

Coronary Revascularization for Severe LV Dysfunction

*Is the concept of
viability testing still
viable ?*

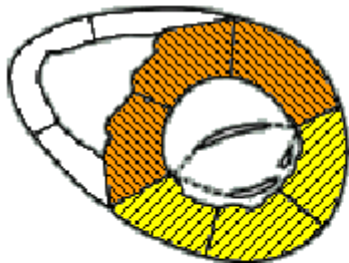
Torino2017

Before Surgery – LVEF = 26%

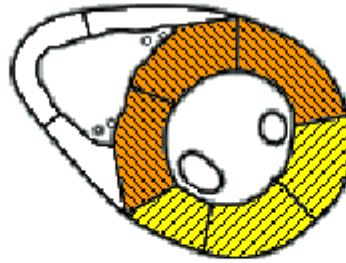
Performed 3 Oct 2003
 Printed 3 Oct 2003
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Wall Motion (Continued)

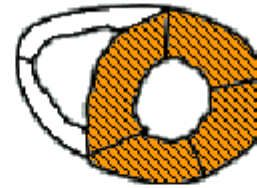
Baseline Wall Motion Score Index 2.63
 Anterior



Base



Mid



Apex

Posterior

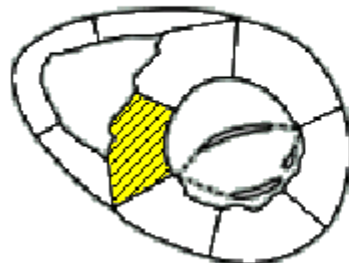
-  Normal
-  Hypokinesis
-  Akinesis
-  Dyskinesis
-  Aneurysm
-  Scarred
-  Not Seen

After Surgery – LVEF = 45%

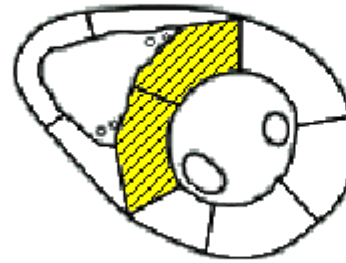
Performed 16 Jan 2004
 Printed 16 Jan 2004
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Wall Motion

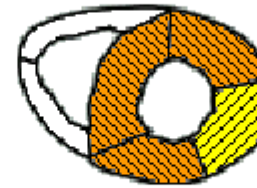
Baseline Wall Motion Score Index 1.63
 Anterior



Base



Mid



Apex

Posterior

-  Normal
-  Hypokinesis
-  Akinesis
-  Dyskinesis
-  Aneurysm
-  Scarred
-  Not Seen

Viability and Prognosis in Patients with LV Dysfunction



Different Substrates

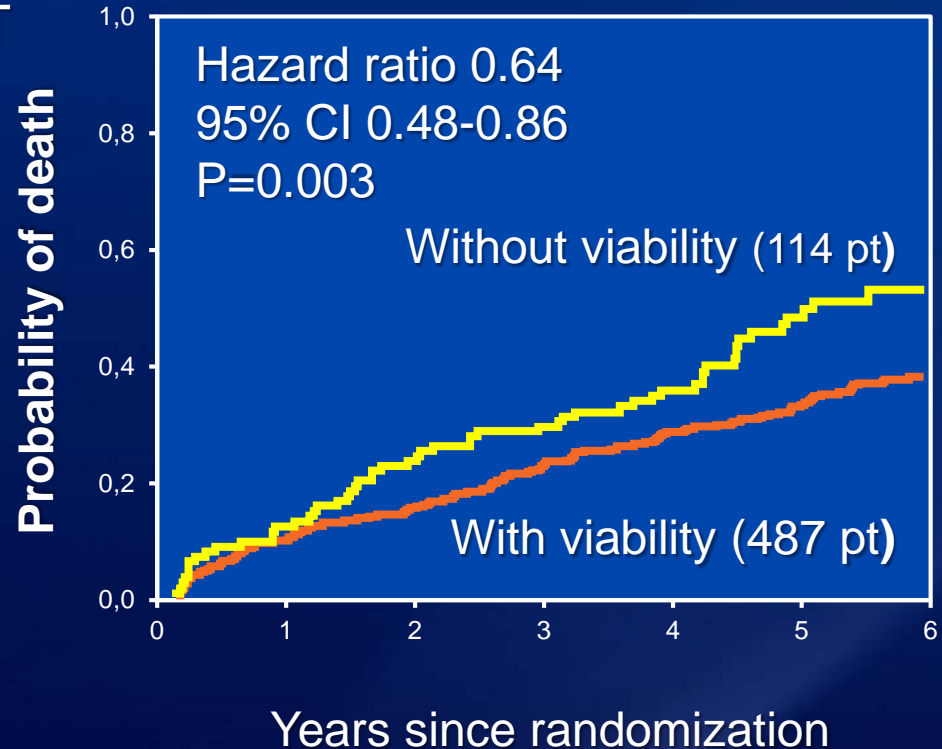
- Hibernation (resting ischemia)
- Repetitive stunning (inducible ischemia)
- Extent of scar
- Extent of remodeling
- Duration of hibernation

