

**Is it necessary to perform
complete revascularization in
patients with chronic LV systolic
dysfunction?**

YES!, but it depends on..

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2007 Focused update of the ACC/AHA/SCAI 2005 guideline for PCI

1. No description about multi-vs disease with LV dysfunction

2. Non-invasive risk stratification

- high risk (>3% annual mortality)

 - LVEF <35%

- intermediate risk (1-3% mortality)

 - LVEF 35-49%

ESC guideline 2008

- 1. CABG/PCI should be considered in selected HF pts with CAD**
- 2. No multi-center trials assessing revascularization for the relief of HF**
- 3. Single observational study; RVSC may lead to symptomatic improvement and potentially improve cardiac function**

ACCF/SCAI/STS/AATS/AHA/ASNC 2009

Appropriateness criteria for coronary revascularization

- 3-vs disease (no LMT) with abnormal LV systolic dysfunction
 - Asymptomatic; appropriate
 - CCS class I or II; appropriate
 - CCS class III or IV; appropriate

ACCF/SCAI/STS/AATS/AHA/ASNC 2009 Appropriateness criteria for coronary revascularization

- **Method of RSVC** in pts with depressed LVEF

	PCI	CABG
2-vs with LADp	Appropriate	Appropriate
3-vs disease	Uncertain	Appropriate
Isolated LMT	Inappropriate	Appropriate
LMT with additional CAD	Inappropriate	Appropriate
Prior CABG (multiple grafts failure), patent LIMA	Appropriate	Uncertain
Prior CABG (multiple grafts failure), failure of LIMA	Uncertain	Appropriate

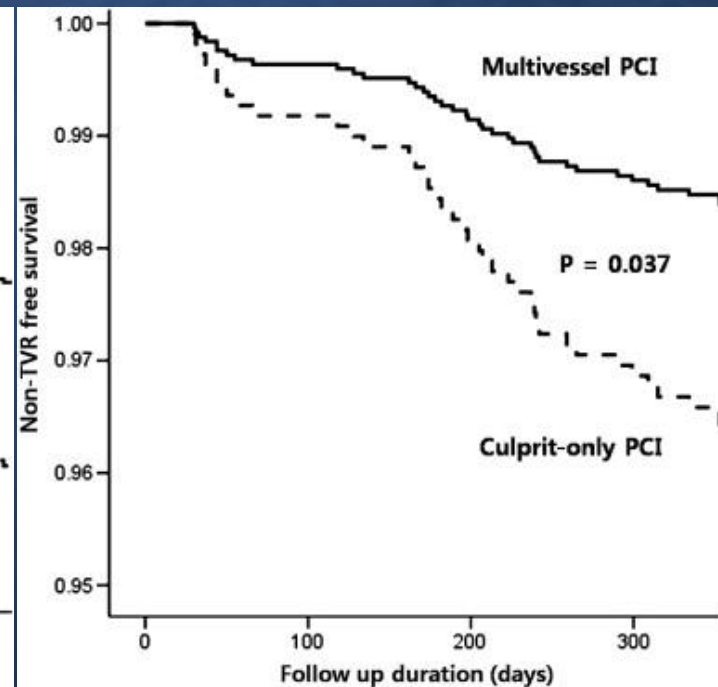
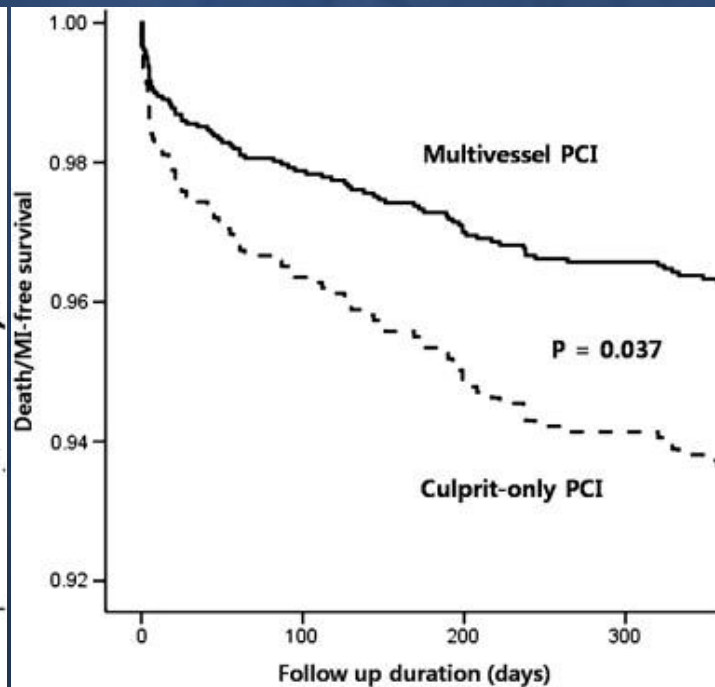
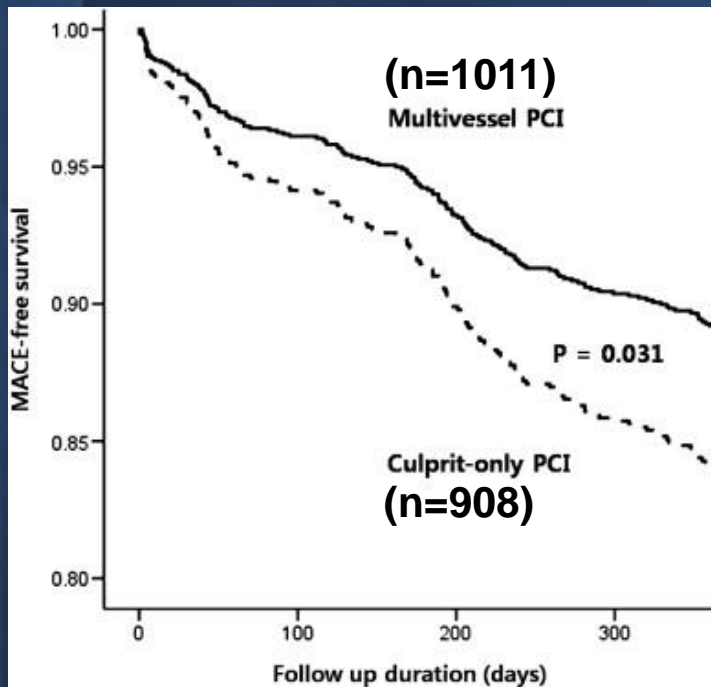
Complete vs. Incomplete RVSC in pts with chronic LV systolic dysfunction

No information in guidelines

CABG = CR (complete RVSC)

PCI = CR vs. IR

Culprit only vs. Multi-vessel PCI in NSTEMI



Primary PCI in STEMI

Class III

1. Elective PCI should not be performed in a non-IRA at the time of primary PCI of the IRA in patients ***without hemodynamic compromise.***

(Level of Evidence: C)

