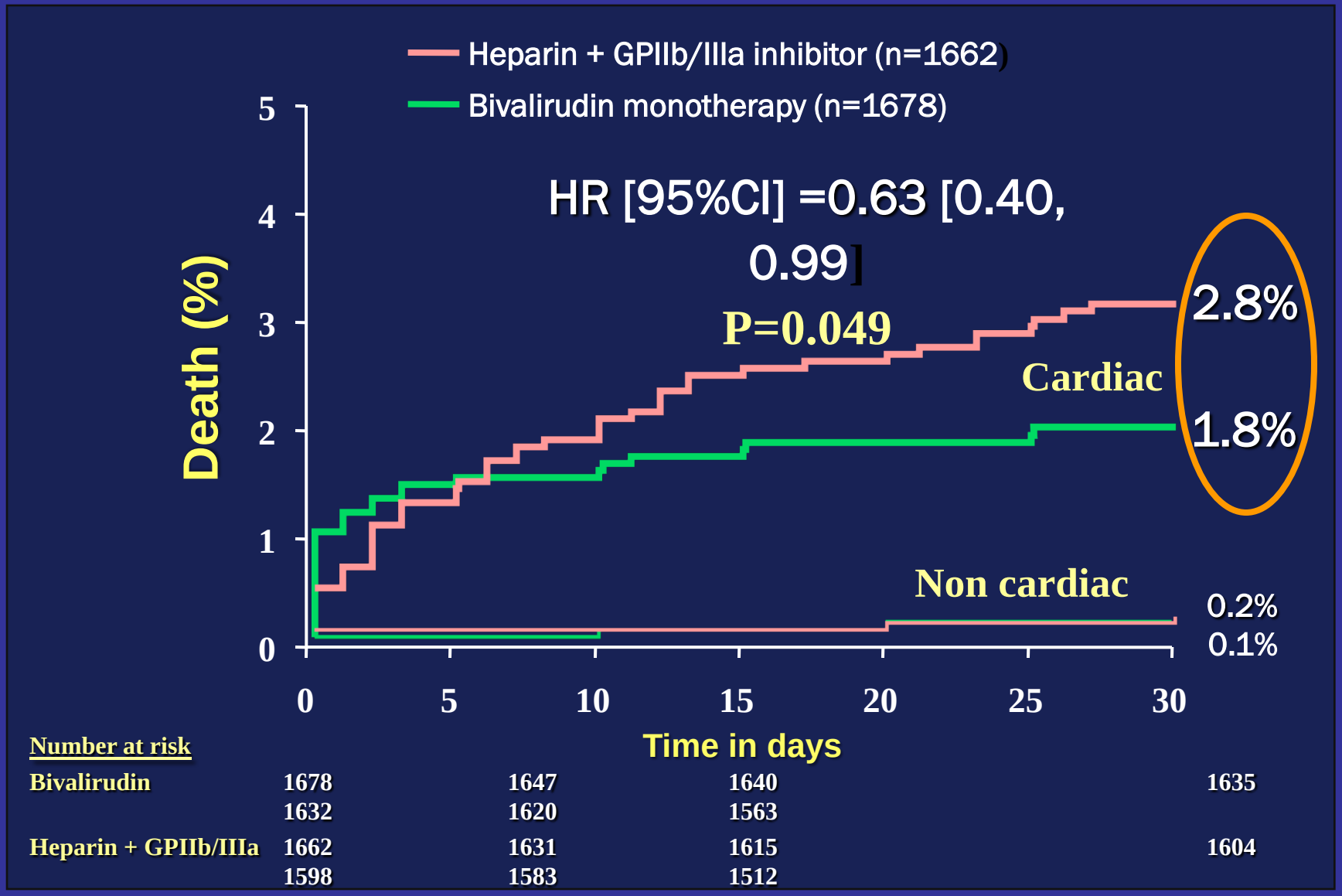
[c] TIMI major and minor non-coronary artery bypass grafting at 15 months

Bleeding rates were similar between the 2 treatment arms for both major and minor bleeding, as well as in patients undergoing primary vs. secondary PCI.

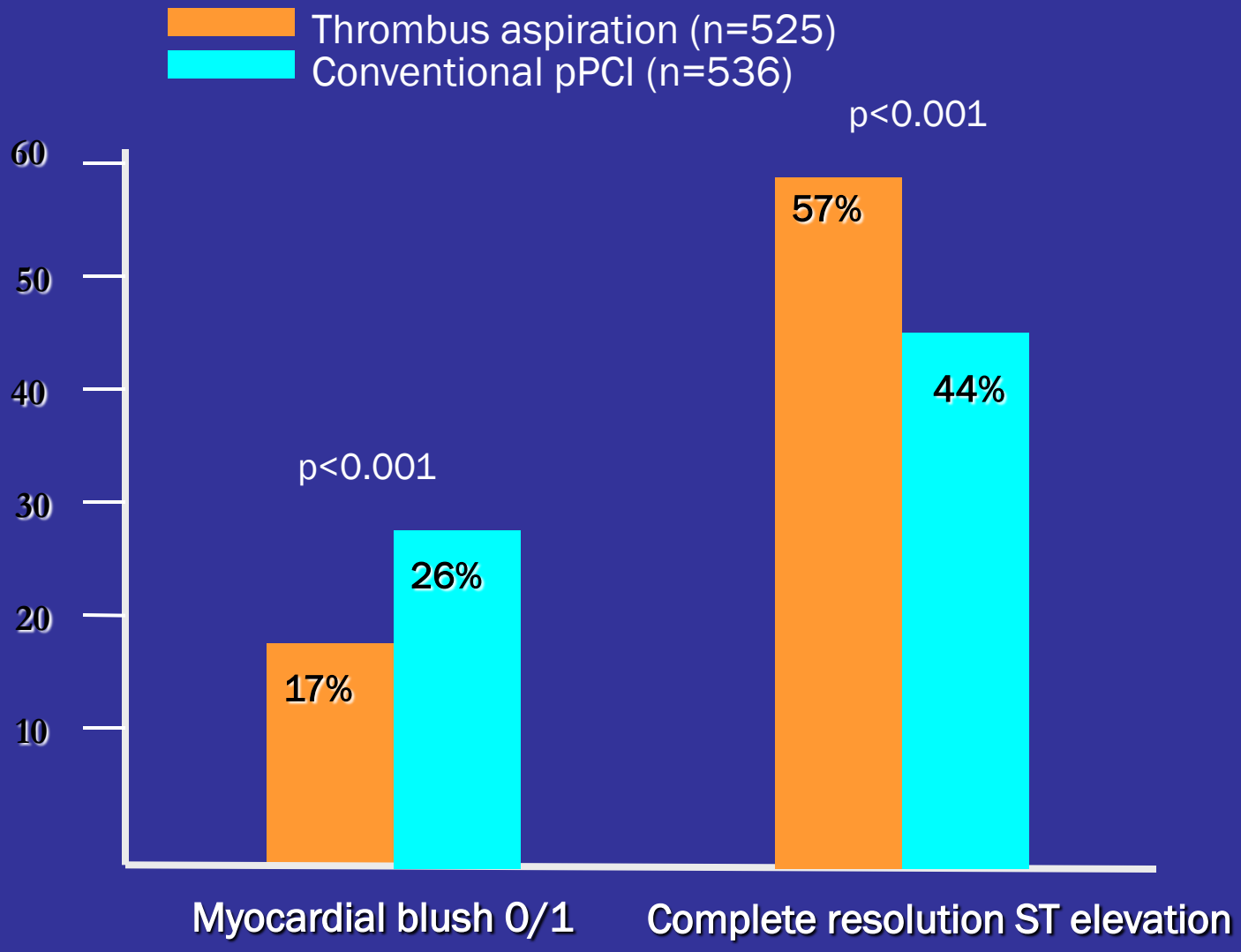
(Presented in Munich 2008)

HORIZONS AMI

30 Day Mortality: PCI Cohort



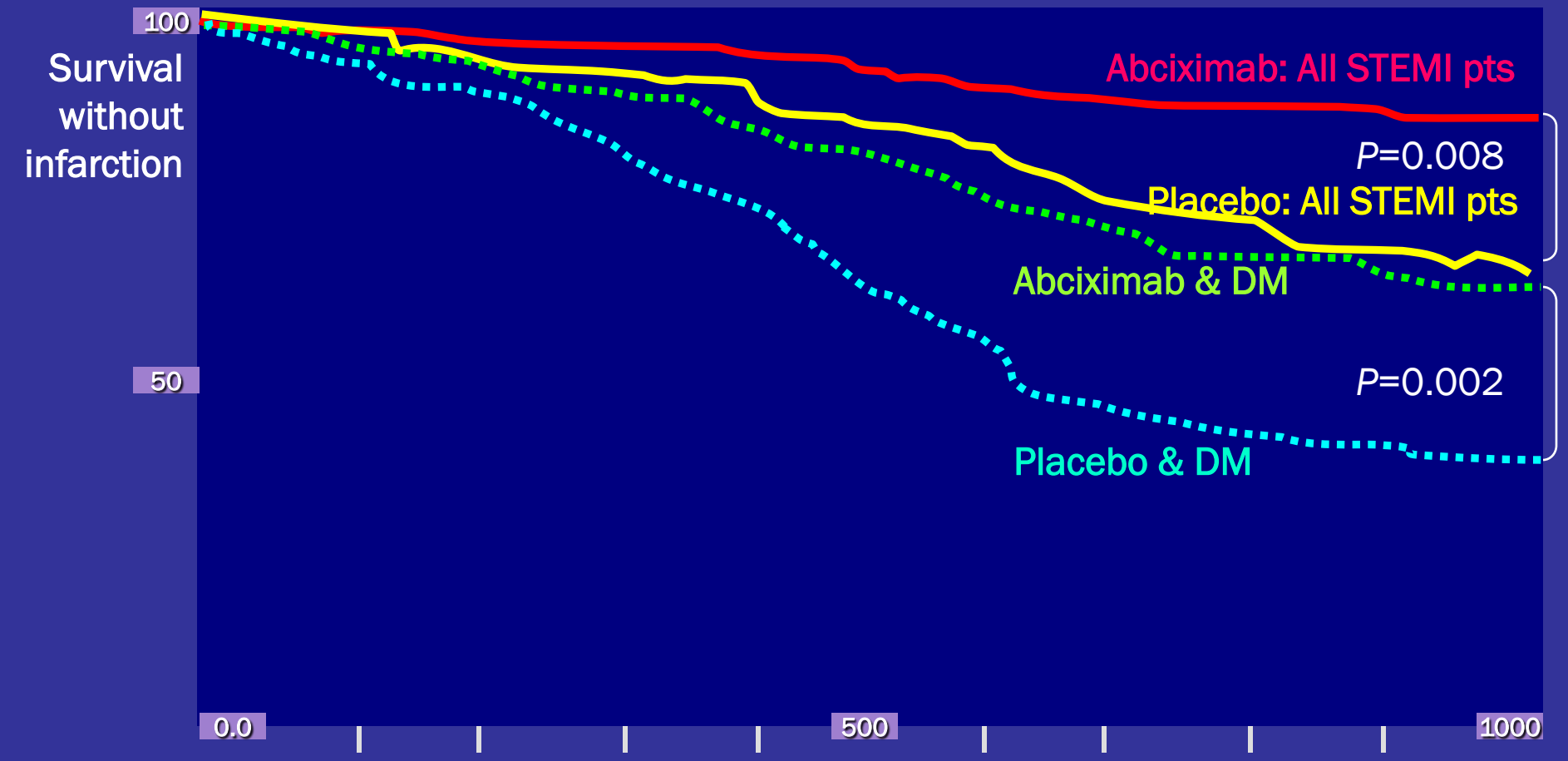
Thrombus aspiration during pPCI



(Svilaas et al: NEJM 2008;358:557)

Abciximab in primary STEMI: A European meta-analysis

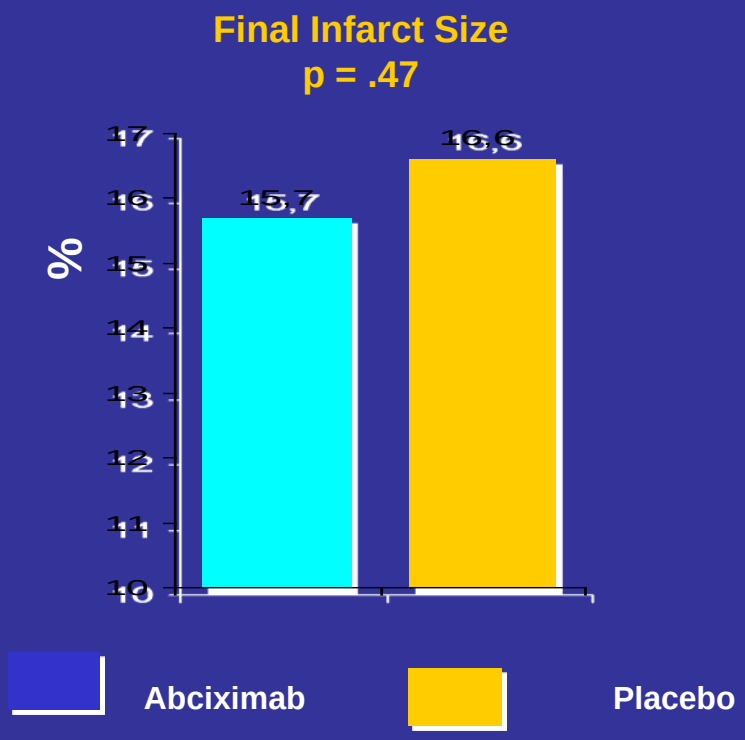
No nangiographic selection criteria, no previous thrombolysis, always stenting, 3-year follow-up



(Montalescot G et al: EHJ 2007;28:443-449)

BRAVE 3

Trial Design: BRAVE 3 was a randomized, double-blind, placebo, multicenter trial to evaluate the role of abciximab in reducing left ventricular infarct size in patients with acute STEMI undergoing primary PCI who have been pretreated with a high loading dose of clopidogrel (600 mg) plus ASA and unfractionated heparin.



Results

- Final left ventricular infarct size was similar for both abciximab and placebo groups using SPECT 5-7 days after randomization (Figure)

- 30-day mortality was observed to be higher in the abciximab group as compared to placebo (p=.53)

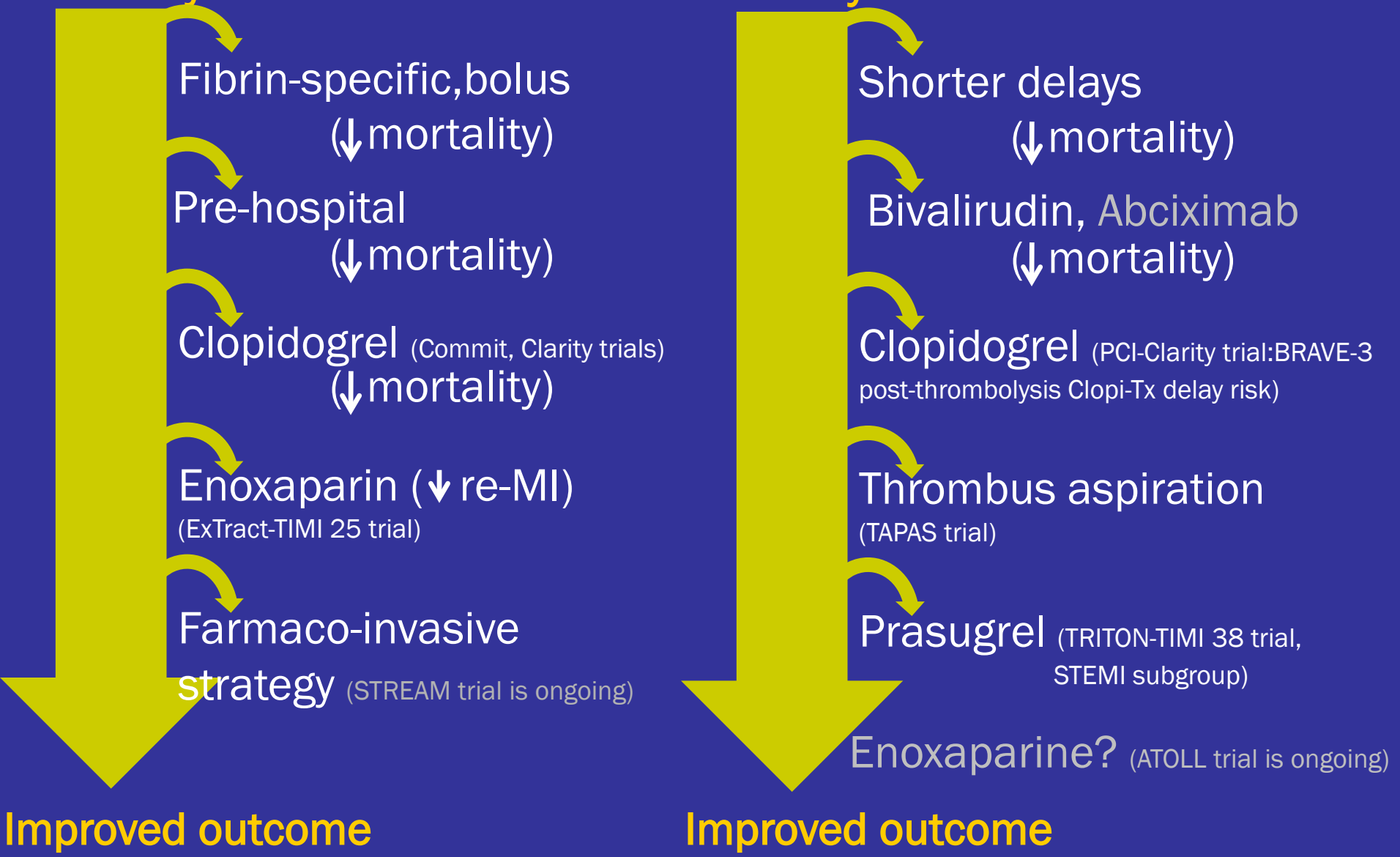
Conclusions

- Abciximab was not associated with a reduction in LV infarct size

- No difference on adverse clinical effects

Wiviott et al., Presented at ACC, 2008

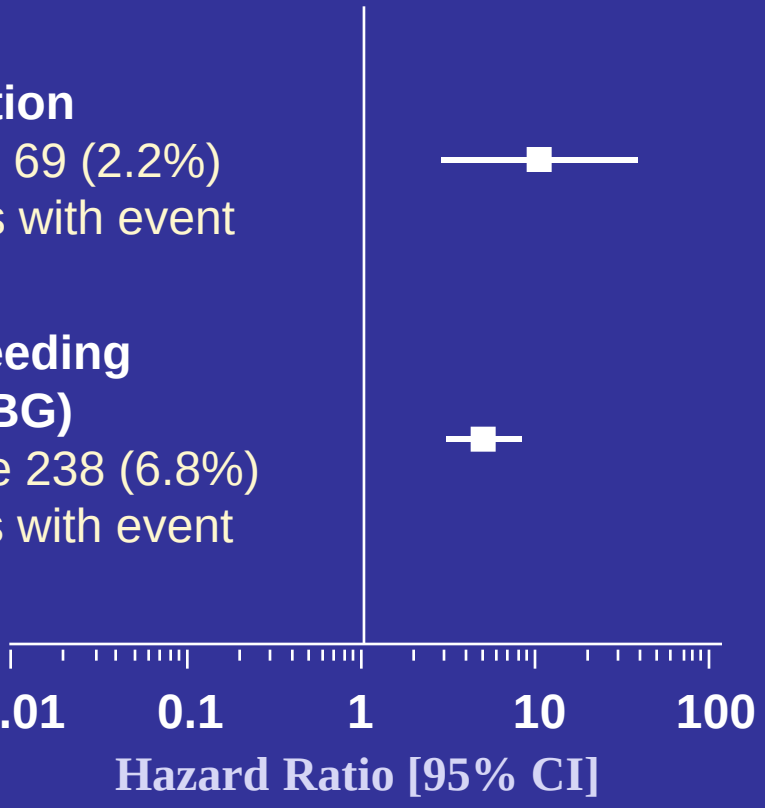
STEMI reperfusion is evolving...



