STEMI Guidelines and Research

James G. Jollis, MD, FACC

President, North Carolina Chapter of the
American College of Cardiology

Disclosure

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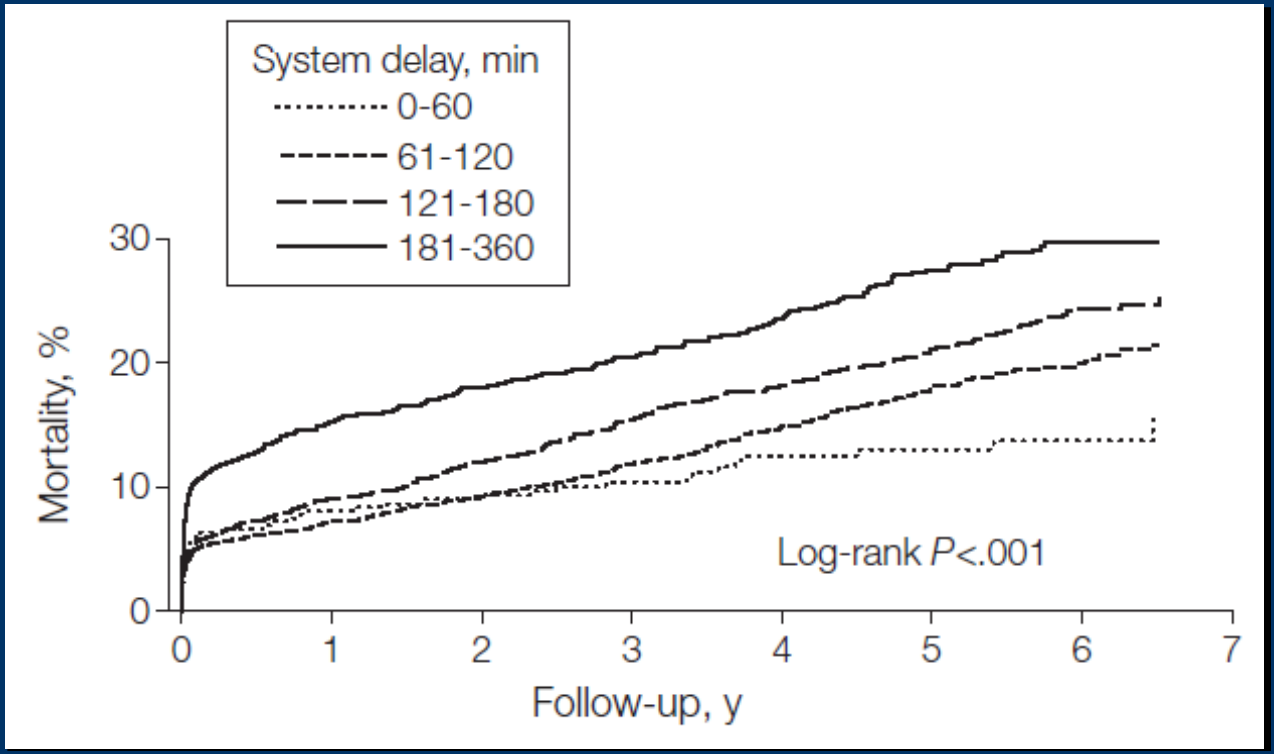
"I'll be happy to give you innovative thinking. What are the guidelines?"

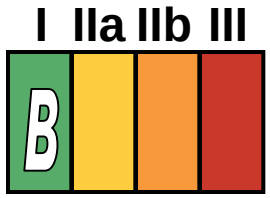
System Delay (First Medical Contact to Wire) and Long-Term Mortality



Each hour of delay associated with 10% ↑ risk of death

Terkelsen JAMA. 2010;304(7):763-771

PCI in Specific Clinical Situations: STEMI–Primary PCI of the Infarct Artery



Primary PCI should be performed in patients with STEMI presenting to a hospital with PCI capability

within 90 minutes of first medical contact

as a systems goal.

