Αντιμετώπιση τού ΟΞΕΩΣ ΕΜΦΡΑΓΜΑΤΟΣ του ΜΥΟΚΑΡΔΙΟΥ σε Νοσοκομείο χωρίς Αιμοδυναμικό Εργαστήριο

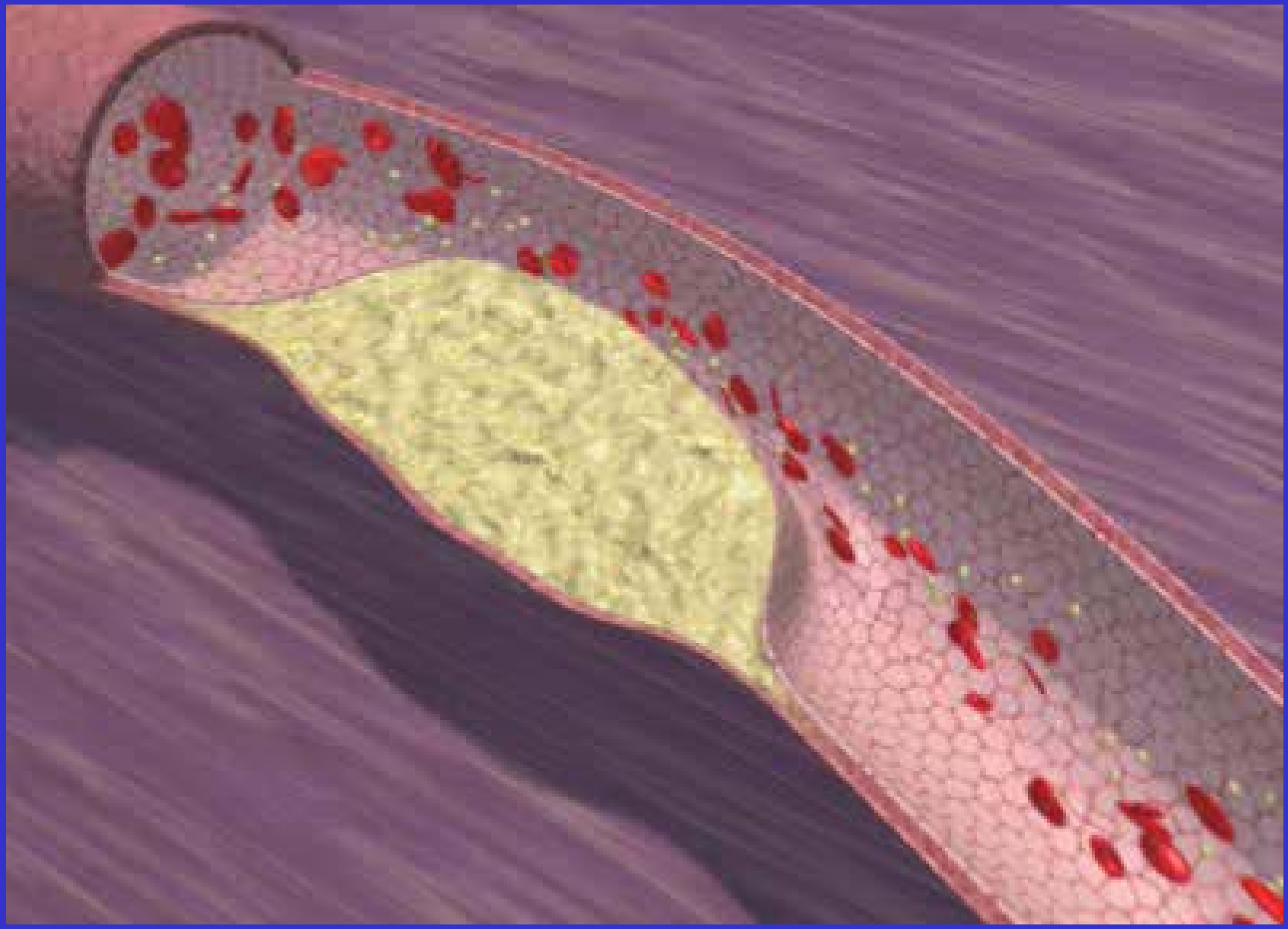
Πανελλήνιο Καρδιολογικό Συνέδριο

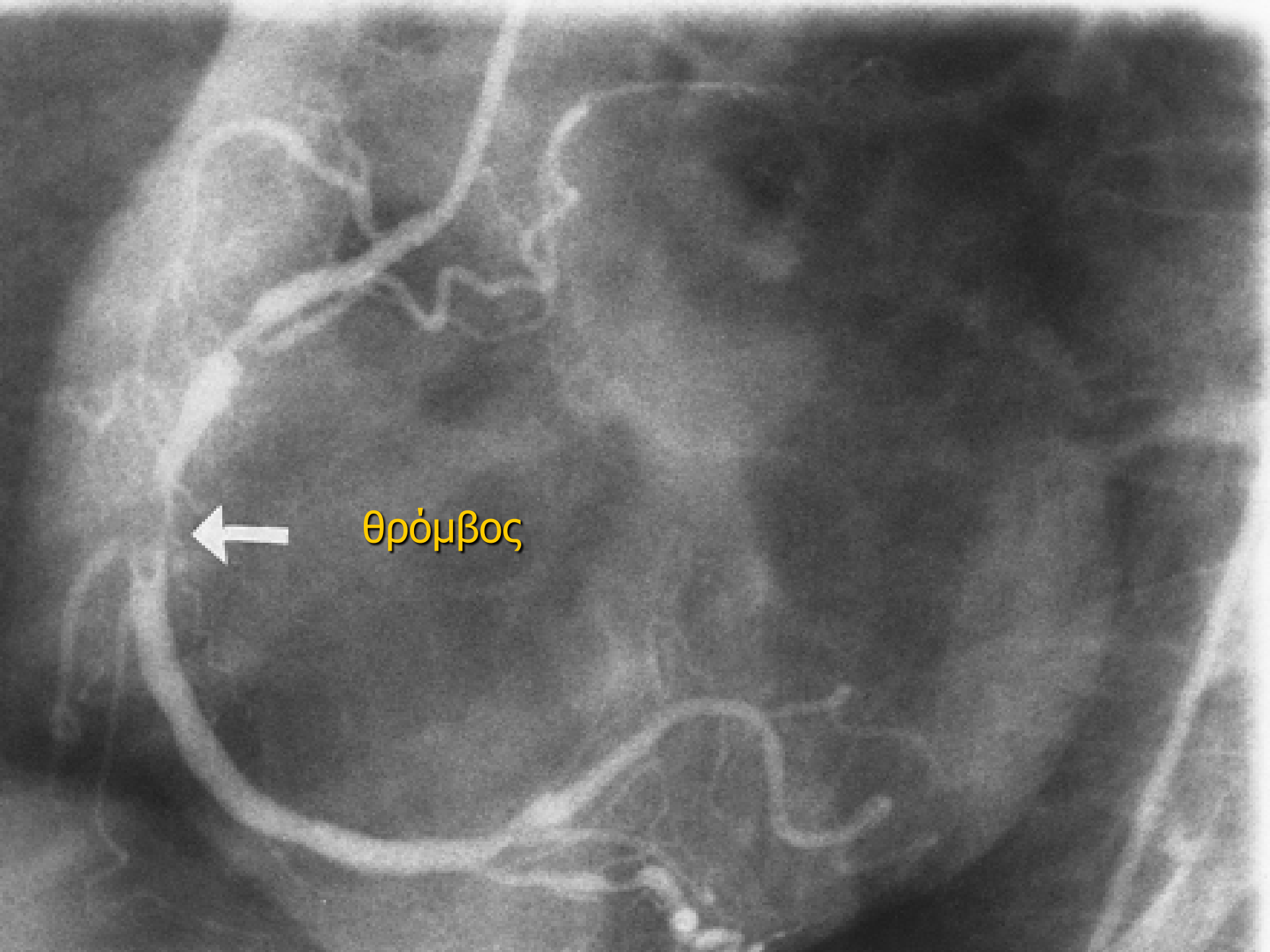
Αθήνα 30/10 - 1/11/2008

Βλάσης Ν. Πυργάκης MD FESC

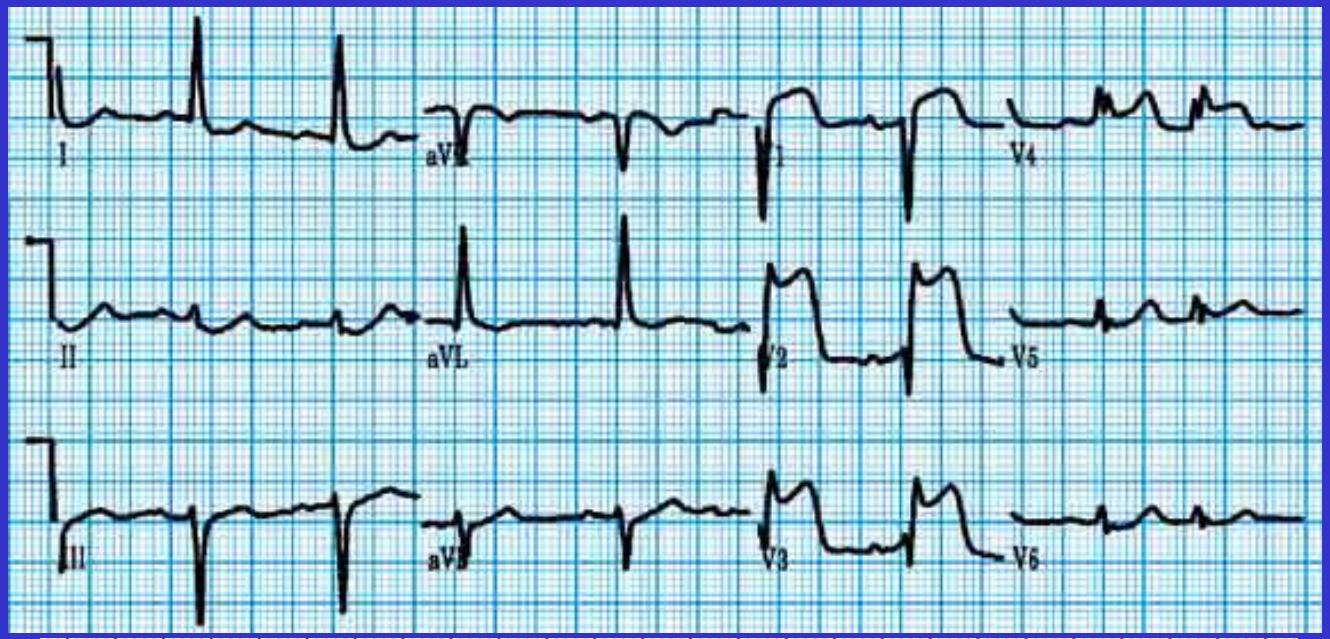
Διευθυντής Καρδιολογικής Κλινικής

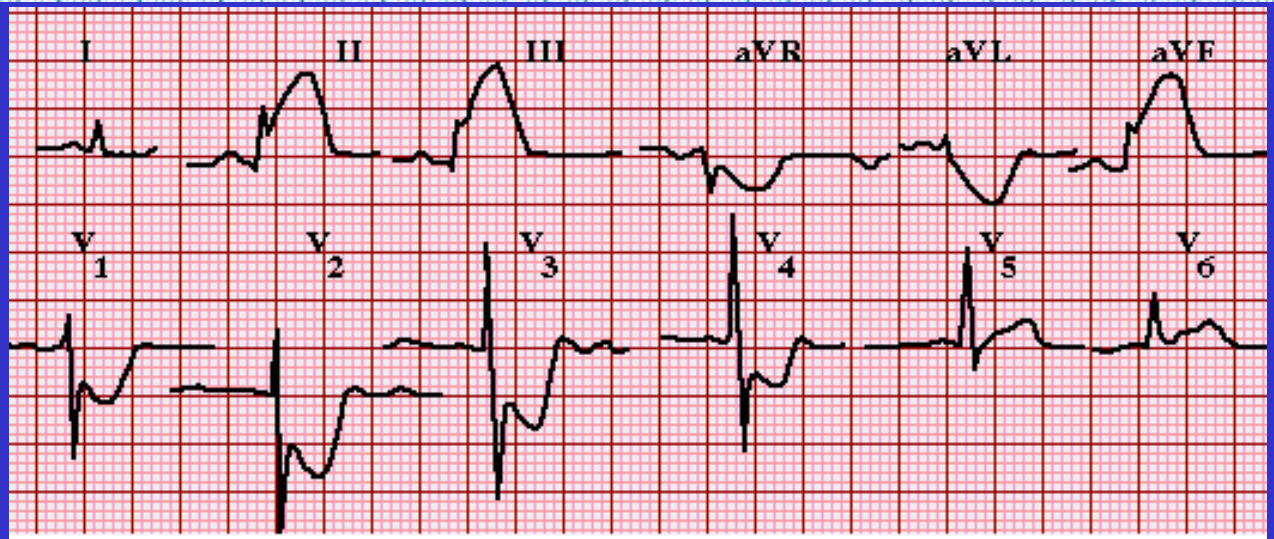
Γεν. Νοσοκομείου Κορίνθου




θρόμβος

STEMI





Acute inferior transmural myocardial infarction ST segment elevation in leads II, III, and aVF is characteristic of an acute inferior infarct. Reciprocal ST segment depression is present in this case in leads V1 to V4, and aVL.

Θνητότητα ΟΕΜ

Τελευταίες 10-ετίες :

μεγάλη μείωση της **Νοσοκομειακής** θνητότητας

(βελτίωση του τρόπου θεραπείας)

Dellborg M, Eriksson P, Riha M, Swedberg K. Declining hospital mortality in acute myocardial infarction. Eur Heart J 1994; 15: 5–9.

Koenig W, Löwel H, Lewis M, Hörmann A. Long-term survival after myocardial infarction: relationship with thrombolysis and discharge medication. Results of the Augsburg myocardial infarction follow-up study 1985 to 1993. Eur Heart J 1996; 17: 1199–1206.