HORIZONS AMI: Relation of 30-day events to 30-day mortality

Time-updated covariate-adjusted Cox model; complete model with MACE components and major bleeding

Risk Factor	HR [95% CI]	P-value	Attributable Deaths
Reinfarction Incidence 69 (2.2%) 10 deaths with event	**9.75 [2.72,34.91]**	**<0.001**	**9.0* [6.3, 9.7]**
Major bleeding (Non CABG) Incidence 238 (6.8%) 26 deaths with event	**4.66 [2.84, 7.63]**	**<0.001**	**20.4** [16.8, 22.6]**



*9.7% of 93 total deaths
**21.9% of 93 total deaths

C-statistic = 0.87. Attributable deaths = N deaths among pts with the time updated event (attribute) X (adj. HR – 1)/adj. HR

2007 STEMI Recommendation for primary PCI (AHA/ACC): *Class I*

- PCI hospital and D2B time≤ 90 min *(LoE: A)*

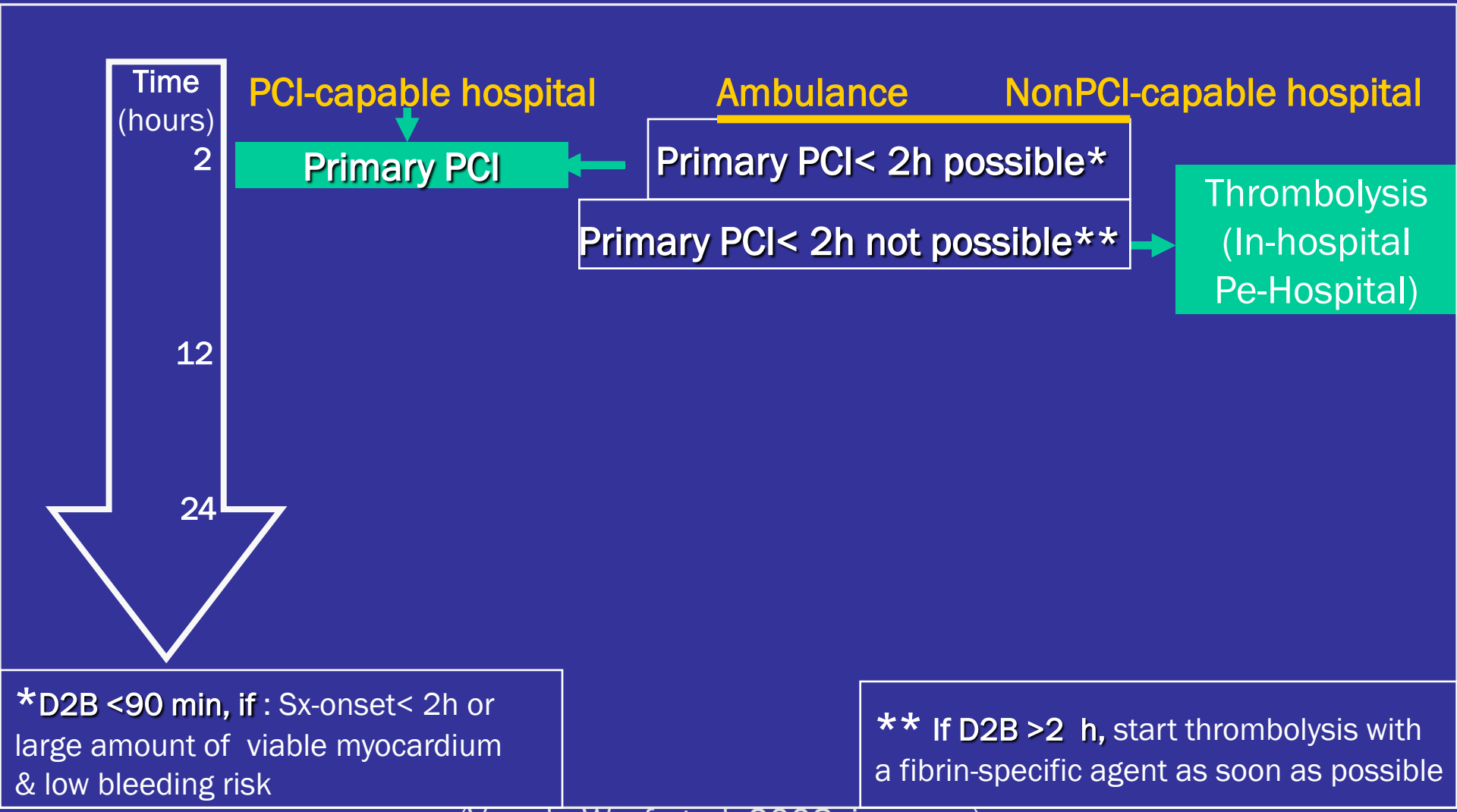
- Non-PCI hospital & pts *cannot be transferred* for pPCI (D2B >90 min): Fibrinolysis ≤ 30 min, unless contraindicated *(LoE: B)*

- Operator volume: ≥75 PCIs/year & ≥36 pPCIs/year

- In patients < 75 years old with STEMI or LBBB with cardiogenic shock ≤36 hours of MI and primary PCI performance ≤18 hours of shock *(LoE: A)*

2008 STEMI Recommendation for pPCI (ESC Guidelines)

- ASA + Clopidogrel (300-600 mg) + Abciximab (inhospital) + UFA (or: Bivalirudin)



***D2B <90 min, if** : Sx-onset< 2h or large amount of viable myocardium & low bleeding risk

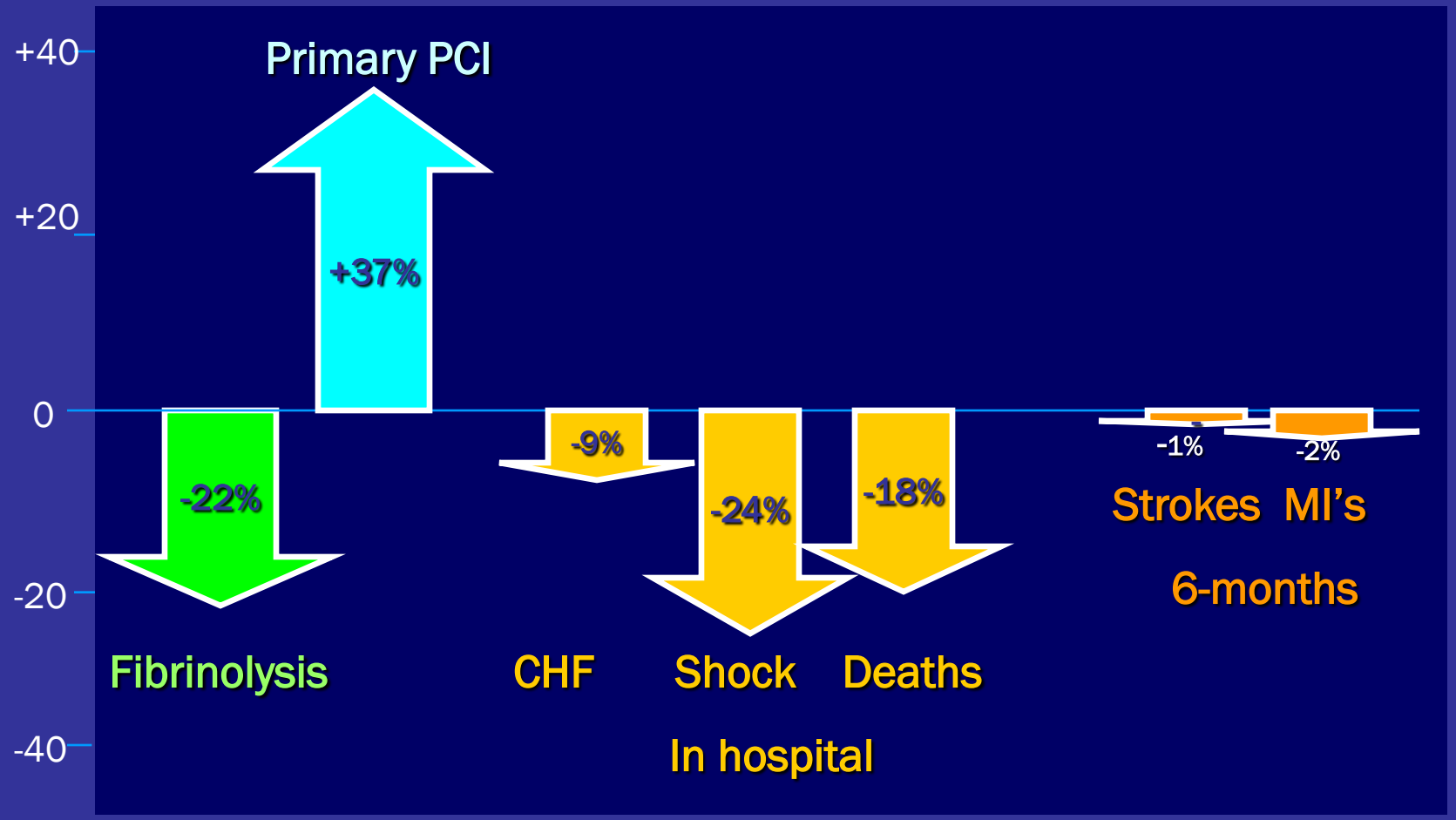
**** If D2B >2 h,** start thrombolysis with a fibrin-specific agent as soon as possible

(Van de Werf et al: 2008, in press)

Decline in rates of death and heart failure in ACSs, 1999-2006

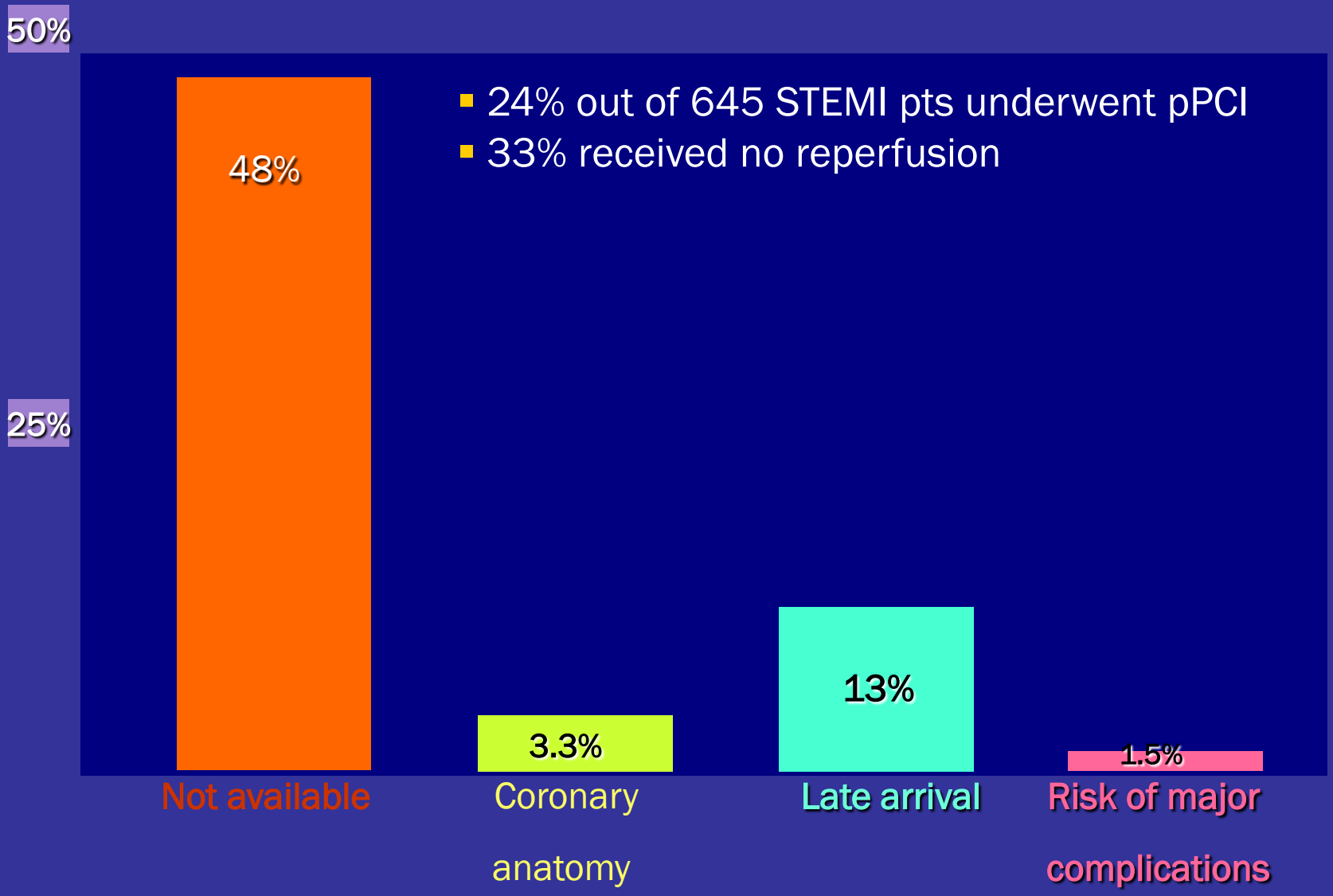
(The GRACE Registry: JAMA. 2007;297:1892)

- Multinational cohort study - 44 372 patients with an ACS enrolled & followed up
- 113 hospitals in 14 countries between July 1999 & Dec. 2006.



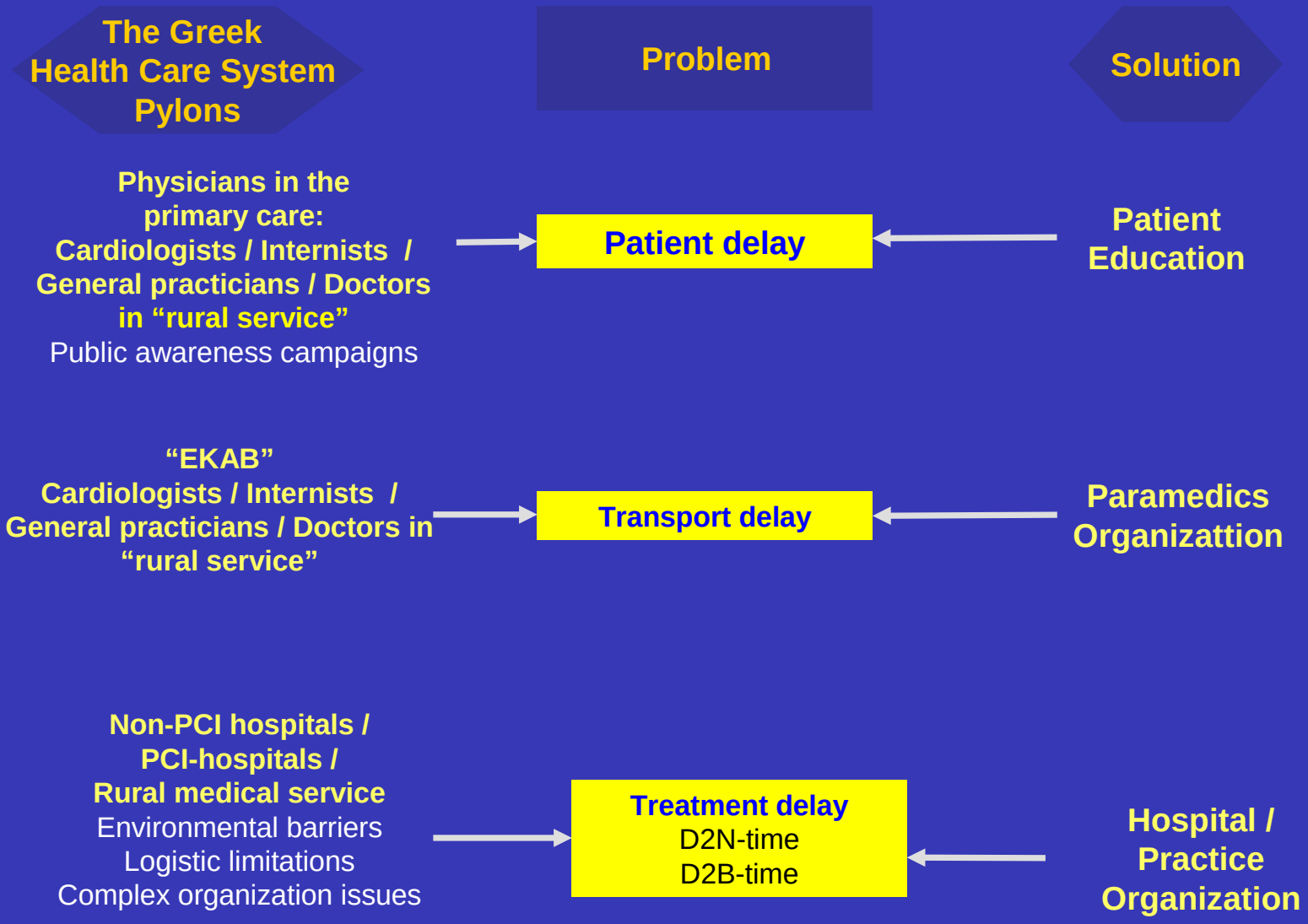
"Improvements in the management of patients with ACS were associated with significant reductions in the rates of CHF, mortality and in rates of stroke and mycoardial infarction at 6 months"

Reasons for not performing pPCI in "primary" PCI hospitals in Greece (Helios study)



(Andrikopoulos: Presented at ESC 2008)

Establishing a Greek pPCI network...
Possible delay sources & suggested solutions



(Adapted from the 2005 ESC guidelines)

Establishing systems for STEMI care

- Whole insurance system participation
- Flexible, yet accountable payment policy on a case -by-case- basis
- No patient financial load

Payers

Patient

- Call "EKAB"
- Avoid delay

SYSTEM OF CARE

"EKAB" Emergency departments

- 12-lead ECG
- Activate team
- Interhospital transport

Non PCI capable

CENTER OF CARE

STEMI referral

Treatment protocols and clinical pathways

PCI capable

CENTER OF CARE

STEMI receiving

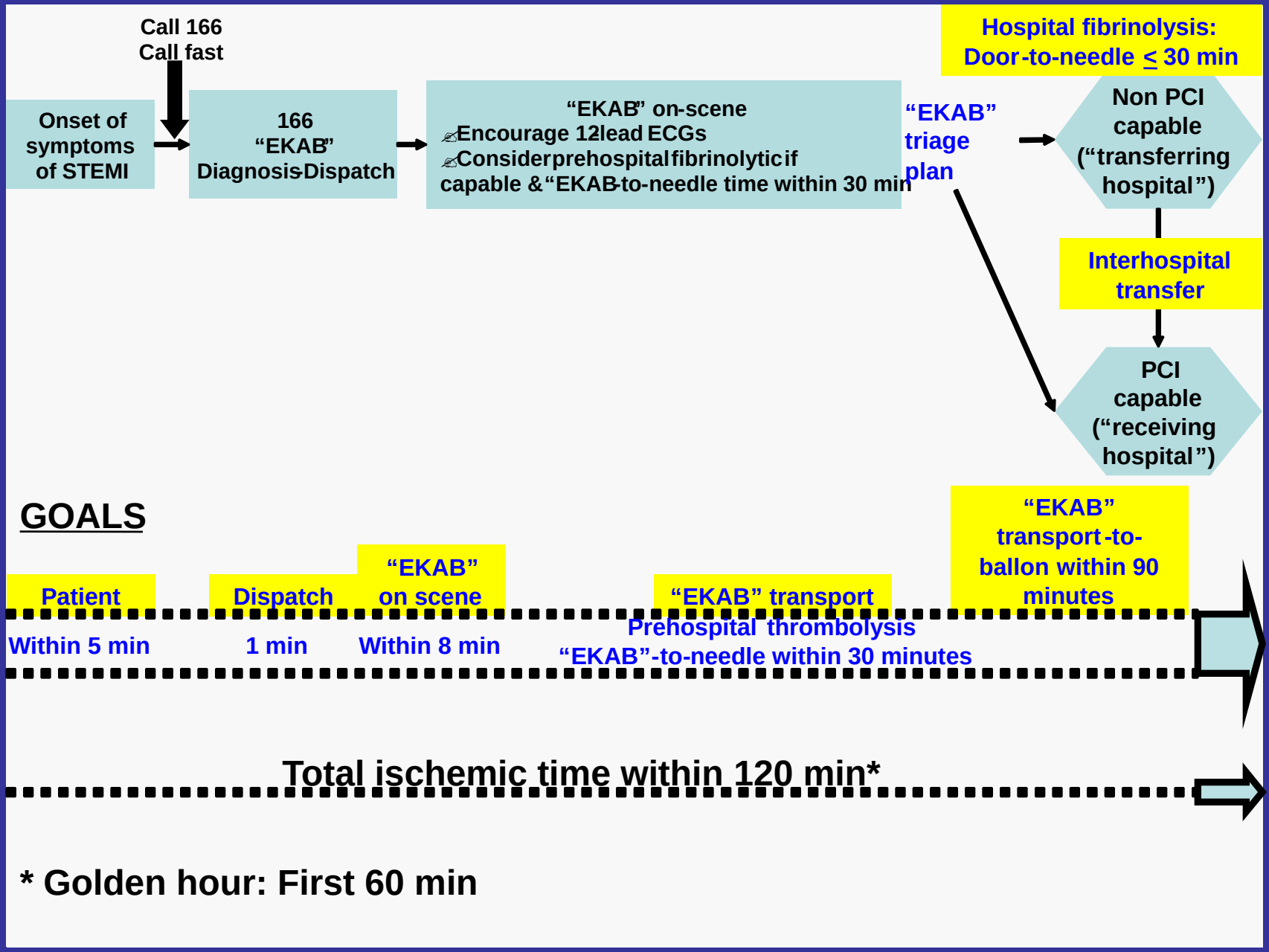
Policy Makers

- Global rethinking on financial and human resources
- Protocols across the system of care and assessment toolkits
- STEMI center certification
- Quality improvement measures

(Adapted from Jacobs et al: Circulation 2007)

Thank you for your attention

2007 STEMI Recommendation (AHA/ACC)



pPCI is the winner…

- Better than thrombolysis, even if transfer is needed
- Equal or better than pre-hospital thrombolysis
- Probable benefit even in late pPCI (STEMI>12 h)
- pPCI centers capable of optimizing thrombolysis results
  - ✓ Rescue or urgent PCI
  - ✓ Routine early (24 h) PCI
  - ✓ Before discharge PCI, if ischemia provokable

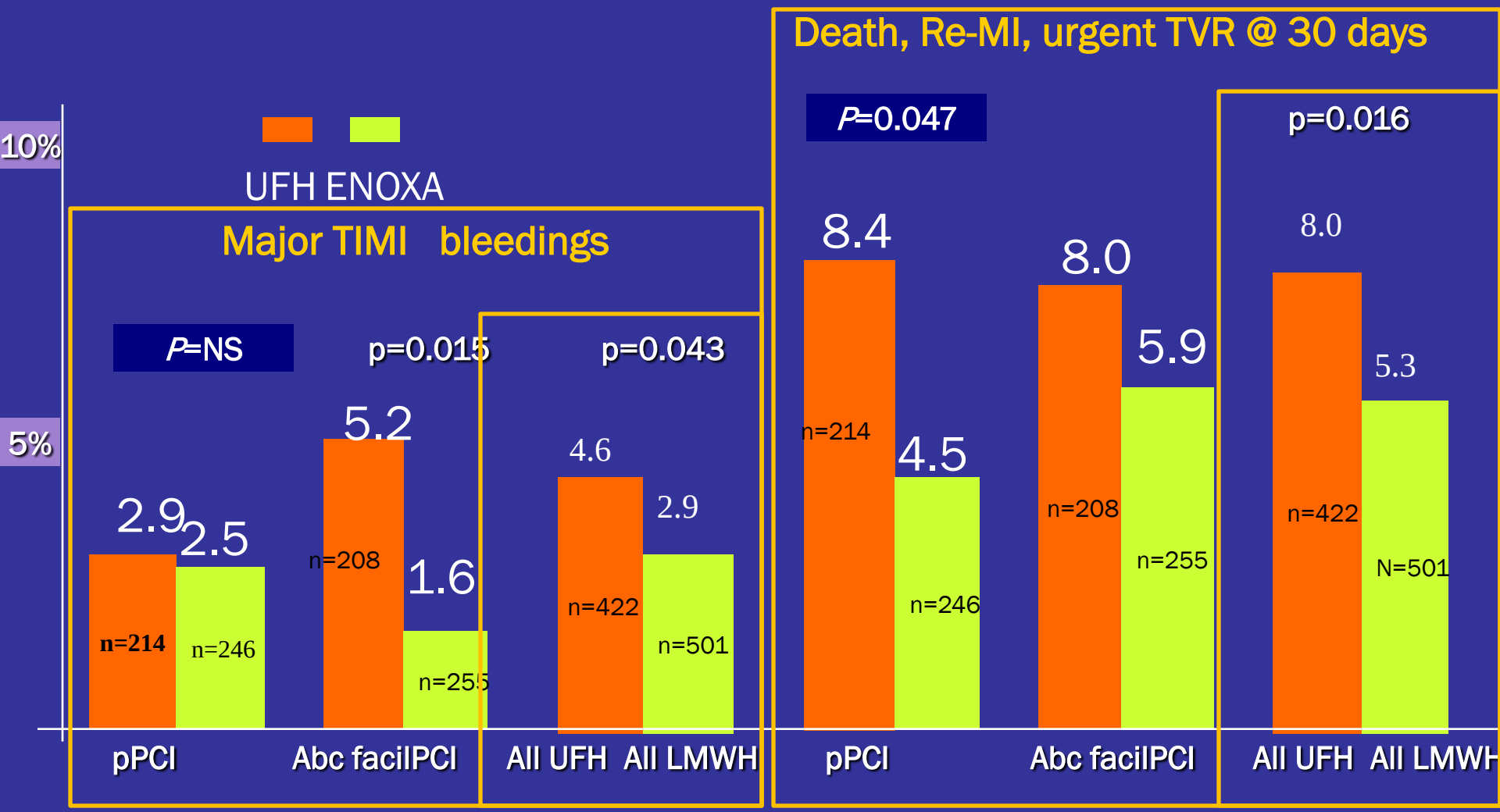
pPCI related problems…

- ✓ Transfer delays (D2B time>90 min in most cases)
- ✓ 24 h a day-7 days a week cath-lab coverage
- ✓ Poor recovery of LV function on the long-term (G. Stone)
- ✓ Major bleeding

HORIZONS AMI

	UFH + GP IIb/IIIa (N=1802)	Bivalirudin (N=1800)
Death	3.1%	2.1%
Reinfarction	1.8%	1.8%
Ischemic TVR	1.9%	2.6%
Stroke	0.6%	0.7%