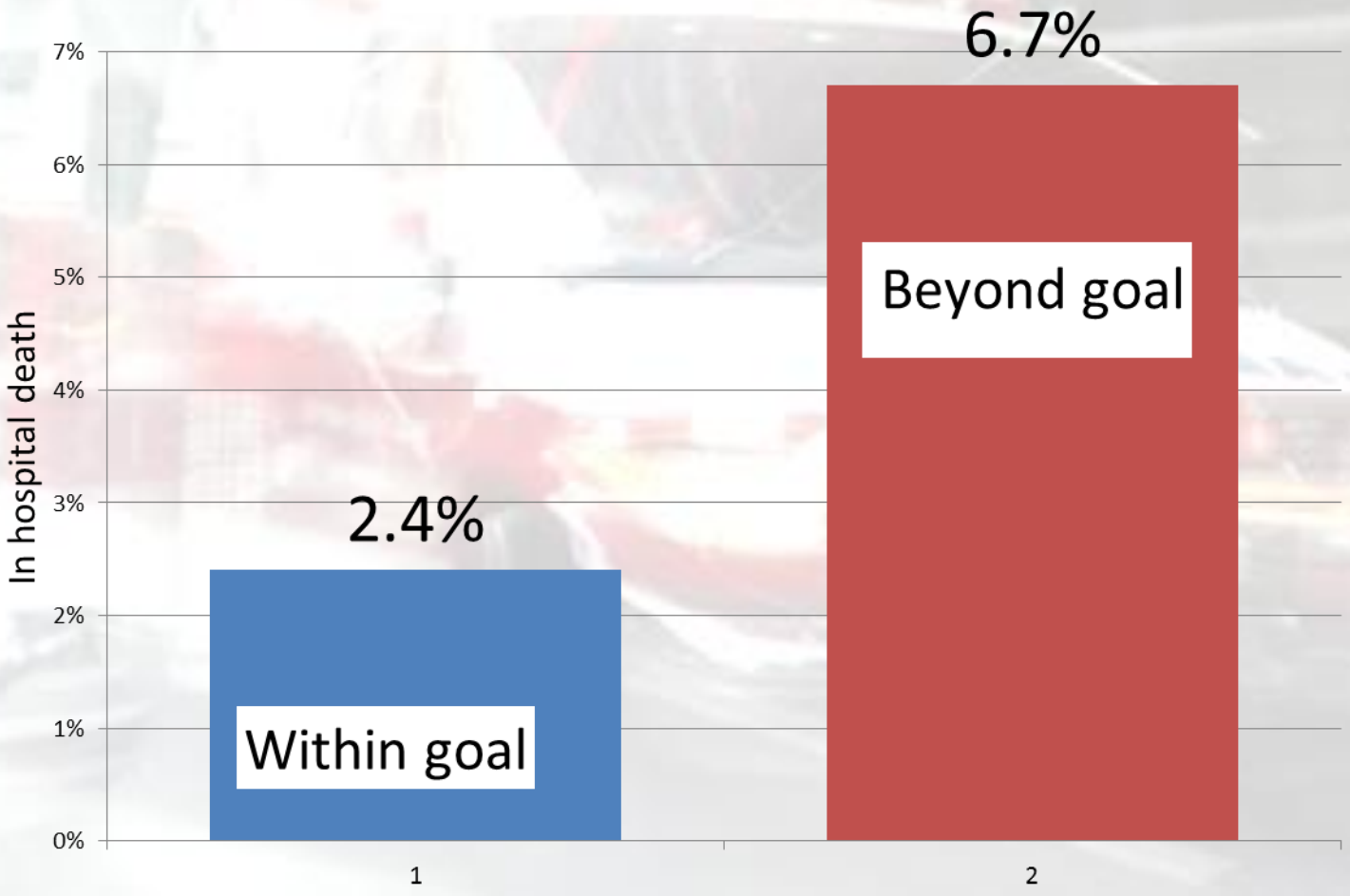
Primary PCI should be performed in patients with STEMI presenting to a hospital without PCI capability

within 120 minutes of first medical contact

as a systems goal.

American Heart Association.

Death by guideline goal



NC RACE, *Circulation.2012;126:189–195.*

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.

European Heart Journal 2012 - doi:10.1093/eurheartj/ehs215

Logistics of pre-hospital care, con't

All hospitals and EMSs participating in the care of patients with STEMI must record and monitor delay times and work to achieve and maintain the following quality targets:
• first medical contact to first ECG ≤10 min;
• first medical contact to reperfusion therapy:
  • for fibrinolysis ≤30 min;
  • for primary PCI ≤90 min (≤60 min if the patient presents within 120 min of symptom onset or directly to a PCI-capable hospital).
	I	B

All EMSs, emergency departments, and coronary care units must have a written updated STEMI management protocol, preferably shared within geographic networks.	I	C
Patients presenting to a non-PCI-capable hospital and awaiting transportation for primary or rescue PCI must be attended in an appropriately monitored area.	I	C
Patients transferred to a PCI-capable centre for primary PCI should bypass the emergency department and be transferred directly to the catheterization laboratory.	IIa	B

