ACC/AHA 2007 STEMI Guidelines Focused Update Slide Set

Based on the 2007 Focused Update of the ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction (STEMI): A Report of the ACC/AHA Task Force on Practice Guidelines

This slide set was adapted from the *2007 Focused Update of the ACC/AHA Guidelines for Management of Patients With ST-Elevation Myocardial Infarction* (*Journal of the American College of Cardiology* published ahead of print on December 10, 2007, available at http://content.onlinejacc.org/cgi/content/full/j.jacc.200

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The full-text guidelines are also available on the Web sites:

ACC (www.acc.org) and,

AHA (www.americanheart.org)

Special Thanks to

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Elliott M. Antman, MD, FACC, FAHA

and

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Applying Classification of Recommendations and Level of Evidence

Class I	Class IIa	Class IIb	Class III
Benefit >>> Risk Procedure/ Treatment **SHOULD** be performed/ administered	*Benefit >> Risk* *Additional studies with focused objectives needed* **IT IS REASONABLE** to perform procedure/administer treatment	*Benefit ≥ Risk* *Additional studies with broad objectives needed; Additional registry data would be helpful* Procedure/Treatment **MAY BE CONSIDERED**	*Risk ≥ Benefit* *No additional studies needed* Procedure/Treatment should **NOT** be performed/administered **SINCE IT IS NOT HELPFUL AND MAY BE HARMFUL**
should is recommended is indicated is useful/effective/ beneficial	is reasonable can be useful/effective/ beneficial is probably recommended or indicated	may/might be considered may/might be reasonable usefulness/effectiveness is unknown /unclear/uncertain or not well established	is not recommended is not indicated should not is not useful/effective/beneficial may be harmful

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Applying Classification of Recommendations and Level of Evidence

Class I	Class IIa	Class IIb	Class III
Benefit >>> Risk Procedure/ Treatment **SHOULD** be performed/ administered	*Benefit >> Risk* *Additional studies with focused objectives needed* **IT IS REASONABLE** to perform procedure/administer treatment	*Benefit ≥ Risk* *Additional studies with broad objectives needed; Additional registry data would be helpful* Procedure/Treatment **MAY BE CONSIDERED**	*Risk ≥ Benefit* *No additional studies needed* Procedure/Treatment should **NOT** be performed/administered **SINCE IT IS NOT HELPFUL AND MAY BE HARMFUL**

Level A:	Recommendation based on evidence from multiple randomized trials or meta-analyses (3-5) population risk strata evaluated; General consistency of direction and magnitude of effect	Multiple
Level B:	Recommendation based on evidence from a single randomized trial or non-randomized studies Limited (2-3) population risk strata evaluated	
Level C:	Recommendation based on expert opinion, case studies, or standard-of-care limited (1-2) population risk strata evaluated	Very

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Evolution of Guidelines for ACS

1990	1992	1994	1996	1998	2000	2002	2004	2007

1990
ACC/AHA
AMI
R. Gunnar

1994
AHCPR/NHLBI
UA
E. Braunwald

1996 *Rev* 1999 *Upd*
ACC/AHA AMI
T. Ryan

2000 *Rev* 2002 *Upd* 2007 *Rev*
ACC/AHA UA/NSTEMI
E. Braunwald J. Anderson

2004 *Rev* 2007 *Upd*
ACC/AHA STEMI
E. Antman

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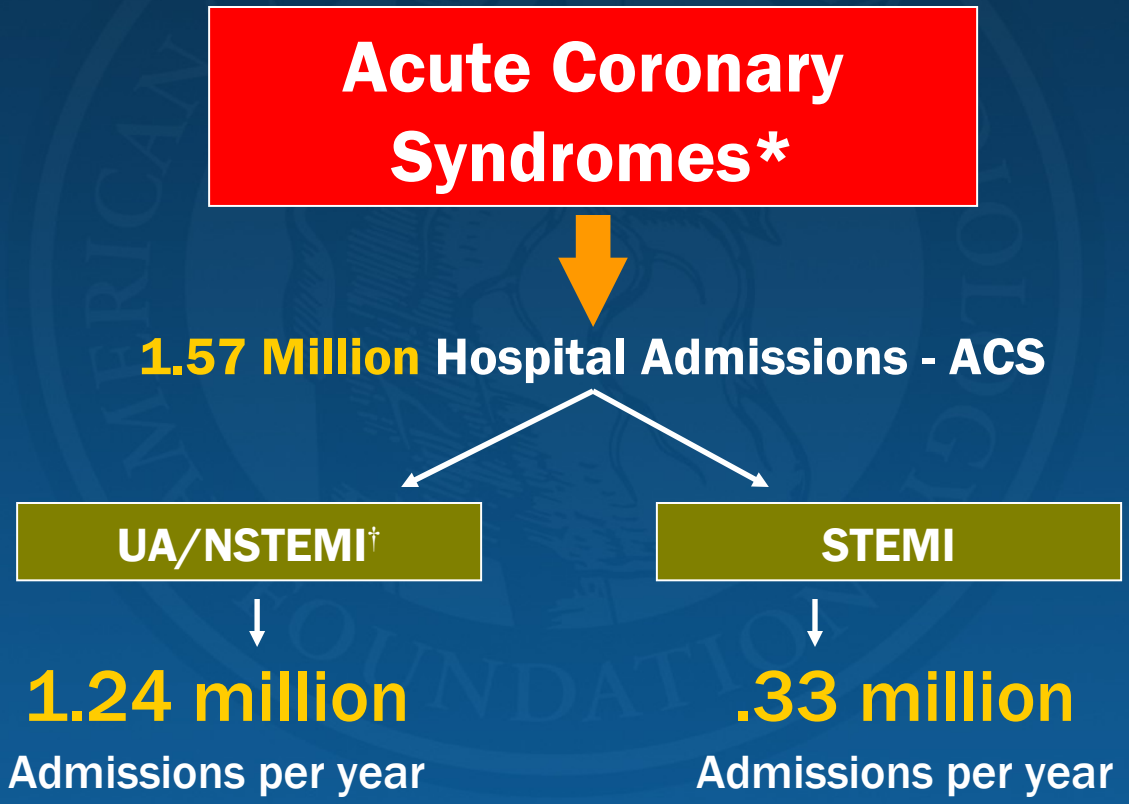
Hospitalizations in the U.S. Due to Acute Coronary Syndromes (ACS)



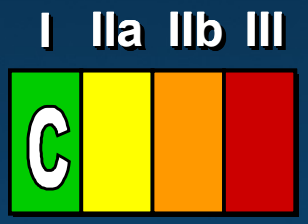
Heart Disease and Stroke Statistics – 2007 Update. Circulation 2007; 115:69-171.
*Primary and secondary diagnoses. †About 0.57 million NSTEMI and 0.67 million UA.

Analgesia

Analgesia

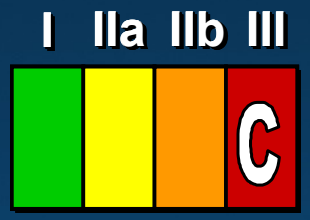
- Morphine remains Class I for STEMI although may increase adverse events in UA/NSTEMI
- NSAID medications increase mortality, reinfarction, and heart failure in proportion to degree of COX-2 selectivity
  - Discontinue on admission for STEMI
  - Do not initiate during acute phase of management

Analgesia



Patients routinely taking nonsteroidal anti-inflammatory drugs (NSAIDs) (except for aspirin), both non-selective as well as COX-2 selective agents, prior to STEMI should have those agents discontinued at the time of presentation with STEMI because of the increased risks of mortality, reinfarction, hypertension, heart failure, and myocardial rupture associated with their use.

Analgesia



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 risks of mortality, reinfarction, hypertension, heart failure, and myocardial rupture associated with their use.

Beta-Blockers

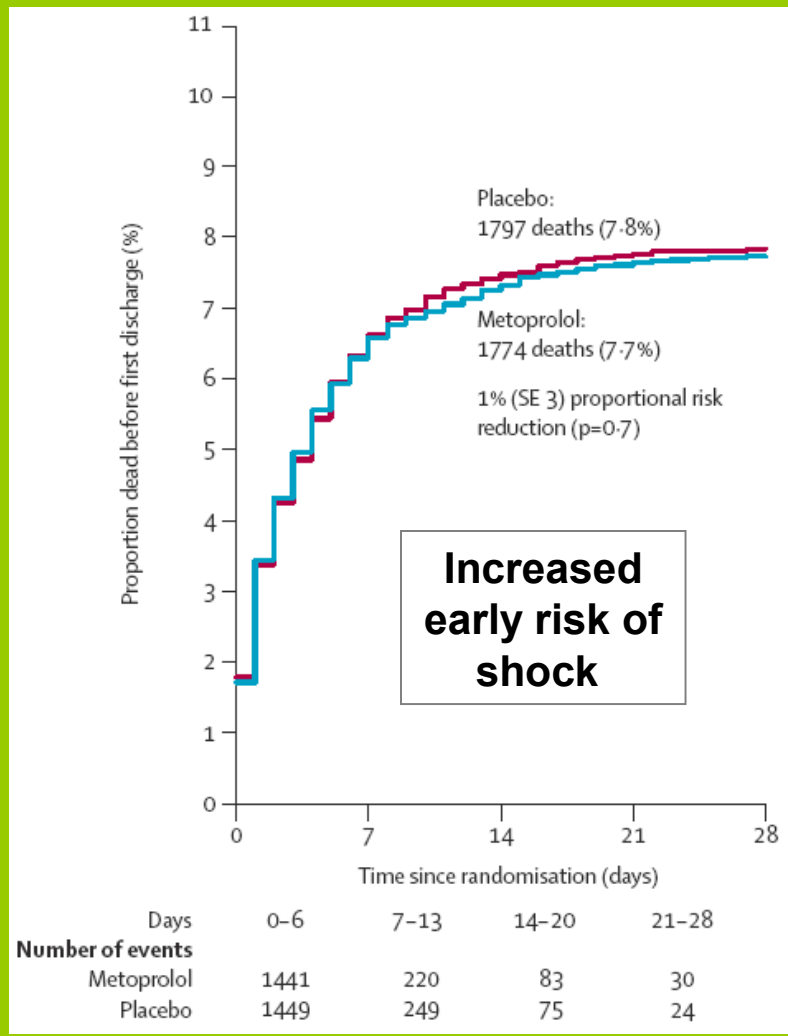
COMMIT: Study design

TREATMENT:	Metoprolol 15 mg iv over 15 mins, then 200 mg oral daily vs matching placebo
INCLUSION:	Suspected acute MI (ST change or LBBB) within 24 h of symptom onset
EXCLUSION:	Shock, systolic BP <100 mmHg, heart rate <50/min or II/III AV block
1° OUTCOMES:	Death & death, re-MI or VF/arrest up to 4 weeks in hospital (or prior discharge)