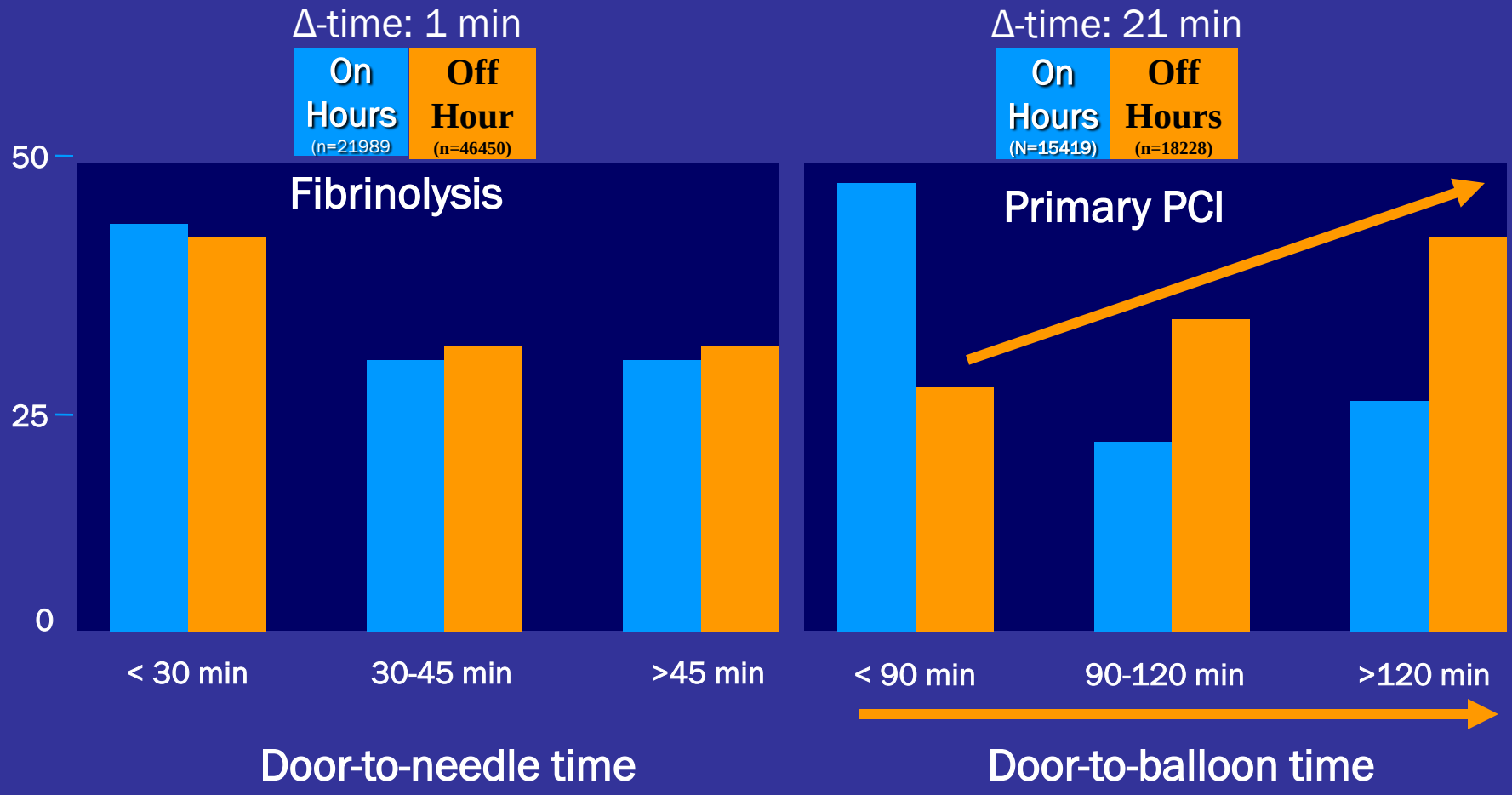
UFH vs Enoxaparin & primary PCI in FINESSE



(Montalescot G: Presented at TCT 2007)

On- vs. Off hours in STEMI reperfusion & mortality

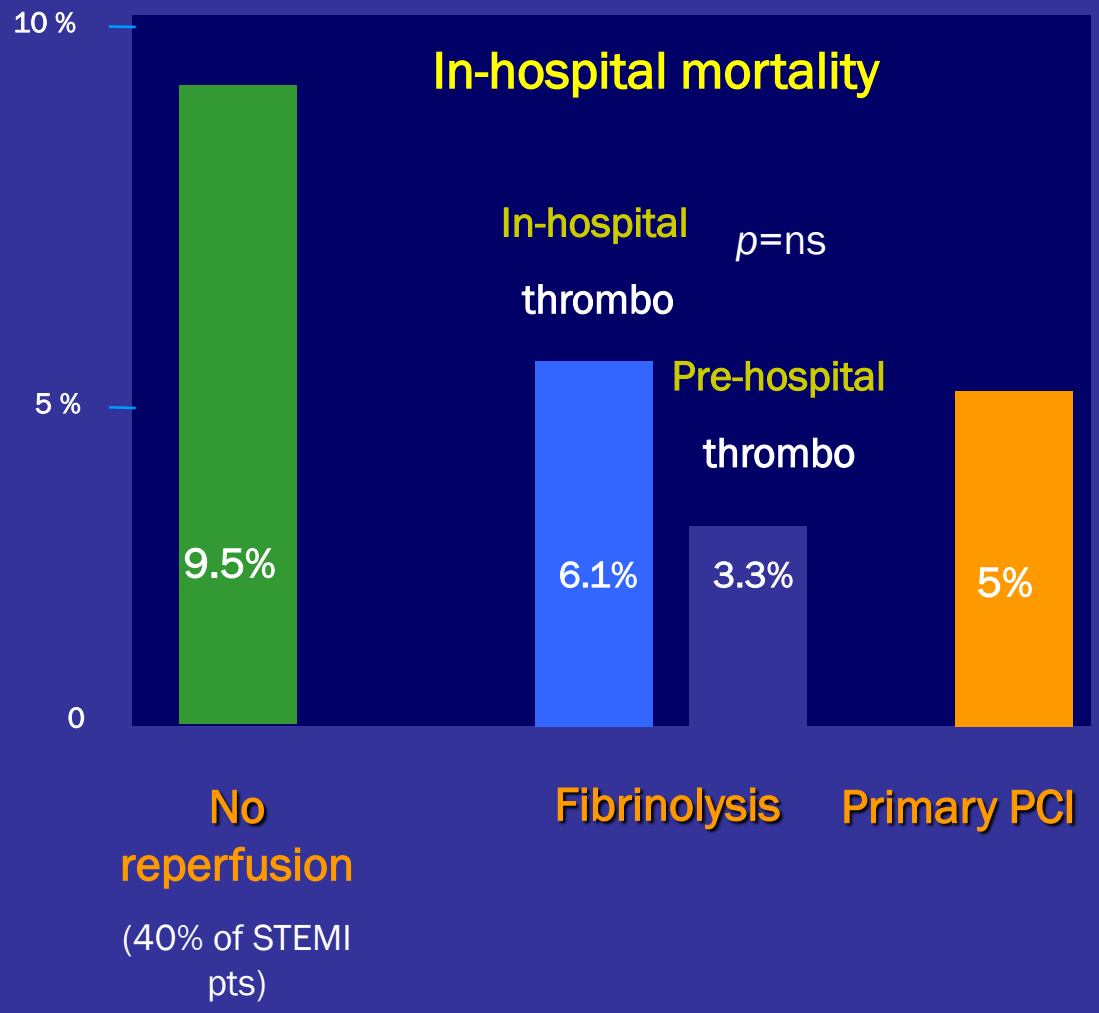
(NMRI 3-4, 1999-2002)



Regular hours include weekdays, 7 AM to 5 PM
Off-hours include weekdays 5 PM to 7 AM and all times on the weekend days.

(Magid DJ et al:JAMA 2005;294:803)

FAST-MI French Registry



(Danchin N et al: Circulation 2008;118:268)

Multicentre randomized trial comparing transport to primary angioplasty vs immediate thrombolysis vs combined strategy for patients with acute myocardial infarction presenting to a community hospital without a catheterization laboratory

The PRAGUE Study

P. Widimský[1], L. Groch[1], M. Želízko[1], M. Aschermann[1], F. Bednář[1] and H. Suryapranata[2] on behalf of the PRAGUE Study Group Investigators*

[1]*Cardiocenter, University Hospital, Vinohrady, Prague, Czech Republic;* [2]*Hospital De Weezenlanden, Zwolle, The Netherlands*

Group A (Thrombolysis)	Group B (Thrombolysis+PTCA)	Group C (PTCA)
Patient stays in the primary hospital	Transport to PTCA centre immediately after *beginning* of thrombolysis	Transport to PTCA centre imme after randomization
Lysin salicylate 900 mg i.v.	Lysin salicylate 900 mg i.v.	Lysin salicylate 900 mg i.v. Heparin 10 000 U i.v.
Streptokinase 1·5 ml . U^{-1} i.v./45–60 min	Streptokinase idem+PTCA/stent if significant obstruction persists	PTCA/stent+additional Heparin (5000 U)

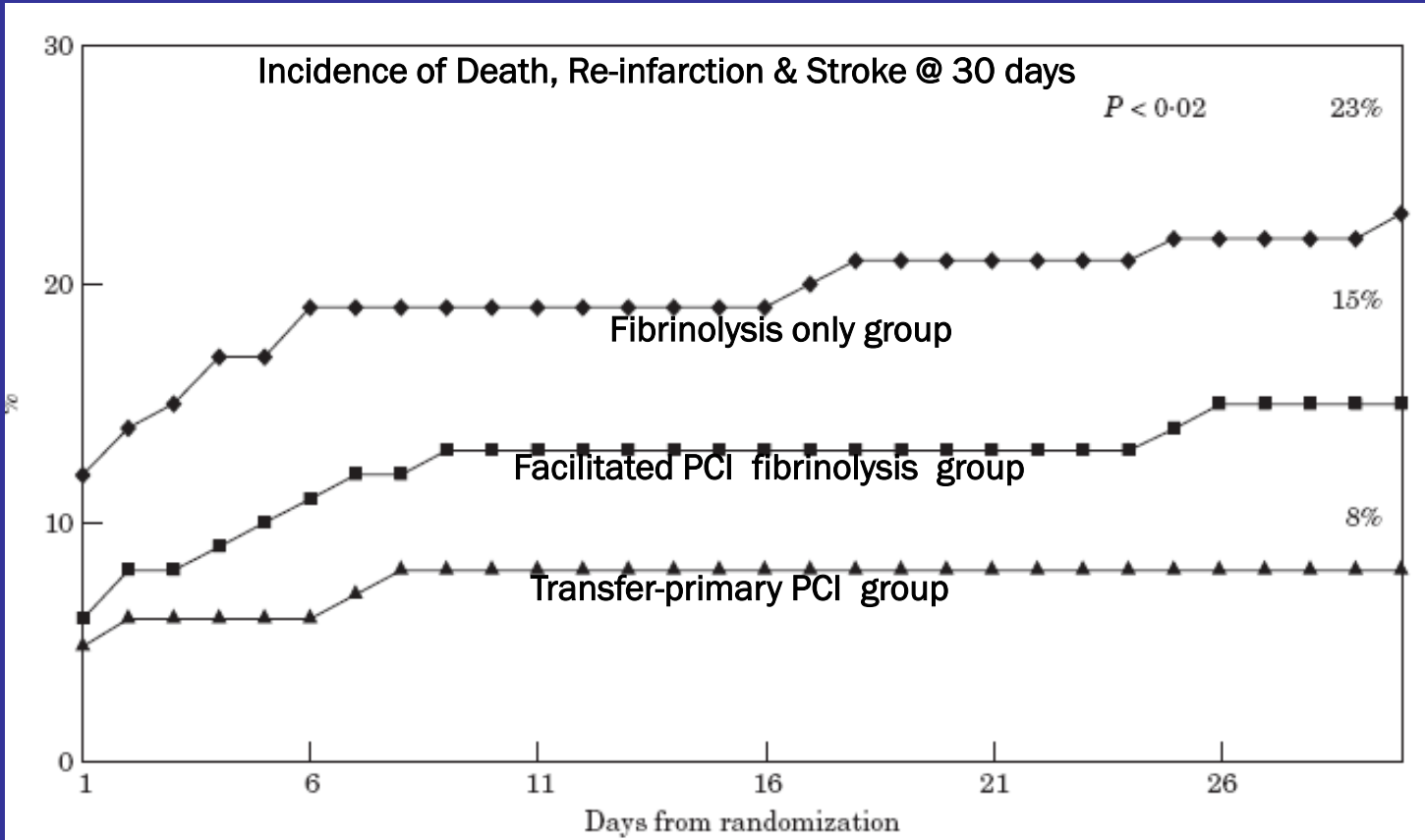
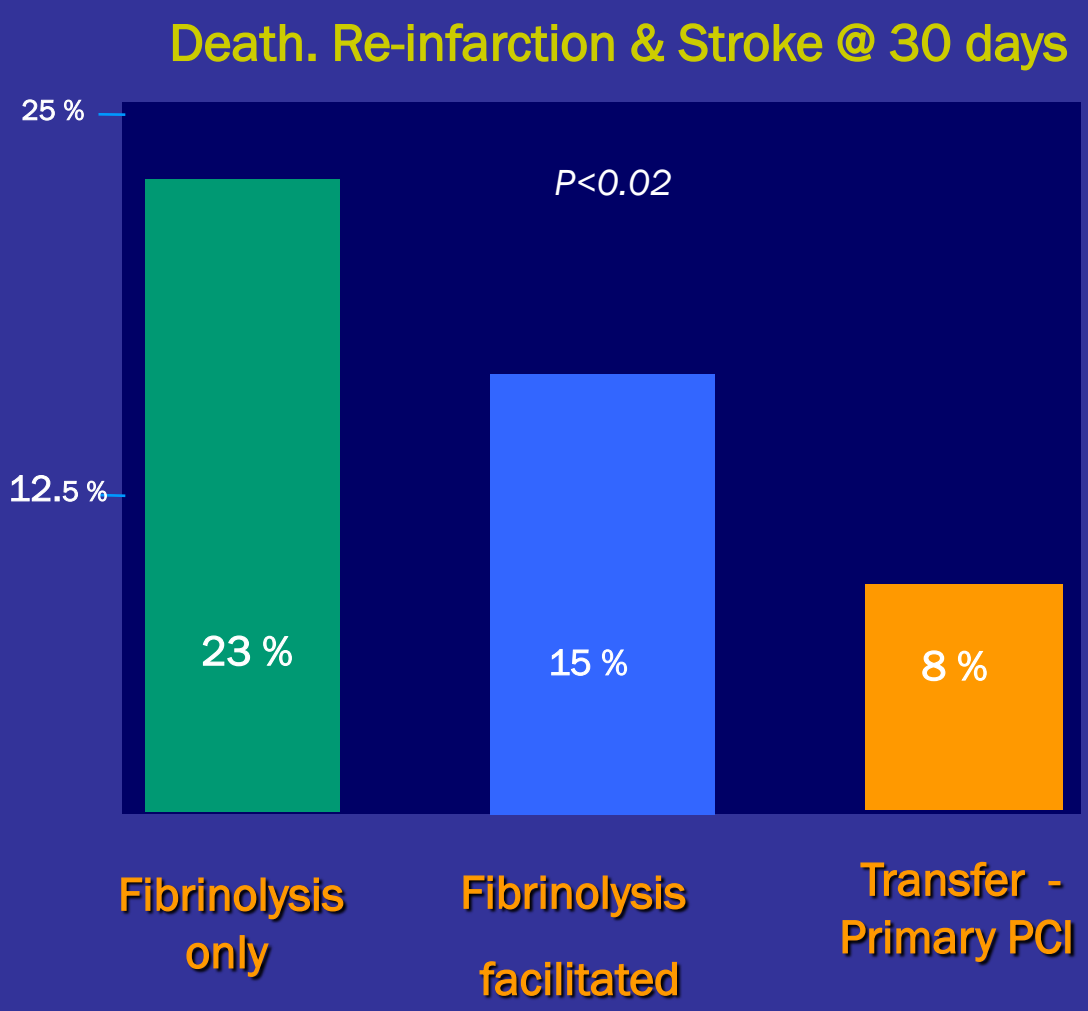


Figure 3 **Primary end-point (death/reinfarction/stroke) at 30 days. ◆=group A; ■=group B; ▲=group C.**

(*The Prague study., Eur Heart J, 2000*)

The Prague study

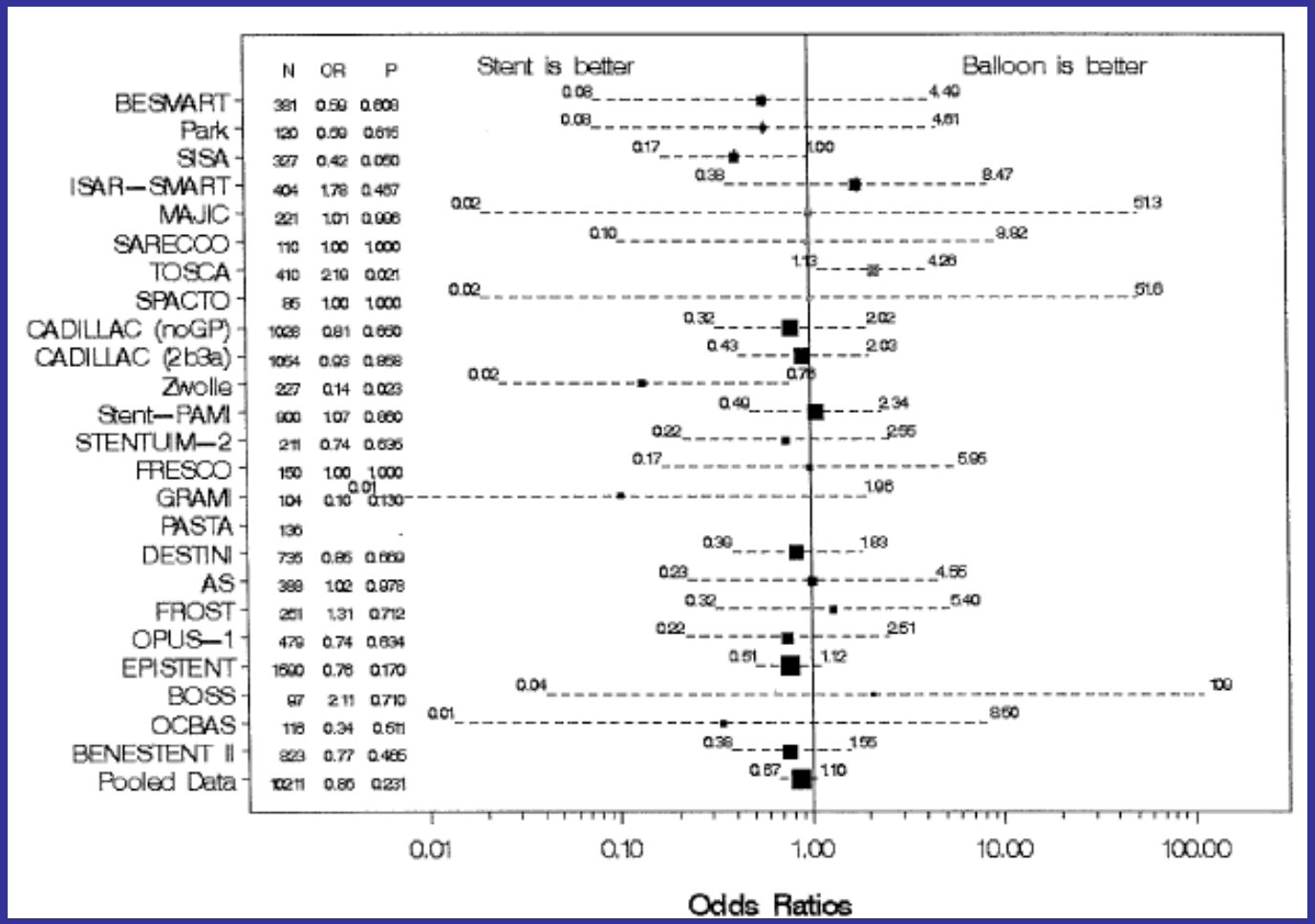


(Widimsky et al: *Eur Heart J, 2000*)

The impact of stenting (vs. POBA) in pPCI

(Suwaidi J Al, et al: AHJ 2004;147:815)

- 23 trials; 10,347 patients enrolled



'An initial strategy of stent placement versus POBA with provisional stenting is associated with a similar mortality rate and frequency of nonfatal myocardial infarction after a mean FU of 13 months.'

Primary PCI compared with fibrinolysis for MI and DM: results from the Primary Coronary Angioplasty vs Thrombolysis-2 trial

Timmer JR, Ottervanger JP, de Boer MJ, Boersma E, Grines CL, Westerhout CM, Simes RJ, Granger CBZijlstra F; Primary Coronary Angioplasty vs Thrombolysis-2 Trialists Collaborators Group

Arch Intern Med. 2007 Jul 9;167(13):1353-9

- Pooled analysis of individual patient data from 19 trials comparing pPCI with fibrinolysis for treatment of STEMI

- Trials that enrolled at least 50 patients with STEMI pts to receive either pPCI or fibrinolysis were considered

Reperfusion Issues in Diabetes Mellitus: Summary

- Thrombolytic therapy
  - ✓Impaired response (increased platelet agreeability)
  - ✓Ambiguous αngiographic, ECG and myocardial perfusion success
- PCI may result in a less favorable outcome
  - ✓More diffuse and extensive disease
  - ✓Smaller reference diameters
  - ✓ Higher restenosis rates
  - ✓ More life-threatening adverse events (e.g., subacute ST)

pPCI vs Thrombolysis in STEMI According to Diabetes Status

Timmer JR, Ottervanger JP, de Boer MJ, Boersma E, Grines CL, Westerhout CM, Simes RJ, Granger CB, Zijlstra F; Primary Coronary Angioplasty vs Thrombolysis-2 Trialists Collaborators Group.

