Management of spontaneous reperfusion and late arrival

Héctor Bueno, MD, PhD, FAHA, FESC

Associate Professor of Medicine
Universidad Complutense de Madrid

Head. Clinical Cardiology & CCU
Department of Cardiology
Hospital General Universitario Gregorio Marañón
Madrid (SPAIN)

SaludMadrid

Hospital General Universitario Gregorio Marañón

DISCLOSURE

Dr. Bueno reports having received research grants from Astra-Zeneca and consulting/speaking fees from Astra-Zeneca, Bayer Healthcare, Daichii-Sankyo, Eli-Lilly, and Novartis.

Rates of Spontaneous Reperfusion in STEMI

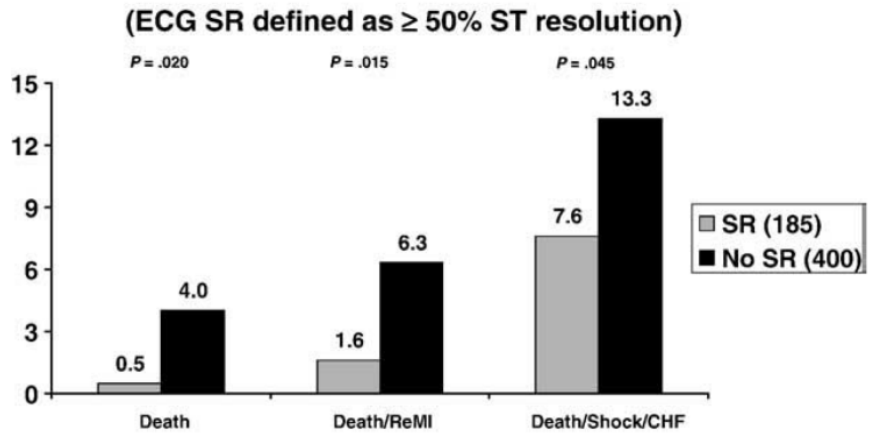
Table III. Reported rates of SR

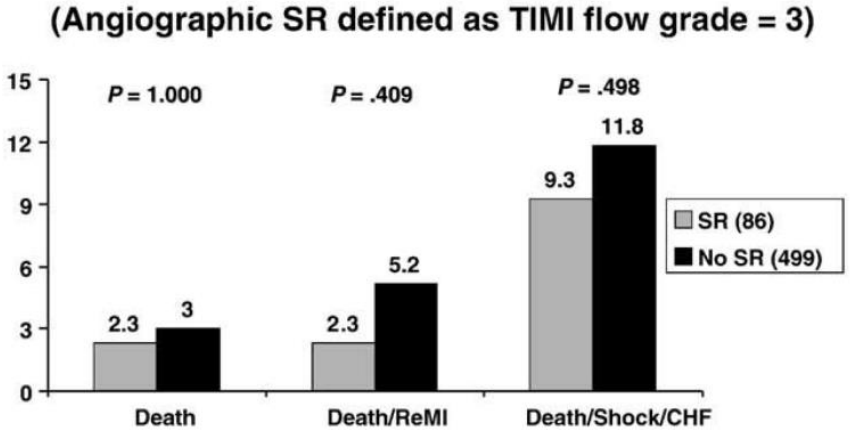
	SR definition	SR rate (%)	Timing of assessment (h)	n
De Wood et al[1]	Angiographic (any flow)	12.7	4.0	126
Steg et al[3]	Angiographic (TIMI = 3)	13.3	3.6	325
Christian et al[4]	Angiographic (TIMI 1-3)	57.0	18	21
Ross et al[5]	Angiographic (TIMI = 3)	15.0	2.2	304
Lee et al[6]	Angiographic (TIMI ≥2)	22.4	3.8	196
Stone et al[7]	Angiographic (TIMI = 3)	16.0	4.4	2507
Rimar et al[2]	ECG (>50% STR)	4.0	approximately 2.3	98
Terkelsen et al[8]	ECG (≥70% STR)	23.9	–	92
Bainey et al (current study)	Angiographic (TIMI = 3)	14.7	4.1	585
	ECG (≥70% STR)	14.9	4.2	

Timing of assessment, time from symptom onset to acquisition of the reperfusion (ECG/angiogram) assessment. *STR*, ST resolution.

Bainey KR. *Am Heart J* 2008;156:248-55.

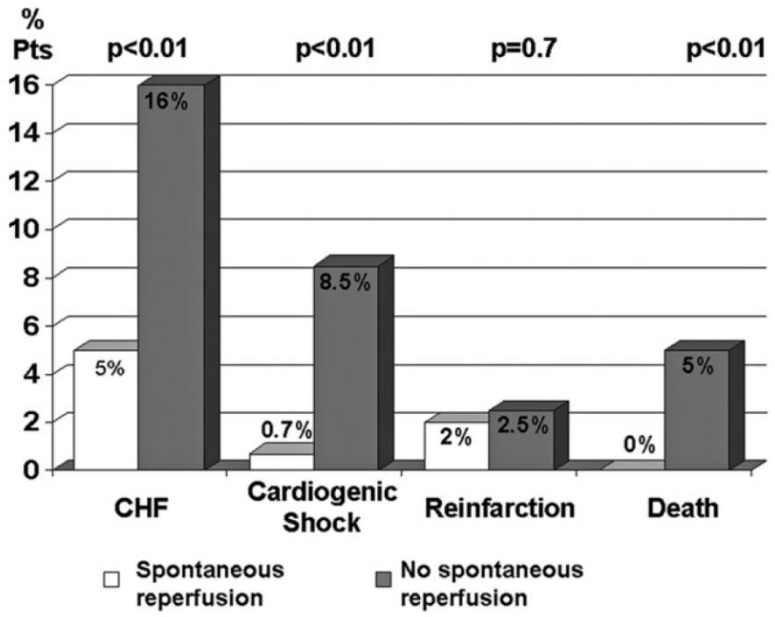
30-day outcomes in STEMI patients with spontaneous reperfusion according to diagnostic criterium (ASSENT 4 Trial)