Mean treatment and follow-up: 16 days

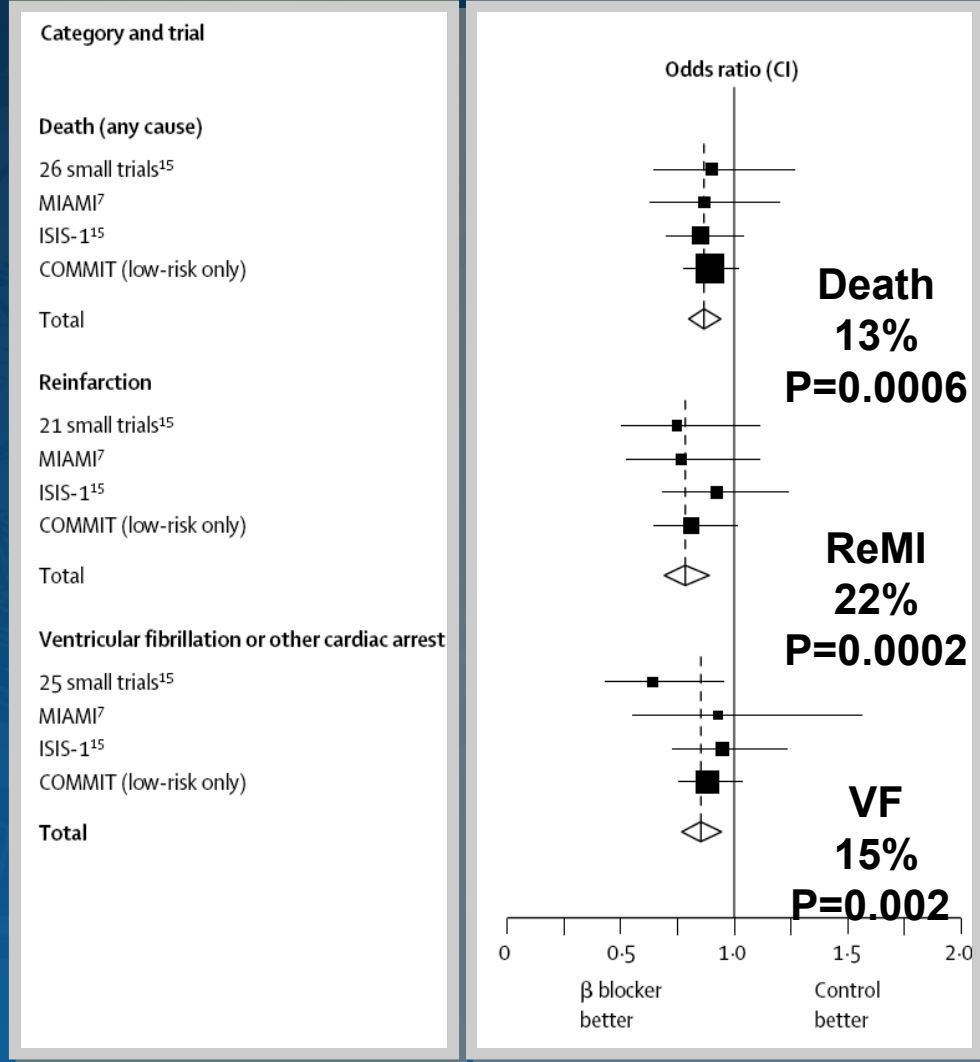
Effects of Metoprolol

COMMIT (N = 45,852)



Days	0–6	7–13	14–20	21–28
Number of events				
Metoprolol	1441	220	83	30
Placebo	1449	249	75	24

Totality of Evidence (N = 52,411)



Risk factors for cardiogenic shock :heart failure, age > 70 , systolic blood pressure < 120, sinus tachycardia > 110 or heart rate < 60, increased time since onset of STEMI symptoms

Lancet. 2005;366:1622.
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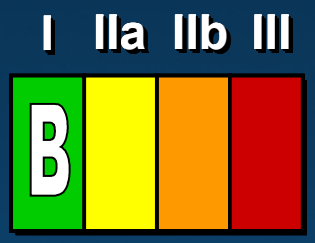
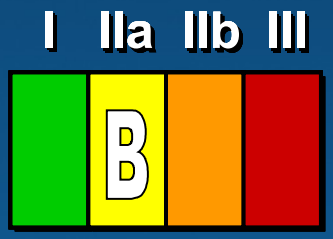
Beta-Blockers



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 > 0.24 sec, 2nd- or 3rd-degree heart block, active asthma, or reactive airway disease).



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 > 0.24 sec, 2nd- or 3rd-degree heart block, active asthma, or reactive airway disease).

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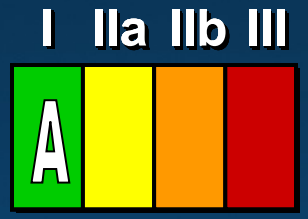
Beta-Blockers

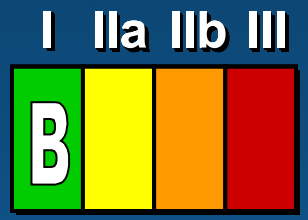
IV beta blockers should not be administered to STEMI patients who have any of the following: 1) signs of heart failure, 2) evidence of a low output state, 3) increased risk* for cardiogenic shock, or 4) other relative contraindications to beta blockade (PR interval > 0.24 sec, 2nd- or 3rd-degree heart block, active asthma, or reactive airway disease).

Primary PCI

Primary PCI



STEMI patients presenting to a hospital with PCI capability should be treated with primary PCI within 90 min of first medical contact as a systems goal.



STEMI patients presenting to a hospital without PCI capability, and who cannot be transferred to a PCI center and undergo PCI within 90 min of first medical contact, should be treated with fibrinolytic therapy within 30 min of hospital presentation as a systems goal, unless fibrinolytic therapy is contraindicated.

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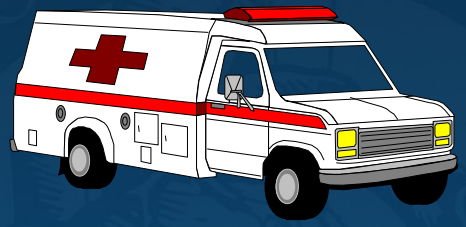
Options for Transport of Patients With STEMI and Initial Reperfusion Treatment

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.

Hospital fibrinolysis: Door-to-Needle within 30 min.

EMS Triage Plan

- Not PCI capable
- PCI capable

Inter-Hospital Transfer

GOALS

5 min.		8 min.	EMS Transport
Patient		**EMS**	

Dispatch
1 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.

Golden Hour = first 60 min. | **Total ischemic time: within 120 min.**

Antman EM, et al. *J Am Coll Cardiol 2008.* Published ahead of print on December 10, 2007. Available at http://content.onlinejacc.org/cgi/content/full/j.jacc.2007.10.001. Figure 1.

