8th International Conference Acute Cardiac Care

Approach to microvascular obstruction

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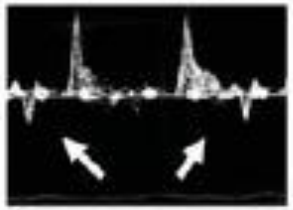
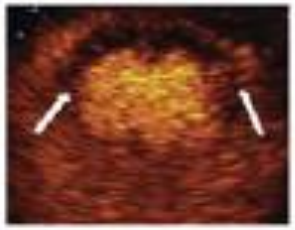
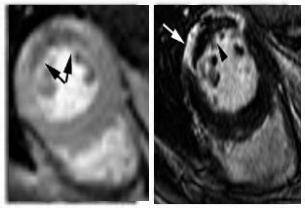
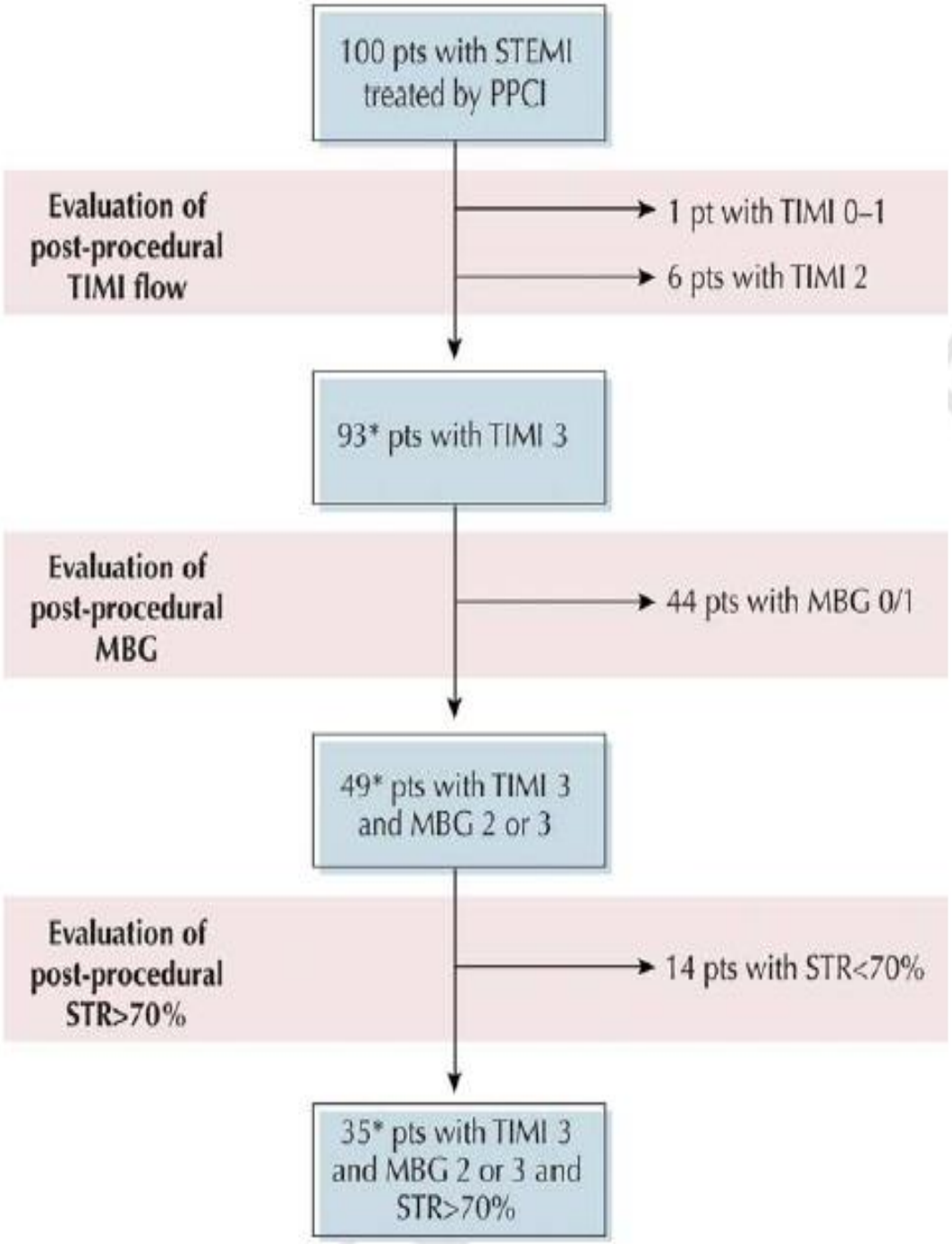
Diagnosis of MVO

In the cath-lab	• Angiography	Final TIMI flow ≤2 Final TIMI flow 3 with MBG <2	
	• Doppler wire	Systolic retrograde flow Diminished systolic antegrade flow Rapid deceleration of diastolic flow	
In the CCU	• Electrocardiogram	ST resolution <50 or 70% 60/90 min after PPCI	 Pre-PPCI After PPCI
Pre-discharge	• MCE	Lack of intramyocardial contrast opacification	
	• CE-CMR	Lack of gadolinium enhancement during first pass Lack of gadolinium enhancement within a necrotic Region (late gadolinium hyperenhancement)	 FP DE

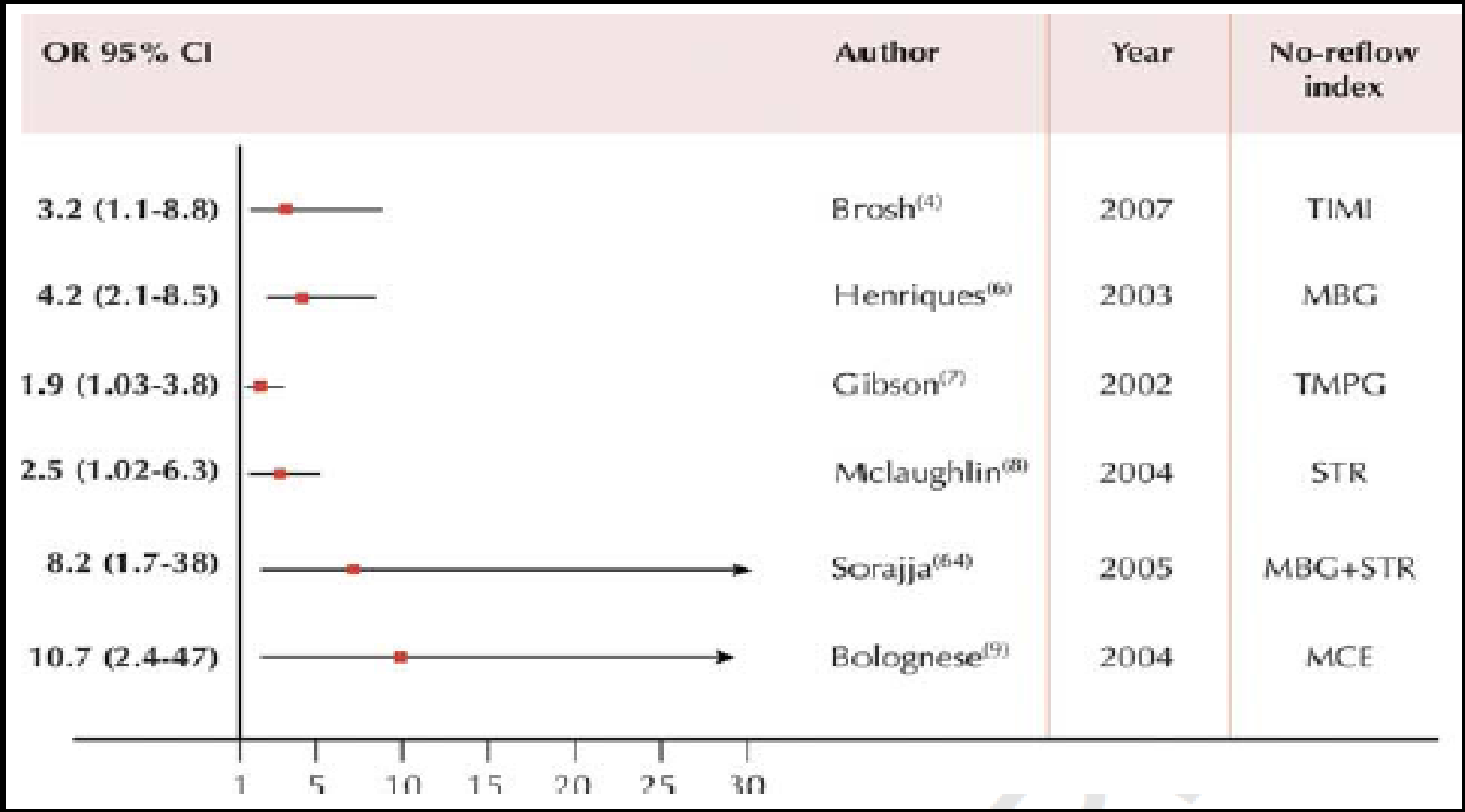
(Niccoli et al, JACC 2009)



