Acute coronary syndrome with Cardiogenic Shock

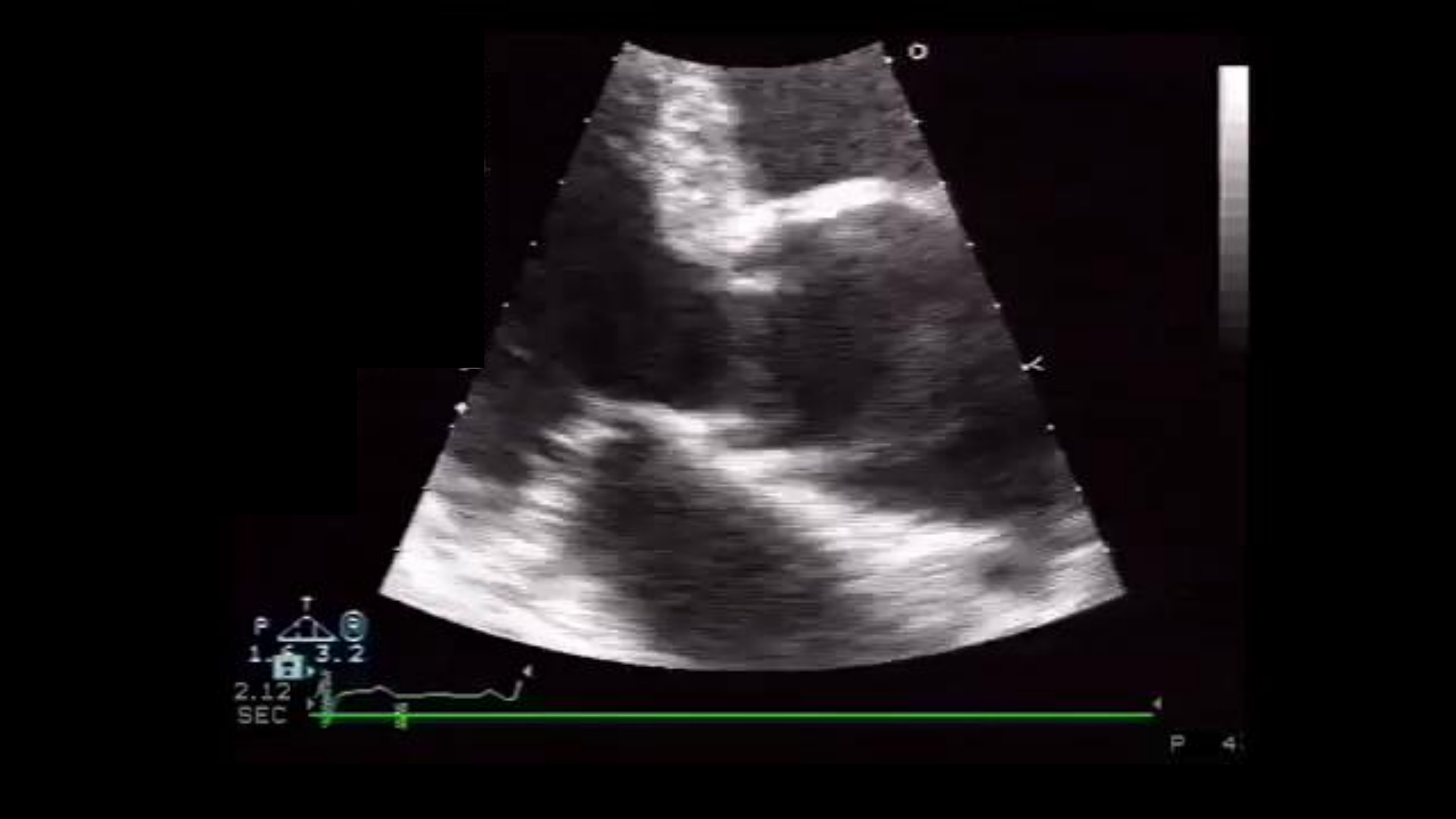
Chaisiri Wanlapakorn MD, MSc.
Cardiovascular Unit
Cardiac Center
King Chulalongkorn Memorial Hospital