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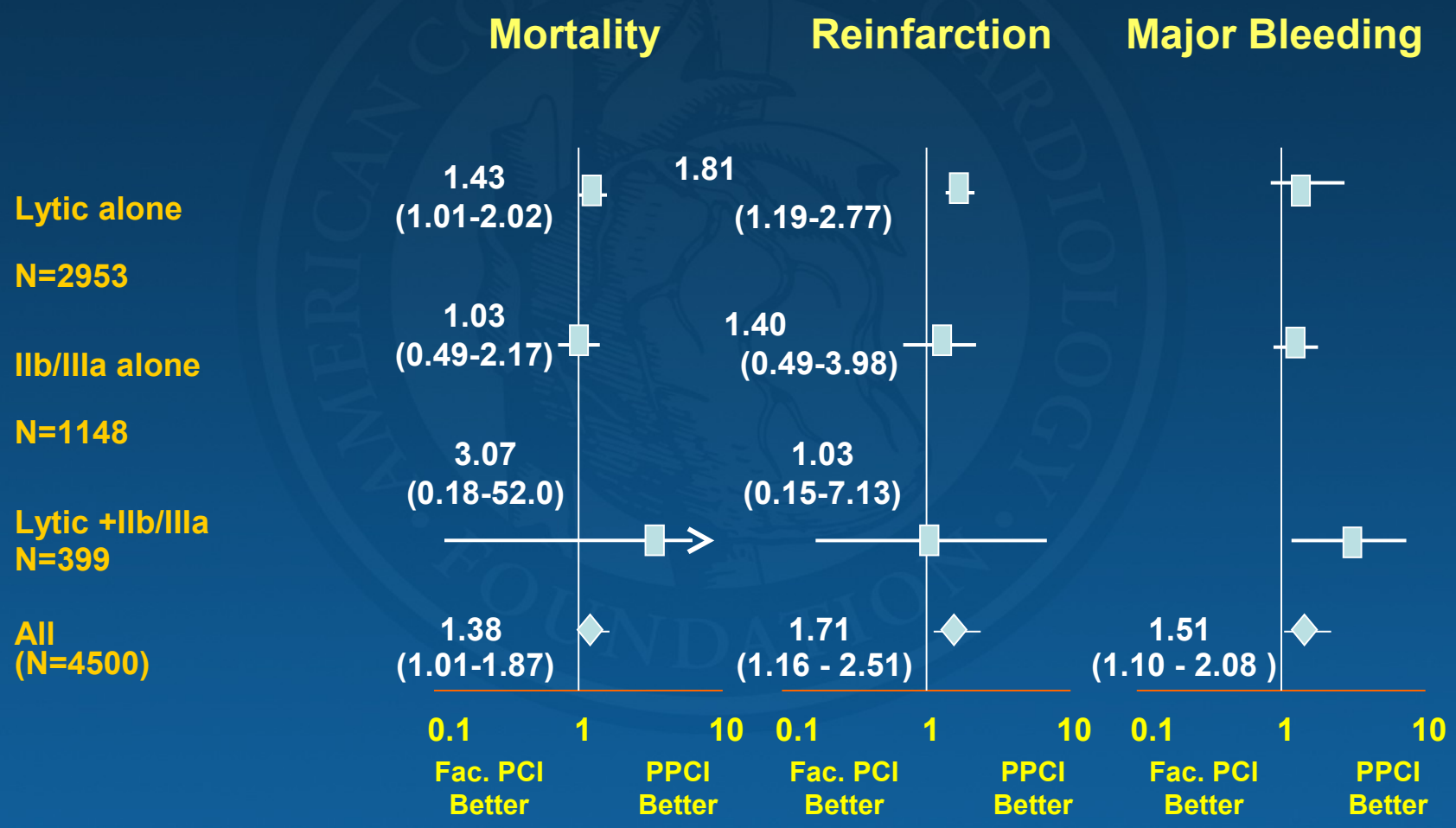
Facilitated PCI

Meta-analysis: Facilitated PCI vs Primary PCI



Keeley E, et al. *Lancet* 2006;367:579.

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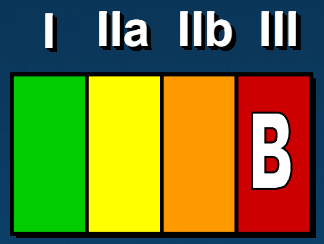
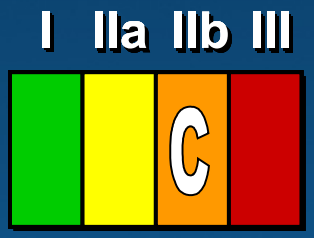
Facilitated PCI



A planned reperfusion strategy using full-dose fibrinolytic therapy followed by immediate PCI is not recommended and may be harmful.



Facilitated PCI using regimens other than full-dose fibrinolytic therapy might be considered as a reperfusion strategy when all of the following are present:

a. Patients are at high risk,

b. PCI is not immediately available within 90 minutes, and

c. Bleeding risk is low (younger age, absence of poorly controlled hypertension, normal body weight).

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Facilitated PCI

Further Studies Ongoing

- Prehospital fibrinolytic therapy
- Better anticoagulant and antiplatelet therapy
- Use in circumstances of longer delays to PCI

However, based on available data, facilitated PCI offered no clinical benefit, and was associated with harm when full dose fibrinolytics were used.

Rescue and Late PCI

Meta-analysis: Rescue PCI vs Conservative Tx

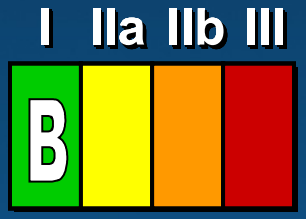
Outcome	Rescue PCI	Conservative Treatment	RR (95% CI)	*P*
Mortality, % (n)	7.3 (454)	10.4 (457)	0.69 (0.46–1.05)	.09
HF, % (n)	12.7 (424)	17.8 (427)	0.73 (0.54–1.00)	.05
Reinfarction, % (n)	6.1 (346)	10.7 (354)	0.58 (0.35–0.97)	.04
Stroke, % (n)	3.4 (297)	0.7 (295)	4.98 (1.10–22.48)	.04
Minor bleeding, % (n)	16.6 (313)	3.6 (307)	4.58 (2.46–8.55)	<.001

In 3 trials, enrolling 700 patients that reported the composite end point of all-cause mortality, reinfarction, and HF, rescue PCI was associated with a significant RR reduction of 28% (RR 0.72; 95% CI, 0.59-0.88; *P*=.001)

Wijeysundera HC, et al. *J Am Coll Cardiol.* 2007;49:422-430.

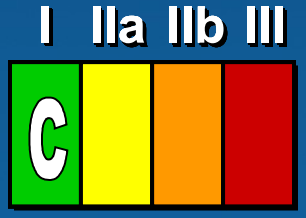
Rescue PCI

A strategy of coronary angiography with intent to perform PCI (or emergency CABG) is recommended in patients who have received fibrinolytic therapy and have:



a. Cardiogenic shock in patients < 75 years who are suitable candidates for revascularization

b. Severe congestive heart failure and/or pulmonary edema (Killip class III)



c. Hemodynamically compromising ventricular arrhythmias.

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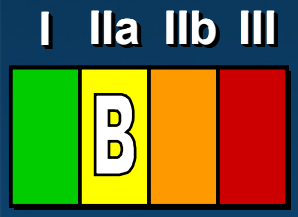
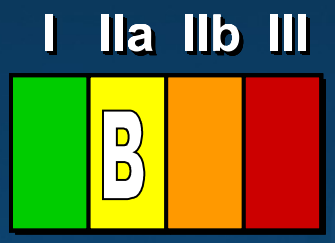
Rescue PCI



A strategy of coronary angiography with intent to perform PCI (or emergency CABG) is reasonable in patients ≥ 75 years who have received fibrinolytic therapy, and are in cardiogenic shock, provided they are suitable candidates for revascularization.

Rescue PCI



A strategy of coronary angiography with intent to perform rescue PCI is reasonable for patients in whom fibrinolytic therapy has failed (ST-segment elevation < 50% resolved after 90 min 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].

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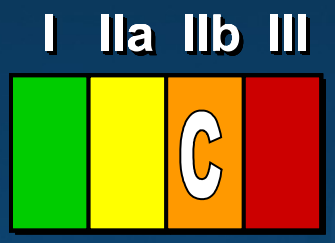
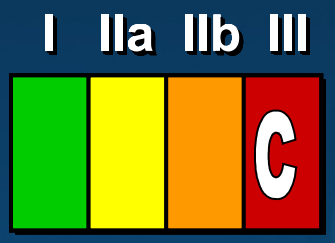
Rescue PCI



A strategy of coronary angiography with intent to perform PCI in the absence of any of the above Class I or IIa indications might be reasonable in moderate- or high-risk patients, but its benefits and risks are not well established. The benefits of rescue PCI are greater the earlier it is initiated after the onset of ischemic discomfort.

Rescue PCI



A strategy of coronary angiography with intent to perform PCI (or emergency CABG) is not recommended in patients who have received fibrinolytic therapy if further invasive management is contraindicated or the patient or designee do not wish further invasive care.

Occluded Artery Trial (OAT)

Eligibility:

- Confirmed Index MI
- Total IRA occlusion
- 3-28 days (>24 hours)

Exclusion criteria:

- Significant left main or 3 vessel CAD
- Hemodynamic or electrical instability
- Rest or low-threshold angina
- NYHA Class III-IV HF or shock

RESULTS

2166 randomized

1082 PCI + optimal medical therapy
1084 Optimal medical therapy (MED)

Death, MI, CHF Class IV

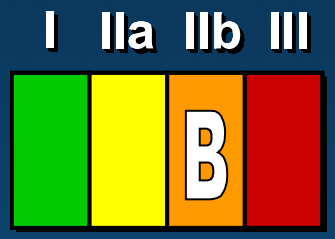
4 year event rate:
17.2% PCI vs 15.6% MED
Hazard Ratio: PCI vs MED=1.16;
95% CI (0.92, 1.45); p=0.20

Fatal and Non fatal MI

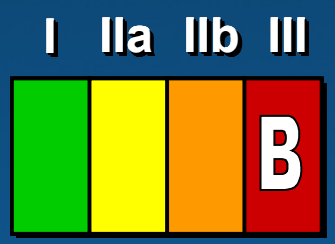
4 year event rate:
7.0% PCI vs 5.3% MED
Hazard Ratio: PCI vs MED=1.36;
95% CI (0.92, 2.00); p=0.13

Hochman JS, et al. *Am Heart J* 2005;150:627-42;
Hochman JS, et al. *N Engl J Med* 2006;355:2395-407.

Late PCI after Fibrinolysis or for Patients Not Undergoing Primary Reperfusion



PCI of a hemodynamically significant stenosis in a patent infarct artery > 24 hours after STEMI may be considered as part of a invasive strategy.



PCI of a totally occluded infarct artery > 24 hours after STEMI is not recommended in asymptomatic patients with 1- or 2-vessel disease if they are hemodynamically and electrically stable and do not have evidence of severe ischemia.