European Heart Journal 2012 - doi:10.1093/eurheartj/ehs215

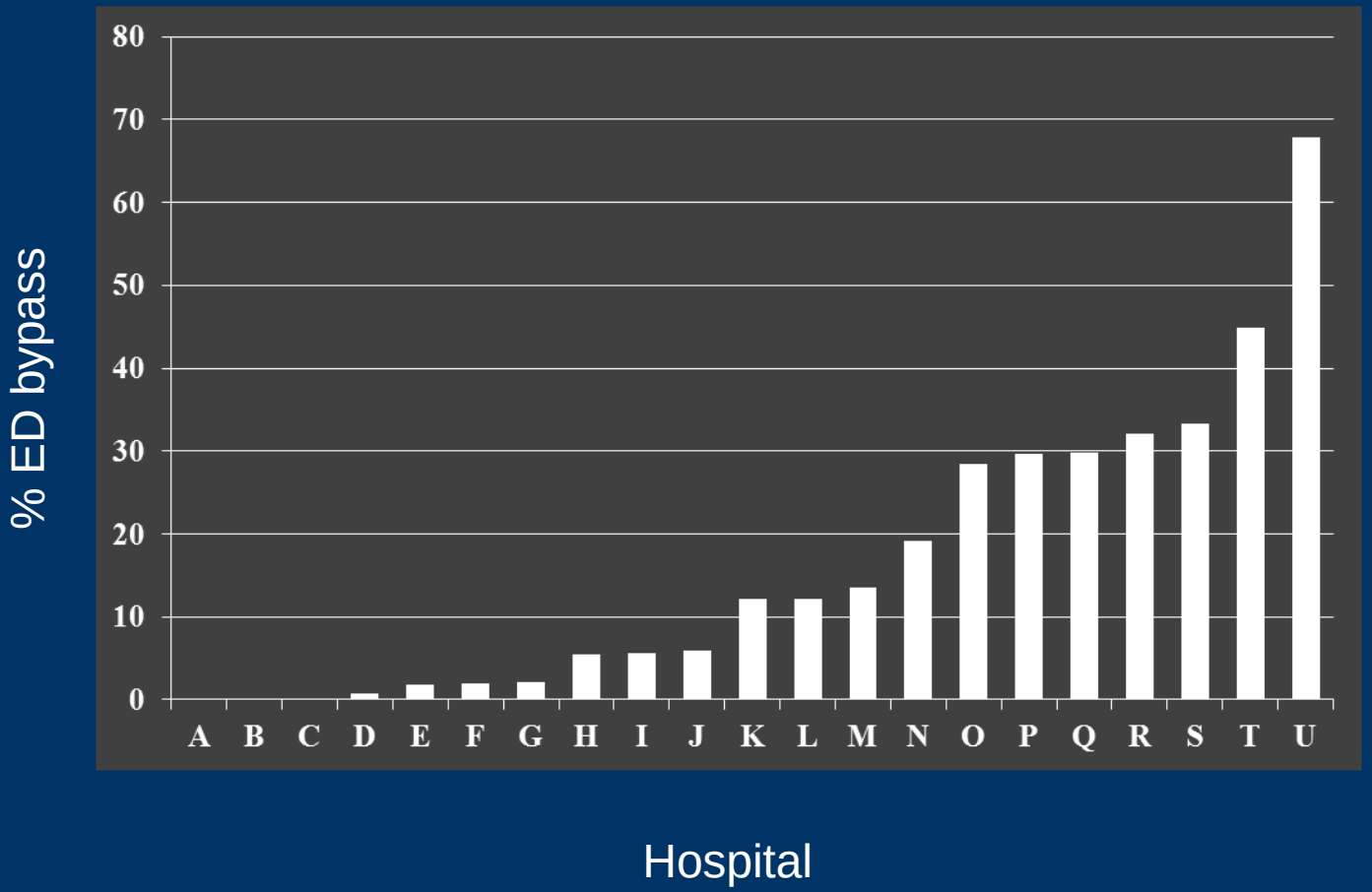
Important delays and treatment goals in the management of acute STEMI

Delay	Target
Preferred for FMC to ECG and diagnosis	≤**10 min**
Preferred for FMC to fibrinolysis ('FMC to needle')	≤**30 min**
Preferred for FMC to primary PCI ('door to balloon') in primary PCI hospitals	≤**60 min**
Preferred for FMC to primary PCI	≤**90 min** (≤60 min if early presenter with large area at risk)
Acceptable for primary PCI rather than fibrinolysis	≤**120 min** (≤90 min if early presenter with large area at risk) if this target cannot be met, consider fibrinolysis.
Preferred for successful fibrinolysis to angiography	**3–24 h**

FMC = first medical contact; PCI = percutaneous coronary intervention.