The first 3 things to do

Echo

Echo

Echo


P
1.6
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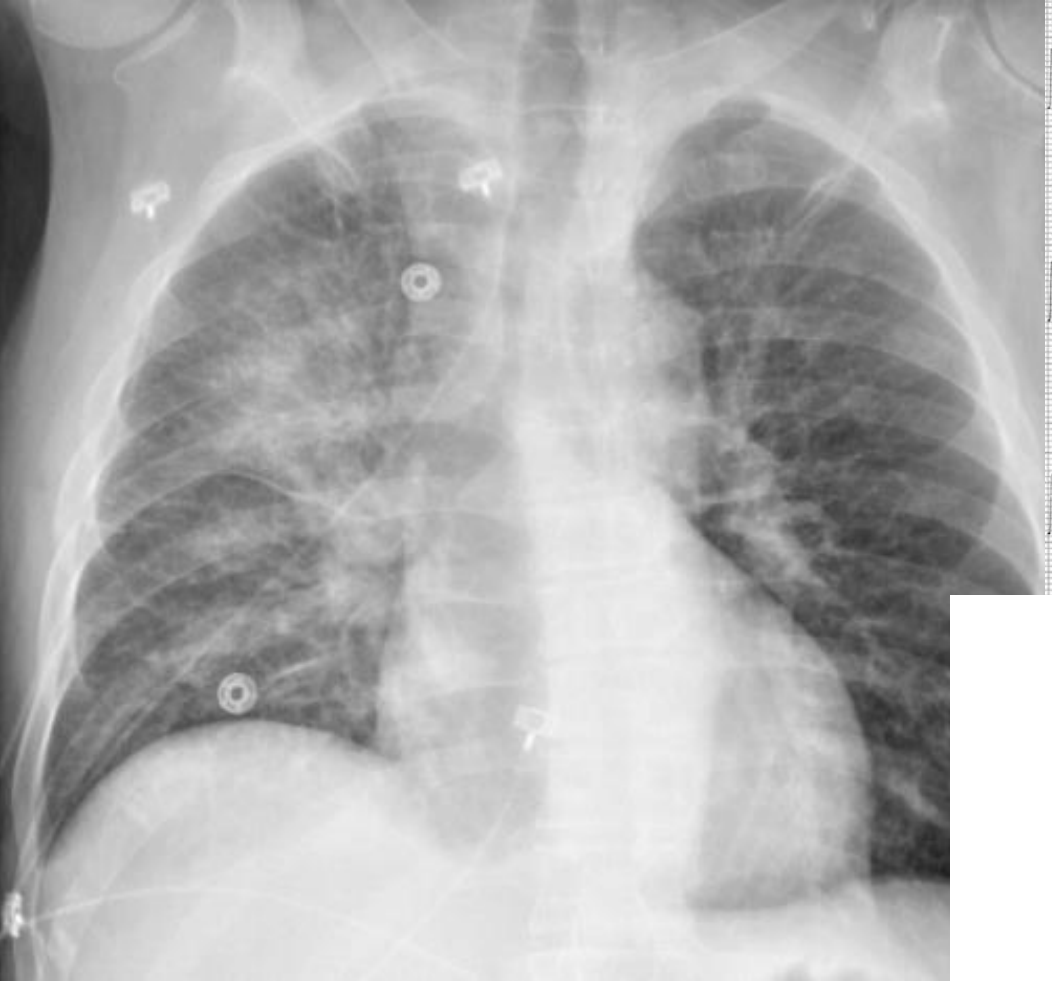