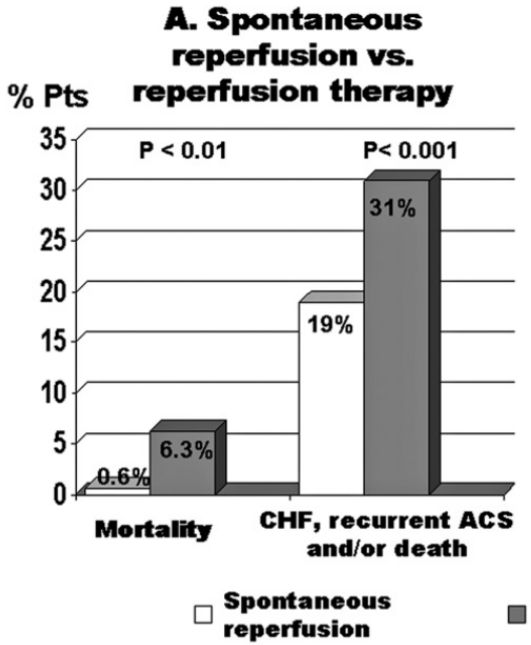


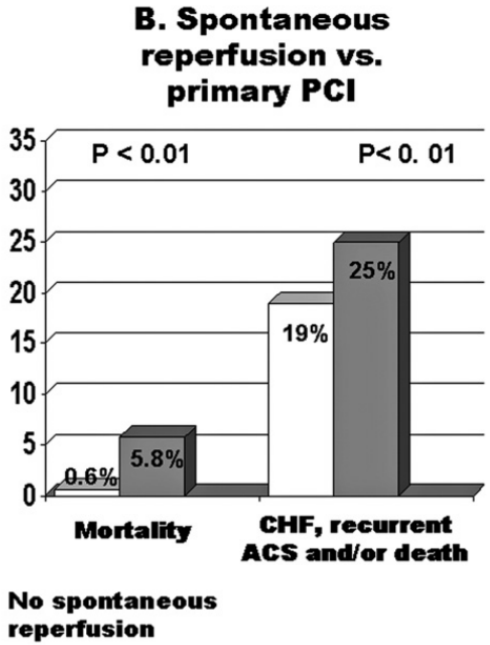


Bainey KR. *Am Heart J* 2008;156:248-55.

Relation of Clinically Defined Spontaneous Reperfusion to 30-day outcomes in STEMI

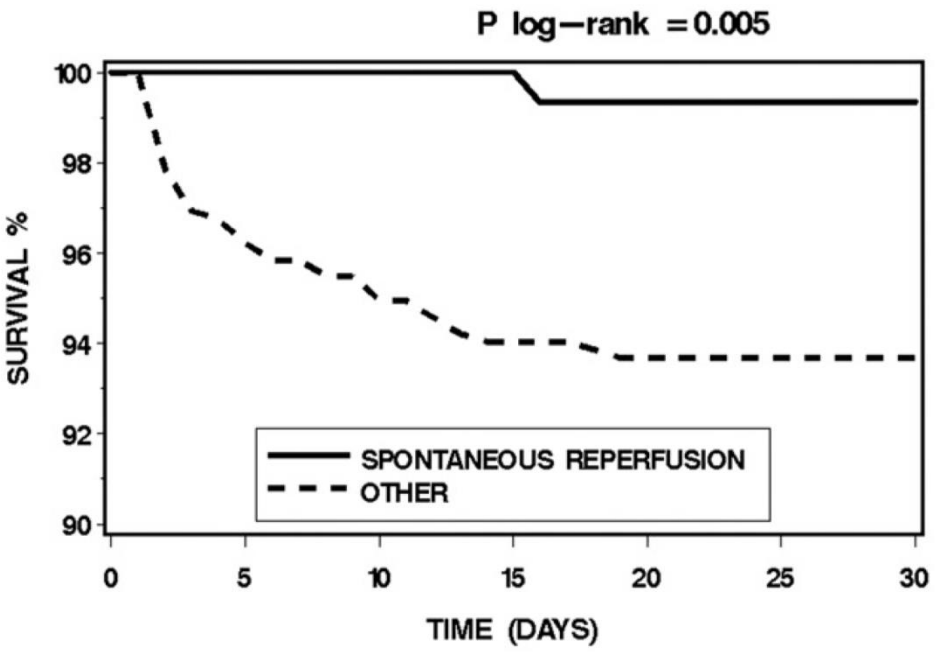






Fefer P. *Am J Cardiol* 2009;103:149–153.

Relation of Clinically Defined Spontaneous Reperfusion With mortality in STEMI



Fefer P. *Am J Cardiol* 2009;103:149–153.

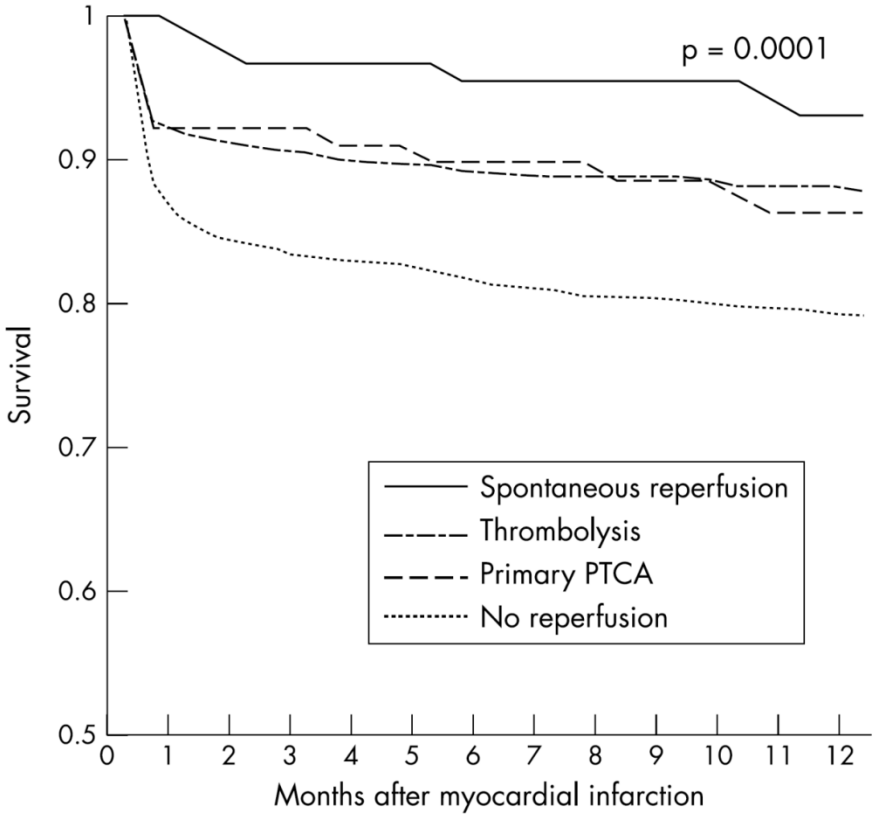


Figure 1 Kaplan-Meier survival curve. Cumulative survival after acute myocardial infarction in patients according to reperfusion treatment ($p_{\text{log rank test}} = 0.0001$).

