Meet the Experts over Breakfast

Door to Device – Optimizing Outcomes with Mechanical Support in Cardiogenic Shock

Does the Timing of IABP Matter?

The Evidence of Utilization of IABP

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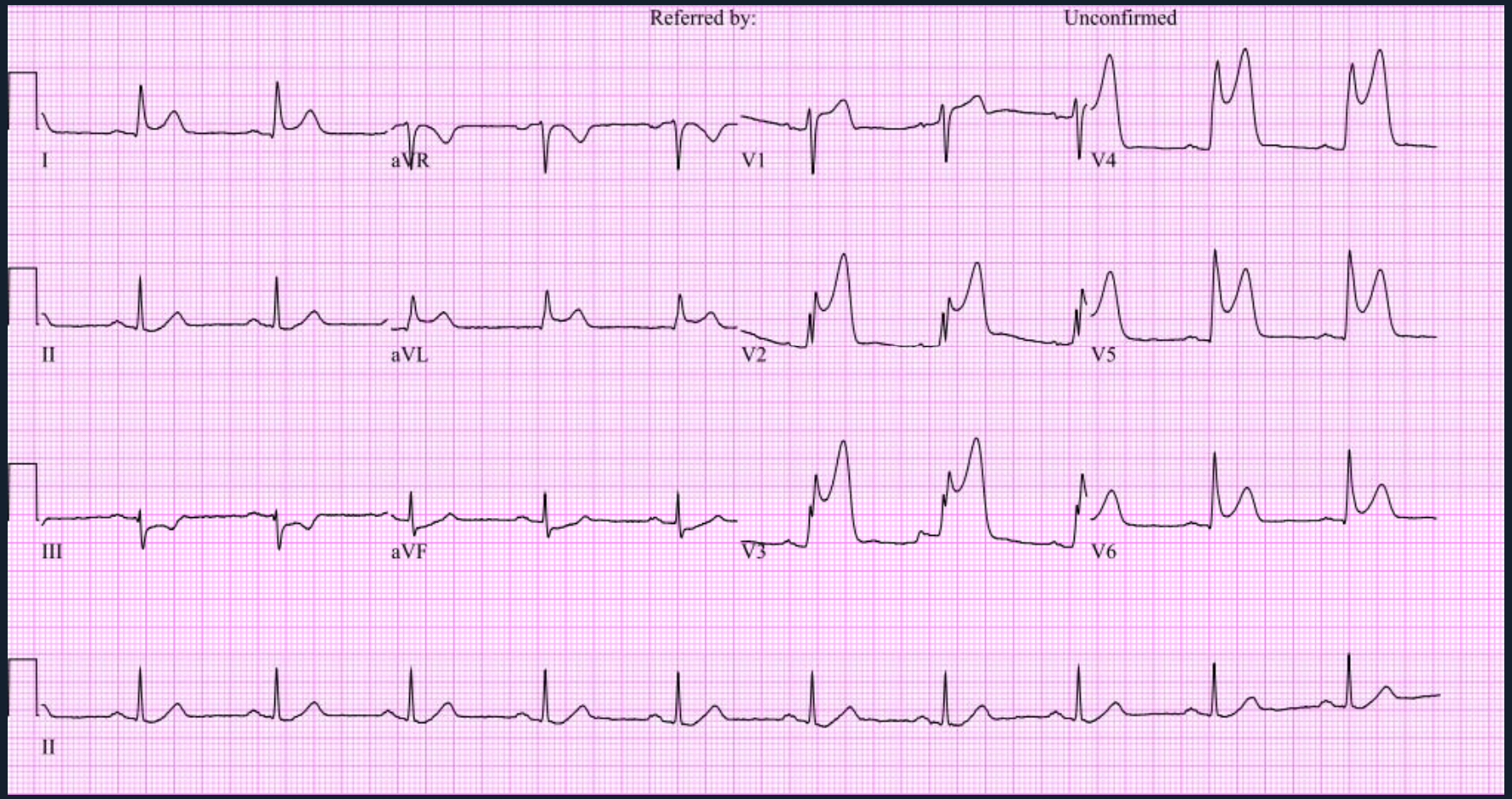
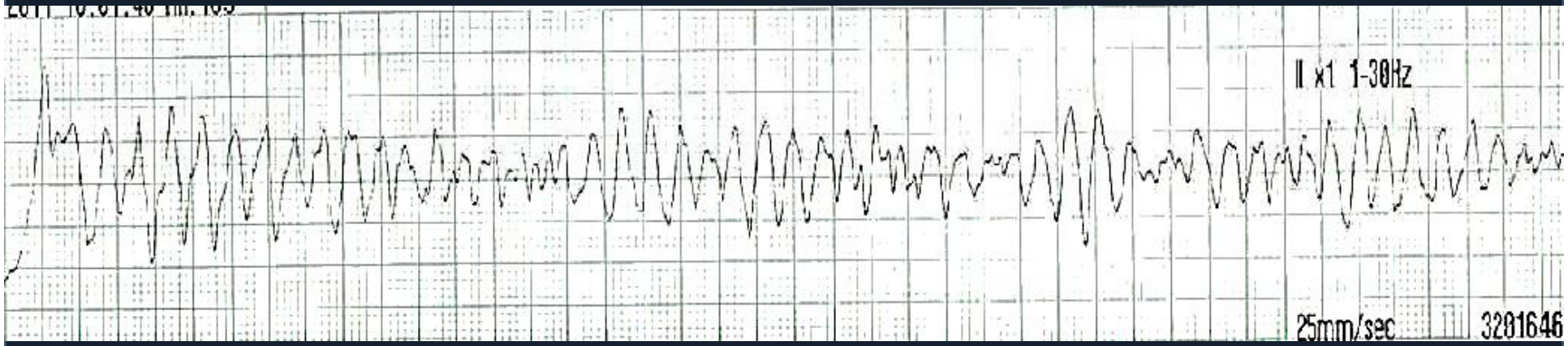
52/M

- C.C
  - Chest pain
- P.I
  - A 52-year old man visited our emergency room with acute chest pain developed 5-hours before and aggravated 1 hour before.
- Vital Sign
  - 112/82 mmHg– 64/min – 20/min – 36.0 °

Initial ECG

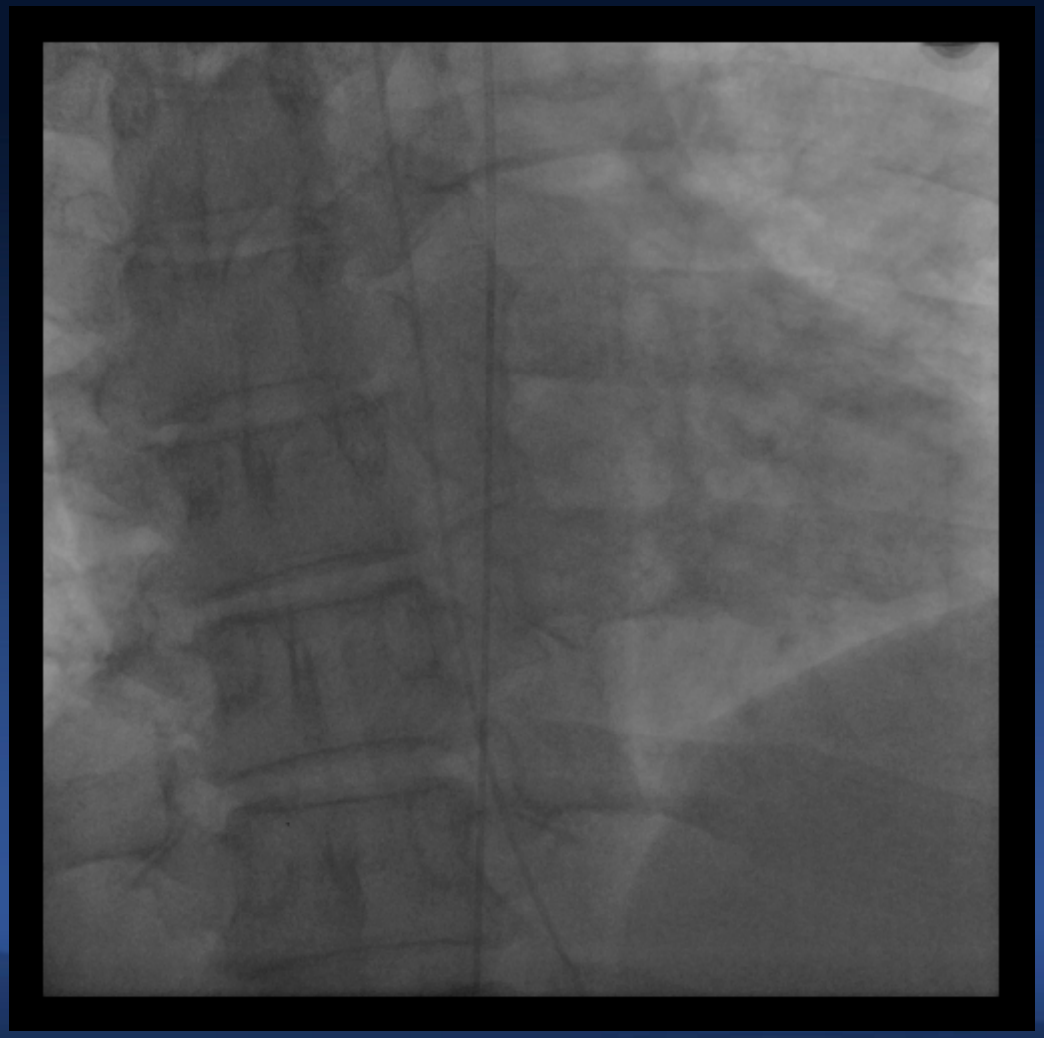

Referred by:
Unconfirmed
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II

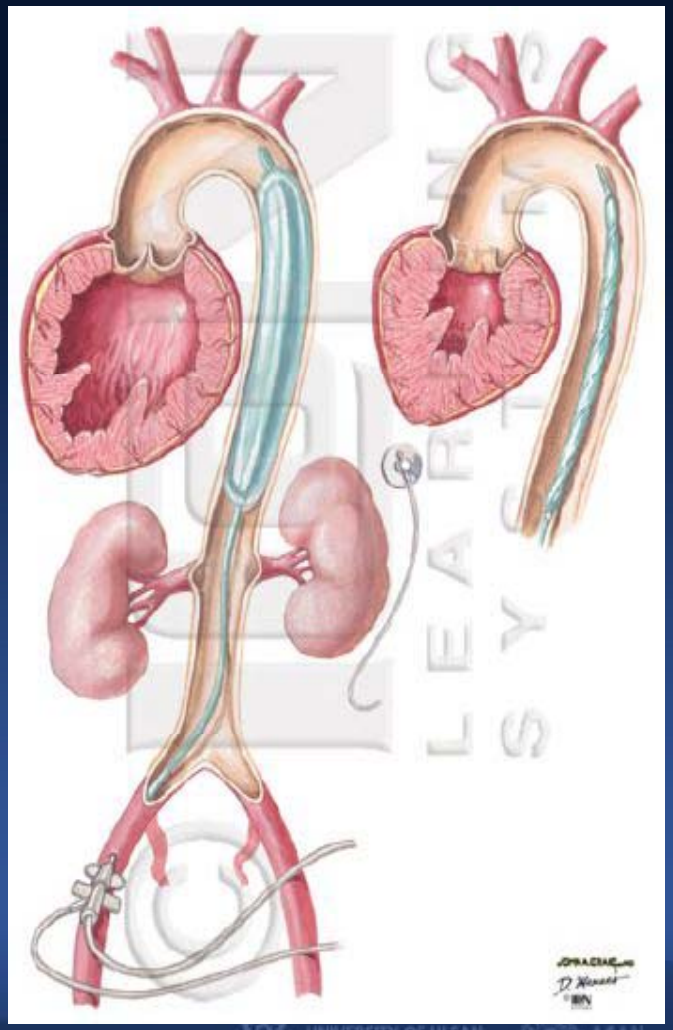
- 6 minutes after, cardiac arrest was developed
- ROSC was attained after 2 times of defibrillation.
- Immediately after, he referred to cardiac cath lab