The illusion of reperfusion after primary PCI

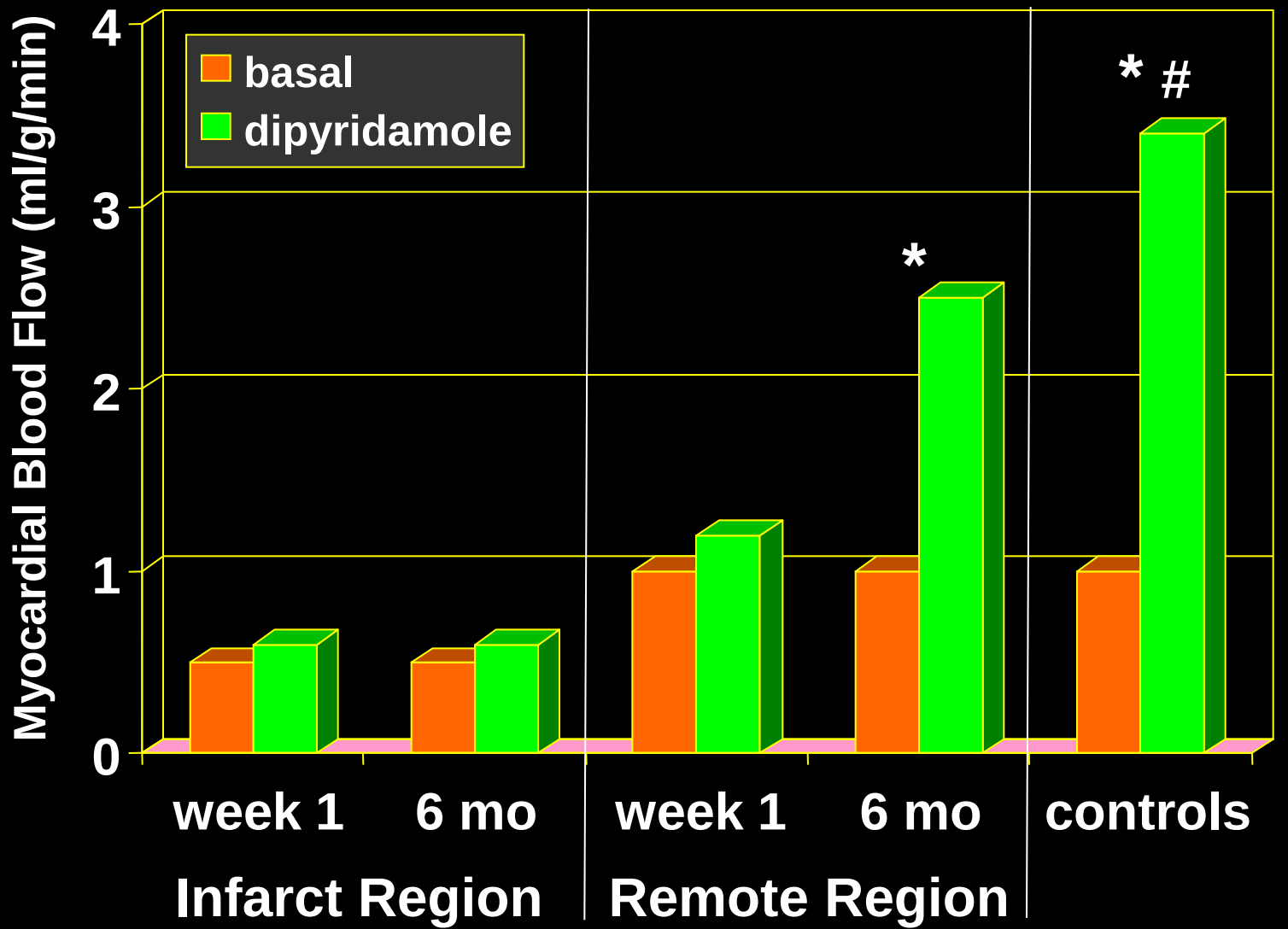
(Niccoli et al, JACC 2009)

Prognostic Value of MVO According to Angiographic, ECG, and Echo-contrastographic Indexes



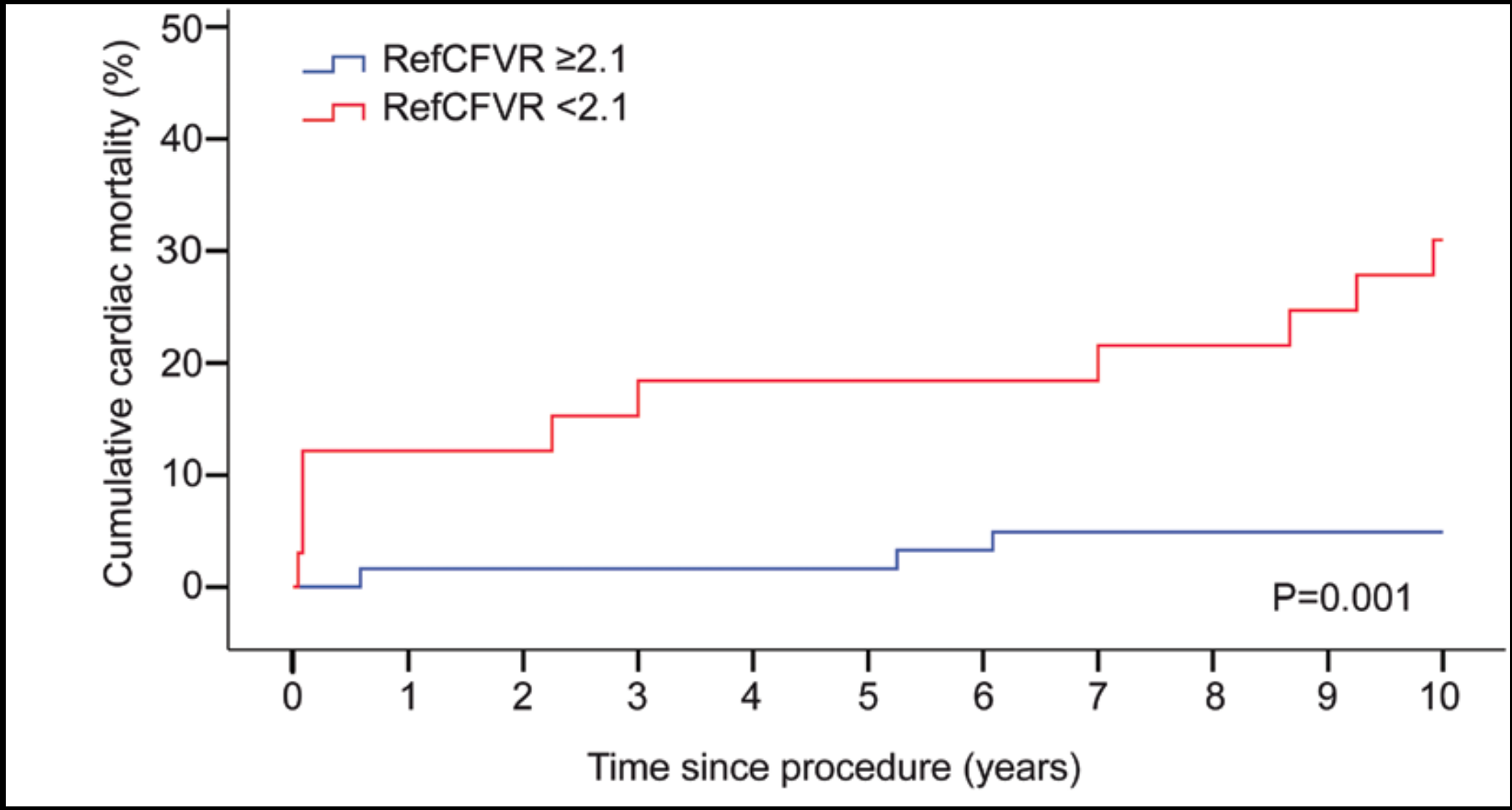
(Niccoli et al, JACC 2009)