Rimar D. *Heart* 2002;88:352–356

Prognostic value of Spontaneous Reperfusion in STEMI

Table 3
Predictors of 30-day adverse outcome (death, heart failure, and/or recurrent acute coronary syndrome)

	Odds Ratio	95% Confidence Interval	p Value
SR	0.5	0.3–0.87	0.01
Age (1 yr)	1.05	1.04–1.07	<0.001
Anterior myocardial infarction	2.28	1.5–3.47	<0.001
Previous myocardial infarction	1.93	1.16–3.19	0.01
Killip class II–IV	10.8	6.4–18.4	<0.001

Fefer P. *Am J Cardiol* 2009;103:149–153.

Table II. Multivariate predictors of 30-day composite death/shock/CHF

	Odds ratio (95% CI)	***P***
Age (y)	1.06 (1.03-1.09)	<.001
Previous MI	2.76 (1.31-5.83)	.008
Noninferior MI	1.98 (1.11-3.55)	.021
Systolic BP (mm Hg)	0.99 (0.97-1.00)	.018
Time to treatment (h)	1.09 (0.99-1.20)	.084
∑ST at baseline (mm)	1.07 (1.04-1.10)	<.001
ECG SR (≥70% STR)	0.51 (0.20-1.27)	.147

BP, blood pressure.

Bainey KR. *Am Heart J* 2008;156:248-55.

Management of patients with STEMI and Spontaneous Reperfusion

- SR is associated with relatvely good prognosis in STEMI patients
- No evidences about optimal management are available
- IF SR occurs within first 20 minutes → Manage as high-risk NSTEMI
- If SR occurs after first 20 minutes
  - → No thrombolysis
  - → Primary PCI if easily available
    or
  - → Intensive antithrombotic Rx + rapid/elective PCI

Reasons for the lack of use of reperfusion therapy in STEMI

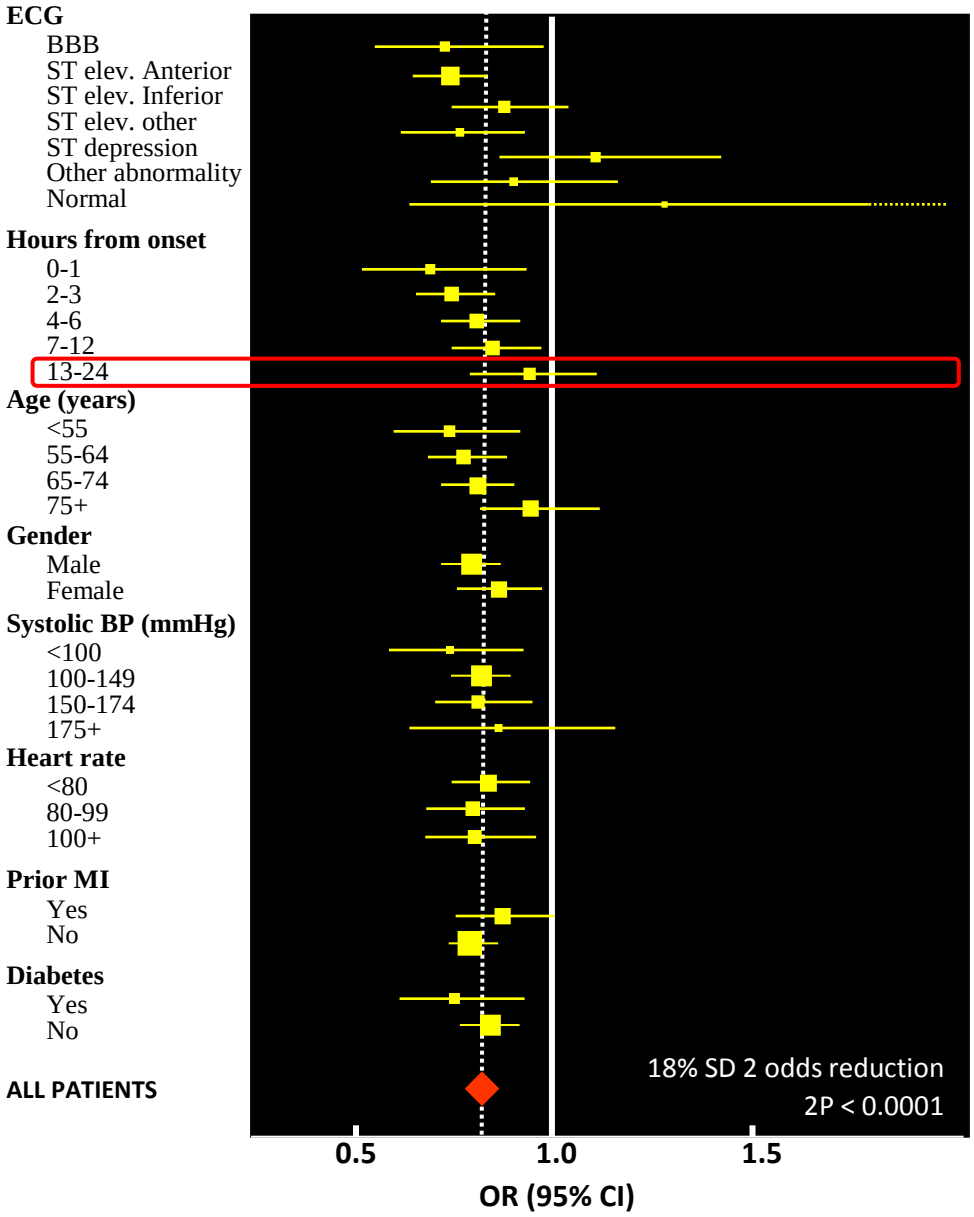
Table I. Reasons of contraindications to reperfusion therapy in STEMI patients (n = 881)