Νοσοκομειακή Θνητότητα ΟΕΜ στην **Ευρώπη**

7 %

A prospective survey of the characteristics, treatments and outcomes of patients with acute coronary syndromes in Europe and the Mediterranean basin

The Euro Heart Survey of Acute Coronary Syndromes

(Euro Heart Survey ACS)

D. Hasdai1, S. Behar2, L. Wallentin3, N. Danchin4, A. K. Gitt5, E. Boersma6, P. M. Fioretti7, M. L. Simoons6 and A. Battler1

European Heart Journal (2002) **23,** 1190–1201

Νοσοκομειακή Θνητότητα ΟΕΜ στην **Ελβετία**

Νοσοκομεία

διαθέτοντα ΑΙΜΟΔΥΝΑΜΙΚΟ ΕΡΓΑΣΤΗΡΙΟ	8.9 %
ΧΩΡΙΣ >>	**10.6** %

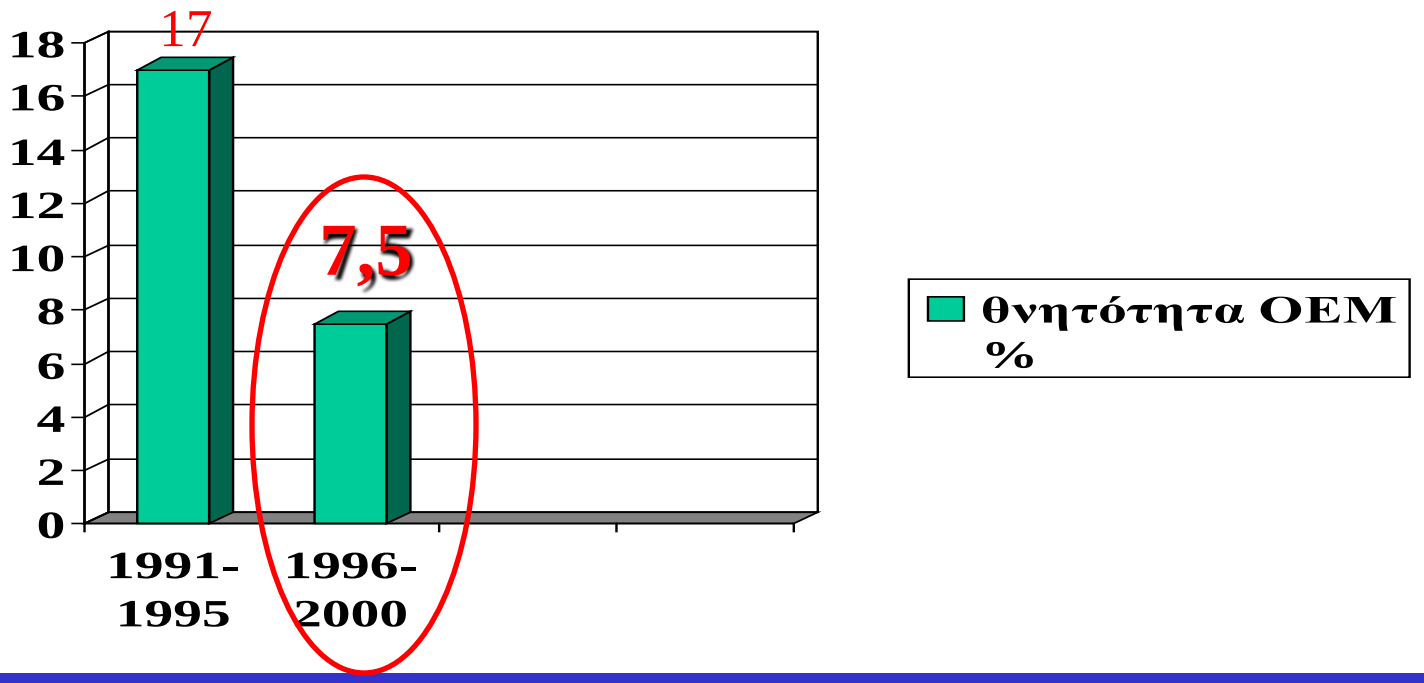
In-Hospital Mortality following hospital admission for AMI in Switzerland: is it related to in house cath-lab availability? Jean-Christophe Stauffer, Valérie Stolt, Philip Urban, Dragana Radovanovic, Nicole Duvoisin, Marco Maggiorini, Osmund Bertel, Paul Erne, for the AMIS investigators

Kardiovaskuläre Medizin 2005; 8(Suppl 8):S40.

ΜΕΙΩΣΗ ΤΗΣ ΣΥΧΝΟΤΗΤΑΣ ΚΑΙ ΤΗΣ ΘΝΗΤΟΤΗΤΑΣ ΤΟΥ ΟΞΕΩΣ ΕΜΦΡΑΓΜΑΤΟΣ ΤΟΥ ΜΥΟΚΑΡΔΙΟΥ ΣΤΗΝ ΕΛΛΗΝΙΚΗ ΕΠΑΡΧΙΑ ΤΗΝ ΤΕΛΕΥΤΑΙΑ ΠΕΝΤΑΕΤΙΑ.

Β Ν Πυργάκης, Ο Α Κάπη-Λιάτα, Μ Ι Μπάντερ, Θ Ν Κόντη, Β Β Κολοκούρη, Ε Δ Ζαχαρή, Ε Γ Αθανασοπούλου, Χ Θ Δηλανάς.

22-ο Πανελλήνιο Καρδιολογικό Συνέδριο. Θεσσαλονίκη 22-24 Νοεμβρίου 2001.



μεγάλη μείωση (55,88%) της θνητότητας του ΟΕΜ από την 5-ετία 1995-2000

Θνητότητα ΟΕΜ

Η πλειοψηφία των θανάτων :

- τις πρώτες ώρες ΕΜ οφείλεται σε **VF**

Cummins RO, Ornato JP, Thies WH, Pepe PE. Improving survival from sudden cardiac arrest: the "chain of survival" concept: a statement for health professionals from the Advanced Cardiac Life Support Subcommittee and the Emergency Cardiac Care Committee, American Heart Association. *Circulation* 1991;83: 1832-47.

VF επί ΟΕΜ

the key to improved survival : **early defibrillation**

Stiell IG, Wells GA, Field BJ, et al. Improved out-of-hospital cardiac arrest survival through the inexpensive optimization of an existing defibrillation program: OPALS study phase II. Ontario Prehospital Advanced Life Support. *JAMA* 1999;281:1175-81.

Ασθενείς με συμπτώματα ΟΕΜ

activation of Emergency Medical Services (EMS---166)

- transport to the nearest appropriate Hospital

- transport should be by  equipped with a defibrillator and personnel proficient in its use

Α. Γενικά θεραπευτικά μέτρα

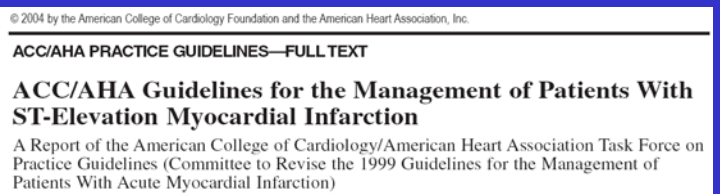
- CCU

Class I

1. STEMI patients should be admitted to a quiet and comfortable environment that provides for continuous monitoring of the ECG and pulse oximetry and has ready access to facilities for hemodynamic monitoring and defibrillation. (*Level of Evidence: C*)

- O2 (2-4 l/min) (Sat 96%)

(προστατευτική δράση στο μυοκάρδιο)



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Α. Γενικά θεραπευτικά μέτρα

- ASPIRIN

Class I

A daily dose of aspirin (initial dose of 162 to 325 mg orally; maintenance dose of 75 to 162 mg) should be given indefinitely after STEMI to all patients without a true aspirin allergy. ***(Level of Evidence: A)***

εκτός αν αντενδείκνυται : αλλεργία

ενεργός αιμορραγία

ενεργό πεπτικό έλκος

(για ταχύτερη δράση αποφεύγονται τα σκευάσματα πού απορροφώνται στο έντερο)

Antiplatelet Trialists' Collaboration. Collaborative overview of randomised trials of antiplatelet therapy (Part 1 of 3): prevention of death, myocardial infarction and stroke by prolonged antiplatelet therapy in various categories of patients. *BMJ* 1994; 308: 81-106.

Α. Γενικά θεραπευτικά μέτρα

- **Αγχολυτικά**

(βενζοδιαζεπίνες)

Class IIa

1. It is reasonable to use anxiolytic medications in STEMI patients to alleviate short-term anxiety or altered behavior related to hospitalization for STEMI. (*Level of Evidence: C*)

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Α. Γενικά θεραπευτικά μέτρα

Έλεγχος του Καρδιακού πόνου

- Αναλγητικά

Class I

1. **Morphine sulfate (2 to 4 mg IV with increments of 2 to 8 mg IV repeated at 5- to 15-minute intervals) is the analgesic of choice for management of pain associated with STEMI. (*Level of Evidence: C*)**

(μειώνουν την διέγερση του συμπαθητικού και το καρδιακό έργο)

(+ αντιεμετικά - metoclopramide 10 mg)

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Α. Γενικά θεραπευτικά μέτρα

Έλεγχος του Καρδιακού πόνου

- Νιτρώδη Sl or IV :

Class I

1. **Patients with ongoing ischemic discomfort should receive sublingual nitroglycerin (0.4 mg) every 5 minutes for a total of 3 doses, after which an assessment should be made about the need for intravenous nitroglycerin. (*Level of Evidence: C*)**

- έλεγχος τής Στηθάγχης και της ΥΠ
- δεν επιδρούν στην θνητότητα (ISIS4)

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Α. Γενικά θεραπευτικά μέτρα

Έλεγχος του Καρδιακού πόνου

Νιτρώδη

Ενδείκνυνται , ιδίως επί :

- Ισχαιμίας
- ΥΠ
- πνευμονικής συμφόρησης

αντενδείκνυνται :

- υπόταση
- ΕΜ Δεξ Κοιλ

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Α. Γενικά θεραπευτικά μέτρα
Έλεγχος του Καρδιακού πόνου

2007 STEMI Focused Update Recommendation

Class I

2. Patients routinely taking NSAIDs (except for aspirin), both nonselective as well as COX-2 selective agents, before STEMI should have those agents discontinued at the time of presentation with STEMI because of the increased risk of mortality, reinfarction, hypertension, heart failure, and myocardial rupture associated with their use. (*Level of Evidence: C*)

Class III

1. NSAIDs (except for aspirin), both nonselective as well as COX-2 selective agents, should not be administered during hospitalization for STEMI because of the increased risk of mortality, reinfarction, hypertension, heart failure, and myocardial rupture associated with their use. (*Level of Evidence: C*)

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

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

Karen P. Alexander, L. Kristin Newby, Paul W. Armstrong, Christopher P. Cannon, W. Brian Gibler, Michael W. Rich, Frans Van de Werf, Harvey D. White, W. Douglas Weaver, Mary D. Naylor, Joel M. Gore, Harlan M. Krumholz and E. Magnus Ohman

Circulation 2007;115;2570-2589

Α. Γενικά θεραπευτικά μέτρα

Καλή Ρύθμιση Γλυκόζης Αιμ.

Insuline

Class I

1. An insulin infusion to normalize blood glucose is recommended for patients with STEMI and complicated courses. (*Level of Evidence: B*)

Class IIa

1. During the acute phase (first 24 to 48 hours) of the management of STEMI in patients with hyperglycemia, it is reasonable to administer an insulin infusion to normalize blood glucose, even in patients with an uncomplicated course. (*Level of Evidence: B*)

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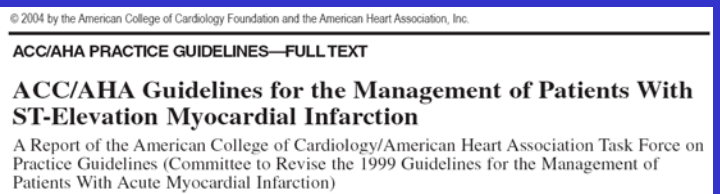
Θεραπεία STEMI

Β. Εκτίμηση της Αιμοδυναμικής κατάστασης και διόρθωση τυχόν υπαρχουσών ανωμαλιών

(π .χ βραδυκαρδία, αρρυθμίες, υπόταση, Ο ΠΟΙ)



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Θεραπεία ΟΕΜ-

Β. Εκτίμηση της Αιμοδυναμικής κατάστασης και διόρθωση τυχόν υπαρχουσών ανωμαλιών

Οξεία Καρδιακή Ανεπάρκεια

- O2 by mask or intranasally
- Diuretics (furosemide PO or IV)
- Nitrates SL or IV