Reduced coronary flow response in non-stenosed non IMA-related Arteries

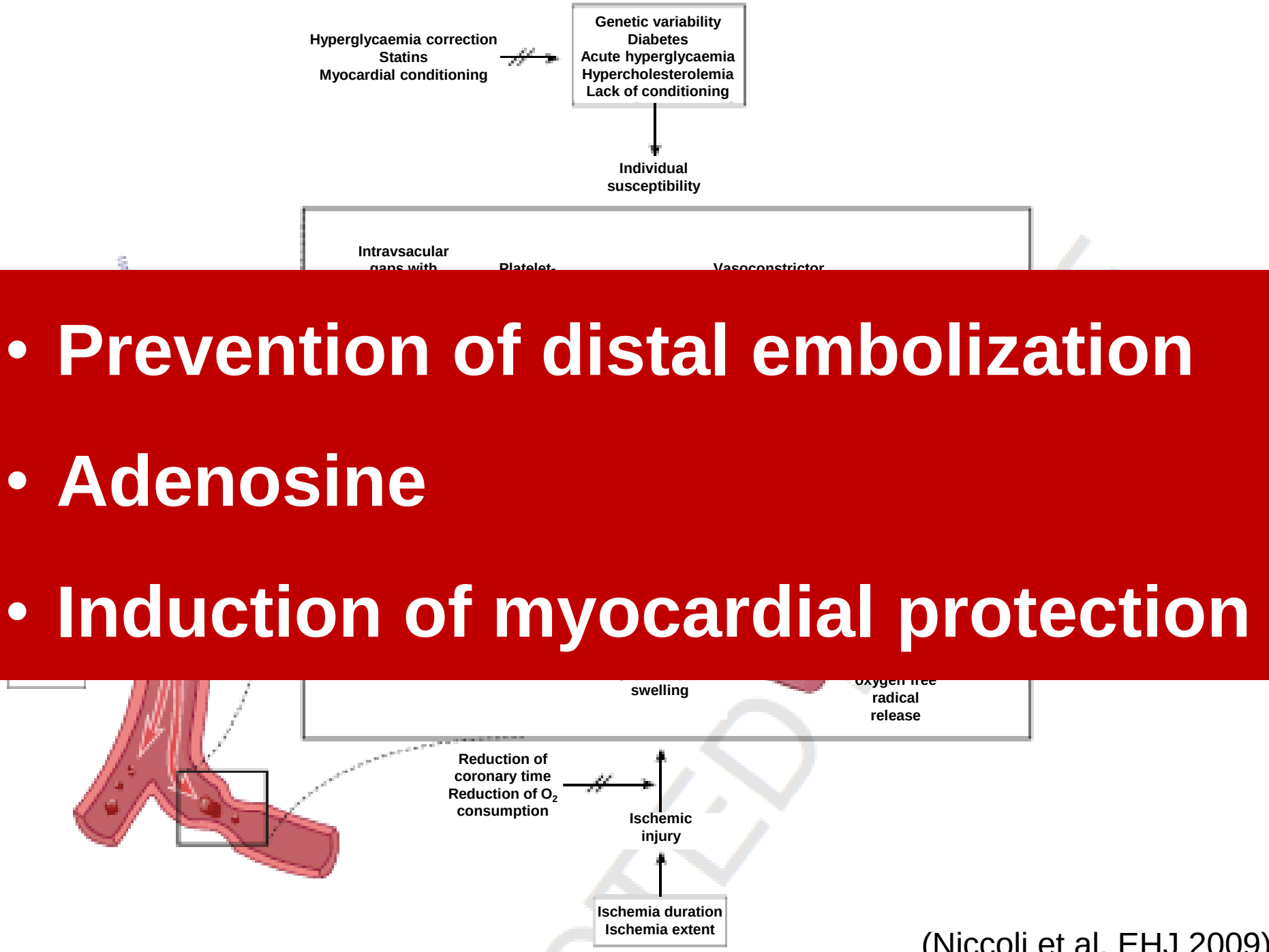


(Uren et al, N Engl J Med 1994)

Impact of coronary microvascular dysfunction in non IMA-related arteries on cardiac mortality (n=100



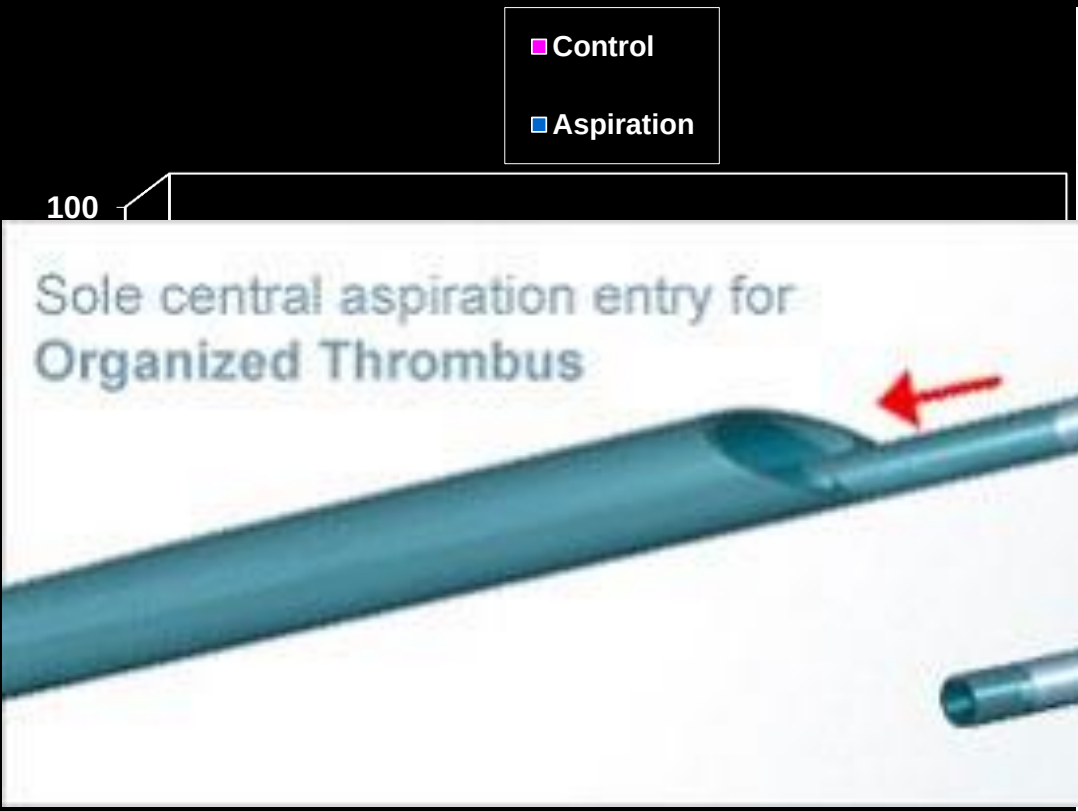
(van de Hoef et al, Circulation Cardiov Int 2013)



- **Prevention of distal embolization**
- **Adenosine**
- **Induction of myocardial protection**

(Niccoli et al, EHJ 2009)

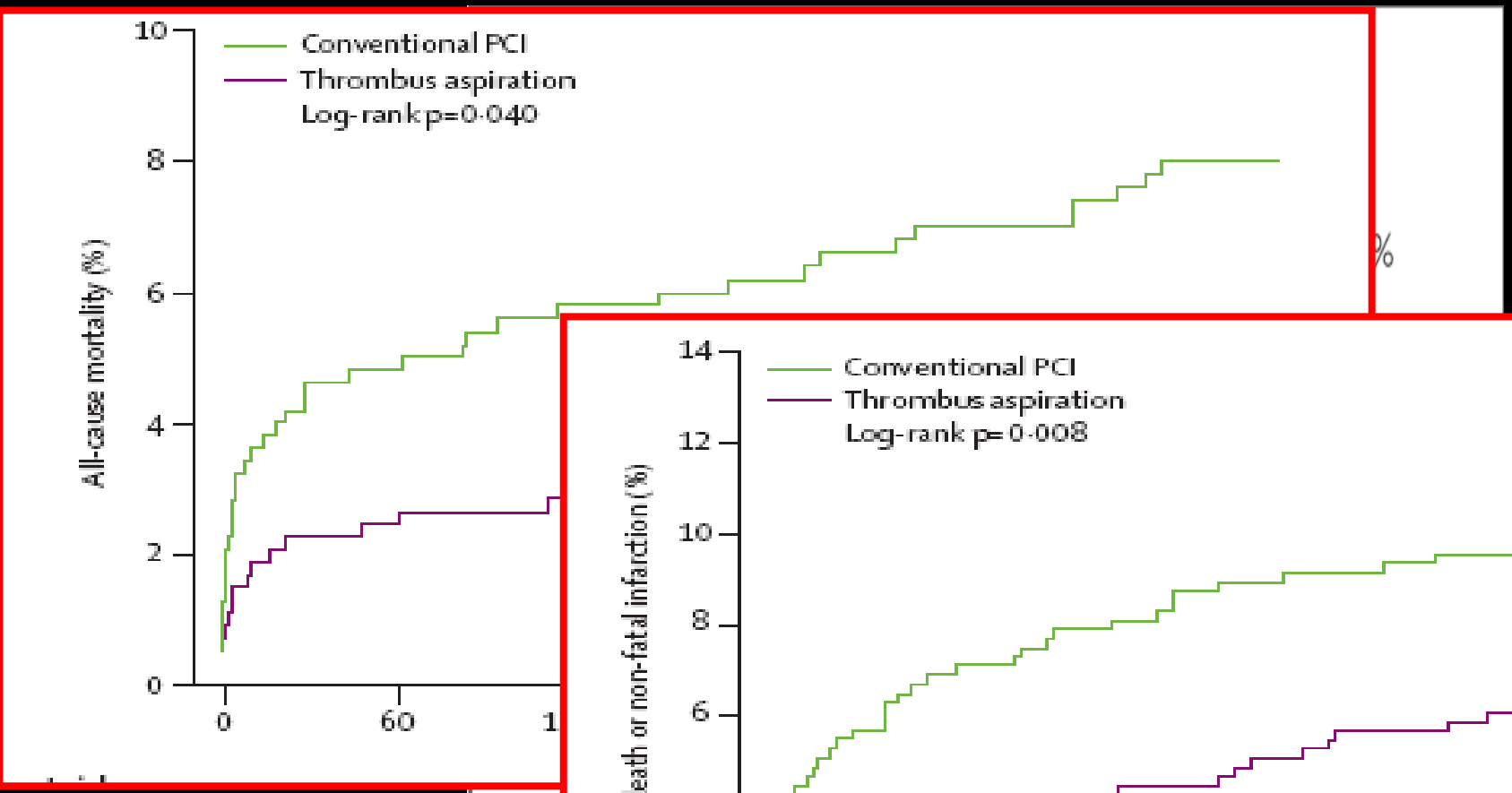
REMEDIA trial (n=100)