No ischemic indication (n)	474 (53.8%)
No ST elevation or LBBB	56
ST elevation resolved	78
MI diagnosis unclear	41
MI symptom onset >12 h	157
Chest pain resolved	120
No chest pain	22
Bleeding risk (n)	147 (16.7%)
Intracranial neoplasm, AVM, or aneurysm	3
Significant closed head or facial trauma within previous 3 mo	2
Active bleeding on arrival or within 24 h	20
Known bleeding diathesis	8
History of stroke	41
Active peptic ulcer	2
Traumatic CPR that precluded use of thrombolytics	13
Bleeding within previous 4 wk	13
Recent surgery/trauma	24
Current use of oral anticoagulants	6
Severe uncontrolled hypertension	11
Suspected aortic dissection	4
Patient-related reasons (n)	223 (25.3%)
Patient/family refusal	64
DNR status at time of treatment decision	63
Quality-of-life decision	35
Comorbid disease	60
Prior allergic reaction to thrombolytics or IV contrast	1
Other* (n)	37 (4.2%)

17.5%

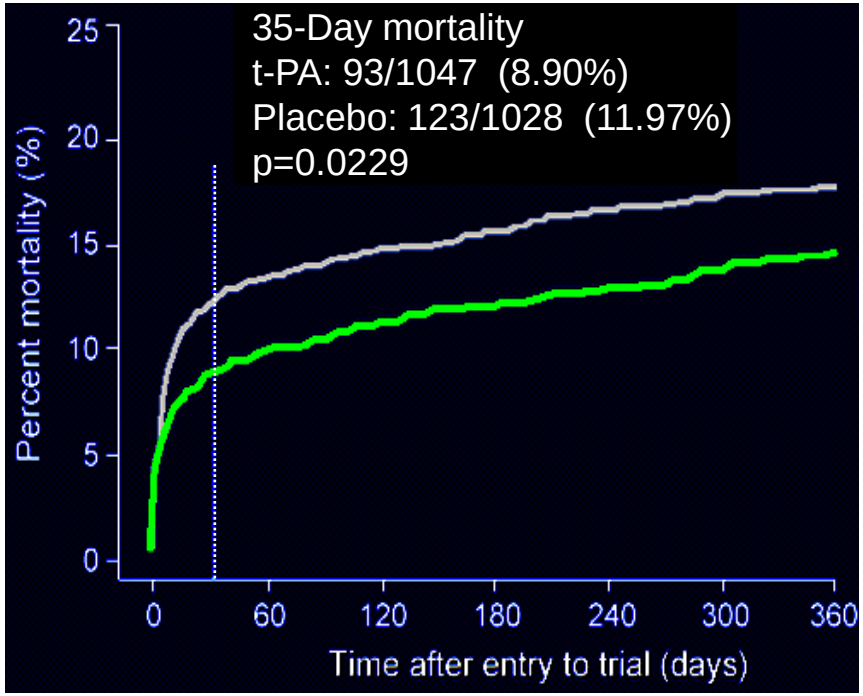
Gharacholou SM. *Am Heart J* 2010;159:757-63.

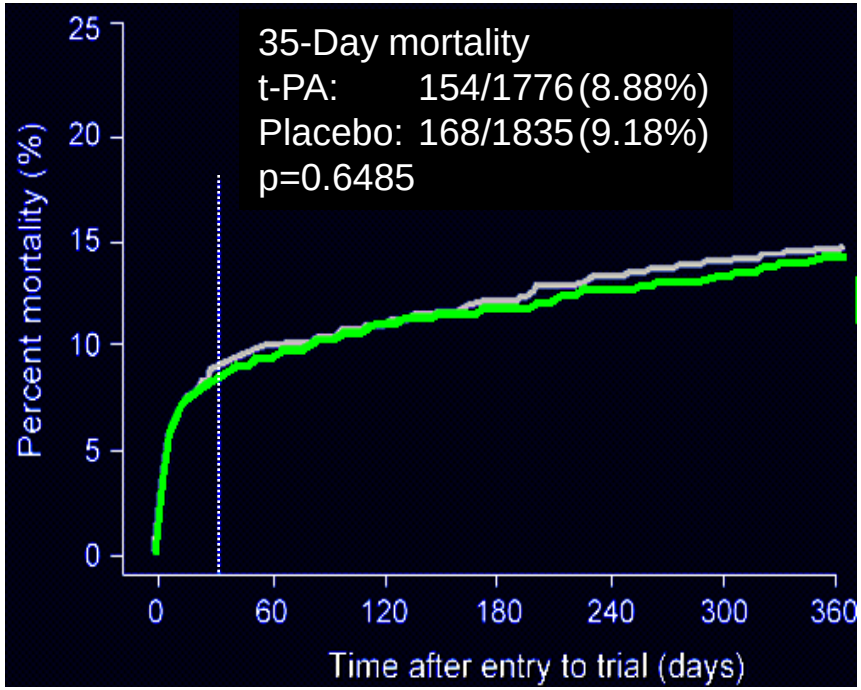
Thrombolytic Therapy in late arrival



FTT Collaborative Group.
Lancet 1994; 343:311-322.

