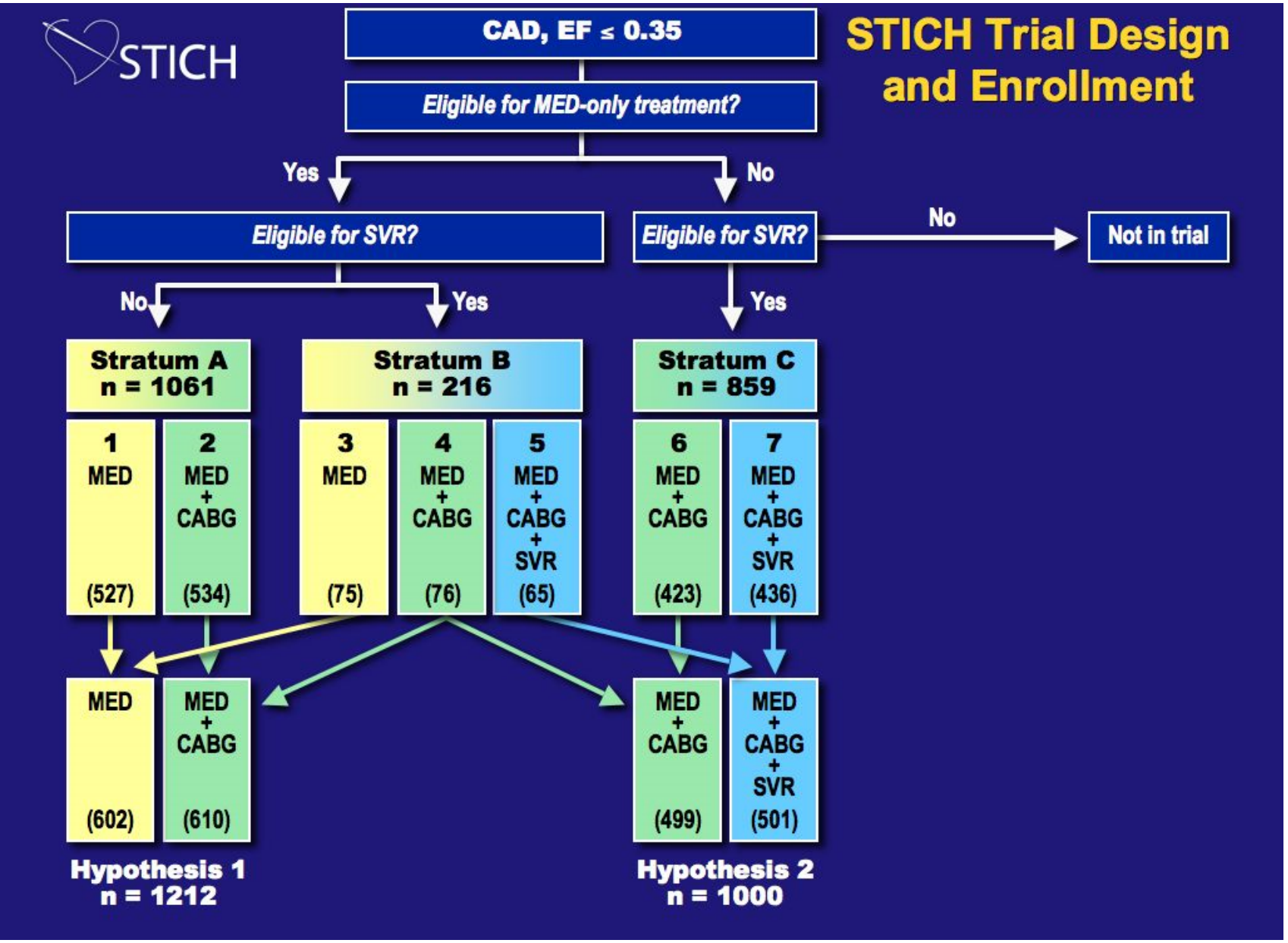
STICH & beyond: Der Patient mit schlechter EF & KHK auf der ICU

Revaskularisation bei chronischer HI?

05.Mai 2017

Christopher Adlbrecht
4. Med. Abteilung, Kardiologie, KH Hietzing

Was war der STICH Trial??