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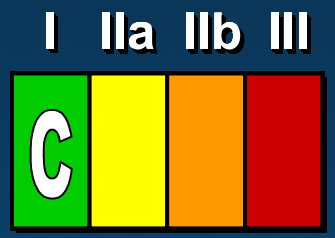
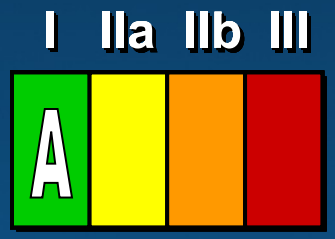
Anticoagulants

Anticoagulants





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 unfractionated heparin [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)*

Anticoagulant regimens with established efficacy include:

- UFH *(LOE: C)*
- Enoxaparin *(LOE:A)*
- Fondaparinux *(LOE:B)*

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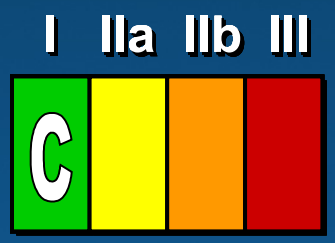
Anticoagulants

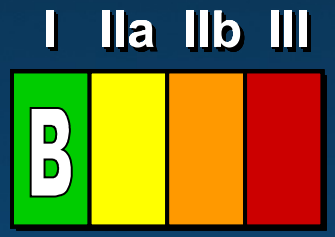


For patients undergoing PCI after having received an anticoagulant regimen, the following dosing recommendations should be followed:

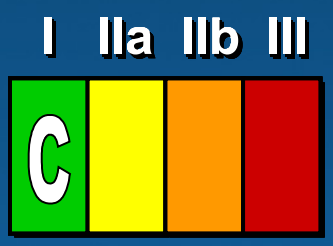
a. For prior treatment with UFH: administer additional boluses of UFH as needed to support the procedure taking into account whether GP IIb/IIIa receptor antagonists have been administered. *(Level of Evidence: C)* Bivalirudin may also be used in patients treated previously with UFH. *(Level of Evidence: C)*

Recommendation continues on the next slide.

Anticoagulants

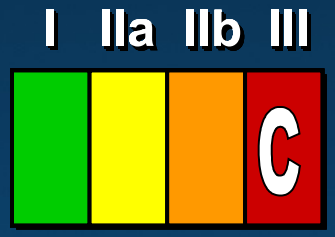


b. For prior treatment with enoxaparin: if the last SC dose was administered within the prior 8 hours, no additional enoxaparin should be given; if the last SC dose was administered at least 8 to 12 hours earlier, an IV dose of 0.3 mg/kg of enoxaparin should be given.



c. For prior treatment with fondaparinux: administer additional intravenous treatment with an anticoagulant possessing anti-IIa activity taking into account whether GP IIb/IIIa receptor antagonists have been administered.

Anticoagulants



Because of the risk of catheter thrombosis, fondaparinux should not be used as the sole anticoagulant to support PCI. An additional anticoagulant with anti-IIa activity should be administered.

Unfractionated Heparin

Advantages

- Immediate anticoagulation
- Multiple sites of action in coagulation cascade
- Long history of successful clinical use
- Readily monitored by aPTT and ACT

Disadvantages

- Indirect thrombin inhibitor so does not inhibit clot-bound thrombin
- Nonspecific binding to:
  - Serine proteases
  - Endothelial cells

  (can lead to variability in level of anticoagulation)
- Reduced effect in ACS
  - Inhibited by PF-4
- Causes platelet aggregation
- Nonlinear pharmacokinetics
- Risk of HIT

Hirsh J, et al. *Circulation*. 2001;103:2994-3018. aPTT = activated partial thromboplastin time; ACT = activated coagulation time; PF-4 = platelet factor 4; HIT = heparin-induced thrombocytopenia.

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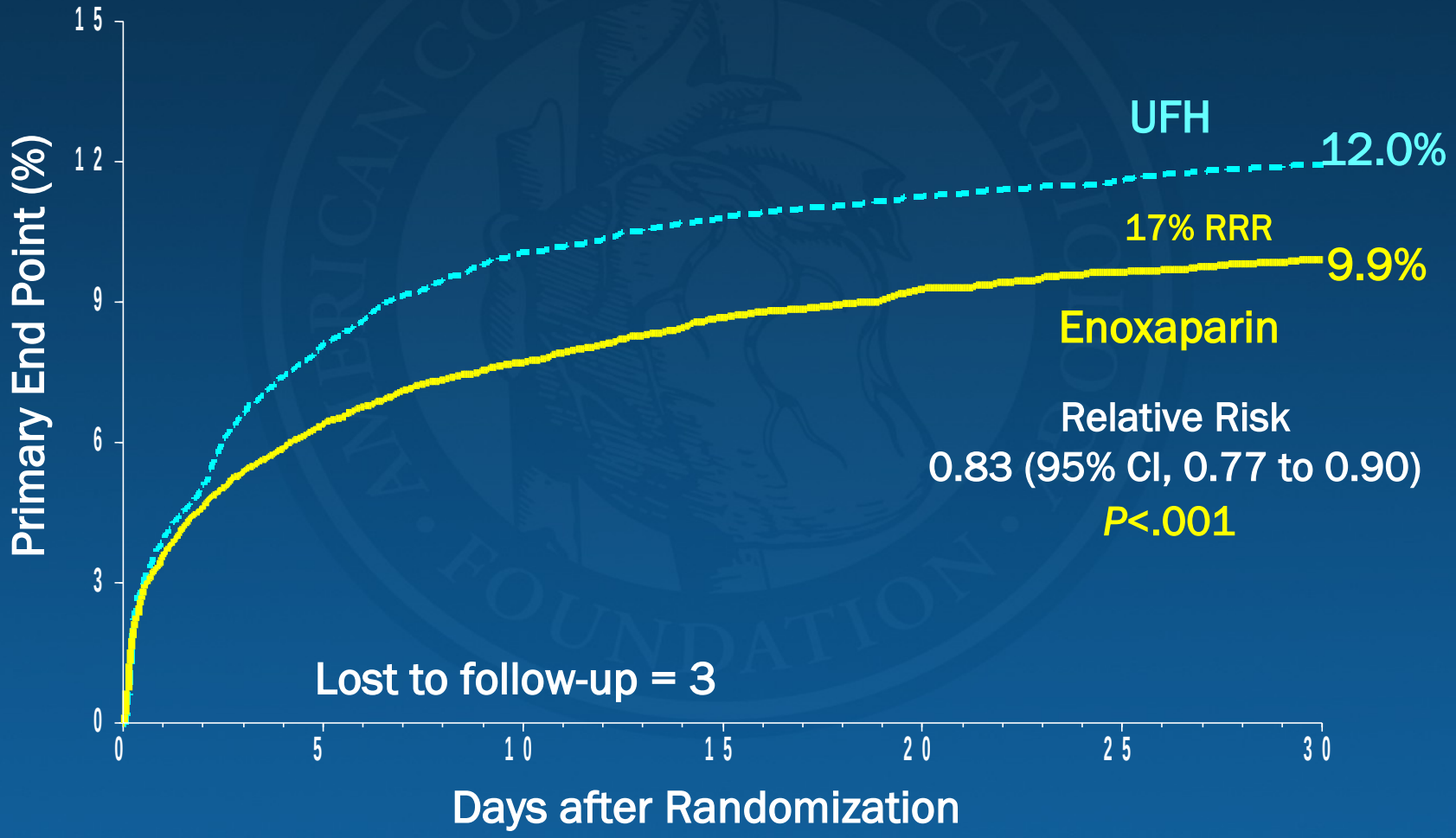
ExTRACT-TIMI 25: Primary End Point (ITT) Death or Nonfatal MI



Adapted with permission from Antman EM, et al. *N Engl J Med*. 2006;354:1477-1488.

ACC/AHA 2007 STEMI Guidelines Focused Update

Low-Molecular-Weight Heparin

Advantages

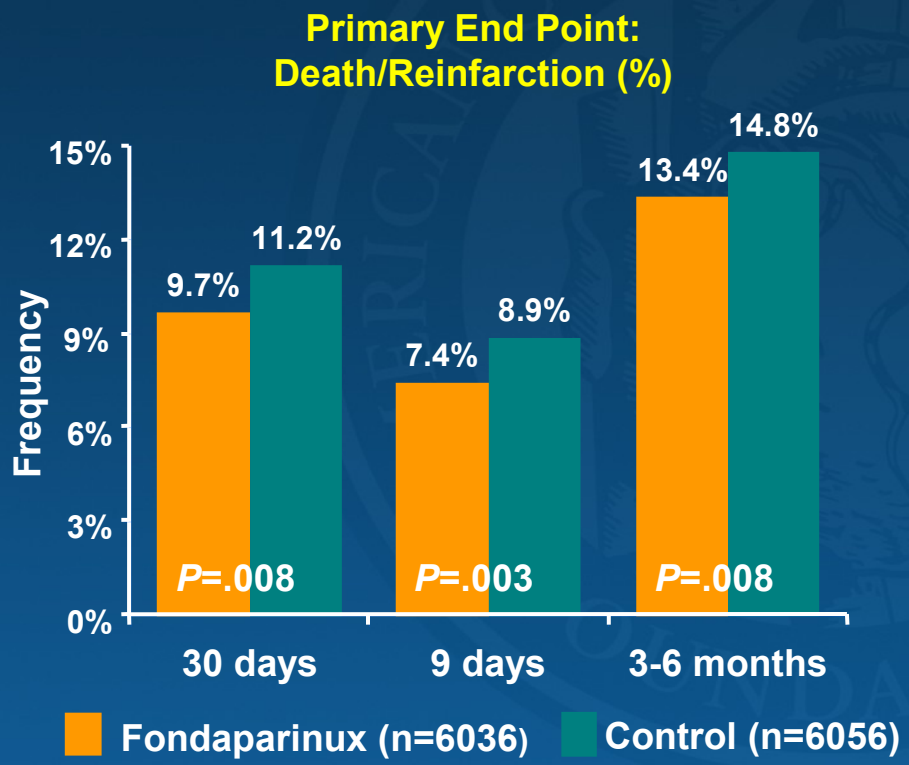
- Increased anti-Xa to anti-IIa activity → inhibits thrombin generation more effectively
- Induces ↑ release of TFPI vs UFH
- Not neutralized by platelet factor 4
- Less binding to plasma proteins (eg, acute-phase reactant proteins) → more consistent anticoagulation
- Lower rate of HIT vs UFH
- Lower fibrinogen levels
- Easy to administer (SC administration)
- Long history of clinical studies and experience, FDA-approved indications
- Monitoring typically unnecessary