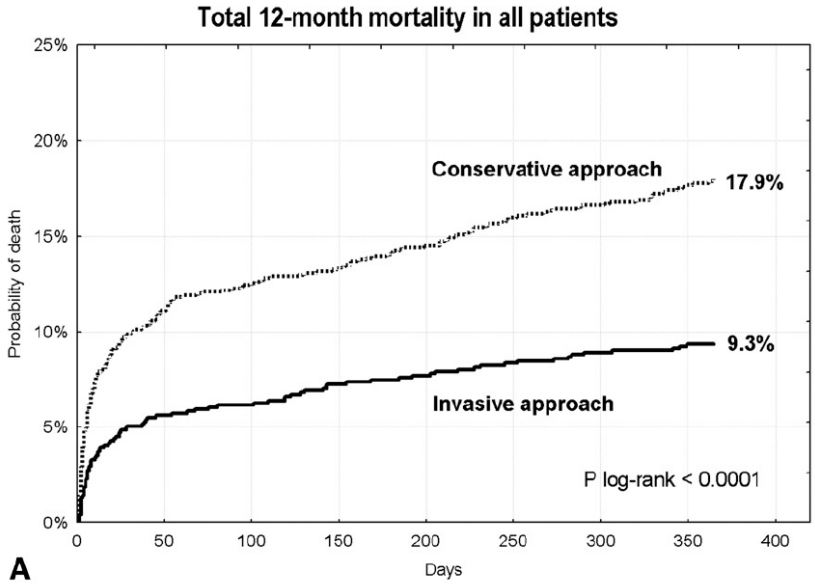
Thrombolytic Therapy in late arrival



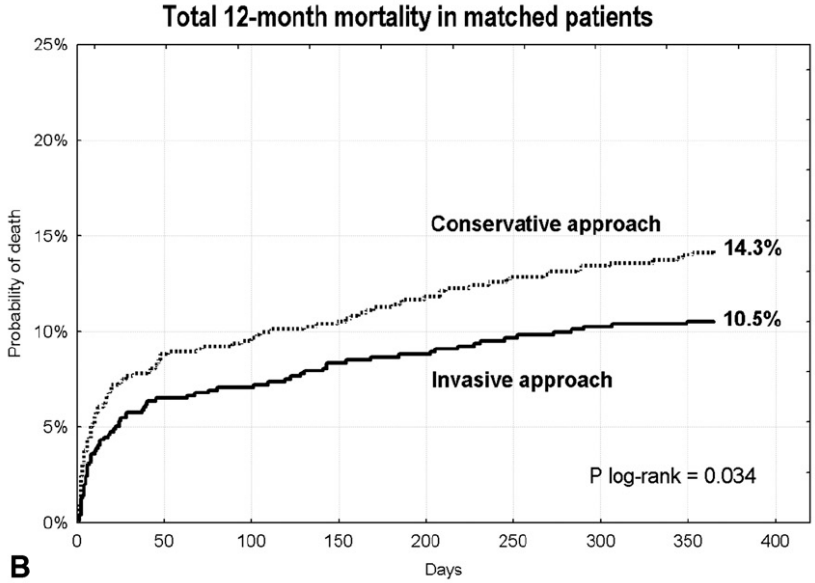


LATE Study Group. Lancet 1993;342:759

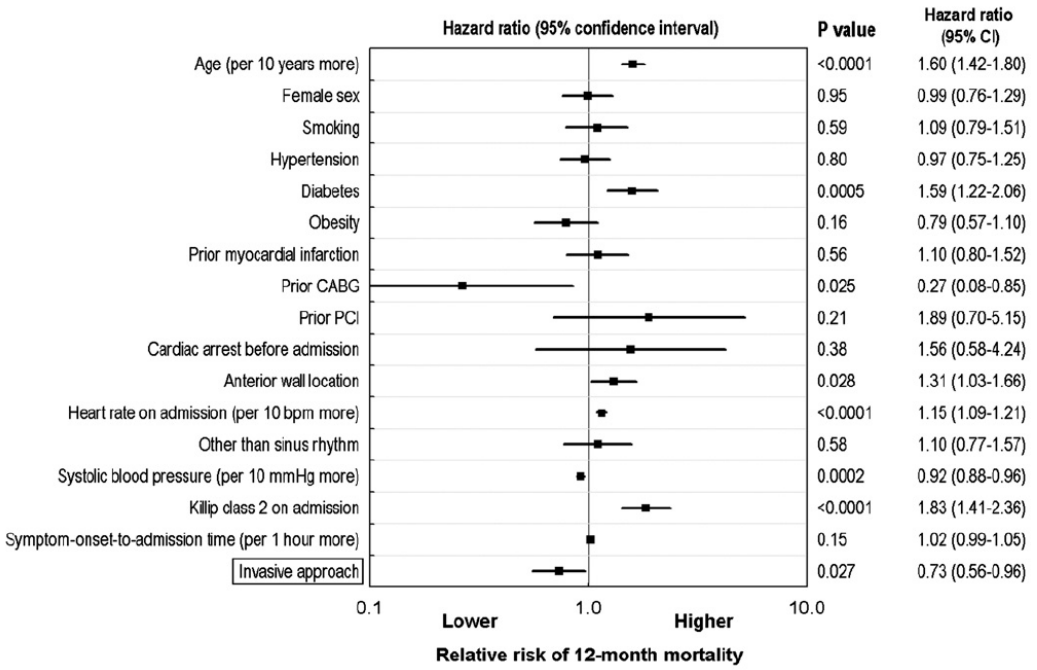
Reperfusion by primary PCI in patients with STEMI within 12 to 24 hours (PL-ACS Registry)