**Expert opinion = no RCT
= no large clinical study**

Multi-vessel PCI in AMI

Multi-vessel PCI is associated with higher

1. Re-infarction (13.0% vs. 2.8%, $p < 0.001$)

No inform about re-infarction

2. Revascularization (25% vs. 15%, $p = 0.007$)

BMS era

3. MACE (40% vs. 28%, $p = 0.006$)

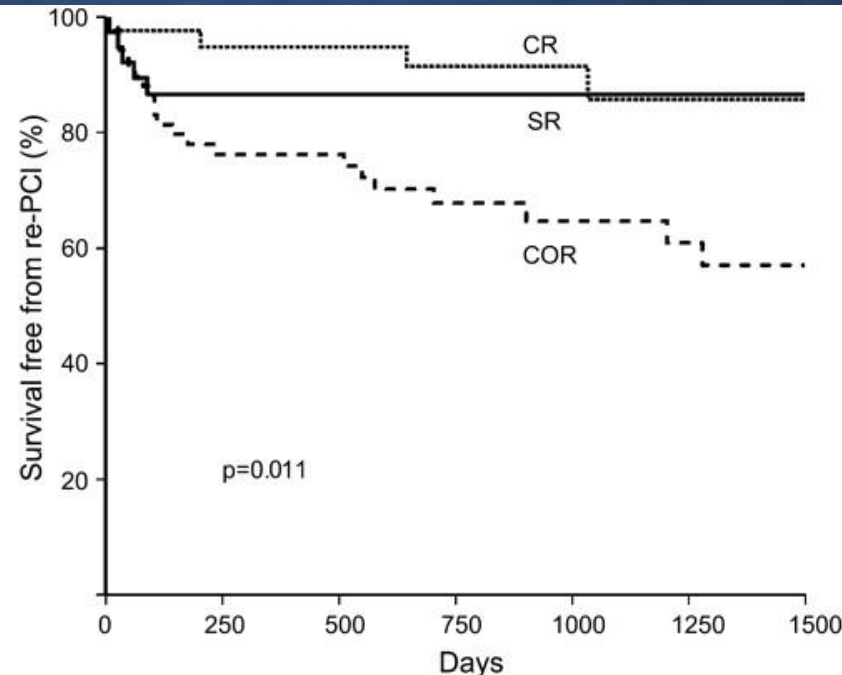
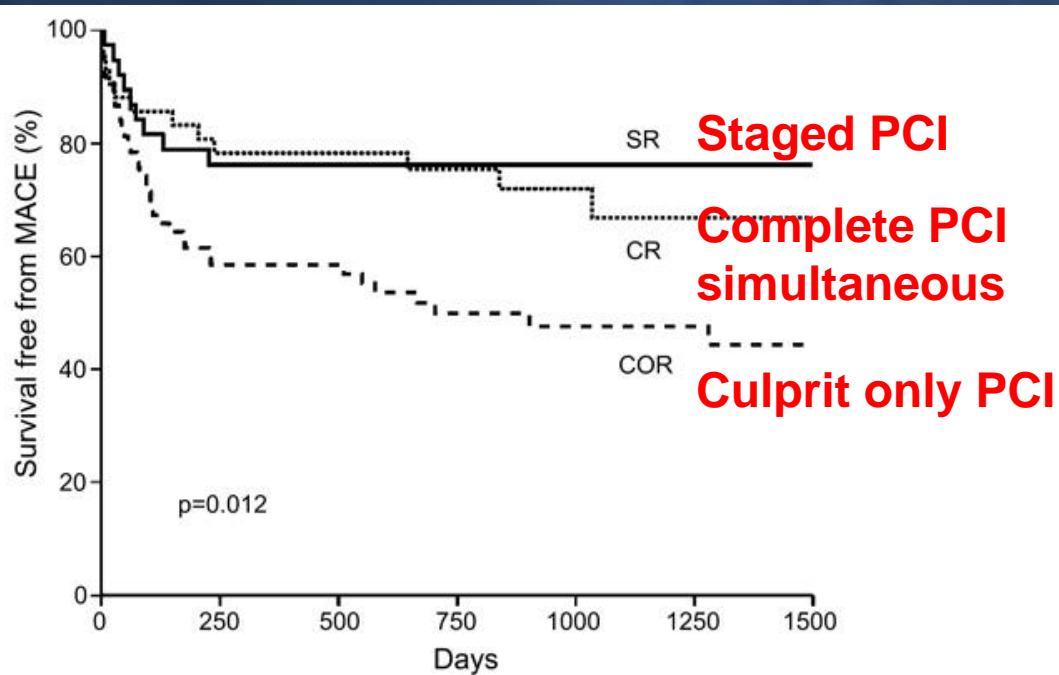
But, no difference in mortality

Conclusion: PCI should be directed at the IRA only

This is a retrospective study (selection bias)

Culprit only vs. Multi-vessel PCI in STEMI

RCT, DES era, 214 pts, 2.5 yrs FU



Pts at risk

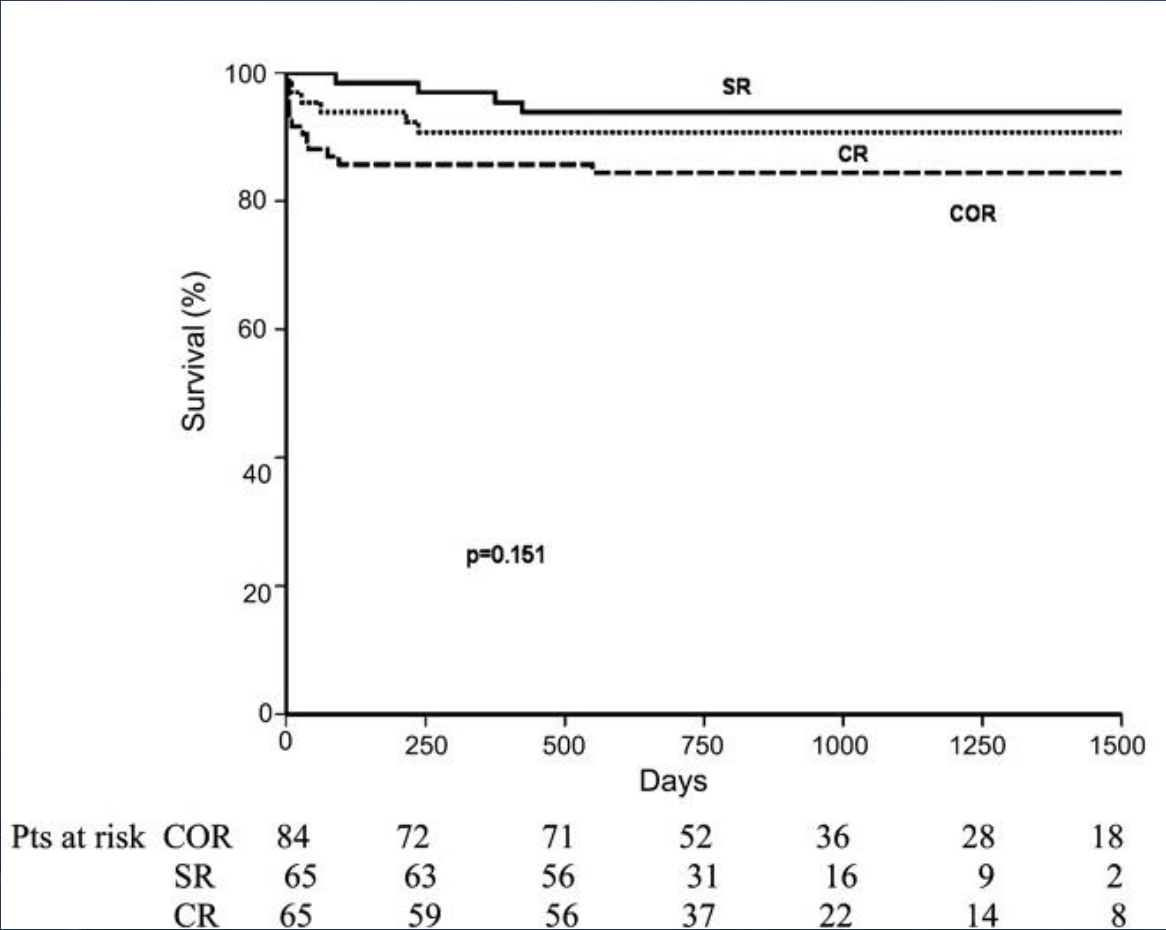
COR	84	47	40	25	17	15	8
SR	65	53	45	20	9	3	0
CR	65	53	49	28	15	6	3

