The new ESC Guidelines in STEMI

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Potential conflicts of interest

• AstraZeneca Pharmaceuticals	Research grant/consultant, Ad board
• Daiichi Sankyo Company	Research grant/consultant,
• Eli Lilly and Company	Research grant/consultant. Ad board
• Sanofi-Aventis	Honoraria. Ad board
• The Medicines Company	Honoraria
• BMS	Research grant/consultant
• Merck	Honoraria/consultant
• Medtronic	Research grant/consultant, Ad board
• Boston Scientific	Research grant/consultant
• Cordis	Honoraria/consultant
• Terumo Inc	Research grant/consultant

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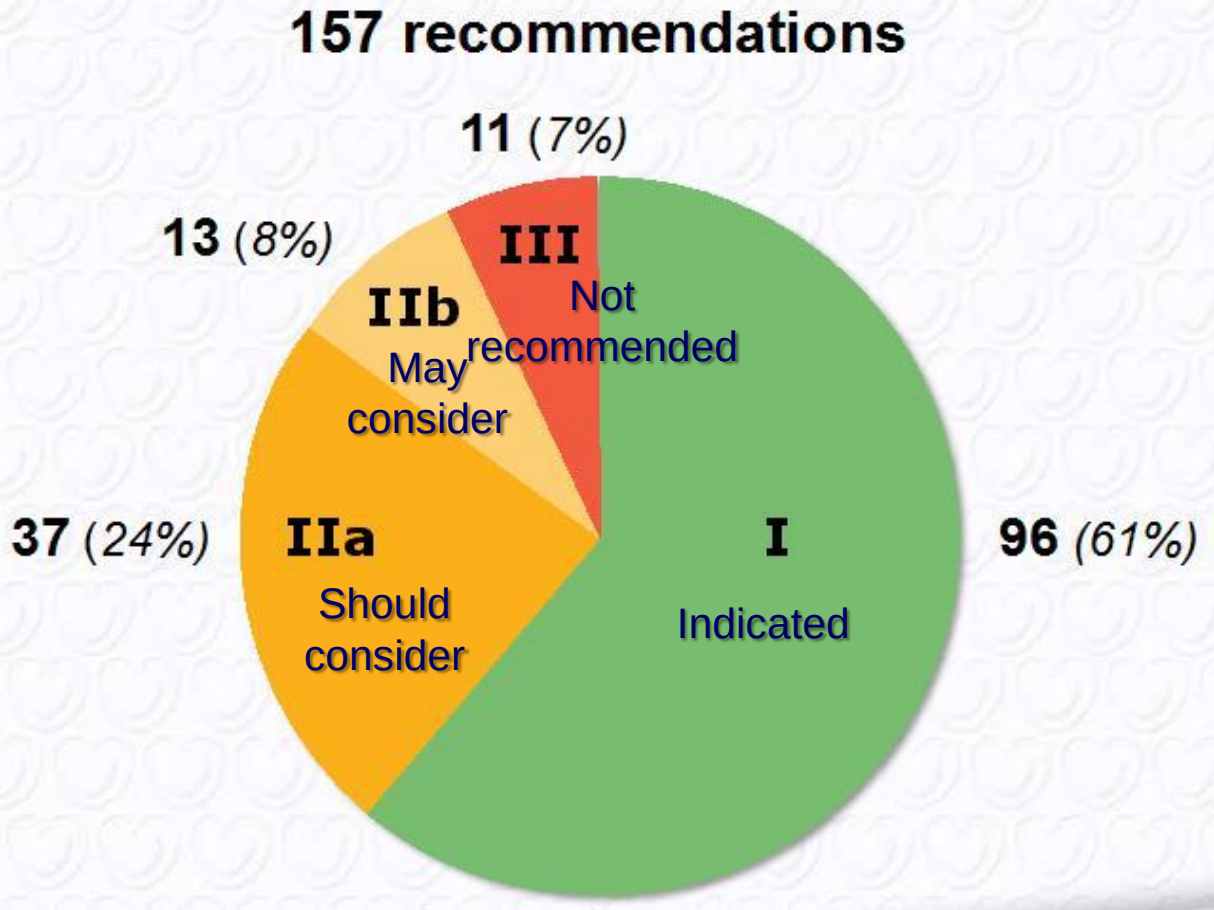
Classes of recommendation



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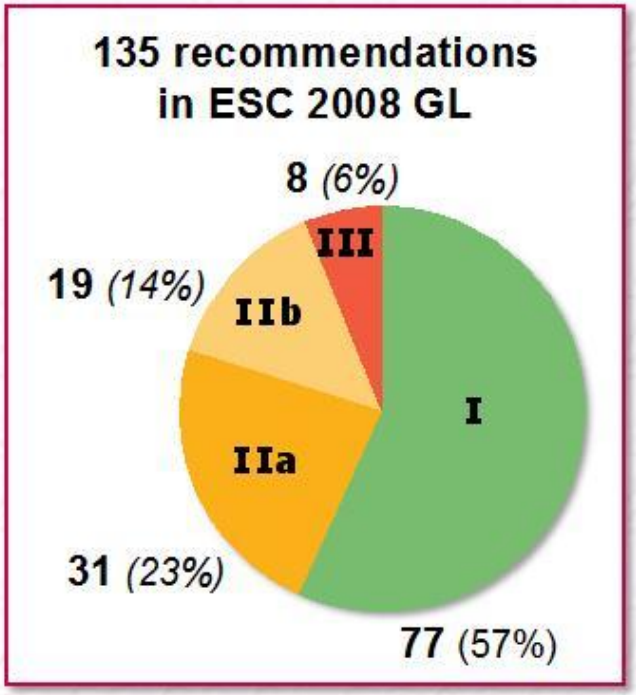
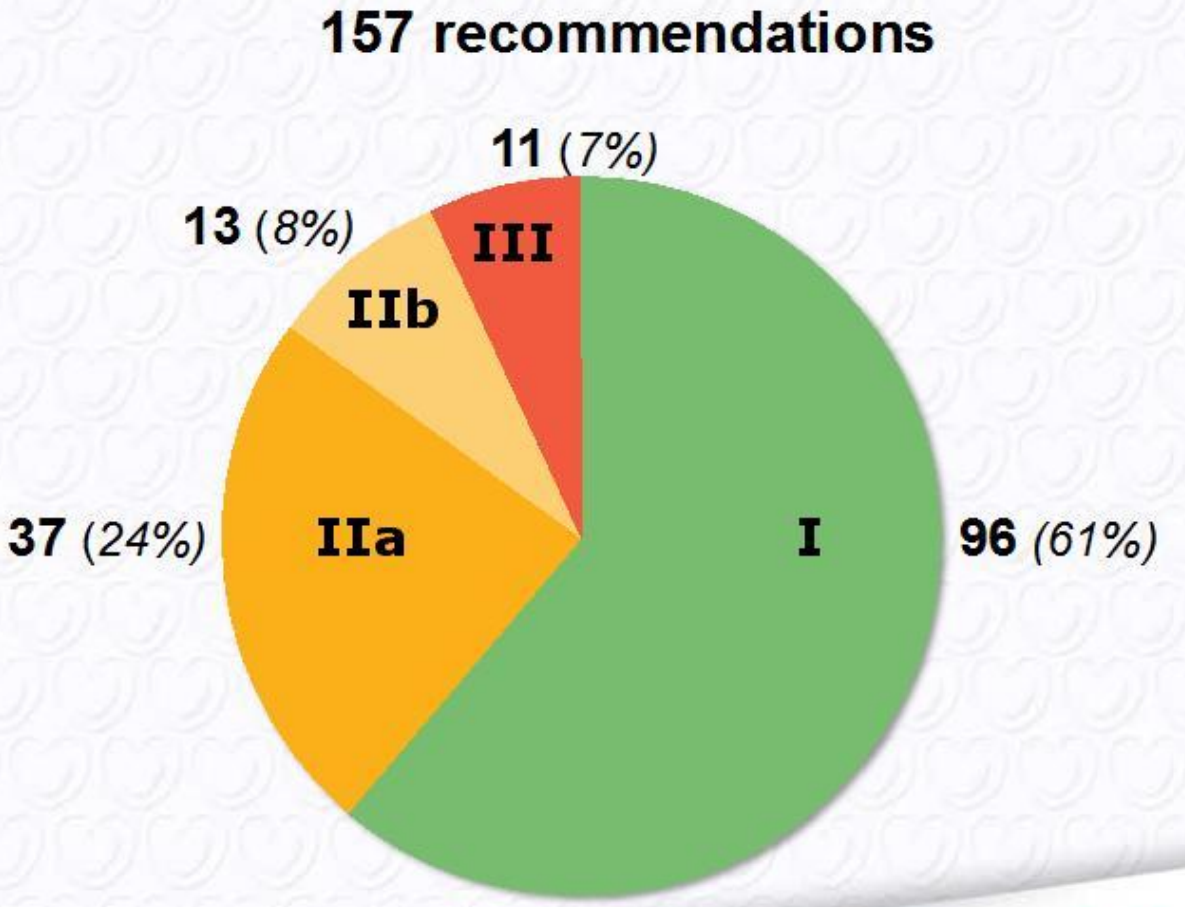
Classes of recommendation