IABP Insertion first

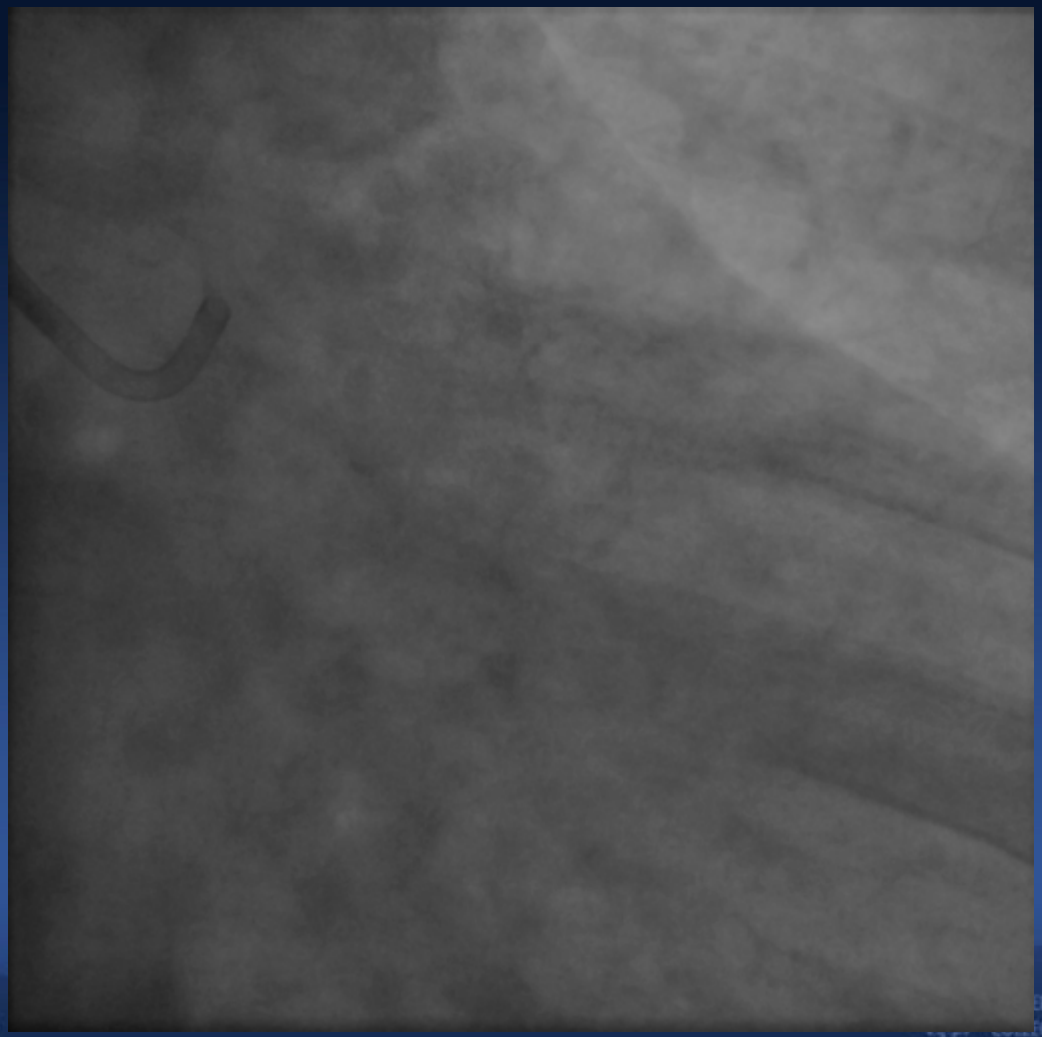
in the cardiogenic shock (80/50mmHg)





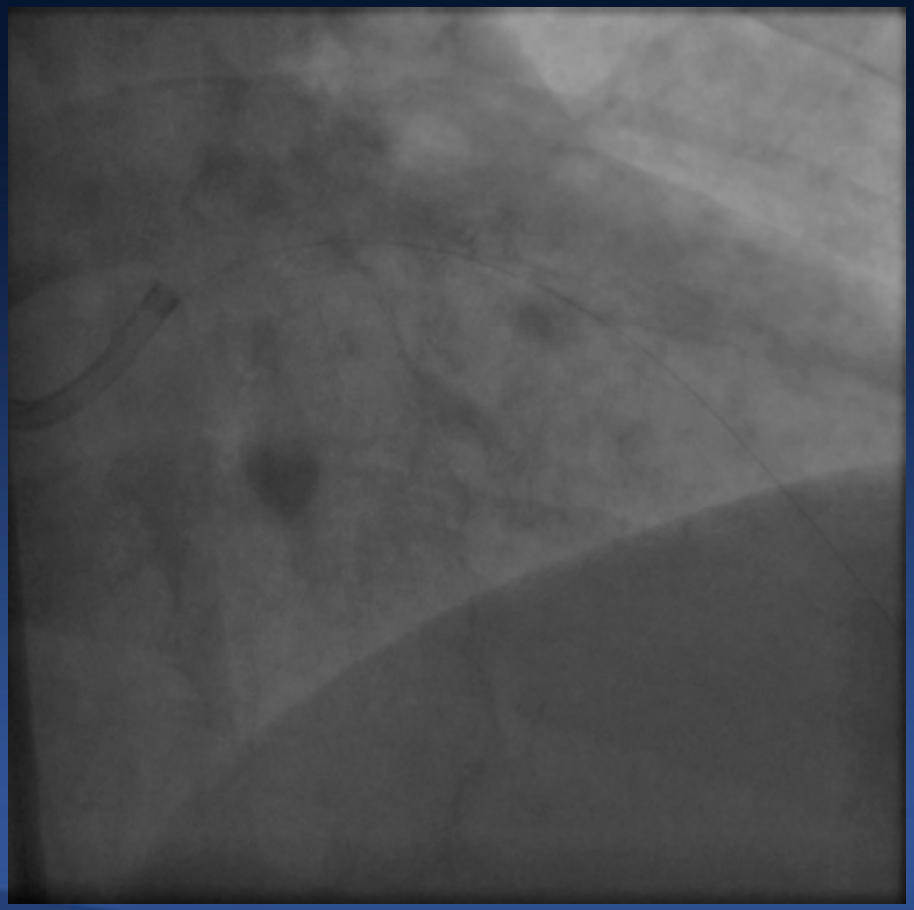
Coronary Angiogram

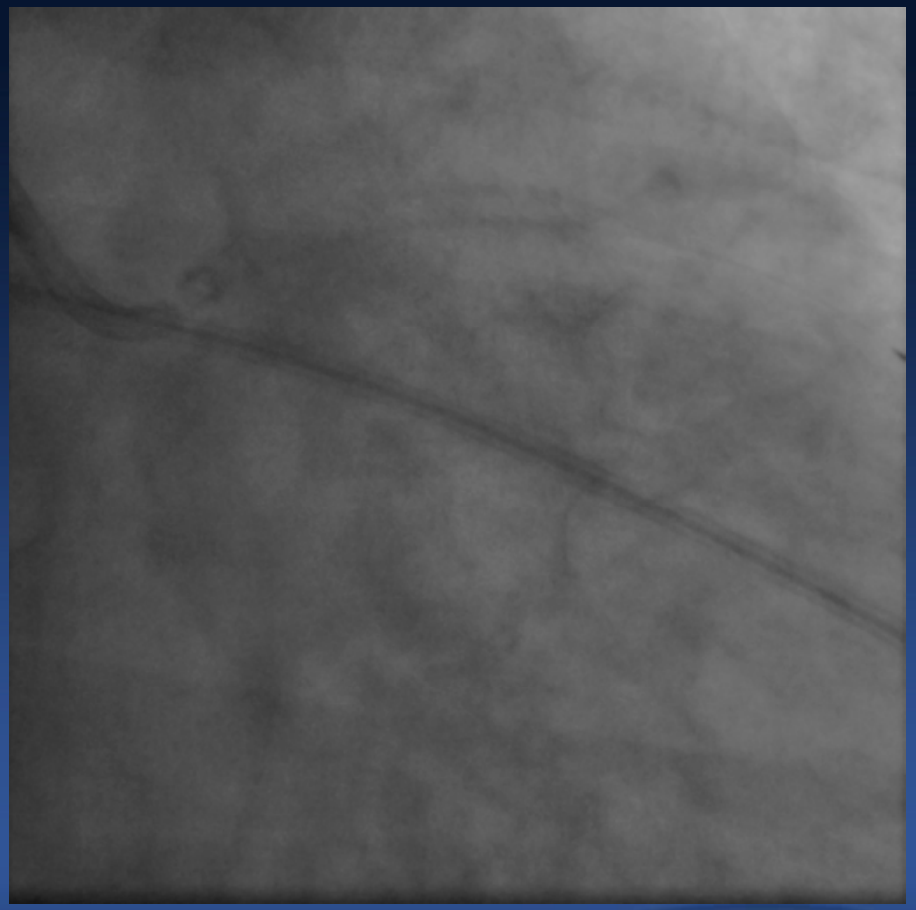
Proximal LAD thrombotic total occlusion with TIMI 0 flow