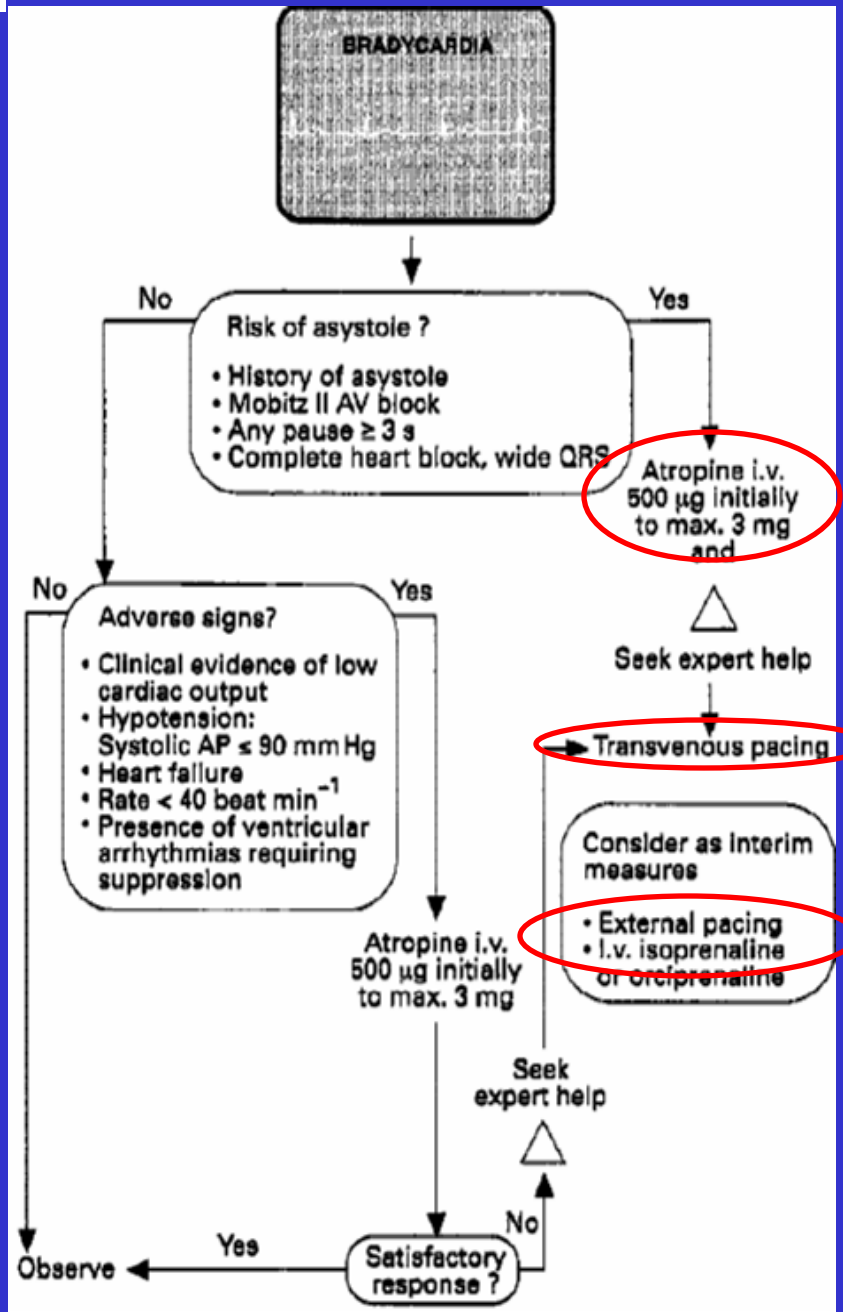
European Heart Journal (1998) **19**, 1140–1164
Article No. 981106

Task Force Report

The pre-hospital management of acute heart attacks

Recommendations of a Task Force of the The European Society of Cardiology and The European Resuscitation Council

Θεραπεία ΟΕΜ- **Β.** Εκτίμηση της Αιμοδυναμικής κατάστασης και διόρθωση τυχόν υπαρχουσών ανωμαλιών



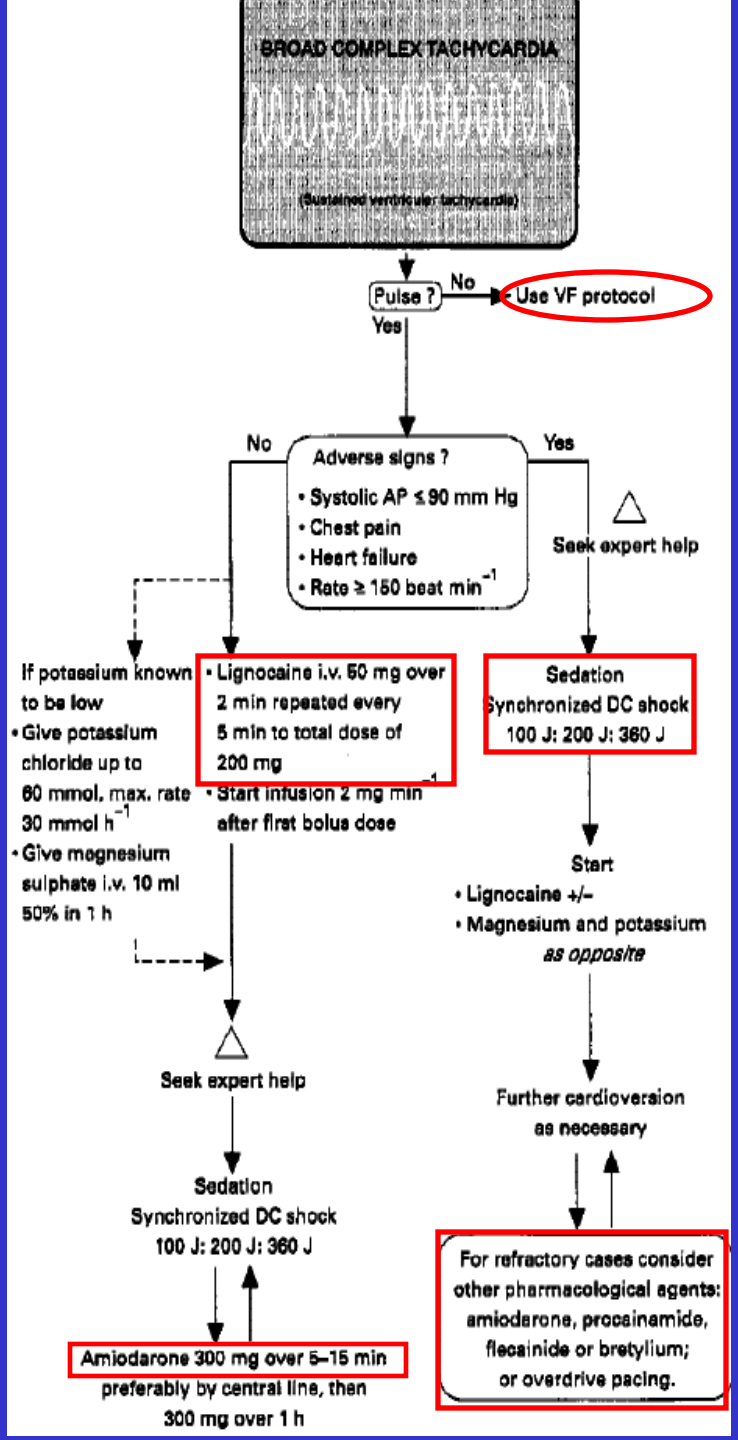
EMERGENCY TREATMENT

PERI-ARREST ARRHYTHMIAS

A statement for the Advanced Cardiac Life Support Committee of the European Resuscitation Council, 1994. Management of peri-arrest arrhythmias. Resuscitation 1994; 28: 151–9(Update: Resuscitation 1996; 31: 281.)

A statement by the Advanced Cardiac Life Support Committee of the European Resuscitation Council, 1994, [1] updated 1992 [2] and 1998. Peri-arrest arrhythmias: the management of arrhythmias associated with cardiac arrest. In: L Bossaert, ed. European Resuscitation Council Guidelines for Resuscitation. Amsterdam. Elsevier 1998; 159–67.

Θεραπεία ΟΕΜ- Β. Εκτίμηση της Αιμοδυναμικής κατάστασης και διόρθωση τυχόν υπαρχουσών ανωμαλιών



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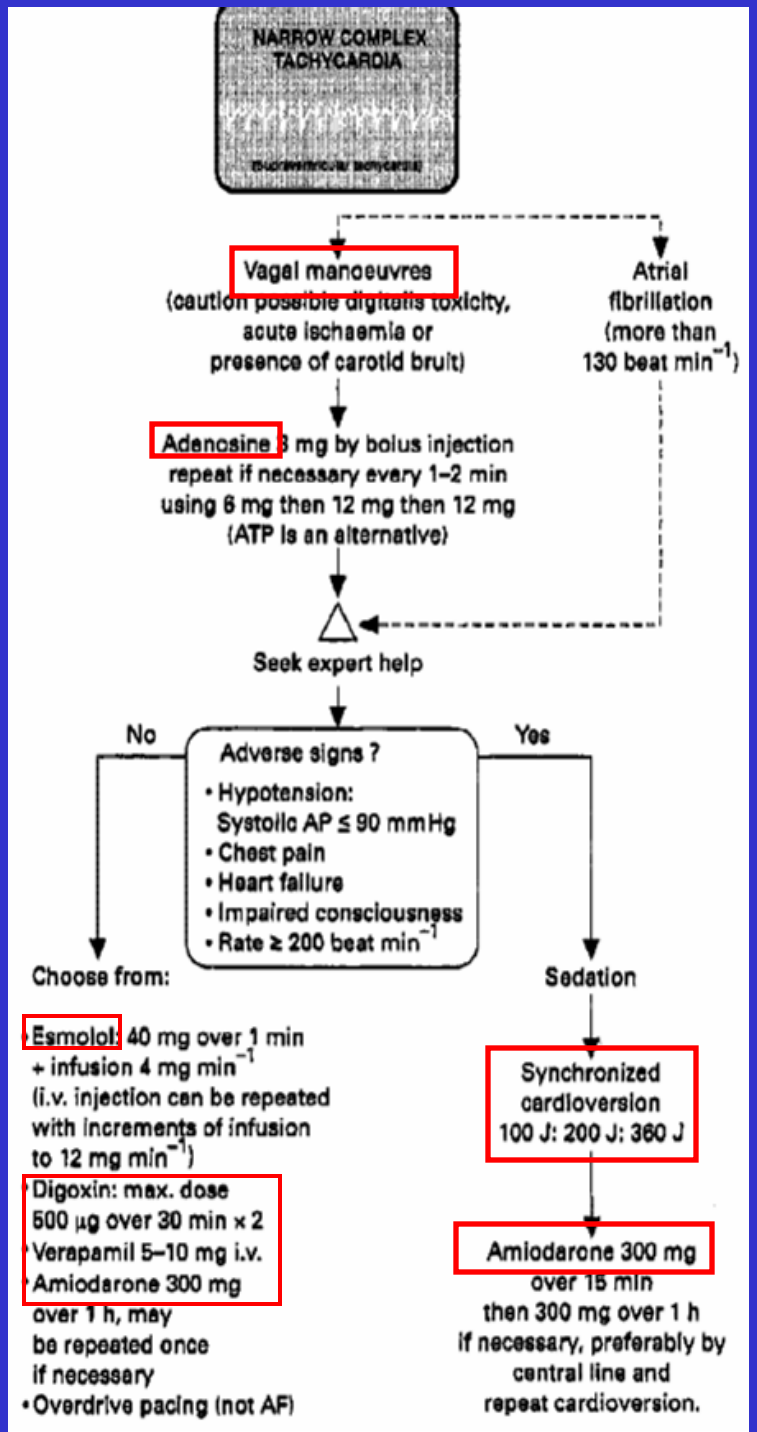

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Γ. Στρατηγικές για τον περιορισμό του μεγέθους του Εμφράγματος

Ανάπαυση στο κρεββάτι

Class IIa

1. After 12 to 24 hours, it is reasonable to allow patients with hemodynamic instability or continued ischemia to have bedside commode privileges. (*Level of Evidence: C*)

Class III

1. Patients with STEMI who are free of recurrent ischemic discomfort, symptoms of heart failure, or serious disturbances of heart rhythm should not be on bed rest for more than 12 to 24 hours. (*Level of Evidence: C*)

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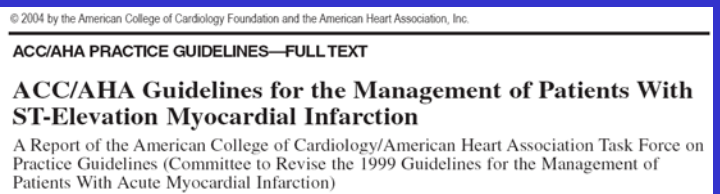
Γ. Στρατηγικές για τον περιορισμό του μεγέθους του Εμφράγματος

ακρογωνιαίος λίθος της σύγχρονης αντιμετώπισης του ΟΕΜ :

<u>Επείγουσα</u> Επαναιμάτωση του ισχαιμούντος μυοκαρδίου με αποκατάσταση της ροής στην αποφραχθείσα στεφανιαία αρτηρία (IRA)



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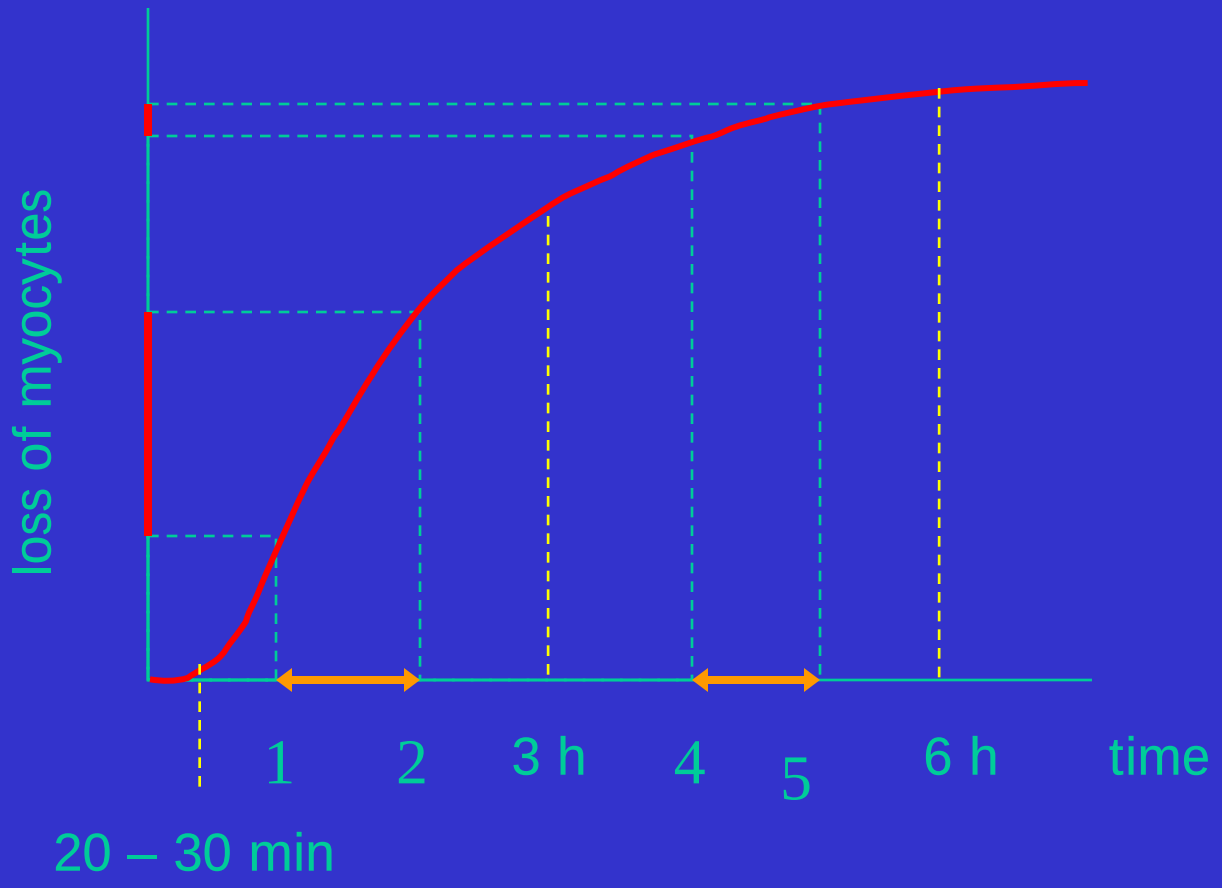
Θεραπεία ΟΕΜ