A

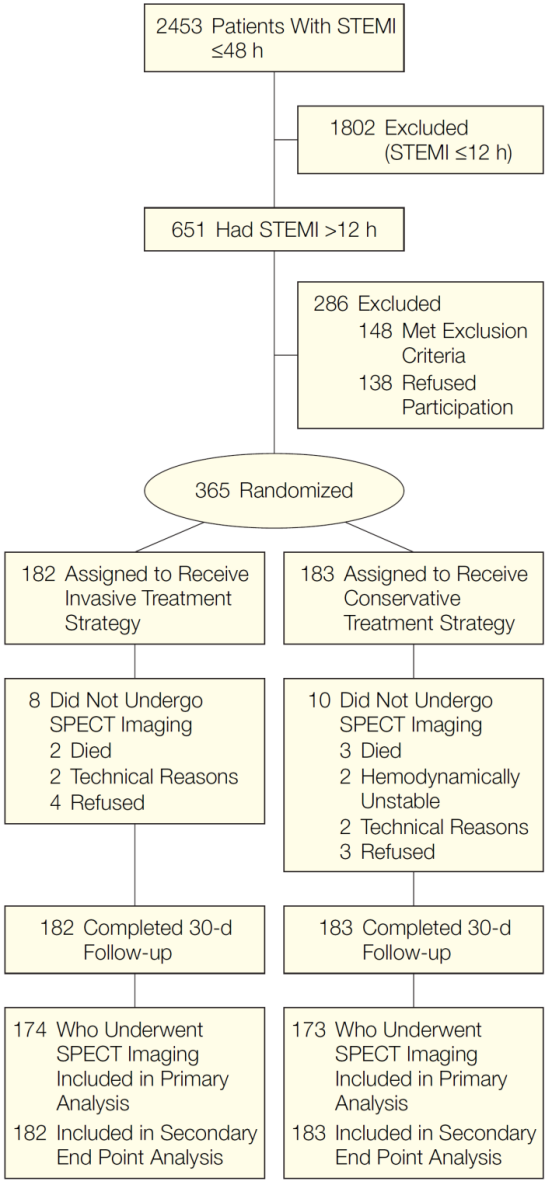


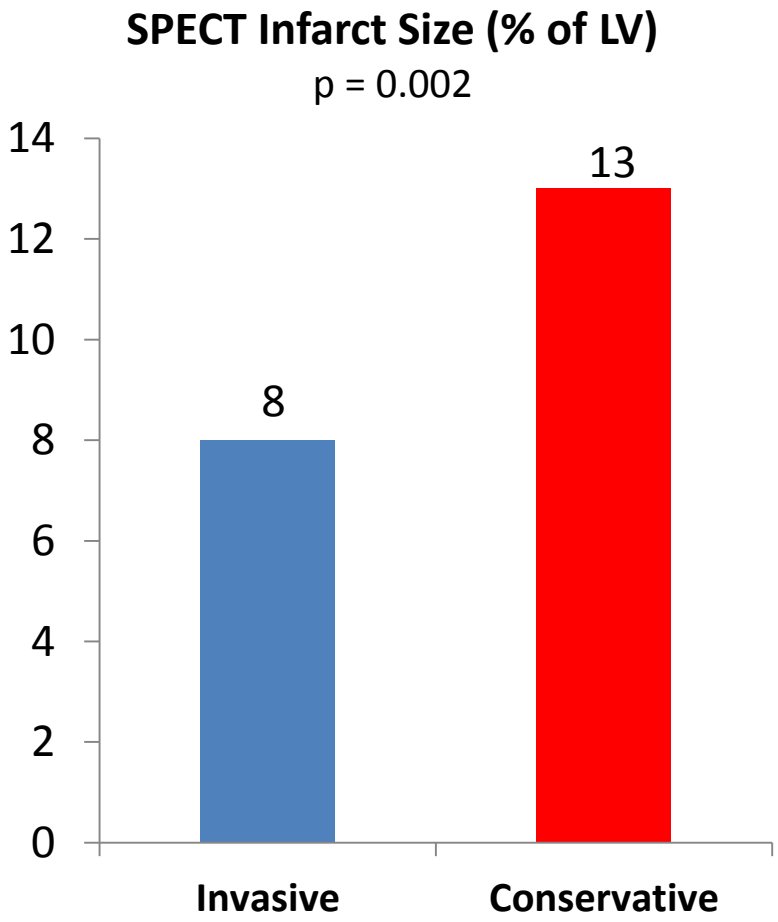
B



Gierlotka M. *Am J Cardiol* 2011;107:501–8.

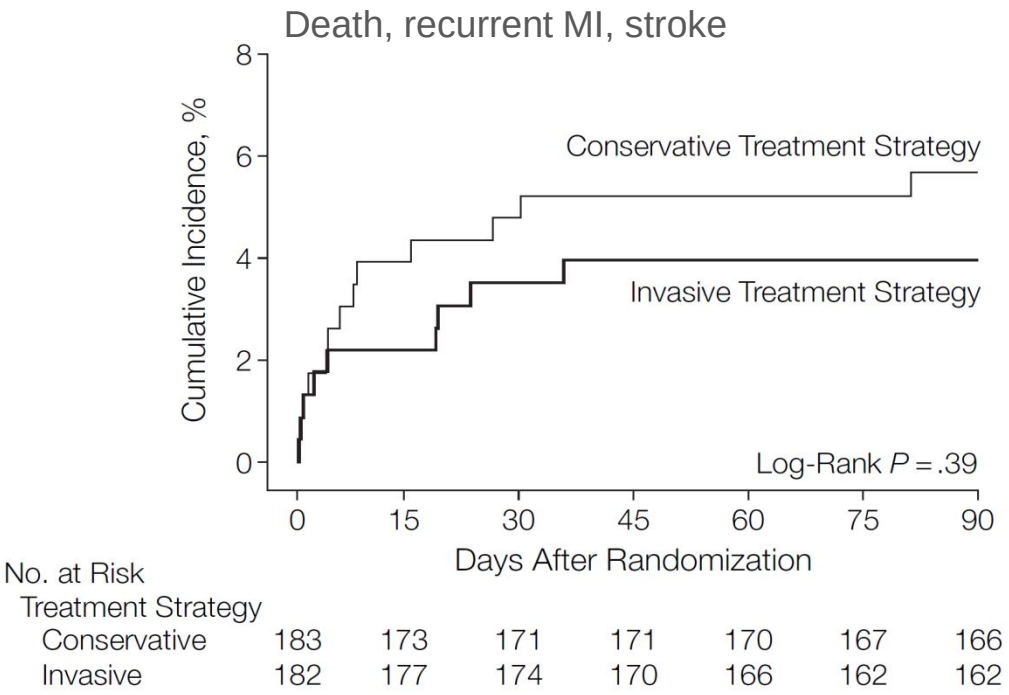
Routine PCI vs conservative management in patients with STEMI between 12 and 48 hours