“How much is enough – not an all or none issue”

Need for combined imaging approaches to characterize substrates and reversibility

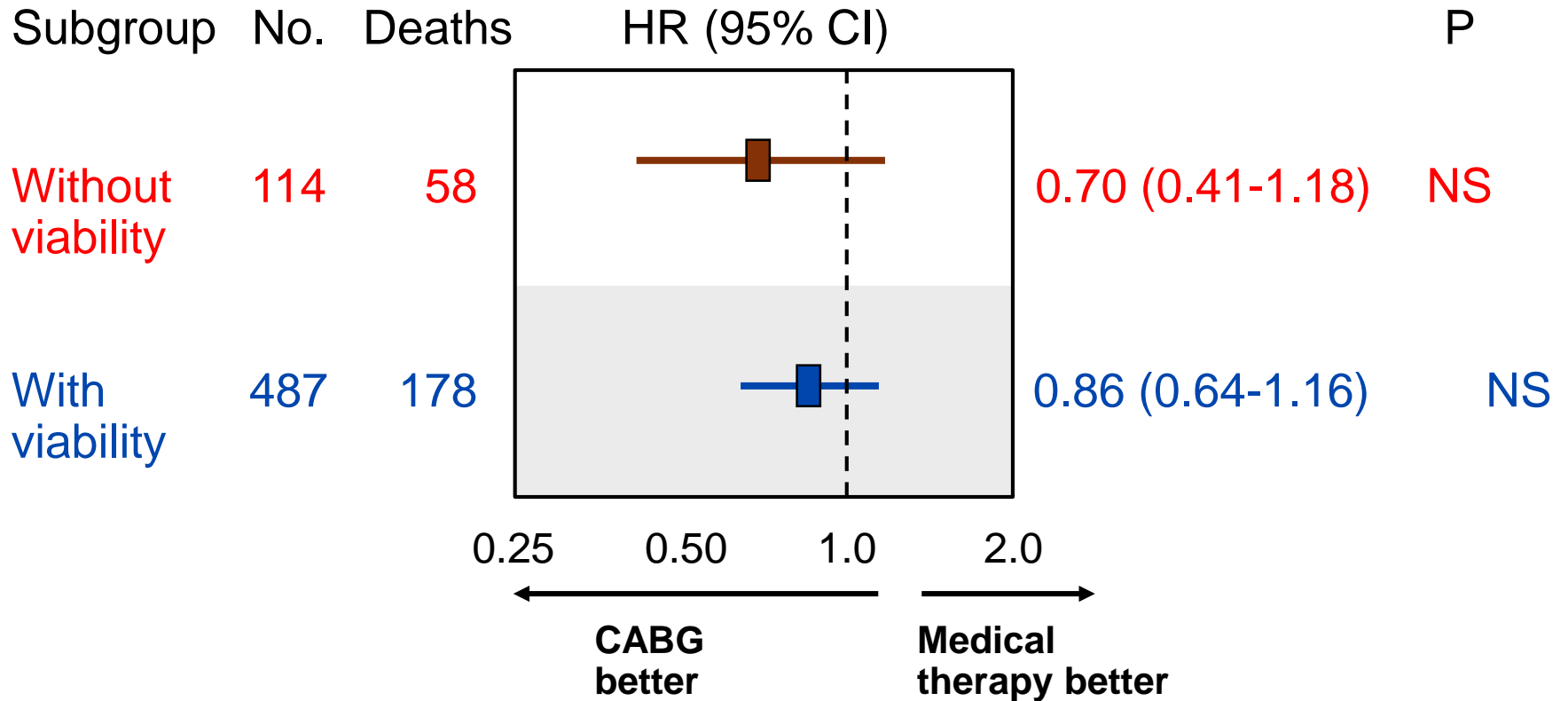
STICH – Myocardial Viability and Survival

601 pt – viability testing



Bonow: NEJM, 2011

STICH – Myocardial Viability and Survival




“If you are not confused
by this – you are not
thinking clearly.”