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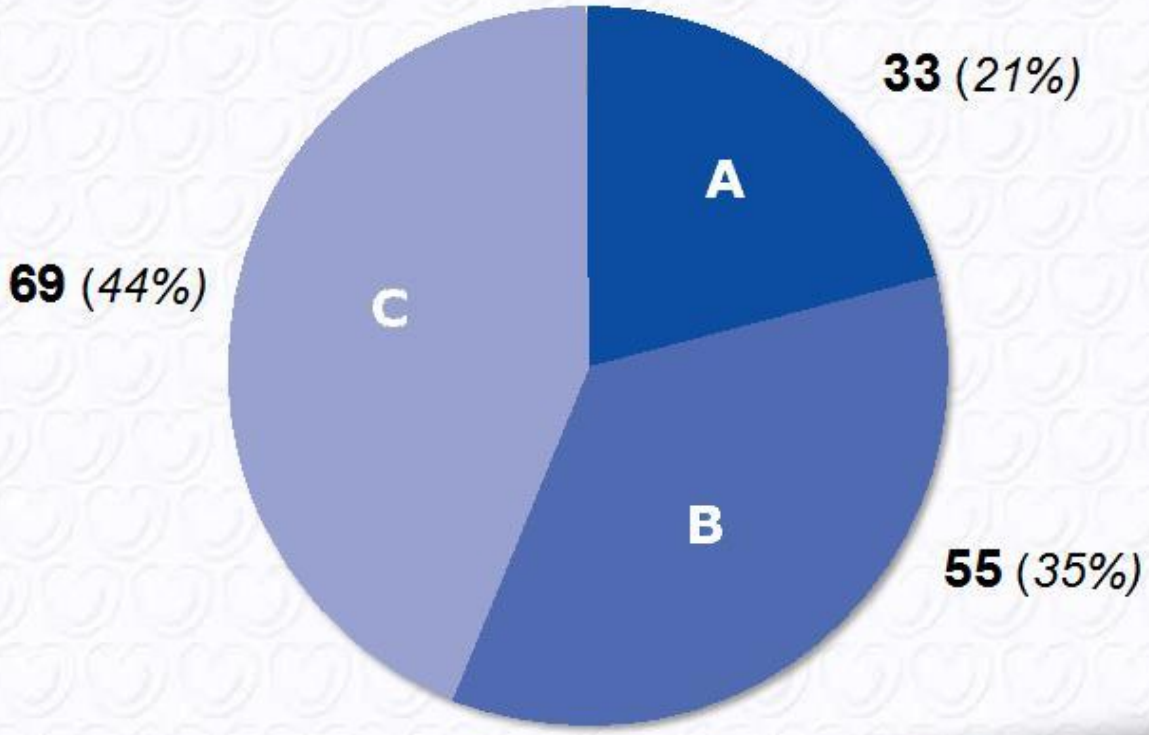
Levels of evidence

157 recommendations based on 346 references



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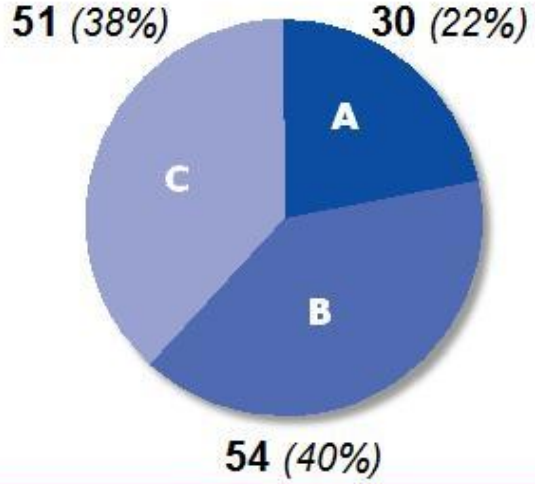
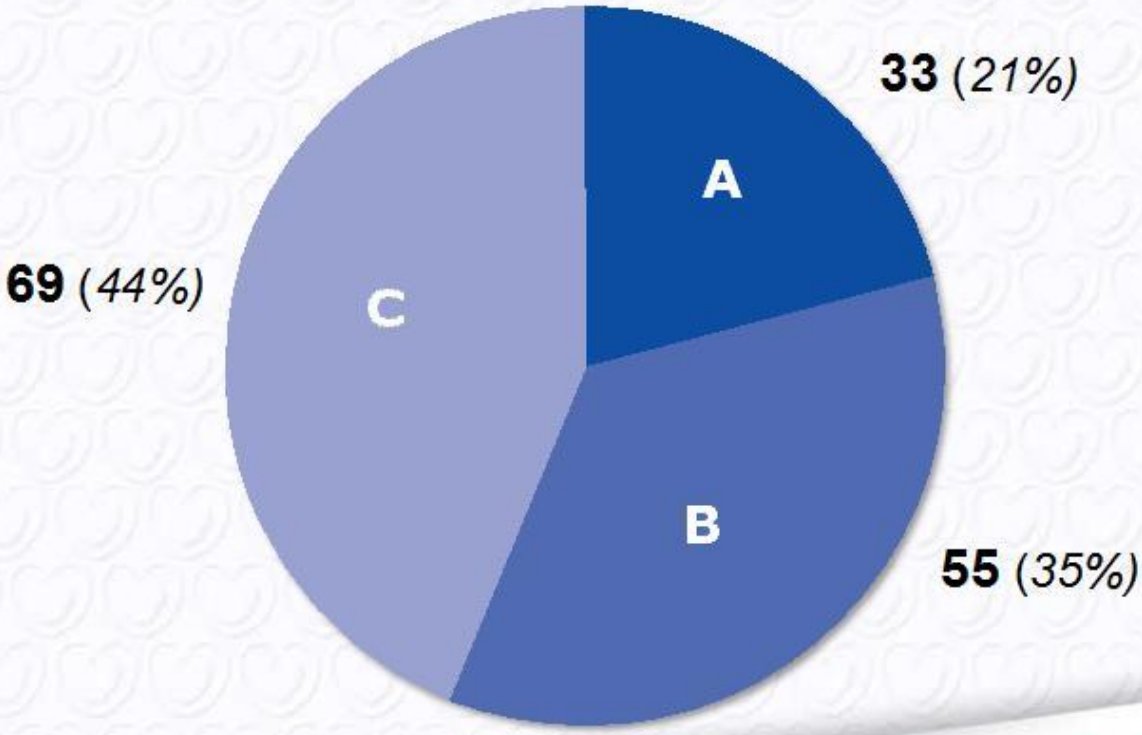
Levels of evidence

157 recommendations based on 346 references

ESC 2008 GL
135 recommendations based on 257 references





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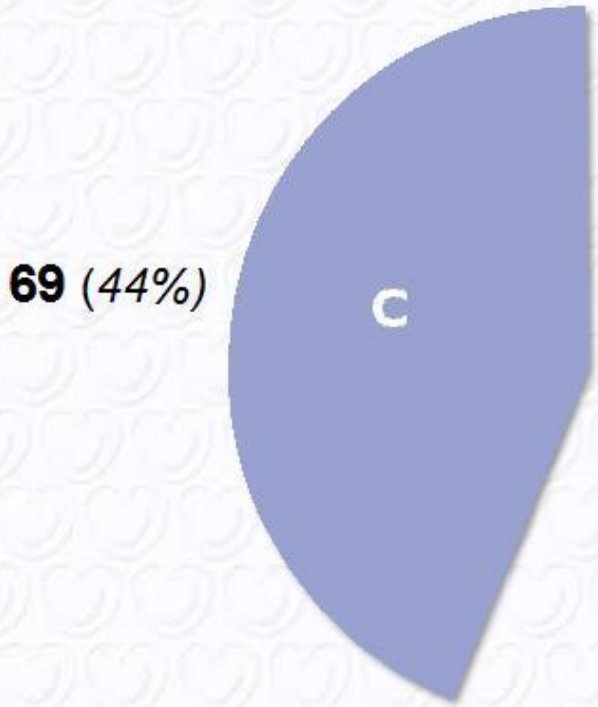
Levels of evidence

Remaining need for research



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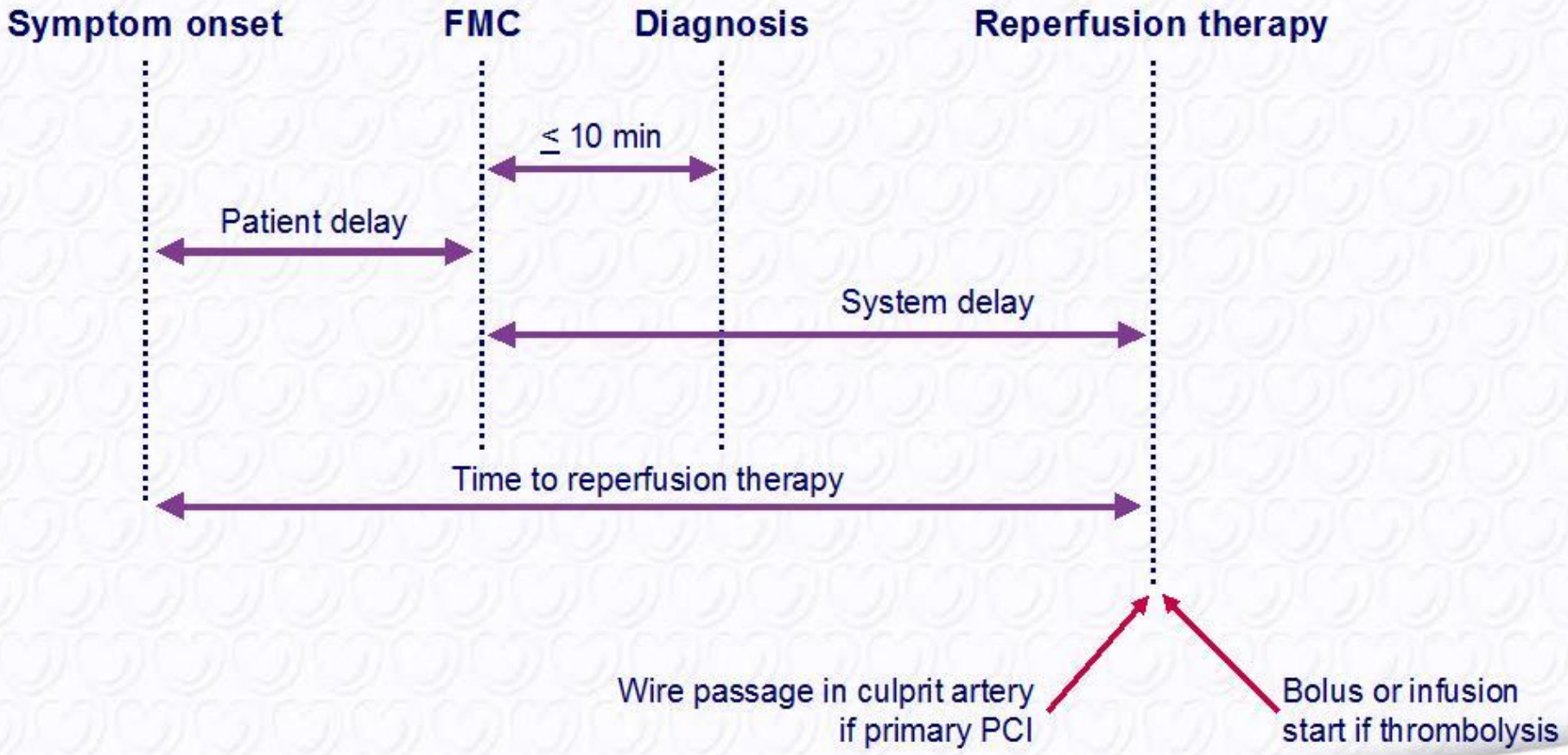
Components of delay in STEMI and ideal time intervals for intervention