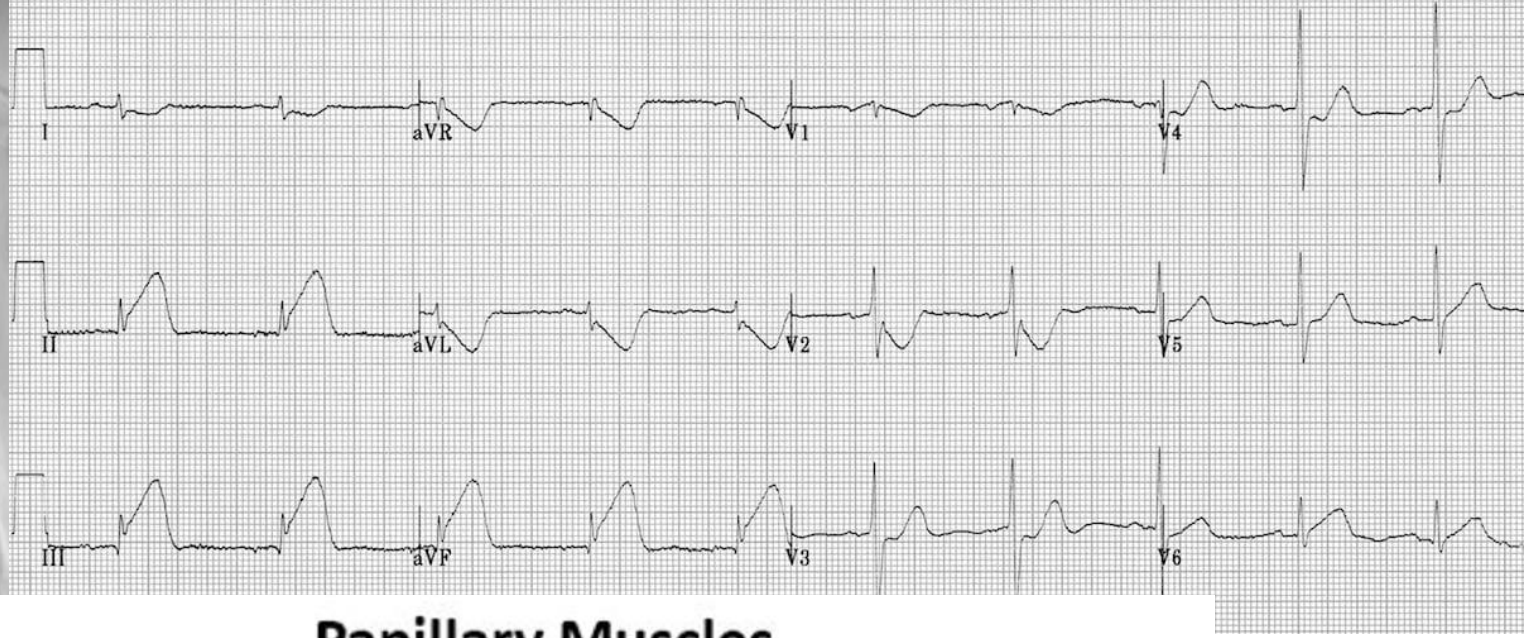
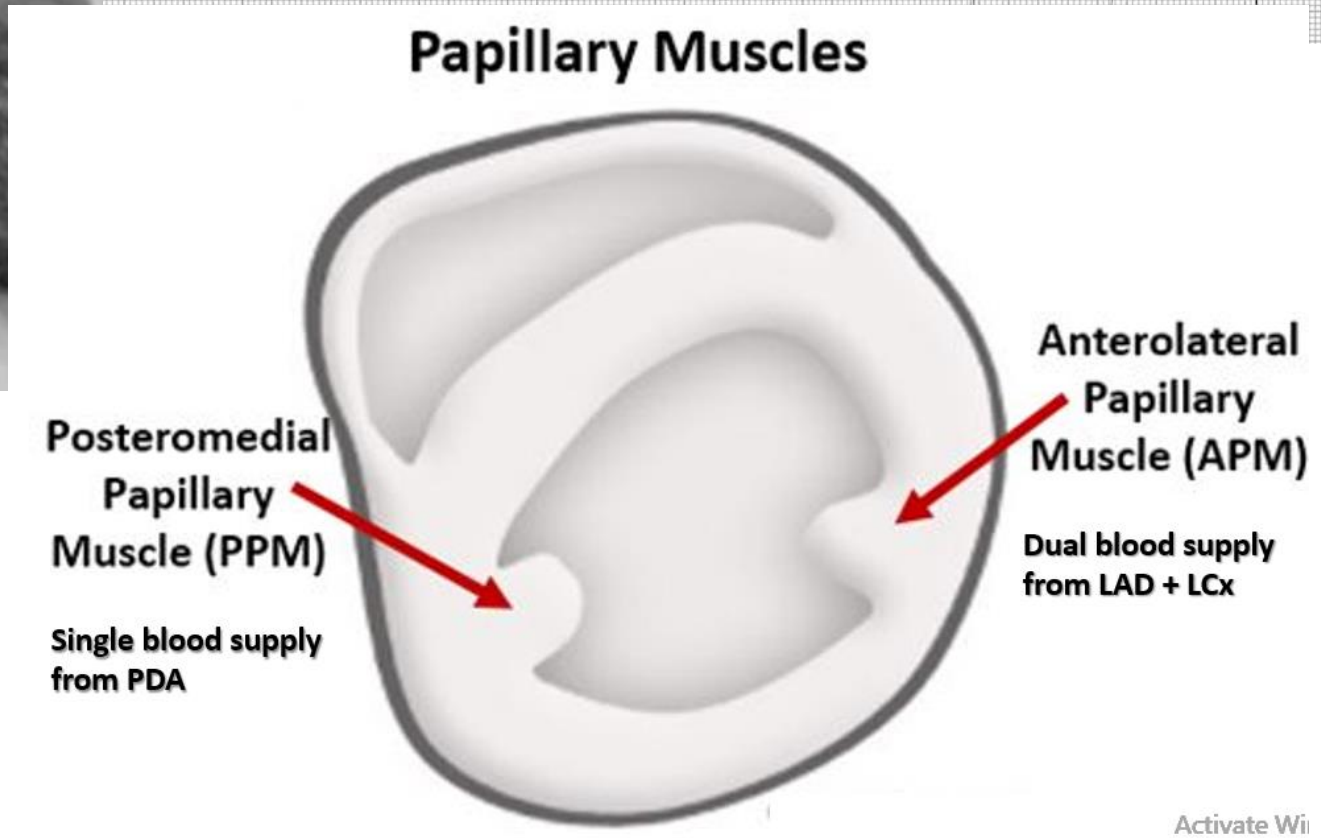
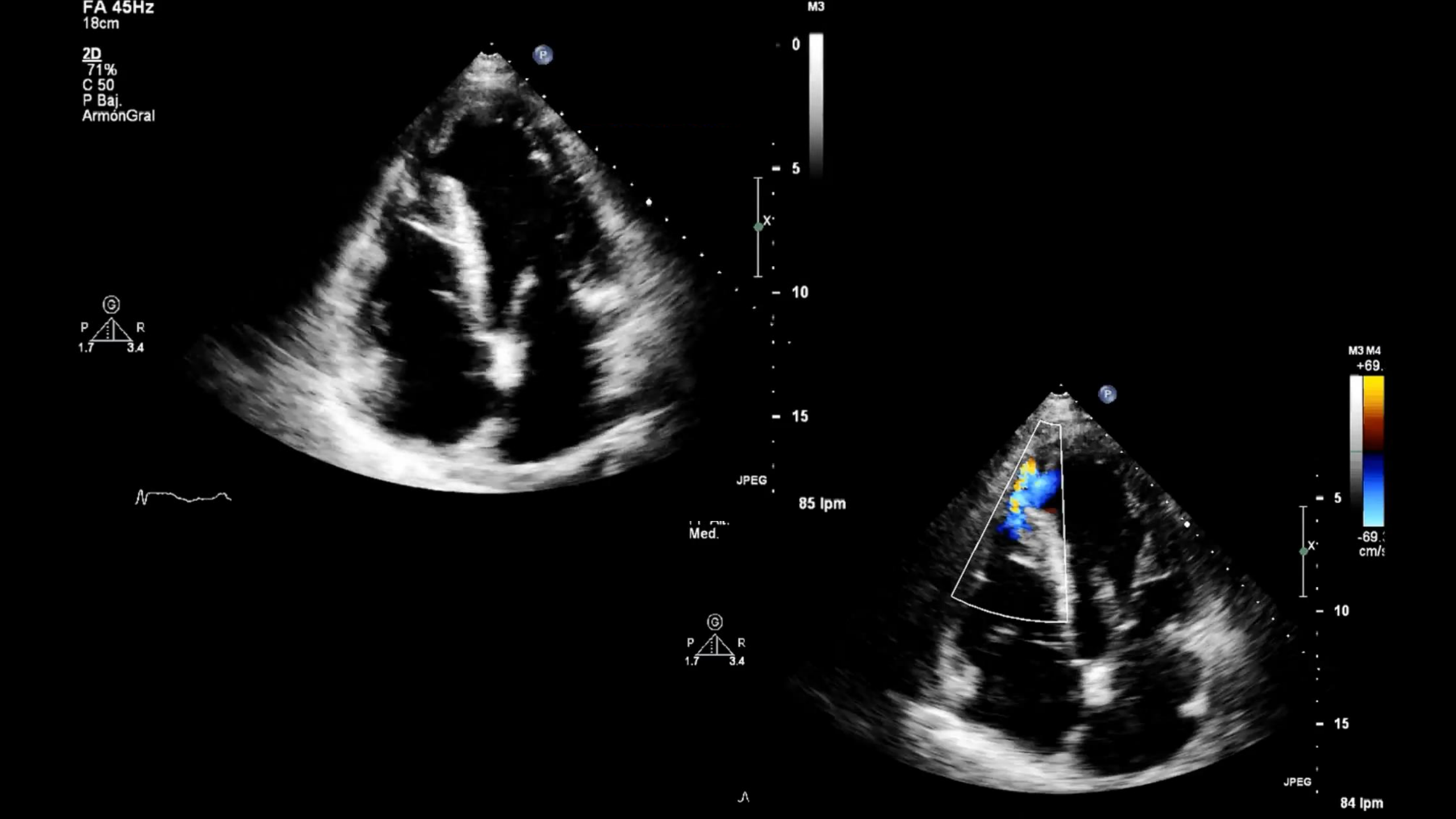