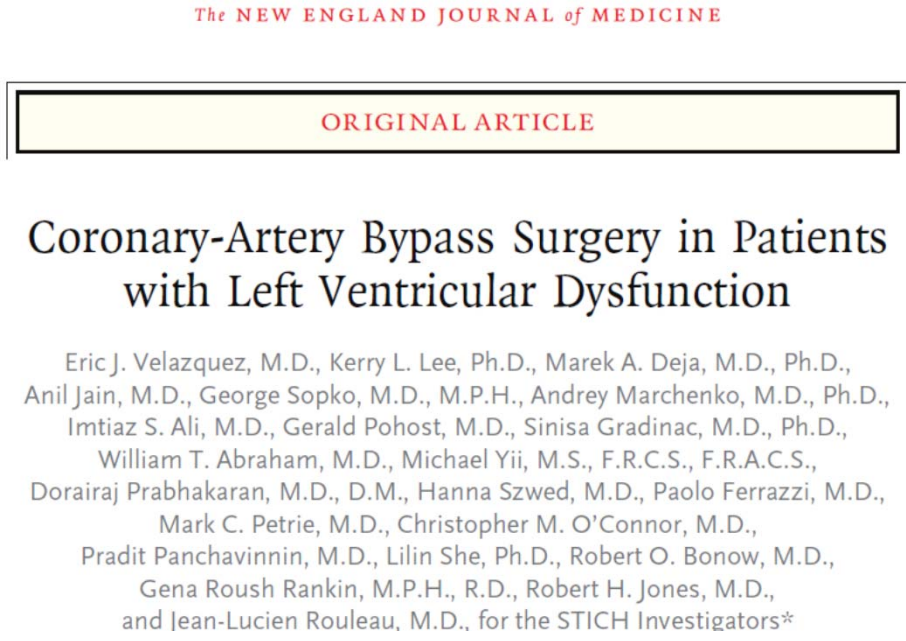


STICH Trial Design and Enrollment

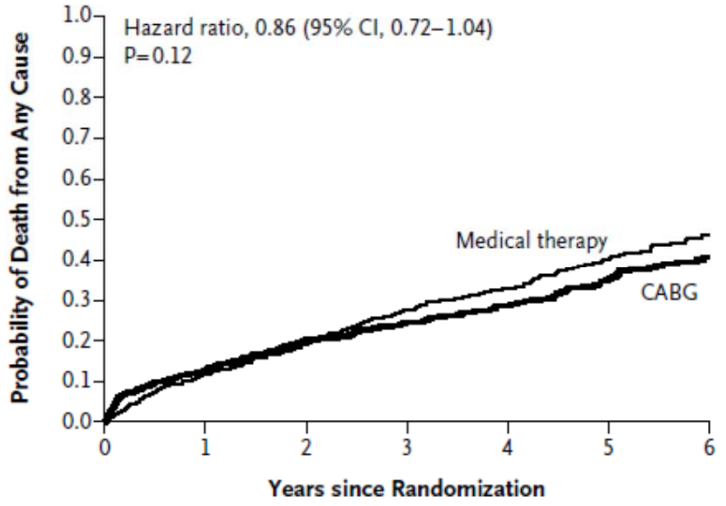
Curtesy R. Jones
adpt. Velazquez E. et al.
J Thorac Cardiovasc Surg. 2007
134(6): 1540–1547.

Surgical Treatment for Ischemic Heart Failure (STICH) trial

- 1212 patients with an LVEF of 35% or less
- Coronary artery disease amenable to CABG were randomly assigned to medical therapy alone or medical therapy plus CABG
- Primary outcome was death from any cause



Velazquez E. et al. N Engl J Med 2011;364:1607-16.