All delays are related to FMC (first medical contact)

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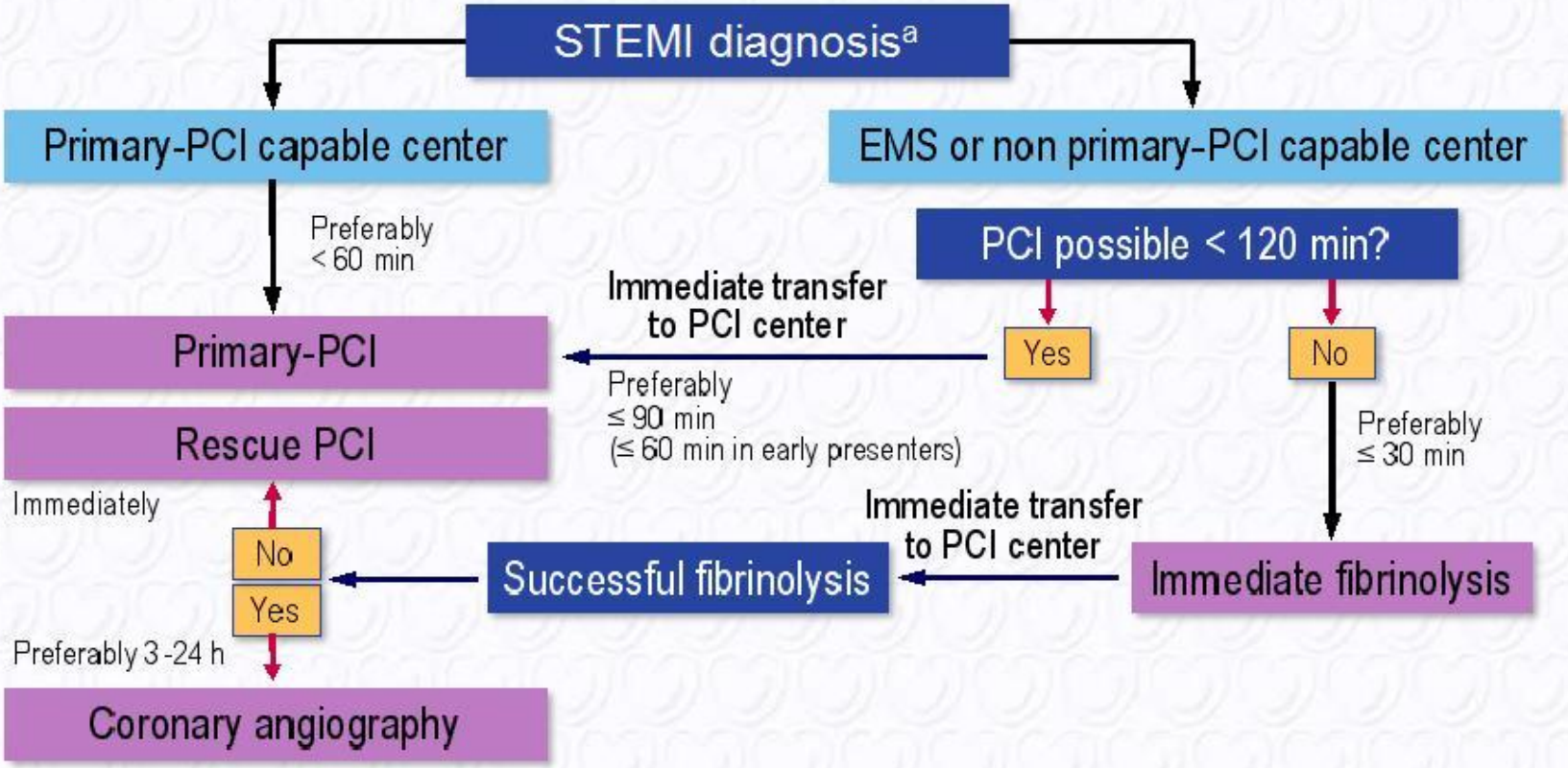
Prehospital and in-hospital management, and reperfusion strategies within 24 h of FMC



[a] The time point the diagnosis is confirmed with patient history and ECG ideally within 10 min from the first medical contact (FMC). All delays are related to FMC (first medical contact).

Cath = catheterization laboratory; EMS = emergency medical system; FMC = first medical contact; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction.

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Logistics of pre-hospital care

Recommendations	Class[a]	Level[b]
Ambulance teams must be trained and equipped to identify STEMI (with use of ECG recorders and telemetry as necessary) and administer initial therapy, including thrombolysis where applicable.	I	B
The prehospital management of STEMI patients must be based on regional networks designed to deliver reperfusion therapy expeditiously and effectively, with efforts made to make primary PCI available to as many patients as possible.	I	B
Primary PCI-capable centres must deliver a 24/7 service and be able to start primary PCI as soon as possible but always within 60 min from the initial call.	I	B

ECG = electrocardiogram; EMS = emergency medical system; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction.

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Reperfusion therapy

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

ECG = electrocardiogram; i.v. = intravenous; LBBB = left bundle branch block; PCI = percutaneous coronary intervention.

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Cardiac arrest

Recommendations	Class	Level
All medical and paramedical personnel caring for a patient with suspected myocardial infarction must have access to defibrillation equipment and be trained in cardiac life support.	I	C
It is recommended to initiate ECG monitoring at the point of FMC in all patients with suspected myocardial infarction.	I	C
Therapeutic hypothermia is indicated early after resuscitation of cardiac arrest patients who are comatose or in deep sedation.	I	B
Immediate angiography with a view to primary PCI is recommended in patients with resuscitated cardiac arrest whose ECG shows STEMI.	I	B
Immediate angiography with a view to primary PCI should be considered in survivors of cardiac arrest without diagnostic ECG ST-segment elevation but with a high suspicion of ongoing infarction.	IIa	B

ECG = electrocardiogram; FMC = first medical contacts; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction.

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Procedural aspects of primary PCI

Procedural aspects of primary PCI		
Stenting is recommended (over balloon angioplasty alone) for primary PCI.	I	A
Primary PCI should be limited to the culprit vessel with the exception of cardiogenic shock and persistent ischaemia after PCI of the supposed culprit lesion.	IIa	B
If performed by an experienced radial operator, radial access should be preferred over femoral access.	IIa	B
If the patient has no contraindications to prolonged DAPT (indication for oral anticoagulation, or estimated high long-term bleeding risk) and is likely to be compliant, DES should be preferred over BMS.	IIa	A
Routine thrombus aspiration should be considered.	IIa	B
Routine use of distal protection devices is not recommended.	III	C
Routine use of IABP (in patients without shock) is not recommended.	III	A

BMS = bare-metal stent; DAPT = dual antiplatelet therapy; DES = drug-eluting stent; IABP = intra-aortic balloon pump