Επαναιμάτωση → Θρομβόλυση
Επαναιμάτωση → PCI

- ↓ θνητότητα (25%)
- περιορίζει την μυοκαρδιακή βλάβη (δυσλειτουργία ΑΚ)
- ↓ επιπλοκών

επανέμφραγμα
μετεμφραγματική ισχαιμία
αρρυθμίες

Fibrinolytic Therapy Trialists' (FTT) Collaborative Group. Indications for fibrinolytic therapy in suspected acute myocardial infarction: collaborative overview of early mortality and major morbidity results from all randomised trials of more than 1000 patients. Lancet 1994;343:311–22.

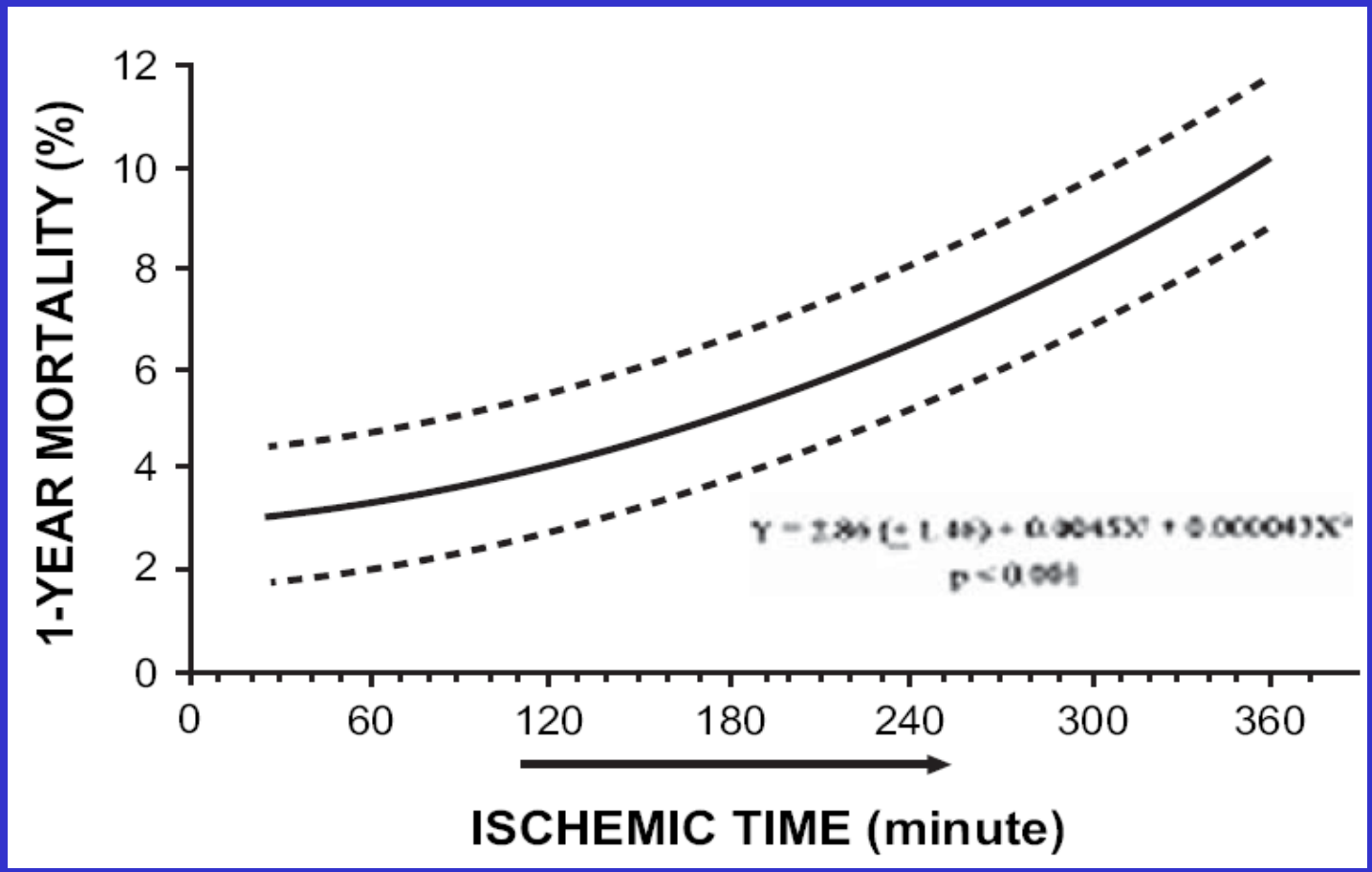

loss of myocytes
1
2
3 h
4
5
6 h
time
20 – 30 min

Επαναιμάτωση

τά αποτελέσματα της επαναιμάτωσης είναι χρονοεξαρτώμενα

"Time is myocardium"

Θρομβόλυση



dicted mortality. (*Modified from* Rogers WJCJ, Lambrew CT, et al. Temporal trends in the treatment of over 1.5 million patients who had myocardial infarction in the US from 1990 through 1999: the National Registry of Myocardial Infarction 1, 2 and 3. J Am Coll Cardiol 2000;36:2056–63; with permission.)

σχέση χρόνου εφαρμογής θρομβολυτικής θεραπείας και ετήσιας θνητότητας σε ασθενείς με ΟΕΜ

PCI

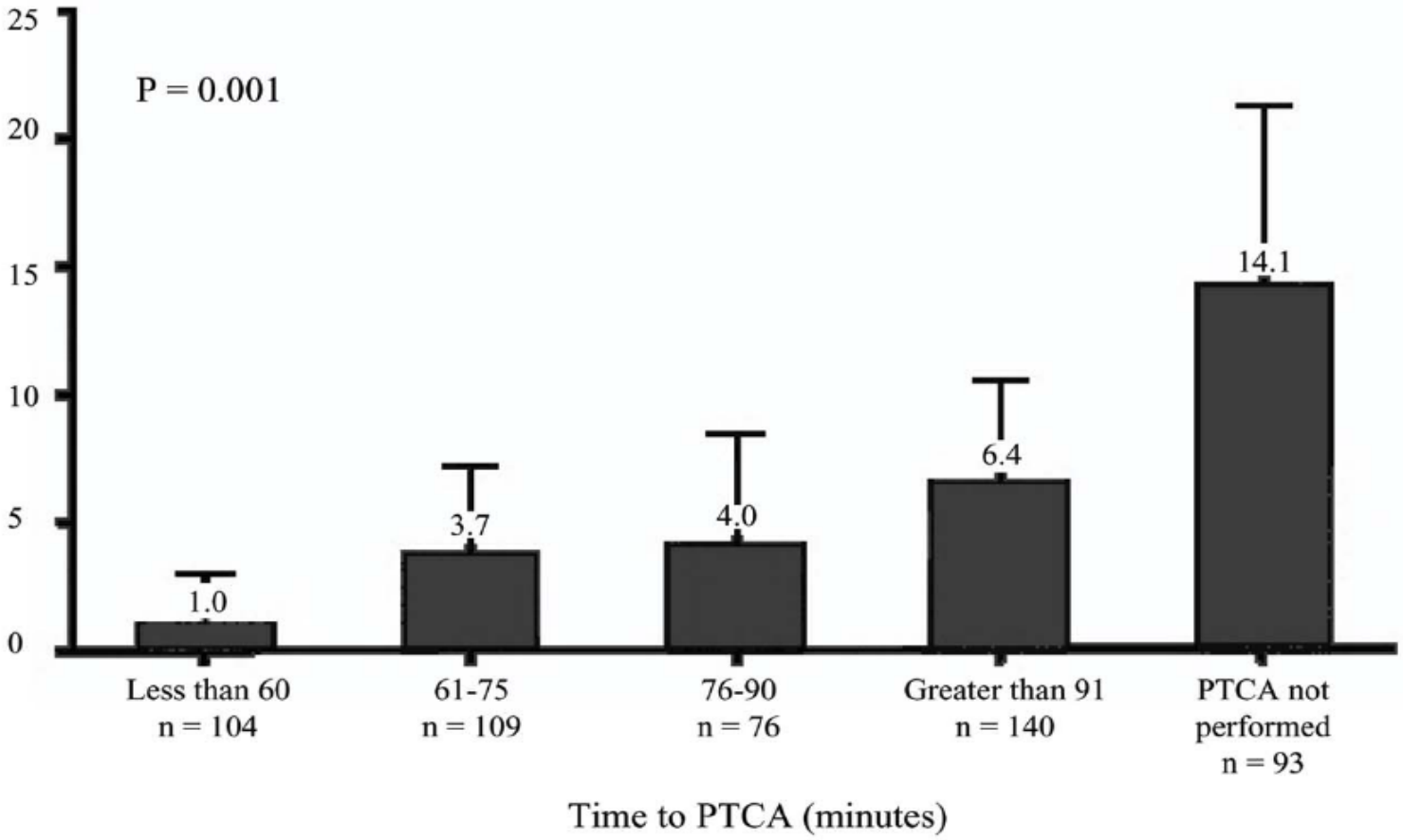


Figure 7. Relationship between 30-day mortality and time from study enrollment to first balloon inflation. Patients assigned to angioplasty in whom angioplasty was not performed are also shown. n indicates number of patients; and PTCA, percutaneous transluminal coronary angioplasty. Reprinted with permission from Berger et al. Circulation 1999;100:14-20 (418).

σχέση time-to-baloon inflation και θνητότητας 30 ημερών

Θρομβόλυση

Θρομβολυτικά φάρμακα

Variable	Streptokinase	Alteplase tPA*	Reteplase rPA	Tenecteplase TNK-tPA
Molecular weight	47,000	70,000		
Administration	Infusion (1.5 MU over 30 minutes)	Infusion (weight based up to 100 mg over 90 minutes)	10 units over 2 min repeated after 30 minutes	Weight adjusted bolus 30-50 mg over 5–10 seconds
Fibrin specific	No	Yes++	Yes+	Yes+++
Systemic fibrinogen depletion	+++	+	++	Minimal
Bleeding (non-cerebral)	+++	++	++	+
Haemorrhagic stroke	+	++	++	++
Antigenic	Yes	No	No	No
Hypotension with administration	Yes	No	No	No
TIMI grade 3 flow at 90 minutes (%)	32	54	60	63
Cost	+	++	+++	++++

Επιλογή Θρομβολυτικού

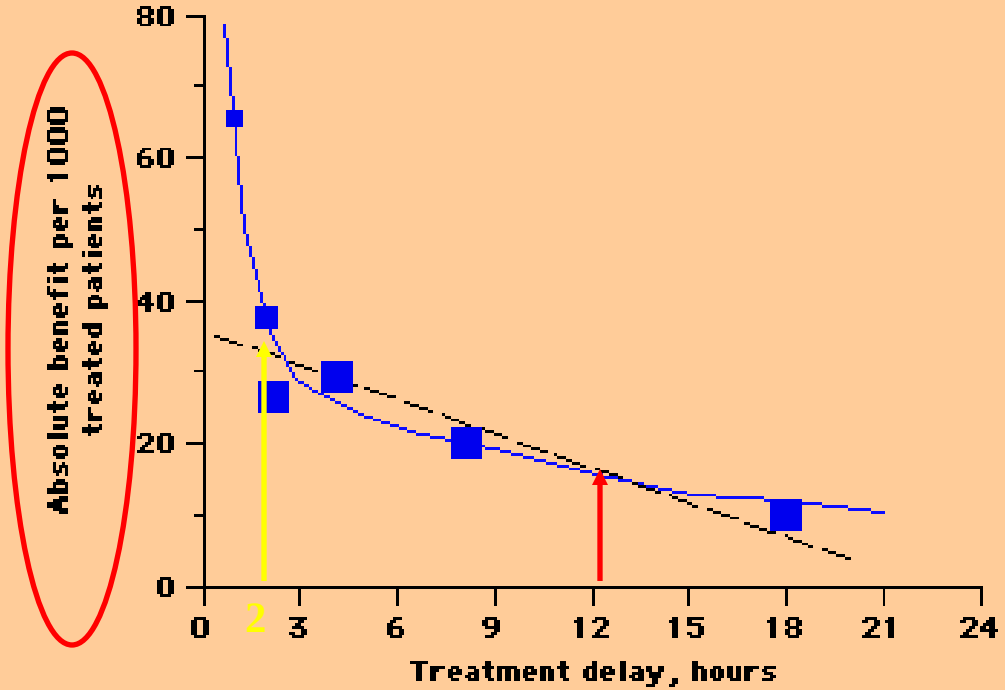
- θρομβολυτικά με ειδικότητα στο ινώδες tPA, TNK, rPA προτιμώνται
- μεταξύ τους παρόμοια κλινική αποτελεσματικότητα

Συγκρινόμενα με SK

- πιο αποτελεσματικά
- έλλειψη αντιγονικότητας

An international randomized trial comparing four thrombolytic strategies for acute myocardial infarction. The GUSTO investigators. *N Engl J Med* 1993; 329: 673-682.