No. at Risk

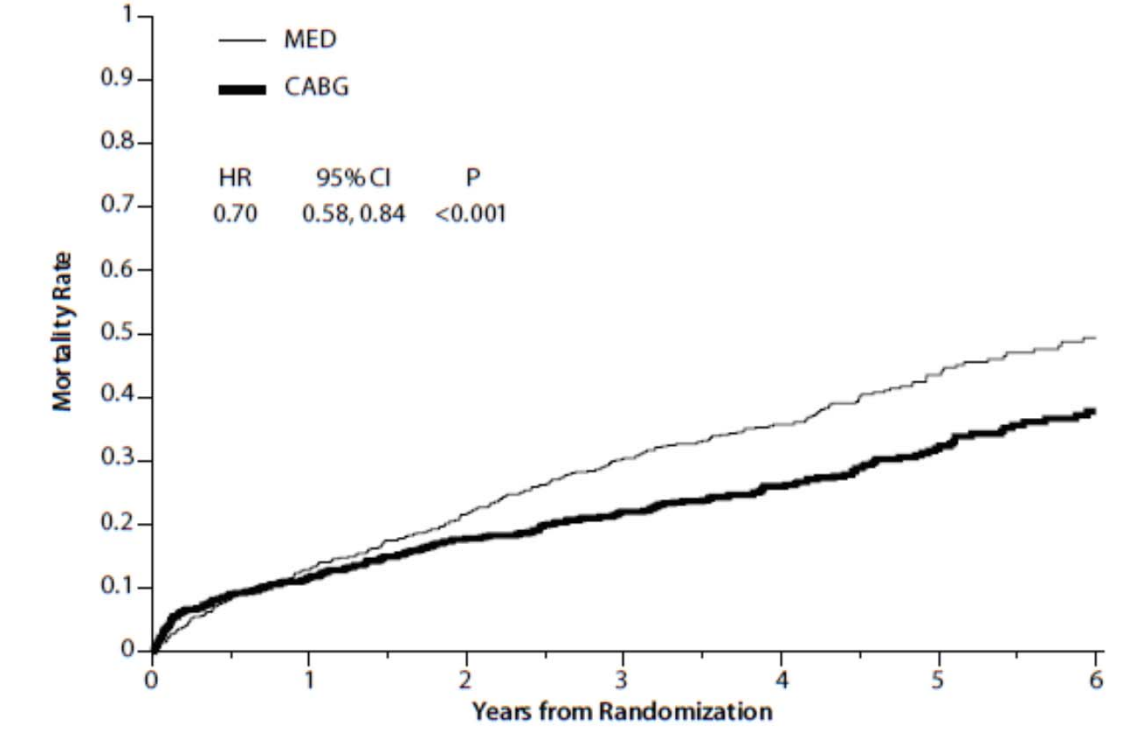
Medical therapy	602	532	487	435	312	154	80
CABG	610	532	486	459	340	174	91

Figure 1. Kaplan–Meier Curves for the Probability of Death from Any Cause.
CABG denotes coronary-artery bypass grafting.

Outcome	Medical Therapy (N=602)	CABG (N=610)	Hazard Ratio with CABG (95% CI)	P Value†
	no. (%)			
Primary outcome: rate of death from any cause	244 (41)	218 (36)	0.86 (0.72–1.04)	0.12
Secondary outcomes				
Death from any cause within 30 days after randomization				
Logistic-regression model	7 (1)	22 (4)	3.19 (1.35–7.52)‡	0.008
Cox proportional-hazards model	7 (1)	22 (4)	3.12 (1.33–7.31)	0.006
Death from cardiovascular causes	201 (33)	168 (28)	0.81 (0.66–1.00)	0.05
Death from any cause or hospitalization for heart failure	324 (54)	290 (48)	0.84 (0.71–0.98)	0.03
Death from any cause or hospitalization for cardiovascular causes	411 (68)	351 (58)	0.74 (0.64–0.85)	<0.001
Death from any cause or hospitalization for any cause	442 (73)	399 (65)	0.81 (0.71–0.93)	0.003
Death from any cause or revascularization with the use of PCI or CABG	333 (55)	237 (39)	0.60 (0.51–0.71)	<0.001

Velazquez E. et al. N Engl J Med 2011;364:1607-16.