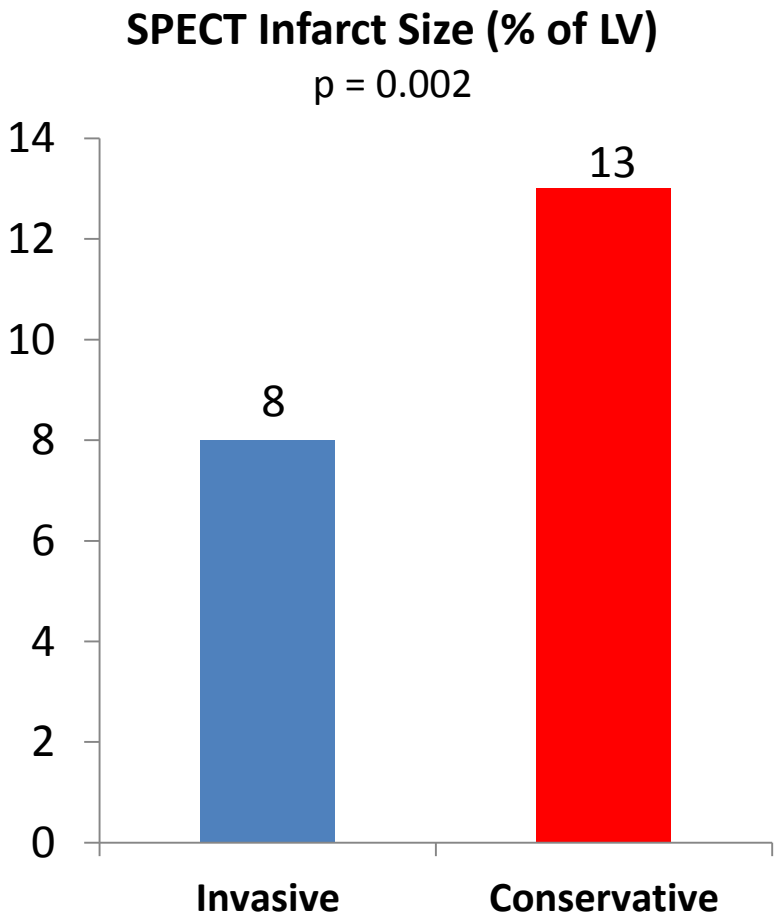




Schömig A. *JAMA* 2005;293:2865-2872

Routine PCI vs conservative management in patients with STEMI between 12 and 48 hours