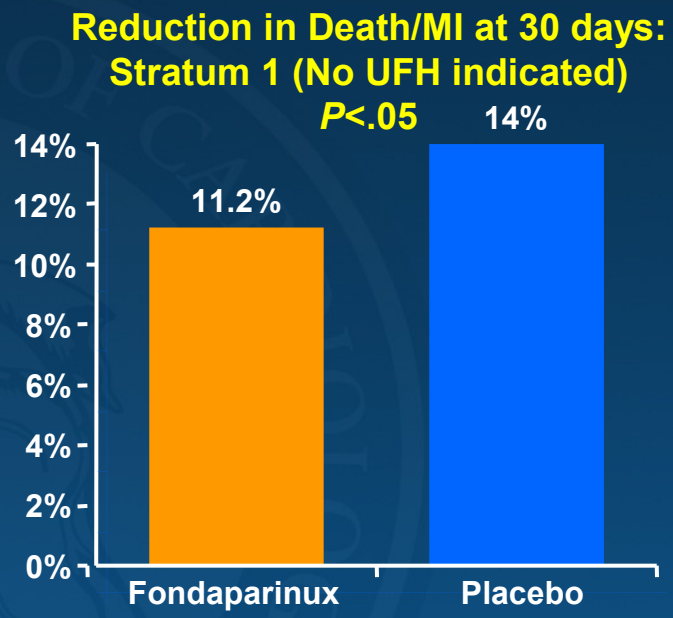
Disadvantages

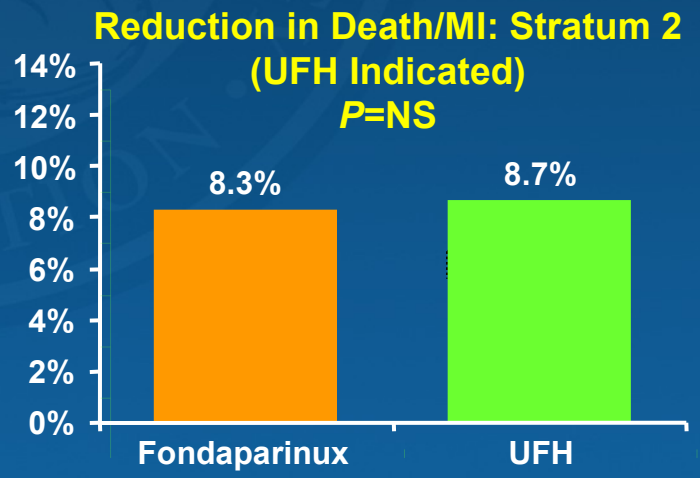
- Indirect thrombin inhibitor
- Less reversible
- Difficult to monitor (no aPTT or ACT)
- Renally cleared
- Long half-life
- Risk of HIT

Hirsh J, et al. *Circulation*. 2001;103:2994-3018. TFPI = tissue factor pathway inhibitor; UFH = unfractionated heparin; SC = subcutaneous; aPTT = activated partial thromboplastin time; ACT = activated coagulation time.

OASIS-6 Trial: Results







Yusuf S, et al. *JAMA*. 2006;295:1519-1530. Adapted with permission from www.clinicaltrialresults.org

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Fondaparinux

Advantages

- SC administration
  - Potential exists for outpatient management
- Once-daily administration
- Predictable anticoagulant response
- Fixed dose
- No antigenicity
- Potentially no need for serologic parameters
- Does not cross the placenta
- HIT antibodies do not cross-react
- Decreased bleeding complications vs UFH or LMWH

Disadvantages

- Difficult to monitor (no aPTT or ACT)
- Long half-life
- Catheter thrombosis during PCI

Simoons ML, et al. *J Am Coll Cardiol*. 2004;43:2183-2190.
Yusuf S, et al. *N Engl J Med*. 2066;354:1464-1476.

Summary of Observations from Trials of Anticoagulants for STEMI

Anticoagulant	Efficacy (through 30 d)	Safety	Use During PCI
Reviparin	Fibrinolysis: probably superior to placebo.* No reperfusion: probably superior to placebo.*	↑ risk of serious bleeds†	No data on reviparin alone during PCI. Additional anticoagulant with anti-IIa activity, such as UFH or bivalirudin, recommended.
Fondaparinux	Fibrinolysis: appears superior to control rx (placebo/UFH). Relative benefit vs placebo and UFH separately cannot be reliably determined from available data.* Primary PCI: when used alone, no advantage over UFH and trend toward worse outcome. No reperfusion: appears superior to control therapy (placebo/UFH). Relative benefit versus placebo and UFH separately cannot be reliably determined from available data.*	Trend toward ↓ risk of serious bleeds†	↑ risk of catheter thrombosis when fondaparinux used alone. Additional anticoagulant with anti-IIa activity, such as UFH or bivalirudin, recommended.
Enoxaparin	Fibrinolysis: appears superior to UFH	↑ risk of serious bleeds†	Enoxaparin can be used to support PCI after fibrinolysis. No additional anticoagulant needed.

Antman EM, et al. *J Am Coll Cardiol 2008.* Published ahead of print on December 10, 2007. Available at http://content.onlinejacc.org/cgi/content/full/j.jacc.2007.10.001. Table 10.

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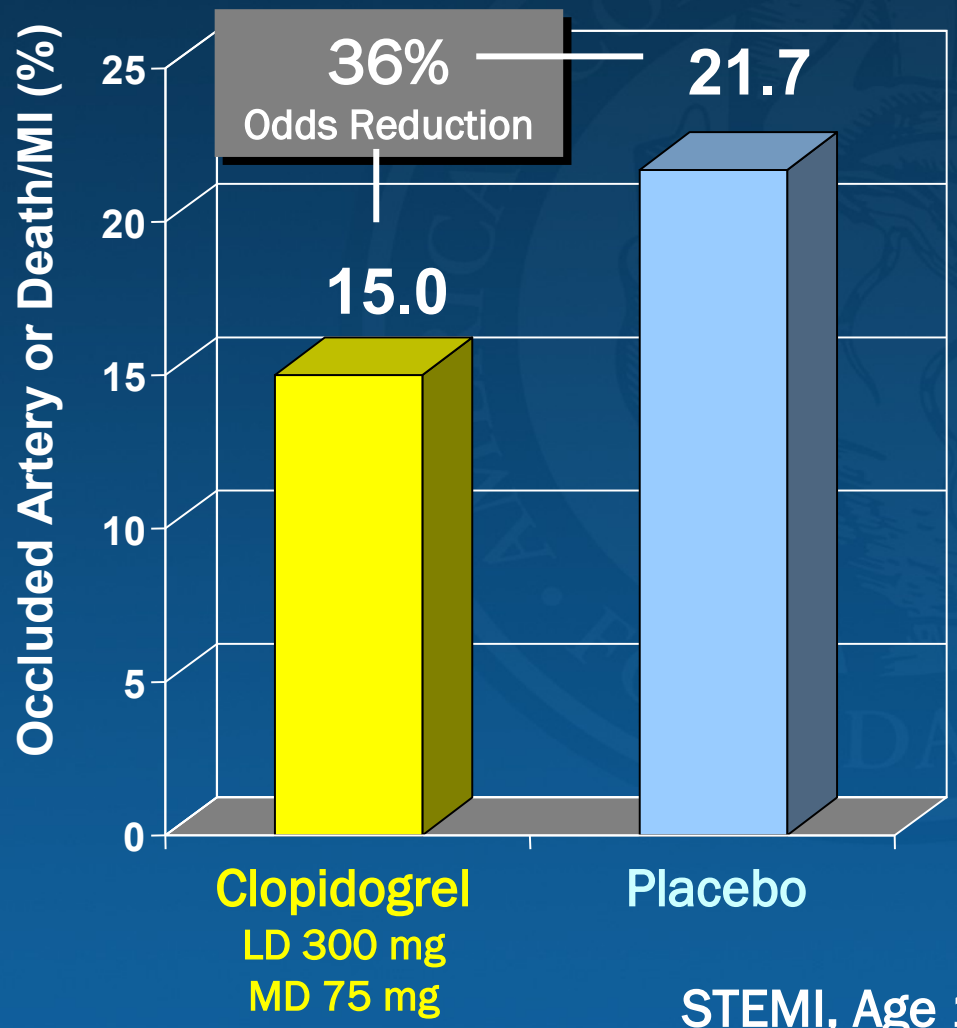
Thienopyridines

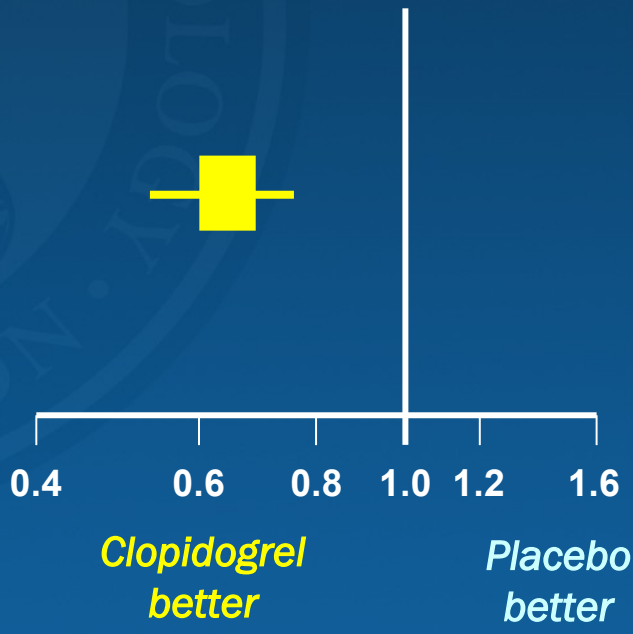
CLARITY-TIMI 28 Primary Endpoint:
Occluded Artery (or D/MI thru Angio/HD)



STEMI, Age 18-75

Odds Ratio 0.64
(95% CI 0.53-0.76)

P=0.00000036



Sabatine N Eng J Med 2005;352:1179.