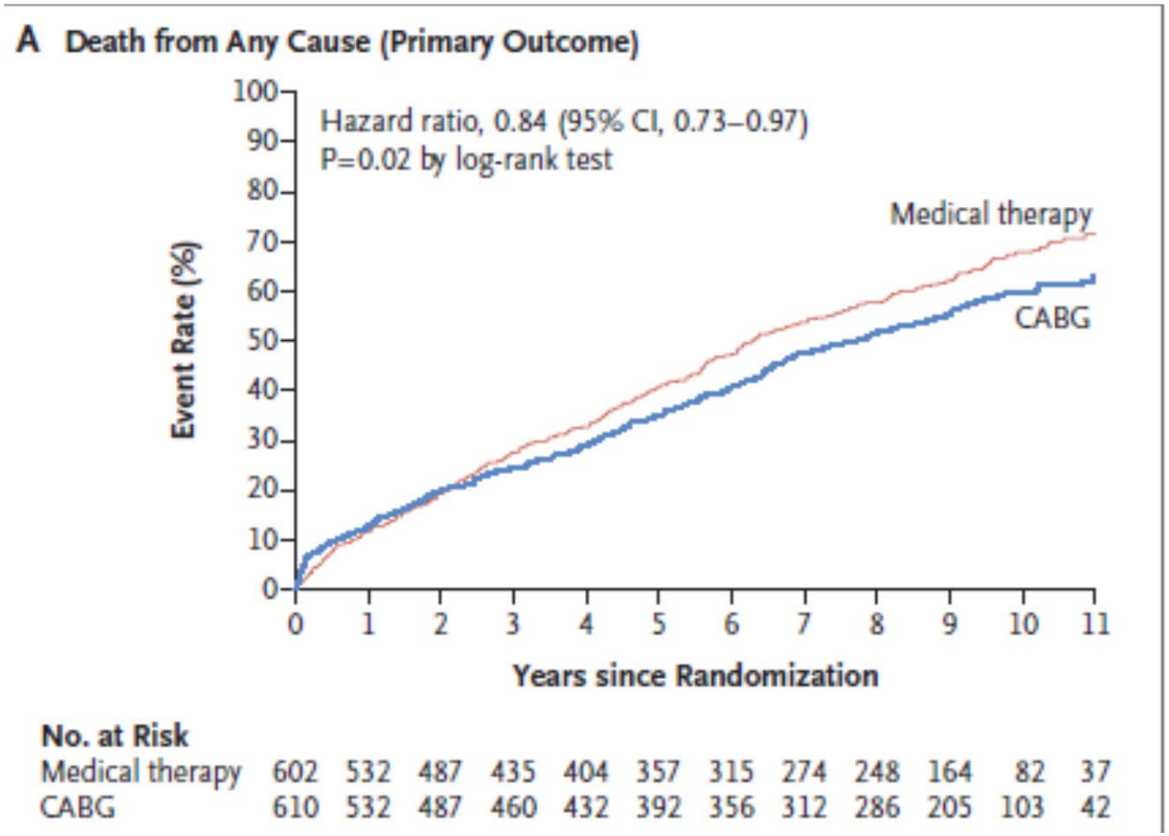
Supplementary Figure 2. Kaplan-Meier estimate of death from any cause as treated within the first year analysis



Supplementary Appendix Velazquez E. et al. N Engl J Med 2011;364:1607-16.

Extended FU: STICHES

"Before the treatment-group assignments were revealed or any intermediate-term results were reported, the protocol was amended to extend the follow-up period by an additional 5 years for all patients"



Velazquez E. et al. N Engl J Med 2016;374:1511-20.

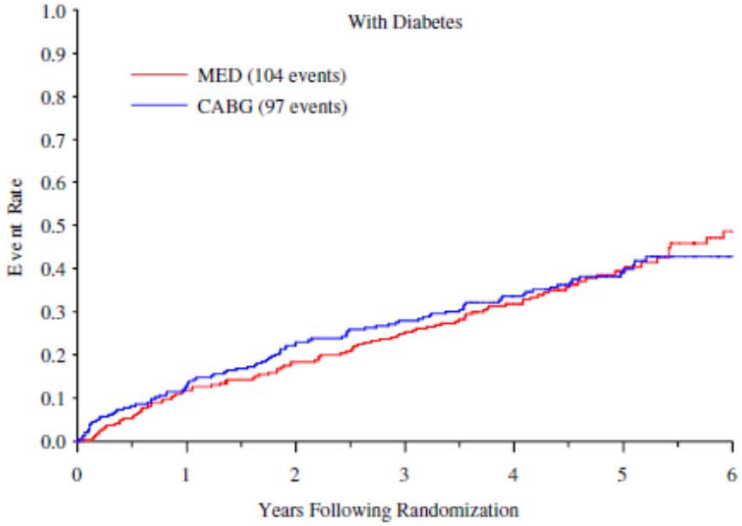
Subgruppen von besonderem Interesse:

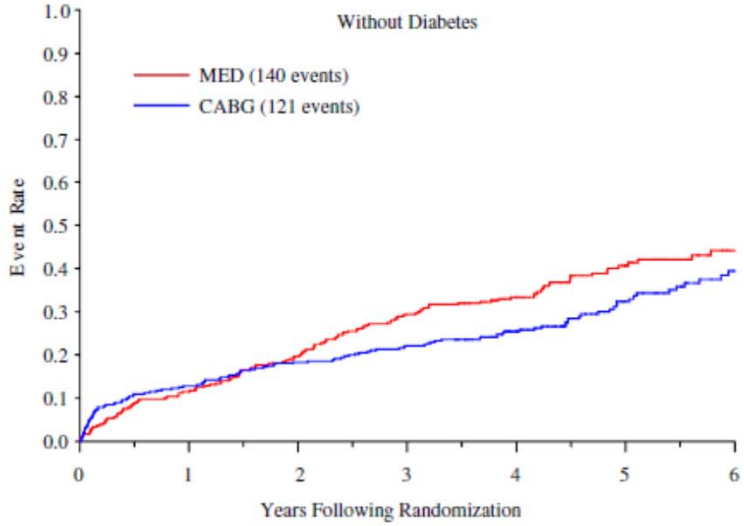
- Diabetes ?
- Alte Patienten ?
- Vitalitätstest ?

Diabetes?

Clinical characteristics and outcomes of patients with and without diabetes in the Surgical Treatment for Ischemic Heart Failure (STICH) trial

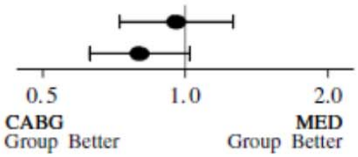
Michael R. MacDonald[1]*, Lilin She[2], Torsten Doenst[3], Philip F. Binkley[4], Jean L. Rouleau[5], Ru-San Tan[6], Kerry L. Lee[7], Alan B. Miller[8], George Sopko[9], Dominika Szalewska[10], Myron A. Waclawiw[9], Rafal Dabrowski[11], Serenella Castelvecchio[12], Christopher Adlbrecht[13], Robert E. Michler[14], Jae K. Oh[15], Eric J. Velazquez[16], and Mark C. Petrie[17]





Sub-group	N	Events	Hazard Ratio	95% CI	5 Year Rates MED Group	5 Year Rates CABG Group
With Diabetes	489	201	0.96	0.73, 1.26	39.4 %	39.0 %
Without Diabetes	723	261	0.80	0.63, 1.02	40.7 %	32.3 %