European Heart Journal 2012 - doi:10.1093/eurheartj/ehs215

NC STEMI Bypassing PCI Center ED



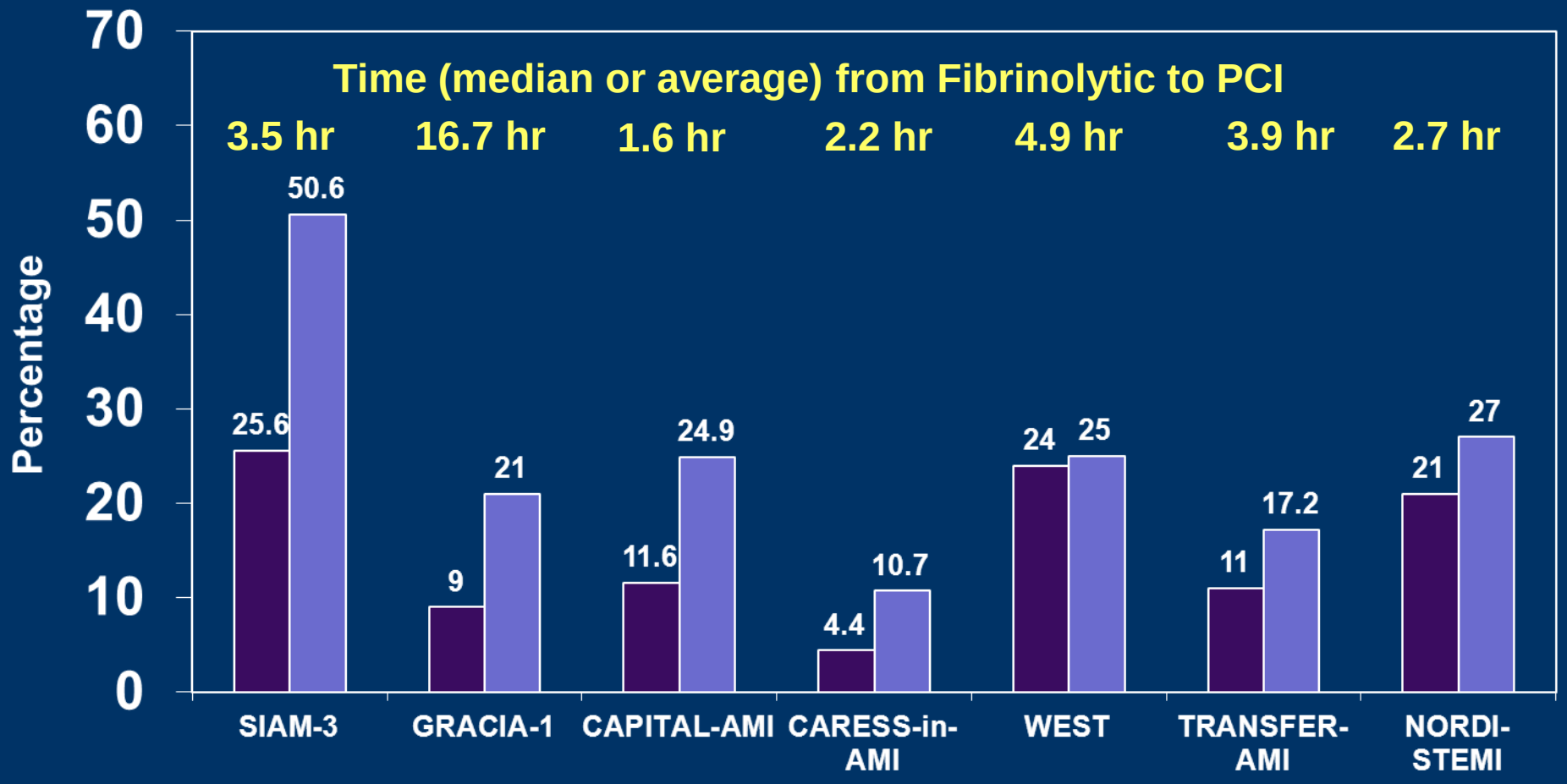
Akshay Bagai TCT 2012

RACE 2008-2009 STEMI diagnosed pre-hospital and taken directly to PCI Centers

- FMC to device < 90 min in 54%
- 17% ED bypass
- Median ED arrival to cath lab 30 min (IQR 20, 41)
- FMC to device 75 (ED bypass) vs. 90 minutes
- FMC to device within 90 min 74% vs. 50%