(Arch Intern Med. 2007 Jul 9;167(13):1353)

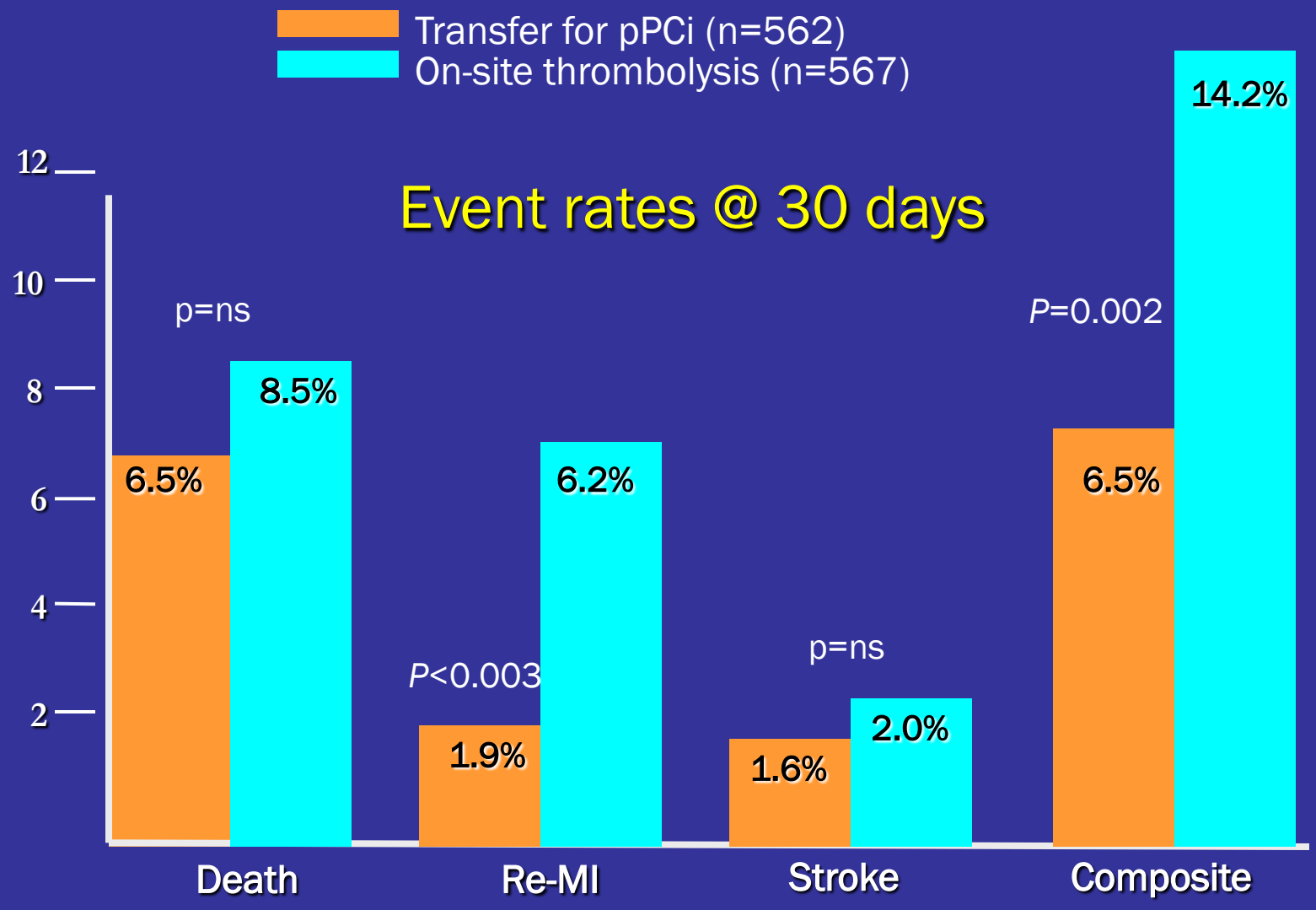
- 877 out of 6315 pts (14%) with DM
- Clinical end points:
  - total deaths, recurrent infarction,
  - death or nonfatal recurrent infarction & stroke @ 30 d.
- 30 d. mortality:
  - 9.4% with DM vs 5.9% without DM (P< 0.001)

pPCI in patients ≥85 Years

(Valente S et al: Circ J 2008;78:67)

- Mortality in pts without cardiogenic shock: 8%
- MV in-hospital mortality predictors:
  - ✓PCI failure
  - ✓Killip class ≥III
  - ✓Age≥90 y.o.

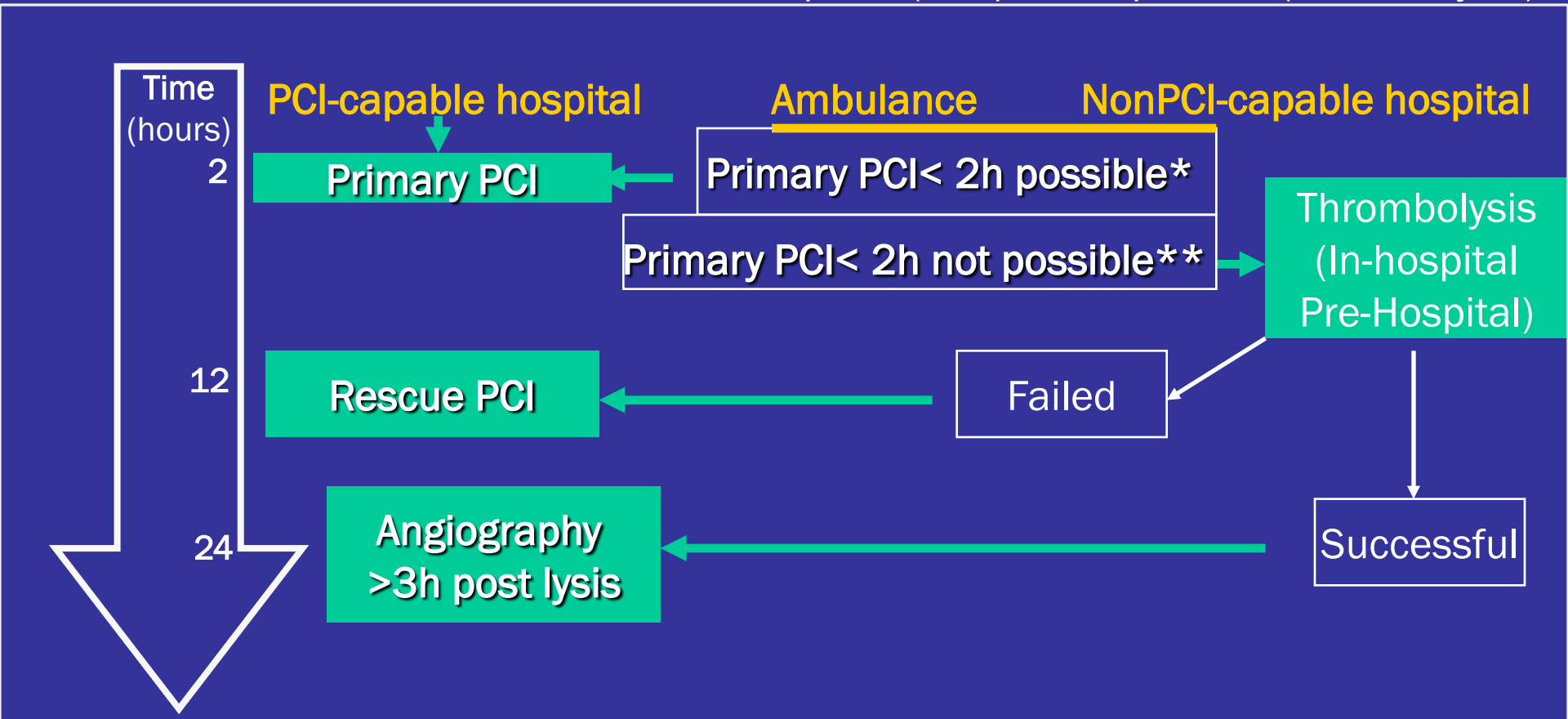
Thrombolysis vs. Transfer-pPCI in DANAMI-2
(from referral hospitals only)



(Andersen et al: NEJM 2000;349:733)

2008 STEMI Recommendation for pPCI (ESC Guidelines)

- ASA + Clopidogrel (300-600 mg) + Abciximab (pPCI) + UFA / Bivalirudin (pPCI)
  + Enoxaparin (UFH/Fondaparinux (thrombolysis)



*D2B <90 min, if : Sx-onset< 2h or large amount of viable myocardium & low bleeding risk

** If D2B >2 h, start thrombolysis with a fibrin-specific agent as soon as possible

(Van de Werf et al: 2008, in press)

pPCI vs Thrombolysis in STEMI According to Diabetes Status

Timmer JR, Ottervanger JP, de Boer MJ, Boersma E, Grines CL, Westerhout CM, Simes RJ, Granger CB, Zijlstra F, Primary Coronary Angioplasty vs Thrombolysis-2 Trialists Collaborators Group

Arch Intern Med. 2007 Jul 9;167(13):1353-9

Table 2. Baseline Characteristics of Patients With STEMI Without vs With Diabetes[a]

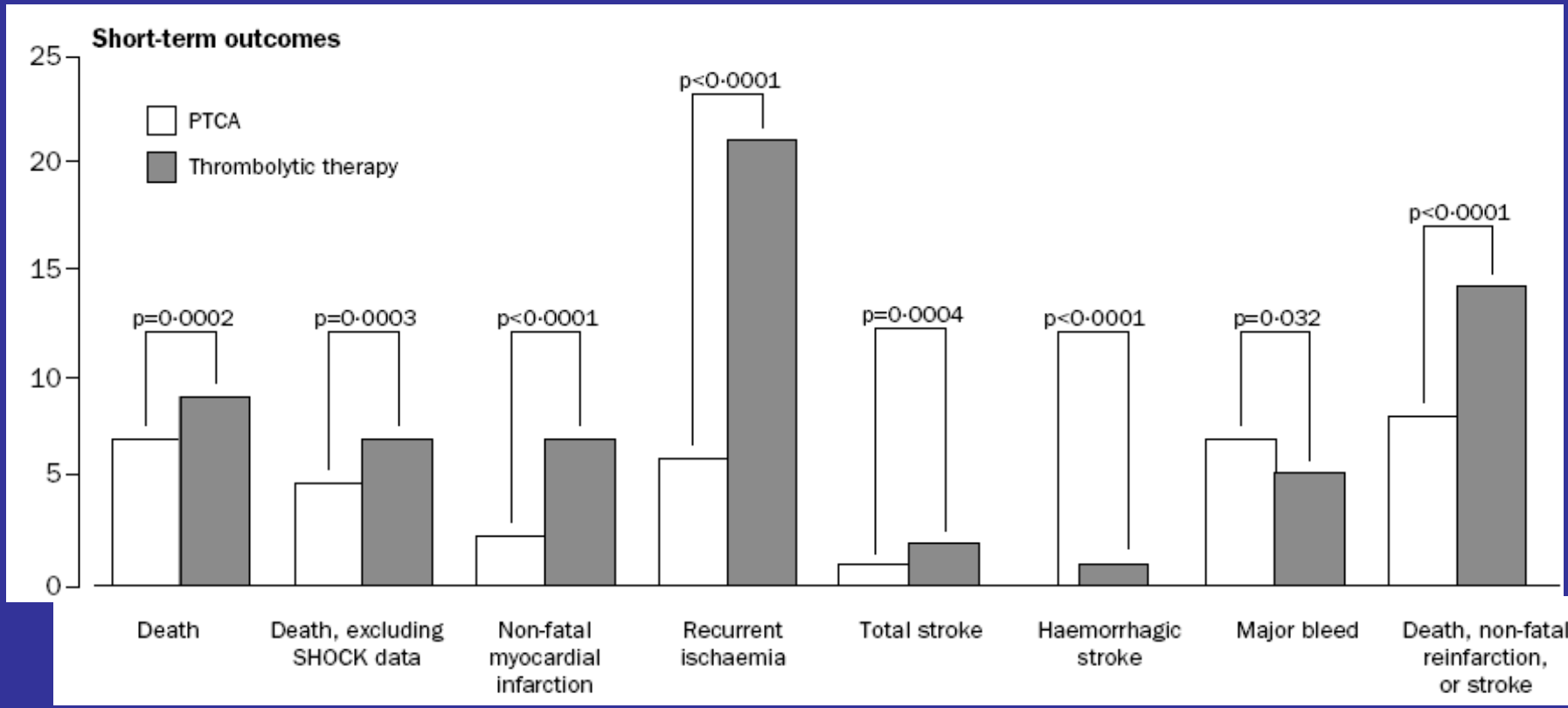
Characteristic	Patients Without Diabetes (n = 5438)	Patients With Diabetes (n = 877)	*P* Value
Age, y	62 ± 12	65 ± 11	<.001
Male sex	4043 (74)	560 (64)	<.001
Systolic blood pressure, mm Hg	133 ± 24	135 ± 24	.004
Heart rate, beats/min	76 ± 17	79 ± 17	<.001
Weight, kg	79 ± 12	80 ± 12	.001
Previous MI	701 (13)	143 (16)	.02
Previous PCI	227 (4)	27 (3)	<.001
Previous CABG	96 (2)	16 (2)	.56
Time from symptom onset to randomization, h			<.001
0-1	635 (12)	83 (10)	
>1-2	1772 (32)	196 (22)	
>2-3	1346 (5)	224 (26)	
>3-6	1228 (23)	241 (28)	
>6	507 (9)	133 (15)	
Median percentile (25th-75th percentile)	137 (90-212)	163 (110-272)	<.001
PCI-related delay, min[b]			<.001
0-35	1125 (21)	170 (19)	
36-50	1011 (19)	167 (19)	
51-62	1222 (23)	174 (20)	
63-79	1026 (19)	128 (15)	
≥80	1054 (19)	238 (27)	
Median percentile (25th-75th percentile)	55 (38-74)	58 (37-80)	.01

Table 3. Baseline Characteristics of Patients With Diabetes According to Randomized Method of Reperfusion Therapy: Fibrinolysis vs Primary PCI[a]

Characteristic	Fibrinolysis (n = 421)	Primary PCI (n = 456)	*P* Value
Age, y	65 ± 11	65 ± 11	.92
Male sex	268 (64)	292 (64)	.89
Systolic blood pressure, mm Hg	136 ± 24	134 ± 24	.17
Heart rate, beats/min	80 ± 17	79 ± 17	.26
Weight, kg	81 ± 12	80 ± 12	.93
Previous MI	63 (15)	80 (18)	.59
Previous PCI	13 (3)	14 (3)	.98
Previous CABG	8 (2)	8 (2)	.97
Time from symptom onset to randomization, h			.80
0-1	44 (11)	39 (9)	
>1-2	94 (22)	102 (22)	
>2-3	102 (24)	122 (27)	
>3-6	119 (28)	122 (27)	
>6	62 (15)	71 (16)	
Median percentile (25th-75th percentile)	160 (105-280)	164 (110-270)	.64
PCI-related delay, min[b]			.92
0-35	81 (19)	89 (20)	
36-50	83 (20)	84 (18)	
51-62	81 (19)	93 (20)	
63-79	65 (15)	63 (14)	
≥80	111 (26)	127 (28)	
Median percentile (25th-75th percentile)	58 (37-80)	58 (37-80)	.86
Anterior infarction	212 (50)	203 (45)	.18

Primary angioplasty versus intravenous thrombolytic therapy for acute myocardial infarction: a quantitative review of 23 randomised trials

Lancet 2003; **361:** 13–20



Call 9-1-1
Call fast

Onset of symptoms of STEMI

9-1-1 EMS Dispatch

EMS on-scene
- Encourage 12-lead ECGs
- Consider prehospital fibrinolytic if capable and EMS-to-needle within 30 min

EMS Triage Plan

Hospital fibrinolysis:
Door-to-Needle within 30 min

Not PCI capable

Inter-Hospital Transfer

PCI capable

Goals†

Patient	*Dispatch*	*EMS on scene*	*EMS transport*	
5 min after symptom onset	1 min	Within 8 min	Prehospital fibrinolysis: EMS-to-Needle within 30 min	*EMS transport:* EMS-to-Balloon within 90 min *Patient self-transport:* Hospital Door-to-Balloon within 90 min

Total ischemic time: Within 120 min*

*Golden Hour = First 60 minutes

Predictors of pPCI-delays

Entire STEMI cohort (**"real world"**) **vs.***after exclusion of patients* with atypical symptoms and/or presentations of STEMI that resulted in inherent delay in diagnosis and treatment (**"ideal world"**)

(Am Heart J 2008).

- **Δ-median: 7 min.**

- **Predictors of delay:**
  - ✓ female sex,
  - ✓ previous stroke,
  - ✓ nighttime,
  - ✓ weekend presentation, and
  - ✓ cardiogenic shock

The D2B Alliance campaign (Availabla at::http://www.d2balliance.org/)

- Launched by the ACC
- Effort to improve the timeliness of pPCI
- Divided into four distinct phases: planning, enrollment, intervention and evaluation
- Several working groups established
- Collaboration with numerous other organizations
- Goal: to increase the percentage of patients with timely pPCI
- Emphasis on having ≥75% of non-transfer patients with D2B ≤90 minutes
- Has enrolled > 1,000 pPCI hospitals and has 38 strategic partners including the AHA

The D2B Alliance campaign (Availabla at::http://www.d2balliance.org/)

- Successfully united practitioners, hospitals, and organizations
- The evaluation of this campaign will provide evidence on the success of the initiative and how best to disseminate and translate research about health care delivery into practice
- Established in recognition that some patients have clinically relevant non–system-based delays that do not represent quality-of-care issues (e.g., uncertainty about diagnosis, evaluation and treatment of other life-threatening conditions, obtaining informed consent) or anatomical challenges (issues of arterial, coronary, or lesion access) that prolong the PCI procedure

The D2B Alliance campaign (Availabla at::http://www.d2balliance.org/)

Based on the following principles

:

1.Treatment of patients within the guideline recommendations is feasible
2.Strong empirical evidence supports the effectiveness of specific strategies for reducing D2B time
3.Evidence-based strategies could be widely and rapidly adopted, changing the way care is delivered
4.Innovations shared among institutions would accelerate rapid improvements
5.Partnerships across the spectrum of organizations with an interest in outstanding care for patients with STEMI would support and sustain the effort
6.The initiative could be practical and accomplished efficiently with a minimum investment by hospitals.

The D2B Alliance campaign (Availabla at::http://www.d2balliance.org

he D2B Alliance is now in the evaluation phase. Participating hospitals are being asked to complete and return their follow-up surveys assessing their use of evidence-based strategies as soon as possible. The evaluation will analyze the following outcomes:

- Changes in the use of evidenced-based strategies
- Changes in D2B times
- Identification of hospital characteristics correlated with participation in the D2B Alliance
- Hospital views about the role of the D2B Alliance in fostering changes and remaining barriers to improve D2B times

Strategies chosen by the D2B Alliance

1. Activation of the cath lab **by emergency medicine physicians**
2. Establishment of a **single-call system** for activating the cath lab
3. Expectation that the cath team be **available ,20-30 min**.of being paged.
4. Use of **data monitoring and prompt data feedback** to emergency department and cath lab staff
5. **Senior management support & organizational environment** that fosters and sustains organizational change directed at improving D2B time.
6. **Team-based approach from ambulance to balloon**, within a culture of continuous quality improvement.

Optional strategy: Use of prehospital ECG to activate the cath lab

Recognizing that activation on the basis of a **prehospital ECG might be particularly challenging and not fully within a hospital's control**, the D2B Alliance did not include this as a core strategy despite its strong association with shorter D2B times.)

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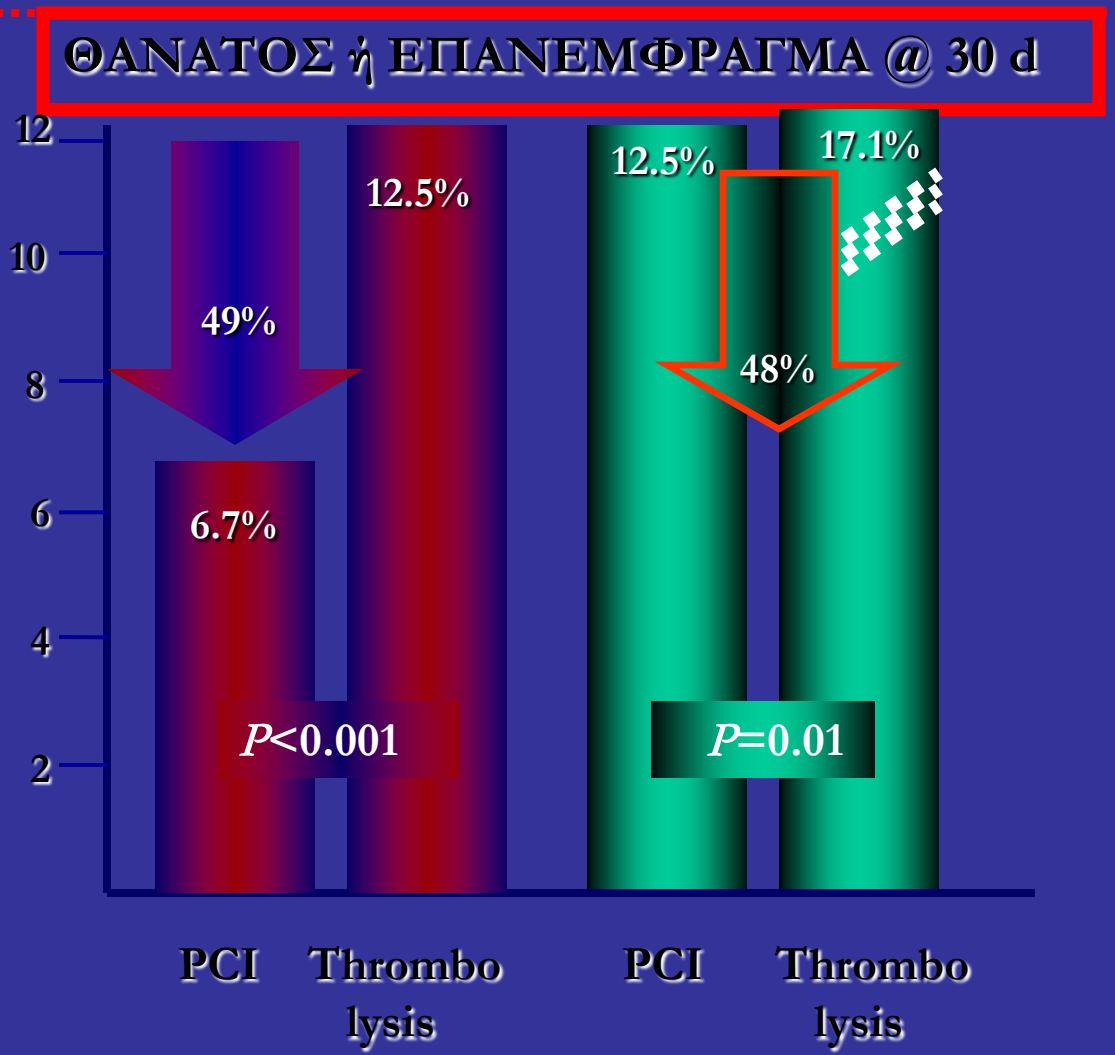

Ασθενείς με STEMI: **ΧΩΡΙΣ Σ.Δ** (n=5438) **ΜΕ Σ.Δ.** (n=877)

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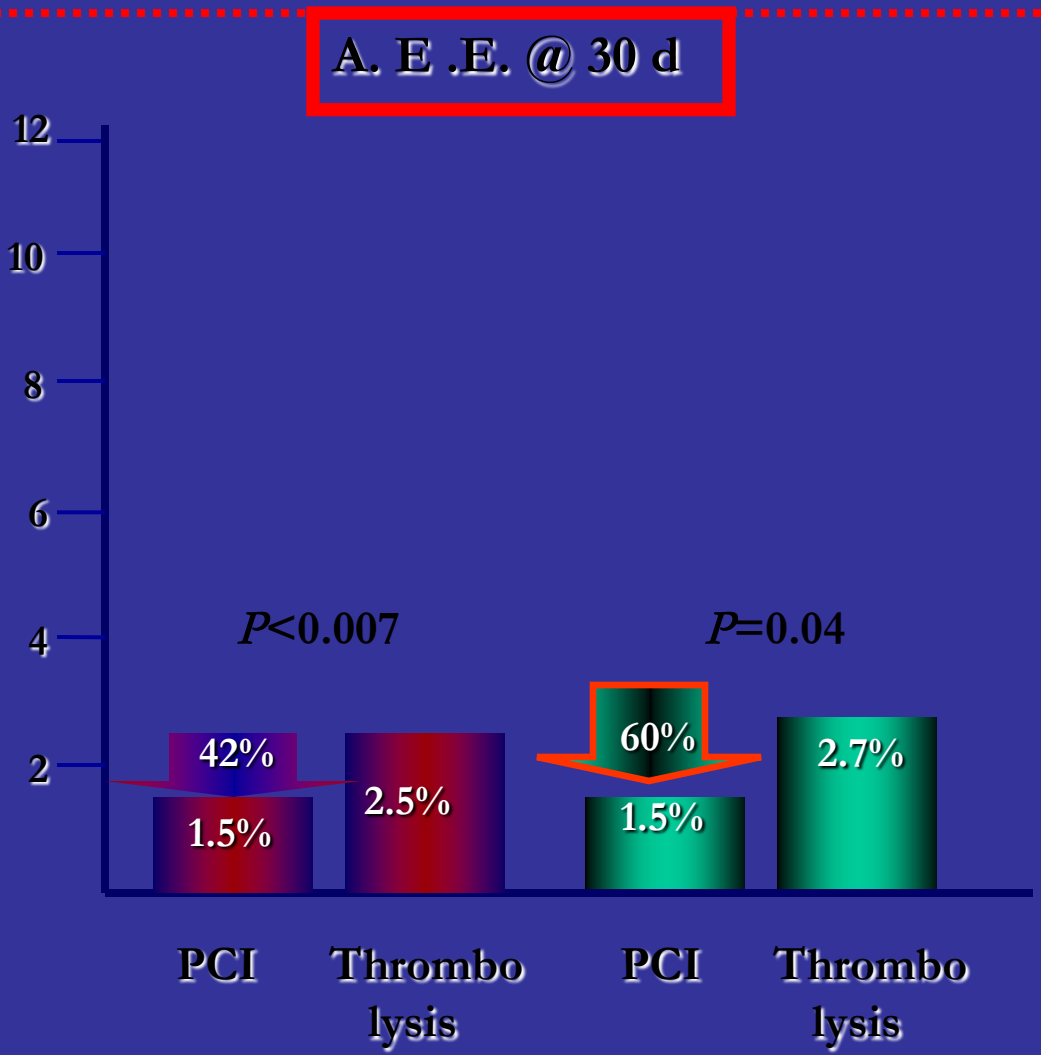

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CONCLUSIONS

- **Multivariable analysis: pPCI associated with decreased 30-day mortality in patients with and without DM, with a point estimate of greater benefit in diabetic patients**
- **The beneficial effect of primary PCI compared with fibrinolysis is consistent in patients with and without diabetes**
- **Wider application of timely primary PCI could be an important strategy to improve outcomes in the high-risk population of diabetic patients**

- Patients with DM & STEMI:
Impaired clinical outcome post-thrombolysis & possible etiological factors
- Primary PCI vs Thrombolysis in STEMI
- Patients with DM & STEMI:
Impaired clinical outcome post-pPCI & possible (pts- & intervention-specific) etiological factors
- Meta-analysis of pPCI vs Thrombolysis studies in DM
- ESC (AHA) guidelines

Stroke Complicating Percutaneous Coronary Interventions

Incidence, Predictors, and Prognostic Implications

Shmuel Fuchs, MD; Eugenio Stabile, MD; Timothy D. Kinnaird, MD; Gary S. Mintz, MD; Luis Gruberg, MD; Daniel A. Canos, MPH; Ellen E. Pinnow, MS; Ran Kornowski, MD; William O. Suddath, MD; Lowell F. Satler, MD; Augusto D. Pichard, MD; Kenneth M. Kent, MD; Neil J. Weissman, MD

Background—Stroke associated with percutaneous coronary intervention (PCI) is an infrequent although devastating complication. We investigated the incidence, predictors, and prognostic impact of periprocedural stroke in unselected patients undergoing PCI.