I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6


Papillary Muscles
Posteromedial Papillary Muscle (PPM)
Single blood supply from PDA
Anterolateral Papillary Muscle (APM)
Dual blood supply from LAD + LCx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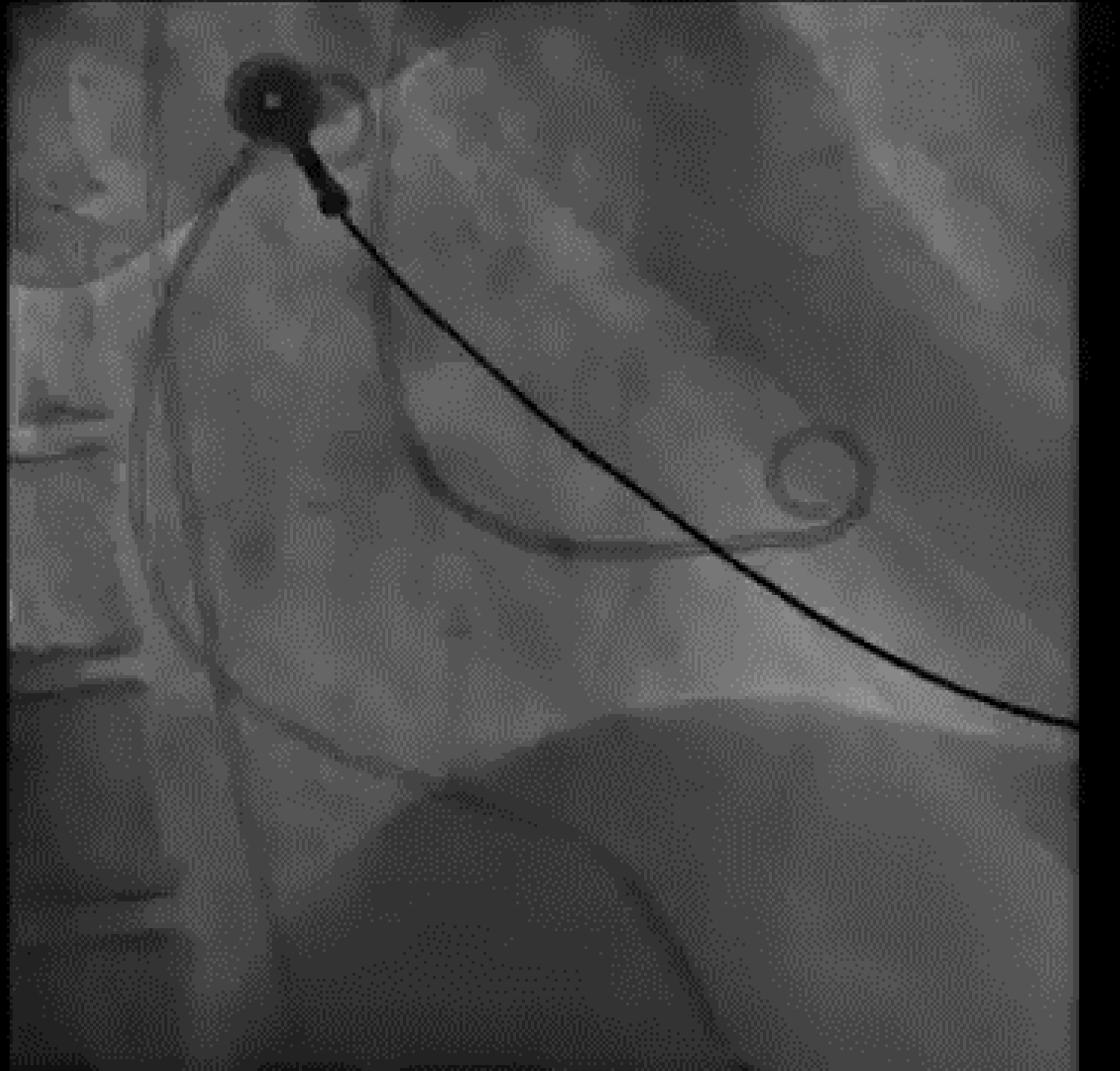


	Ruptured ventricular septum	Ruptured free wall	Ruptured papillary muscle with severe MR
Incidence	< 1%	< 1%	< 1%
Onset	2-7 days	2-7 days	2-7 days
Related territory	Any	Any	Most likely inferior wall
Symptom	Shock	Cardiac tamponade	Acute heart failure
Sign	PSM and systolic thrill	Tamponade physiology Distant heart sound	Low intensity and short duration murmur
Invasive monitoring	Oxygen step up Giant V wave	Blunt Y descend Diastolic equalization	Giant V wave

ACS with cardiogenic shock

- Cardiogenic shock

  - Persistent hypotension (SBP < 90 mmHg) despite adequate filling status with signs of hypoperfusion.

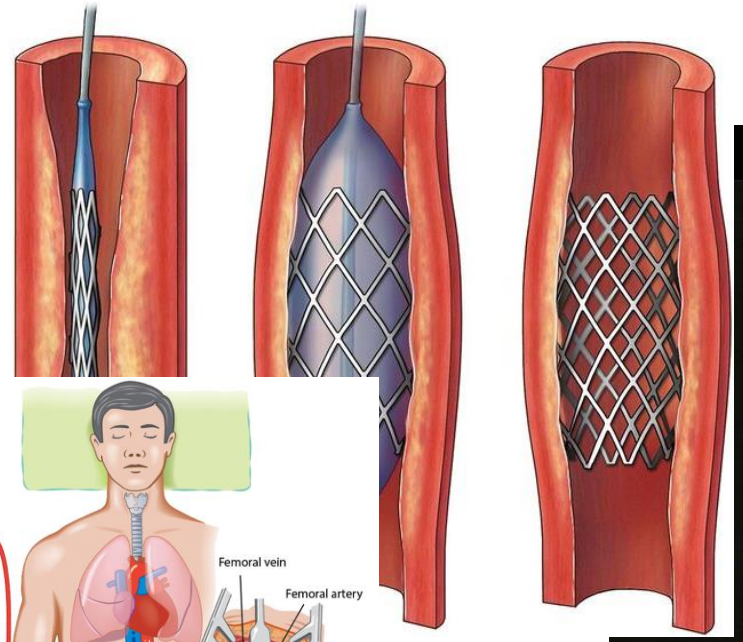
- 6-10% of all STEMI cases (NSTEMI ???)
- In-hospital mortality rate ≥ 50%

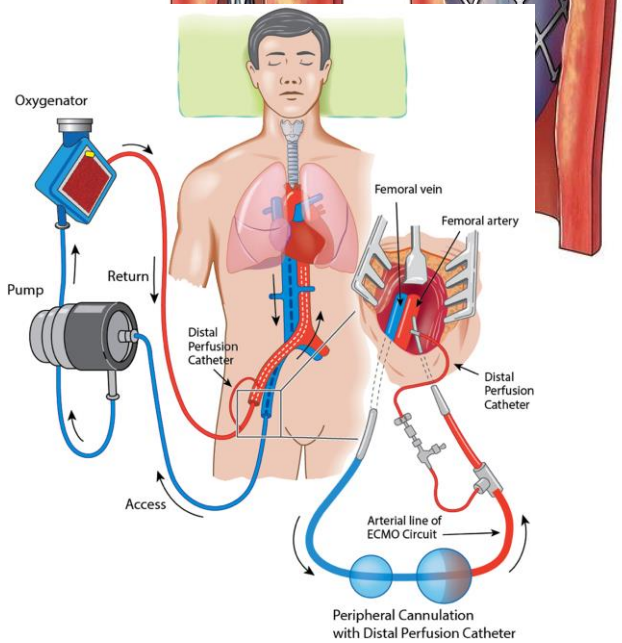
Circulation 2009;119(9):1211–1219

ACS with cardiogenic shock

- Mechanical complication
- Large area of infarction
- Culprit lesion is a collateral giver
- Double culprit lesions
- Pre-existing LV dysfunction
- Multivessel disease
- RV infarction

What about the evidences?