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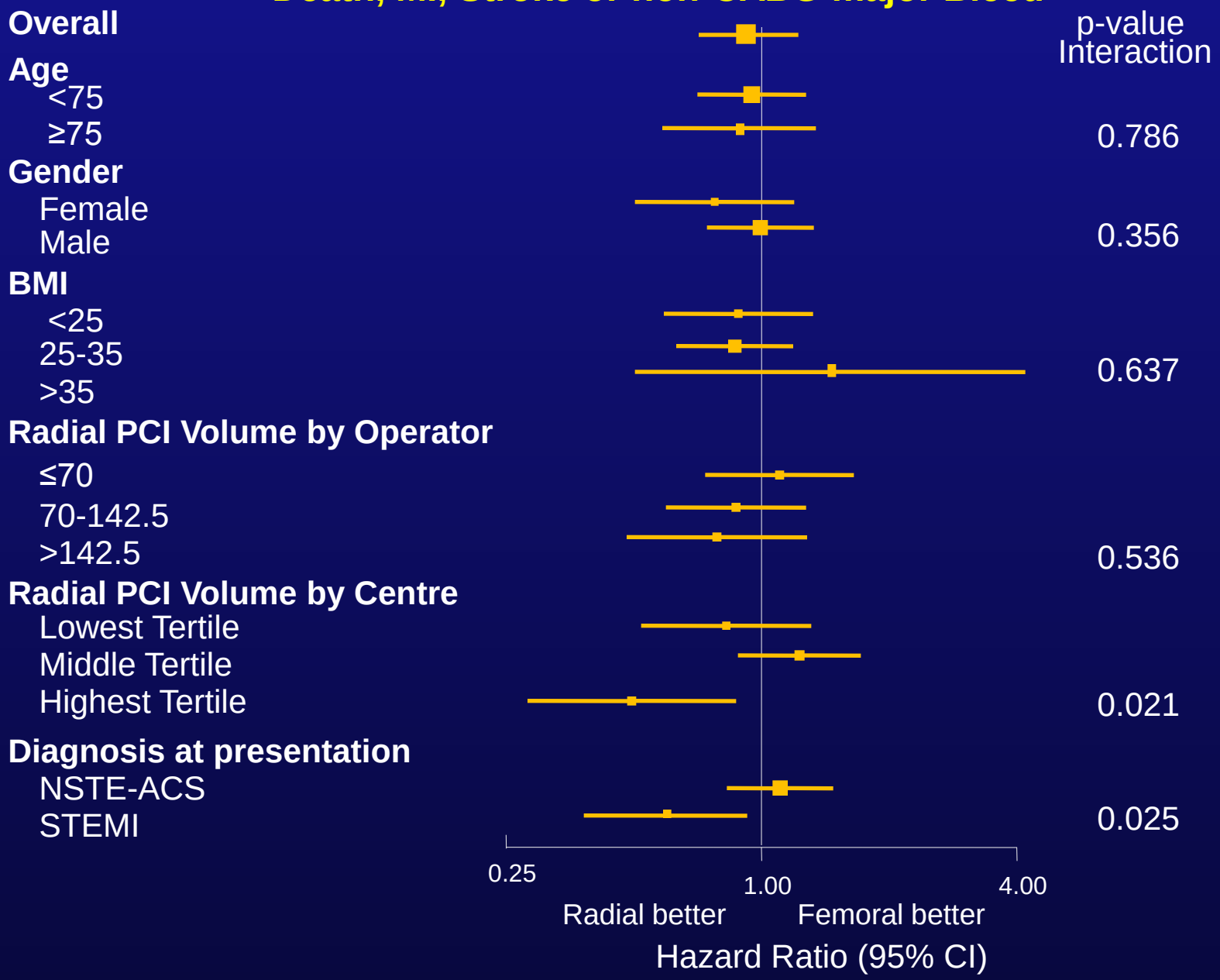
RIVAL

Subgroups: Primary Outcome

Death, MI, Stroke or non-CABG major Bleed



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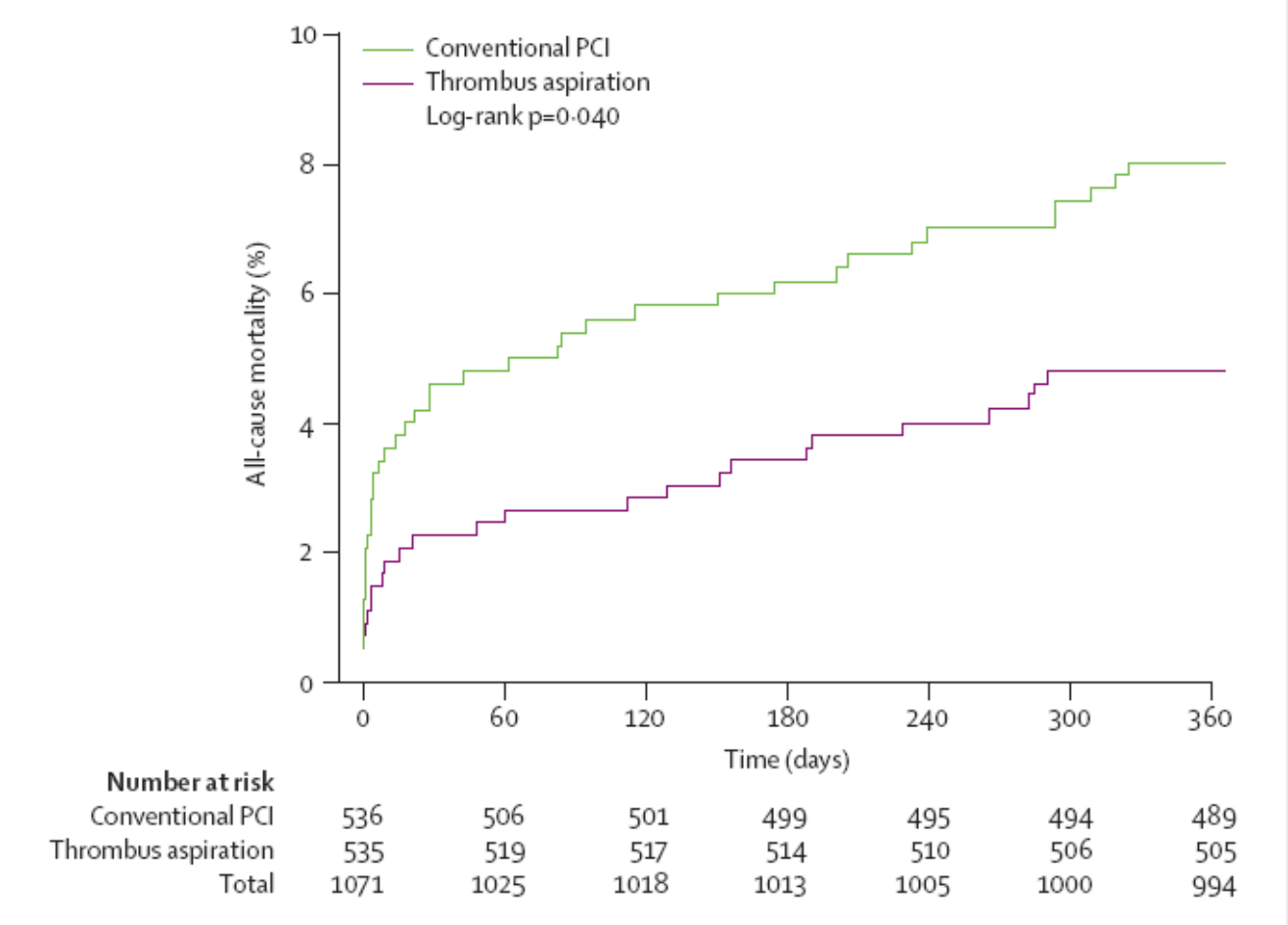
TAPAS, total mortality at 1 year

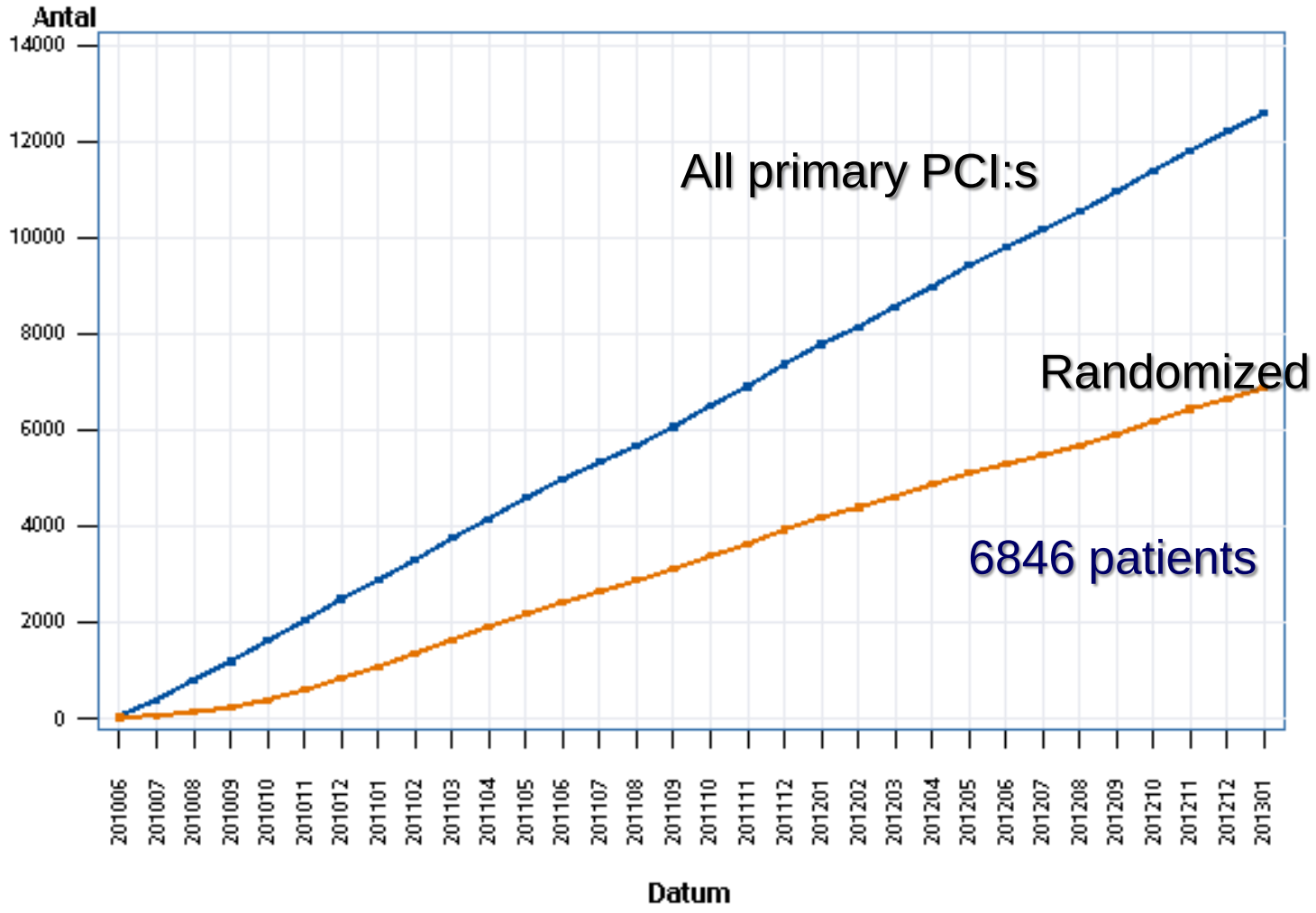


Vlaar, P.J. et al. NEJM 2008, 371: 1915

TASTE

SCAAR
SWEDE HEART

spiration in ST-Elevation myocardial infarction in S



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Periprocedural anti thrombotic medication in primary PCI