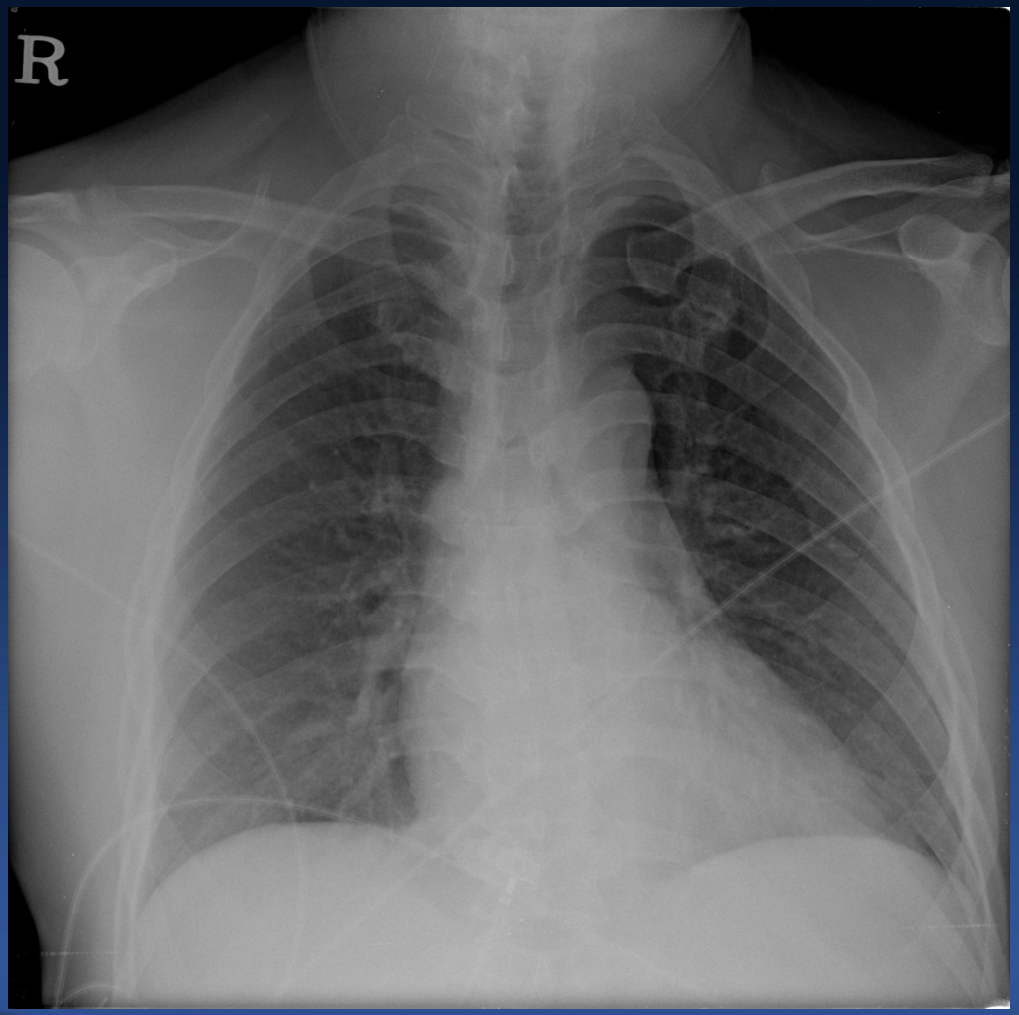
Primary PCI for pLAD lesion

GENOUS 3.0(28) stent implantation at pLAD





2 Days after PCI

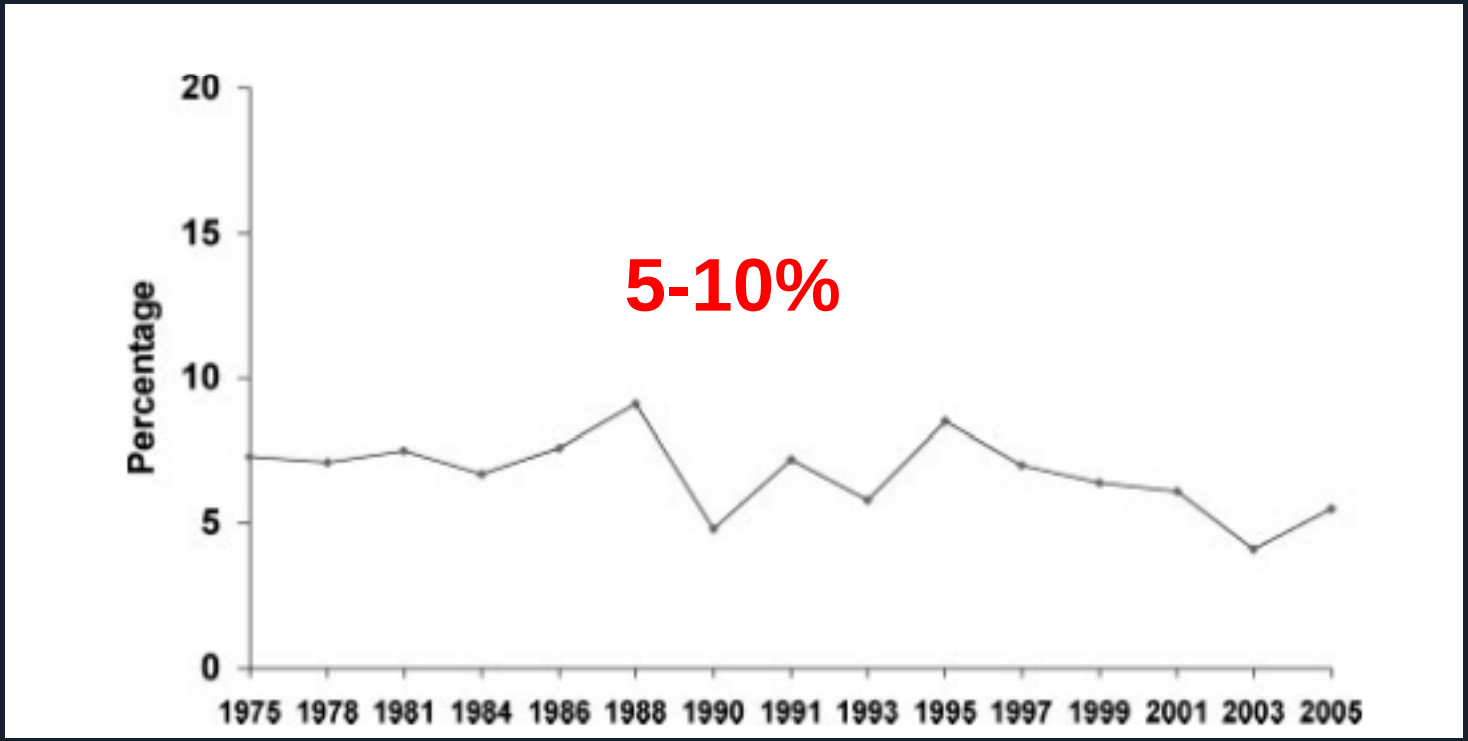


- Stable V/S
- EchoCG
  - LVEF 52%
  - Apical inferior focal akinesia
- Transferred to GW

4 Days after admission

- He discharged without immediate complication

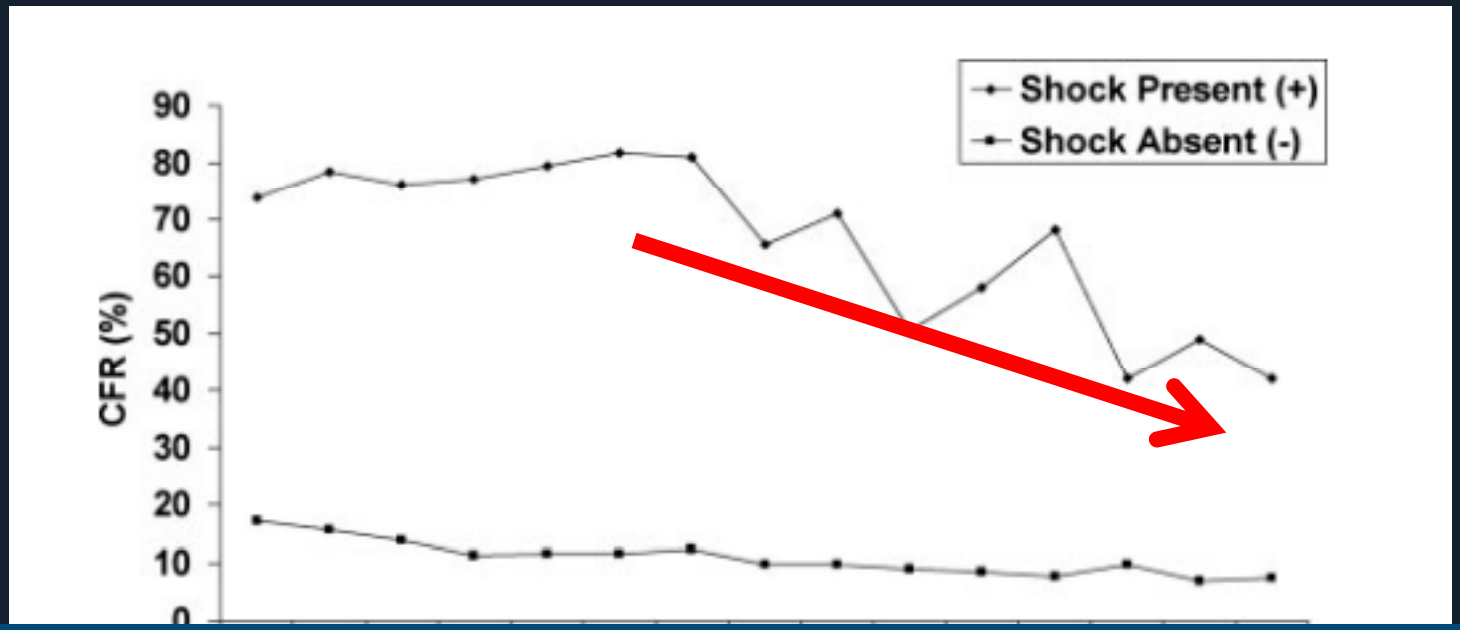
Incidence



The incidence rates of cardiogenic shock remained stable between 1975 and the late 1990s but declined in an inconsistent manner thereafter.

Circulation 2009;119:1211-1219

Case Fatality Rate



- The increase of primary PCI for reperfusion
- The use of IABP

Circulation 2009;119:1211-1219
European Heart Journal (2009) 30 389-390

Who can survive in CS ?

Not Modifiable !!

- Thrombolysis
- PCI
- Bypass surgery
- Intraaortic balloon counterpulsation

Circulation 2009;119:1211-1219

Should We Emergently Revasculize Occluded Coronaries for Cardiogenic Shock?