International Joint Efficacy Comparison of Thrombolytics (INJECT). Randomised. double-blind comparison of reteplase double-bolus administration with streptokinase in acute myocardial infarction: trial to investigate equivalence. Lancet 1995;346: 329–36.



Time to thrombolysis and 35-day mortality The importance of time to thrombolysis in acute myocardial infarction and the absolute reduction in 35 day mortality in a meta-analysis of over 50,000 patients. The benefit from thrombolytic therapy is greatest when it is administered within two hours of symptom onset. The survival benefit is progressively reduced as the delay in therapy increases after two hours, the benefit from thrombolytic therapy fits a linear function (black line) in which the benefit falls by approximately 1.6 lives per 1000 patients per hour of treatment delay. (Data from Boersma, E, Maas, ACP, Simoon, ML, Lancet 1996; 348:771.)

Khan I, Gowda R. Clinical perspectives and therapeutics of thrombolysis. Int J Cardiolol 2003;91: 115–27.
Late Assessment of Thrombolytic Efficacy (LATE) study with alteplase 6–24 hours after onset of acute myocardial infarction. Lancet 1993;342:759–66.

Θρομβόλυση - Ενδείξεις

- *« ασθενείς με ΟΕΜ, με έναρξη των συμπτωμάτων εντός των προηγουμένων 12 ωρών και ανάσπαση ST σε τουλάχιστον 2 παρακείμενες απαγωγές (> 1 mm στις απαγωγές των άκρων ή > 2 mm στις απαγωγές V1-V6)*
- *…και νέο ή υποτιθέμενο νέο LBBB »*

ACC/AHA PRACTICE GUIDELINES—FULL TEXT

ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction

A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1999 Guidelines for the Management of Patients With Acute Myocardial Infarction)

Θρομβόλυση

ενδείξεις επιτυχούς επαναιμάτωσης :

1. Ύφεση συμπτωμάτων εντός 60-90 min από την εφαρμογή
2. Μείωση της ανάσπασης του ST > 50%

Canadian Cardiovascular Society Working Group. Applying the new STEMI guidelines: 1. Reperfusion in acute ST-segment elevation myocardial infarction. CMAJ 2004;171:1039–41.

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Θρομβόλυση

Καλύτερα αποτελέσματα :

- ηλικία < 75 yrs
- χωρίς ΚΑ ή αιμοδυναμική αστάθεια
- χαμηλός κίνδυνος μείζονος αιμορραγίας

Canadian Cardiovascular Society Working Group. Applying the new STEMI guidelines: 1. Reperfusion in acute ST-segment elevation myocardial infarction. CMAJ 2004;171:1039–41.

Θρομβόλυση

όφελος θνητότητας σε σχέση με το ΗΚΓ εισόδου

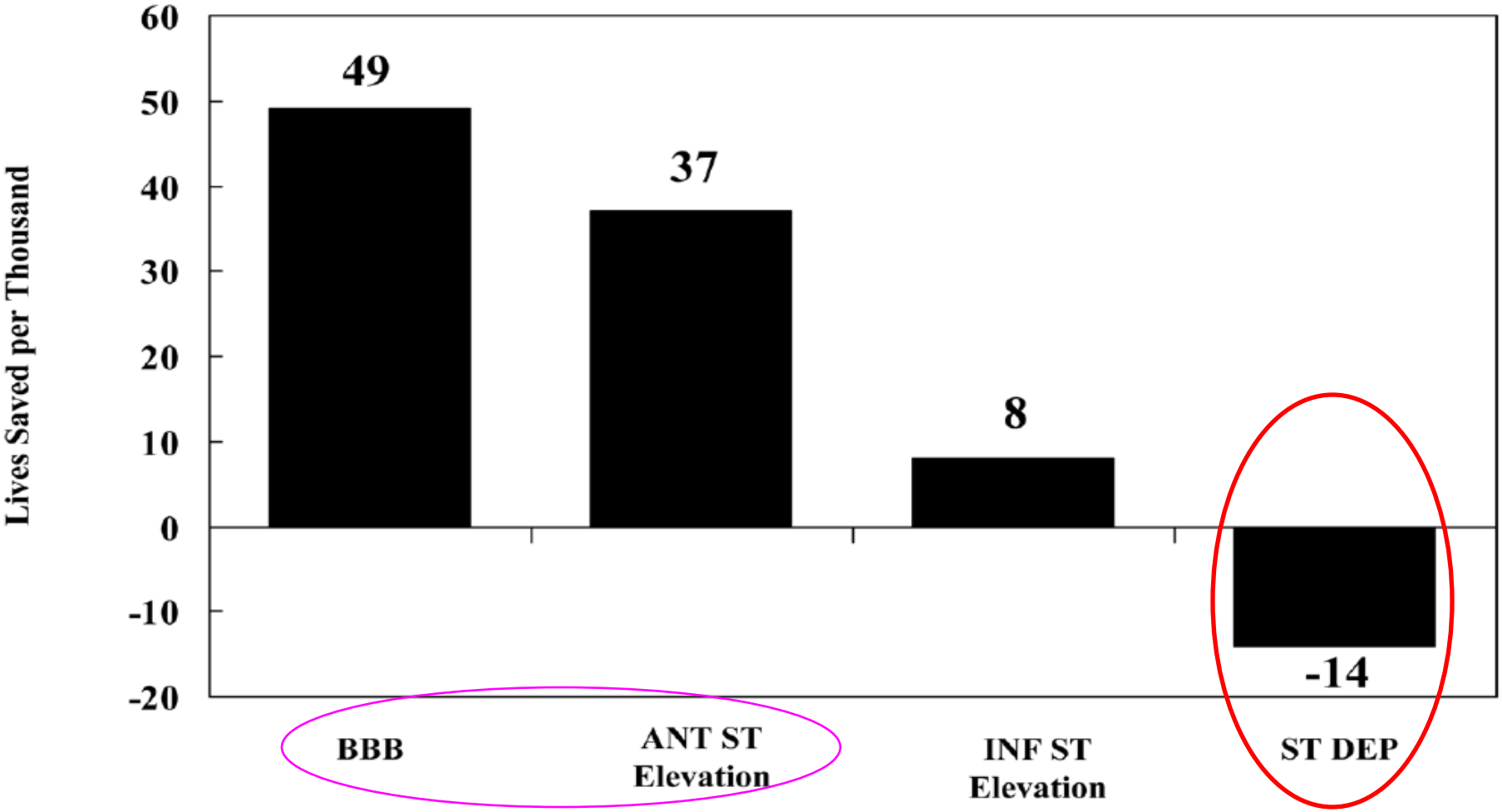

Figure 16. Effect of fibrinolytic therapy on mortality according to admission electrocardiogram. Patients with bundle-branch block (BBB) and anterior ST-segment elevation (ANT ST Elevation) derive the most benefit from fibrinolytic therapy. Effects in patients with inferior ST-segment elevation (INF ST Elevation) are much less, while patients with ST-segment depression (ST DEP) do not benefit. Reprinted with permission from Elsevier (Fibrinolytic Therapy Trialists' Collaborative Group. The Lancet 1994;343:311-22) (156).

Θρομβόλυση

Επιπλοκές

- Αιμορραγία (≈ 10% των ασθενών
  (συνήθως ελάσσονες στα σημεία φλεβοκέντησης)
- Υπόταση κατά την διάρκεια της έγχυσης
- αλλεργικές αντιδράσεις (SK)
- Εγκεφαλική Αιμορραγία (SK ≈ 0.3%, rt-PA 0.6%)
- αρρυθμίες Επαναιμάτωσης
- συστηματική εμβολή από λύση θρόμβου εντός του ΑΚΟ, ΑΚ ή ανευρύσματος Αορτής

An international randomized trial comparing four thrombolytic strategies for acute myocardial infarction. The GUSTO investigators. *N Engl J Med* 1993; 329: 673-682.

Θρομβόλυση -- Αντενδείξεις

Absolute contraindications

- Any prior ICH
- Known structural cerebral vascular lesion (eg, AVM)
- Known malignant intracranial neoplasm (primary or metastatic)
- Ischemic stroke within 3 months EXCEPT acute ischemic stroke within 3 hours
- Suspected aortic dissection
- Active bleeding or bleeding diathesis (excluding menses)
- Significant closed head or facial trauma within 3 months

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Θρομβόλυση -- Αντενδείξεις

Relative contraindications

- History of chronic severe, poorly controlled hypertension
- Severe uncontrolled hypertension on presentation (SBP greater than 180 mm Hg or DBP greater than 110 mm Hg)†
- History of prior ischemic stroke greater than 3 months, dementia, or known intracranial pathology not covered in contraindications
- Traumatic or prolonged (greater than 10 minutes) CPR or major surgery (less than 3 weeks)
- Recent (within 2 to 4 weeks) internal bleeding
- Noncompressible vascular punctures
- For streptokinase/anistreplase: prior exposure (more than 5 days ago) or prior allergic reaction to these agents
- Pregnancy
- Active peptic ulcer
- Current use of anticoagulants: the higher the INR, the higher the risk of bleeding

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Θρομβόλυση -- Περιορισμοί

1. **βατότητα** μόνο στό 15-20%
2. κανονική **ροή** **(TIMI III)** μόνο στο 40-60%
3. **Εγκεφαλική αιμορραγία** (0.5-1%)
4. **Επανέμφραξη** (10-15%)

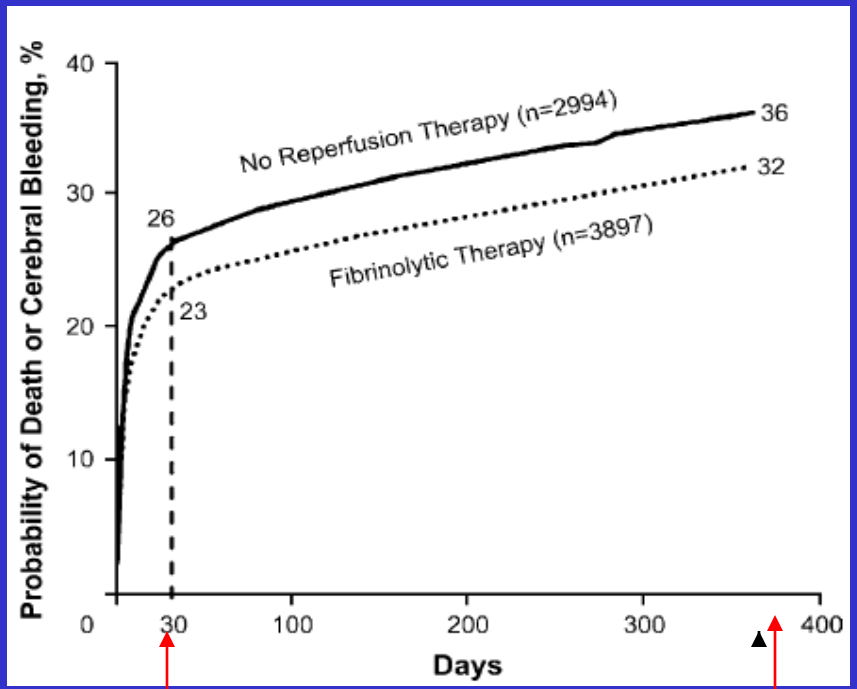
«η Αχίλλειος πτέρνα» της θρομβόλυσης

The GUSTO investigators. An international randomized trial comparing four thrombolytic strategies for acute myocardial infarction. N Engl J Med 1993;329:673–82.

Gore J, Granger C, Simoons M, et al. Stroke after thrombolysis. Mortality and functional outcomes in the GUSTO-I trial. Global Use of Strategies to Open Occluded Coronary Arteries. Circulation 1995;92:2811–8.

Berkowitz S, Granger C, Pieper K, et al. Incidence and predictors of bleeding after contemporary thrombolytic therapy for myocardial infarction. The Global Utilization of Streptokinase and Tissue Plasminogen activator for Occluded coronary arteries (GUSTO) I Investigators. Circulation

elderly pts (> 75 yrs) derive smaller morbidity and mortality benefits



Thiemann D, Coresh J, Schulman S. Lack of benefit for intravenous thrombolysis in patients with myocardial infarction who are older than 75 years. Circulation 2000;101:2239–46.
White HD. Thrombolytic therapy in the elderly. Lancet 2000;356:2028–30.

το ΟΕΜ στους Ηλικιωμένους - ΘΡΟΜΒΟΛΥΣΗ

- Θρομβόλυση ενδείκνυται μέχρι της ηλικίας των 85 ετών

η θρομβόλυση, ακόμα και αν είναι επιτυχής, δεν θα πρέπει να θεωρείται σαν τελική θεραπεία

"lyse now, stent later"

The GUSTO investigators. An international randomized trial comparing four thrombolytic strategies for acute myocardial infarction. N Engl J Med 1993;329:673–82.

Gore J, Granger C, Simoons M, et al. Stroke after thrombolysis. Mortality and functional outcomes in the GUSTO-I trial. Global Use of Strategies to Open Occluded Coronary Arteries. Circulation 1995;92:2811–8.

Berkowitz S, Granger C, Pieper K, et al. Incidence and predictors of bleeding after contemporary thrombolytic therapy for myocardial infarction. The Global Utilization of Streptokinase and Tissue Plasminogen activator for Occluded coronary arteries (GUSTO) I Investigators. Circulation 1997;95:2508–16.