Pogo

STICH Viability Study

Limitations

- Study is underpowered
- Non-randomized – viability performed at physician discretion and unblinded
- Baseline differences between pt with/without viability testing – ↓ comorbidities
- Generalizability to contemporary population 
 - ICD – 50%
 - CRT – 20%
- 85% of patients in substudy – non-USA
- 3 VD only present in approximately one third
- Viability determined in a binary fashion – PET and CMRI – greater accuracy and provide additional information
- Does not distinguish between dysfunctioning potentially viable myocardium and reversibility

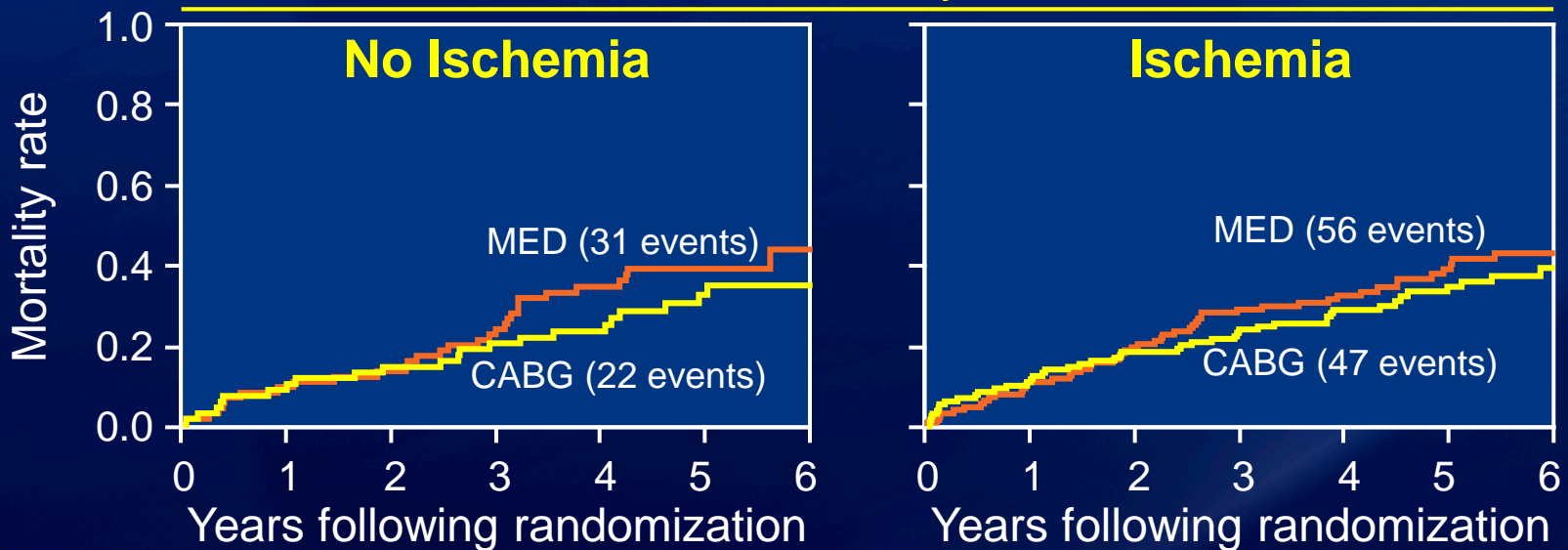
Inducible Myocardial Ischemia and Outcomes of Revascularization

- STICH Trial
- EF <0.35

Stress testing

- Inducible ischemia 64%
- % ischemic myocardium ($18 \pm 11\%$)

Mortality



Panza: JACC, 2012

Importance of Angina in Patients With Coronary Disease, Heart Failure, and Left Ventricular Systolic Dysfunction

Insights From STICH

Jolicouer et al



“Presence of angina does **not** confer markedly worse prognosis or a greater benefit from revascularization by CABG
But CABG does improve angina symptoms compared with medical therapy alone”