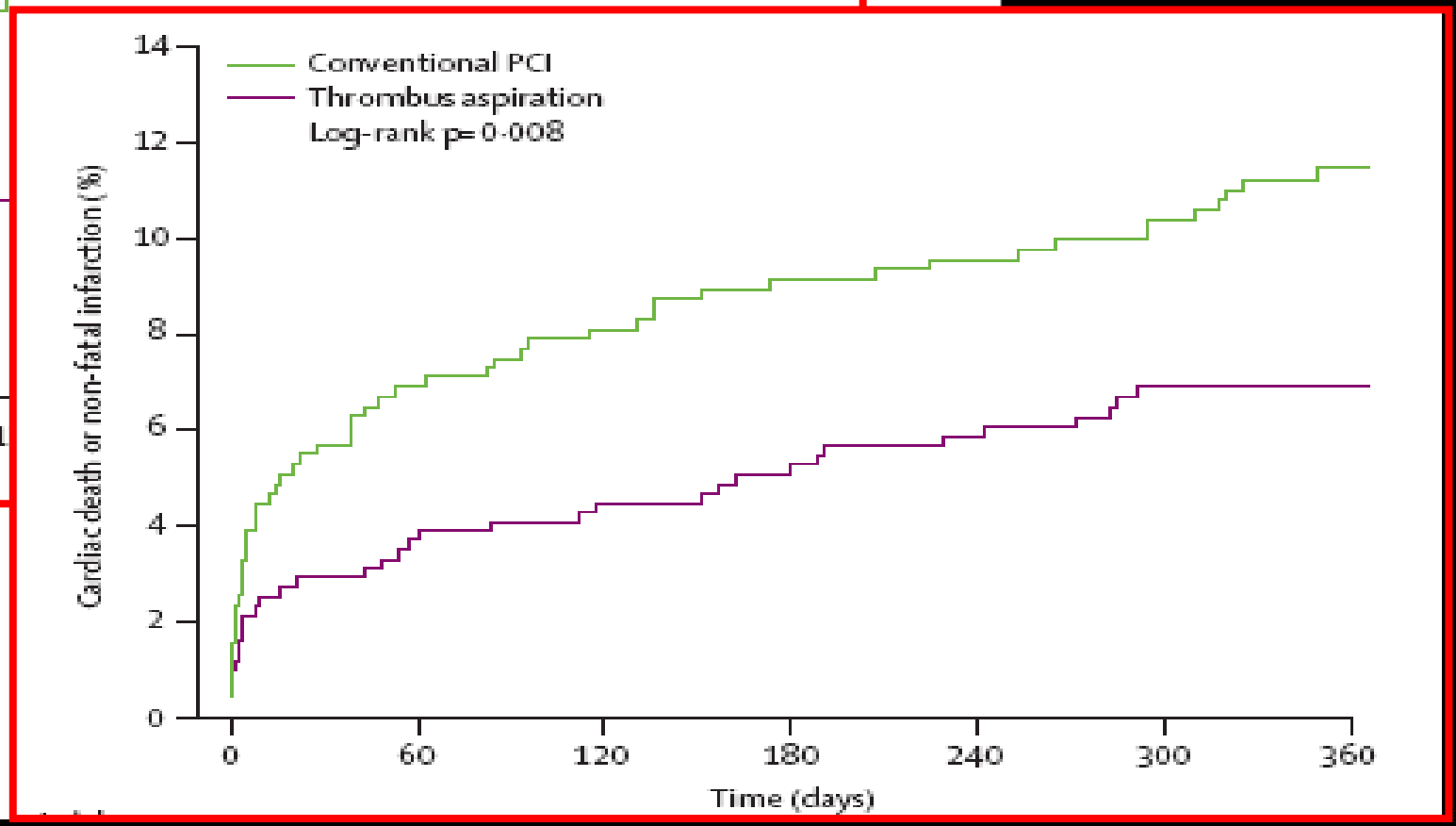


MGB>/=2 STR>/=70%

(Burzotta et al, JACC 2005)

TAPAS trial (n=1060)

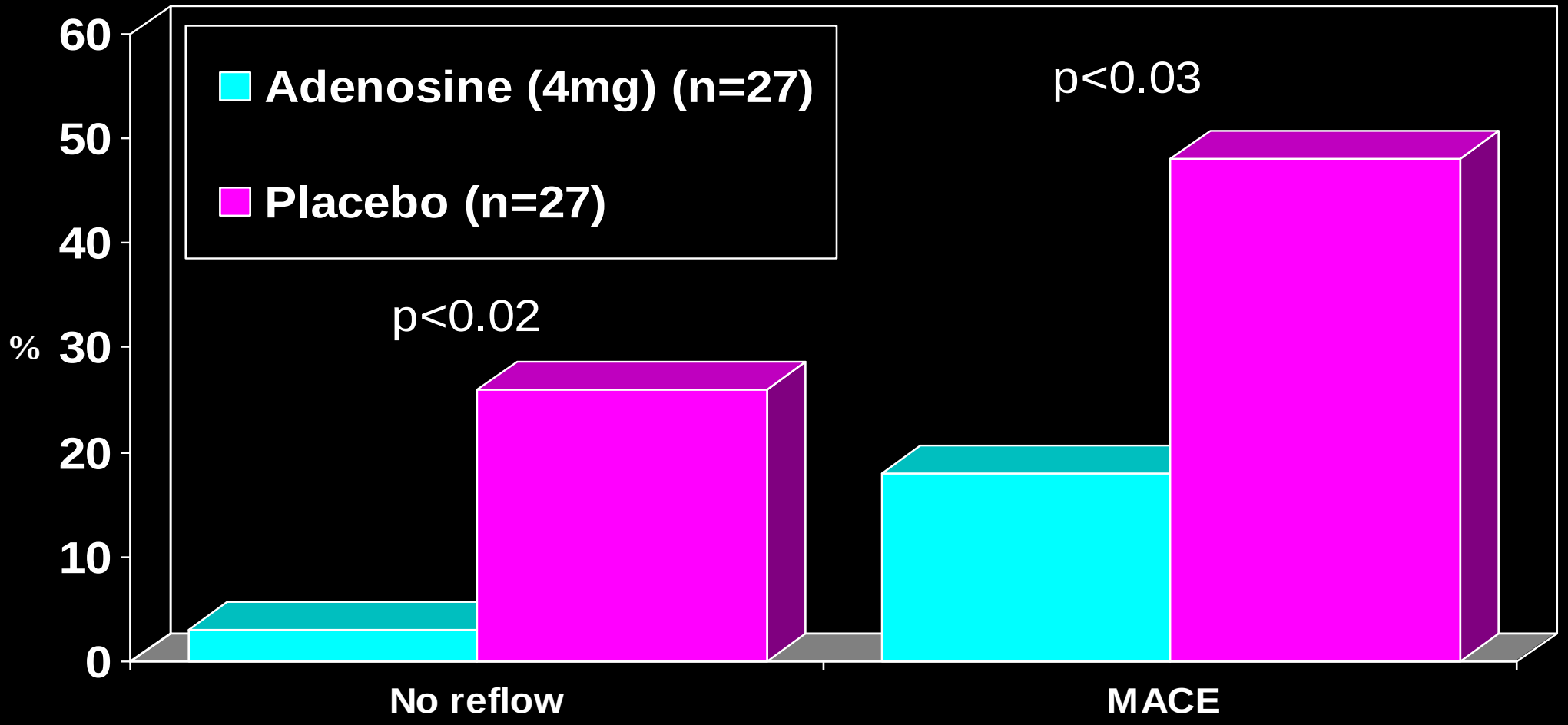




(Svilaas et al, NEJM 2008)

(Vlaar et al, Lancet 2008)

Effects of ic Adenosine (4mg) prior to PPCI (n=54)