Akshay Bagai TCT 2012

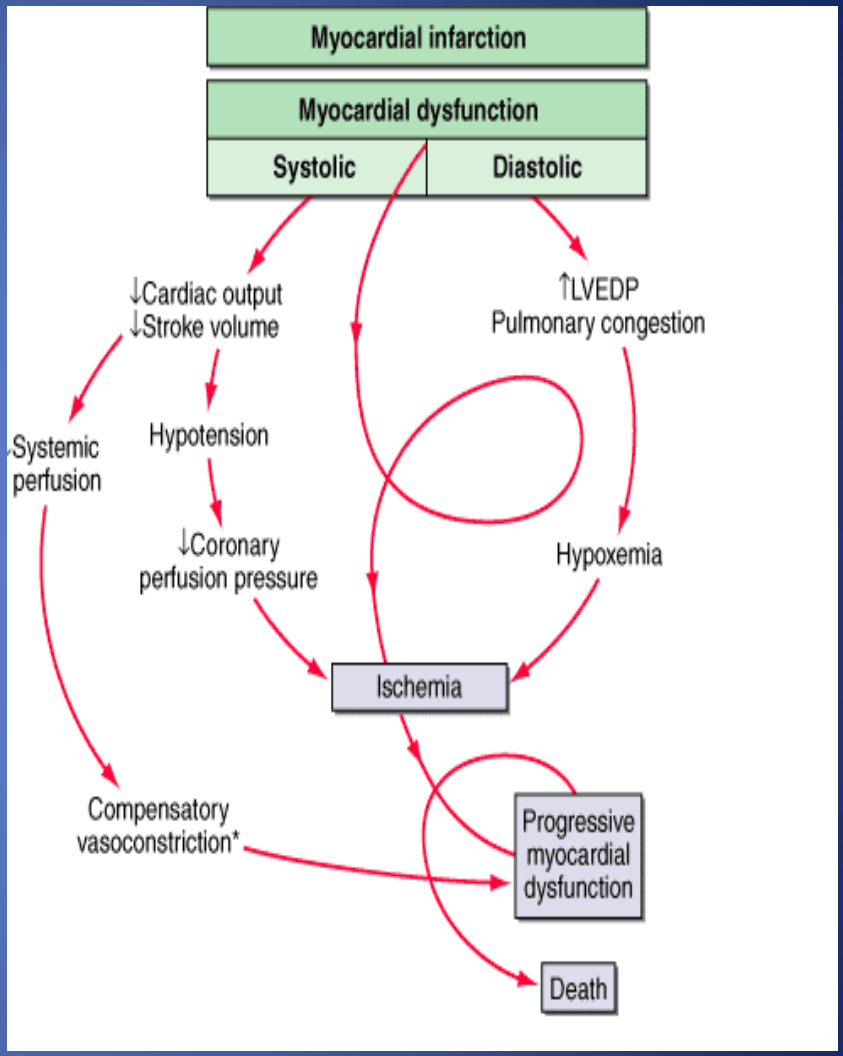
Primary Outcome of 7 Trials of Routine vs Ischemia-driven Catheterization and PCI After Fibrinolytic Therapy



	SIAM-3	GRACIA-1	CAPITAL-AMI	CARESS-in-AMI	WEST	TRANSFER-AMI	NORDI-STEMI
N	163	500	170	600	204	1059	266
Risk	All	All	High	High	All	High	All
Follow-up	6 mo	12 mo	6 mo	30 d	30 d	30 d	12 mo
Composite	D,MI,RI,TVR	D,MI,revasc	D,MI,RI, stroke	D, MI, RI	D,MI,RI,CHF, shock, arrhy	D,MI,RI,CHF, shock	D, MI, RI, stroke

Cardiogenic Shock: Pathophysiology

- Ventricular failure (left in most forms of CS)
- Decrease cardiac output/stroke volume
- Decrease regional and peripheral perfusion
- Release of catecholamines and neurohormones
- Systemic inflammatory response syndrome
- Continuous and progressive myocardial dysfunction