SHOCK trial

SHOCK Trial

302 Pts. with ST elevation (or new LBBB) and cardiogenic shock

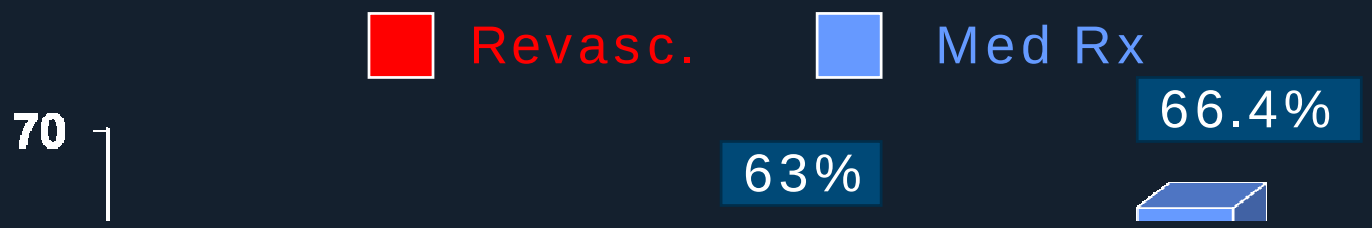
Immediate Revascularization (CABG/PTCA)

Late revascularization (if indicated) deferred for at least 54 hours

Primary End Point : mortality at 30 days

N Engl J Med 1999;341:625-34

Primary End Point
Mortality @ 30 days, 6mo, & 12 mo



86% of patients used IABP

Diff.=9%
P=0.11

Diff.=13%
P=0.027

Diff.=14%
P<0.02

N Engl J Med 1999;341:625-34

Current Guidelines of IABP utilization

- ACC/AHA

  Class I

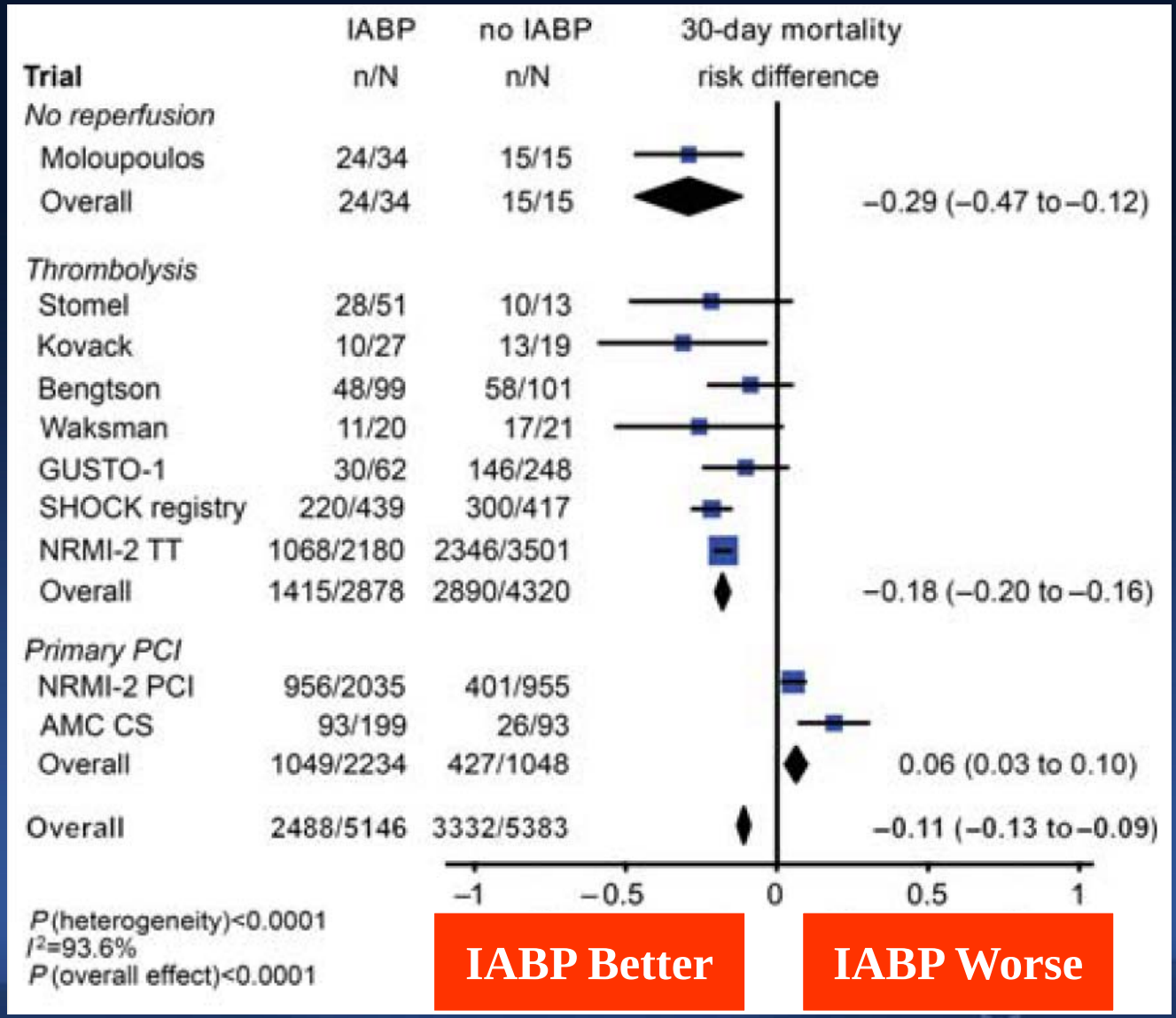
  • STEMI with hypotension who do not respond to other intervention (**LOE B**)
  • STEMI with low-output state. (**LOE B**)
  • Cardiogenic shock not quickly reversed with medications. (**LOE B**)
  •Recurrent ischemic type chest discomfort and signs of hemodynamic instability, poor LV dysfunction, or a large area of myocardium at risk. (**LOE C**)

- ESC 2009

  Class I

  • Treatment of shock in STEMI (Killip class IV) (**LOE C**)