PCI

- ✓ Primary = PCI in the culprit vessel within 12hours after the onset of chest pain or other symptoms, without prior thrombolytic or other clot dissolving therapy
- ✓ Immediate or Emergency PCI and Rescue PCI = PCI within 12 hours after unseccesful or failed fibrinolysis for patients with continuing or recurrent myocardial ischemia.

- ✓ After Succesful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

- ✓ Facilitated = a strategy of planned immediate PCI after administration of an initial pharmacological regimen intended to improve coronary patency before the procedure

Primary-PCI

PCI in the culprit vessel within 12hours after the onset of chest pain or other symptoms, without prior thrombolytic or other clot dissolving therapy

STEMI :Treatment

REPERFUSION

many RCT have documented :

primary PCI is superior to IV Thrombolysis

- ✓ more effective restoration of coronary patency
- ✓ less recurrent myocardial ischaemia
- ✓ less coronary reocclusion
- ✓ improved residual LV function and

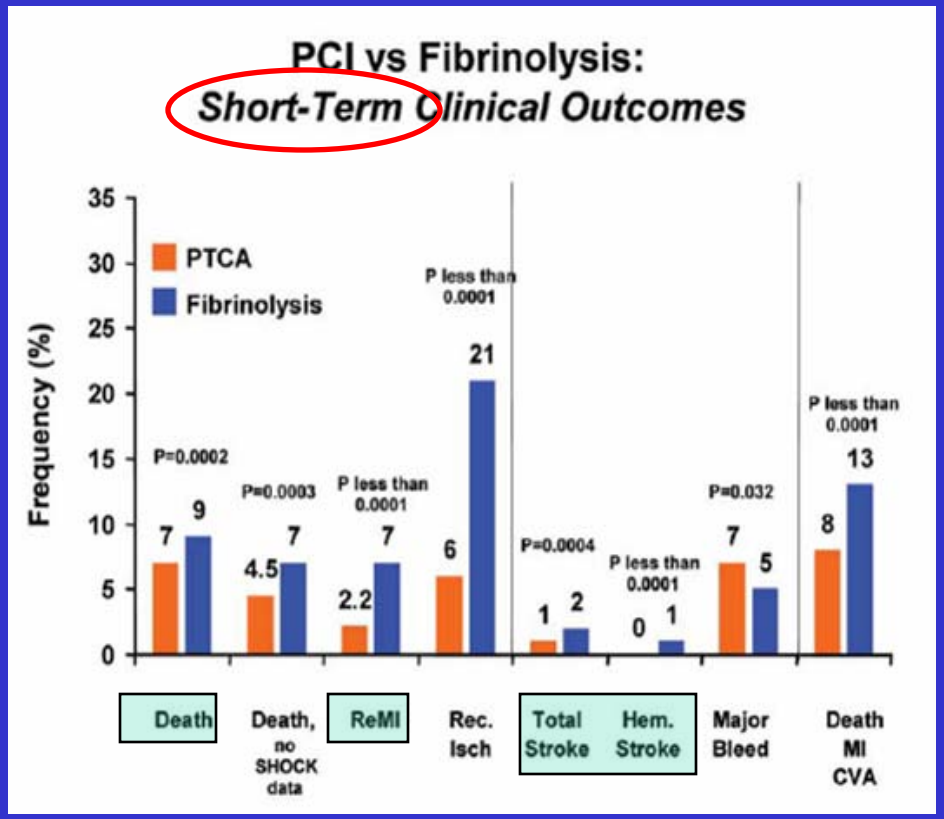
Guidelines for Percutaneous Coronary Interventions

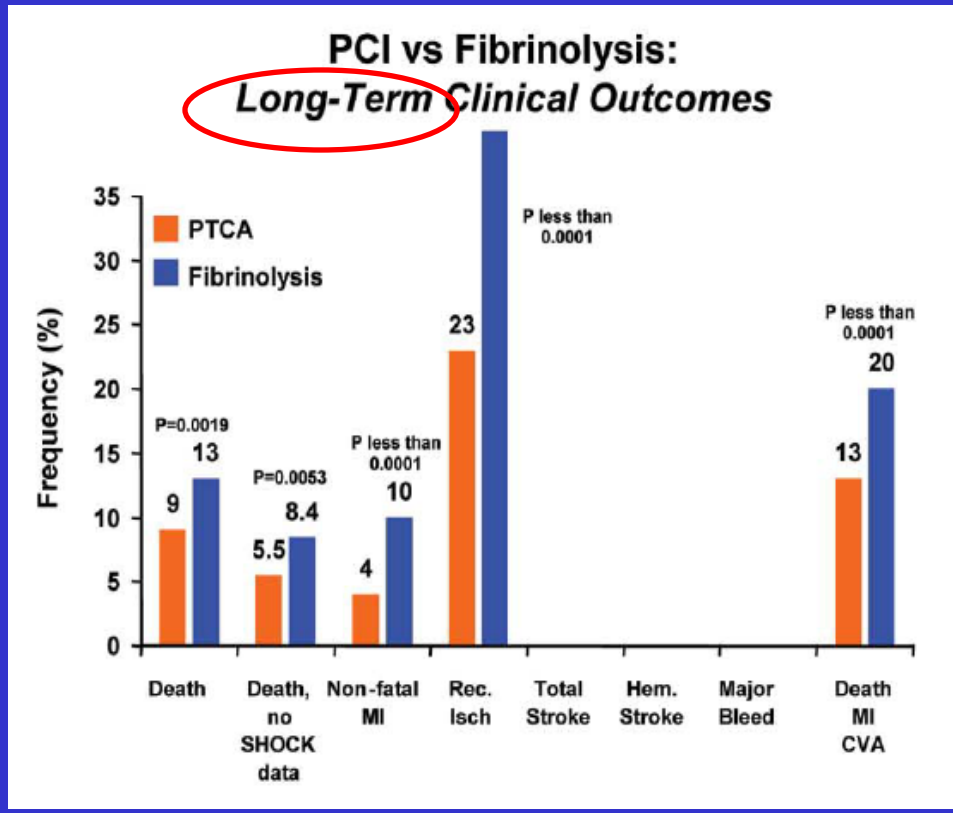
The Task Force for Percutaneous Coronary Interventions of the European Society of Cardiology

European Heart Journal (2005) **26**, 804–847

primary PCI vs Thrombolysis

- ✓ better clinical outcomes





Keeley et al. The Lancet. 2003;361:13–20

primary PCI vs Thrombolysis

the superiority of PCI is more evident in patients with prehospital delays

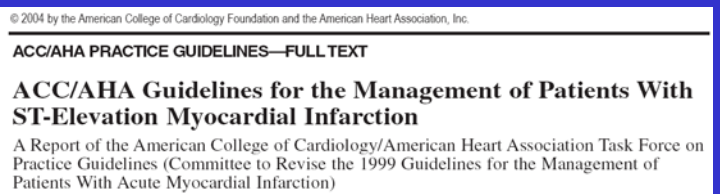
MORTALITY

		PCI	Thrombolysis	
Symptom onset	< 3 hours	7.3%	7.4%	(P= NS)
Symptom onset	> 3 hours	6%	15.3%	(P=0.02)

20. Widimský P, Groch L, Zelízko M, Aschermann M, Bednár F, Suryapranata H. 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. Eur Heart J. 2000;21:823-31. [PMID: 10781354]

fibrinolysis vs primary PCI

PCI is the best available treatment
if provided promptly
by a qualified interventional cardiologist
in an appropriate facility



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πρωτογενής PCI

- 30 min καθυστέρησης στήν διενέργεια PCI έχουν σαν αποτέλεσμα αύξηση της θνητότητας (1 έτους) κατά 7.5%
- εάν ο χρόνος πού απαιτείται για την διενέργεια PCI (door-to-balloon time) υπερβαίνει κατά **60 min** τον χρόνο εφαρμογής θρομβολυτικής θεραπείας (door-to-needle time) η διαφορά στην θνητότητα εξαφανίζεται

44. De Luca G, Suryapranata H, Ottervanger JP, Antman EM. Time delay to treatment and mortality in primary angioplasty for acute myocardial infarction: every minute of delay counts. Circulation. 2004;109:1223-5. [PMID: 15007008]

45. Nallamothu BK, Bates ER. Percutaneous coronary intervention versus fibrinolytic therapy in acute myocardial infarction: is timing (almost) everything? Am J Cardiol. 2003;92:824-6. [PMID: 14516884]

Immediate or Emergency PCI and **Rescue** PCI =

PCI within 12 hours after unseccesful or failed fibrinolysis for patients with continuing or recurrent myocardial ischemia.

Immediate or Emergency PCI and **Rescue** PCI

Wijeysundera HC, Vijayaraghavan R, Nallamothu BK, et al. Rescue angioplasty or repeat fibrinolysis after failed fibrinolytic therapy for ST-segment myocardial infarction: a meta-analysis of randomized trials. J Am Coll Cardiol 2007;49:422–30.

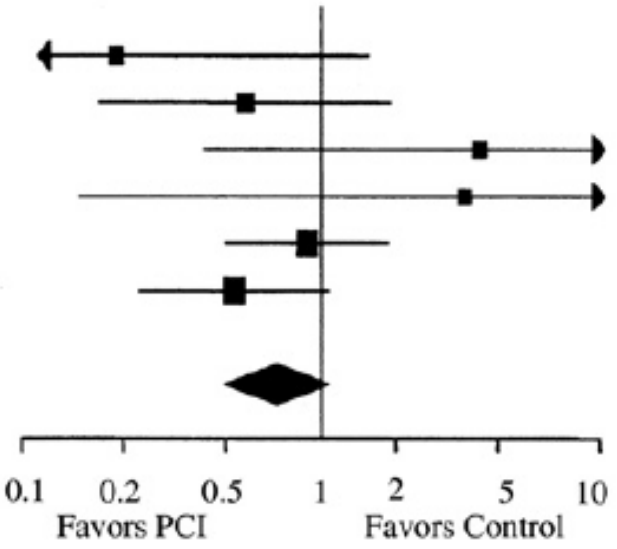
rescue PCI decreases adverse clinical events compared with medical therapy.

Immediate or Emergency PCI and **Rescue** PCI

Mortality

Study	PCI	Control	RR (95% CI)
Belenkie et al.	1/16	4/12	0.19 (0.02-1.47)
RESCUE	4/78	7/73	0.53 (0.16-1.75)
TAMI	3/49	1/59	3.61 (0.39–33.64)
RESCUE II	1/14	0/15	3.20 (0.14–72.62)
MERLIN	15/153	17/154	0.89 (0.46-1.71)
REACT	9/144	18/141	0.49 (0.23-1.05)
Total	**33/454**	**47/454**	**0.69 (0.46-1.05)**
	(7.3%)	**(10.4%)**	**p=0.09**

Absolute risk reduction 3% (95% CI 0%-7%)
NNT 33
Test for heterogeneity: χ^2 6.1 df 5 (p 0.30) I^2 18%



Efficacy End Points for Rescue PCI Versus Conservative Therapy

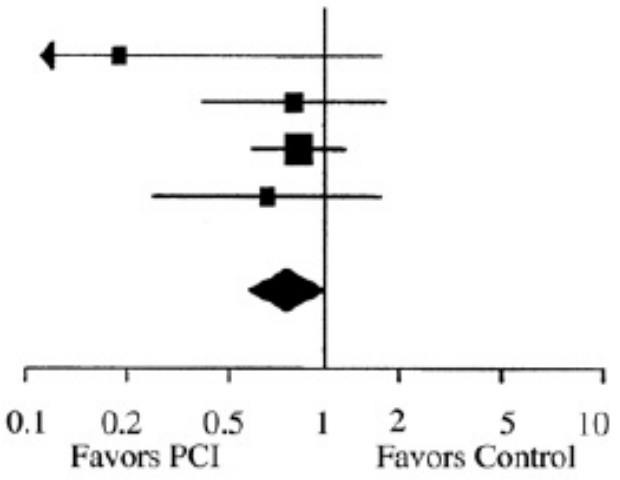
Wijeysundera HC, Vijayaraghavan R, Nallamothu BK, et al. Rescue angioplasty or repeat fibrinolysis after failed fibrinolytic therapy for ST-segment myocardial infarction: a meta-analysis of randomized trials. J Am Coll Cardiol 2007;49:422–30.

Immediate or Emergency PCI and **Rescue** PCI

Heart Failure

Study	PCI	Control	RR (95% CI)
RESCUE	1/78	5/73	0.19 (0.02-1.56)
TAMI	9/49	14/59	0.77 (0.37-1.63)
MERLIN	37/153	46/154	0.81 (0.56-1.17)
REACT	7/144	11/141	0.62 (0.25-1.56)
Total	**54/424 (12.7%)**	**76/427 (17.8%)**	**0.73 (0.54-1.00) p=0.05**

Absolute risk reduction 5% (95% CI 0%-9%)
NNT 20
Test for heterogeneity: χ^2 2.0 df 3 (p 0.57) I^2 0%



Efficacy End Points for Rescue PCI Versus Conservative Therapy

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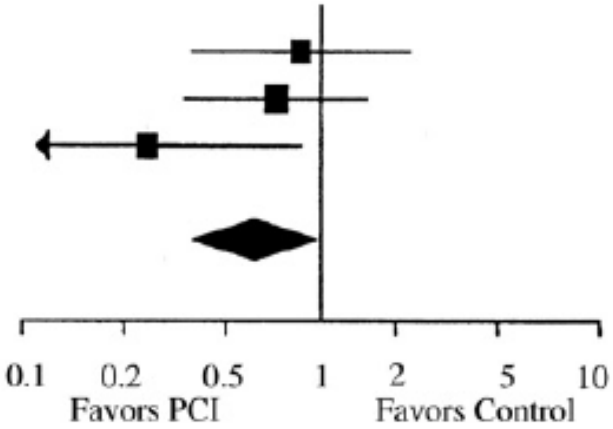
Immediate or Emergency PCI and **Rescue** PCI

Reinfarction

Study	PCI	Control	RR (95% CI)
TAMI	7/49	10/59	0.84 (0.35-2.05)
MERLIN	11/153	16/154	0.69 (0.33-1.44)
REACT	3/144	12/141	0.24 (0.07-0.85)
Total	**21/346**	**38/354**	**0.58 (0.35-0.97)**
	(6.1%)	**(10.7%)**	**p=0.04**



Absolute risk reduction 4% (95% CI 0%-9%)
NNT 25
Test for heterogeneity: χ^2 2.7 df 2 (p 0.25) I^2 27%

Efficacy End Points for Rescue PCI Versus Conservative Therapy

Wijeysundera HC, Vijayaraghavan R, Nallamothu BK, et al. Rescue angioplasty or repeat fibrinolysis after failed fibrinolytic therapy for ST-segment myocardial infarction: a meta-analysis of randomized trials. J Am Coll Cardiol 2007;49:422–30.