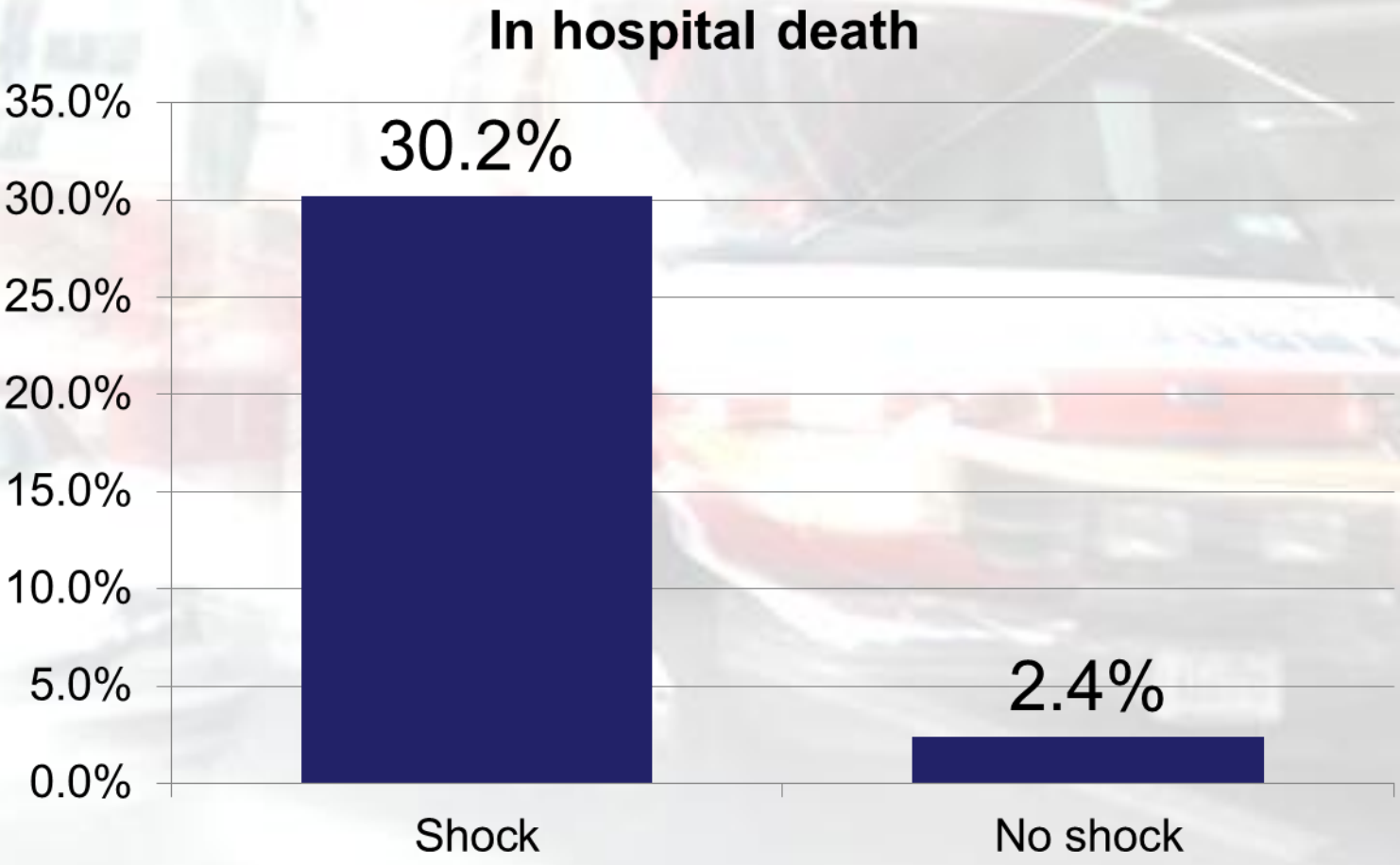


Clinical signs

- Oliguria, cool, pale and clammy extremities, altered mental status, pulmonary congestion, tachycardia, elevated lactate, mixed venous saturation of less than 65%

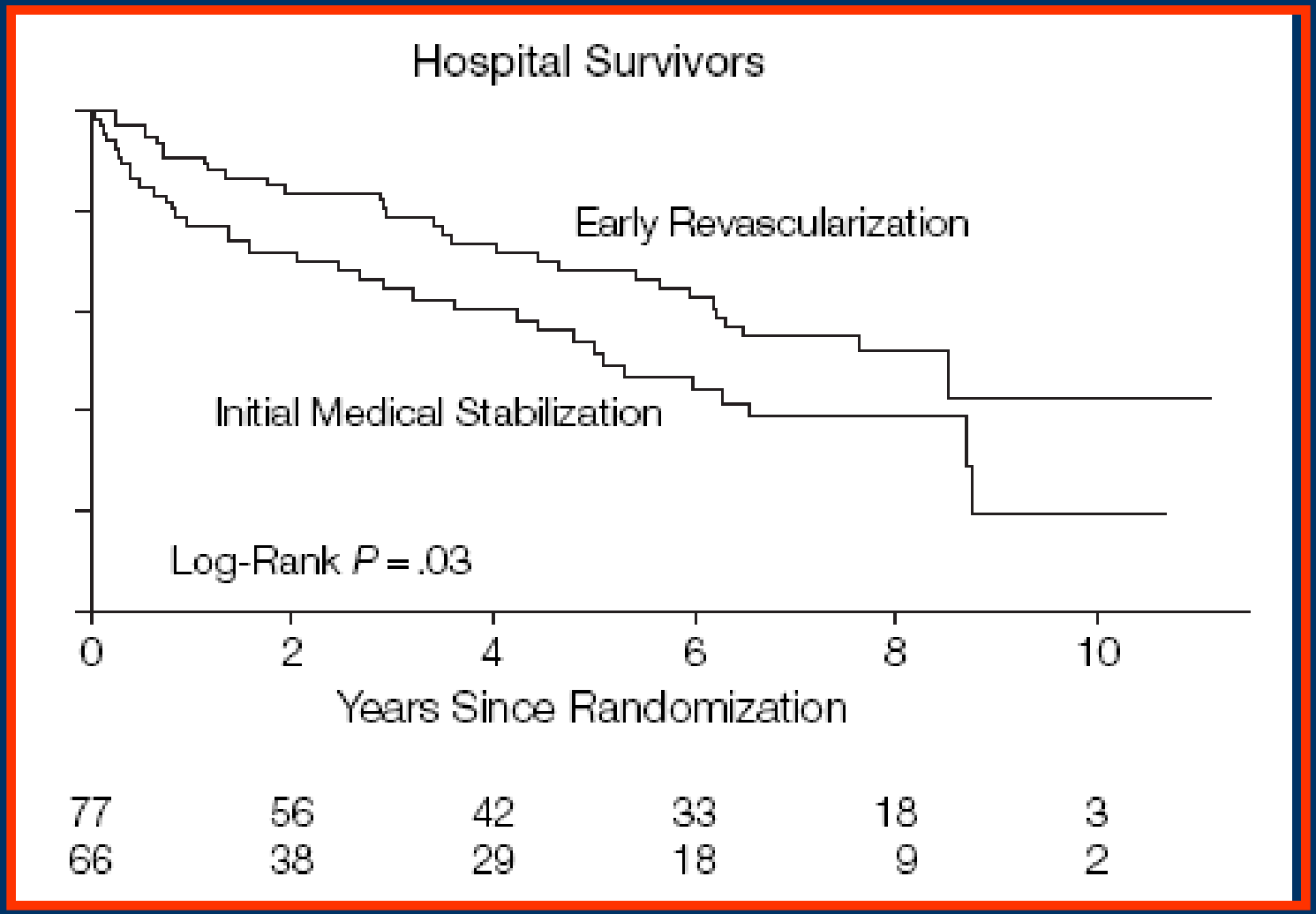
- Pre shock
  - higher HR, lower BP among patients on presentation among those who develop CS
- STEMI
  - Systolic blood pressure <= 90 on presentation