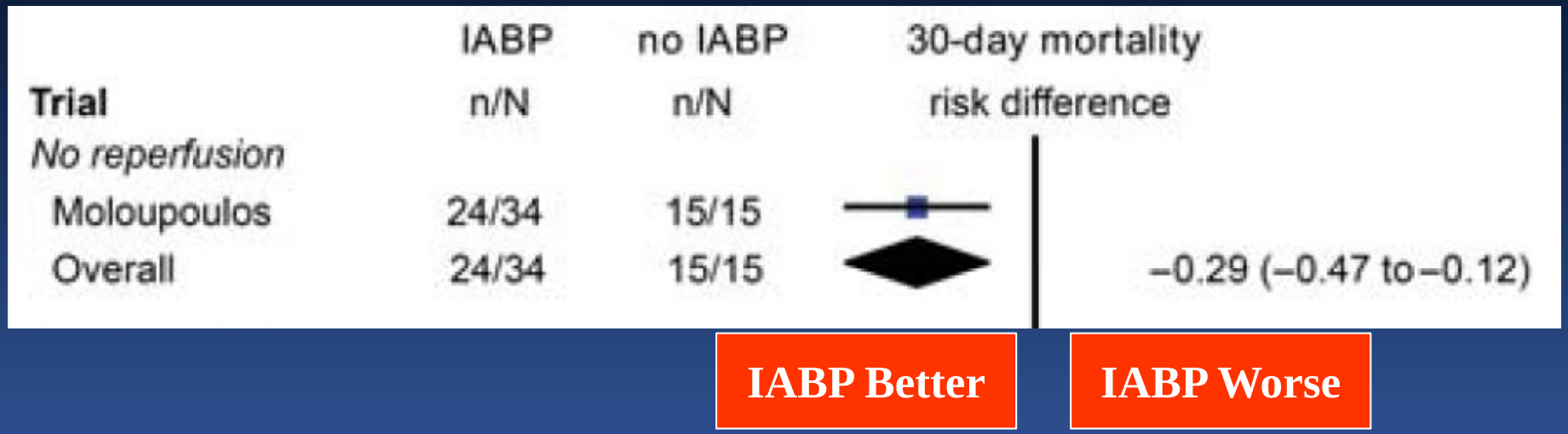
Meta-analysis of cohort studies



European Heart Journal (2009) 30,459-468

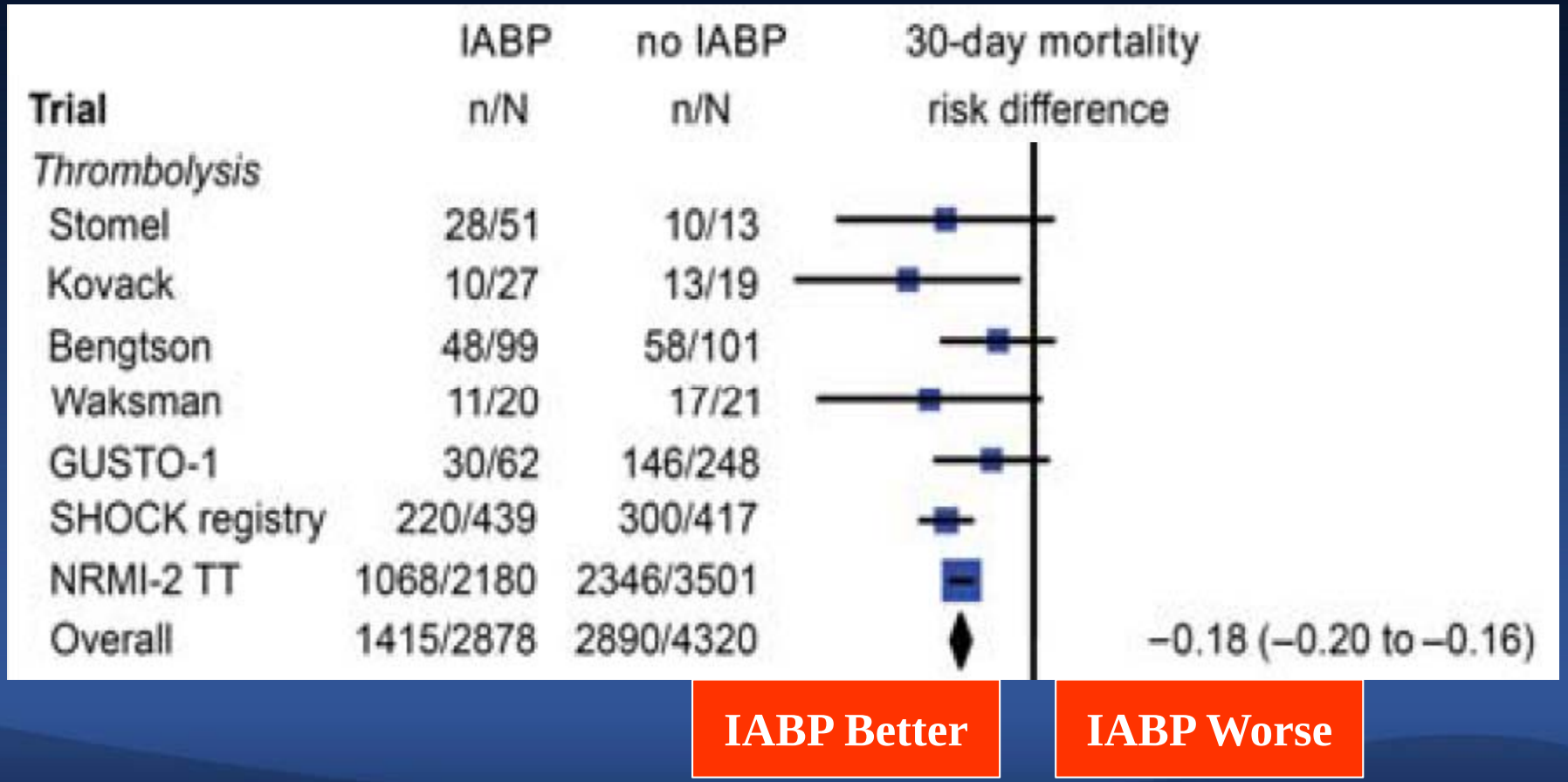
Meta-analysis of cohort studies

No reperfusion



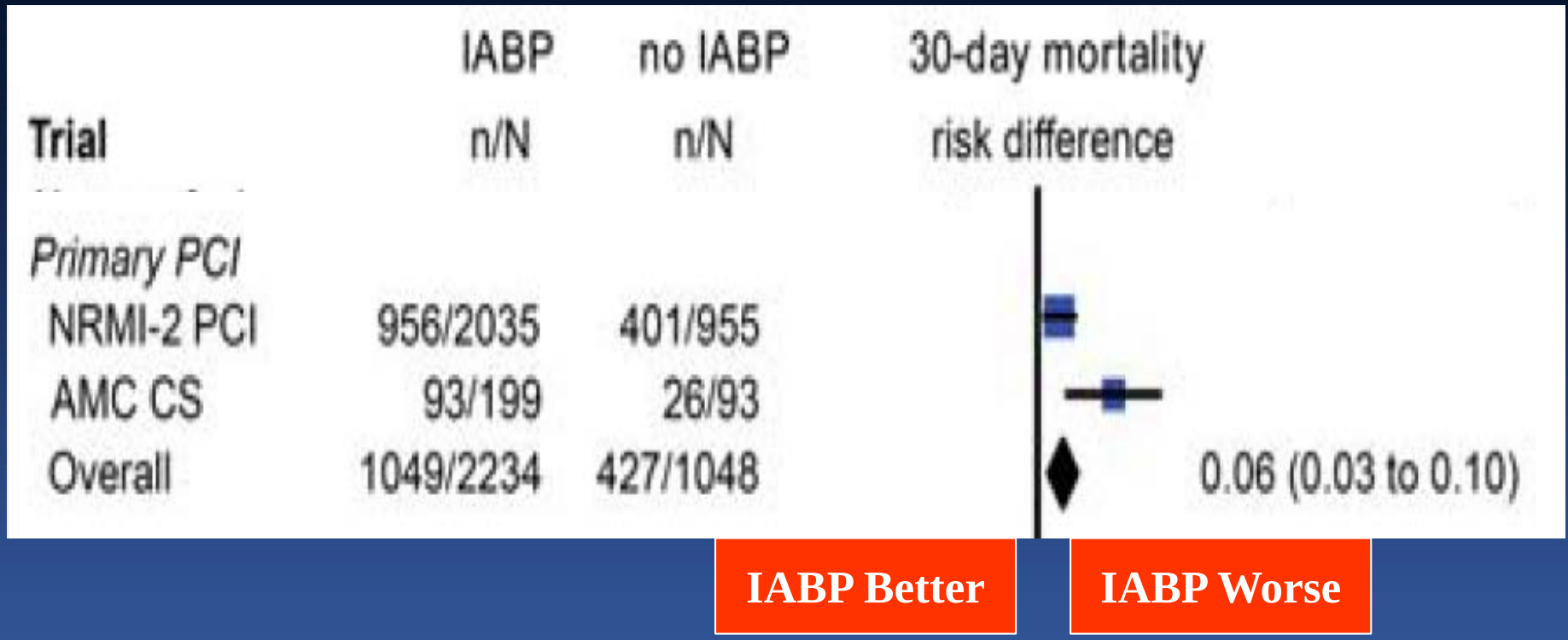
Meta-analysis of cohort studies

Thrombolysis



Meta-analysis of cohort studies

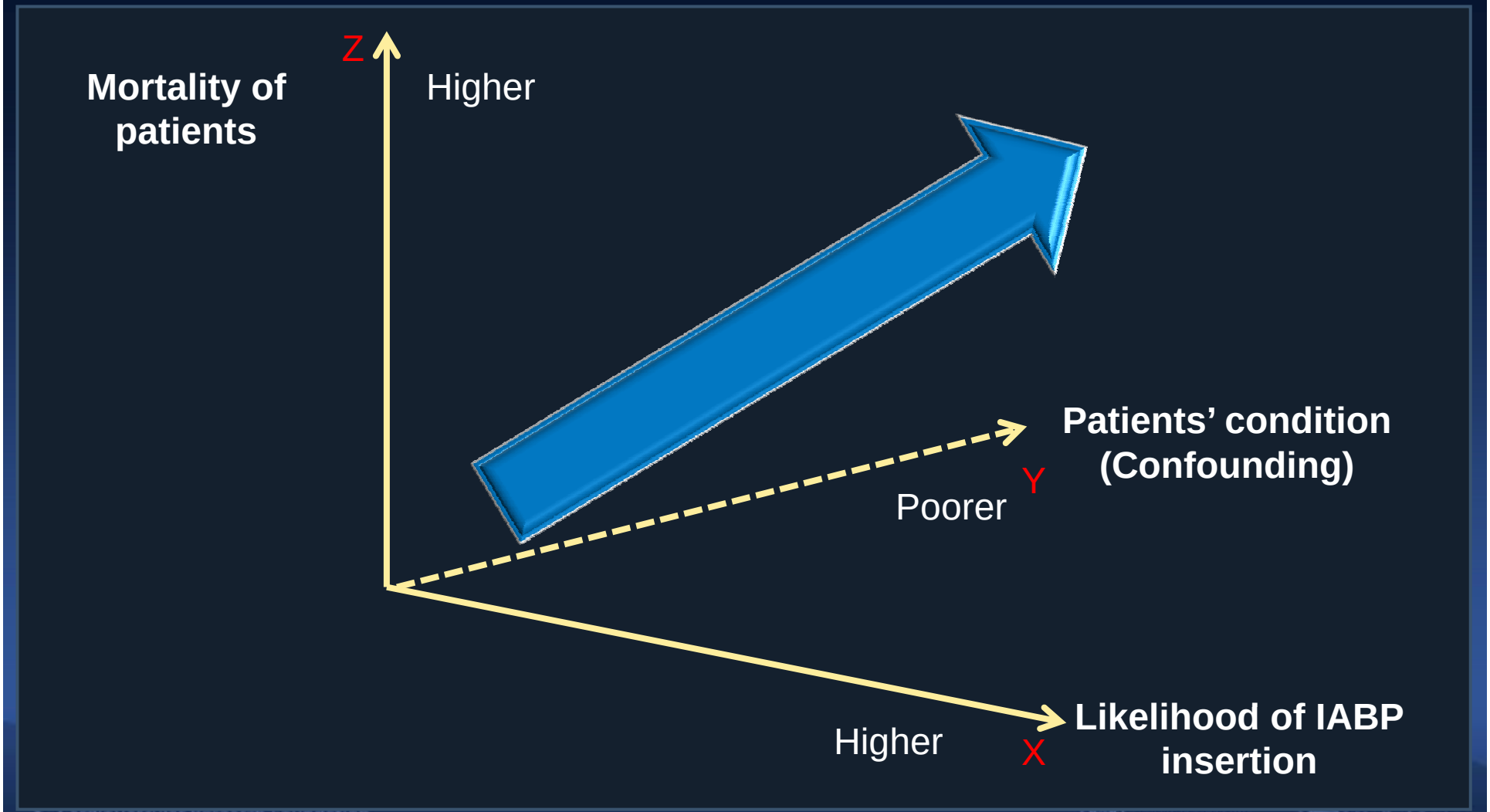
Primary PCI



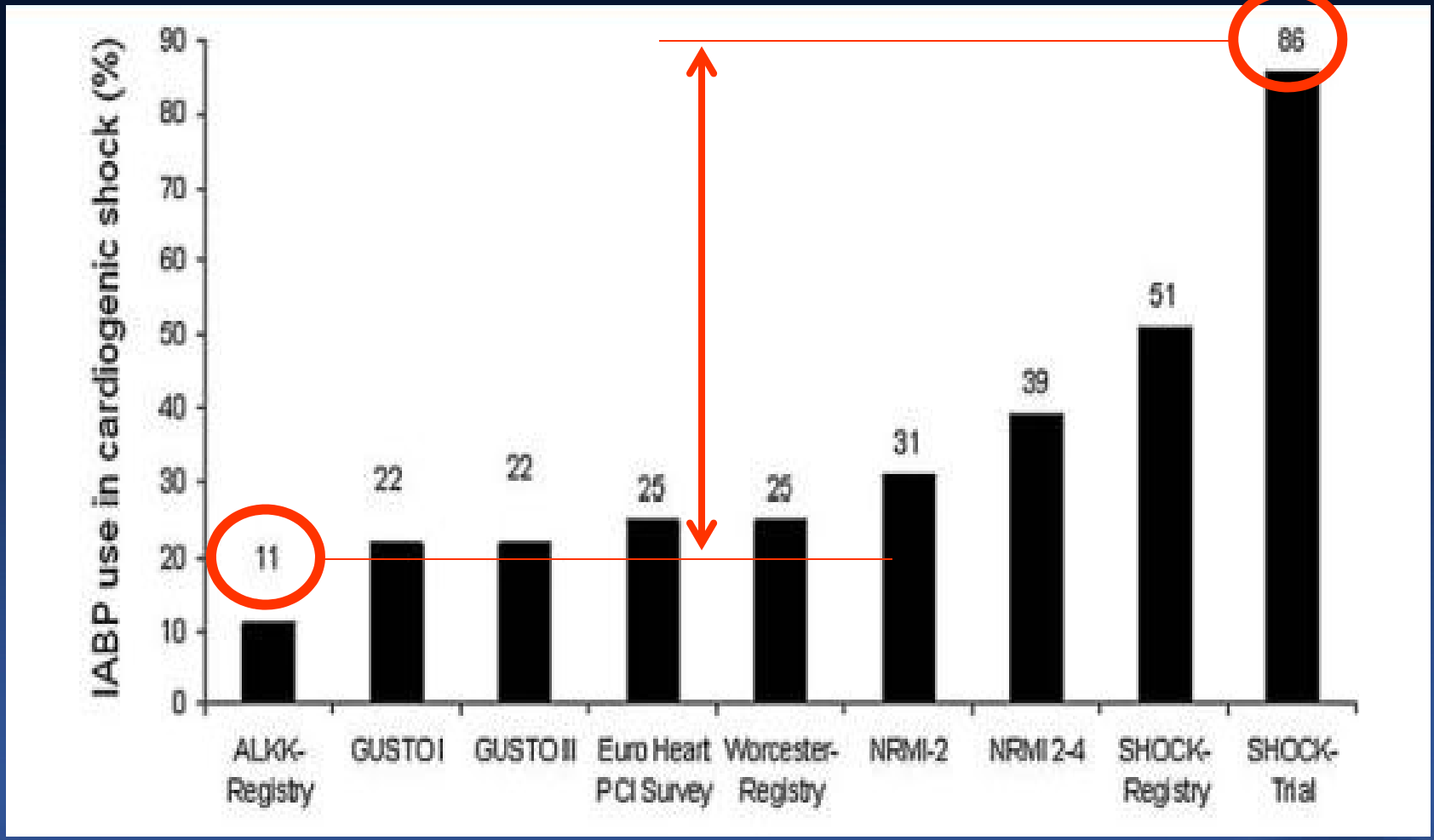
Careful Interpretation

- No adequate randomized trials
- All of previous studies were registry trials
- Selection bias and confounding factors could be ruled out