EDITORIAL COMMENT

Angina in Revascularization of Ischemic Cardiomyopathy

The Whole Quilt, or Just a STICH?*

Jeffrey B. Geske, MD, Bernard J. Gersh, MB, ChB, DPHIL

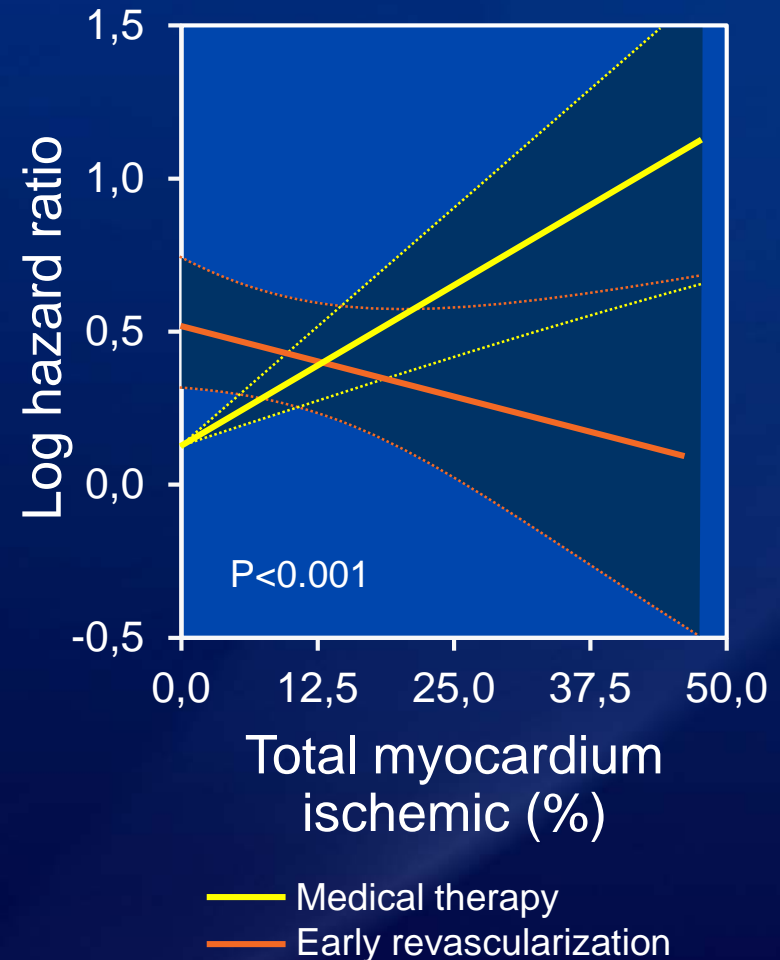


Impact of Ischemia and Scar on Therapeutic Benefit from Coronary Revascularization