The New England
Journal of Medicine

VOLUME 341 AUGUST 26, 1999 NUMBER 9

SHOCK

EARLY REVASCULARIZATION IN ACUTE MYOCARDIAL INFARCTION COMPLICATED BY CARDIOGENIC SHOCK

JUDITH S. HOCHMAN, M.D., LYNN A. SLEEPER, SC.D., JOHN G. WEBB, M.D., TIMOTHY A. SANBOR
HARVEY D. WHITE, D.SC., J. DAVID TALLEY, M.D., CHRISTOPHER E. BULLER, M.D., ALICE K. JACOB
JAMES N. SLATER, M.D., JACQUES COL, M.D., SONJA M. MCKINLAY, PH.D., AND THIERRY H. LEJEM
FOR THE SHOCK INVESTIGATORS*

- **Acute MI with cardiogenic shock (N = 302)**
- **Revascularization vs Medical treatment**
- **Revascularization**
  - **PCI**
  - **CABG**
- **30-day mortality: 46% vs 56%**
- **6-month mortality: 50% vs 63%**

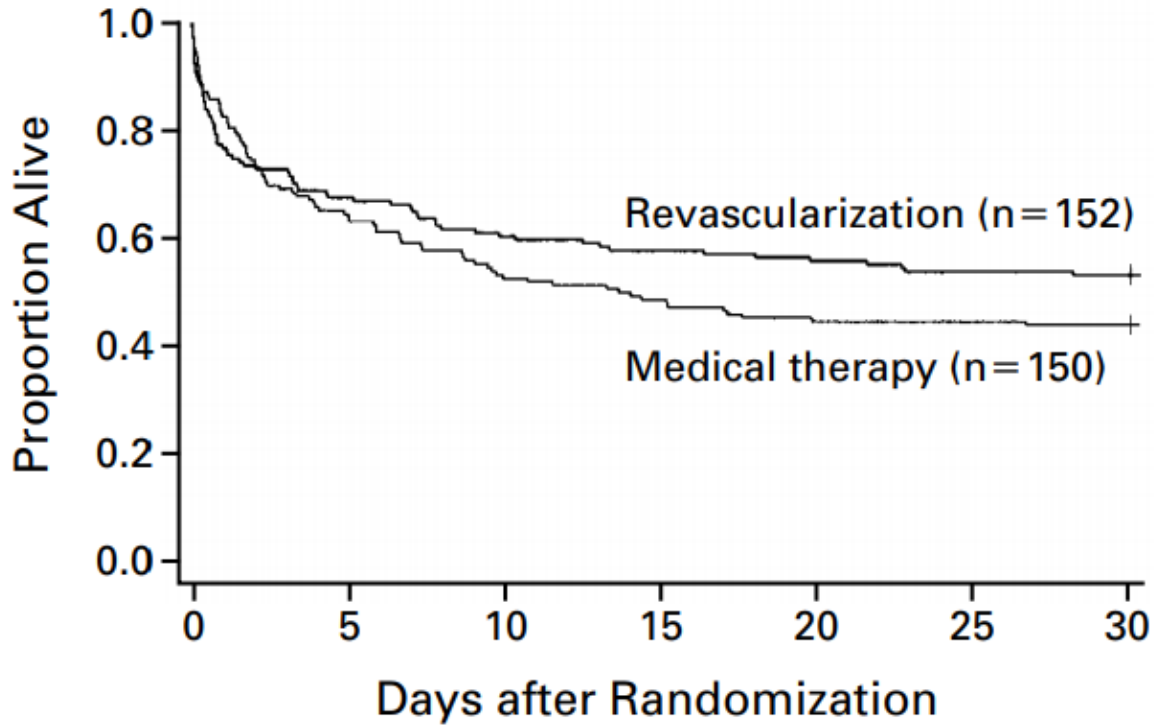


Figure 1. Overall 30-Day Survival in the Study.