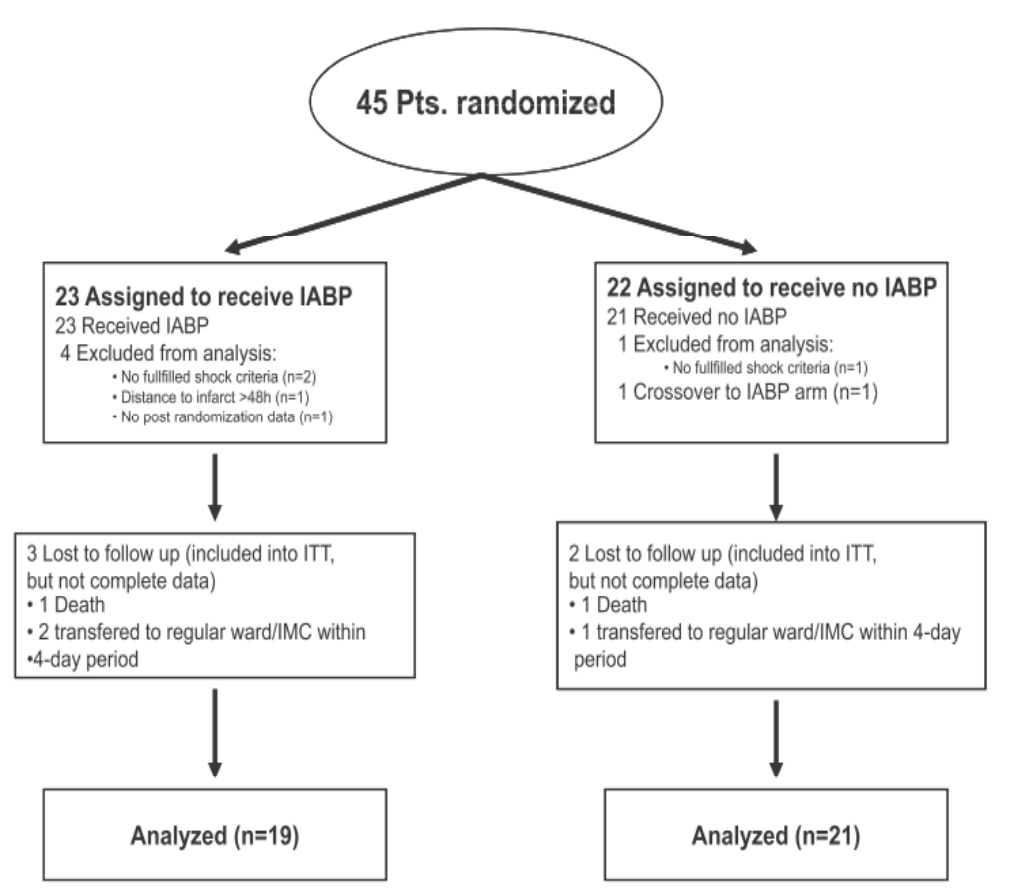
Function of likelihood of IABP insertion and patients' condition



Percentage of IABP used

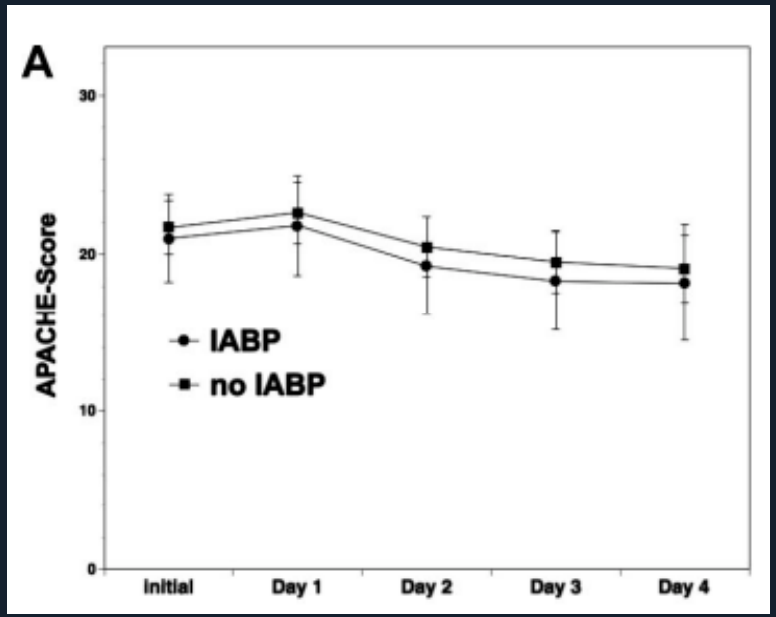


IABP-SHOCK trial



- Primary Endpoint

Change in APACHE II score



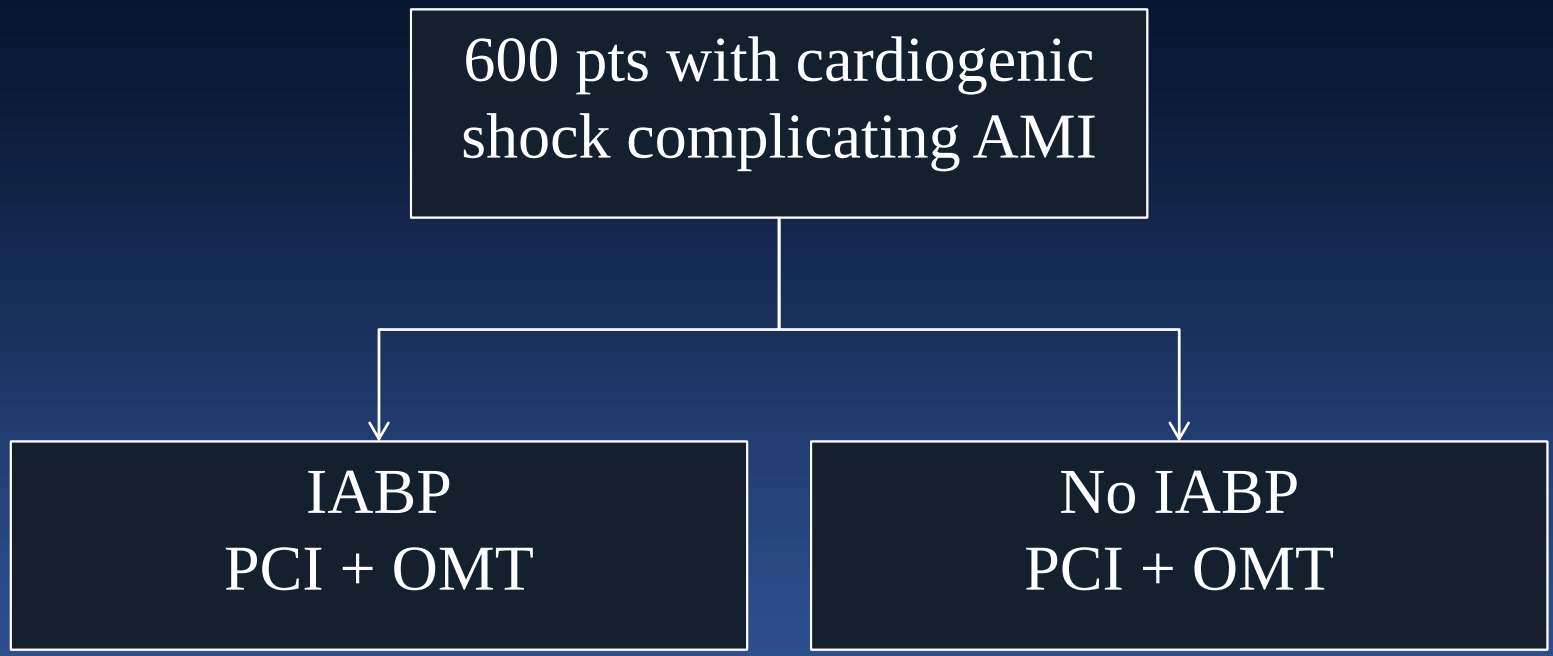
Only randomized trial in primary PCI setting

Crit Care Med 2010;38:152-160

IABP-SHOCK II trial

Primary Outcome : 30-day mortality

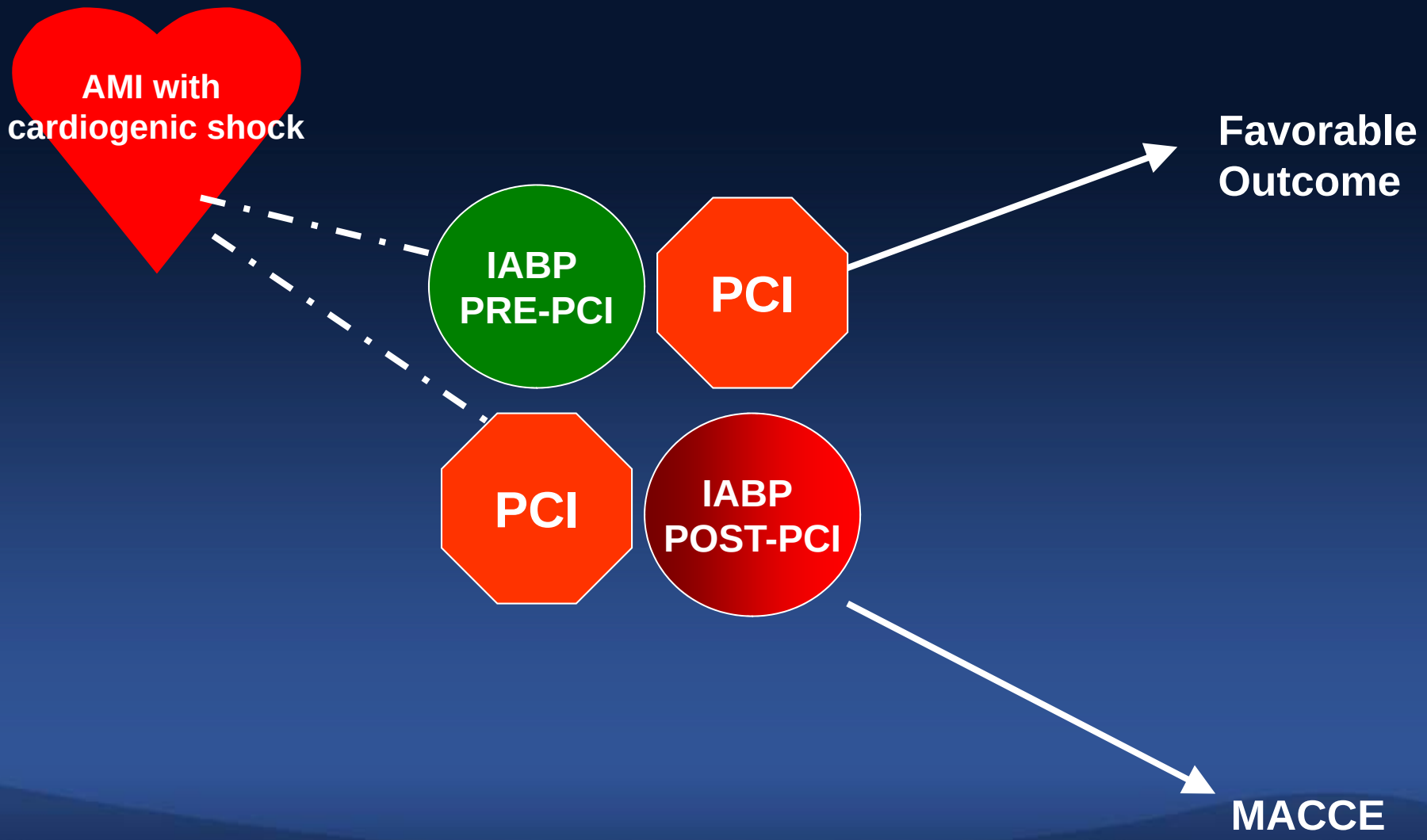
Study Chair : Holger Thiele, MD University of Leipzig