Recommendations	Class[a]	Level[b]
Antiplatelet therapy		
Aspirin oral or i.v. (if unable to swallow) is recommended	I	B
An ADP-receptor blocker is recommended in addition to aspirin. Options are:	I	A
• Prasugrel in clopidogrel-naive patients, if no history of prior stroke/TIA, age <75 years.	I	B
• Ticagrelor.	I	B
• Clopidogrel, preferably when prasugrel or ticagrelor are either not available or contraindicated.	I	C

ADP = adenosine diphosphate;

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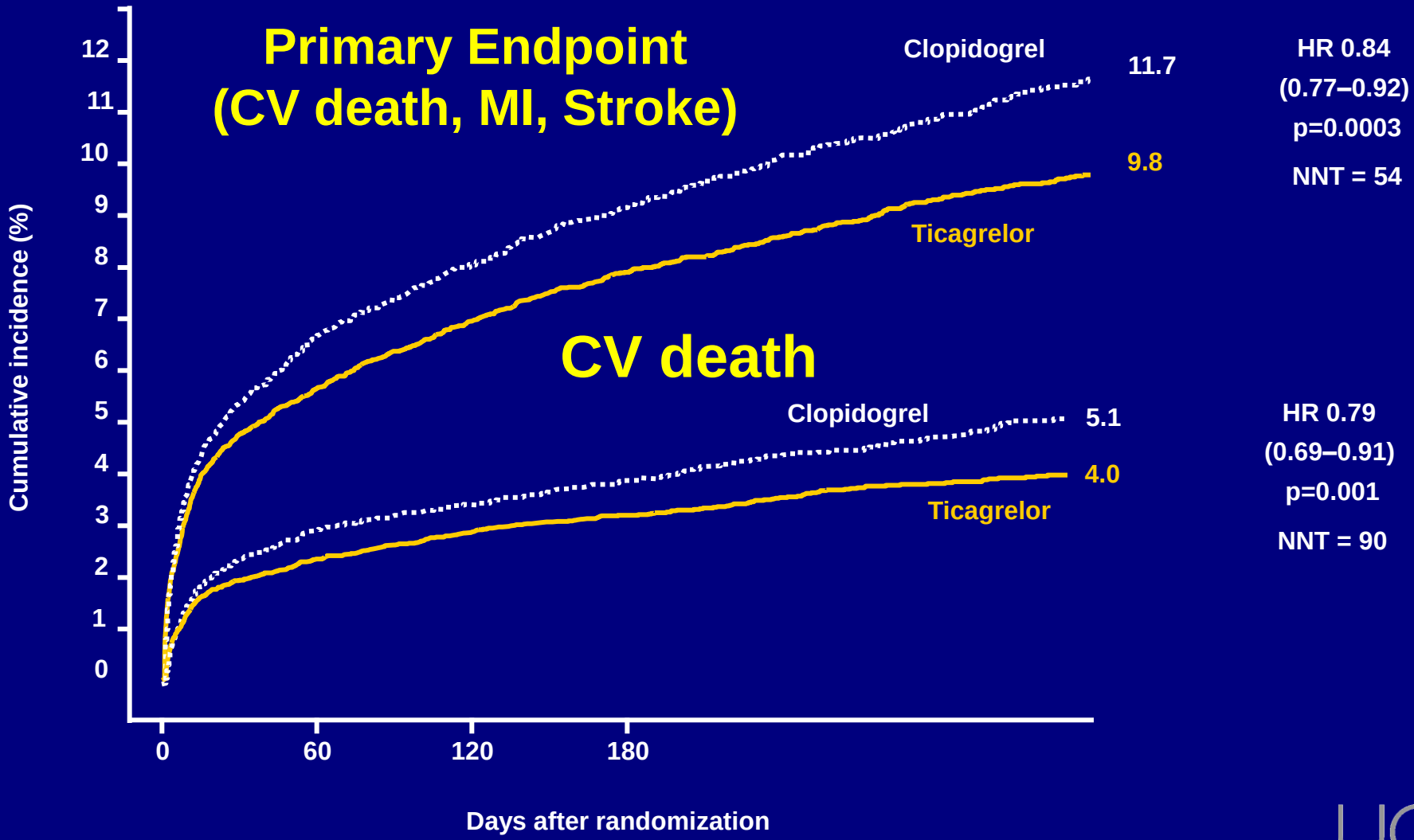
PLATO

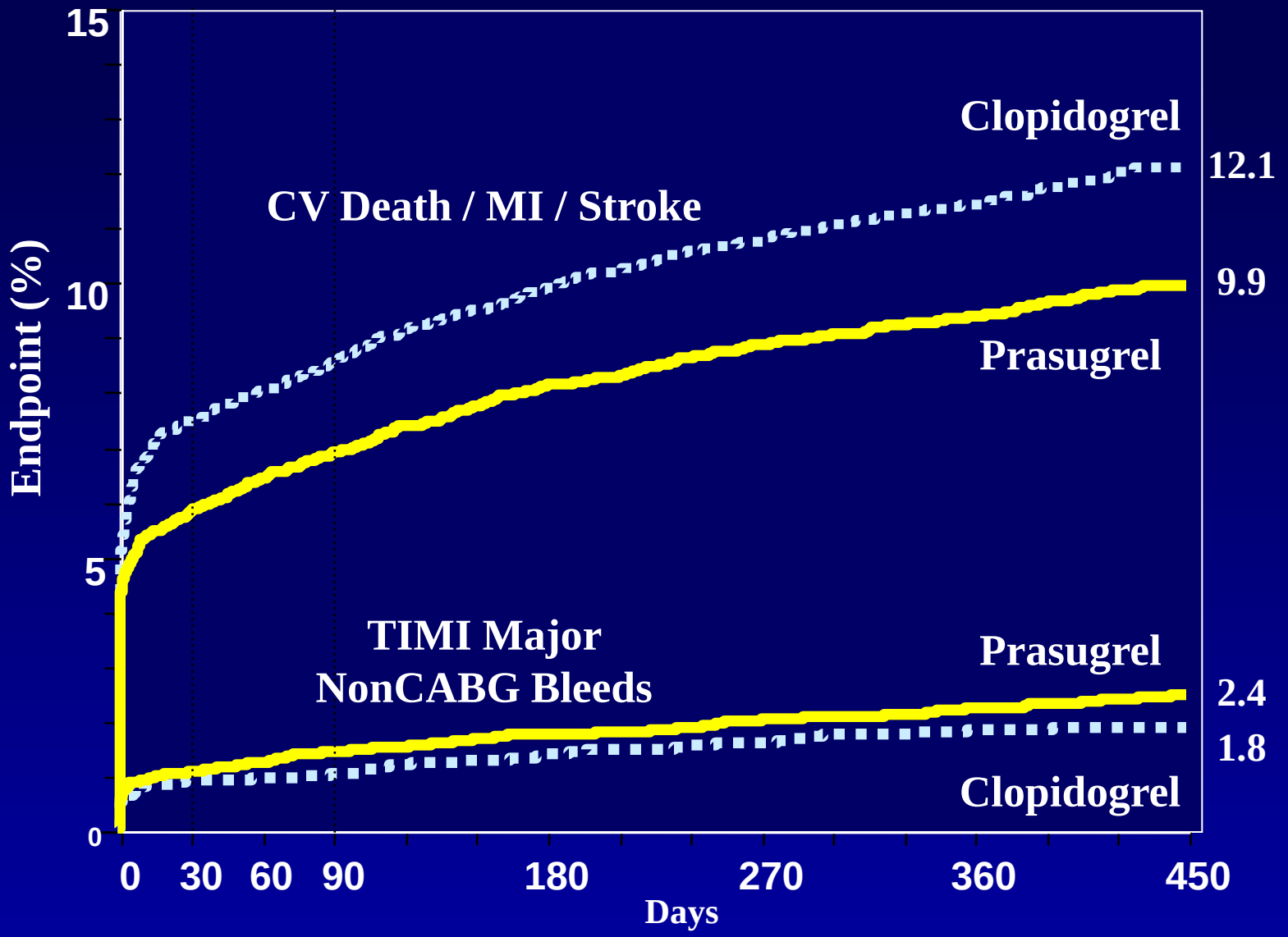
N=18,624



Wallentin L, et al. *N Engl J Med.* 2009;361:1045-57.