- 13,969 pt
- Adenosine or exercise SPECT

Role of ischemia in pt with >10% *fixed* myocardial defect

- % ischemic myocardium = $P=0.089$
- Ischemia treatment interaction = $P=0.489$

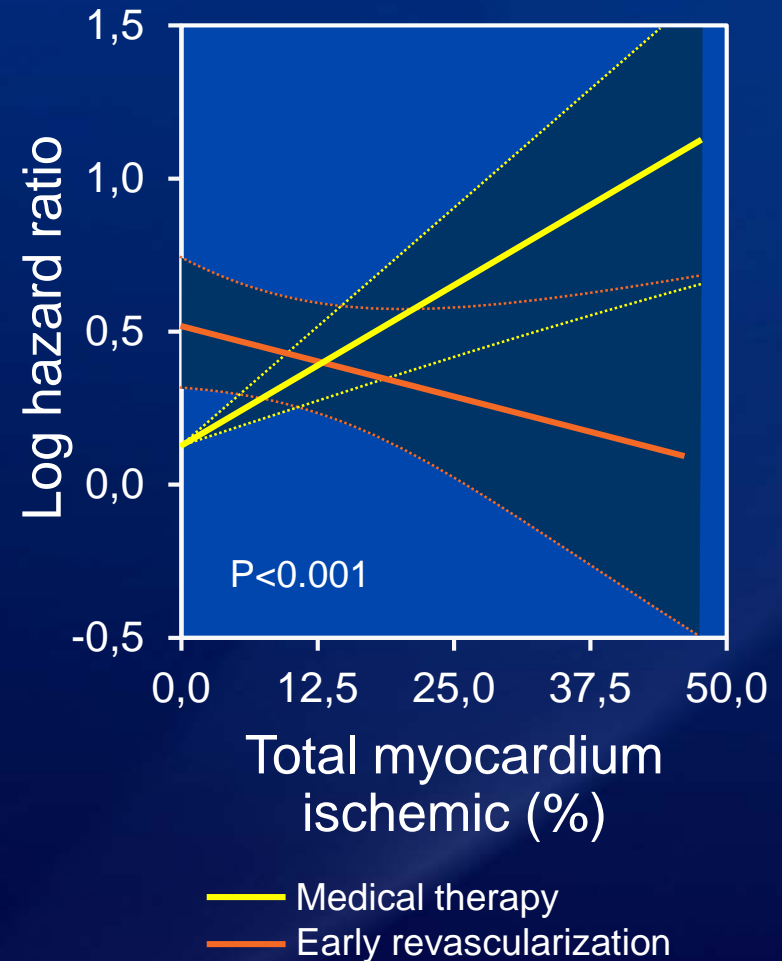


Hachamovich: EHJ, 2011

Impact of Ischemia and Scar on Therapeutic Benefit from Coronary Revascularization

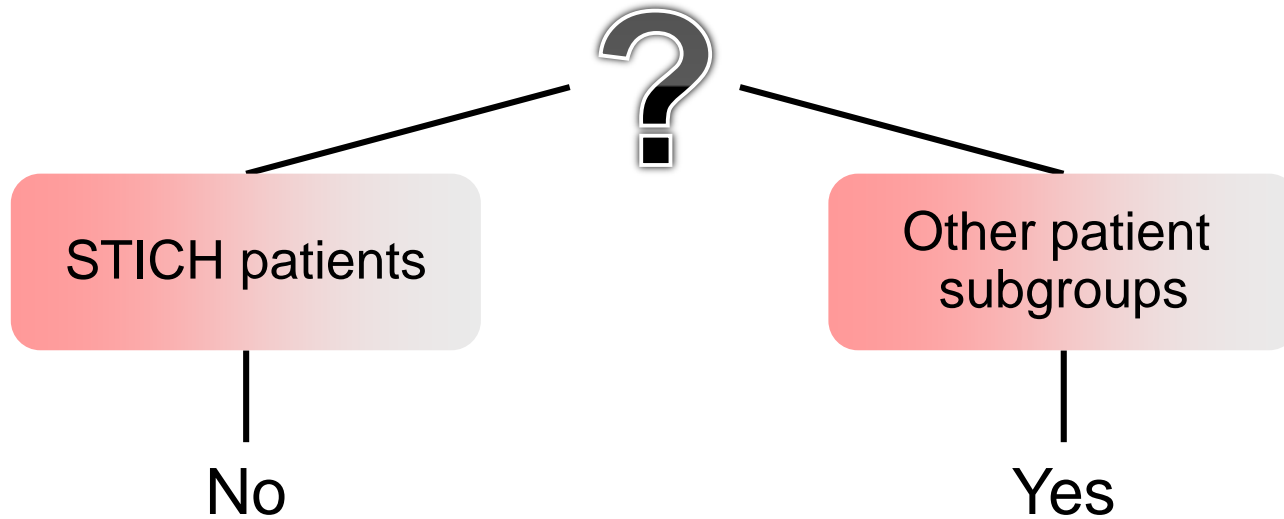
- 13,969 pt
- Adenosine or exercise SPECT

Role of ischemia on benefit of revascularization was nullified by presence of extensive infarction/scar



Hachamovich: EHJ, 2011

Is There a Role for Viability and Ischemia Testing? Is the Concept Still Valid and Rational?



- No effect of viability, inducible ischemia and angina on surgical outcomes
- ↑ remodeling with non-viability but no effect on surgical outcomes

Bonow: NEJM, 2011; Panza: JACC, 2012
Jolicouer: JACC, 2015; Bonow: JACC, 2015



In patients with LV dysfunction and CAD, are the presence of viability, inducible ischemia and angina still therapeutic targets