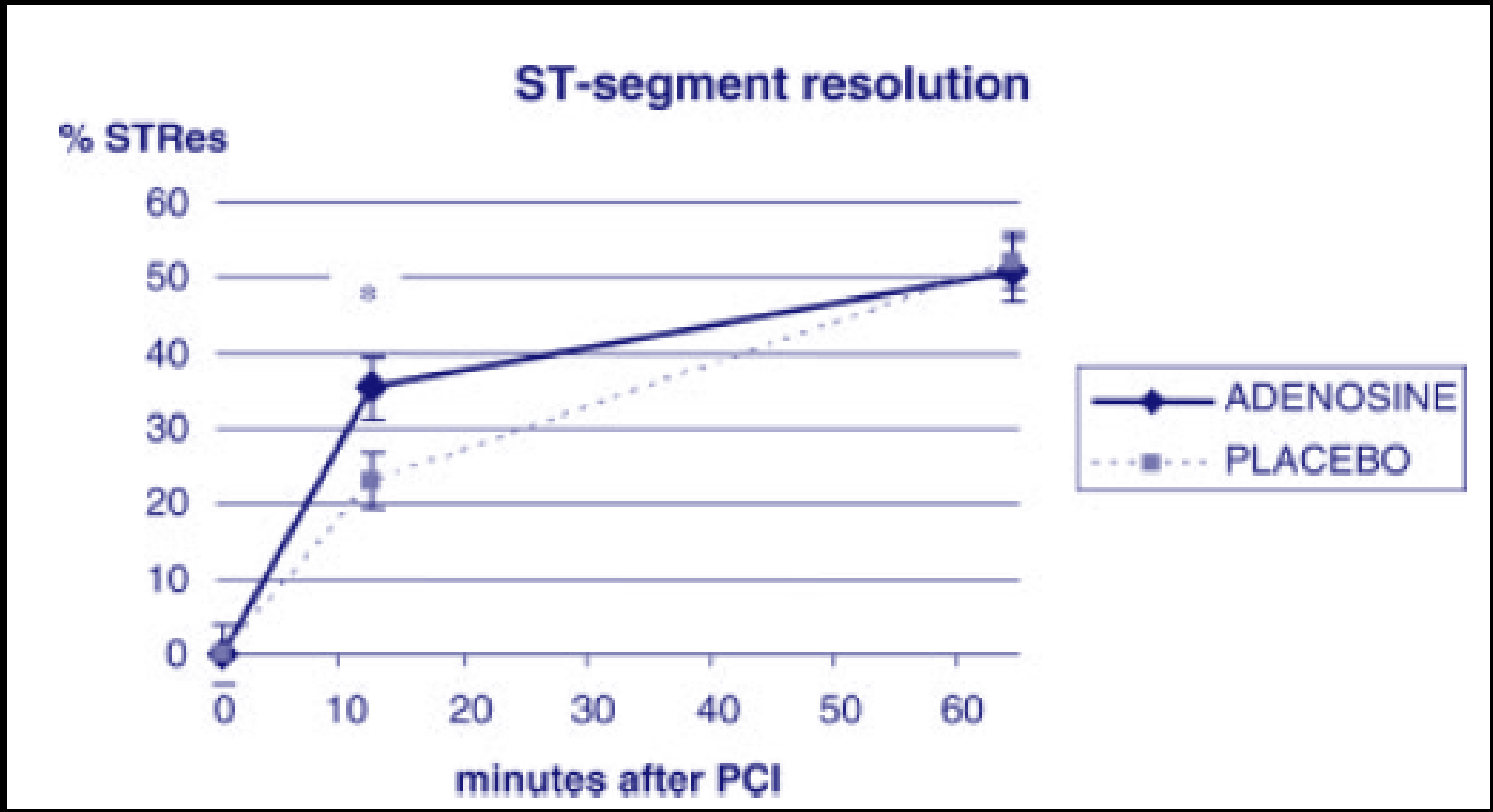
(Marzilli et al, Circulation 2000)

Adenosine as an Adjunct to Reperfusion in the Treatment of Acute Myocardial Infarction (n=2118)

End Point	Treatment Groups				p Value†
	Placebo	Pooled Adenosine	Adenosine* 50 μg/kg/min	Adenosine 70 μg/kg/min	
Intention-to-treat analysis					
n	703	1,414	701	713	
Death	83 (11.8%)	146 (10.3%)	73 (10.4%)	73 (10.2%)	0.29
In-hospital CHF	28 (4.0%)	60 (4.2%)	28 (4.0%)	32 (4.5%)	0.75
Re-hospitalization for CHF	30 (4.3%)	56 (4.0%)	27 (3.9%)	29 (4.1%)	0.81
Composite	126 (17.9%)	231 (16.3%)	116 (16.5%)	115 (16.1%)	0.43
Per protocol analysis					
n	538	1,050	519	531	
Death	62 (11.5%)	99 (9.4%)	45 (8.7%)	54 (10.2%)	0.18
In-hospital CHF	25 (4.6%)	44 (4.2%)	22 (4.2%)	22 (4.1%)	0.70
Re-hospitalization for CHF	25 (4.6%)	39 (3.7%)	21 (4.0%)	18 (3.3%)	0.45
Composite	98 (18.2%)	160 (15.2%)	79 (15.2%)	81 (15.2%)	0.16

(AMISTAD-2 JACC 2005)

Effects of ic Adenosine (40mg) > 10 min after PPCI (n=51)



(Stoel et al, Cath & Cardiov. Int. 2008)

REOPEN-AMI

471 STEMI patients were assessed for eligibility

123 patients did not meet angiographic eligibility criteria

12 did not undergo PCI
97 had TIMI flow 2-3did not provide written informed consent
4 had culprit lesion non-identified
5 had culprit lesion in a by-pass graft
6 had stent thrombosis
6 had left main disease
3 had acute CABG

108 patients did not meet clinical or ECG eligibility criteria

13 had a diagnosis other than STEMI
7 did not provide written informed consent
5 died before entry into the cath-lab
12 had a previous STEMI in the same territory
16 had cardiogenic shock
5 had contraindications to contrast agent
13 had contraindications to study medications
12 had severe renal failure
25 had left bundle block, frequent ventricular ectopy, paced rhythm, or pre-excitation

240 STEMI patients (TIMI flow 0-1) were randomly assigned to a treatment group

80 were assigned to TA+saline
(*2 ml of heparinized saline as fast bolus followed by 33 ml of heparinized saline in 2 min as slow bolus*)

drug through the guiding catheter due to TA failure — *N=7*

drug through the TA device — *N=73*

80 were assigned to TA+Adenosine
(*120 mcg as fast bolus followed by 2 mg in 33 ml of saline in 2 min as slow bolus*)

drug through the guiding catheter due to TA failure — *N=8*

drug through the TA device — *N=72*

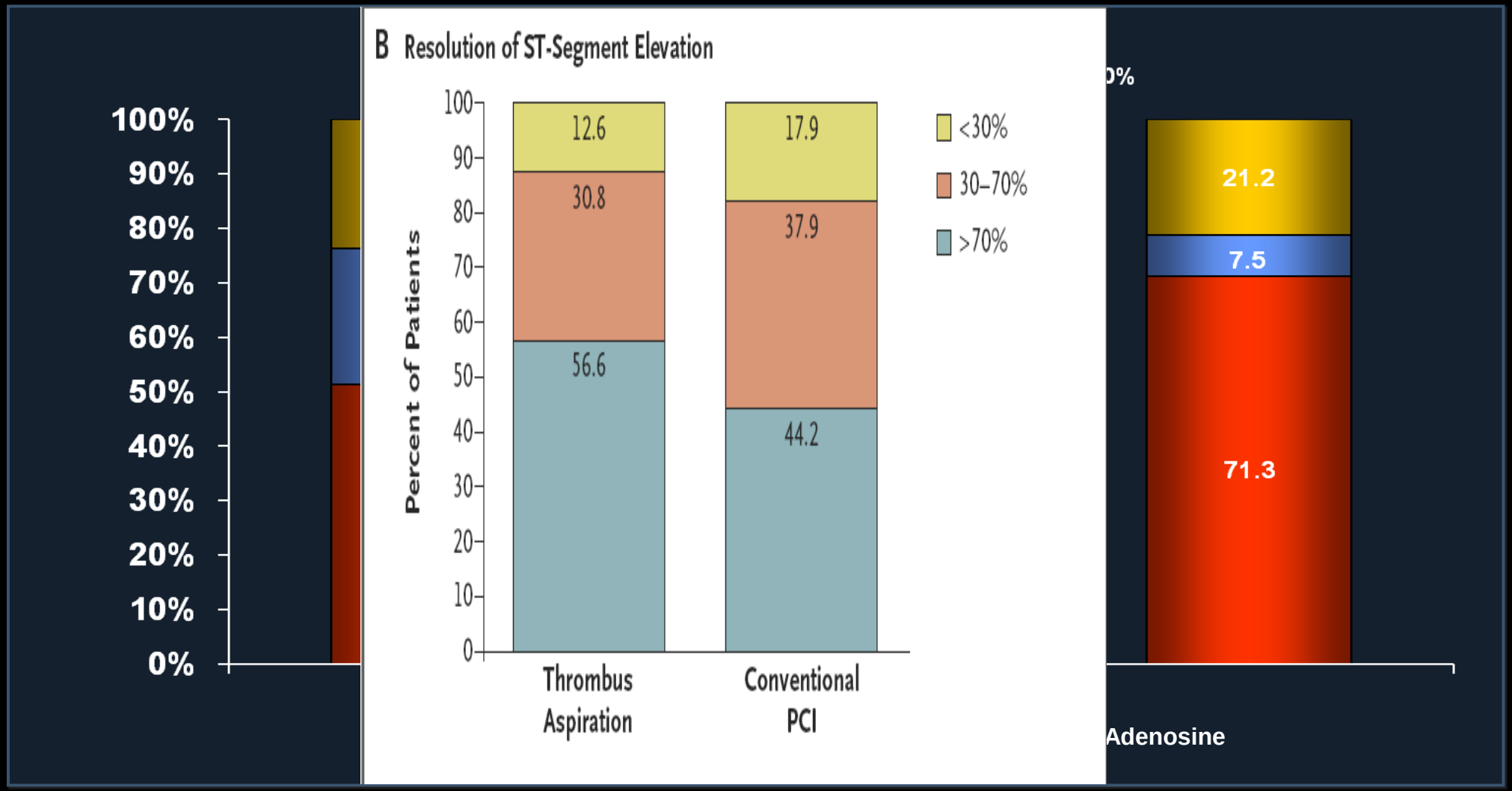
80 were assigned to TA+Nitroprusside
(*60 mcg as fast bolus followed by 100 mcg in 33 ml of 5% glucose in 2 min as slow bolus*)