Interaction with Treatment P-value = 0.339

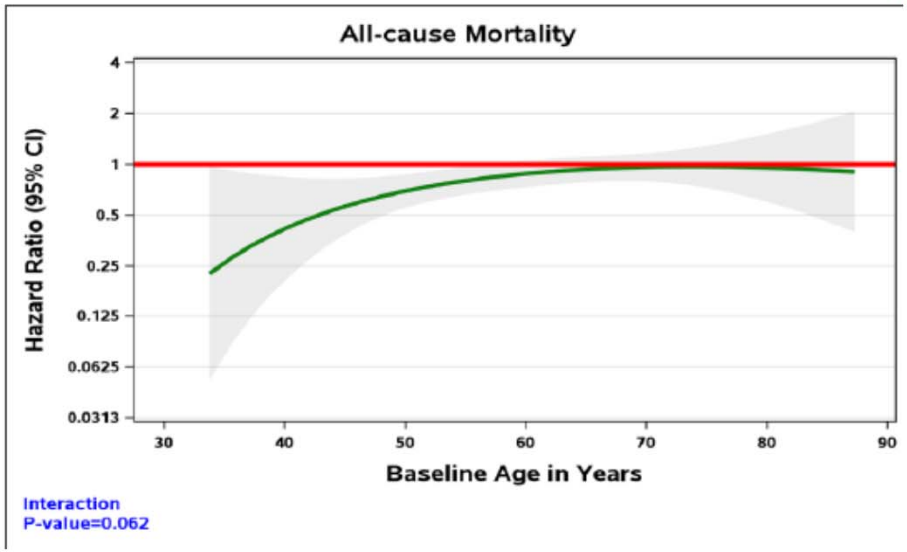


MacDonald MR et al. EuJHF (2015) 17, 725–734

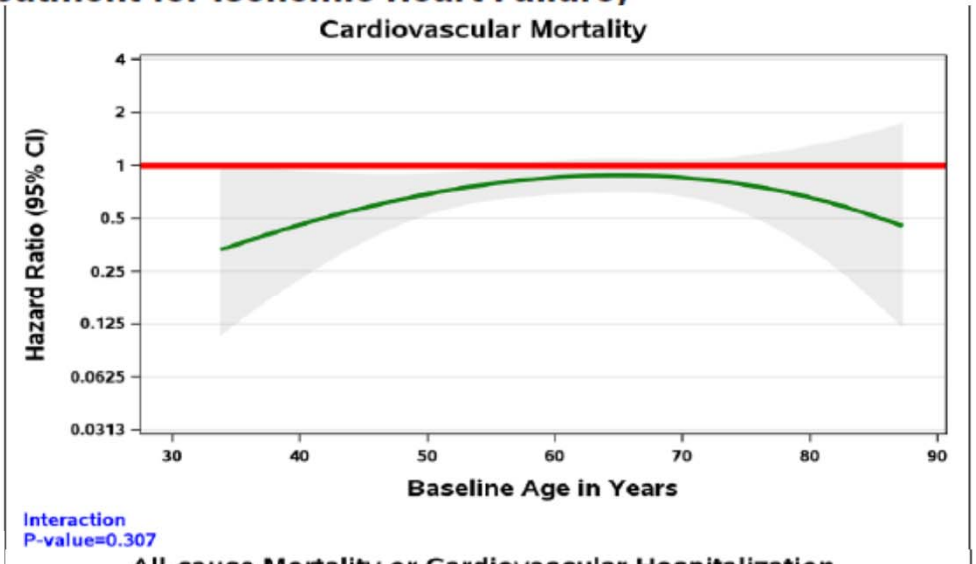
Alter?

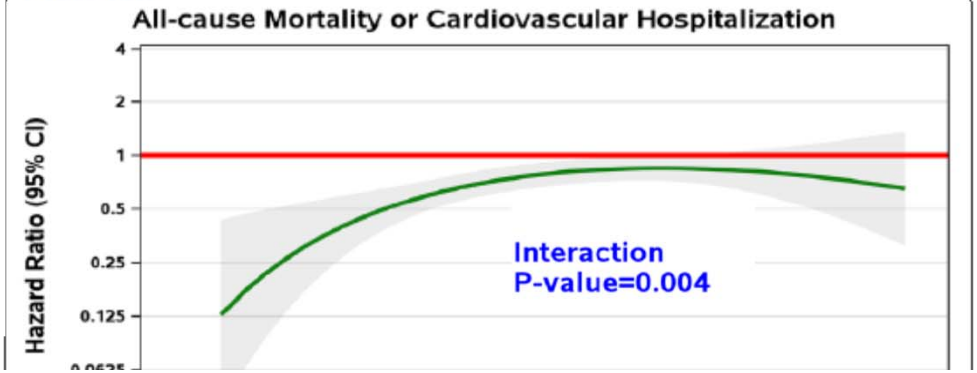
Ten-Year Outcomes After Coronary Artery Bypass Grafting According to Age in Patients With Heart Failure and Left Ventricular Systolic Dysfunction

An Analysis of the Extended Follow-Up of the STICH Trial (Surgical Treatment for Ischemic Heart Failure)



Baseline Age Quartiles			
Quartile 1 (Age ≤54 y) (n=330)	Quartile 2 (54<Age≤60 y) (n=295)	Quartile 3 (60<Age≤67 y) (n=279)	Quartile 4 (Age>67 y) (n=308)





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Torsten Doenst, MD
Julio A. Panza, MD
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Imtiaz S. Ali, MD
Jyotsna Maddury, MD
Krzysztof S. Golba, MD
Harvey D. White, MD
Peter Carson, MD
Lukasz Chrzanowski, MD
Alexander Romanov, MD
Alan B. Miller, MD
Eric J. Velazquez, MD
On behalf of the STICH Trial Investigators

Petrie MC et al. Circulation.2016;134(18):1314-24.

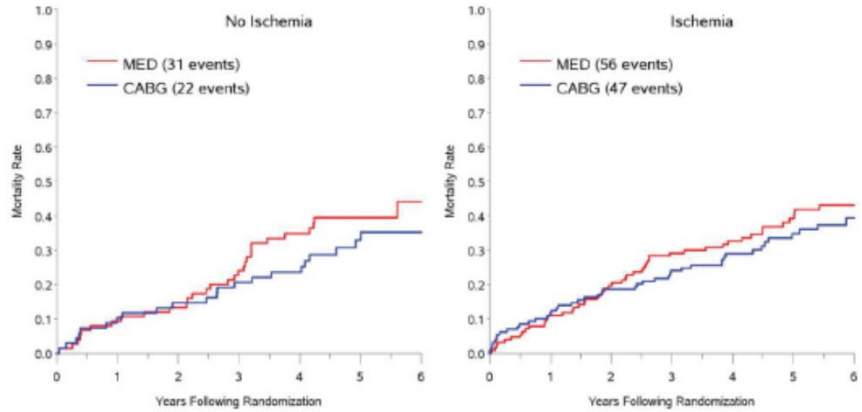
Alter ?