Death, shock on presentation



NC RACE, *Circulation.2012;126:189–195*

SHOCK Trial: Long term survival after discharge



- Hochman JAMA 2006

IABP-SHOCK II Trial
2012 ESC / NEJM

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Intraaortic Balloon Support for Myocardial Infarction with Cardiogenic Shock

Holger Thiele, M.D., Uwe Zeymer, M.D., Franz-Josef Neumann, M.D.,

IABP-SHOCK II Trial
2012 ESC / NEJM

- 600 AMI patients with cardiogenic shock - IABP or no IABP
- All early revascularization

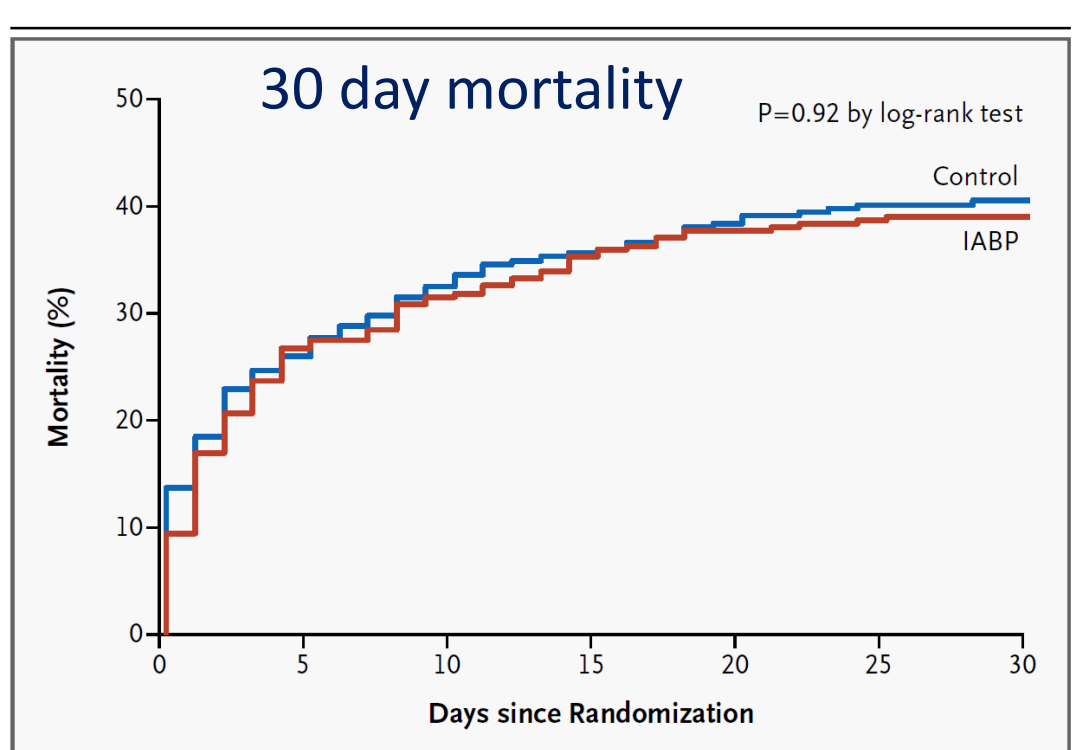
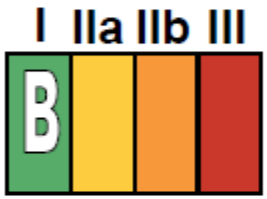


Figure 1. Time-to-Event Curves for the Primary End Point.

PCI in Specific Clinical Situations: STEMI–Primary PCI of the Infarct Artery (cont.)



Primary PCI should be performed in patients with STEMI presenting to a hospital without PCI capability within 120 minutes of first medical contact as a systems goal.