Pts at risk

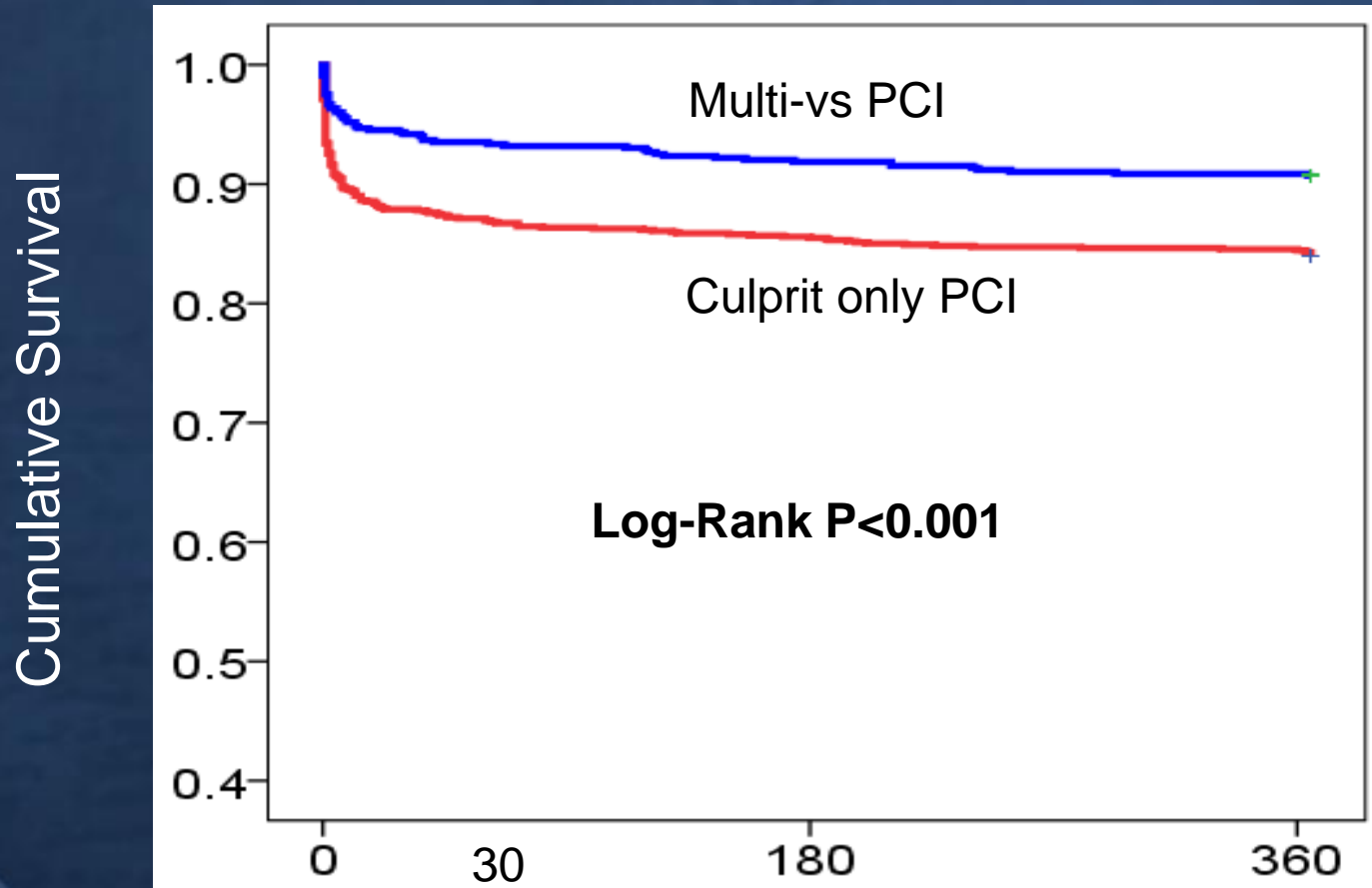
COR	84	50	41	26	17	16	9
SR	65	55	47	22	9	3	0
CR	65	56	52	29	17	7	4

MACE; in-hospital death, repeat PCI, re-hospitalization

Culprit only vs. Multi-vessel PCI in STEMI



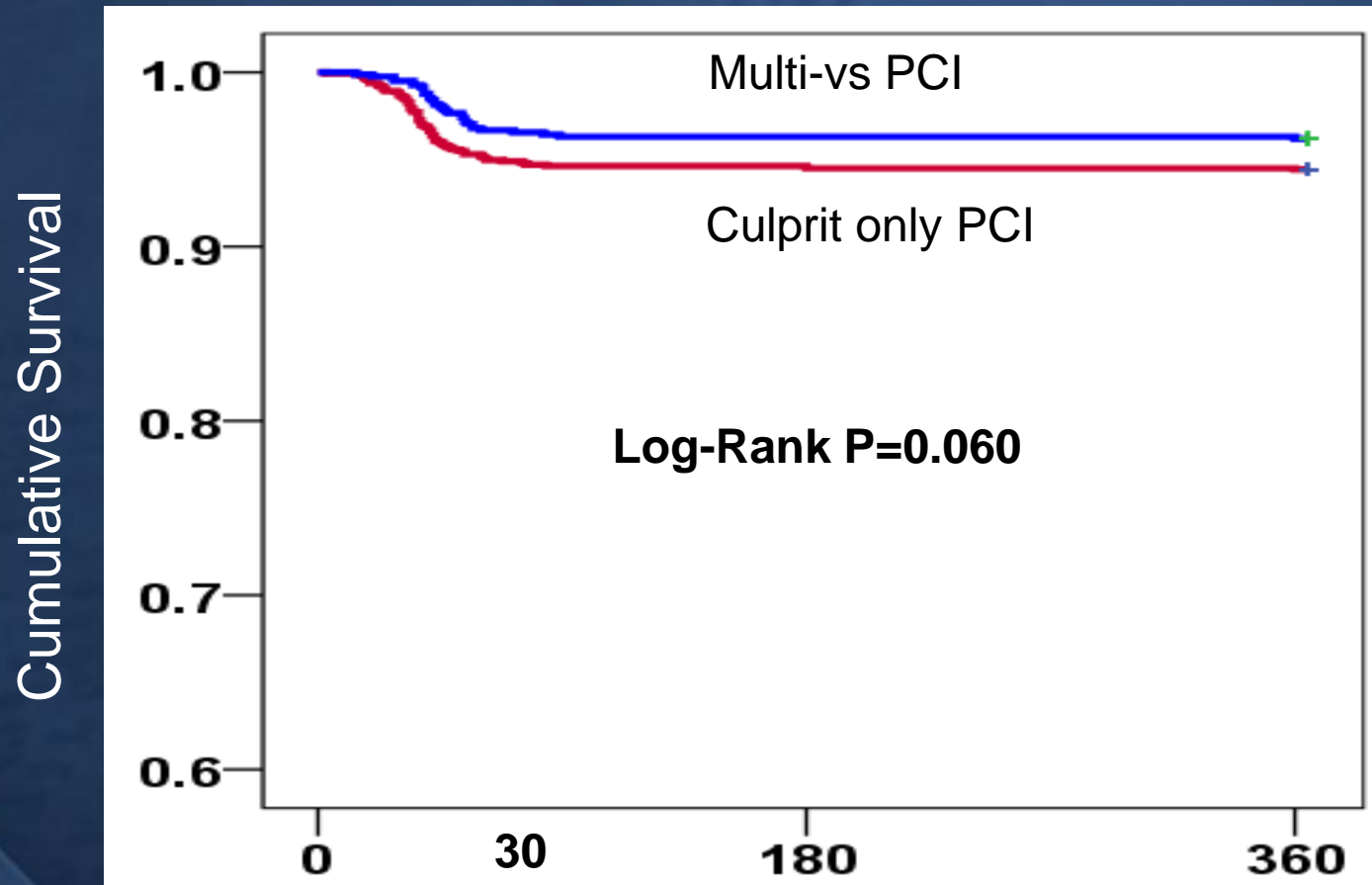
Cumulative 12-month Mortality (KAMIR data)



Events/n at Risk

Culprit only	124/1489,	14/1222,	22/1038,	8/889
Total	30/812,	14/703,	12/612,	5/552
P-value	0.000	0.136	0.827	0.991