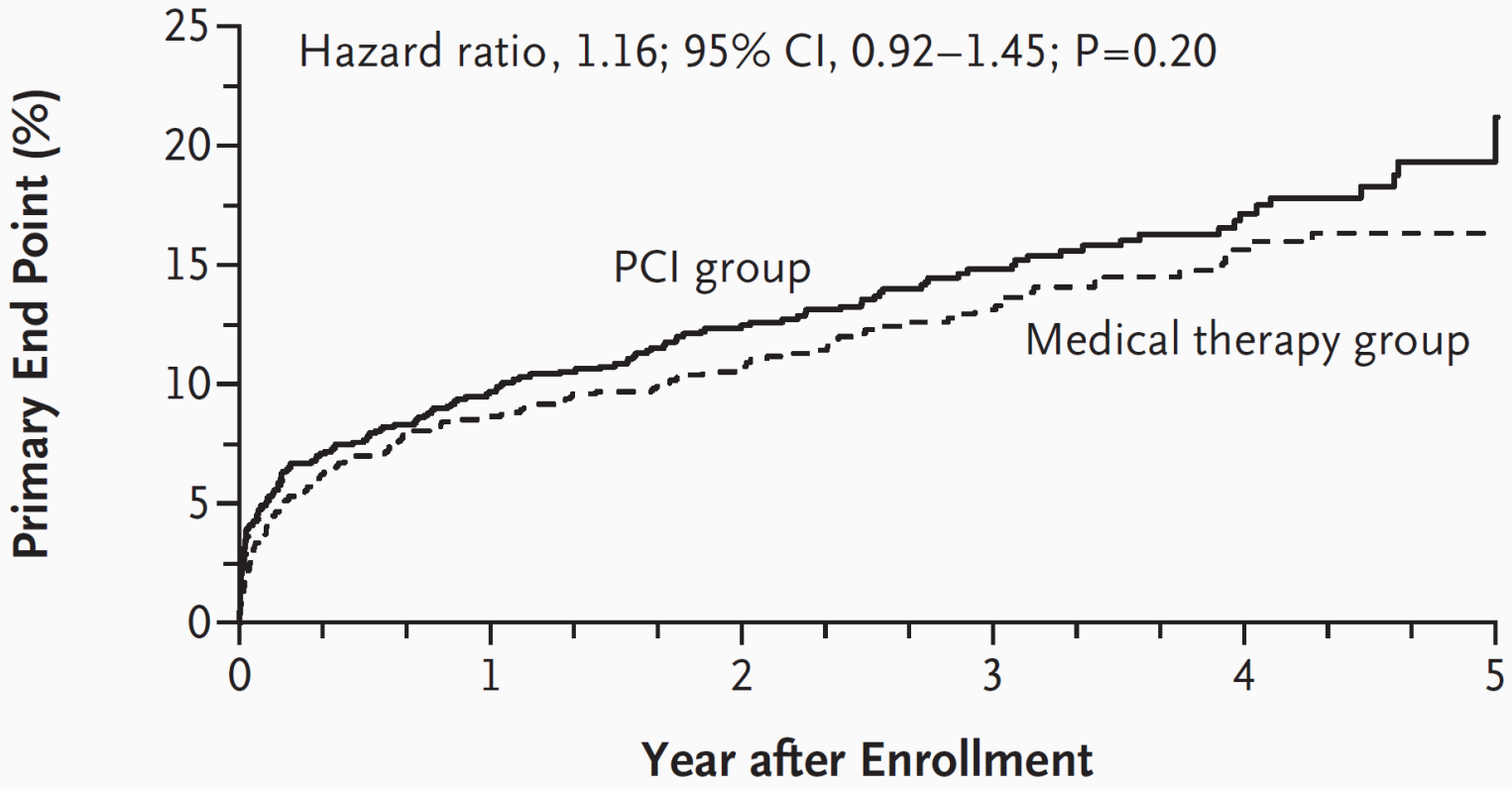




Schömig A. *JAMA* 2005;293:2865-2872

PCI for Persistent Occlusion after STEMI

OAT Trial



No. at Risk

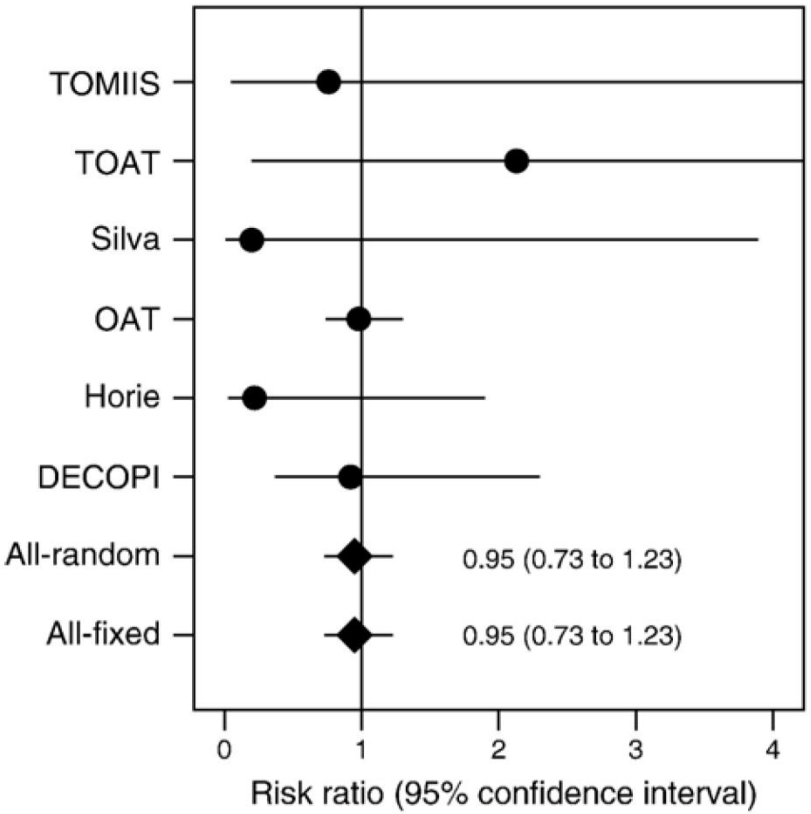
PCI group	1082	895	719	482	265	85
Medical therapy group	1084	909	714	474	268	78

Hochman JS. *N Engl J Med* 2006;355:2395-407.

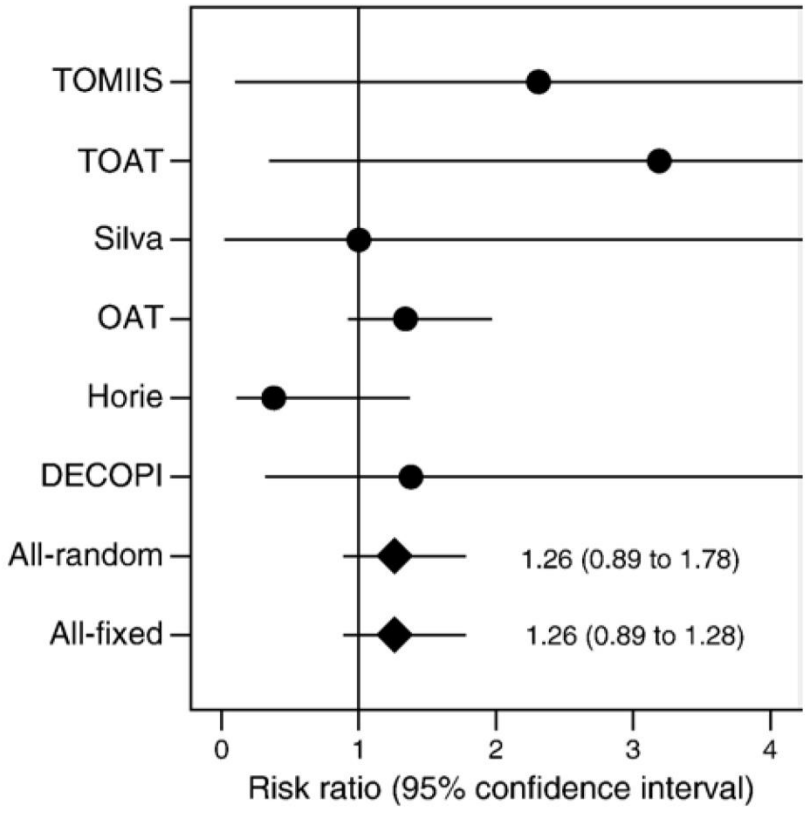
PCI for Persistent Occlusion after STEMI

Meta-analysis of trials

Death



MI



Ioannidis JPA. *Am Heart J* 2007;154:1065-71.)

ESC 2012 STEMI Guidelines

Reperfusion therapy

Recommendations	Class[a]	Level[b]
Reperfusion therapy is indicated in all patients with symptoms of <12 h duration and persistent ST-segment elevation or (presumed) new LBBB.	I	A
Reperfusion therapy (preferably primary PCI) is indicated if there is evidence of ongoing ischaemia, even if symptoms may have started >12 h beforehand or if pain and ECG changes have been stuttering.	I	C
Reperfusion therapy with primary PCI may be considered in stable patients presenting 12–24 h after symptom onset.	IIb	B
Routine PCI of a totally occluded artery >24 h after symptom onset in stable patients without signs of ischaemia (regardless of whether fibrinolysis was given or not) is not recommended.	III	A

AHA/AHA 2013 STEMI Guidelines

Class IIa

1. **Reperfusion therapy is reasonable for patients with STEMI and symptom onset within the prior 12 to 24 hours who have clinical and/or ECG evidence of ongoing ischemia. Primary PCI is the preferred strategy in this population.[81,94,95] (*Level of Evidence: B*)**

Table 2. Primary PCI in STEMI

	COR	LOE	References
Ischemic symptoms <12 h	I	A	82, 208, 209
Ischemic symptoms <12 h and contraindications to fibrinolytic therapy irrespective of time delay from FMC	I	B	210, 211
Cardiogenic shock or acute severe HF irrespective of time delay from MI onset	I	B	212–215
Evidence of ongoing ischemia 12 to 24 h after symptom onset	IIa	B	94, 95

Class IIa

1. **In the absence of contraindications and when PCI is not available, fibrinolytic therapy is reasonable for patients with STEMI if there is clinical and/or ECG evidence of ongoing ischemia within 12 to 24 hours of symptom onset and a large area of myocardium at risk or hemodynamic instability. (*Level of Evidence: C*)**

Table 4. Indications for Fibrinolytic Therapy When There Is a >120-Minute Delay From FMC to Primary PCI (Figure 2)

	COR	LOE	References
Ischemic symptoms <12 h	I	A	81, 306–311
Evidence of ongoing ischemia 12 to 24 h after symptom onset and a large area of myocardium at risk or hemodynamic instability	IIa	C	N/A

Management of patients with STEMI and late arrival: A non evidence-based proposal

PCI

- Cardiogenic shock
- Signs of persistent ischemia, heart failure or ventricular arrhythmias
- RVI or complete AV block

Urgent / Rapid

- Asymptomatic, stable, no signs of active ischemia, 12 - 24 hours
  - Large MI / severe LVSD
  - Small MI

Rapid
No / Elective?

- Asymptomatic, stable, no signs of active ischemia >24 hours

No / Elective?

No Thrombolysis