drug through the guiding catheter due to TA failure — *N=9*

drug through the TA device — *N=71*

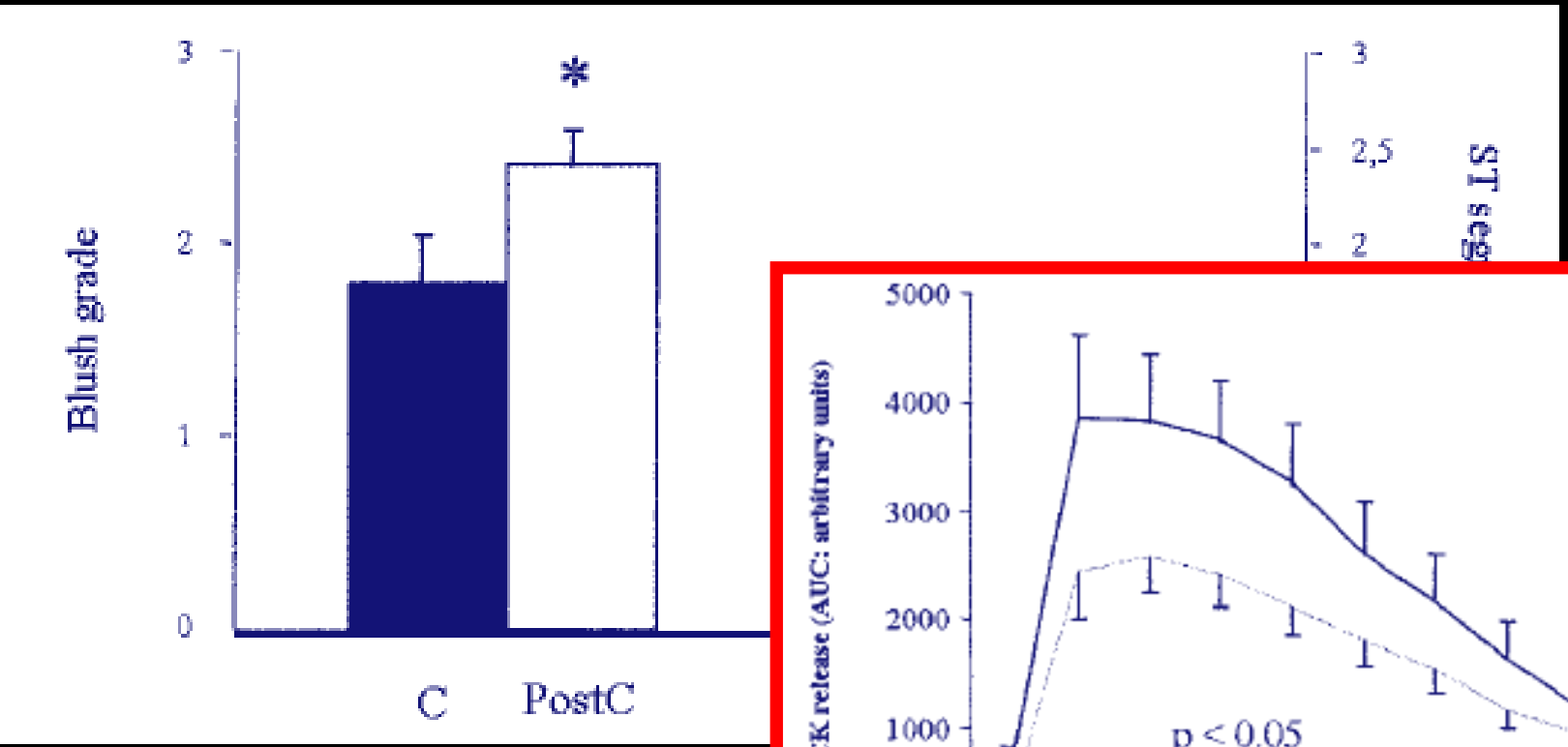
All patients received a weight adjusted bolus and infusion of abciximab for 12 h

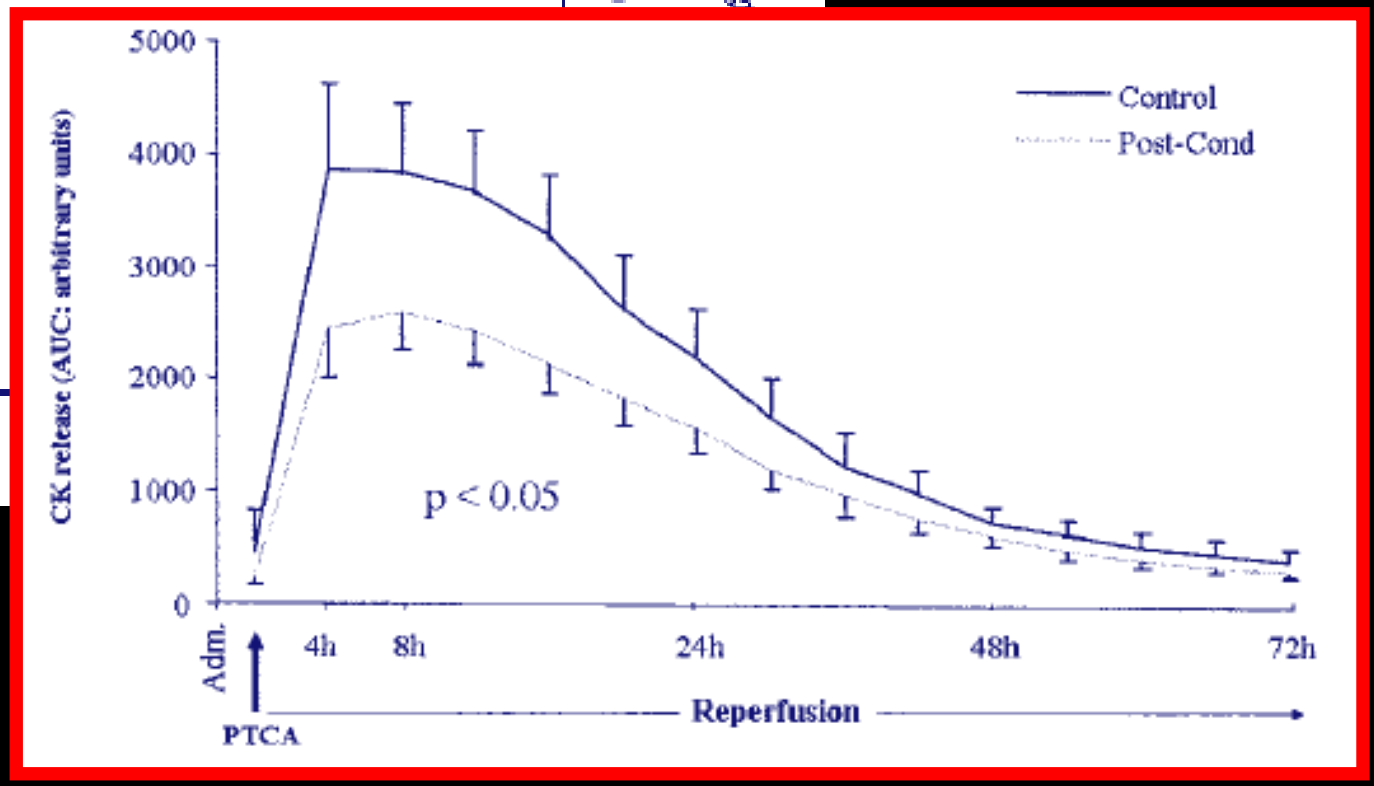
ST-segment resolution



Adenosine vs Saline p = 0.009
Nitroprusside vs Saline p = 0.75

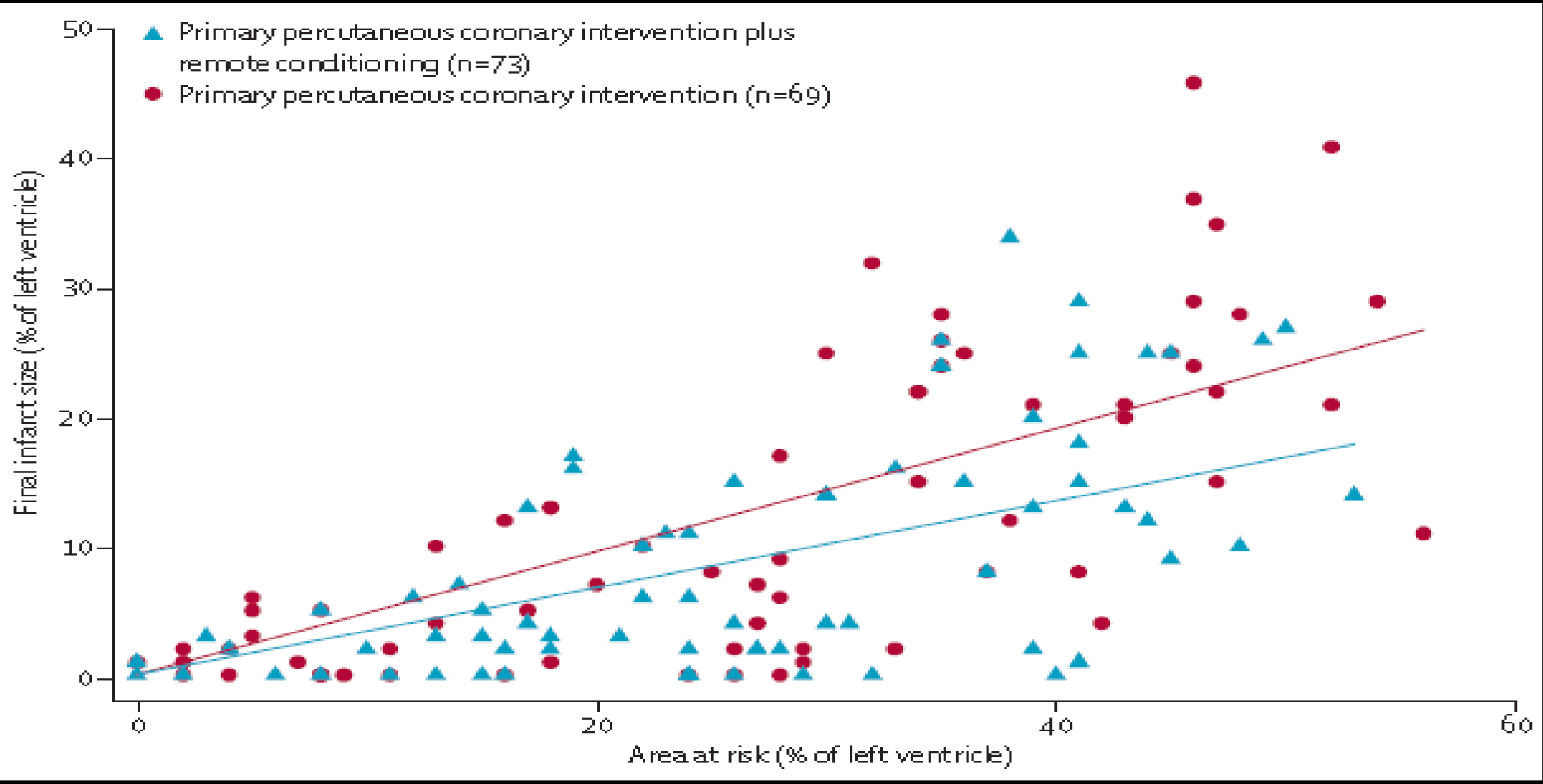
Effects of post-conditioning prior to PPCI (n=30)