Cumulative 12-month non-target vessel PCI



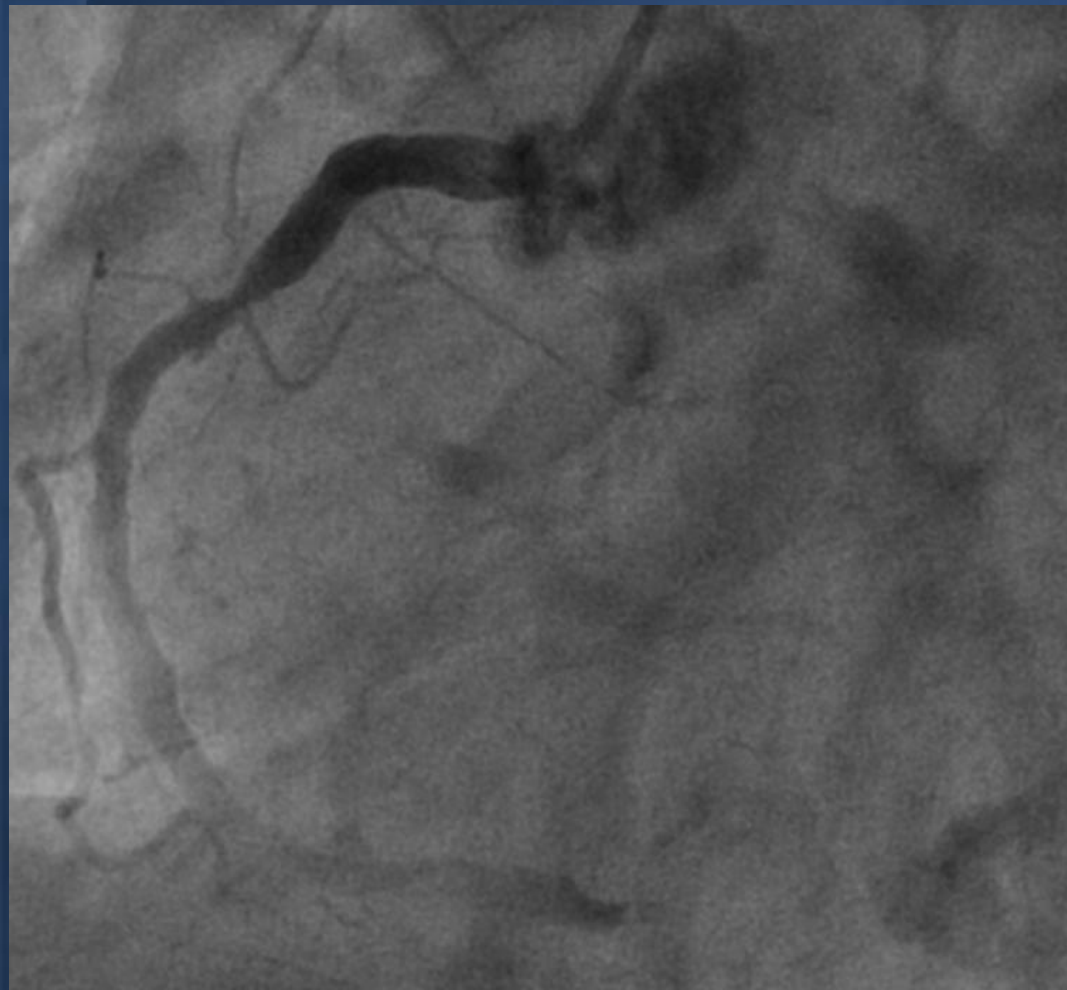
Events/n at Risk

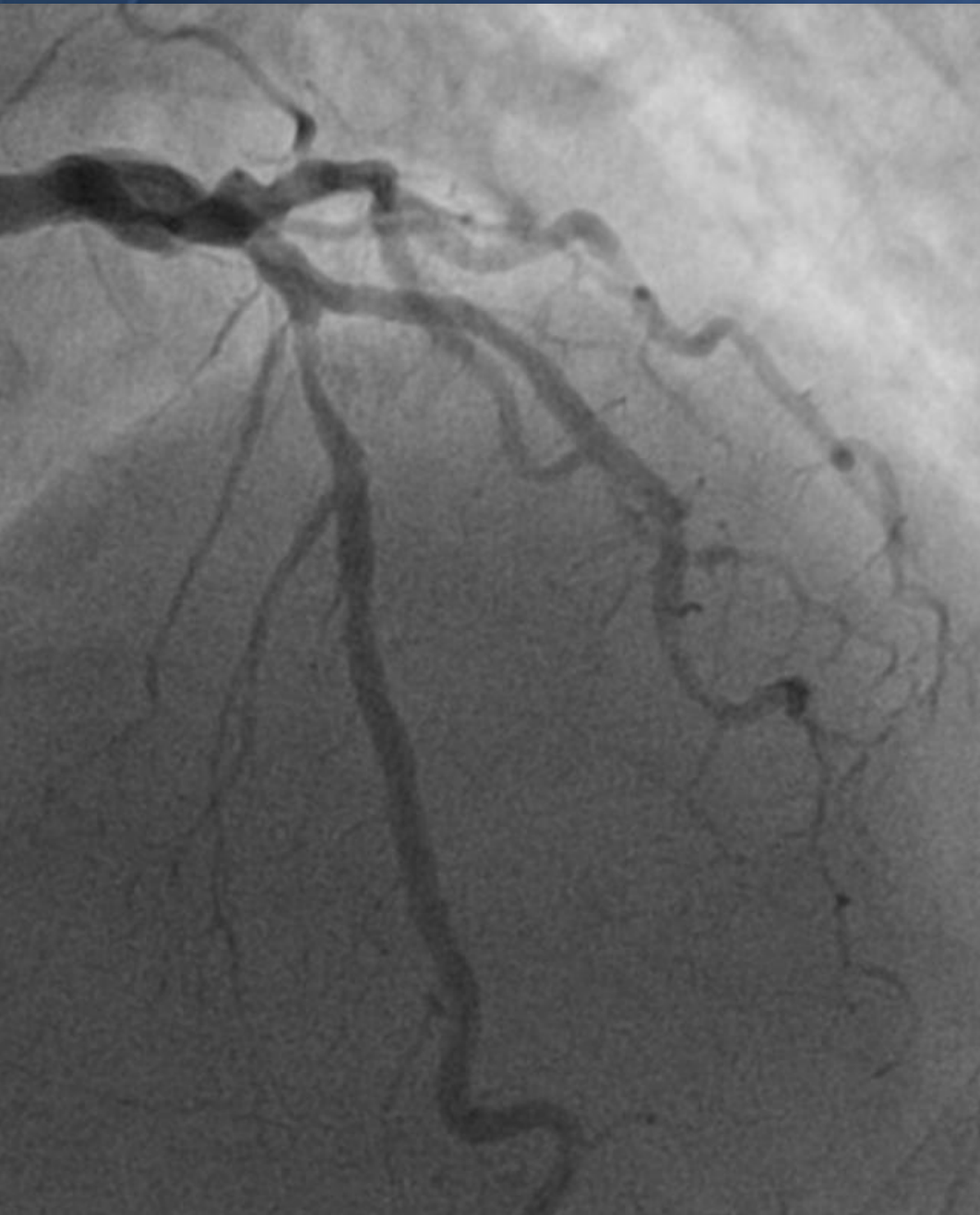
Culprit only	21/1222,	41/1038,	23/889
Multi-vessel	2/703,	25/612,	6/552
P-value	0.058	0.176	0.181

Multi-vessel disease in STEMI

1. Single-vessel acute PCI should be the default strategy (to treat only the IRA during the acute phase of STEMI).
2. Acute multi-vessel PCI can be justified only in exceptional patients with *multiple critical (>90%)* and *potentially unstable* lesions.
3. Significant lesions of the non-infarct arteries should be treated either medically or by staged revascularization procedures – *both options are currently acceptable.*

STEMI, 59/M, 2011-10-18





Hospital course

- **TTE; basal & inf. RWMA, EF=50%**
- **No pain after primary PCI**
- **Discharged 3 days after**
- **ASA, Plavix, Crestor, BB, ACEI**

FU CAG d/t UA (2011-11-26)