Methods and Results—A total of 9662 patients who underwent 12 407 PCIs between January 1990 and July 1999 were retrospectively studied. Stroke was diagnosed in 43 patients (0.38% of procedures). Patients with stroke were older (72±11 versus 64±11 years, $P<0.001$), had lower left ventricular ejection fraction (42±12 versus 46±13%, $P=0.04$) and more diabetes (39.5% versus 27.2%, $P=0.07$), and experienced a higher rate of intraprocedural complications necessitating emergency use of intra-aortic balloon pump (IABP) (23.3% versus 3.3%, $P<0.001$). In-hospital mortality (37.2% versus 1.1%, $P<0.001$) and 1-year mortality (56.1% versus 6.5%, $P<0.001$) were higher in patients with stroke. Compared with hemorrhagic stroke, patients with ischemic stroke had higher rate of in-hospital major adverse cardiac events (57.1% versus 25%, $P=0.037$). Multivariate logistic regression analysis identified emergency use of IABP as the strongest predictors for stroke (OR=9.6, CI 3.9 to 23.9, $P<0.001$), followed by prophylactic use of IABP (OR=5.1), age >80 years (OR=3.2, compared with age <50 years), and vein graft intervention (OR=2.7).

Conclusions—Stroke associated with contemporary PCI is associated with substantial increased mortality. Elderly patients who experience intraprocedural complications necessitating the use of IABP are at particularly high risk. (***Circulation.*** **2002;106:86-91.)**

TABLE 5. Independent Predictors for In-Hospital Stroke and One-Year Mortality

Predictive Variables	OR	95% Confidence Interval	*P*
Stroke			
IABP, emergency use	9.6	3.9–23.9	<0.001
IABP, prophylactic use	5.1	1.8–14.0	0.002
Age >80 years*	3.2	1.4–7.7	0.008
Intervention to SVG	2.7	1.3–5.8	0.01
1-year mortality			
Stroke	9.8	4.6–21	<0.001
IABP, emergent use	4.4	3.3–6.0	<0.001
IABP, prophylactic use	2.9	2.2–3.9	0.002
Age*			
61–70 y	1.8	1.3–2.3	<0.001
71–80 y	3.1	2.4–4.0	<0.001
>80 y	5.1	3.6–7.0	<0.001
Chronic renal failure	3.4	2.7–4.2	<0.001
Diabetes	1.9	1.5–2.3	<0.001
Intervention to SVG	1.6	1.3–2.0	<0.001
CK-MB >5 times, periprocedure	1.6	1.3–1.9	<0.001
Female sex	1.3	1.1–1.5	0.003
Prior myocardial infarction	1.3	1.1–1.6	0.004
Unstable angina	1.3	1.0–1.5	0.019
Hypertension	1.2	1.0–1.5	0.034

*Odds ratio presents estimated risk compared with patients <50 years of age.

SVG indicates saphenous vein graft.

Clinical Outcomes

Patients with stroke had higher in-hospital and 1-year cumulative mortality, and higher in-hospital Q- and non–Q-wave myocardial infarction rates (Table 6). Out-of-hospital mortality rate was also increased in stroke patients (22.2% versus 3.9%, $P=0.006$). In-hospital death occurred 8.0 ± 10.9 and

TABLE 6. In-Hospital and 1-Year Events

	With Stroke	Without Stroke	*P*
In-hospital events			
Angiographic success	95.4	98.1	0.45
Clinical success, %	53.5	95.9	<0.001
Major adverse cardiac events, %	41.9	2.7	<0.001
Death	37.2	1.1	<0.001
Q-wave infarction	4.7	0.3	<0.001
Repeat lesion angioplasty	4.7	1.5	0.09
Non–Q-wave infarction, %	41.5	19.3	<0.001
Pulmonary edema, %	17.2	3.2	<0.001
Major bleeding,* %	23.3	3.4	<0.001
1-year cumulative events			
Death, %	56.1	6.5	<0.001
Q-wave infarction, %	4.7	6.1	0.93
Death/Q-wave infarction, %	58.5	11.5	<0.001

Primary PCI vs. thrombolysis in the elderly

(Alexander KP et al:Circulation 2007;115:2570)

- The major benefit from PCI: reduction in reinfarction & TVR
- Mortality reduction trends less robust
- PCI and fibrinolytic: similar outcomes ≤ 3 hours from Sx-onset
- PCI preferable >6 hrs;
still affects myocardial salvage >12 hrs from Sx-onset
- More data needed in patients ≥80 years of age

Acute Coronary Care in the Elderly, Part II: ST-Segment–Elevation Myocardial Infarction

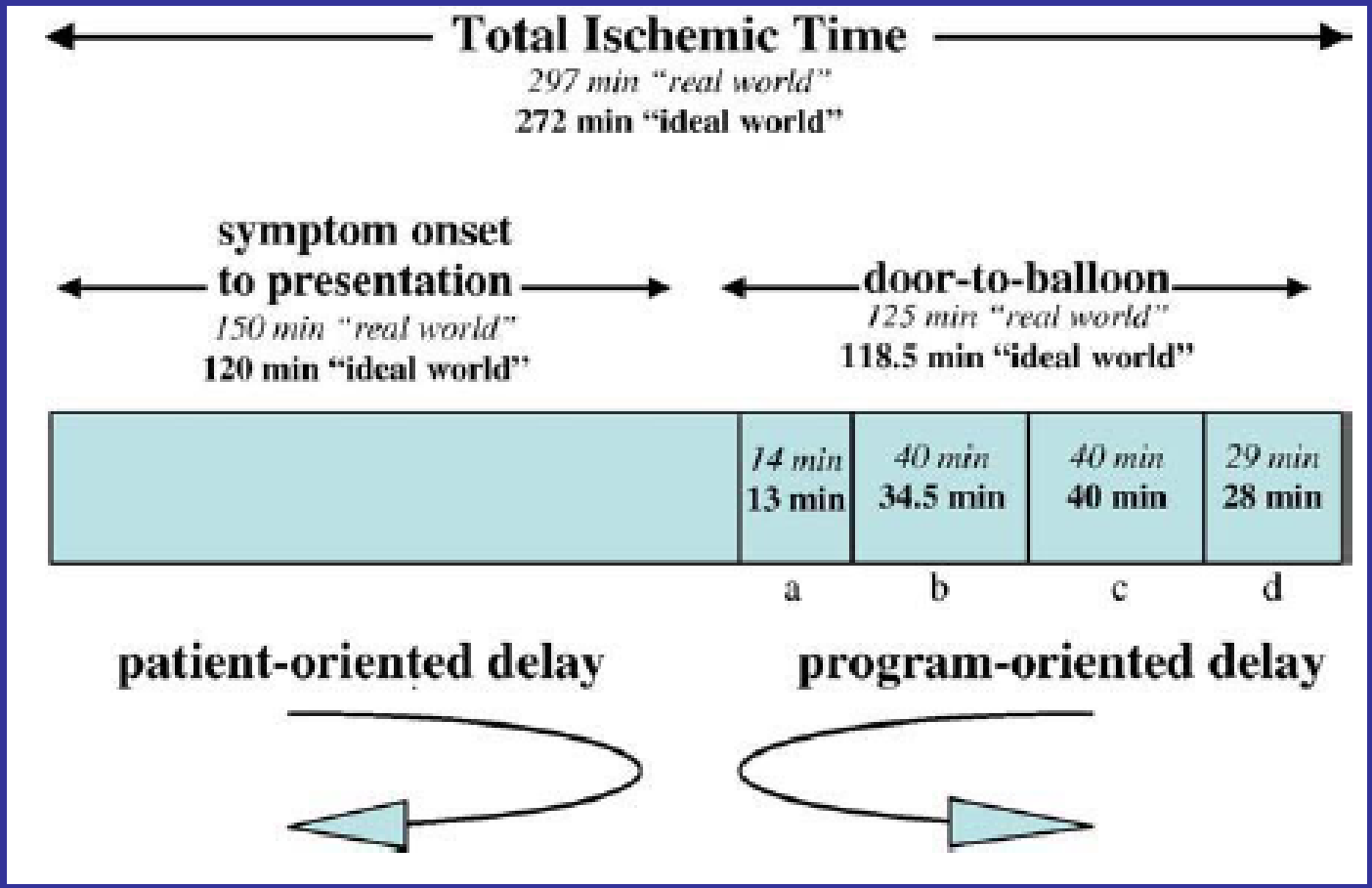
A Scientific Statement for Healthcare Professionals From the

American Heart Association Council on Clinical Cardiology

In Collaboration With the Society of Geriatric Cardiology

Treatment delay in patients undergoing pPCI: A key process analysis of patient and program factors

(Parikh SV et al: AHJ. 2008;155:290)



(a) door to first ECG,
(b) ECG to activation of the on-call cardiac catheterization team, (c) activation of the on-call cardiac catheterization team to start of the procedure, & (d) start of the procedure to balloon inflation.
The times shown are median values.

D2B-related delay

a) Door to first ECG
b) ECG to activation of the on-call cardiac catheterization team
c) Activation of the on-call cath-lab team to start of the procedure,
d) Start of the procedure to balloon inflation

Importance of time-to-reperfusion in patients with acute myocardial infarction with and without cardiogenic shock treated with primary percutaneous coronary intervention

(Brodie BR et al: Am Heart J. 2003 Apr;145(4):708)

- Consecutive patients with AMI (n = 1843) treated with pPCI enrolled
- Late clinical FU at a mean time of 6.1 years
  - ✓In patients with shock (n = 138), the inhospital mortality rate increased progressively with increasing time-to-reperfusion (<3 hours, 31%; 3-<6 hours, 50%; > or =6 hours, 62%; P =.01),
  - ✓In patients without shock (n = 1705), inhospital and late mortality rates were similar across 3 categories of time to reperfusion (<3 hours, 5.8%; 3-<6 hours, 4.6%; > or =6 hours, 4.8%; P =.46).

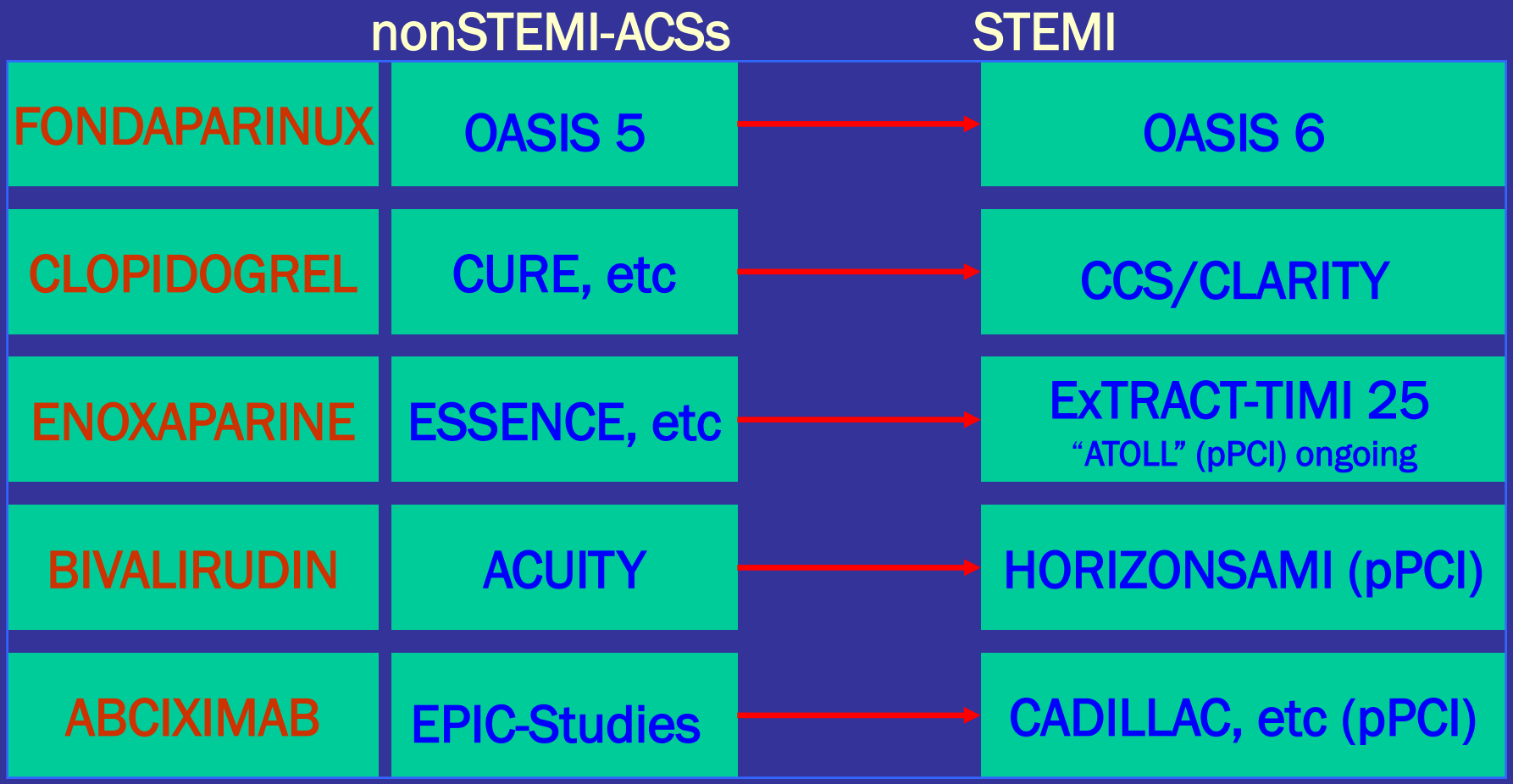
Impact of Time of Presentation on the Care and Outcomes of AMI

(Jneid H, *Circulation* May 13, 2008; Vol 117)

- Get With the Guidelines–Coronary Artery Disease database admitted to 379 hospitals throughout the US from July 2000-September 2005
- A registry and performance-improvement initiative undertaken by the AHA to enhance guideline adherence among hospitalized CAD patients
- Uses of a Web-based Patient Management Tool for interactive assessment & reporting
- Automated electronic data checks to prevent out-of-range entry or duplicate patients.

- 62 814 AMI patients
- **54.1% arrived during off-hours**
  - ✓ Had **longer D2B** times (Δ-median, 25 min; *P*<0.0001), &
  - ✓ **Less likely to achieve D2B <90** min. (adj. OR, 0.34; 95% CI, 0.29-0.39)
  - ✓ Had **similar rate of revascularization**
- **Similar mortality** (vs. on- hours) (adj OR, 1.05; 95% CI, 0.94-1.18)

Patients with STEMI (vs. nonSTEMI-ACSs): Pharmacotherapy development in primary PCI



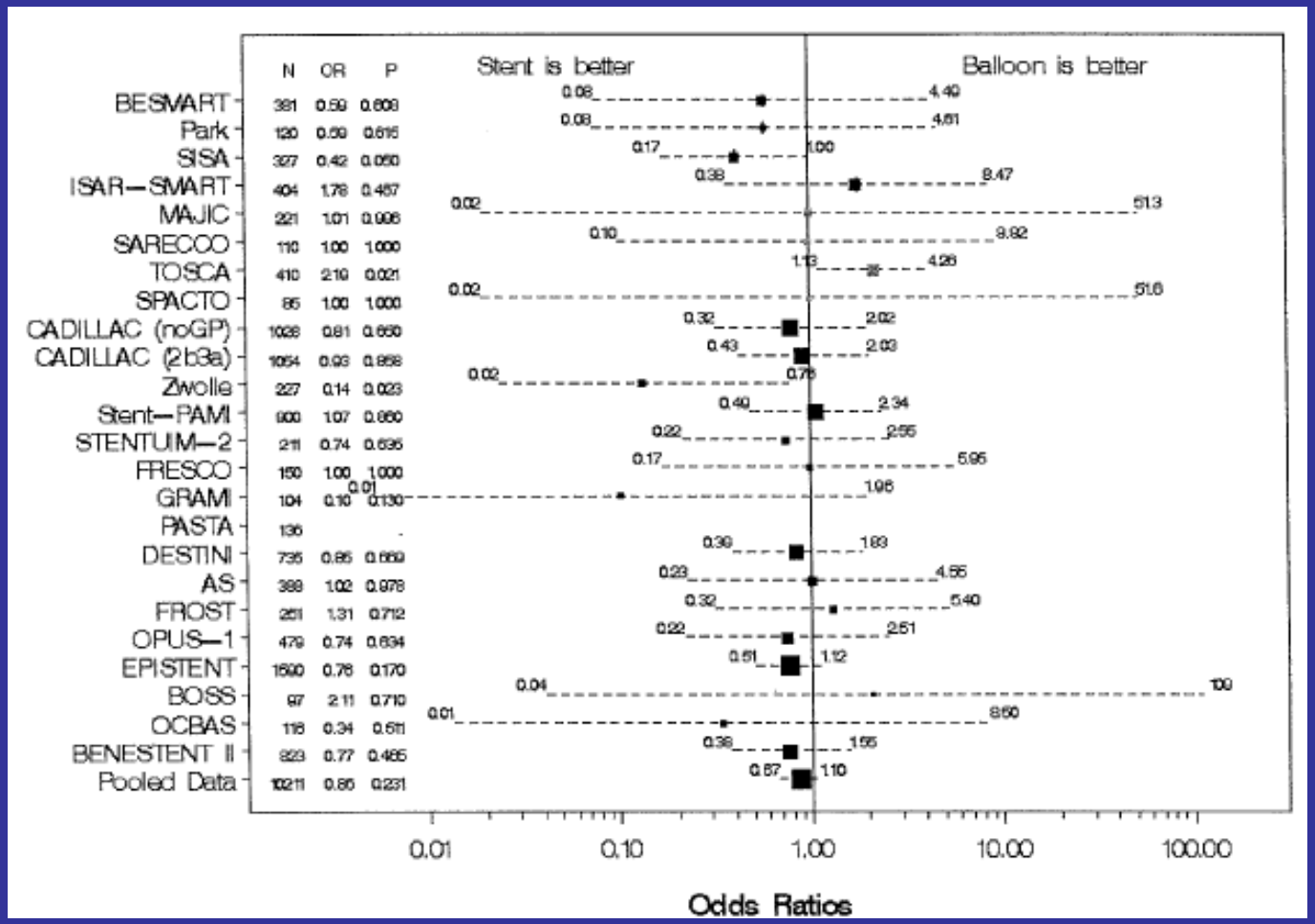
ESC-STEMI Guidelines: 2003

AHA/ACC-STEMI Guidelines: 2004

The impact of stenting (vs. POBA) in pPCI

(Suwaidi J Al, et al: AHJ 2004;147:815)

- 23 trials; 10,347 patients enrolled



'An initial strategy of stent placement versus POBA with provisional stenting is associated with a similar mortality rate and frequency of nonfatal myocardial infarction after a mean FU of 13 months.'