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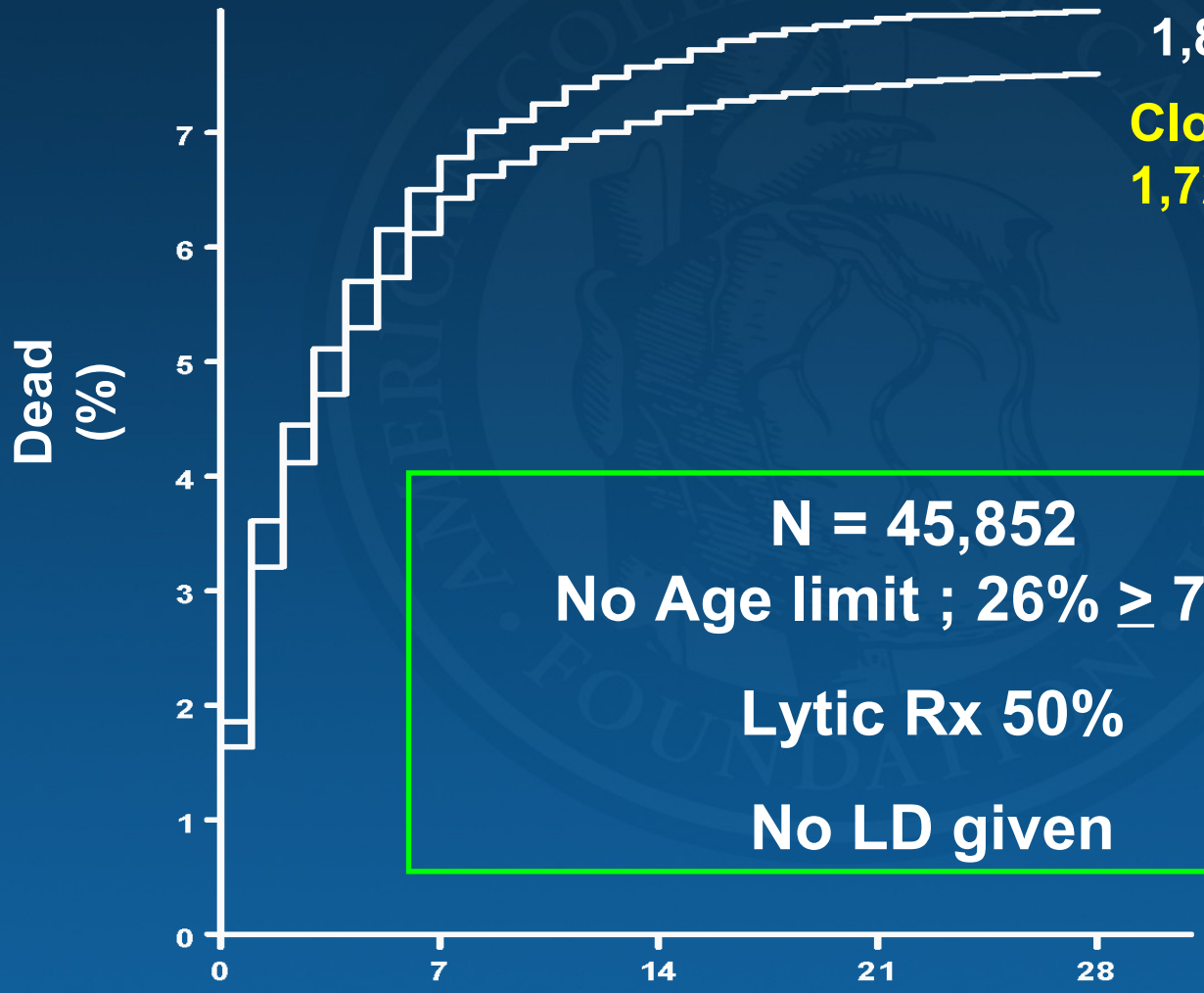
COMMIT: Effect of CLOPIDOGREL on Death In Hospital



Placebo + ASA:
1,846 deaths (8.1%)

Clopidogrel + ASA:
1,728 deaths (7.5%)

0.6% ARD
7% RRR
***P* = 0.03**

N = 45,852
No Age limit ; 26% ≥ 70 y
Lytic Rx 50%
No LD given

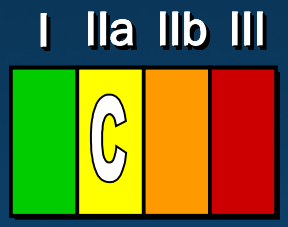
Chen ZM, et al. *Lancet*. 2005;366:1607.

Thienopyridines

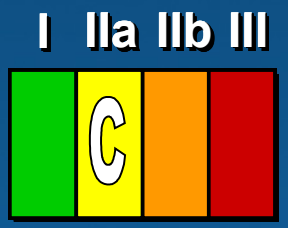
Clopidogrel 75 mg per day orally should be added to aspirin in patients with STEMI regardless of whether they undergo reperfusion with fibrinolytic therapy or do not receive reperfusion therapy.

Treatment with clopidogrel should continue for at least 14 days.

Thienopyridines



In patients < 75 years who receive fibrinolytic therapy or who do not receive reperfusion therapy, it is reasonable to administer an oral clopidogrel loading dose of 300 mg. (No data are available to guide decision making regarding an oral loading dose in patients ≥ 75 years of age.)

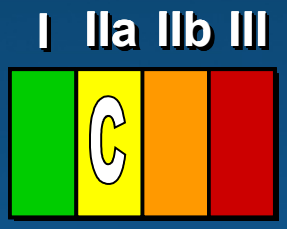


Long-term maintenance therapy (e.g., 1 year) with clopidogrel (75 mg per day orally) can be useful in STEMI patients regardless of whether they undergo reperfusion with fibrinolytic therapy or do not receive reperfusion therapy.

Hospital Care

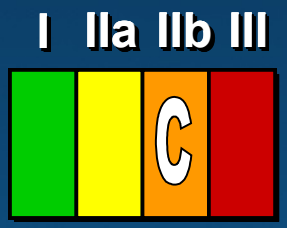
Anticoagulants

It is reasonable for patients with STEMI who do not undergo reperfusion therapy to be treated with anticoagulant therapy (non-UFH regimen) for the duration of the index hospitalization, up to 8 days.



Convenient strategies that can be used include those with LMWH *(Level of Evidence: C)* or fondaparinux *(Level of Evidence: B)* using the same dosing regimens as for patients who receive fibrinolytic therapy.

Invasive Evaluation



Coronary arteriography may be considered as part of an invasive strategy for risk assessment after fibrinolytic therapy *(Level of Evidence: B)* or for patients not undergoing primary reperfusion. *(Level of Evidence: C)*

Secondary Prevention and Long-Term Management

Secondary Prevention

- Ask, advise, assess, and assist patients to stop smoking – I (B)
- Clopidogrel 75 mg daily:
  - PCI – I (B)
  - no PCI – IIa (C)
- Statin goal:
  - LDL-C < 100 mg/dL – I (A)
  - consider LDL-C < 70 mg/dL – IIa (A)
- Daily physical activity 30 min 7 d/wk, minimum 5 d/wk – I (B)
- Annual influenza immunization – I (B)

Secondary Prevention and Long Term Management

Goals	Class I Recommendations
Smoking *2007 Goal:* *Complete cessation.* *No exposure to environmental tobacco smoke.*	• Status of tobacco use should be asked at every visit. • Every tobacco user and family member who smoke should be advised to quit at every visit. • The tobacco user's willingness to quit should be assessed. **NEW** • The tobacco user should be assisted by counseling and developing a plan for quitting. • Follow-up, referral to special programs, or pharmacotherapy (including nicotine replacement and pharmacological rx) should be arranged. • Exposure to environmental tobacco smoke at home and work should be avoided. **NEW**

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Goals

Blood pressure control:

2007 Goal: < 140/90 mm Hg or <130/80 mm Hg if chronic kidney disease or diabetes

Class I Recommendations

If blood pressure is ≥ 140/90 mm Hg or ≥ 130/80 mm Hg for patients with chronic kidney disease or diabetes:

- It is recommended to initiate or maintain lifestyle modification (weight control, ↑ physical activity, alcohol moderation, sodium ↓, and emphasis on ↑ consumption of fresh fruits, vegetables, and low-fat dairy products).