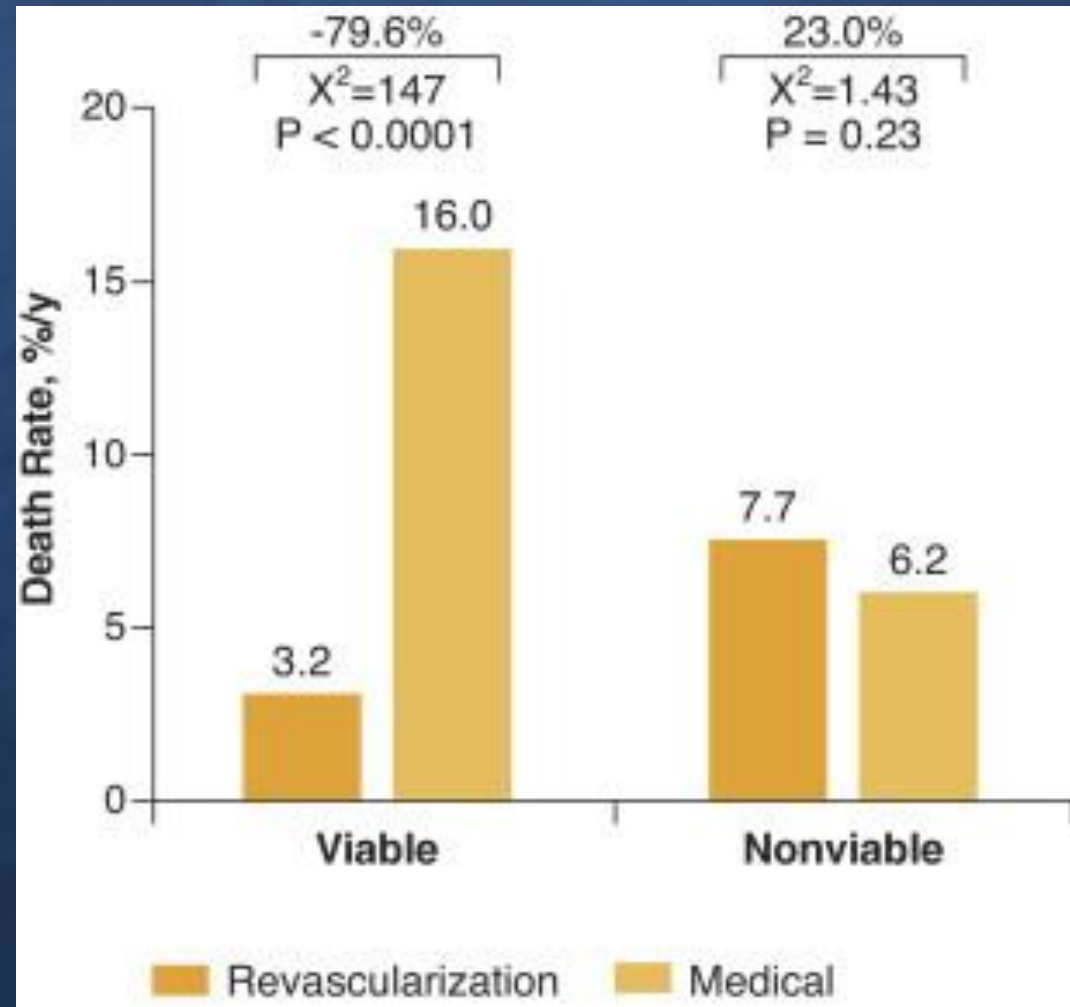






Revascularization in LVD

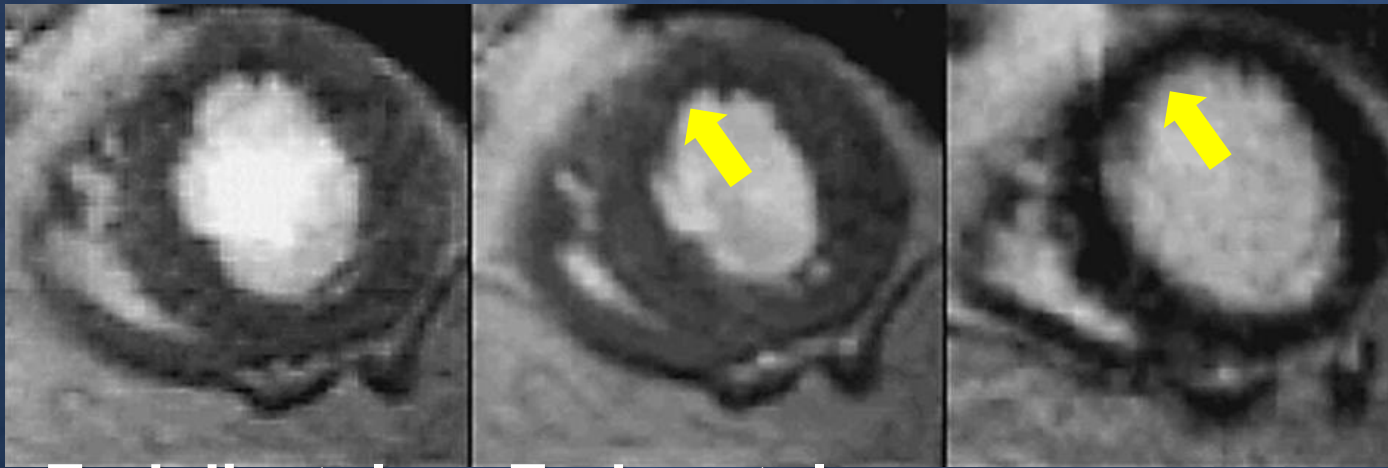
- A meta-analysis
- 3088 pts



Contrast-enhanced CMR Viability

Reversible Dysfunction

Before PCI



End diastole

End systole

No hyperenhancement

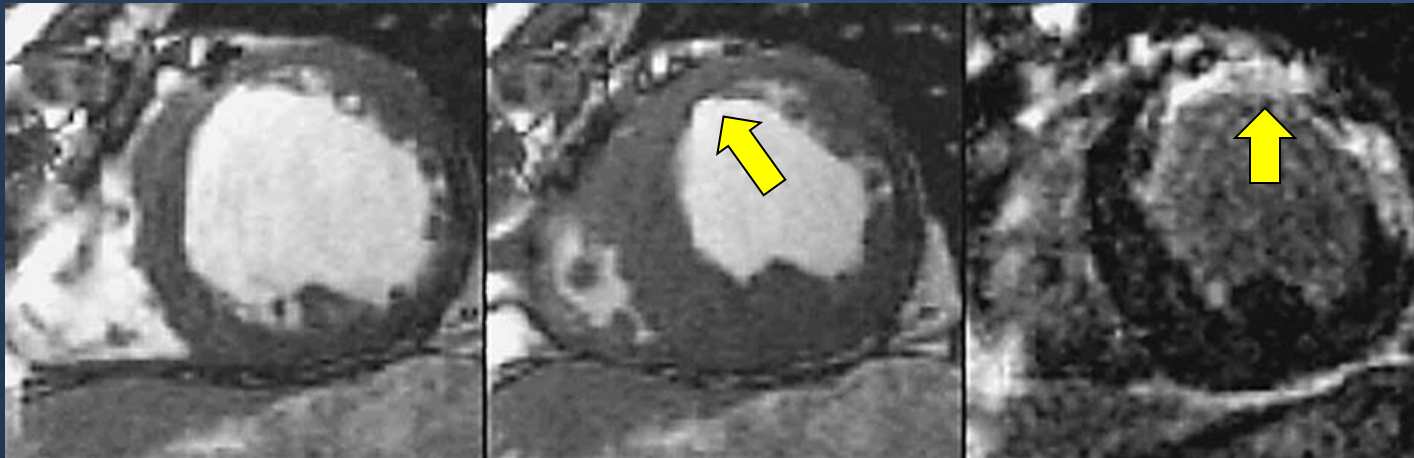
After PCI



Contrast-enhanced CMR Viability

Irreversible Dysfunction

Before PCI