- Benefit of CABG compared with OMT on all-cause mortality and the combination of all-cause mortality and cardiovascular hospitalizations is greater in younger compared with older patients.
- In contrast, the benefit of CABG on cardiovascular mortality is similar across all age groups.
- The discrepancy between the effect of CABG across ages as it relates to cardiovascular mortality and all-cause mortality likely results from the greater proportion of noncardiovascular deaths in older patients, deaths that are less likely to be avoided by CABG.

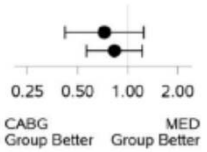
Petrie MC et al. Circulation.2016;134(18):1314-24.

Inducible Myocardial Ischemia and Outcomes in Patients with Coronary Artery Disease and LV-Dysfunction

- In CAD with severe LV dysfunction, inducible myocardial ischemia does not identify patients with worse prognosis or those with greater benefit from CABG over optimal medical therapy.
- There was no interaction between ischemia and treatment for any clinical endpoint.



Sub-group	N	Events	Hazard Ratio	95% CI	5 Year Rates MED Group	5 Year Rates CABG Group
No Ischemia	143	53	0.72	0.42, 1.25	39.4 %	32.9 %
Ischemia	256	103	0.83	0.56, 1.23	39.2 %	34.8 %



Interaction with Treatment
P-value = 0.643

Panza JA et al. Am Coll Cardiol. 2013 May 7; 61(18): 1860–1870.

Revascularization in Patients With Severe Left Ventricular Dysfunction

Is the Assessment of Viability Still Viable?