TRÎTON TIMI·38

Balance of Efficacy and Safety



↓ 138 events

HR 0.81
(0.73-0.90)
P=0.0004

NNT = 46

↑ 35 events

HR 1.32
(1.03-1.68)
P=0.03

NNH = 167

Periprocedural anti thrombotic medication in primary PCI, con't

GP IIb/IIIa inhibitors should be considered for bailout therapy if there is angiographic evidence of massive thrombus, slow or no-reflow or a thrombotic complication.	IIa	C
Routine use of a GP IIb/IIIa inhibitor as an adjunct to primary PCI performed with unfractionated heparin may be considered in patients without contraindications.	IIb	B
Upstream use of a GP IIb/IIIa inhibitor (vs. in-lab use) may be considered in high-risk patients undergoing transfer for primary PCI.	IIb	B
Options for GP IIb/IIIa inhibitors are (with LoE for each agent):		
• Abciximab		A
• Eptifibatide (with double bolus)		B
• Tirofiban (with a high bolus dose)		B

GP = glycoprotein; i.v. = intravenous; lab = catheterization laboratory

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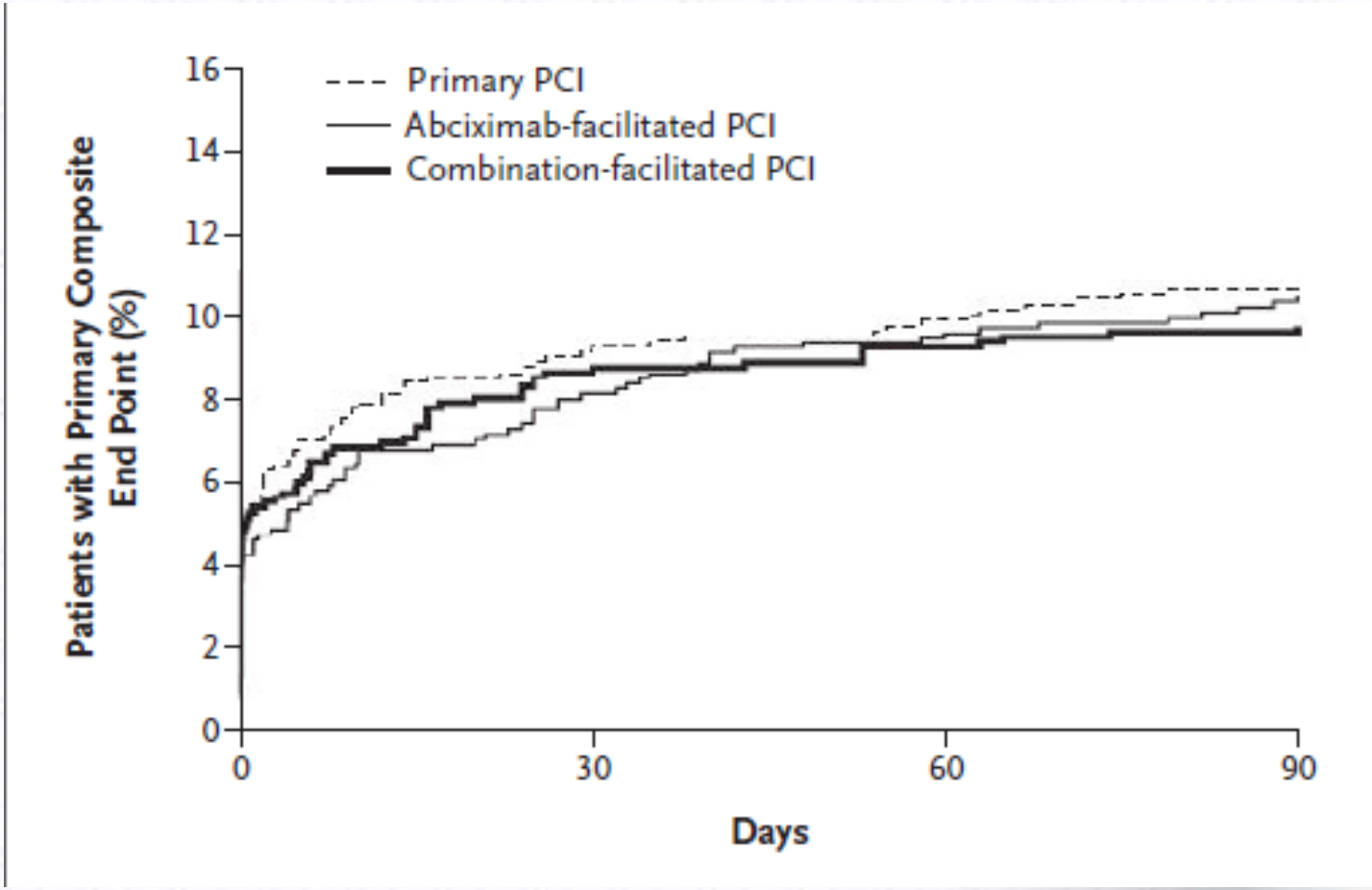
FINESSE



Ellis et a NEJM 2008

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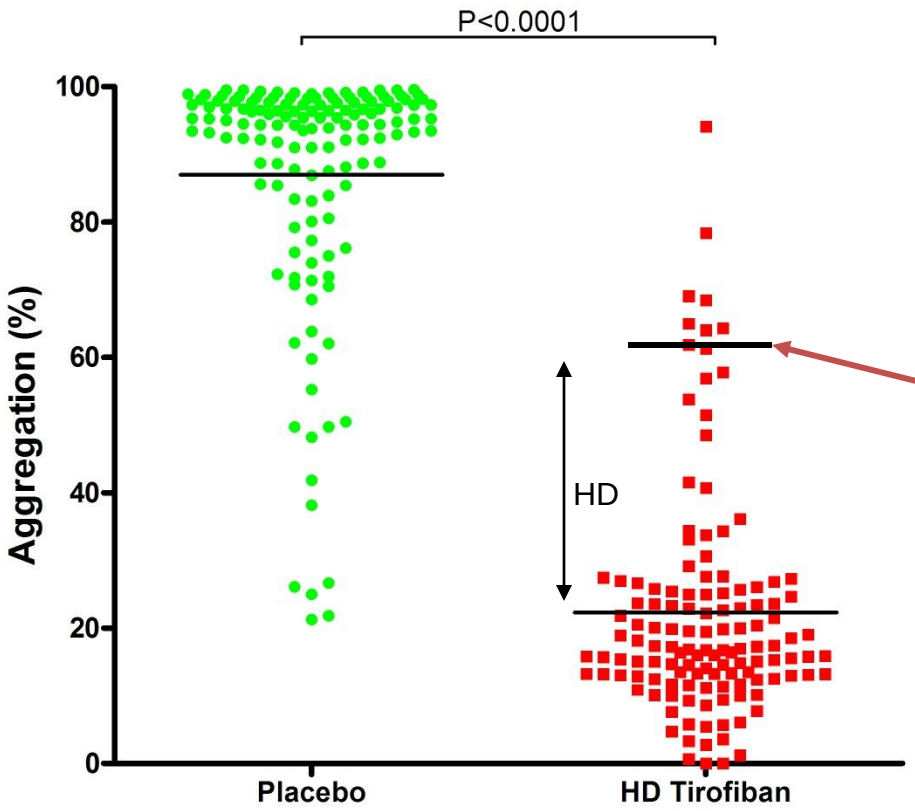
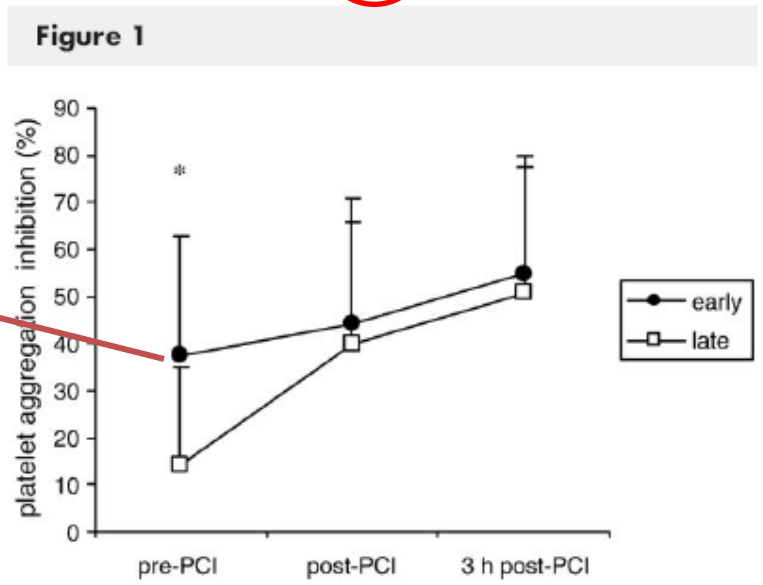
Platelet Aggregation results

OnTIME-2 HD tirofiban



R. Hermanides et al. Heart 2010

OnTIME-1 LD tirofiban



Platelet microaggregation inhibition before, immediately after, and 3 hours after PCI in patients receiving tirofiban before the first pre-PCI sample (early group) and in patients receiving tirofiban after the first pre-PCI sample (late group). The difference between the level of platelet microaggregation inhibition in patients receiving tirofiban (early group) or placebo (late group) was significant (*$P < .001$).

Periprocedural anti thrombotic medication in primary PCI, con't

Anticoagulants		
An injectable anticoagulant must be used in primary PCI.	I	C
Bivalirudin (with use of GP IIb/IIIa blocker restricted to bailout) is recommended over unfractionated heparin and a GP IIb/IIIa blocker.	I	B
Enoxaparin (with or without routine GP IIb/IIIa blocker) may be preferred over unfractionated heparin.	IIb	B
Unfractionated heparin with or without routine GP IIb/IIIa blocker must be used in patients not receiving bivalirudin or enoxaparin.	I	C
Fondaparinux is not recommended for primary PCI.	III	B
The use of fibrinolysis before planned primary PCI is not recommended.	III	A