CHANGED TEXT

- It is useful as tolerated, to add blood pressure medication, treating initially with beta-blockers and/or ACE inhibitors, with the addition of other drugs such as thiazides as needed to achieve goal BP.

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Goals

Lipid management:
2007 goal:
LDL-C << than 100 mg/dL (if TG ≥ 200 mg/dL, non–HDL-C < 130 mg/dL

Class I Recommendations

- Starting dietary therapy in all patients is recommended. ↓ intake of sat. fats (< 7% of total calories), trans fatty acids and cholesterol (< 200 mg/d).
- Adding plant stanol/sterols (2 g/d) and/or viscous fiber (> 10 g/d) is reasonable to further lower LDL-C. *(Class IIa; LOE:A)*

NEW

- Promotion of daily physical activity and weight management is recommended.
- It may be reasonable to encourage ↑ consumption of omega-3 fatty acids in the form of fish or in capsule form (1 g/d) for risk reduction. For treatment of elevated TG, higher doses are usually necessary for risk reduction. *(Class IIb; LOE: B)*

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Goals

Lipid management:
2007 goal:
LDL-C << than 100 mg/dL (if TG ≥ 200 mg/dL, non–HDL-C < 130 mg/dL

Class I Recommendations

- A fasting lipid profile should be assessed in all patients and within 24 hours of hospitalization for those with an acute cardiovascular or coronary event. For hospitalized patients, initiation of lipid-lowering medication is indicated as recommended below before discharge according to the following schedule:

- LDL-C should be < 100 mg/dL.
- Further reduction to < 70 mg /dL is reasonable. *(Class IIa; LOE: A)* ***NEW***
- **If baseline LDL-C is ≥ 100 mg/dL**, LDL-lowering drug rx should be initiated.
- **If on-treatment LDL-C is ≥ 100 mg/dL** intensify LDL-lowering drug rx (may require LDL-lowering combination is recommended.
- **If baseline LDL-C is 70 to 100 mg/dL**, it is reasonable to treat to LDL-C < 70 mg/dL. *(Class IIa; LOE: B)*

NEW

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Goals

Lipid management: (TG 200 mg/dL or greater)
Primary goal: Non–HDL-C < 130 mg/dL

Class I Recommendations

- **If TG are ≥ 150 mg per dL or HDL-C < 40 mg per dL,** weight management, physical activity, and smoking cessation should be emphasized.
- **If TGs are 200 to 499 mg per dL**, non–HDL-C target should be less than 130 mg per dL.
- **If TGs are 200 to 499 mg/dL**, non–HDL-C target is < 130 mg/dL. *(Class I; LOE: B)*; further reduction of non–HDL-C to < 100 mg dL is reasonable. *(Class IIa; LOE: B)*
- Therapeutic options to reduce non–HDL-C include: **NEW**
  - More intense LDL-C-lowering rx is indicated
  - Niacin (after LDL-C-lowering rx) can be beneficial *(Class IIa; LOE B)*
  - Fibrate therapy (after LDL-C-lowering rx) can be beneficial *(Class IIa; LOE B)*
- **If TG are ≥ 500 mg/dL**, therapeutic options indicated and useful to prevent pancreatitis are fibrate or niacin before LDL-lowering rx; and treat LDL-C to goal after TG-lowering rx. Achieving non–HDL-C < 130 mg/dL is recommended.

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Goals

Physical activity:
2007 Goal:
30 min 7 d per wk; minimum 5 d per wk

Class I Recommendations

- For all patients, it is recommended that risk be assessed with a physical activity history and/or an exercise test to guide prescription.
- For all patients, encouraging 30 to 60 min of moderate-intensity aerobic activity, such as brisk walking, on most, preferably all, days of the week, supplemented by an increase in daily lifestyle activities (e.g., walking breaks at work, gardening, household work).
- Advising medical supervised programs (cardiac rehabilitation) for high-risk patients (e.g., recent acute coronary syndrome or revascularization, HF) is recommended.
- ***NEW*** Encouraging resistance training 2 d per week may be reasonable *(Class IIb; LOE: C)*

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Goals

Weight management:
Goal:
BMI 18.5 to 24.9 kg/m^2

Waist circumference:
Women: < 35 in. (102 cm)
Men: < 40 in. (89 cm)

Class I Recommendations

- It is useful to assess body mass index and/or waist circumference on each visit and consistently encourage weight maintenance/reduction through an appropriate balance of physical activity, caloric intake, and formal behavioral programs when indicated to maintain/achieve a body mass index between 18.5 and 24.9 kg/m^2.
- The initial goal of weight loss therapy should be to reduce body weight by approximately 10% from baseline. With success, further weight loss can be attempted if indicated through further assessment.
- If waist circumference (measured horizontally at the iliac crest) is ≥ 35 inches (102 cm) in women and ≥ 40 inches (89 cm) in men, it is useful to initiate lifestyle changes and consider treatment strategies for metabolic syndrome as indicated.

ACC/AHA 2007 STEMI Guidelines Focused Update

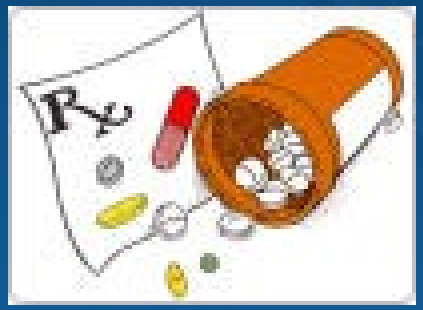
Secondary Prevention and Long Term Management

Goals	Class I Recommendations
Diabetes management: *Goal:* *HbA1c < 7%*	It is recommended to initiate lifestyle and pharmacotherapy to achieve near-normal HbA1c.
	Beginning vigorous modification of other risk factors (e.g., physical activity, weight management, BP control, and cholesterol management as recommended above) is beneficial.
	Coordination of diabetic care with patient's primary care physician or endocrinologist is beneficial. **NEW**

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Goals	Class I Recommendations
Antiplatelet agents/ anticoagulants: Aspirin	For all post-PCI STEMI stented patients without aspirin resistance, allergy, or increased risk of bleeding, aspirin 162 to 325 mg daily should be given for at least 1 month after bare-metal stent implantation, 3 months after sirolimus-eluting stent implantation, and 6 months after paclitaxel-eluting stent implantation, after which long-term aspirin use should be continued indefinitely at a dose of 75 to 162 mg daily.

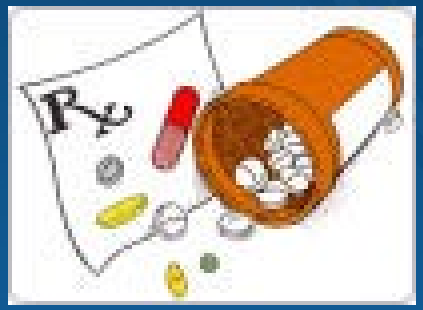


CHANGED TEXT

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

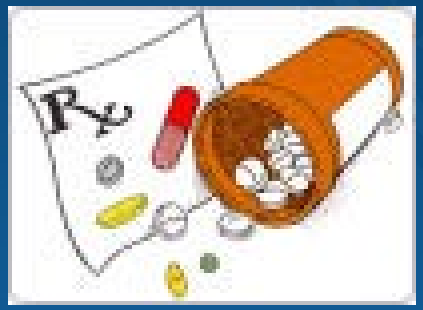
Goals	Recommendations
Antiplatelet agents/ anticoagulants: Aspirin	In patients where the physician is concerned about the risk of bleeding lower-dose 75 to 162 mg of aspirin is reasonable during the initial period after stent implantation. *(Class IIa; LOE: C)*



NEW REC

ACC/AHA 2007 STEMI Guidelines Focused Update

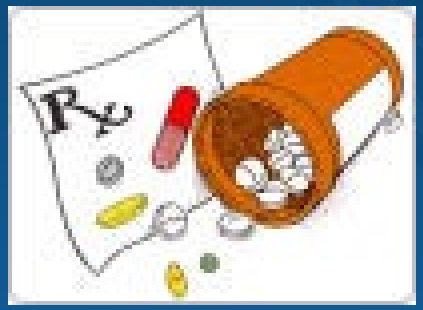
Secondary Prevention and Long Term Management

Goals	Class I Recommendations
Antiplatelet agents/ anticoagulants: Clopidogrel	For all post-PCI patients who receive a drug-eluting stent (DES), clopidogrel 75 mg daily should be given for at least 12 months if patients are not at high risk of bleeding.
	For post-PCI patients receiving a bare metal stent (BMS), clopidogrel should be given for a minimum of 1 month and ideally up to 12 months (unless the patient is at increased risk of bleeding; then it should be given for a minimum of 2 weeks).

CHANGED TEXT

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Goals	Recommendations
Antiplatelet agents/ anticoagulants: Clopidogrel	For all STEMI patients not undergoing stenting (medical therapy alone or PTCA without stenting), treatment with clopidogrel should continue for at least 14 d. *(Class I; LOE: B)*
	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. *(Class IIa; LOE: C)*

NEW RECS

ACC/AHA 2007 STEMI Guidelines Focused Update

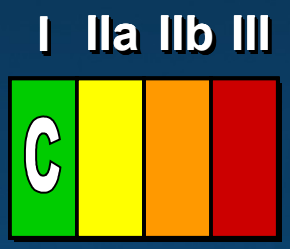
Secondary Prevention and Long Term Management

Goals	Class I Recommendations
Antiplatelet agents/ anticoagulants: Warfarin	Managing warfarin to INR = 2.0 to 3.0 for paroxysmal or chronic atrial fibrillation or flutter is recommended, and in post-STEMI patients when clinically indicated (e.g., atrial fibrillation, left ventricular thrombus). *CHANGED TEXT*
NEW REC	Use of warfarin in conjunction with aspirin and/or clopidogrel is associated with increased risk of bleeding and should be monitored closely.
NEW REC	In patients requiring warfarin, clopidogrel, and aspirin therapy, an INR of 2 to 2.5 is recommended with low dose aspirin (75 to 81 mg) and a 75 mg dose of clopidogrel.