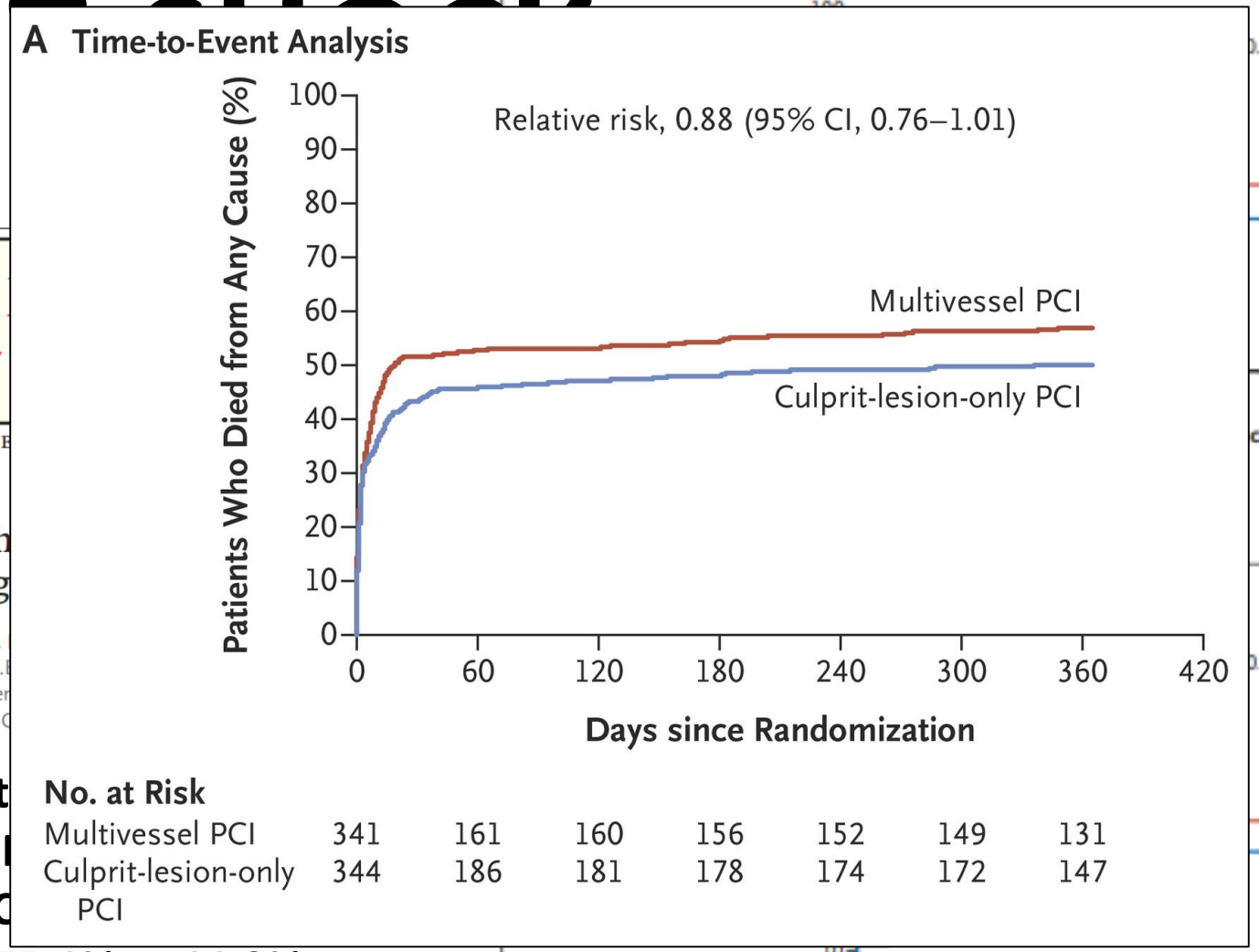
CULPRIT-SHOCK

The NEW E
JOURNAL of
ESTABLISHED IN 1812 DECEMBE

PCI Strategies in Patients with
and Cardiog

H. Thiele, I. Akin, M. Sandri, G. Fuernau, S. de Waha, R.
C. Skurk, A. Fach, H. Lapp, J.J. Piek, M. Noc, T. Goslar, S.
G. Montalescot, O. Barthelemy, K. Huber, S. Windecker
S. Desch, and U. Zeymer, for the C

- **Acute MI with mult**
  cardiogenic shock (
- **Multivessel PCI vs C**
- **Primary outcome: 55.4% vs 44.9%**
- **30-day mortality: 51.5% vs 43.3%**
- **RRT: 16.4% vs 11.6%**



The NEW ENGLAND JOURNAL of MEDICINE

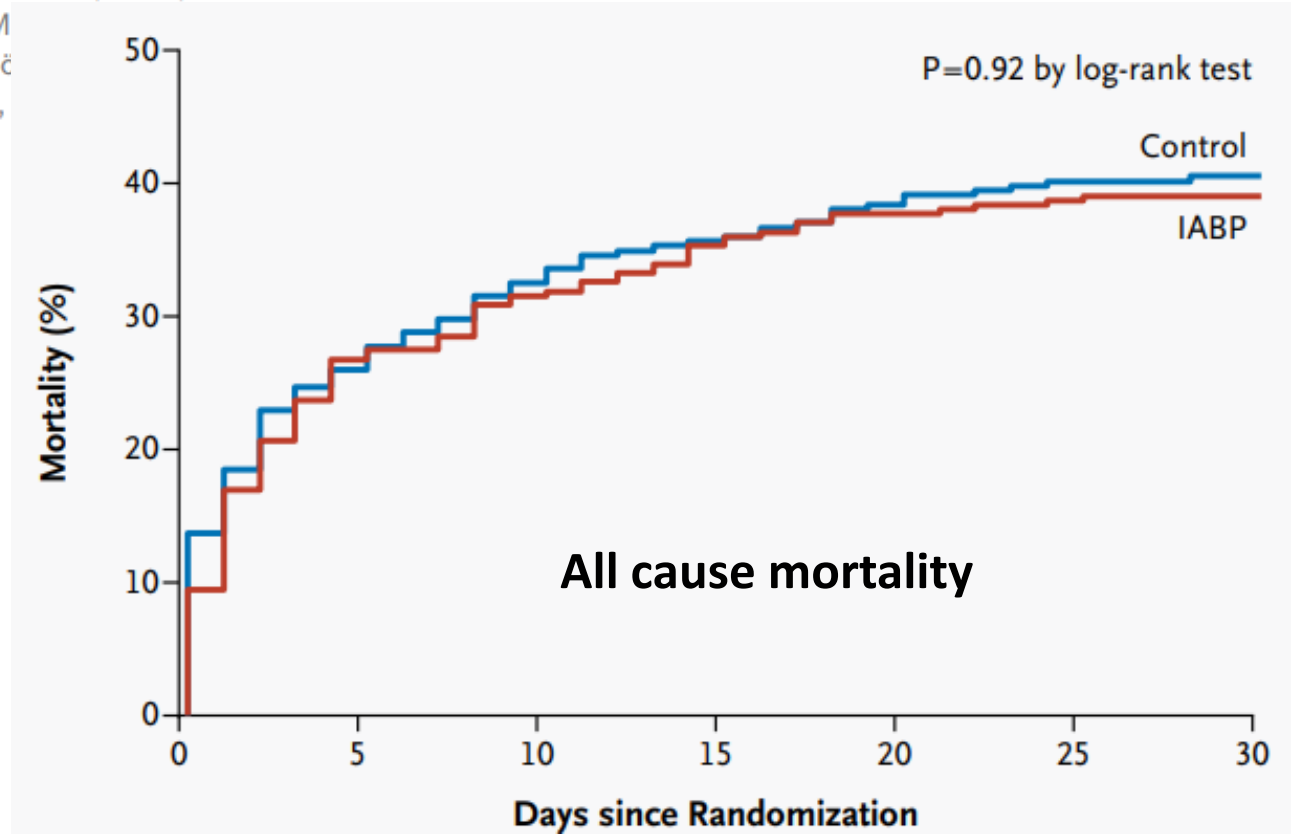
ESTABLISHED IN 1812 OCTOBER 4, 2012 VOL. 367 NO. 14