Immediate or Emergency PCI and **Rescue** PCI

2007 STEMI Focused Update Recommendation	
Class I	1. A strategy of coronary angiography with intent to perform PCI (or emergency CABG) is recommended for patients who have received fibrinolytic therapy and have any of the following: a. Cardiogenic shock in patients less than 75 years who are suitable candidates for revascularization (*Level of Evidence: B*) b. Severe congestive heart failure and/or pulmonary edema (Killip class III) (*Level of Evidence: B*) c. Hemodynamically compromising ventricular arrhythmias (*Level of Evidence: C*)

Immediate or Emergency PCI and **Rescue** PCI in the elderly

2007 STEMI Focused Update Recommendation	
Class IIa	1. A strategy of coronary angiography with intent to perform PCI (or emergency CABG) is reasonable in patients 75 years of age or older who have received fibrinolytic therapy, and are in cardiogenic shock, provided that they are suitable candidates for revascularization. (*Level of Evidence: B*)

Immediate or Emergency PCI and **Rescue** PCI

Class IIa

2007 STEMI Focused Update Recommendation

2. It is reasonable to perform rescue PCI for patients with 1 or more of the following:
   a. Hemodynamic or electrical instability. *(Level of Evidence: C)*
   b. Persistent ischemic symptoms. *(Level of Evidence: C)*

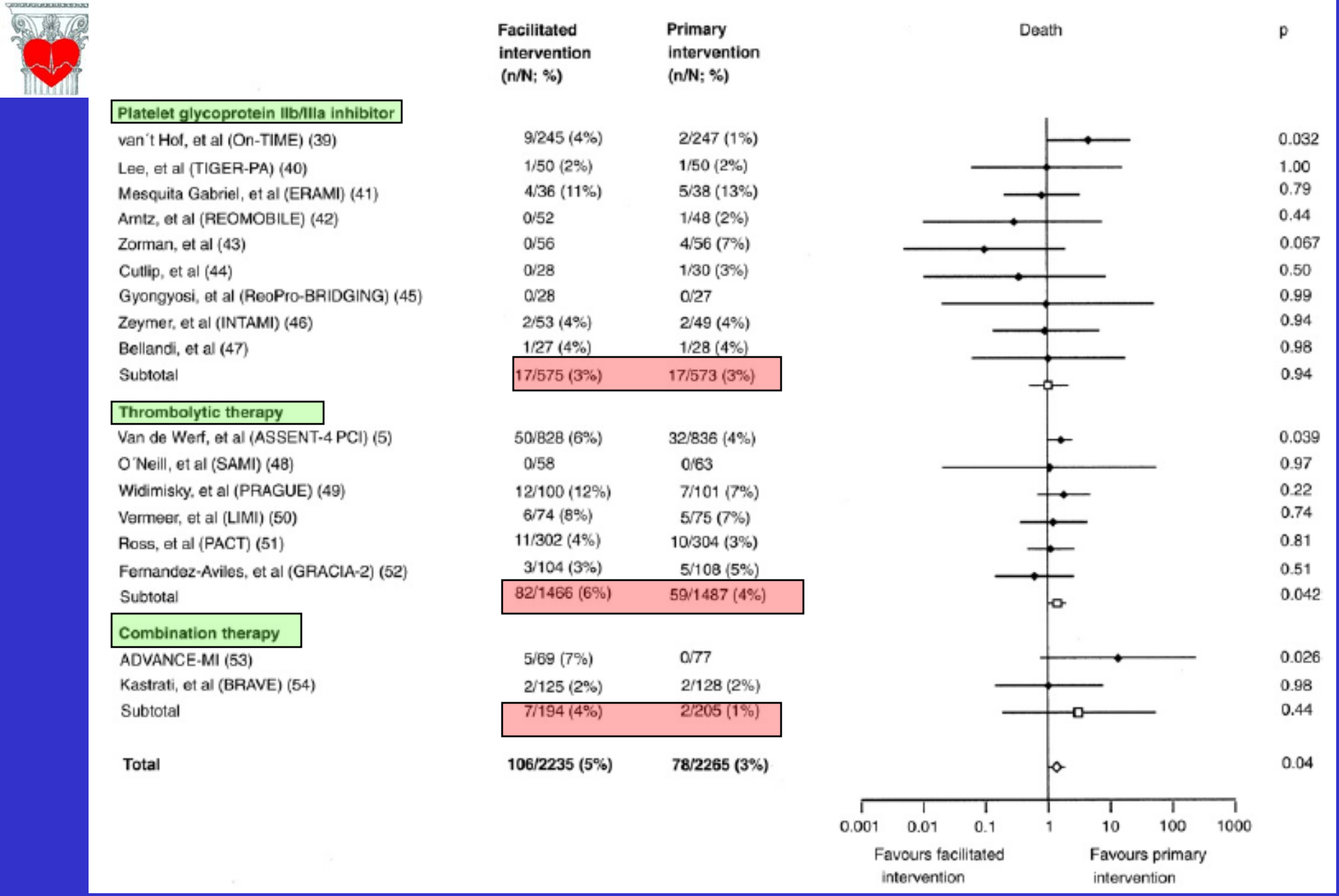
3. A strategy of coronary angiography with intent to perform rescue PCI is reasonable for patients in whom fibrinolytic therapy has failed (ST-segment elevation less than 50% resolved after 90 minutes following initiation of fibrinolytic therapy in the lead showing the worst initial elevation) and a moderate or large area of myocardium at risk (anterior MI, inferior MI with right ventricular involvement or precordial ST-segment depression). *(Level of Evidence: B)*

Facilitated -PCI :

a strategy of planned immediate PCI after administration of an initial pharmacological regimen intended to improve coronary patency before the procedure

regimens :

- GP IIb/IIIa inhibitors
- full-dose or reduced-dose fibrinolytic therapy
- combination of a GP IIb/IIIa inh with a reduced-dose fibrinolytic agent (50%)



Short-Term Death in Patients Treated With Facilitated or Primary PCI

Facilitated-PCI (vs Primary PCI)

- lack of mortality benefit
- increased bleeding risk

condraindicated

PCI After Succesful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

PCI After Succesful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

The Routine Invasive Strategy within 24 hours of Thrombolysis versus Ischaemia-Guided Conservative Approach for Acute Myocardial Infarction with St-segment Elevation (GRACIA-1) trial

patients with STEMI who are treated with thrombolytic therapy benefit from routine coronary angiography and PCI if indicated within 24 hours of thrombolysis

10. Fernandez-Avilés F, Alonso JJ, Castro-Beiras A, Vázquez N, Blanco J, Alonso-Briales J, et al. Routine invasive strategy within 24 hours of thrombolysis versus ischaemia-guided conservative approach for acute myocardial infarction with ST-segment elevation (GRACIA-1): a randomised controlled trial. Lancet. 2004;364:1045-53. [PMID: 15380963]

PCI After Succesful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

Hochman JS, Lamas GA, Knatterud GL, et al. Design and methodology of the Occluded Artery Trial (OAT). Am Heart J 2005;150: 627–42.

Hochman JS, Lamas GA, Buller CE, et al. Coronary intervention for persistent occlusion after myocardial infarction. N Engl J Med 2006; 355:2395–407.

In stable patients

tested the hypothesis that :

routine PCI for total occlusion 3 to 28 days after MI would reduce the composite of death, reinfarction, or HF

4-year cumulative end point : No difference

17.2% in PCI group

15.6% in medical therapy group (P=0.2)

PCI After Succesful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

Dzavik V, Buller CE, Lamas GA, et al. Randomized trial of percutaneous coronary intervention for subacute infarct-related coronary artery occlusion to achieve long-term patency and improve ventricular function: the Total Occlusion Study of Canada (TOSCA)-2 trial. Circulation 2006;114:2449–57.

Steg PG, Thuaire C, Himbert D, et al. DECOPI (DEsobstruction COronaire en Post-Infarctus): a randomized multi-centre trial of occluded artery angioplasty after acute myocardial infarction. Eur Heart J 2004;25:2187–94.

In stable patients

tested the hypothesis that :

Late opening of an occluded infarct artery may reduce adverse LV remodeling and preserve LV volumes

Each group had equivalent improvement in LVEF No difference

(4.2% vs 3.5% P=0.47)

PCI After Succesful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

elective PCI of an occluded infarct artery 1 to 28 days after MI **in stable patients**

had no incremental benefit beyond optimal medical therapy with aspirin, beta blockers, ACE inhibitors, and statins in preserving LV function and preventing subsequent cardiovascular events

PCI After Succesful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

it might be reasonable to select

moderate- and high-risk patients

for PCI **within 24 hours of fibrinolysis** and

to treat **low-risk patients** **with medical therapy**

JACC

JOURNAL of the AMERICAN COLLEGE of CARDIOLOGY

2007 Focused Update of the ACC/AHA 2004 Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines

Developed in Collaboration With the Canadian Cardiovascular Society Endorsed by the American Academy of Family Physicians

J. Am. Coll. Cardiol. 2008;51;210-247; originally published online Dec 10, 2007;

PCI After Succesful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

moderate- and high-risk patients

- cardiogenic shock
- severe heart failure
- hemodynamically compromising ventricular arrhythmias
- Anterior MI or inferior MI with RV involvement

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J. Am. Coll. Cardiol. 2008;51;210-247; originally published online Dec 10, 2007;

PCI After Succesful Fibrinolysis or for Patients Not Undergoing Primary Reperfusion

low-risk patients

(should not be referred for angiography)

- patients with symptom resolution
- improving ST-segment elevation
- inferior MI localized to 3 ECG leads

JACC
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Συμπληρωματικές θεραπείες στό ΟΕΜ

- ✓ διευκολύνουν και ενισχύουν την επαναιμάτωση
- ✓ περιορίζουν τά επακόλουθα της ισχαιμίας
- ✓ βελτιώνουν την μακροπρόθεσμη πρόγνωση

Mechanisms and clinical effects of adjunctive therapies for patients who have ST elevation myocardial infarction

Agent	Mechanism	Clinical Effect
Adjunctive therapies for AMI		
Aspirin	Antiplatelet	Improve survival Decrease reinfarction, CVA
Thienopyridines (clopidogrel, ticlopidine)	Antiplatelet	Recommended in aspirin-allergic patients Decrease death, MI, CVA in NSTE ACS
Glycoprotein IIb/IIIa inhibitors	Antiplatelet	Decrease MI, ischemic complications following primary PCI Decrease death or MI in high-risk NSTE ACS
Unfractionated heparin	Antithrombin	Decrease death and MI in prefibrinolytic era
Low molecular weight heparins	Antithrombin	Reduce cardiac events in NSTE ACS versus unfractionated heparin
Direct thrombin inhibitors	Antithrombin	Recommended in heparin-induced thrombocytopenia
Beta-brockers	Decrease myocardial oxygen demand (↓HR, ↓BP)	Improve survival Reduce infract size, ventricular arrhythmias, recurrent ischemia
Adjunctive therapies for AMI		
ACE Inhibitors	Vasodilator (BP) Prevent LV remodeling	Improve survival Decrease heart failure. LV dysfunction
IV nitroglycerine	Venous, arterial, coronary vasodilator (↓BP, ↓preload)	No effect on survival Decrease recurrent ischemia
HMG CoA Reductase Inhibitors	Lipid lowering Anti-inflammatory	Decrease future CV death and MI May decrease early ischemic events
Magnesium	Myocardial protective Anti-arrhythmic	Therapy for torsades depointes May improve reperfusion outcomes
Calcium-channel blocker	Decrease myocardial oxygen demand (↓HR, ↓BP)	No survival benefit Possible use in beta-blocker–intolerant patients without CHF or LV dysfunction
Warfarin	Oral anticoagulant	Reduced embolic risk with atrial fibrilliation. LV thrombus or dysfunction

STEMI : Ancillary Therapies

b-blockers

reduce

- progression to MI in patients with unstable angina
- size of MI
- complications rate
- reinfarction after fibrinolysis
- ventricular arrythmias (VT, VF)
- mortality rate

Chen ZM, Pan HC, Chen YP, et al. Early intravenous then oral metoprolol in 45,852 patients with acute myocardial infarction: randomised placebo-controlled trial. Lancet 2005;366:1622–32.

Krumholz HM, Radford MJ, Wang Y, Chen J, Heiat A, Marciniak TA. National use and effectiveness of beta-blockers for the treatment of elderly patients after acute myocardial infarction: National Cooperative Cardiovascular Project. *JAMA*. 1998;280:623–629.

The MIAMI Trial Research Group. Metoprolol in Acute Myocardial Infarction (MIAMI): a randomised placebo-controlled international trial. *Eur Heart J*. 1985;6:199–226.

First International Study of Infarct Survival Collaborative Group. Randomised trial of intravenous atenolol among 16 027 cases of suspected acute myocardial infarction: ISIS-1. *Lancet*. 1986;11:57–66.