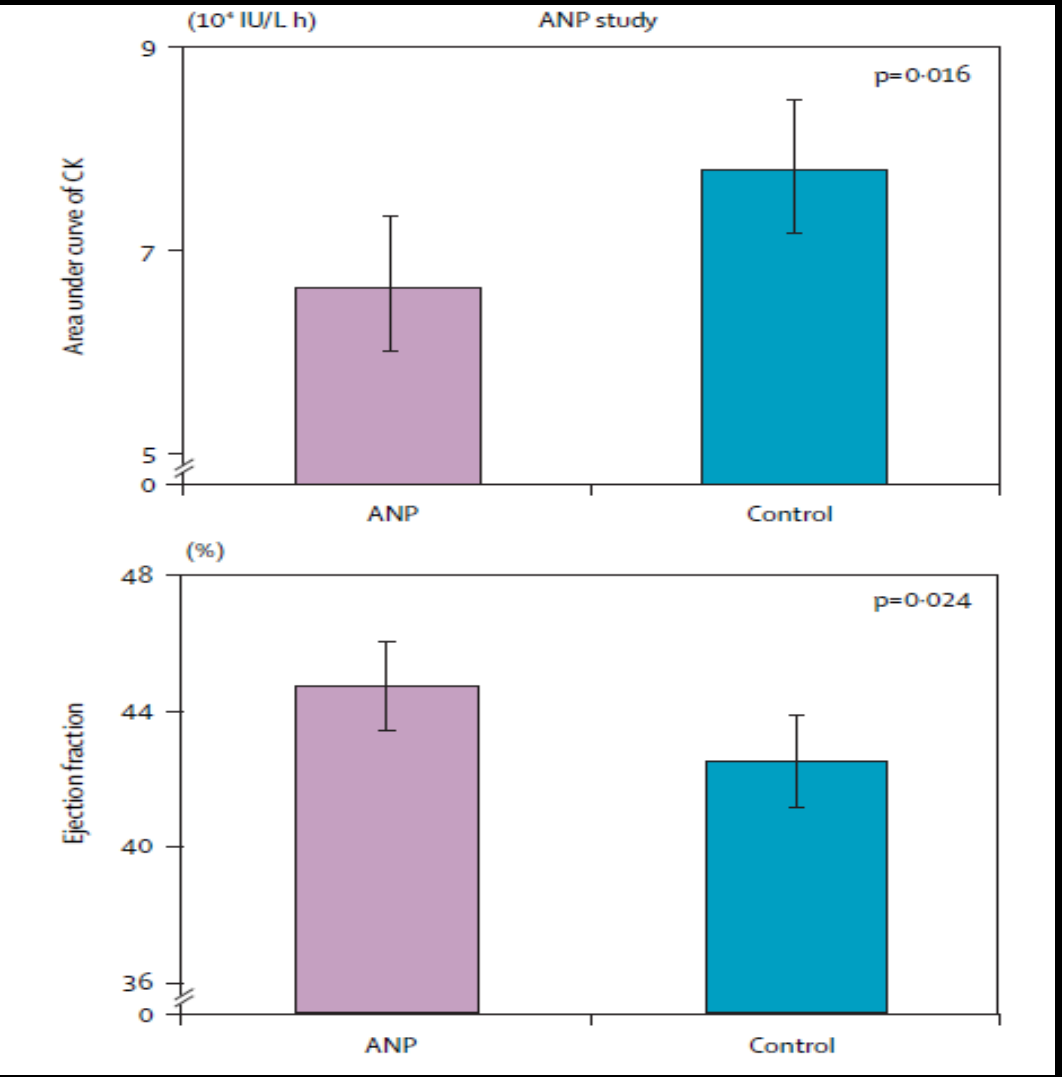
(Piot et al, Circulation 2005)

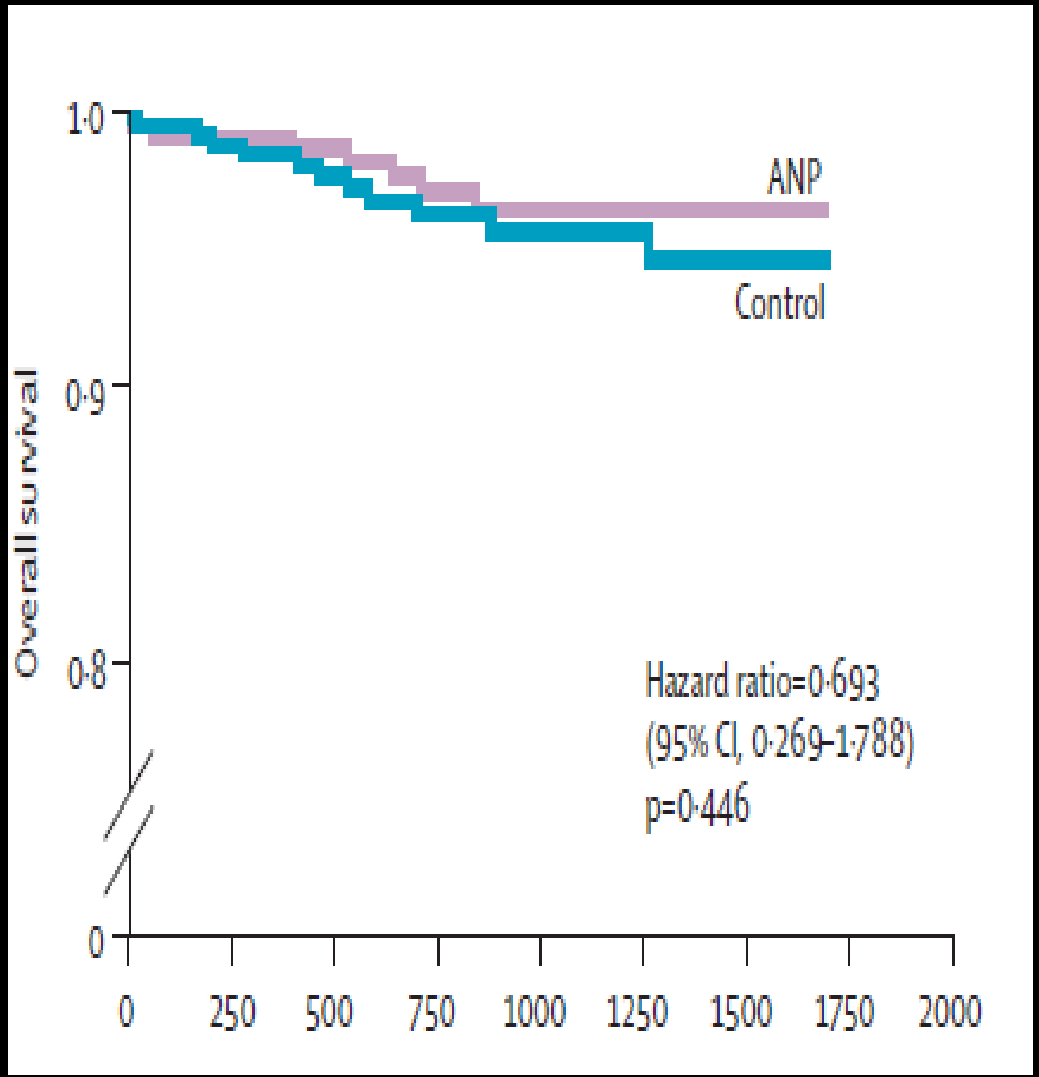
Effects of remote conditioning prior to PPCI (n=142)



(Botker et al, Lancet 2010)