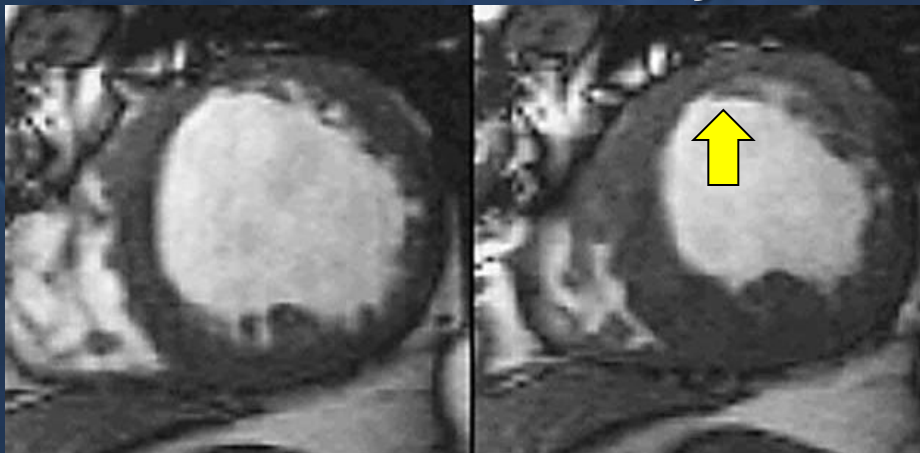


End diastole

End systole

Hyperenhancement

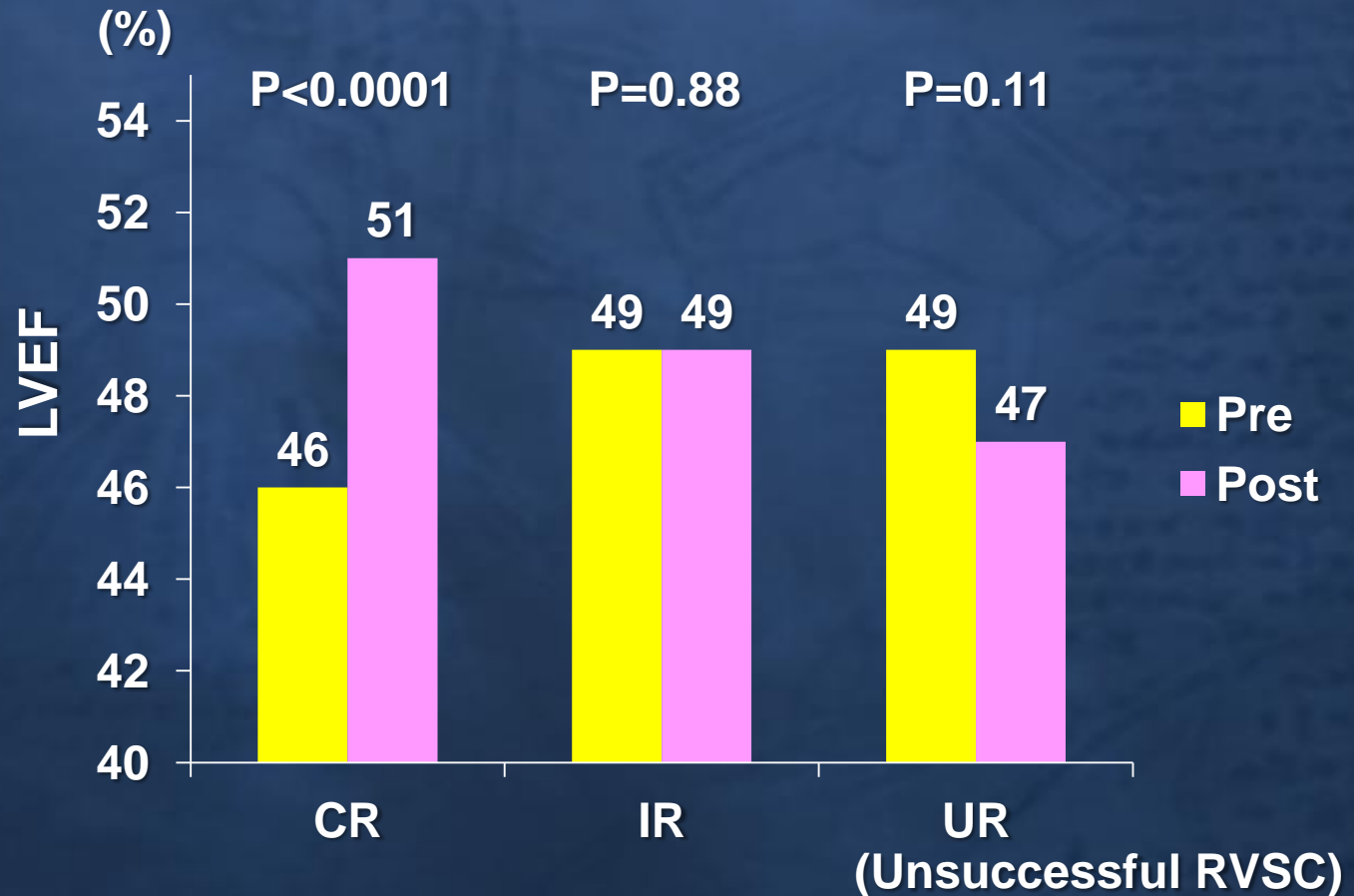
After PCI



CR vs. IR on LVEF

- TEI
(transmural extent of infarction)
=hyperenhance
total area

- TEI < 25%
;predict
functional
recovery



Dysfunctional, but viable is important

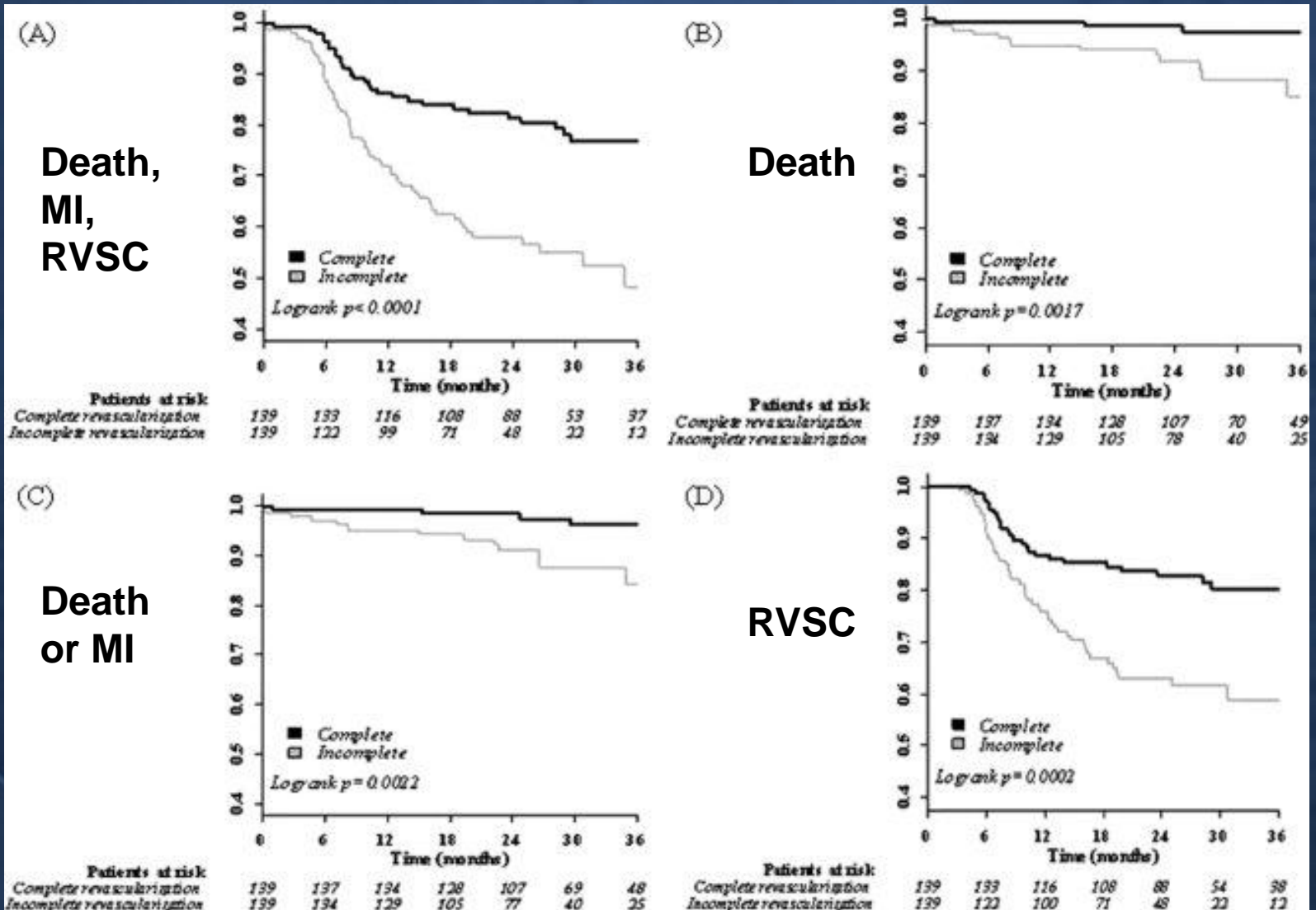
Complete vs. Incomplete RVSC in Pts with MVD undergoing PCI with DES