Will hopefully give us the final answer to whether IABP treatment is beneficial of the treatment of cardiogenic shock in addition to PCI

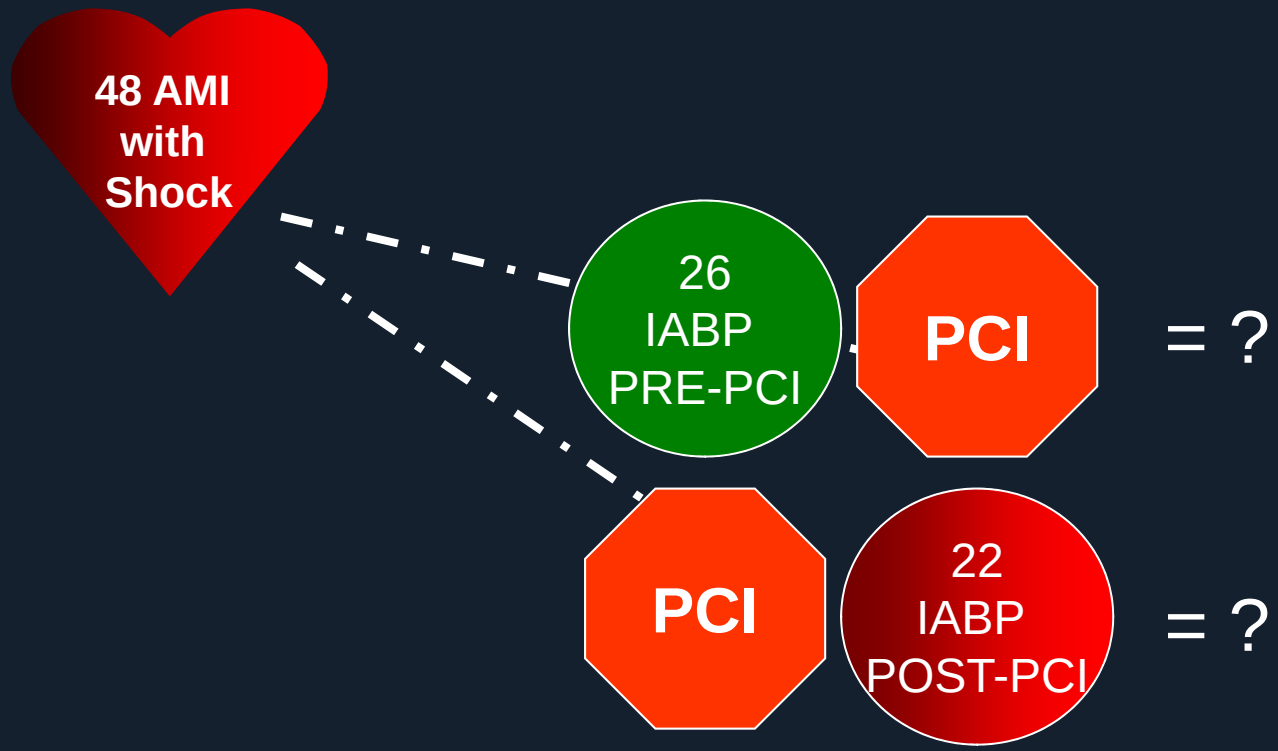
WWW.clinical trials.gov:NCT00491036

Is wrong timing a reason for failure?



Comparison of Hospital Mortality With Intra-Aortic Balloon Counterpulsation Insertion Before Versus After Primary Percutaneous Coronary Intervention for Cardiogenic Shock Complicating Acute Myocardial Infarction

Mohamed Abdel-Wahab, MD*,†, Mohammed Saad, MD†, Joerg Kynast, MD, Volker Geist, MD, Mohammad A. Sherif, MD, Gert Richardt, MD, and Ralph Toelg, MD



Am J Cardiol 2010;105:967–971

Baseline clinical characteristics

Variable	IABP before PCI (n=26)	IABP after PCI (n=22)	P
Females	3 (11.5%)	6 (27%)	0.27
Age (years)	70.2 ± 10.3	71 ± 11.4	0.80
Diabetes	13 (50%)	10 (45%)	0.78
Hypertension	18 (69%)	14 (64%)	0.76
Hyperlipidemia	15 (58%)	12 (54%)	1.0
Smoking	11 (42%)	9 (41%)	1.0
PAD	2 (8%)	4 (18%)	0.39
Previous MI	9 (35%)	9 (41%)	0.77
Previous CABG	4 (15%)	5 (23%)	0.71

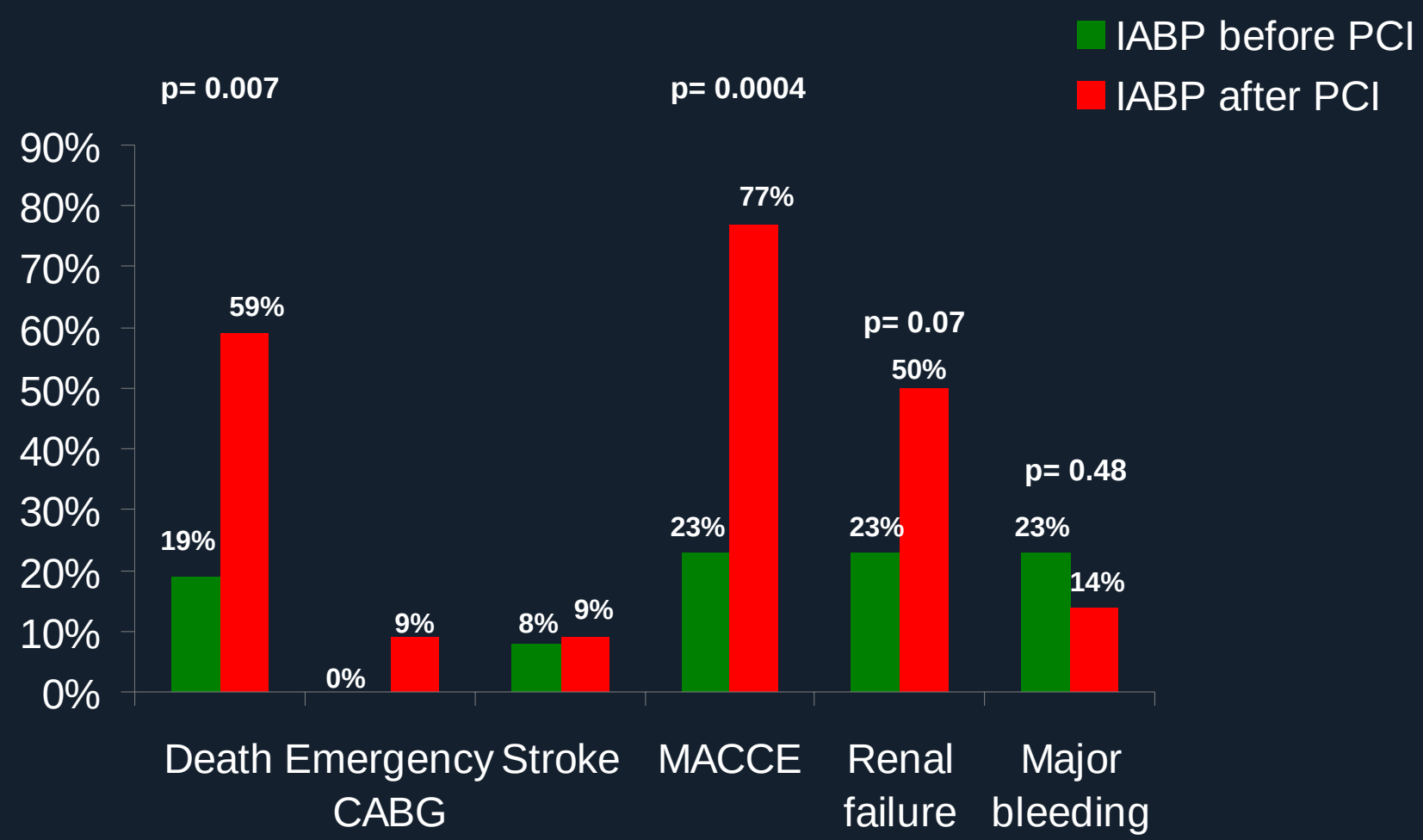
Abdel-Wahab et al, Am J Cardiol 2010; 105:967–971

Infarct Characteristics

Variable	IABP before PCI (n=26)	IABP after PCI (n=22)	P
STEMI	15 (58%)	16 (73%)	0.37
EF (%)	23.5 ± 10.6	23.2 ± 8.7	0.92
Systolic BP	109 ± 10	105 ± 14	0.36
Diastolic BP	60 ± 10	62 ± 13	0.60
Atrial fibrillation	5 (19%)	8 (36%)	0.21
CK max (U/L)	1077 (438-2067)	3299 (695-6834)	0.047
CK-MB max (U/L)	95 (34-196)	192 (82-467)	0.048

Abdel-Wahab et al, Am J Cardiol 2010; 105:967–971

In-Hospital Outcome



independent predictors of in-hospital mortality

	OR	95% CI	*P*
Renal failure	15.2	3.1-73.7	0.001
IABP after PCI	5.2	1.1-24.8	0.039

Abdel-Wahab et al, Am J Cardiol 2010; 105:967–971

Is IABP inferior to the contemporary powerful percutaneous LVAD ?