ACC/AHA 2007 STEMI Guidelines Focused Update

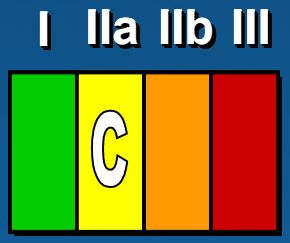
Secondary Prevention and Long Term Management

Antiplatelet agents: NSAIDs



NEW REC

At the time of preparation for hospital discharge, the patient's need for treatment of chronic musculoskeletal discomfort should be assessed and a stepped care approach to pain management should be used for selection of treatments. Pain relief should begin with acetaminophen or aspirin, small doses of narcotics, or non-acetylated salicylates.



NEW REC

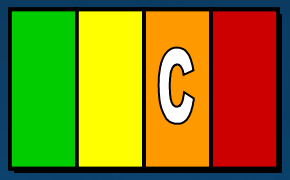
It is reasonable to use non-selective NSAIDs such as naproxen if initial therapy with acetaminophen, small doses of narcotics, or non-acetylated salicylates is insufficient.

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Antiplatelet agents: NSAIDs

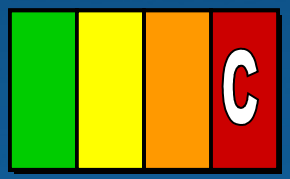
I IIa IIb III



NEW REC

NSAIDs with increasing degrees of relative COX-2 selectivity may be considered for pain relief only for situations where intolerable discomfort persists despite attempts at stepped care therapy with acetaminophen, small doses of narcotics, nonacetylated salicylates, or non-selective NSAIDs. In all cases, the lowest effective doses should be used for the shortest possible time.

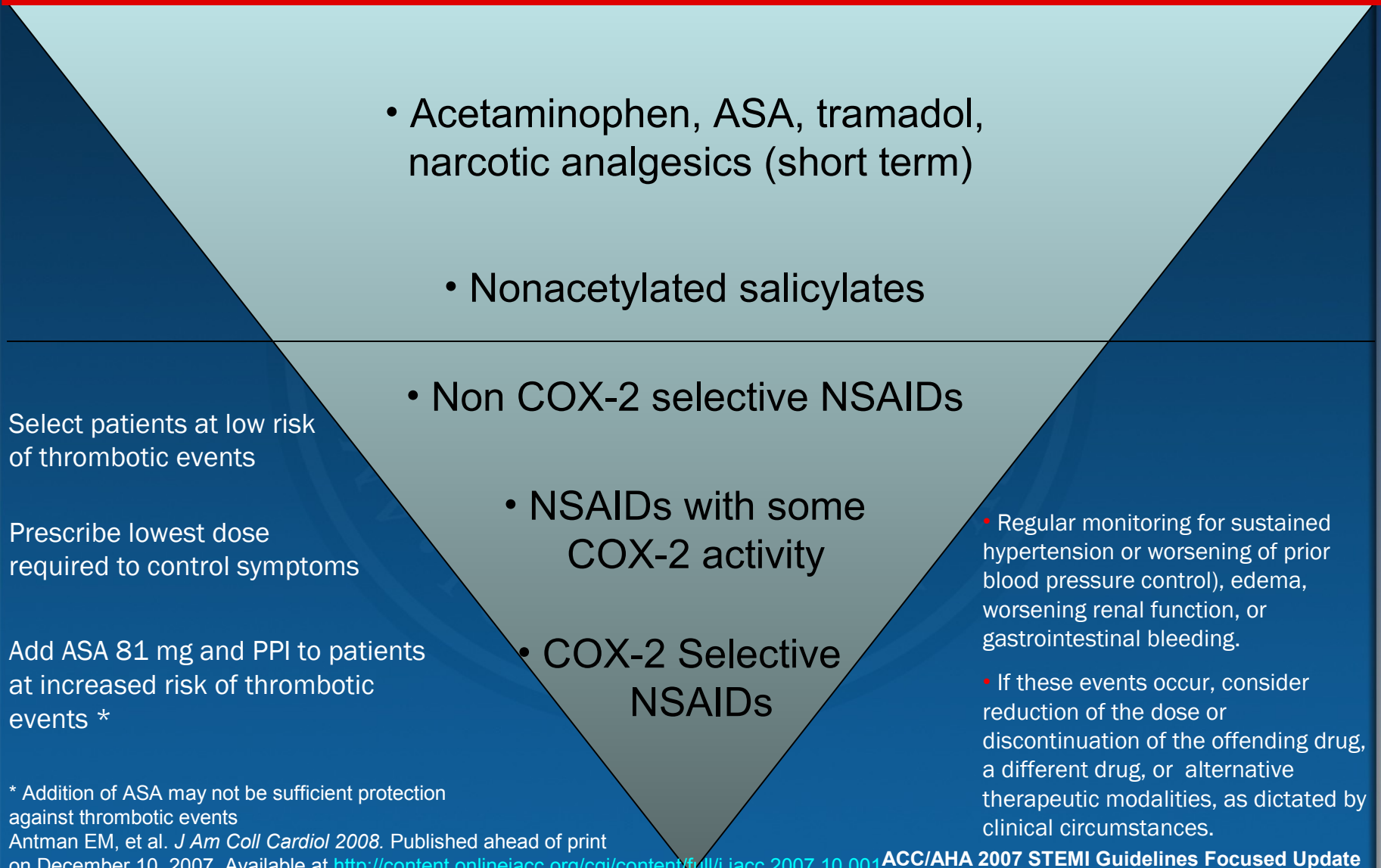
I IIa IIb III



CHANGED TEXT

NSAIDs with increasing degrees of relative COX-2 selectivity should not be administered to STEMI patients with chronic musculoskeletal discomfort when therapy with acetaminophen, small doses of narcotics, non-acetylated salicylates, or non-selective NSAIDs provides acceptable levels of pain relief.

Stepped Care Approach To Pharmacologic Therapy for Musculoskeletal Symptoms with Known Cardiovascular Disease or Risk Factors for Ischemic Heart Disease



Select patients at low risk of thrombotic events

Prescribe lowest dose required to control symptoms

Add ASA 81 mg and PPI to patients at increased risk of thrombotic events *

* Addition of ASA may not be sufficient protection against thrombotic events

Antman EM, et al. *J Am Coll Cardiol 2008.* Published ahead of print on December 10, 2007. Available at http://content.onlinejacc.org/cgi/content/full/j.jacc.2007.10.001.

- Regular monitoring for sustained hypertension or worsening of prior blood pressure control), edema, worsening renal function, or gastrointestinal bleeding.
- If these events occur, consider reduction of the dose or discontinuation of the offending drug, a different drug, or alternative therapeutic modalities, as dictated by clinical circumstances.

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Goals	Class I Recommendations
Renin-Angiotensin-Aldosterone System Blockers: ACE Inhibitors	ACE inhibitors should be started and continued indefinitely in all patients recovering from STEMI with LVEF ≤ 40% and for those with hypertension, diabetes, or chronic kidney disease, unless contraindicated. *CHANGED TEXT*
	ACE inhibitors should be started and continued indefinitely in patients recovering from STEMI who are not lower risk (lower risk defined as those with normal LVEF in whom cardiovascular risk factors are well controlled and revascularization has been performed), unless contraindicated. ***NEW REC***
	Among lower risk patients recovering from STEMI (i.e., those with normal LVEF in whom cardiovascular risk factors are well controlled and revascularization has been performed) use of ACE inhibitors is reasonable. *(Class IIa; LOE: B)* ***NEW REC***

ACC/AHA 2007 STEMI Guidelines Focused Update

Secondary Prevention and Long Term Management

Goals	Class I Recommendations
Renin-Angiotensin-Aldosterone System Blockers: ARBs	Use of ARBs is recommended in patients who are intolerant of ACE inhibitors and have HF or have had a STEMI with LVEF ≤ 40%. *CHANGED TEXT*
	NEW REC It is beneficial to use ARB therapy in other patients who are ACE-inhibitor intolerant and have hypertension.
	NEW REC Considering use in combination with ACE inhibitors in systolic dysfunction HF may be reasonable.

Secondary Prevention and Long Term Management

Goals	Class I Recommendations
Renin-Angiotensin-Aldosterone System Blockers: Aldosterone Blockade *CHANGED TEXT*	Use of aldosterone blockade in post-STEMI 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 ≤ 40% and have either diabetes or HF.

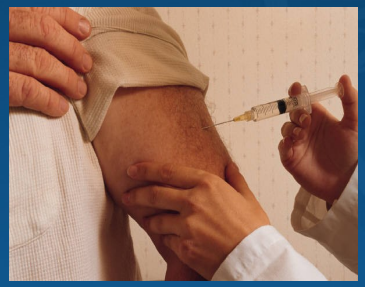
Secondary Prevention and Long Term Management

Goals	Class I Recommendations
Beta-Blockers	It is beneficial to start and continue beta-blocker therapy indefinitely in all patients who have had MI, acute coronary syndrome, or left ventricular dysfunction with or without HF symptoms, unless contraindicated.

CHANGED TEXT

Secondary Prevention and Long Term Management

Goals	Class I Recommendations
Influenza Vaccination	Patients with cardiovascular disease should have an annual influenza vaccination.



NEW REC