Propensity-matched
analysis

N=278

IR associated factor
; triple-vessel disease
; total occlusion

Retrospective



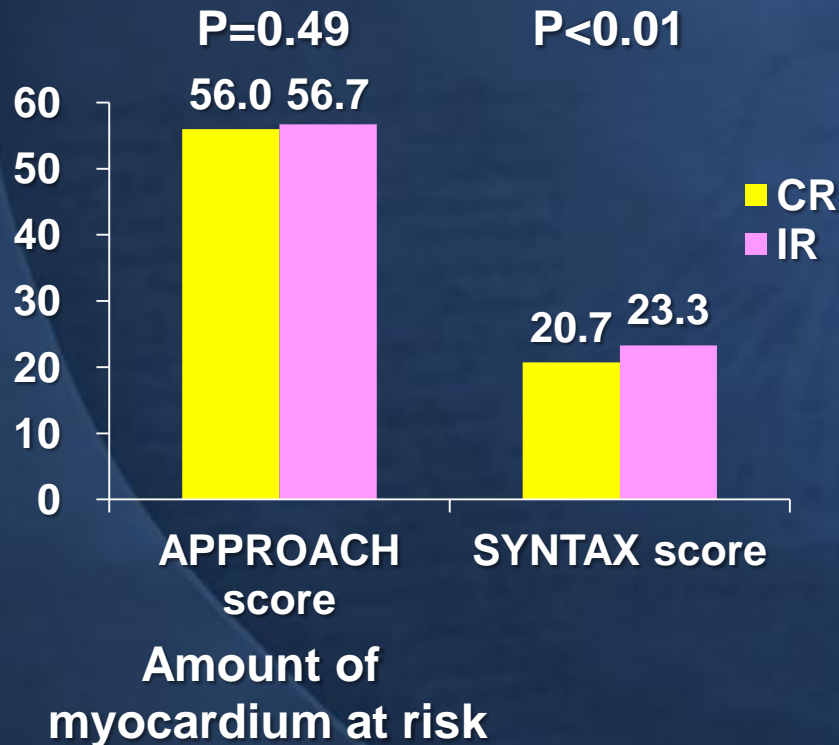
Late PCI of total occluded IRA on LVEF

A meta-analysis

- 5 studies in 648 pts
- 342 PCI vs. 306 OMT
- LVEF difference (+3.1%, p=0.0004)
- Favoring PCI

CR vs. IR for MVD in DES era

Propensity-matched analysis, 873 pts, 225 pairs



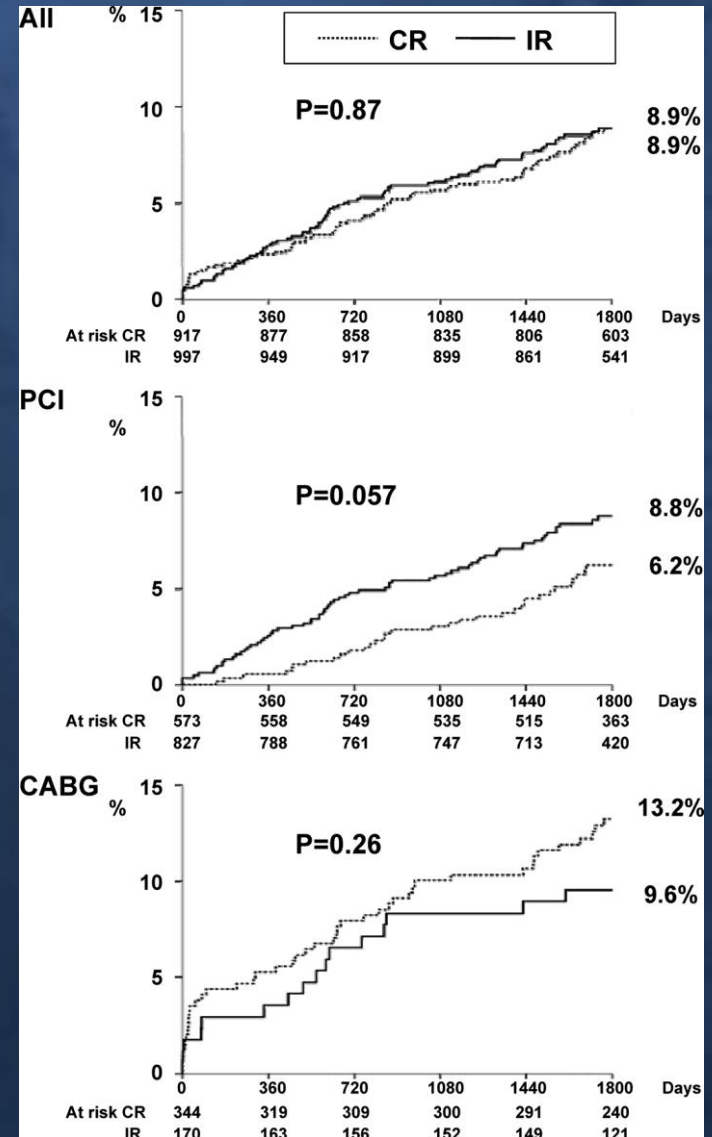
CR was associated with

- lower MACE (death, MI, RVSC)
HR 0.64, p<0.01
- lower RVSC
HR 0.61, p=0.01
- similar death, MI, ST

CR vs. IR with DES/CABG in MVD

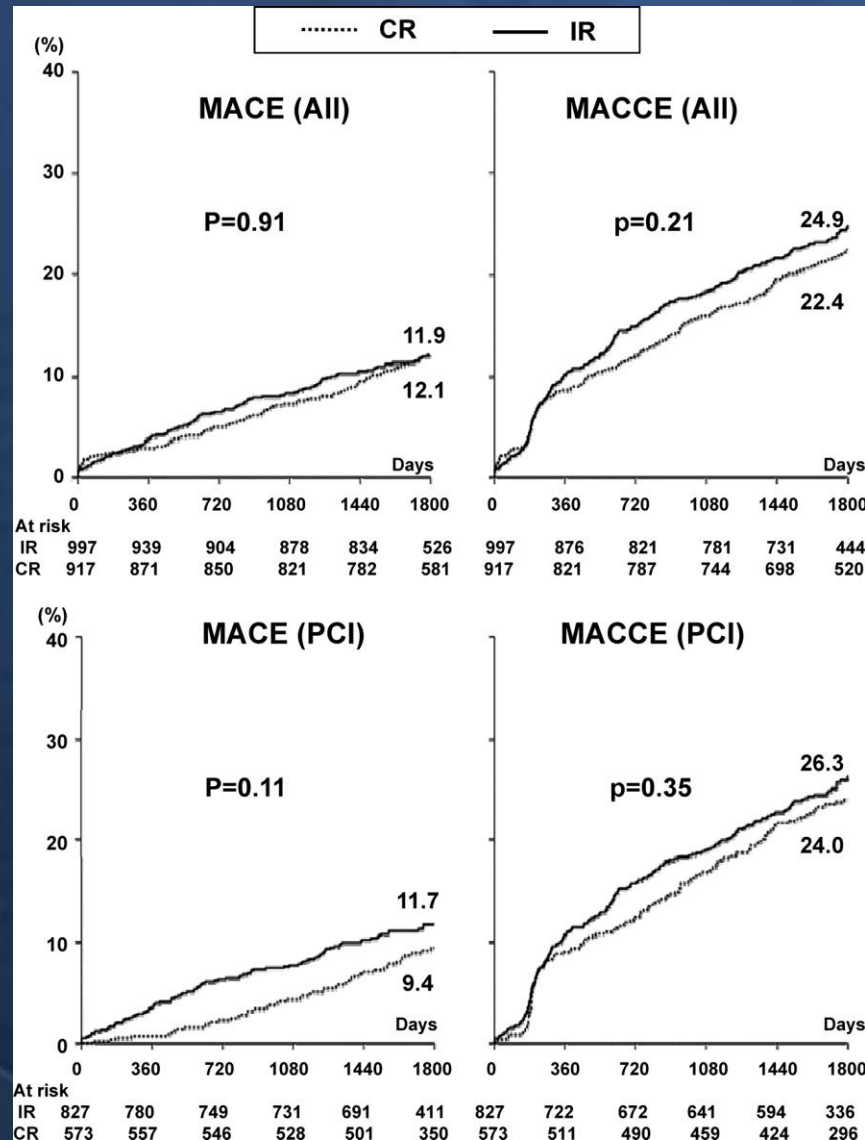
Mortality

(%) CR (complete revascularization)