Πέμπτη 30 Οκτωβρίου 2008 | Thursday, 30 October 2008

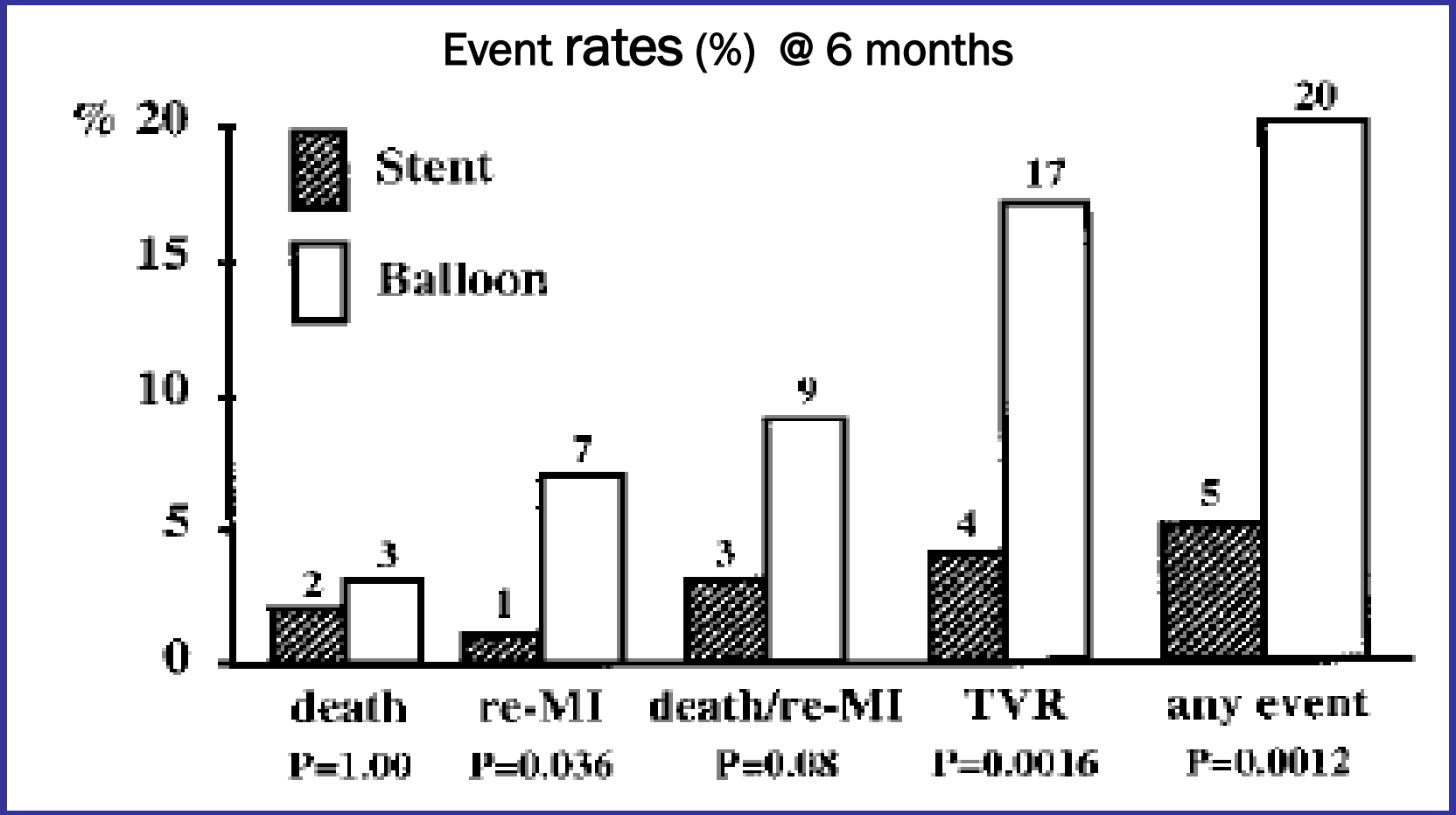
Αίθουσα Β | Room B

16.30 - 18.00 Έμφραγμα του μυοκαρδίου:
Αντιμετώπιση σε νοσοκομείο με ή χωρίς αιμοδυναμικό εργαστήριο
Myocardial infarction: Treatment in a hospital with or without catheterization laboratory
Πρόεδροι: Α. Ζαχαρούλης, Σ. Καστελάνος
Chairpersons: A. Zaharoulis, S. Kastelanos

16.30 - 16.50 Πρωτογενής αγγειοπλαστική στο έμφραγμα του μυοκαρδίου με ανάσπαση του ST - **Γ. Χάχαλης**
Primary angioplasty of ST elevation myocardial infarction - **G. Hahalis**

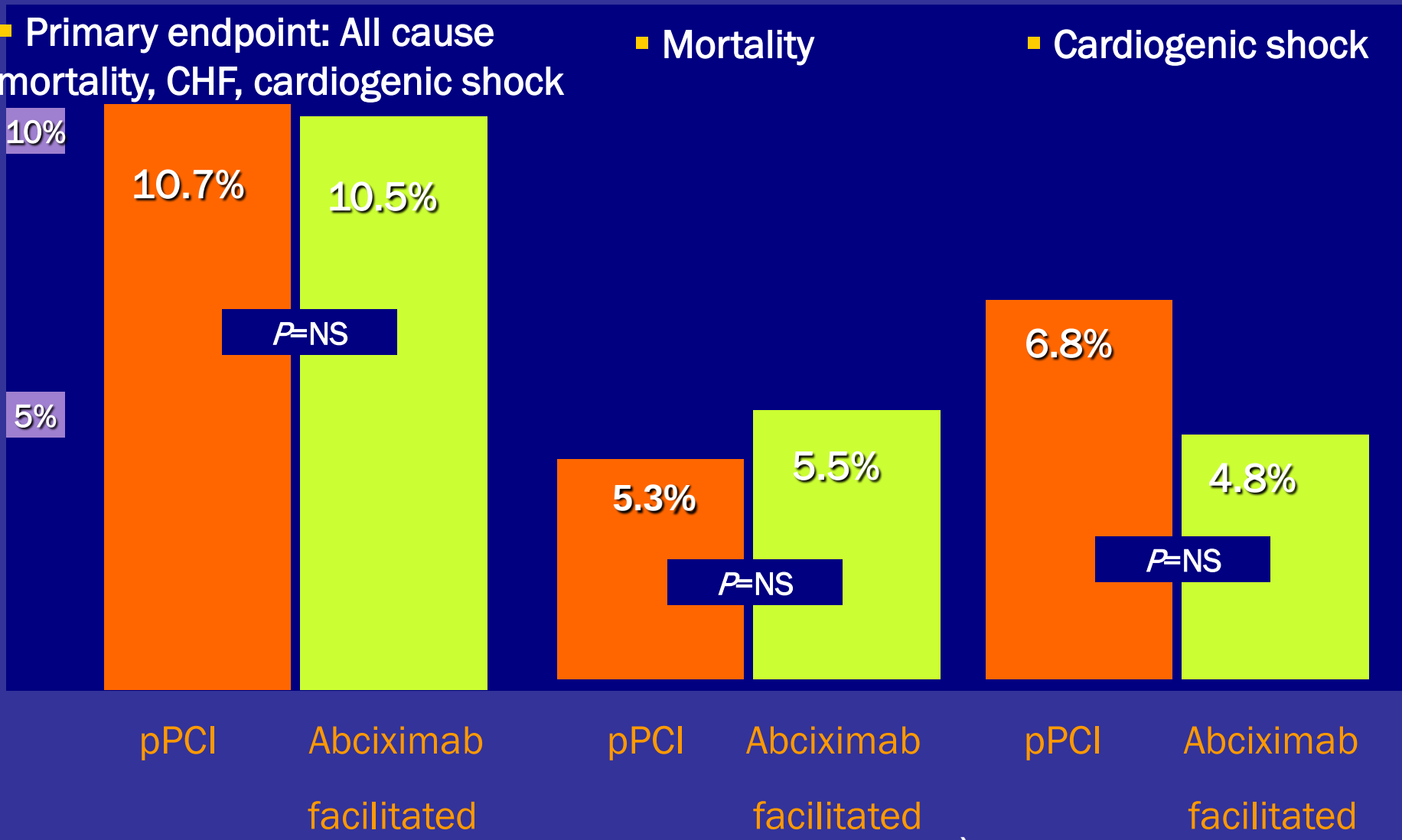
The impact of stenting (vs. POBA) in pPCI

The Zwolle experience (pPCI in 227 selected, randomized STEMI pts)



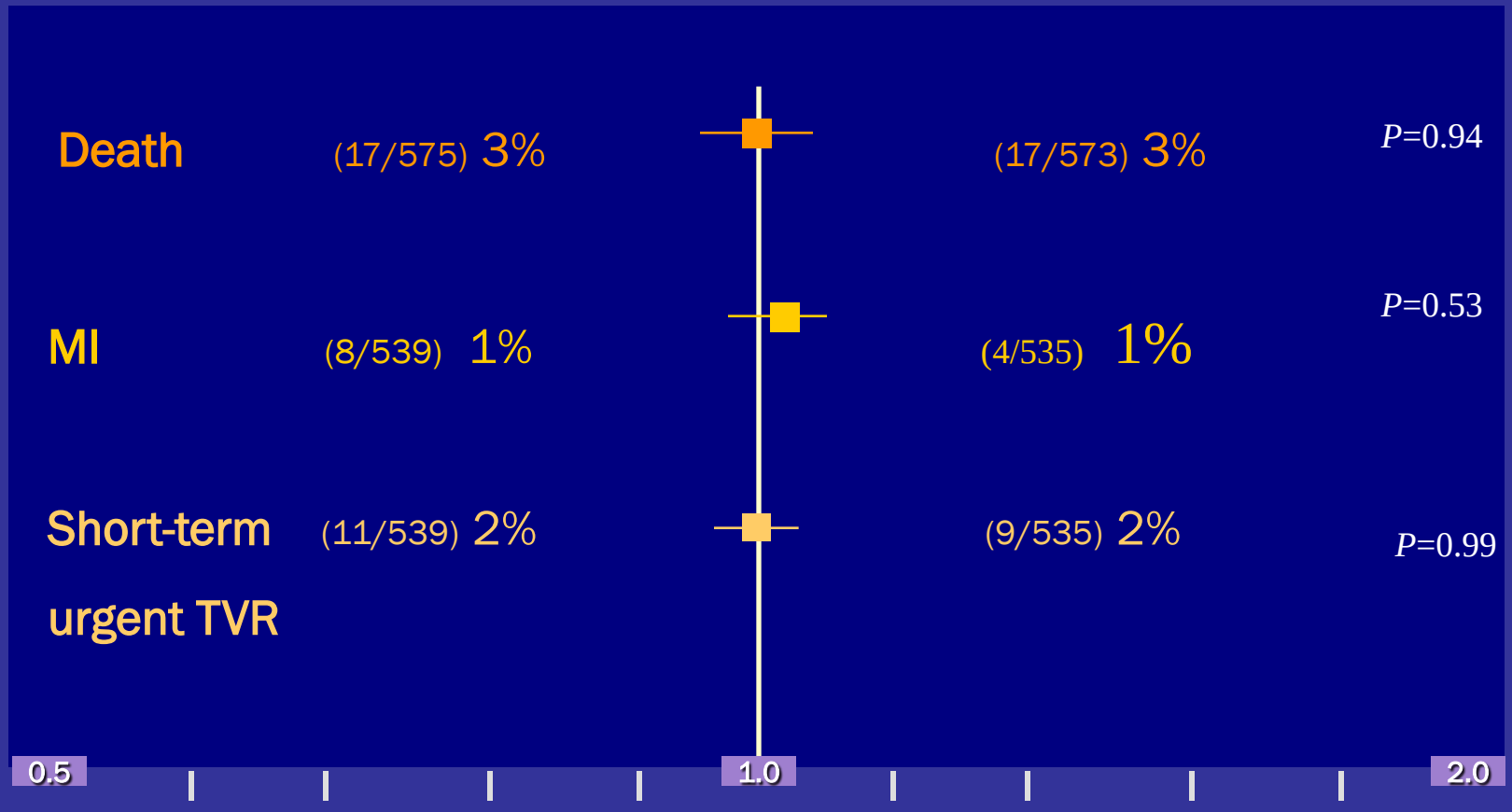
(Suryapranata H et al: Circulation 1998;97:2502)

FINESSE: Abciximab-facilitated PCI vs primary PCI



(Ellis S et al: Presented at ESC & TCT 2007)

IIb/IIIa Inhibitors-Facilitated PCI vs primary PCI
Nine studies, excl. FINESSE



Similar incidence of major bleeds (5% vs 7%)

(Keeley E et al: Lancet 2006;367: 579)

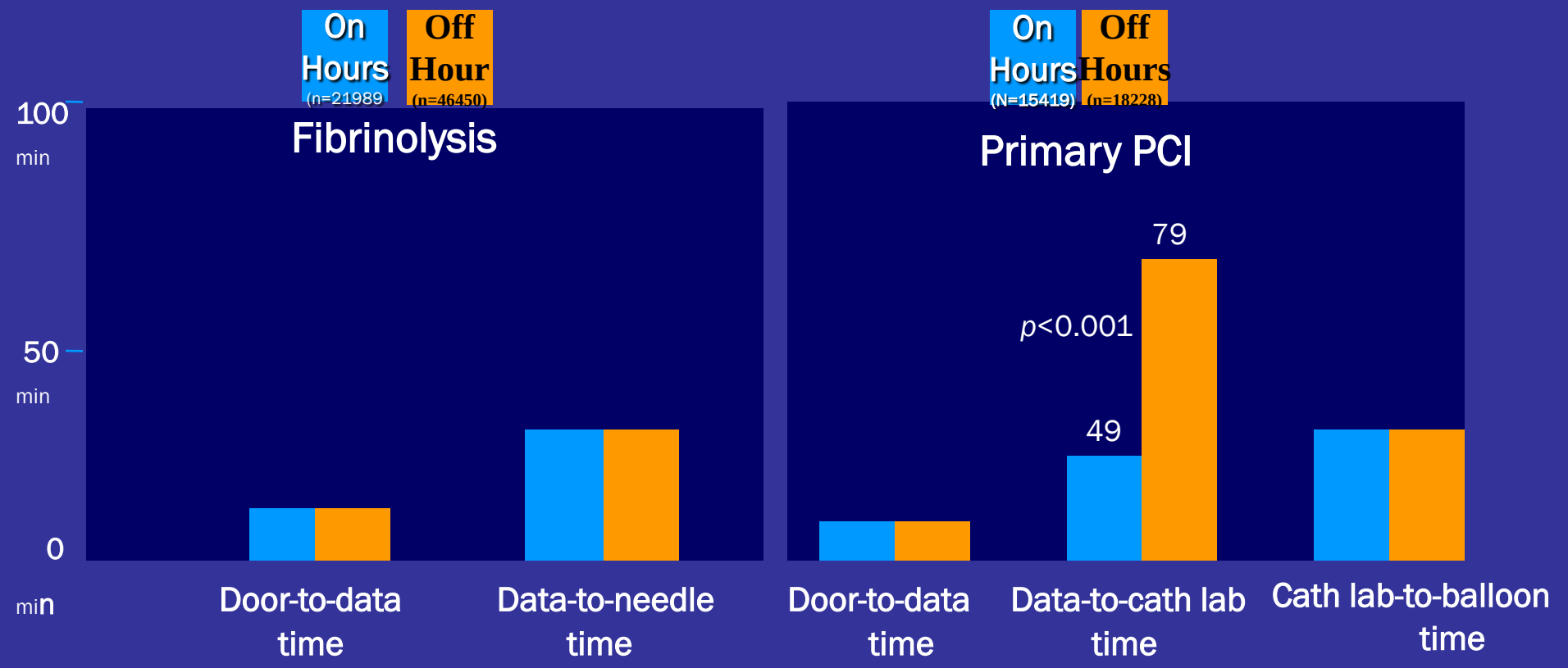
Optimal goals in STEMI reperfusion

- Golden hour: first 60 minutes from symptom onset
- Total ischemic time $\leq$ 120 minutes

On- vs. Off hours in STEMI reperfusion & mortality

(NMRI 3-4, 1999-2002)

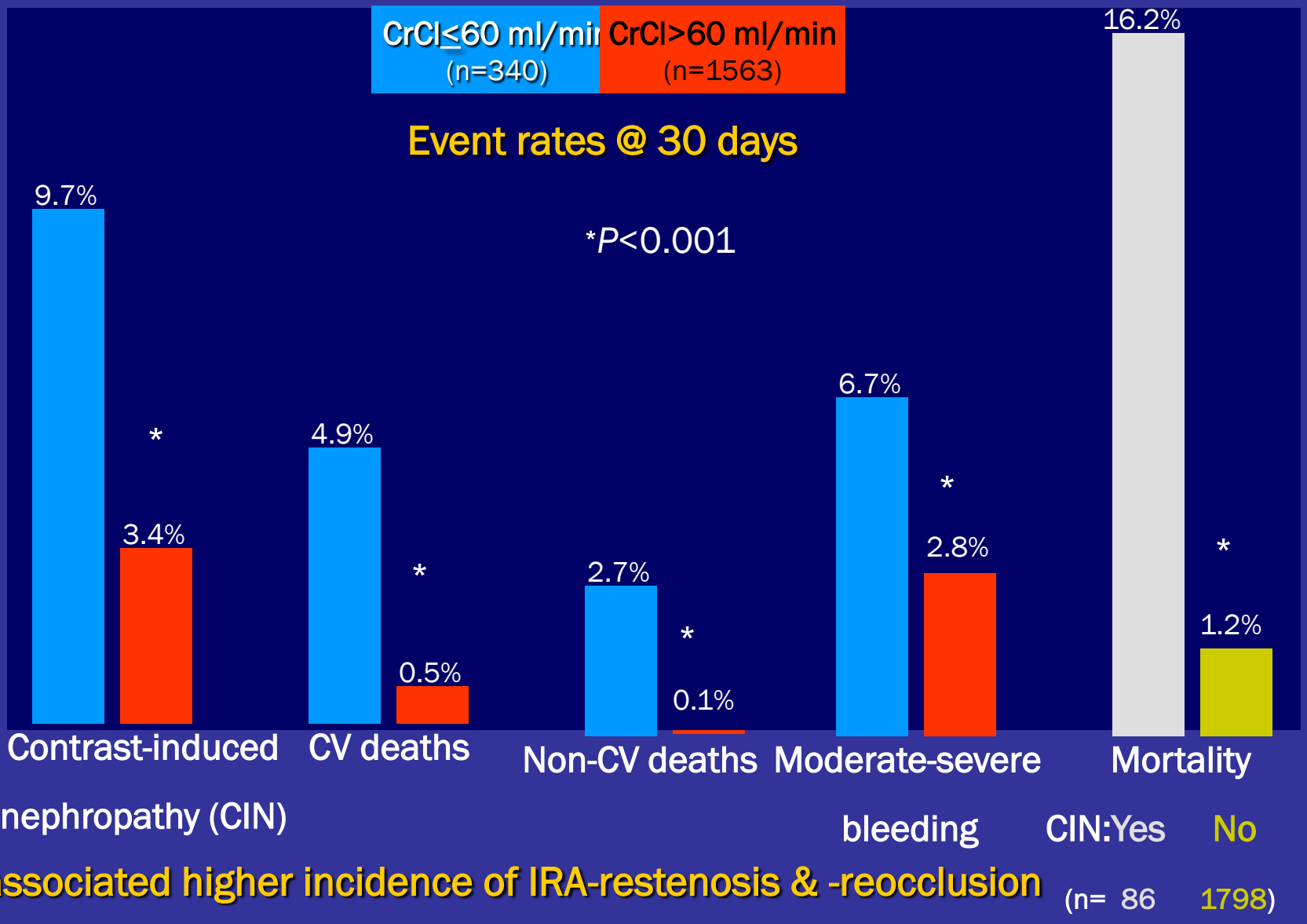
(Magid DJ et al:JAMA 2005;294:803)



- Higher adjusted in-hospital mortality: Off versus On- hours: (OR: 1.07, *P*=0.02)
- Longer activation of the cath lab during off-hours, due to off site cath lab personnel

The impact of renal insufficiency (RI) in primary PCI

(Sadeghi MH et al-The CADILLAC Trial-: Circulation 2003;108:2769)



RI-associated higher incidence of IRA-restenosis & -reocclusion

The impact of volume load in pPCI outcome

(Canto JG et al-The NRMI 2 investigators-: NEJM 2003;342:1573)

	QUARTILE 1	QUARTILE 2	QUARTILE 3	QUARTILE 4	*P*
No. of eligible patients	15,061	18,607	23,590	31,039	
Thrombolytic therapy	59%	58%	47%	27%	<0.01
pPCI	10%	16%	22%	38%	<0.01
Door-to-ballon, median	129 min	135 min	129 min	119 min	
Adjusted hazards ratio	**1.0**	**0.87** (0.71–1.07)	**0.83** (0.69–1.01)	**0.72** (0.60–0.87)	

‘ Among hospitals with full interventional capabilities, a higher volume of PCI procedures is associated with a lower pPCI mortality.
Such association does not exist between volume and mortality for thrombolytic therapy’

No-reflow

(Piek JJ: NEJM 2007;356:1880)

- Incidence approx. 10%
- Thrombus-aspiration devices
- I.V./I.C. Abciximab, SK,
- I.C.Nitro, Adenosin, Nitroprusside, Verapamil
- Additional stenting

False alarm of the cath lab

(Larson DM et al: JAMA 2007;298:2754)

- 1335 pts with pPCI - **9% without culprit IRA & with neg. biomarkers**
- Mortality rate:2.7% vs 4.6% with culprit artery (p=ns)

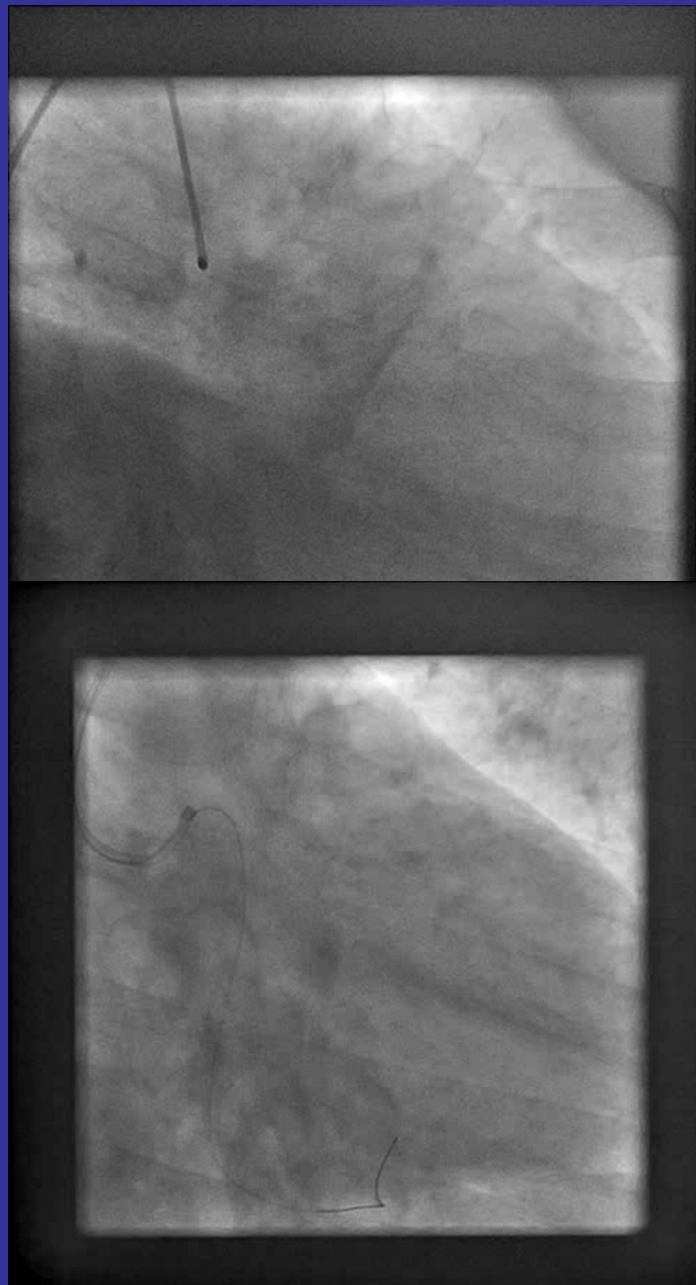
Etiologies	**n**
Early repolarization	25
Non-diagnostic ECG	21
Pericarditis	20
Previous MI	20
LBBB	11
Vasospasm	4
Other	14

Primary STEMI in a 49 years old male patient with inferolateral ST-elevation

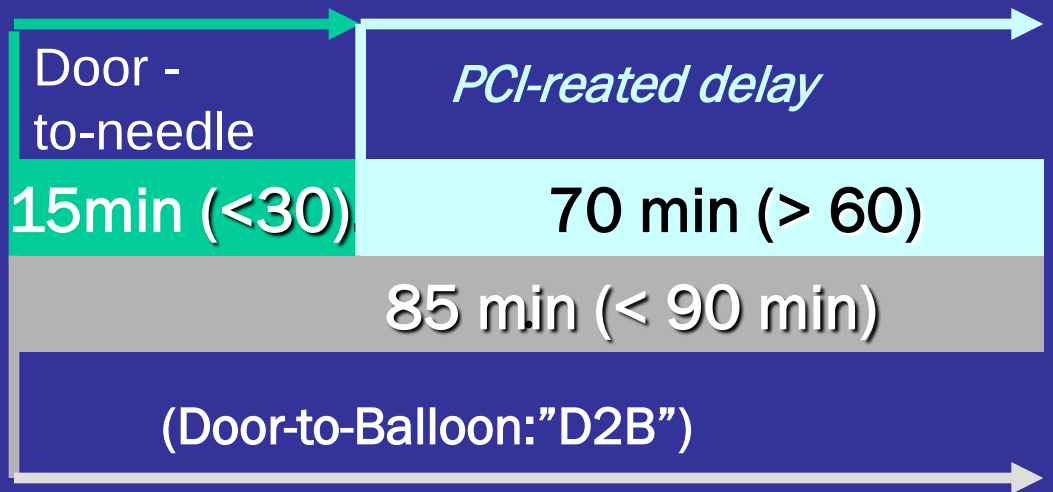
- Symptom onset: 5:15 p.m.
- Arrival at hospital 1 (Agrinio): 6:15 p.m.
Fibrinolysis denied due to high BP
- Contact with the cath lab at our hospital: 6:30 p.m.