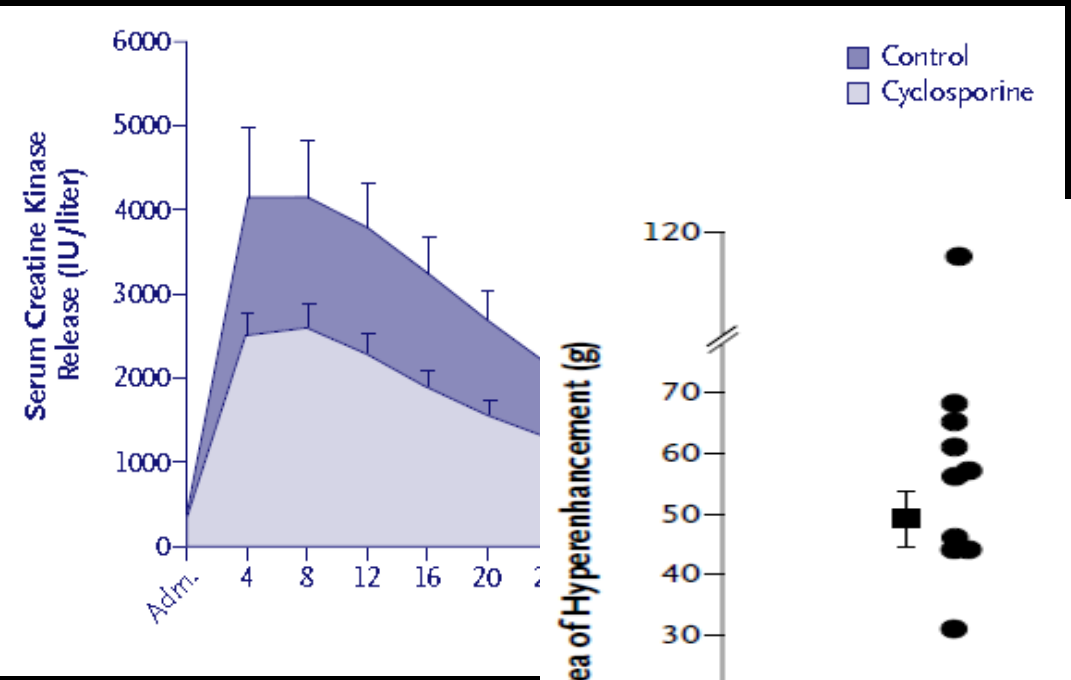
Effects of iv ANP (0.0125 µg/kg for 72 hours) after TL or PCI (n=569)

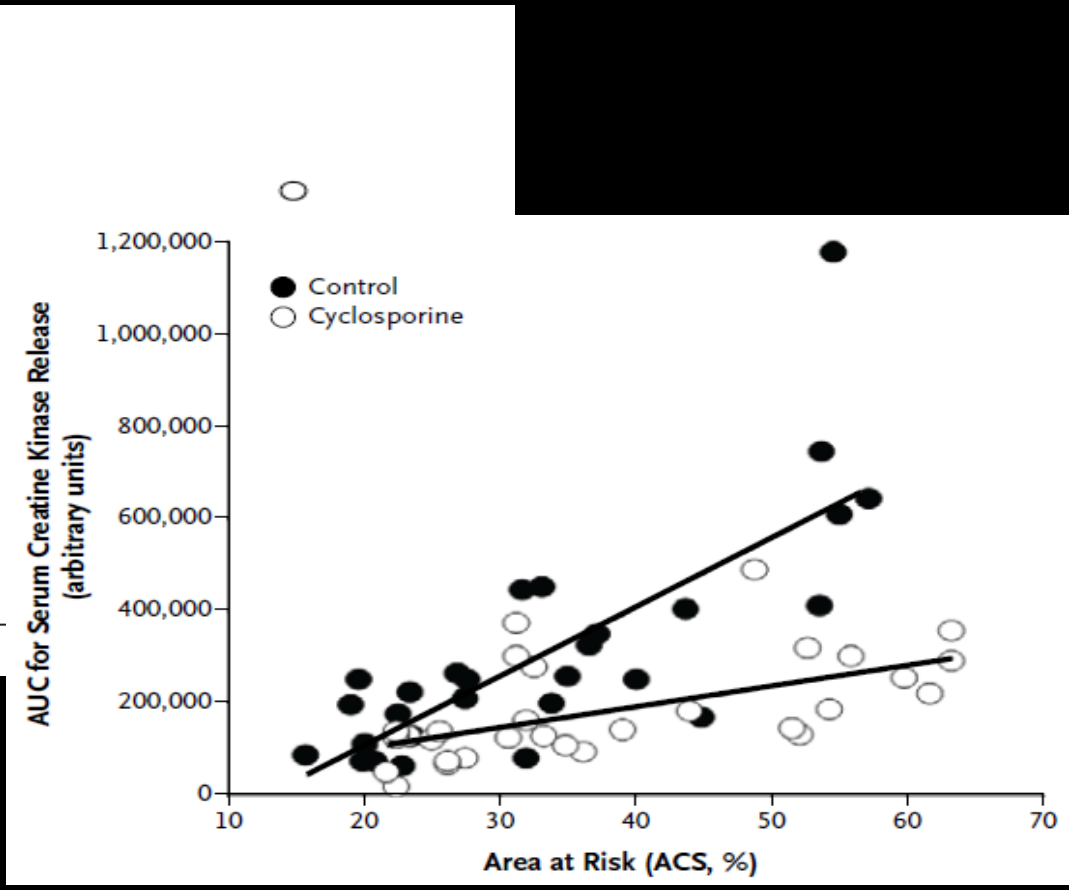




(Kitakaze et al, Lancet 2007)

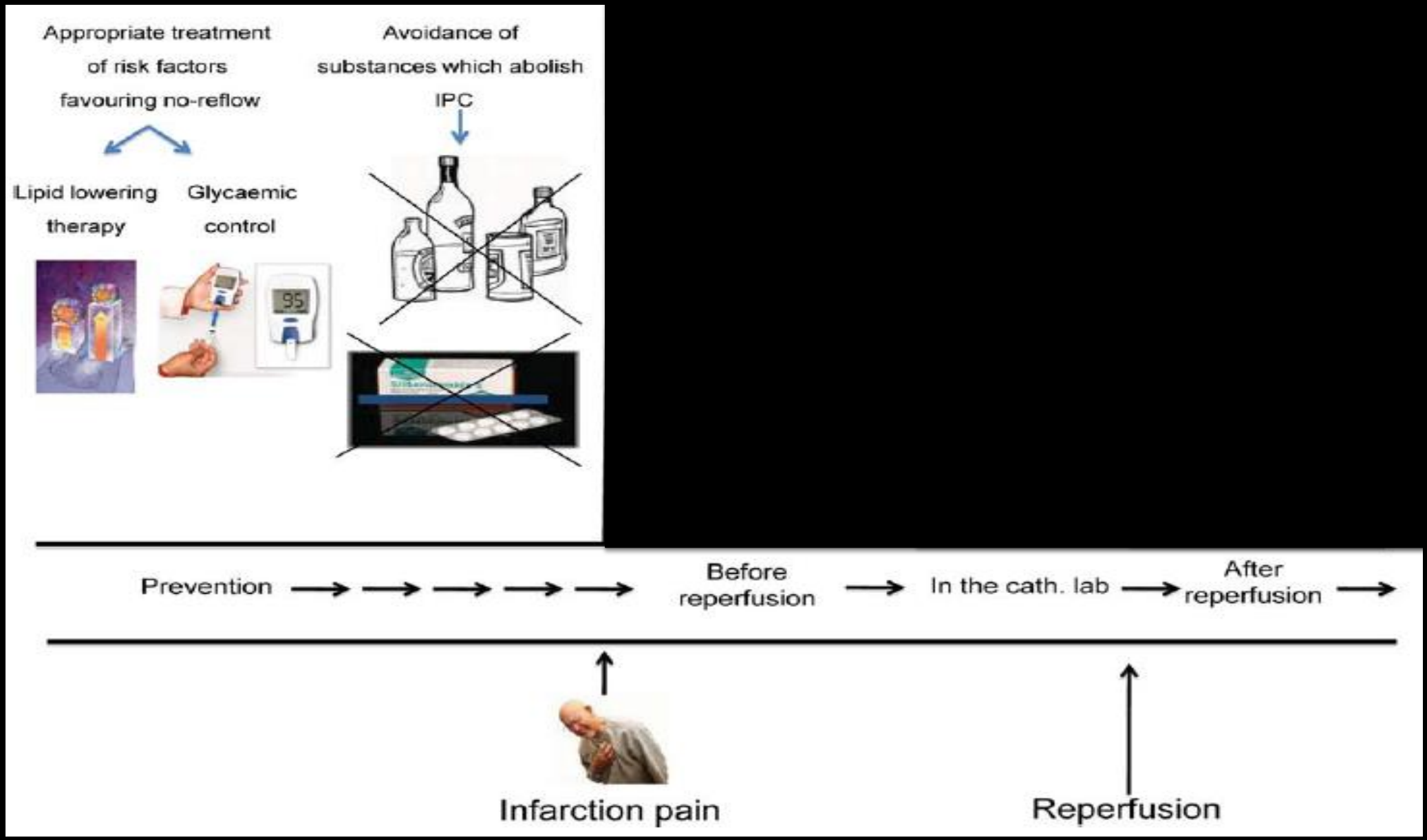
Effects of iv Cyclosporine (2.5mg/Kg) prior to PPCI (n=58)





(Piot et al. NEJM 2008)

MVO: prevention is better than treatment



(Niccoli et al, EHJ 2010)