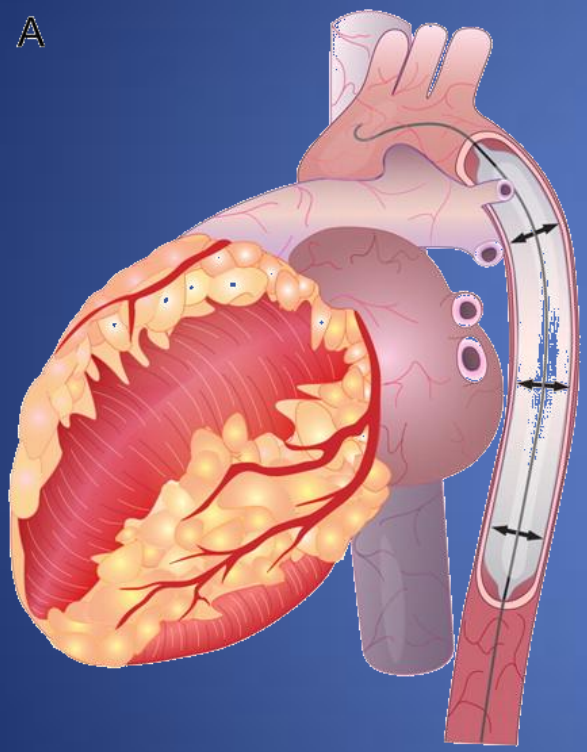
Primary PCI should be performed in patients with STEMI who develop severe heart failure or cardiogenic shock and are suitable candidates for revascularization as soon as possible, irrespective of time delay.

PCI in Specific Clinical Situations: Cardiogenic Shock

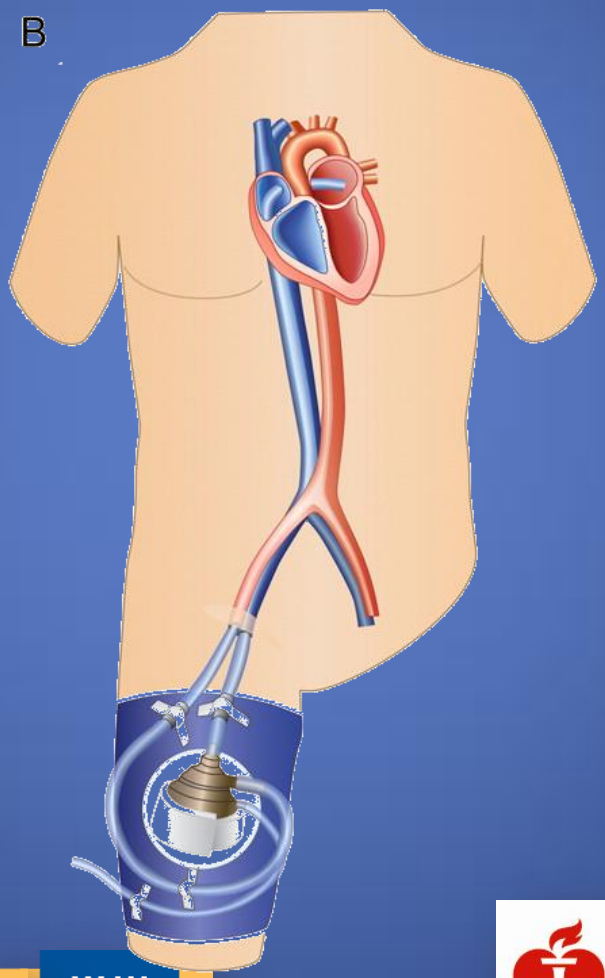
PCI is recommended for patients with acute MI who develop cardiogenic shock and are suitable candidates.

A hemodynamic support device is recommended for patients with cardiogenic shock after STEMI who do not quickly stabilize with pharmacologic therapy.

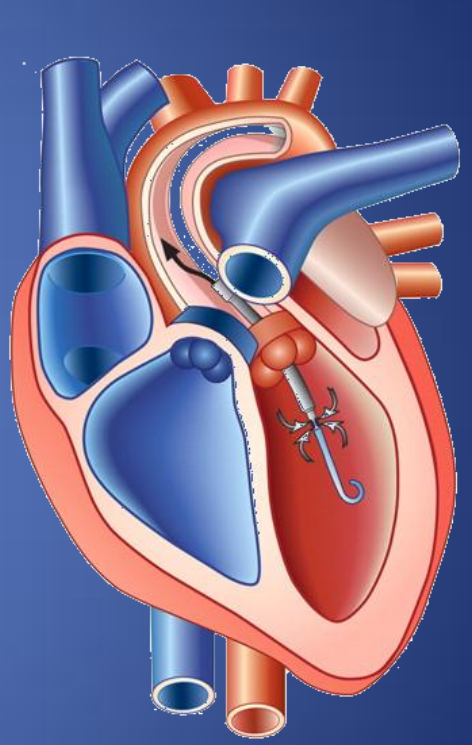
Most Commonly Used Mechanical Devices



IABP



TandemHeart



Impella