Estimated transport time: 45 min

- Arrival at hospital/cath lab 2 (Rio): 7:20 p.m.
Mild Sx/less ST-elevation.
IRA thought to be patent
- First balloon dilatation: 7:40 p.m.



Primary STEMI in a 49 years old male patient with inferolateral ST-elevation



Total ischemic time:
145 min (<2.5 h)
(60 min + 85 min)

Remark #1:
pPCI in contraindicated fibrinolysis

Remark #2:
IRA-patency criteria not accurate

Remark #3:
PCI-related delay by 16%
D2B-time by 5%
than recommended

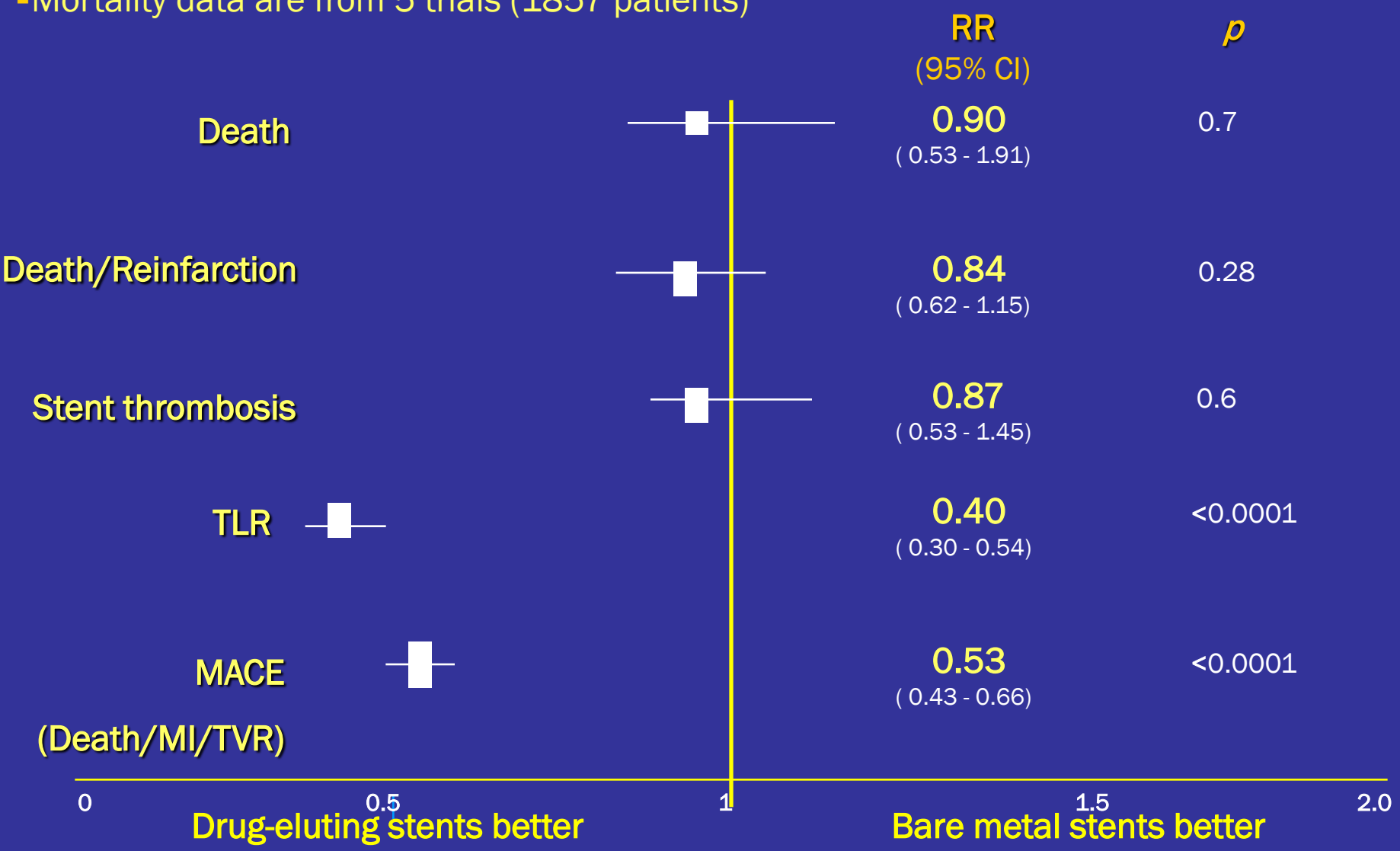
HORIZONS-AMI: Primary efficacy and safety end points

End point	Taxus, n=2257 (%)	Express BMS, n=749 (%)	Hazard ratio (95% CI)
Ischemic TLR	4.5	7.5	0.59 (0.43–0.83)
• Safety MACE	8.1	8.0	1.02 (0.76–1.36)
• All-cause mortality	3.5	3.5	0.99 (0.64–1.55)
• MI	3.7	4.5	0.81 (0.54–3.22)
• Stroke	1.0	0.7	1.52 (0.58–4.00)
• Stent thrombosis	3.1	3.4	0.92 (0.58–1.45)
Binary restenosis, per lesion, at 13 mo	10.0	22.9	0.44 (0.33–0.57)
Binary restenosis, per patient, at 13 mo	10.9	24.9	0.40 (0.33–0.57)

(Stone G. TCT 2008; October 15, 2008; Washington, DC)

Primary PCI with DES vs BMSs

- Pooled analysis of 7 randomized trials comparing DES and BMS in 2357 STEMI pts Follow-up rates are at 12 months in 6 trials and 8 months in 1 trial
- Mortality data are from 5 trials (1857 patients)

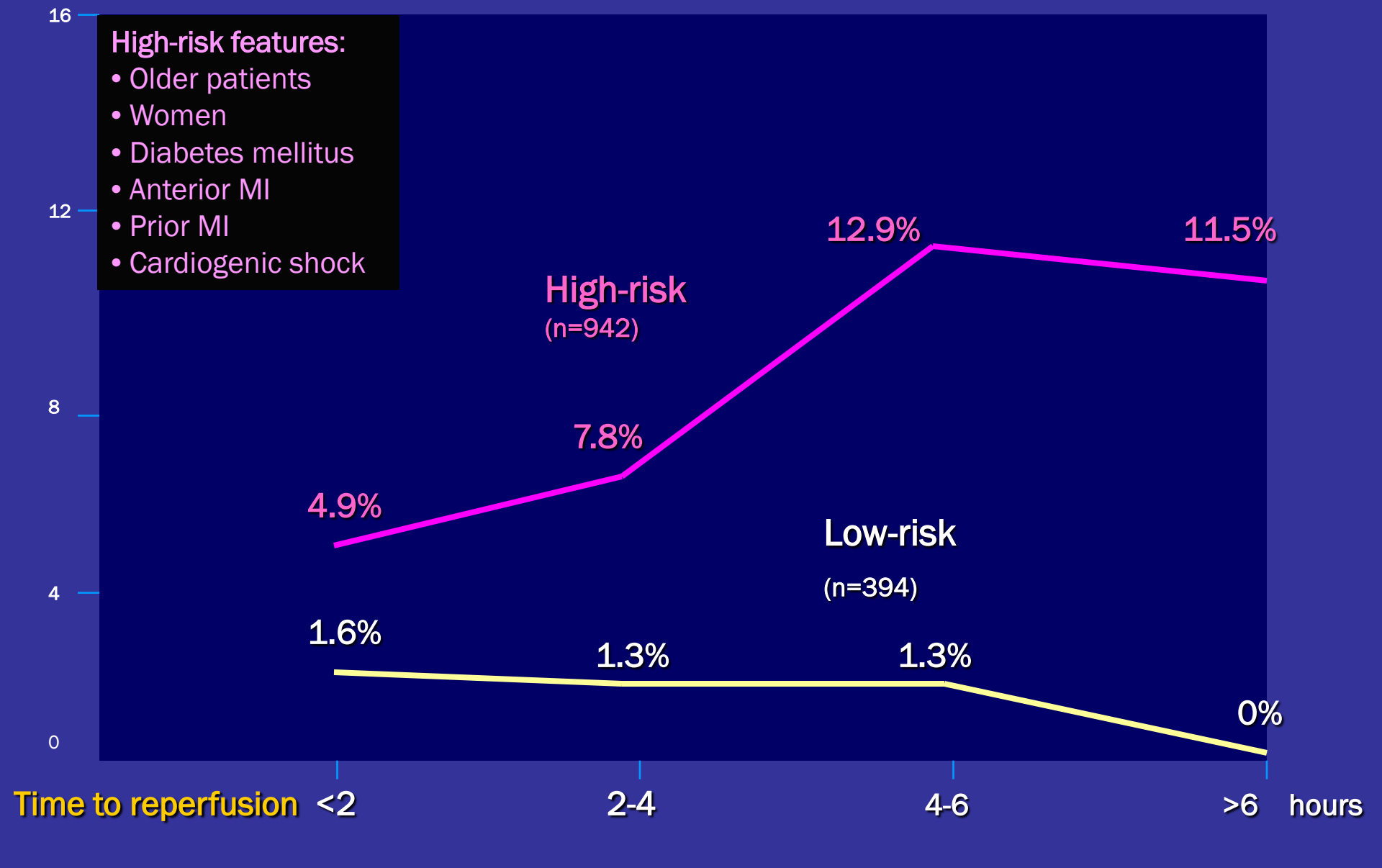


(Pasceri V et al:G: Am Heart J. 2007;153::749)

Relationship between time-to-treatment and mortality

Focus on the *high-risk* patient

(Antoniucci D et al: AJC 2002:89:1248)



Baseline Characteristics, Hospital Characteristics, and Time of Patient Arrival*

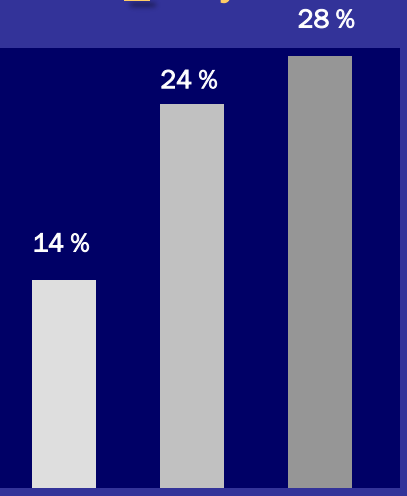
	RCT Participants (n = 953)	Eligible Patients (n = 4669)	Ineligible Patients (n = 2847)	3-Way *P* Value	RCT vs Eligible *P* Value	Eligible vs Ineligible *P* Value	Eligible and Ineligible Patients (n = 7516)	2-Way *P* Value†
	62.3 (52.7-71.8)	64.2 (53.4-74.7)	69.0 (57.4-78.5)	<.001	NA	NA	NA	<.001
	204 (21.7)	1315 (28.4)	997 (35.3)	<.001	NA	NA	NA	<.001
n	163 (17.2)	826 (17.8)	636 (22.4)	<.001	NA	NA	NA	.09
	173 (18.3)	887 (19.1)	748 (26.4)	<.001	NA	NA	NA	.02
	441 (46.5)	2262 (48.8)	1694 (59.9)	<.001	NA	NA	NA	<.001
	334 (35.5)	1739 (37.6)	1088 (38.6)	.23	NA	NA	NA	.13
ttack/stroke	35 (3.7)	44 (1.0)	544 (19.2)	<.001	NA	NA	NA	<.001
sease	51 (5.4)	261 (5.6)	252 (8.9)	<.001	NA	NA	NA	.09
	642 (67.8)	2895 (62.4)	1615 (57.0)	<.001	NA	NA	NA	<.001
ry intervention	77 (8.1)	411 (8.9)	273 (9.6)	.31	NA	NA	NA	.31
ss grafting	30 (3.2)	183 (3.9)	221 (7.8)	<.001	NA	NA	NA	<.01
cs								
	776 (83.1)	3791 (82.4)	2111 (75.3)	<.001	NA	NA	NA	.02
	22 (2.4)	173 (3.8)	65 (2.3)	<.001	NA	NA	NA	.15
an (IQR), mg/dL	1.02 (0.90-1.20)	1.02 (0.90-1.20)	1.07 (0.90-1.30)	<.001	NA	NA	NA	.23
tory	733 (76.9)	3632 (77.8)	2165 (76.0)	.22	.55	.08	5797 (77.1)	.88
	632 (66.3)	2665 (57.1)	1691 (59.4)	<.001	<.001	.048	4356 (58.0)	<.001
o.	600 (350-1300)	500 (275-850)	482 (250-850)	<.001	<.001	.002	500 (300-726)	<.001
	482 (51.1)	1996 (42.8)	1349 (48.6)	<.001	<.001	<.001	3345 (45.0)	<.001

Reperfusion in the elderly

Circulation 2007;115 *AH J* 2001; 141:190

RCT's GRACE NRMI

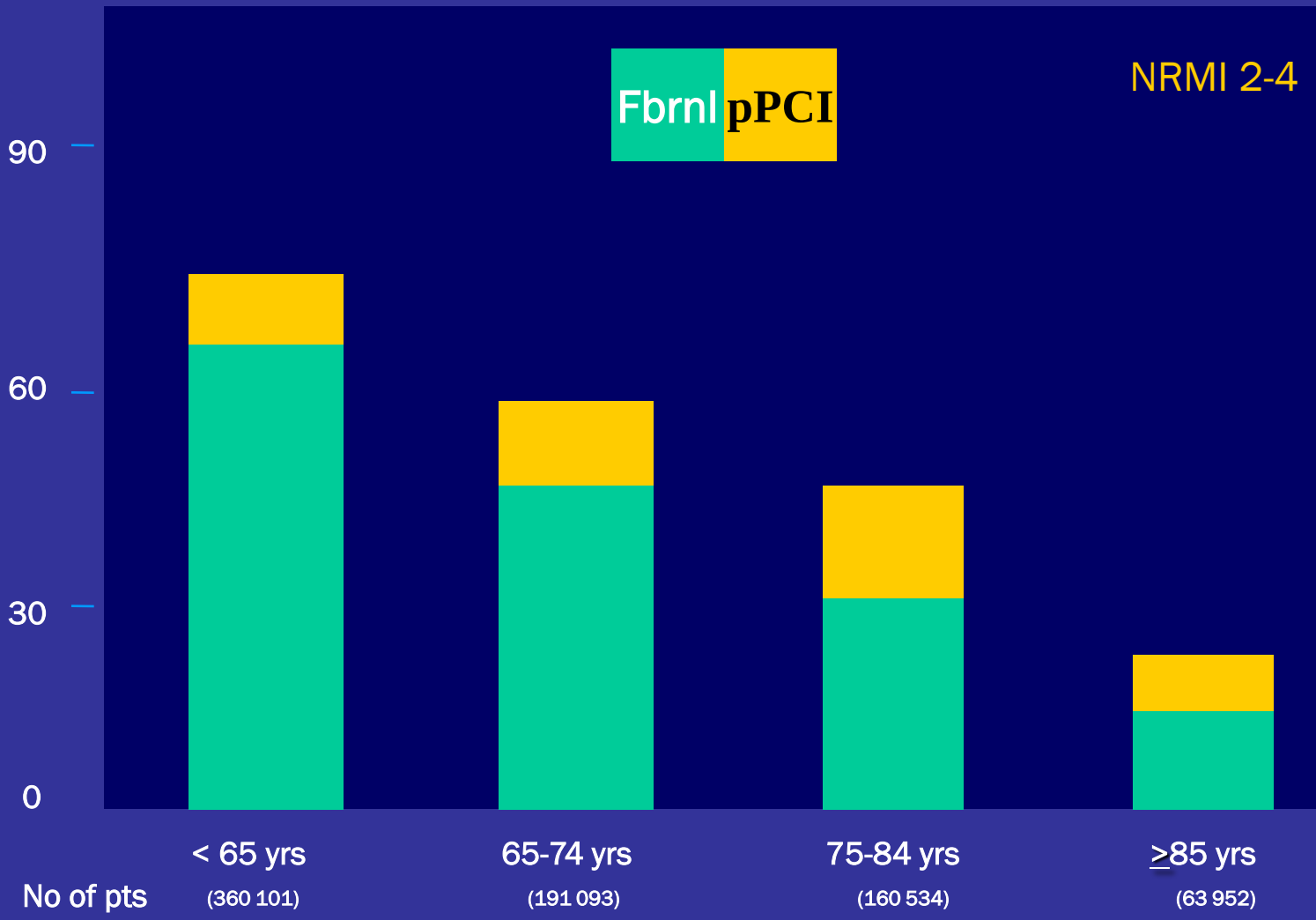
% ≥ 75 y



STEMI population
(N=892 236)

% of age group

(National Registry of Myocardial Infarction Web site. Available at: http://www.nrmi.org).



Abciximab in Patients With AMI Undergoing PCI After High Loading Dose of Clopidogrel Pretreatment (BRAVE-3)

- Patients undergoing PCI, after pretreatment with 500 mg of aspirin, 600 mg of clopidogrel, and 5000 IU UFH were randomly assigned to either abciximab + infusion or placebo (additional UFH of 70 U/kg, followed by placebo infusion for 12 hours).

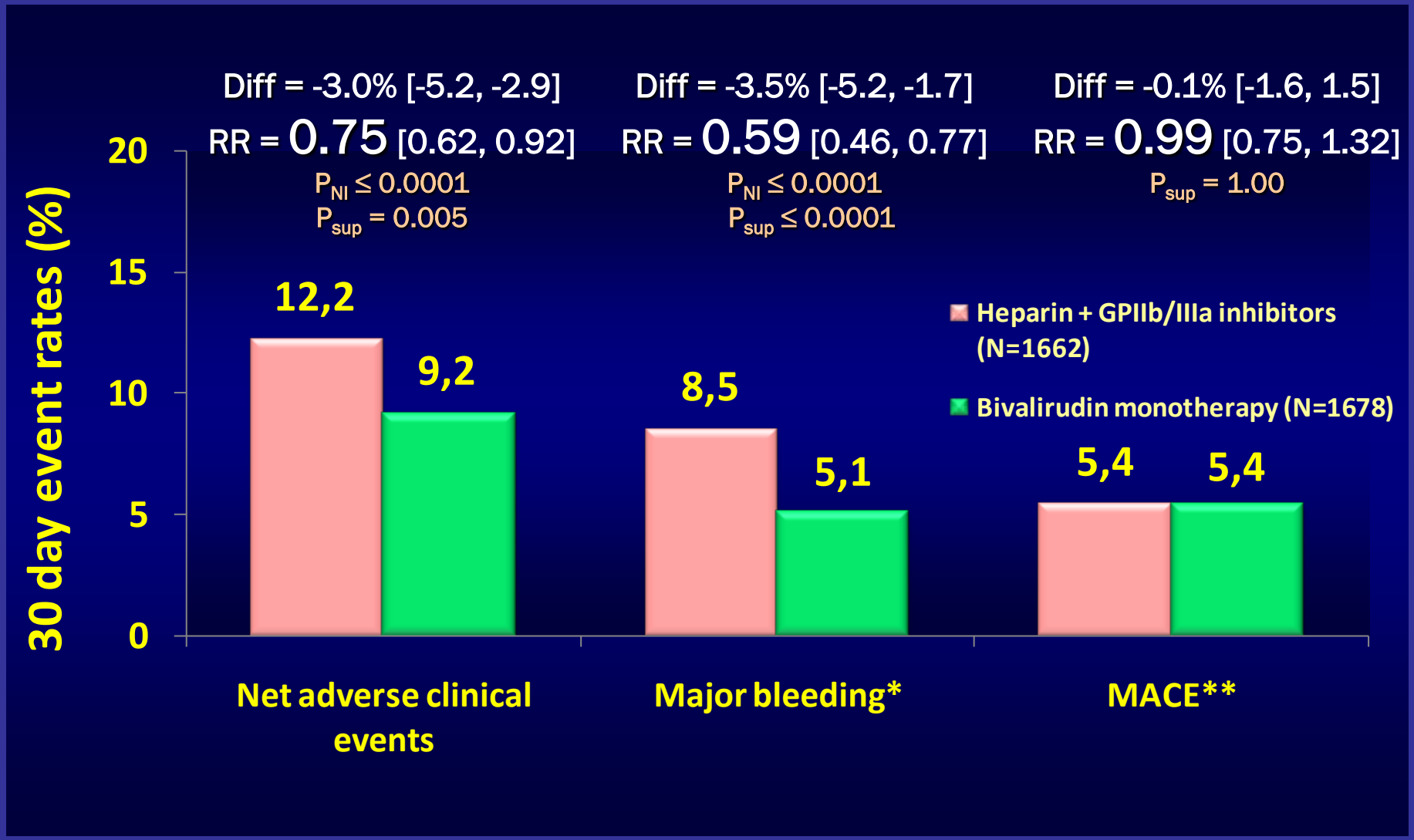
- N=800 pts, 17.5% with diabetes, and 63% with multivessel disease.
- Median door-to-balloon times 79 minutes

TIMI 3 flow in 92% of pts

- DES in about 44%, BMSs in 49% of the pts.
- **Mean final infarct size:** 15.7% vs. 16.5% in the abciximab and control groups, respect. (p = 0.47)

- **Mortality at 30 days:** 3.2% vs 2.5%, respect (p = 0.53).
- **Composite endpoint** of death, MI, stroke, or urgent revascularization:5.0% vs 3.8%, respect (p = 0.39)
- Minor bleeding was nonsignificantly elevated in the abciximab arm vs control arm (3.7% vs. 1.8%, p = 0.09),
- **Thrombocytopenia** was significantly higher (1.5% vs. 0%, p = 0.03).