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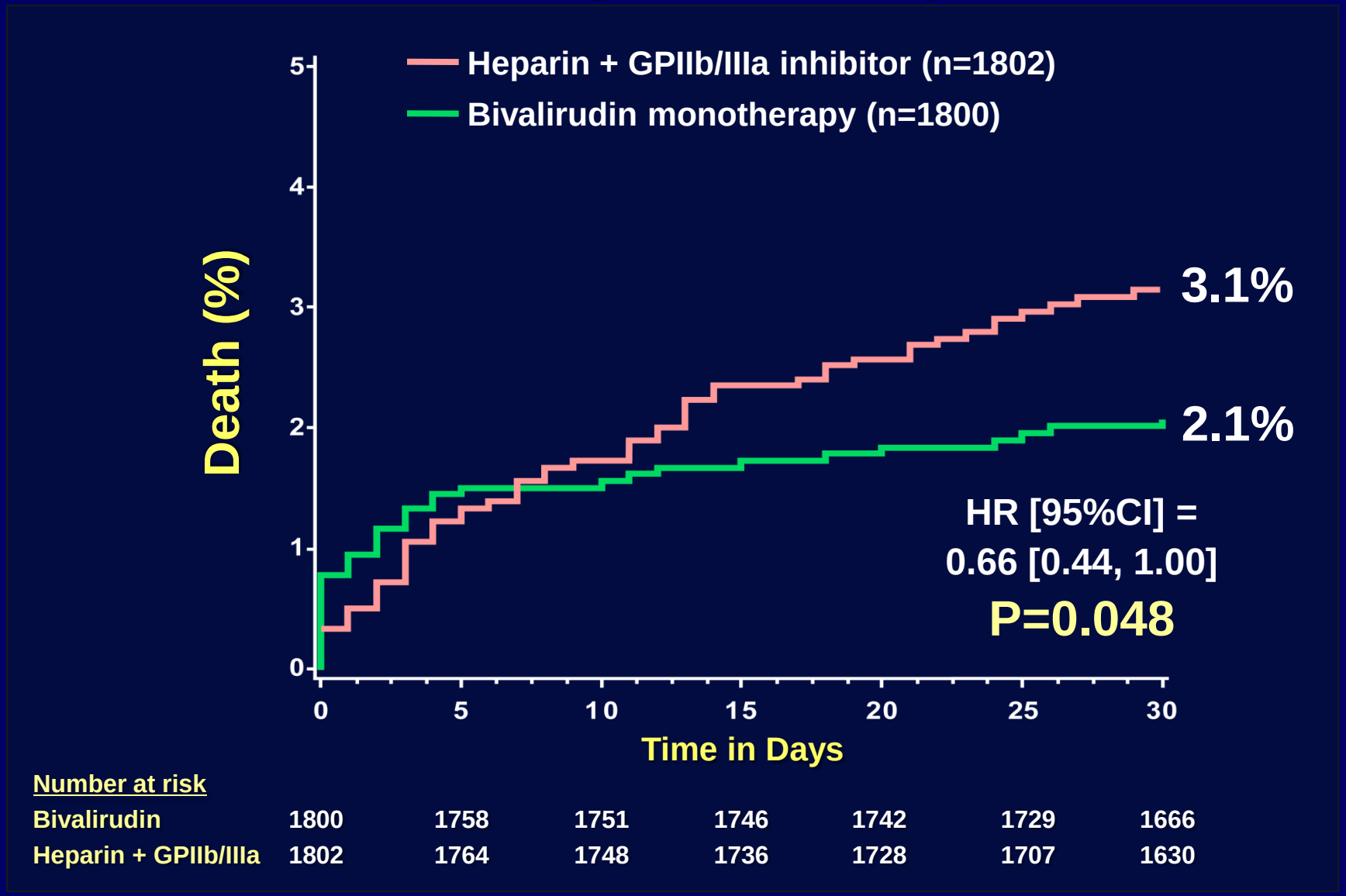
30 Day Mortality



Number at risk							
Bivalirudin	1800	1758	1751	1746	1742	1729	1666
Heparin + GPIIb/IIIa	1802	1764	1748	1736	1728	1707	1630

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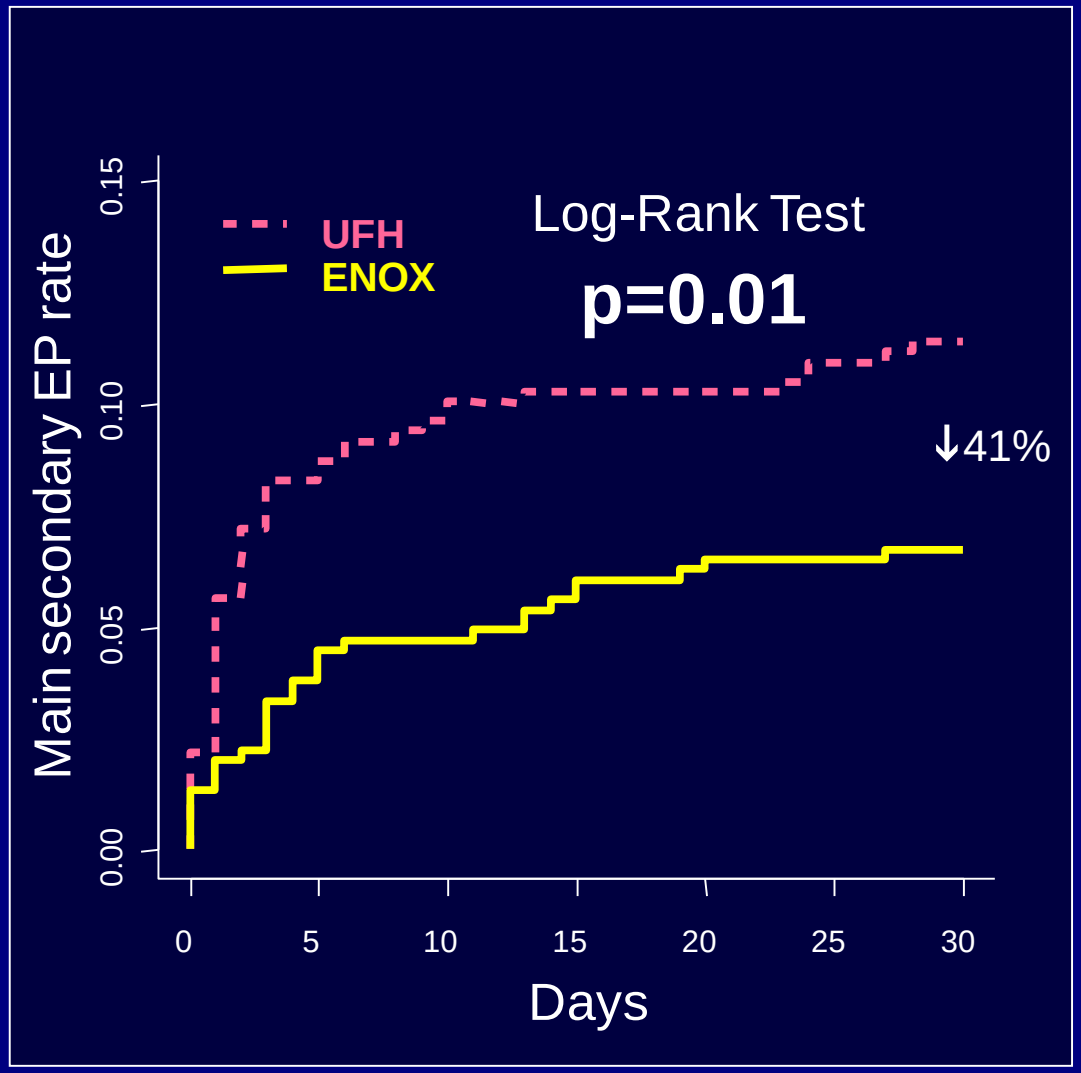
Main Secondary Endpoint (ischemic)

Death, Recurrent ACS or Urgent Revascularization



30d rate (%)

11.3%

6.7%

Routine therapies in the acute, subacute and long term phase of STEMI

Recommendations	Class[a]	Level[b]
DAPT with aspirin and an oral ADP receptor antagonist must be continued for up to 12 months after STEMI, with a strict minimum of:	I	C
• 1 month for patients receiving BMS	I	C
• 6 months for patients receiving DES	IIb	B
In patients with left ventricular thrombus, anticoagulation should be instituted for a minimum of 3 months.	IIa	B
In patients with a clear indication for oral anticoagulation (e.g. atrial fibrillation with CHA_2DS_2-VASc Score ≥2 or mechanical valve prosthesis), oral anticoagulation must be implemented in addition to antiplatelet therapy.	I	C
If patients require triple antithrombotic therapy, combining DAPT and OAC, e.g. because of stent placement and an obligatory indication for OAC, the duration of dual antiplatelet therapy should be minimized to reduce bleeding risk.	I	C

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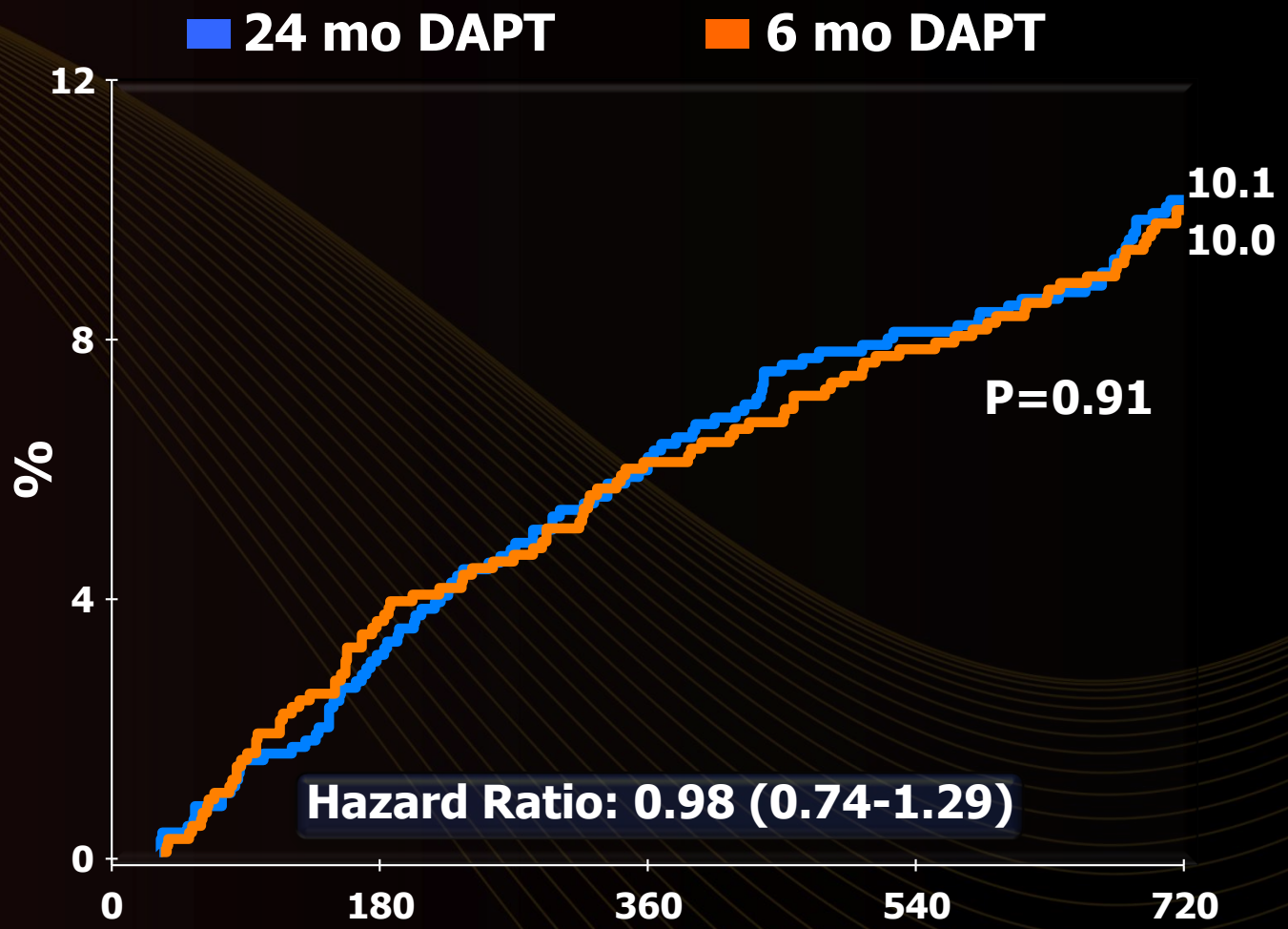
Primary Endpoint