IABP-SHOCK II

Intraaortic Balloon Support for Myocardial Infarction with Cardiogenic Shock

Holger Thiele, M.D., Uwe Zeymer, M.D., Franz-Josef Neumann, M.D., Miroslaw Ferenc, M.D., Hans-Georg Olbrich, M.D., Jörg Hausleiter, M.D., Gert Richardt, M.D., Marcus Hennersdorf, M Georg Fuernau, M.D., Steffen Desch, M.D., Ingo Eitel, M.D., Rainer Hambrecht, M.D., Jö Michael Böhm, M.D., Henning Ebelt, M.D., Steffen Schneider, Ph.D., Gerhard Schuler, M.D., for the IABP-SHOCK II Trial Investigators*

- **Acute MI with cardiogenic shock (N = 600)**
- **IABP vs Control**
- **STEMI ≈ 70%, NSTEMI ≈ 30%**
- **30-day mortality: 39.7% vs 41.3%**
- **Reinfarction: 3.0% vs 1.3%**
- **Stroke: 0.7% vs 1.7%**
- **Stent thrombosis: 1.3% vs 1.0%**



LVAD vs IABP

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

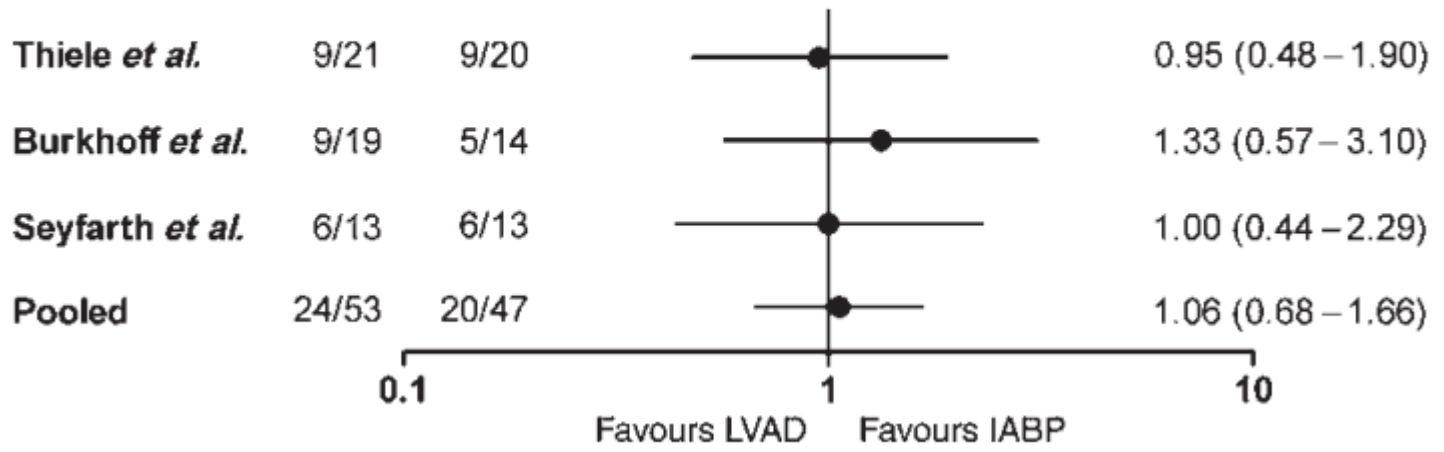
**Jin M. Cheng, Corstiaan A. den Uil*, Sanne E. Hoeks, Martin v
Lucia S.D. Jewbali, Ron T. van Domburg, and Patrick W. Serru**

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

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

Table 1 Study characteristics of included trials

	Thiele *et al.*[16]	Burkhoff *et al.*[17]	Seyfarth *et al.*[18]
Percutaneous LVAD used	TandemHeart	TandemHeart	Impella LP2.5
Control	IABP	IABP	IABP
Total number of patients	41	33	26
Setting	Single-centre	Multi-centre	Two-centre
Inclusion period	2000–2003	2002–2004	2004–2007
Randomization	Yes	Yes	Yes
Sequence generation	Drawing envelopes	Not reported	Not reported
Concealment of allocation	Sealed envelopes[a]	Not reported	Not reported
Blinding	Not possible	Not possible	Not possible
Handling of	Complete	Complete	Complete



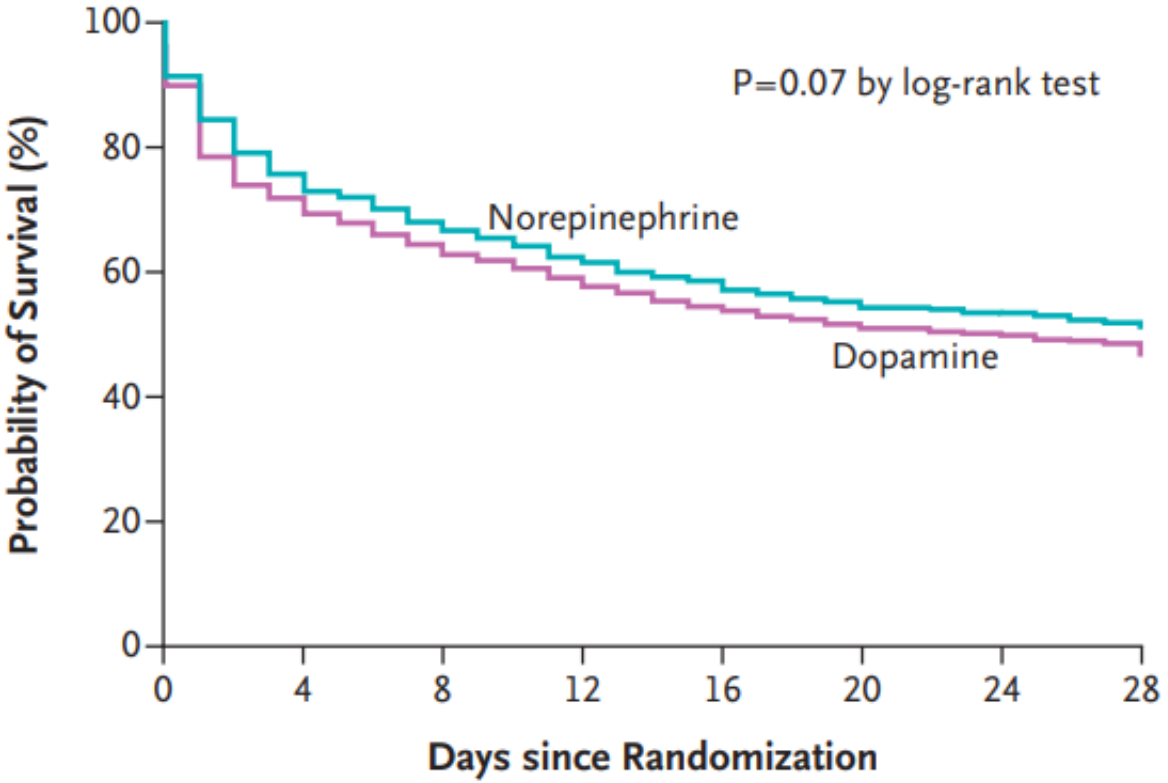
SOAP II

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MARCH 4, 2010 VOL. 362 NO. 9