YES

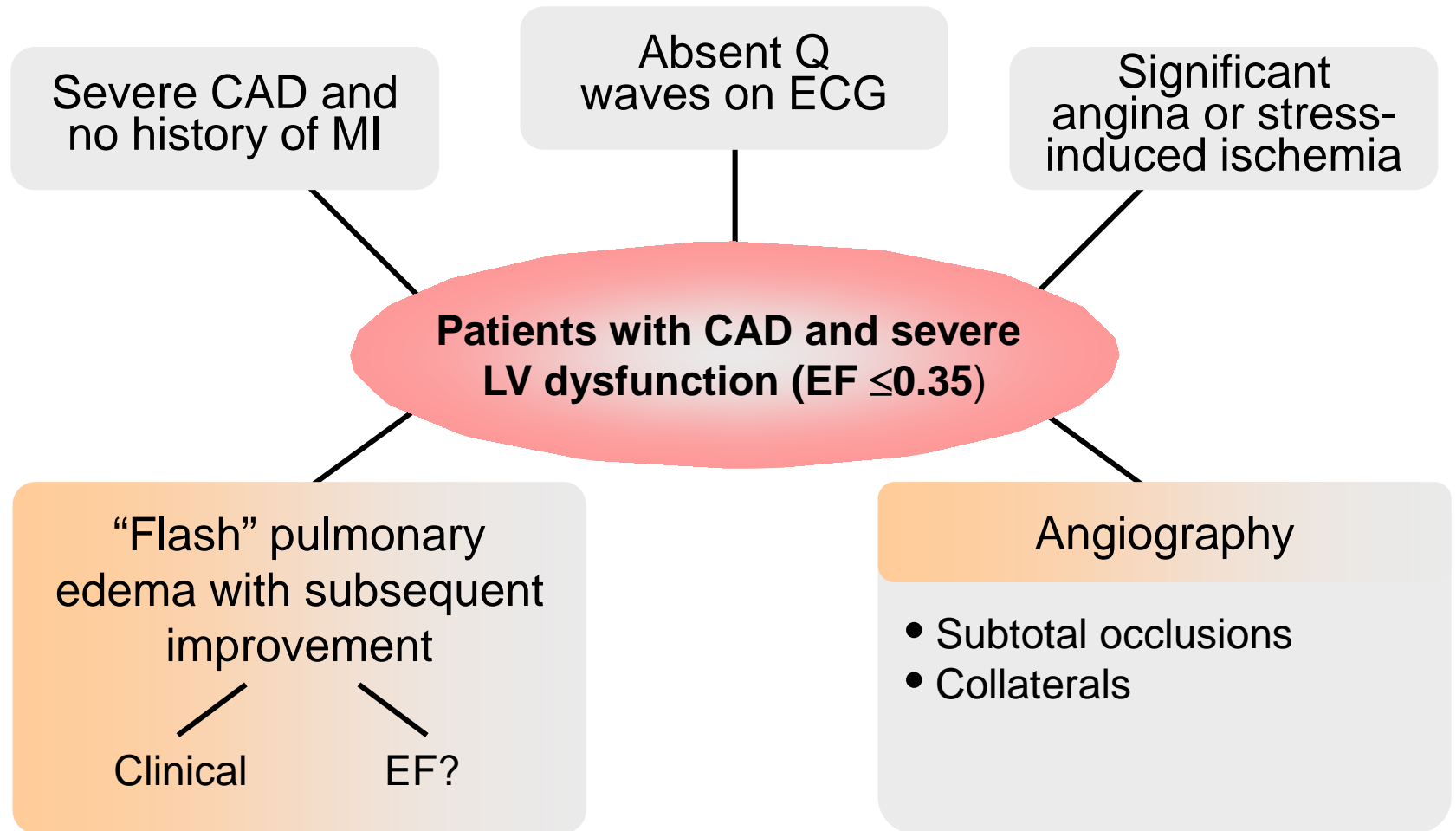
Considerations

Viability and Ischemia

Extent of scar and remodeling

What is the point of no return?

Clinical Scenarios Indicative of Viability



Role of Viability Testing in Clinical Decision Making in Patients With LV Dysfunction

Not Essential

- Significant angina
- Good distal vessels
- ECG $\left\{ \begin{array}{l} \text{No Q waves} \\ \text{Preserved voltage} \end{array} \right.$
- Reasonable surgical risk

Potentially Helpful

- Severe LV dysfunction
- Extensive LV remodeling
- Multiple comorbidities
- Incomplete revascularization is likely
- Angina – less severe

Role of Viability Testing

Conclusions

- May predict response to revascularization in ***selected*** pts with CAD and LV dysfunction
- Marker of prognosis
- May influence response to medical therapy
- Impact of viability and residual ischemia may be overwhelmed by extensive scar and remodeling.
- Should “not” be a routine determinant of decision to revascularize

“The reports of my death are greatly exaggerated.”

Text of a cable sent by Mark Twain from London to the press in the U.S. after his obituary had been mistakenly published

“If the truth is left alone, sooner or later it will come to the surface,

But that is very difficult –
If an authoritarian body has come up with the wrong answer”.

R.A. Willis