Overall Death, MI or CVA

CEC adjudicated



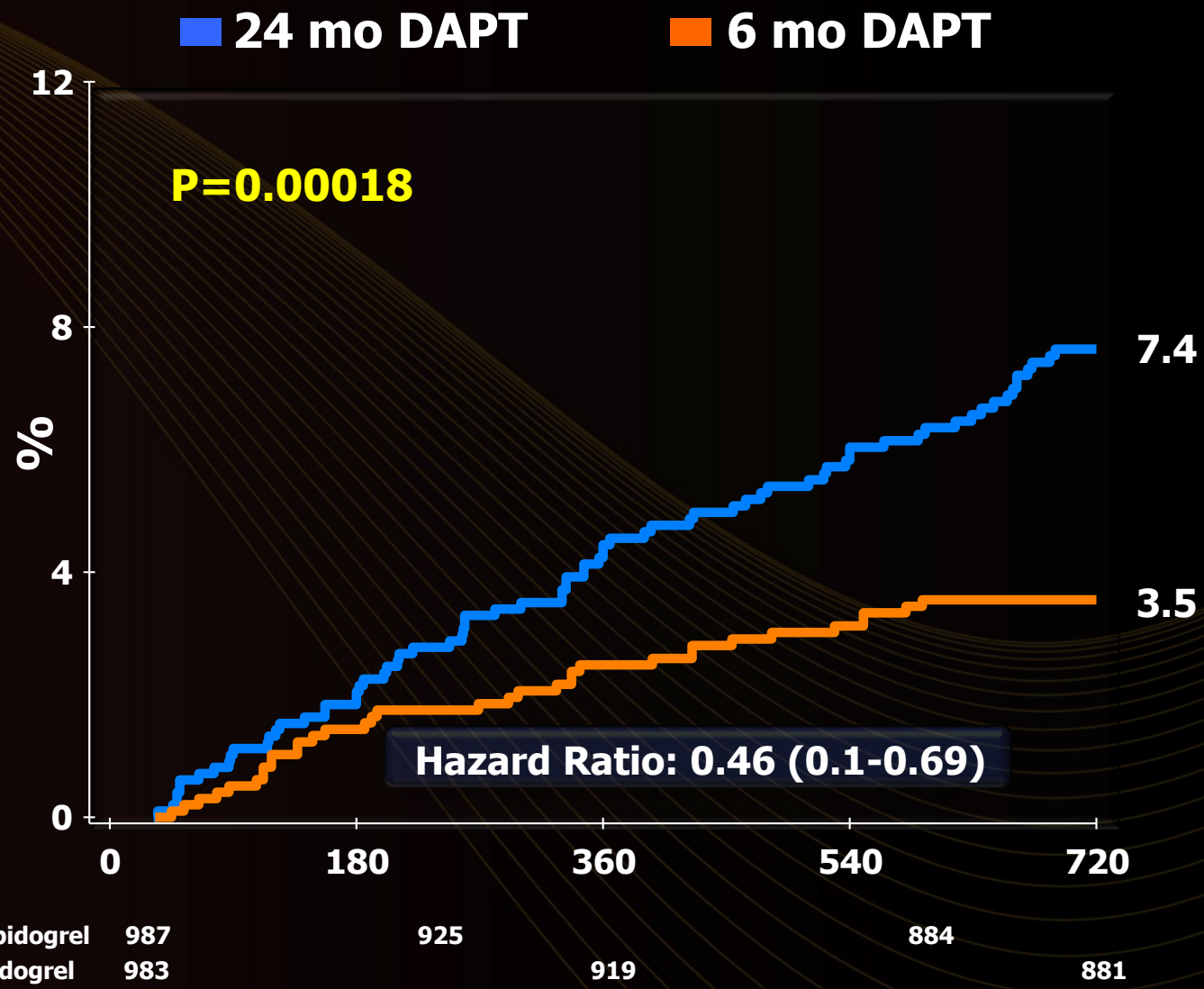
No. at Risk				
24-Month Clopidogrel	987	925	884	
6-Month Clopidogrel	983	919		881

PRODIGY

Key Safety Endpoint

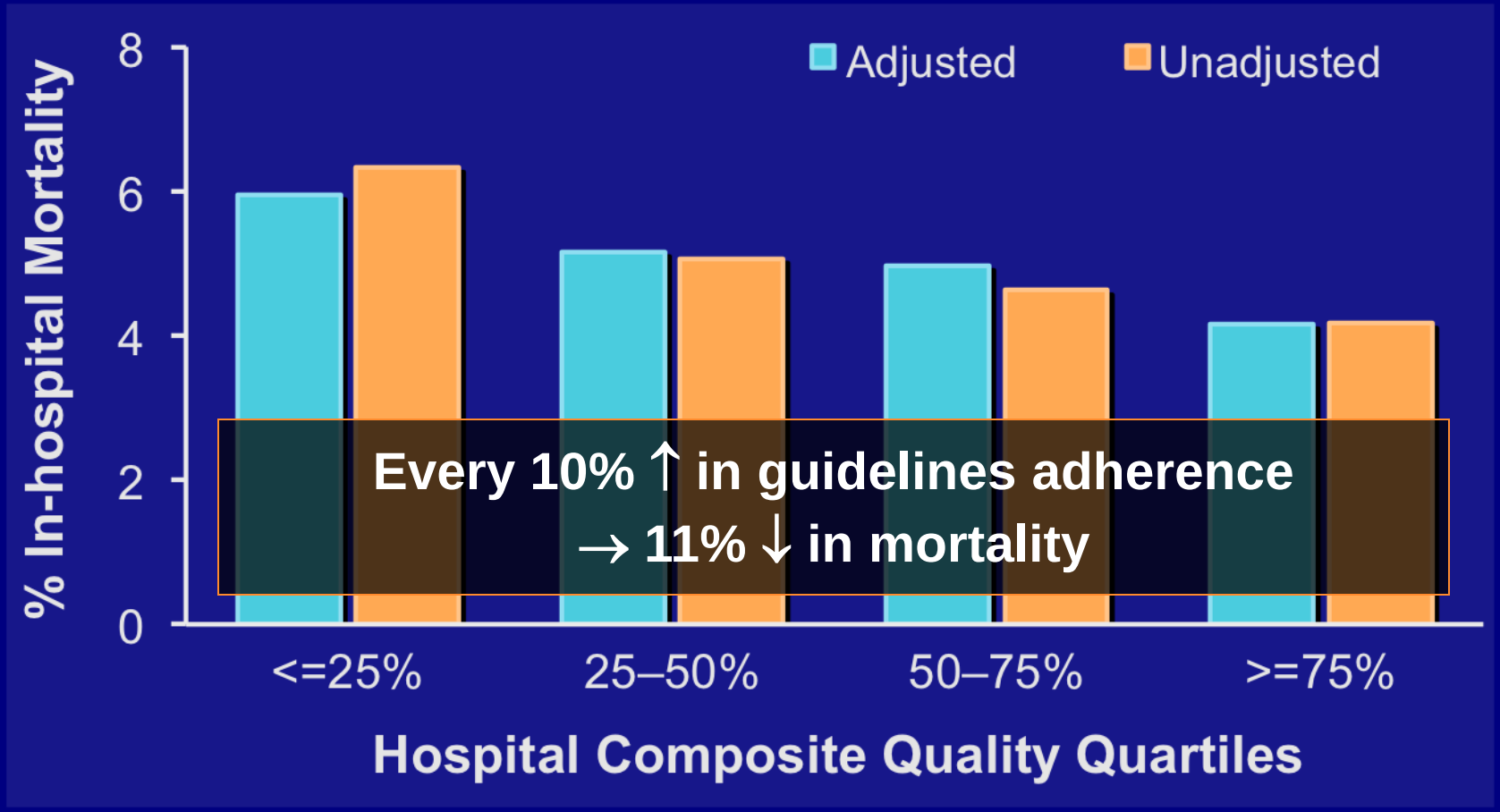
Type II, III or V BARC bleeding

CEC adjudicated



PRODIGY

Link Between Overall ACC/AHA Guidelines Adherence and Mortality



Peterson et al, ACC 2004

Conclusion

The STEMI guidelines aim to guide towards evidenced based therapies

Review them critically

Consider updating your local protocols and personal preferences

Adherence to guidelines improves outcomes

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