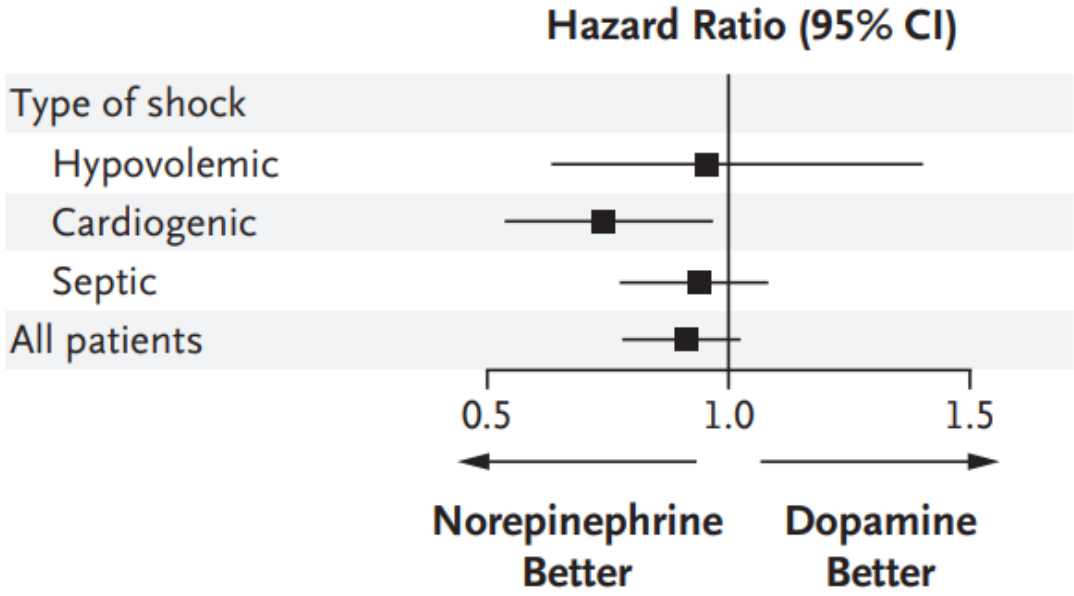
Comparison of Dopamine and Norepinephrine in the Treatment of Shock

Daniel De Backer, M.D., Ph.D., Patrick Biston, M.D., Jacques Devriendt, M.D., Christian Madl, M.D.
Didier Chochrad, M.D., Cesar Aldecoa, M.D., Alexandre Brasseur, M.D., Pierre Defrance, M.D.,
Philippe Gottignies, M.D., and Jean-Louis Vincent, M.D., Ph.D., for the SOAP II Investigators*



- **Patients with shock (N = 1,679)**
- **Dopamine vs Norepinephrine**
- **28-day mortality: 52.5% vs 48.5%**
- **Subgroup cardiogenic shock (N = 280, 17%)**

- The rate of death at 28 days was significantly higher among patients who were treated with dopamine than among those who were treated with norepinephrine



Thrombolysis in cardiogenic shock

TABLE III Summary of Treatment Results for Patients with Cardiogenic Shock or Hypotension

Trial	Therapy	Total Sample Size	Number and % of Patients in CS		Mortality Findings (treated)	Mortality Findings (untreated)
			No.	%		
GISSI	Stk. vs control	11,806	280	2.4	69.9% (in-hospital)	70.1% (in-hospital)
Dioguardi et al	Stk. vs control	321	34	10.6	No data reported	No data reported
AIMS	APSAC vs control	1,258	125	9.9*	15.3% (1 month) 15.3% (1 year)	22.7% (1 month) 31.8% (1 year)
ISIS-2	Stk. vs control	17,187	631	3.7*	27.3% (in-hospital)	35.6% (in-hospital)
International Study Group	rt-PA vs Stk.	20,768	322	1.6	rt-PA: 78.1% Stk: 64.9% (in-hospital)	

*Data for hypotensive patients, not stratified by cardiogenic shock.
AIMS = APSAC Interventional Mortality Study; APSAC = anistreplase; CS = cardiogenic shock; GISSI = Italian Group for the Study of Streptokinase in Myocardial Infarction; ISIS-2 = International Study of Infarct Survival-2; rt-PA = recombinant tissue-type plasminogen activator; Stk. = streptokinase.

(Am J Cardiol 1994;73:149–157)

What do guidelines say?

Immediate PCI is indicated for patients with cardiogenic shock if coronary anatomy is suitable. If coronary anatomy is not suitable for PCI, or PCI has failed, emergency CABG is recommended (LOE B).

Immediate Doppler echocardiography is indicated to assess ventricular and valvular functions, loading conditions, and to detect mechanical complications (LOE C).

Fibrinolysis should be considered in patients presenting with cardiogenic shock if a primary PCI strategy is not available within 120 min from STEMI diagnosis and mechanical complications have been ruled out (LOE C).

Haemodynamic assessment with pulmonary artery catheter may be considered for confirming diagnosis or guiding therapy (LOE B).

Inotropic/vasopressor agents may be considered for haemodynamic stabilization (LOE C).

Short-term mechanical support may be considered in patients in refractory shock (LOE C).

Routine intra-aortic balloon pumping is not indicated (LOE B)

In cardiogenic shock, routine revascularization of non-IRA lesions is not recommended during primary PCI (LOE B)

What I would say …

- Call for help (Class I)
- Make good friends (Class I)
- Echo (Class I)
- IABP, if there is no contraindication (Class I)
- Inotropic drugs (Class I)
- Revascularization (Class I)
- PCI at non-culprit vessel in some cases (class IIb)
- Primary PCI is the treatment of choice even in case of slightly to moderately delay Dx to wire time (class IIb)

Sometimes follow the guidelines.

Sometimes just follow your mind.