STEMI : Ancillary Therapies

b-blockers

Pts receiving IV b-blockers

higher likelihood of

- early death
- heart failure
- pacemaker use
- cardiogenic shock (30%)

Chen ZM, Pan HC, Chen YP, Peto R, Collins R, Jiang LX, Xie JX, Liu LS; COMMIT (ClOpidogrel and Metoprolol in Myocardial Infarction Trial) Collaborative Group. Early intravenous then oral metoprolol in 45,852 patients with acute myocardial infarction: randomised placebo-controlled trial. *Lancet*. 2005;366:1622–1632.

STEMI : Ancillary Therapies

b-blockers

Class IIa

1. It is reasonable to administer an IV beta blocker at the time of presentation to STEMI patients who are hypertensive and who do not have any of the following: 1) signs of heart failure, 2) evidence of a low output state, 3) increased risk* for cardiogenic shock, or 4) other relative contraindications to beta blockade (PR interval greater than 0.24 seconds, second- or third-degree heart block, active asthma, or reactive airway disease). *(Level of Evidence: B)*

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STEMI : Ancillary Therapies

b-blockers

Risk factors for cardiogenic shock

(the greater the number of risk factors present, the higher the risk of developing cardiogenic shock) :

- ✓ age > 70 years
- ✓ SBP < 120 mm Hg
- ✓ sinus tachycardia > 110 /min
- ✓ HR < 60 /min
- ✓ increased time since onset of symptoms of STEMI.

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STEMI : Ancillary Therapies

IV b-blockers

With caution . Especially in

- Hemodynamic compromised
- Killip I+

STEMI : Ancillary Therapies

P.O b-blockers

Class I

1. Oral beta-blocker therapy should be initiated in the first 24 hours for patients who do not have any of the following: 1) signs of heart failure, 2) evidence of a low output state, 3) increased risk* for cardiogenic shock, or 4) other relative contraindications to beta blockade (PR interval greater than 0.24 seconds, second- or third-degree heart block, active asthma, or reactive airway disease). *(Level of Evidence: B)*

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STEMI : Ancillary Therapies

long-term use of oral b-blockers

is strongly recommended (Class I, LOE: A)

for secondary prevention in patients at highest risk

(low ejection fraction, heart failure, postshock)

once they have stabilized with gradual dose titration

1. It is beneficial to start and continue beta-blocker therapy indefinitely in all patients who have had MI, acute coronary syndrome, or LV dysfunction with or without HF symptoms, unless contraindicated.

I (A)

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STEMI : Ancillary Therapies

long-term use of oral b-blockers

improves outcomes after MI

in patients **up to 90 years of age**

STEMI : Ancillary Therapies

ACE inhibitors

Vasodilator (BP)	Improve survival
Prevent LV remodeling	Decrease heart failure. LV dysfunction

Class I

1. An ACE inhibitor should be administered orally within the first 24 hours of STEMI to patients with anterior infarction, pulmonary congestion, or LVEF less than 0.40, in the absence of hypotension (systolic blood pressure less than 100 mm Hg or less than 30 mm Hg below baseline) or known contraindications to that class of medications. *(Level of Evidence: A)*

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STEMI : Ancillary Therapies in the elderly

long-term use

ACE inhibitors

ACE inhibitor at the time of hospital discharge :

⇩

significant reduction in 1-year mortality rate

Krumholz HM, Chen YT, Wang Y, Radford MJ. Aspirin and angiotensin-converting enzyme inhibitors among elderly survivors of hospitalization for an acute myocardial infarction. *Arch Intern Med*. 2001;161: 538–544.

STEMI : Ancillary Therapies

ARB

1. Use of angiotensin receptor blockers is recommended in patients who are intolerant of ACE inhibitors and have HF or have had an MI with LVEF less than or equal to 40%.	*I (A)*
2. It is beneficial to use angiotensin receptor blocker therapy in other patients who are ACE-inhibitor intolerant and have hypertension.	***I (B)***

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STEMI : Ancillary Therapies

Aldosterone blockers (Eplerenone)

EPHESUS

Pitt B, Remme W, Zannad F, Neaton J, Martinez F, Roniker B, Bittman R, Hurley S, Kleiman J, Gatlin M; Eplerenone Post-Acute Myocardial Infarction Heart Failure Efficacy and Survival Study Investigators. Eplerenone, a selective aldosterone blocker, in patients with left ventricular dysfunction after myocardial infarction. *N Engl J Med*. 2003; 348:1309–1321.

eplerenone in addition to standard care :

reduced the mortality rate in the overall population

(RR 0.83; 95% CI, 0.72 to 0.94)

But not in the subgroup >65 years of age

STEMI : Ancillary Therapies

Aldosterone blockers (Eplerenone)

1. Use of aldosterone blockade in post-MI patients without significant renal dysfunction|||| or hyperkalemia¶¶ is recommended in patients who are already receiving therapeutic doses of an ACE inhibitor and beta blocker, have an LVEF of less than or equal to 40%, and have either diabetes or HF.

I (A)

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STEMI : Ancillary Therapies

Statins

Lipid lowering	Decrease future CV death and MI
Anti-inflammatory	May decrease early ischemic events

Intense Lipid lowering therapy

(preferably Statins)

(π.χ simvastatin 40 mg or atorvastatin 80 mg)

to achive a target **LDL-chol < 70 mgr/dl**

without regard to age

Cannon CP, Braunwald E, McCabe CH, et al. Intensive versus moderate lipid lowering with statins after acute coronary syndromes. N Engl J Med 2004;350:1495–504.

de Lemos JA, Blazing MA, Wiviott SD, et al. Early intensive vs a delayed conservative simvastatin strategy in patients with acute coronary syndromes: Phase Z of the A to Z trial. JAMA 2004;292:1307–16.

Fonarow GC, French WJ, Parsons LS, et al. Use of lipid-lowering medications at discharge in patients with acute myocardial infarction: data from the National Registry of Myocardial Infarction 3. Circulation 2001;103:38–44.

STEMI : Ancillary Therapies Antithrombin therapy

2007 STEMI Focused Update Recommendation
Class I
Patients undergoing reperfusion with fibrinolytics should receive anticoagulant therapy for a minimum of 48 hours (*Level of Evidence: C*) and preferably for the duration of the index hospitalization, up to 8 days (regimens other than UFH are recommended if anticoagulant therapy is given for more than 48 hours because of the risk of heparin-induced thrombocytopenia with prolonged UFH treatment). (*Level of Evidence: A*)

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STEMI : Ancillary Therapies Antithrombin therapy

2007 STEMI Focused Update Recommendation
Class I

Anticoagulant regimens with established efficacy include:

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STEMI : Ancillary Therapies Antithrombin therapy

UF Heparin

2007 STEMI Focused Update Recommendation

Class I

a. UFH (initial intravenous bolus 60 U per kg [maximum 4000 U]) followed by an intravenous infusion of 12 U per kg per hour (maximum 1000 U per hour) initially, adjusted to maintain the activated partial thromboplastin time at 1.5 to 2.0 times control (approximately 50 to 70 seconds) (*Level of Evidence: C*). (Note: the available data do not suggest a benefit of prolonging the duration of the infusion of UFH beyond 48 hours in the absence of ongoing indications for anticoagulation; more prolonged infusions of UFH increase the risk of development of heparin-induced thrombocytopenia.)

STEMI : Ancillary Therapies Antithrombin therapy

Enoxaparin

2007 STEMI Focused Update Recommendation

Class I

b. Enoxaparin (provided the serum creatinine is less than 2.5 mg per dL in men and 2.0 mg per dL in women): for patients less than 75 years of age, an initial 30 mg intravenous bolus is given, followed 15 minutes later by subcutaneous injections of 1.0 mg per kg every 12 hours; for patients at least 75 years of age, the initial intravenous bolus is eliminated and the subcutaneous dose is reduced to 0.75 mg per kg every 12 hours. Regardless of age, if the creatinine clearance (using the Cockroft-Gault formula) during the course of treatment is estimated to be less than 30 mL per minute, the subcutaneous regimen is 1.0 mg per kg every 24 hours. Maintenance dosing with enoxaparin should be continued for the duration of the index hospitalization, up to 8 days. (*Level of Evidence: A*)

LMWH

to reduce the risk of deep venous thrombosis :

until the patient with STEMI is ambulatory

Antithrombotic therapy for coronary artery disease:
the 7th ACCP Conference on Antithrombotic and Thrombolytic Therapy
Harrington RA; Becker RC; Ezekowitz M; Meade TW; O'Connor CM; Vorchheimer DA; Guyatt GHSO - Chest 2004 Sep;126(3 Suppl):513S-548S.

STEMI : Ancillary Therapies Antithrombin therapy

Fondaparinux

2007 STEMI Focused Update Recommendation

Class I

c. Fondaparinux (provided the serum creatinine is less than 3.0 mg per dL): initial dose 2.5 mg intravenously; subsequently subcutaneous injections of 2.5 mg once daily. Maintenance dosing with fondaparinux should be continued for the duration of the index hospitalization, up to 8 days. (*Level of Evidence: B*)

STEMI : Ancillary Therapies in the elderly

Antithrombin therapy

Fondaparinux

Yusuf S, Mehta SR, Chrolavicius S, Afzal R, Pogue J, Granger CB, Budaj A, Peters RJ, Bassand JP, Wallentin L, Joyner C, Fox KA; OASIS-6 Trial Group. Effects of fondaparinux on mortality and reinfarction in patients with acute ST-segment elevation myocardial infarction: the OASIS-6 Randomized Trial. *JAMA*. 2006;295: 1519–1530.

Among the older group of patients (>62 years of age) fondaparinux demonstrated :

- greater absolute risk reduction for the primary end point (30 day death or MI) (2.7% versus 0.5%)
- with a lower rate of bleeding

STEMI : Ancillary Therapies in the elderly

Clopidogrel

2007 STEMI Focused Update Recommendation

Class I

1. Clopidogrel 75 mg per day orally should be added to aspirin in patients with STEMI regardless of whether they undergo reperfusion with fibrinolytic therapy or do not receive reperfusion therapy. (*Level of Evidence: A*) Treatment with clopidogrel should continue for at least 14 days. (*Level of Evidence: B*)

Class IIa

1. In patients less than 75 years of age who receive fibrinolytic therapy or who do not receive reperfusion therapy, it is reasonable to administer an oral loading dose of clopidogrel 300 mg. (*Level of Evidence: C*) (No data are available to guide decision making regarding an oral loading dose in patients 75 years of age or older.)
2. Long-term maintenance therapy (e.g., 1 year) with clopidogrel (75 mg per day orally) is reasonable in STEMI patients regardless of whether they undergo reperfusion with fibrinolytic therapy or do not receive reperfusion therapy. *(Level of Evidence: C)*

STEMI : Ancillary Therapies in the elderly

Influenza vaccination

2007 STEMI Focused Update Recommendation	
Class I	
. Patients with cardiovascular disease should have an annual influenza vaccination.	*I (B)*

Options of reperfusion therapy in hospitals without catheterization laboratory

- immediate **Thrombolysis**
- transfer for **PCI**

- primary

- Immediate or Emergency PCI and Rescue PCI

- After Succesful Fibrinolysis

REPERFUSION STRATEGY

STEP 1: Assess Time and Risk

- Time since onset of symptoms
- Risk of STEMI
- Risk of fibrinolysis
- Time required for transport to a skilled PCI laboratory

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STEMI within **3 hours** after onset of symptoms

in a hospital without PCI

transfer time > 30 min

Thrombolysis (up to the age of 85 yrs)

(target < 30 min)

failed within 45-60 min after starting the administration

high risk patient (**cardiogenic shock , HF**

hemodynamically compromising ventricular arrhythmias

Anterior MI or inferior MI with RV involvement)

Successful , low risk patint

medical treatment

if post infarction angina or ischaemia

transfer for

Rescue PCI

2007 STEMI Focused Update Recommendation
Class I
STEMI patients presenting to a hospital without PCI capability and who cannot be transferred to a PCI center and undergo PCI within 90 minutes of first medical contact (see Figure 1) should be treated with fibrinolytic therapy within 30 minutes of hospital presentation as a systems goal unless fibrinolytic therapy is contraindicated. (*Level of Evidence: B*)

transfer for

Cor Angio - PCI

STEMI

within 12 hours after onset of symptoms,

in a hospital without PCI

↓

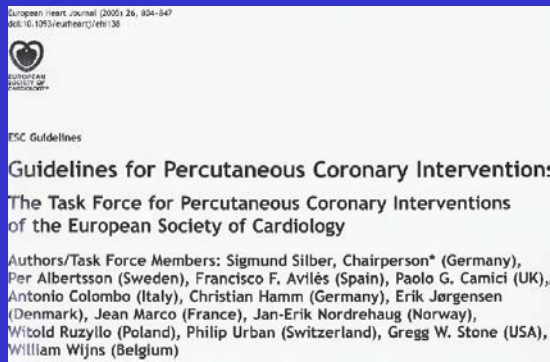
contraindications to Thrombolysis

↓

immediate transfer

↓

Primary PCI



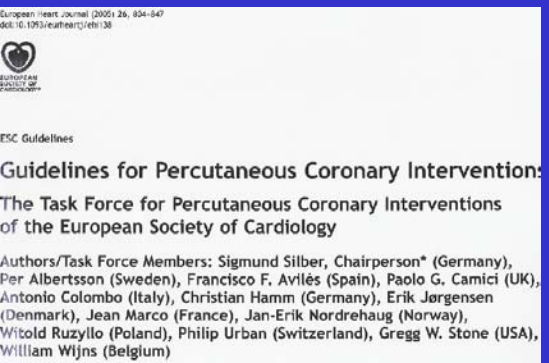
STEMI

within 12 hours after onset of symptoms,
in a hospital without PCI

≥ 3 - 12 hours

immediate transfer

Primary PCI


European Heart Journal (2005) 26, 804–847
doi:10.1093/eurheartj/ehi138

ESC Guidelines

Guidelines for Percutaneous Coronary Interventions

The Task Force for Percutaneous Coronary Interventions of the European Society of Cardiology

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