Bivalirudin in the primary PCI cohort (N=3,340; 92.7%)



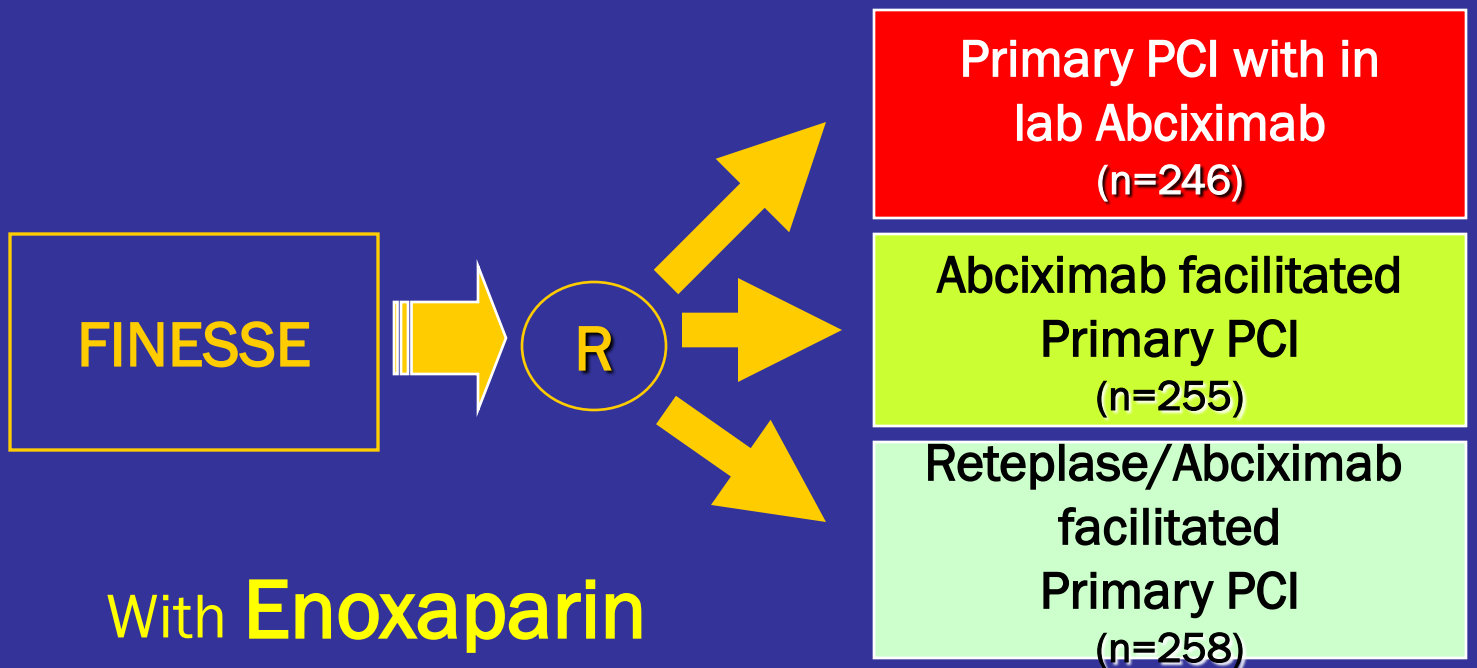
*Not related to CABG

**MACE = All cause death, reinfarction, ischemic TVR or stroke

UFH vs ENOXAPARIN & pPCI in FINESSE

(LMWH Substudy: Largest experience in pPCI w/ LMWH)

Objective: To assess safety & efficacy between LMWH & UFH



(Montalescot G: Presented at TCT 2007)

UFH vs ENOXAPARIN & pPCI in FINESSE

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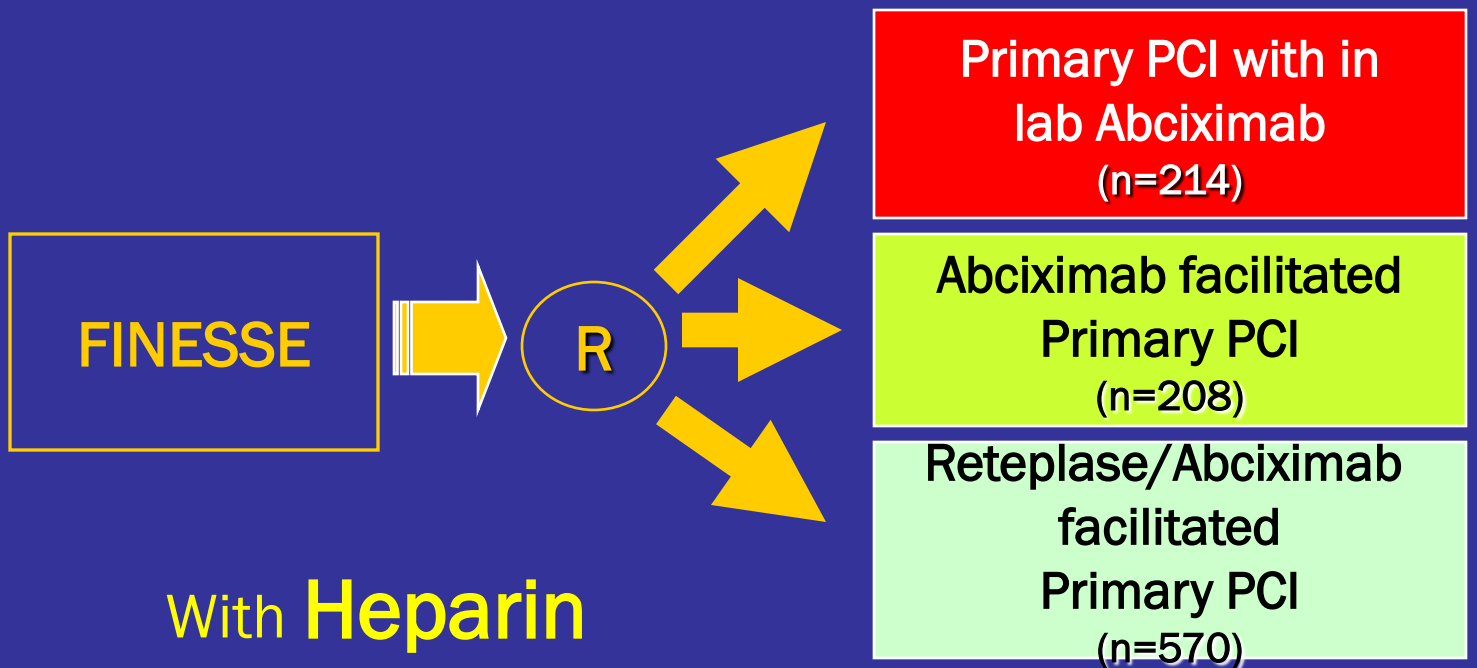


(Montalescot G: Presented at TCT 2007)

The D2B Alliance campaign (Availabla at::http://www.d2balliance.org/)

- Launched by the ACC
- Emphasis on having **≥75% of non-transfer patients with D2B ≤90 minutes**

Selected strategies

1. Activation of the cath lab **by emergency medicine physicians**
2. Establishment of a **single-call system** for activating the cath lab
3. Expectation that the cath team be **available, 20-30 min.**of being paged.
4. Use of **data monitoring and prompt data feedback** to emergency department and cath lab staff
5. **Senior management support & organizational environment** that fosters and sustains organizational change directed at improving D2B time.
6. **Team-based approach from ambulance to balloon**, within a culture of continuous quality improvement.

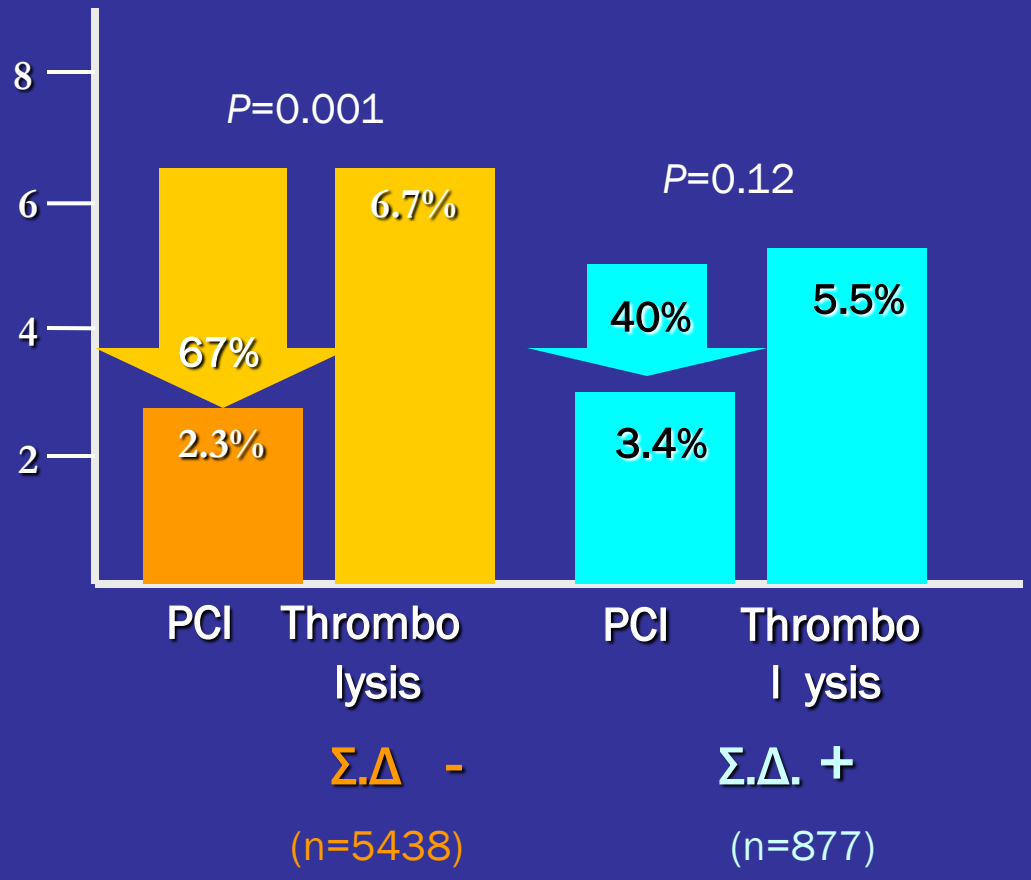
Thrombolysis as compared with primary PCI

- Less efficacious
- Less predictable efficiency
- More reinfarctions & recurrent ischemia
- Associated with intracranial hemorrhage

pPCI vs Thrombolysis in STEMI According to Diabetes Status

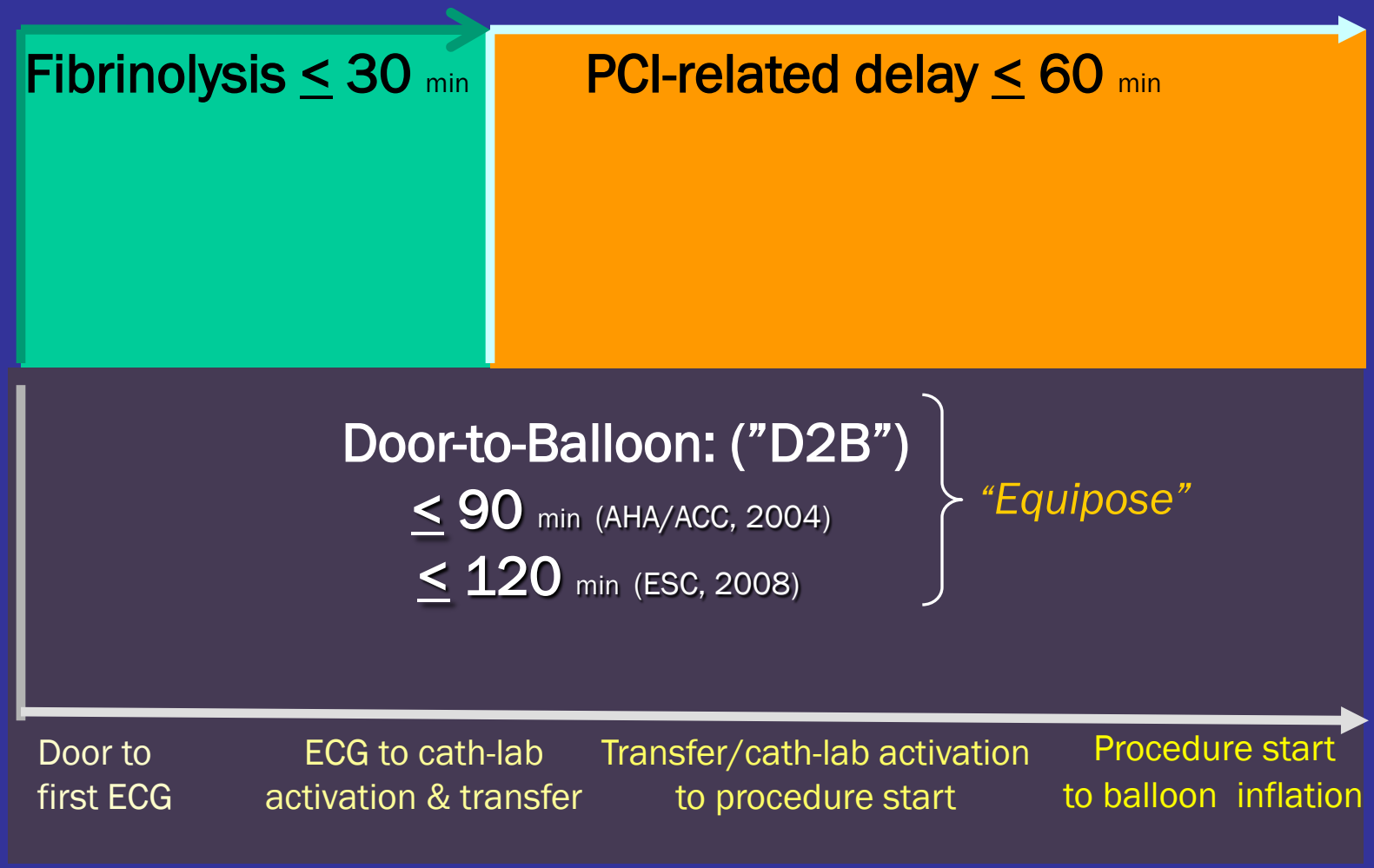
Timmer JR, Ottervanger JP, de Boer MJ, Boersma E, Grines CL, Westerhout CM, Simes RJ, Granger CB, Zijlstra F; Primary Coronary Angioplasty vs Thrombolysis-2 Trialists Collaborators Group.
Arch Intern Med. 2007 Jul 9;167(13):1353-9

ΕΠΑΝΕΜΦΡΑΓΜΑ @ 30 d



Recommended upper delay limits in primary PCI*

* D2B-time: A good indicator of quality of care
* Main determinants of D2B-time & PCI-related delay: Off-hours presentation & transportation

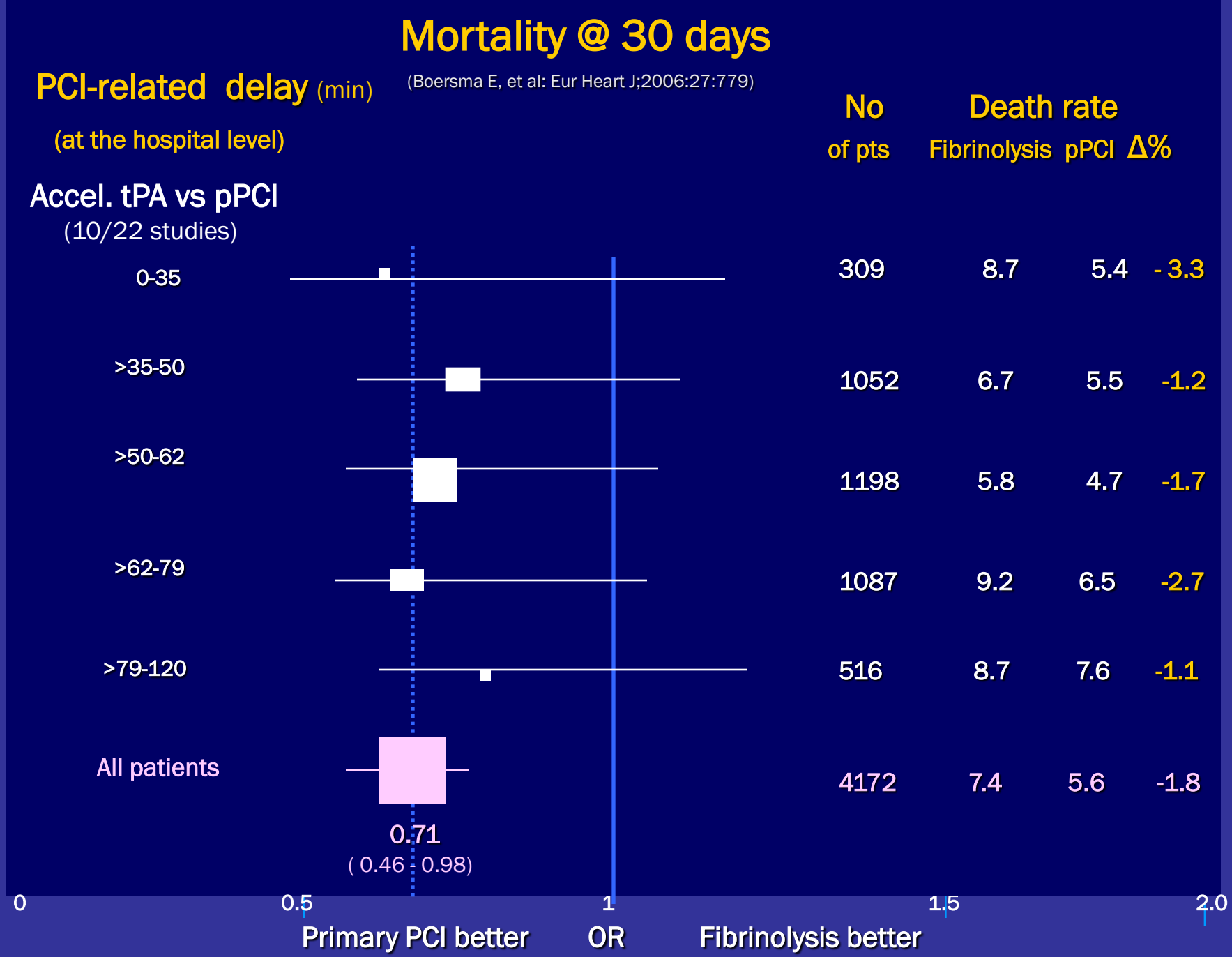


Mortality @ 30 days

(Boersma E, et al: Eur Heart J;2006:27:779)

PCI-related delay (min)

(at the hospital level)

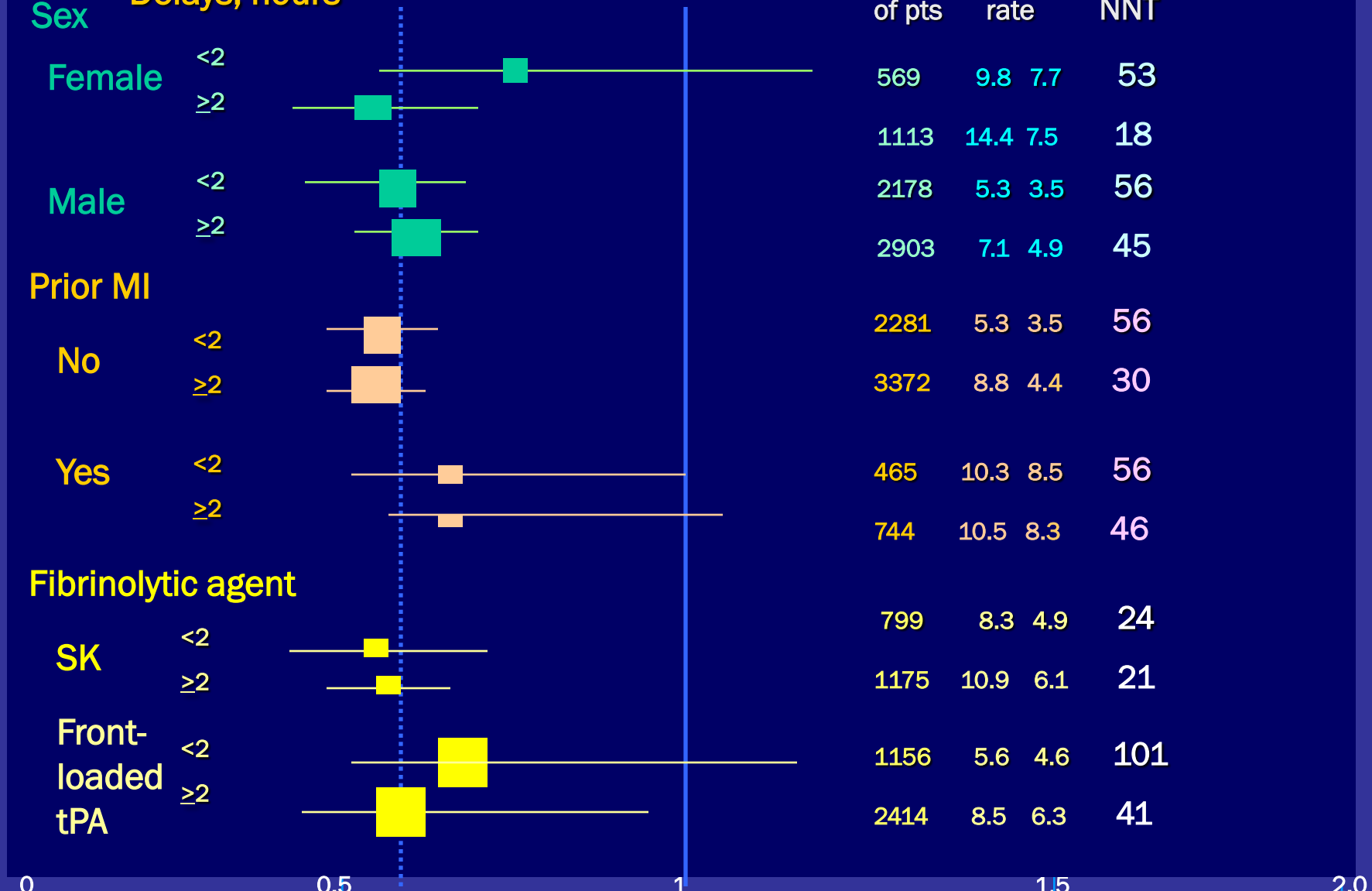


PCI-related delay (min)	No of pts	Death rate Fibrinolysis	Death rate pPCI	Δ%
0-35	309	8.7	5.4	- 3.3
>35-50	1052	6.7	5.5	-1.2
>50-62	1198	5.8	4.7	-1.7
>62-79	1087	9.2	6.5	-2.7
>79-120	516	8.7	7.6	-1.1
All patients	4172	7.4	5.6	-1.8

'pPCI is associated with lower mortality regardless of the treatment delay'

Sub-group mortality @ 30 days & presentation time delay

(Boersma E, et al: Eur Heart J;2006:27:779)



	No of pts	Death rate		NNT
Female <2	569	9.8	7.7	53
Female ≥2	1113	14.4	7.5	18
Male <2	2178	5.3	3.5	56
Male ≥2	2903	7.1	4.9	45
Prior MI: No <2	2281	5.3	3.5	56
Prior MI: No ≥2	3372	8.8	4.4	30
Prior MI: Yes <2	465	10.3	8.5	56
Prior MI: Yes ≥2	744	10.5	8.3	46
Fibrinolytic agent: SK <2	799	8.3	4.9	24
Fibrinolytic agent: SK ≥2	1175	10.9	6.1	21
Front-loaded tPA <2	1156	5.6	4.6	101
Front-loaded tPA ≥2	2414	8.5	6.3	41

53

(Fibrinolysis vs Plac) [9.6% vs 11.5% (Lancet 1994)]