CR vs. IR with DES/CABG in MVD

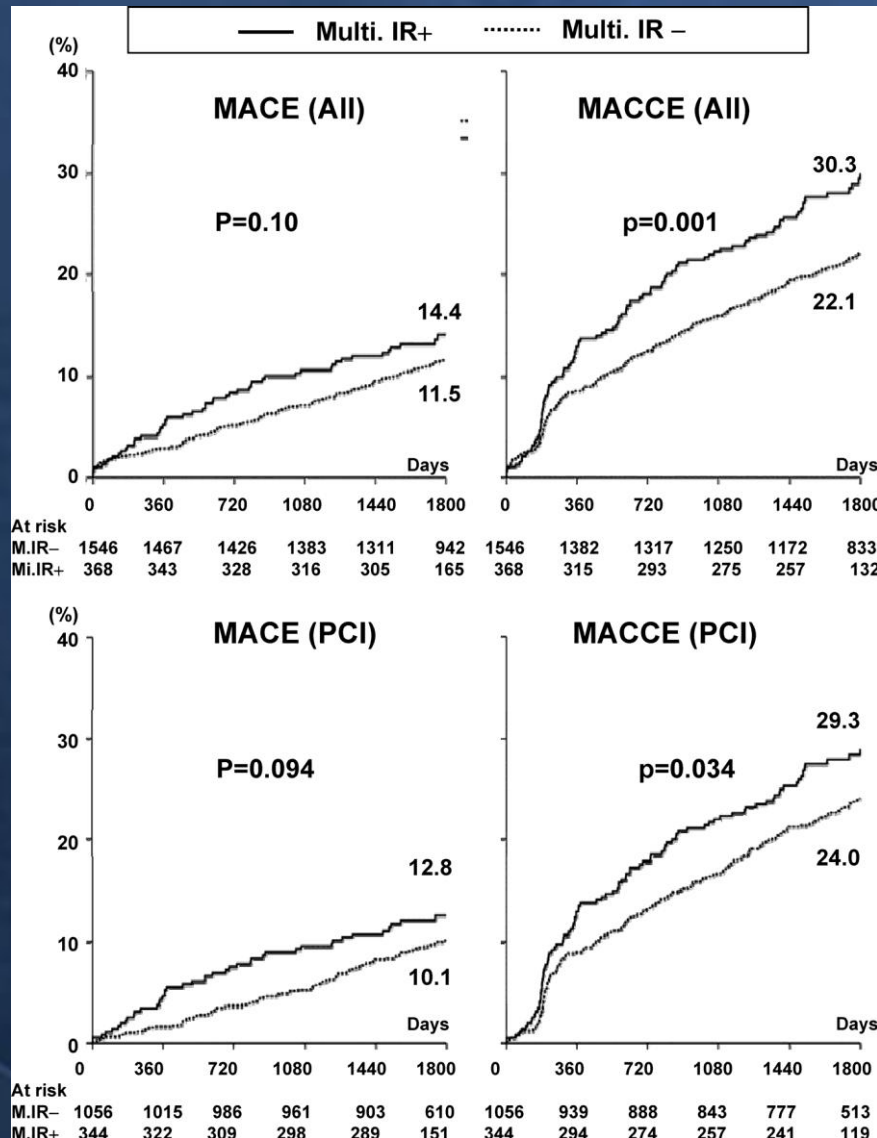
MACE
; death
+MI
+stroke



MACCE
; death
+MI
+stroke
+repeat RVSC

CR vs. IR with DES/CABG in MVD

MACE
; death
+MI
+stroke



MACCE
; death
+MI
+stroke
+repeat RVSC

CR vs. IR in MVD; a meta-analysis

- 9 studies
- CR had
 1. Lower mortality (RR: 0.82, p=0.05)
 2. Non-fatal MI (RR; 0.67, p<0.01)
 3. Subsequent CABG (RR; 0.70, p=0.02)
 4. No difference in repeat PCI

Issues in MVD with LV dysfunction

1. Reversible?

PET, SPECT, MRI, Stress Echo

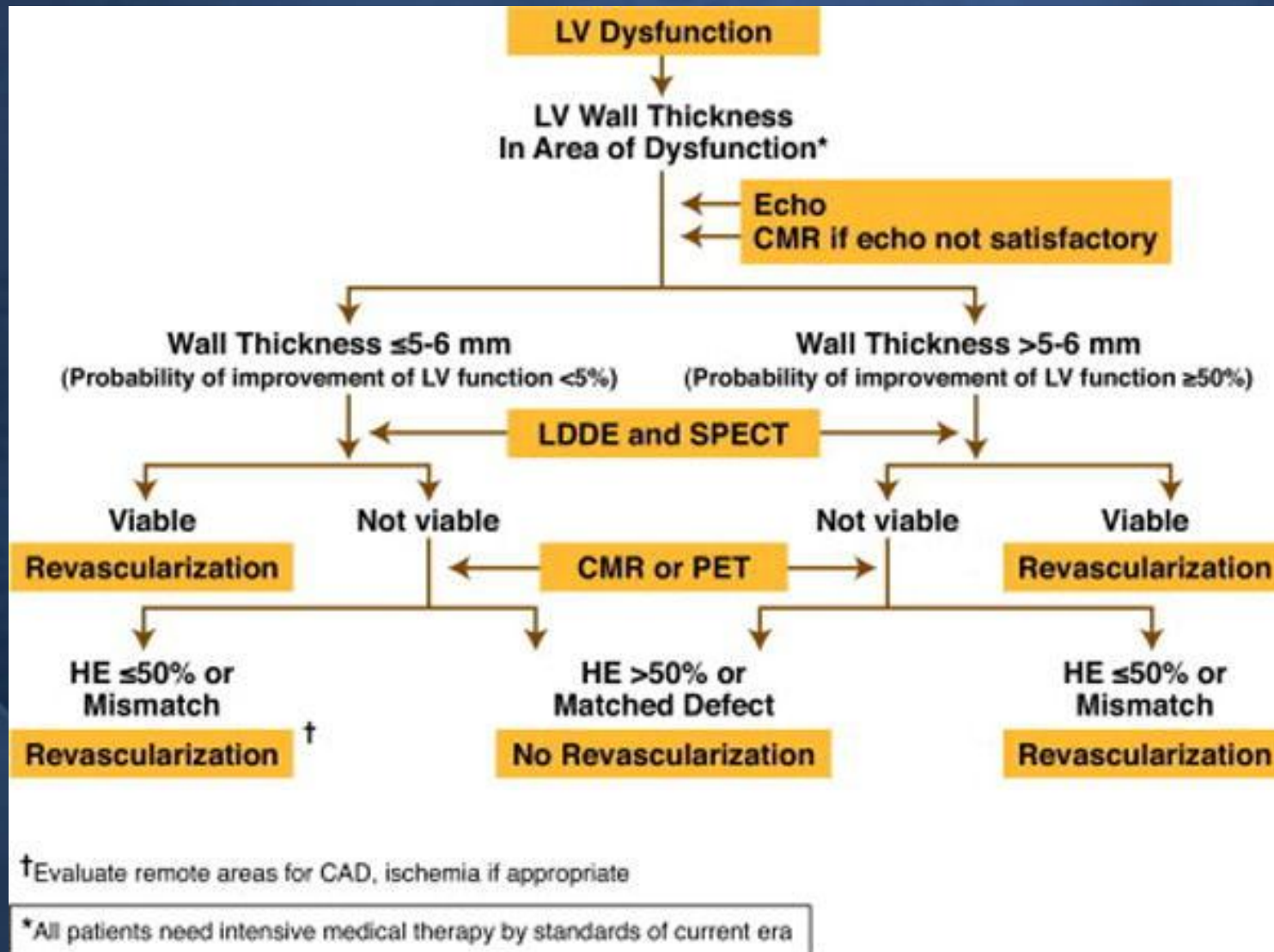
2. Ischemia associated

FFR, IVUS

3. Success vs. Safety

Lesion type, LVEF, et al..

Revascularization in LVD



Treatment in a Patient with

1. Multi-vessel disease
2. Hibernating (reversible)
3. Physiologic significance

CR

**Thank you for
your attention**