EUROPEAN SOCIETY OF CARDIOLOGY®

European Heart Journal (2009) **30**, 2102–2108
doi:10.1093/eurheartj/ehp292

CLINICAL RESEARCH
Coronary heart disease

Percutaneous left ventricular assist devices vs. intra-aortic balloon pump counterpulsation for treatment of cardiogenic shock: a meta-analysis of controlled trials

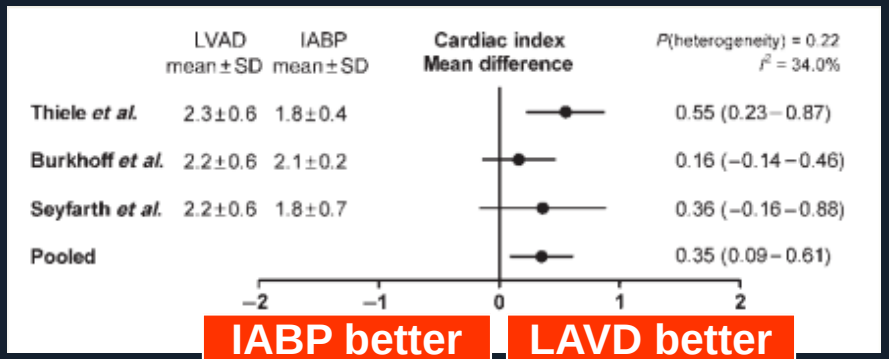
Jin M. Cheng, Corstiaan A. den Uil*, Sanne E. Hoeks, Martin van der Ent, Lucia S.D. Jewbali, Ron T. van Domburg, and Patrick W. Serruys

Department of Cardiology, Erasmus Medical Center, Thoraxcenter, 's-Gravendijkswal 230, Room V-017, 3015 CE Rotterdam, the Netherlands

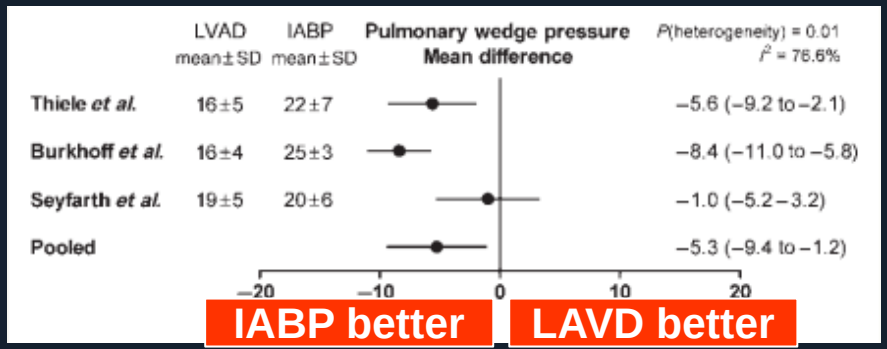
Received 30 January 2009; revised 29 May 2009; accepted 26 June 2009; online publish-ahead-of-print 18 July 2009

Metaanalysis : IABP *vs.* LVAD

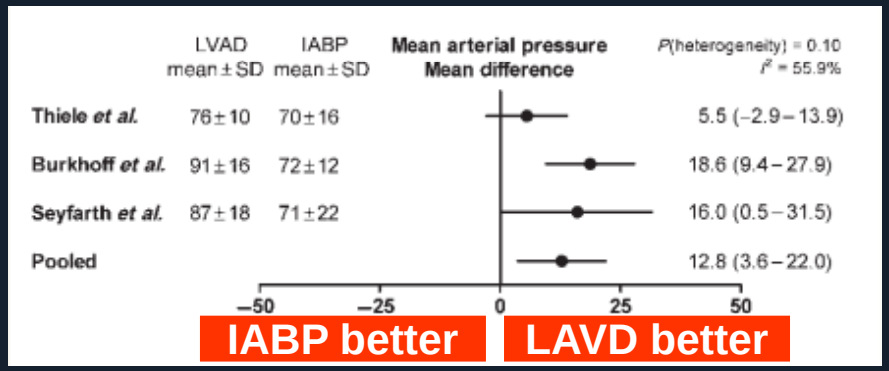
Hemodynamic parameter



Cardiac index



Pulmonary wedge pressure

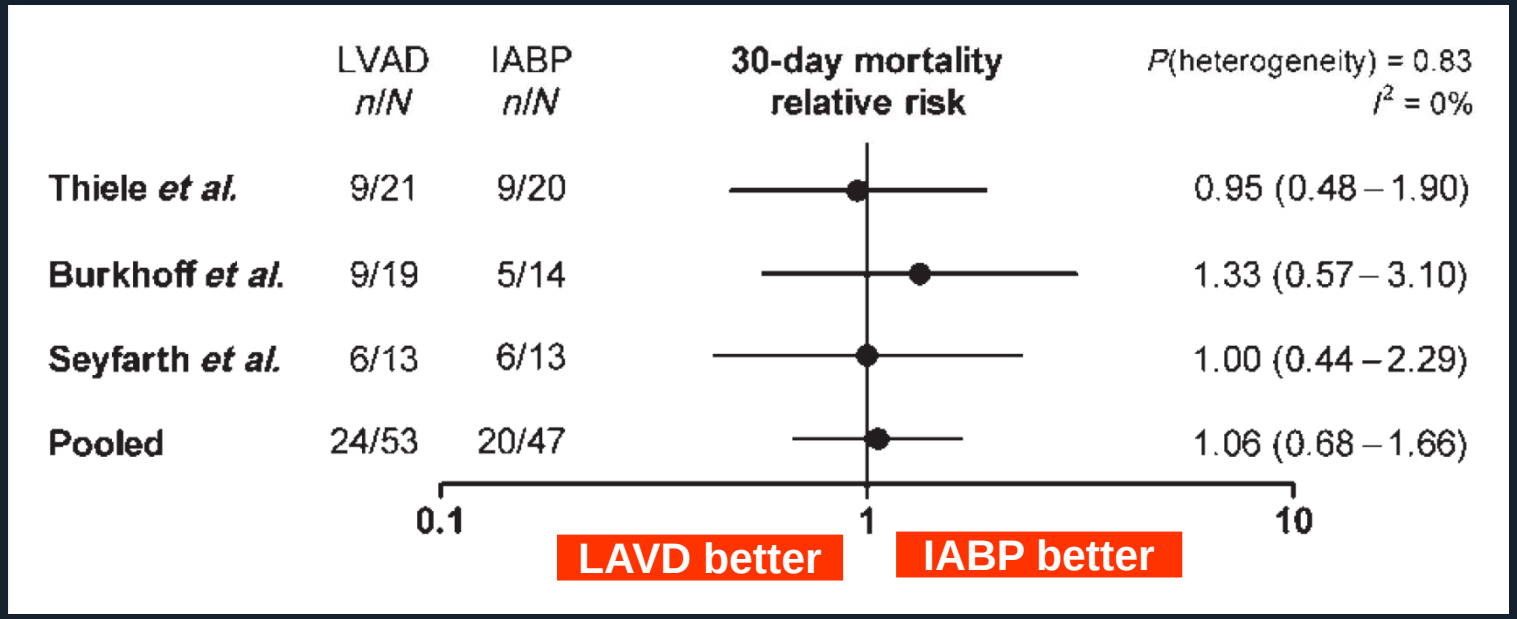


Mean arterial pressure

- LVAD provides superior hemodynamic surpport

Metaanalysis : IABP *vs.* LVAD

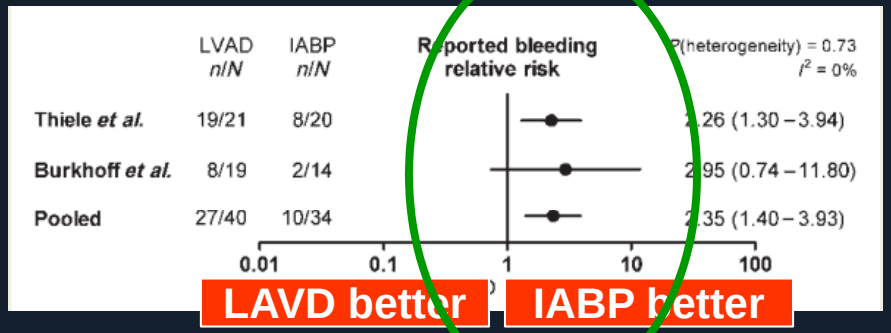
Mortality @ 30 days



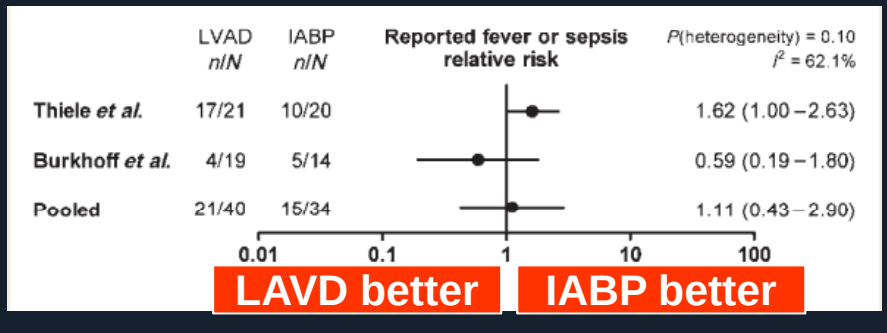
- Percutaneous LVAD use did not result into a reduced 30-day mortality rate

Metaanalysis : IABP *vs.* LVAD

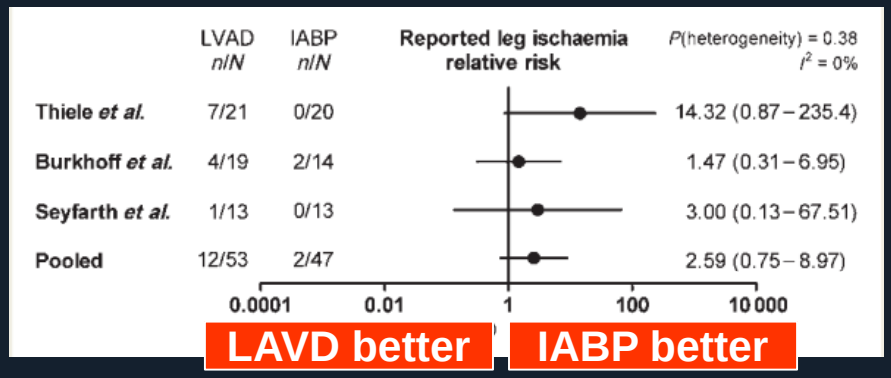
Adverse Events



Bleeding



Fever or sepsis



Leg ischemia

- A higher rate of adverse events was encountered

In patients presenting with cardiogenic shock

- Although IABP provided inferior hemodynamic support compared with the percutanous LVAD.
- The use of IABP is associated with similar 30-day mortality
- And less adverse events, particularly regarding lower bleeding risk.
- Thus, IABP is still safe and effective device in the treatment of patients presenting with cardiogenic shock.

In patients presenting with cardiogenic shock

- However, the observational data did not support IABP therapy adjunctive to primary PCI.
- However, all available observational data concerning IABP therapy in the setting of cardiogenic shock is importantly hampered by bias and confounding.
- Therefore, we should wait the result of ongoing trial.

In patients presenting with cardiogenic shock

- The time of IABP insertion is very important.
- The use of IABP was more beneficial when it was inserted before PCI than after PCI.


Thank You !!
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