Anavekar NS et al. J Am Coll Cardiol 2016;67:2874–87

Revascularization in Patients With Severe Left Ventricular Dysfunction

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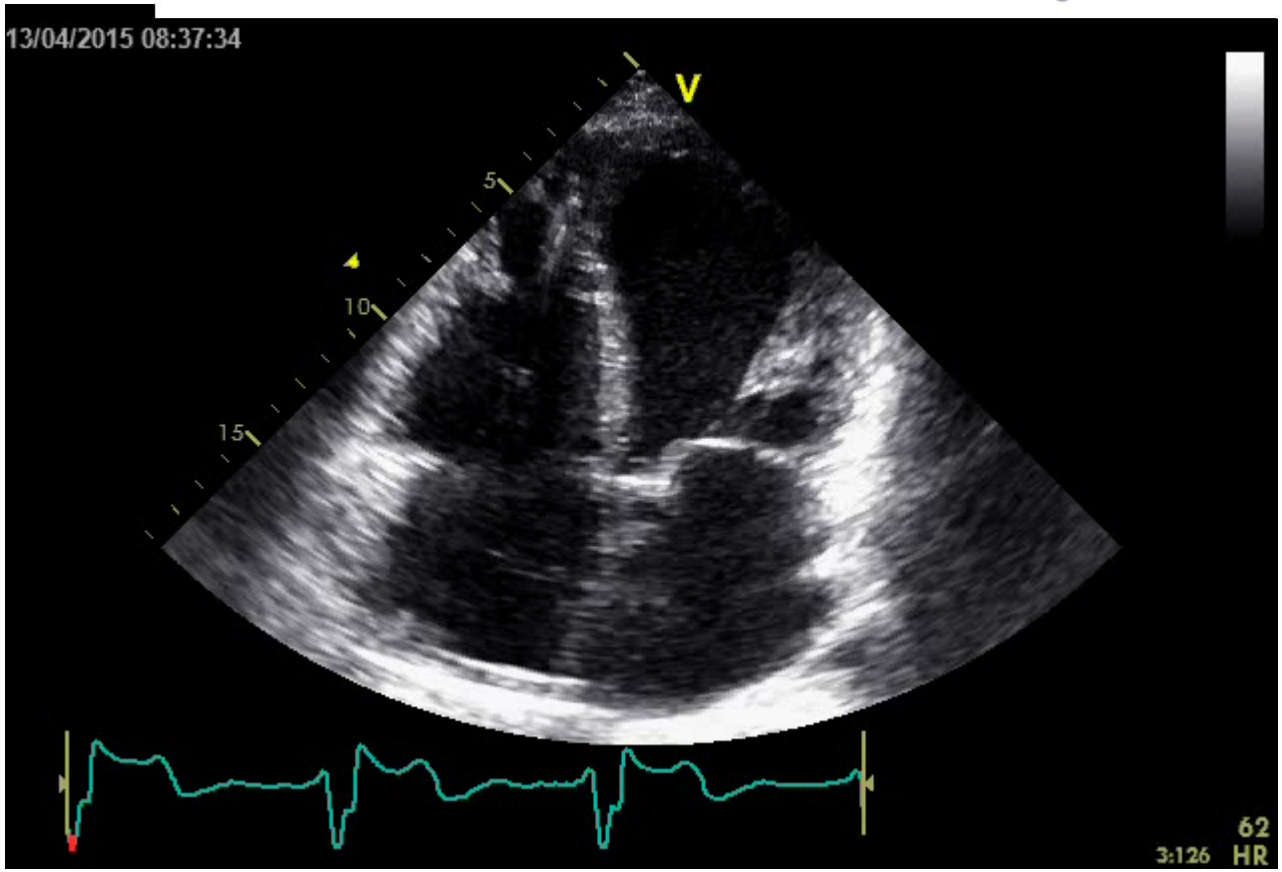
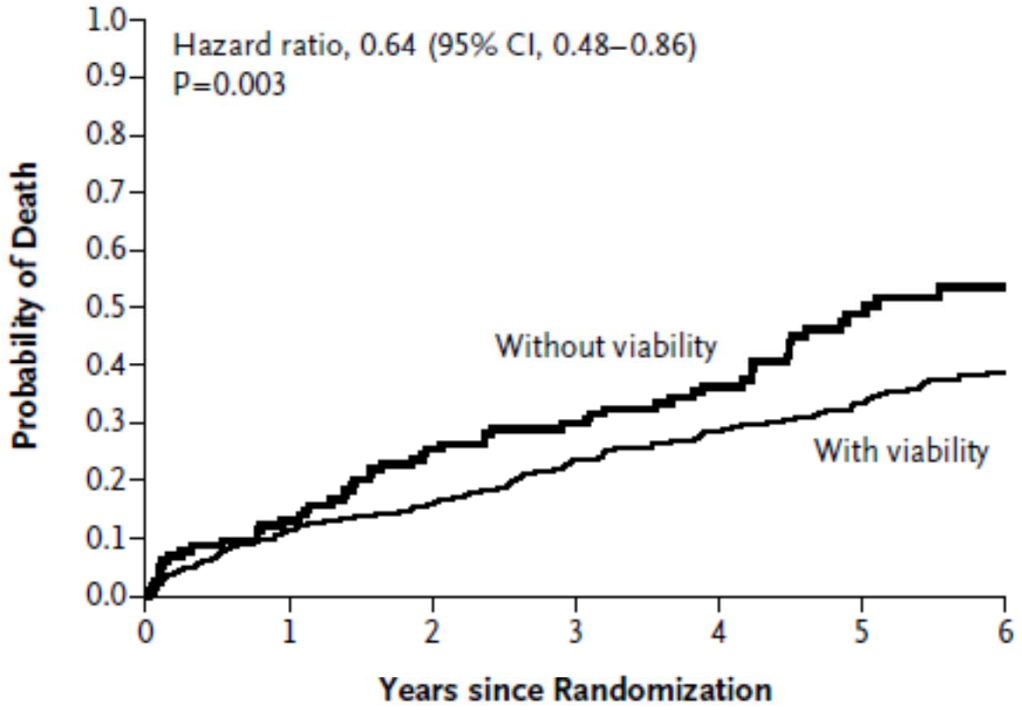


Anavekar NS et al. J Am Coll Cardiol 2016;67:2874–87

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Myocardial Viability and Survival in Ischemic Left Ventricular Dysfunction



No. at Risk							
Without viability	114	99	85	80	63	36	16
With viability	487	432	409	371	294	188	102

Figure 1. Kaplan–Meier Analysis of the Probability of Death, According to Myocardial Viability Status.

Vitalitätstest?

Bonow RO et al. N Engl J Med 2011;364:1617-25.

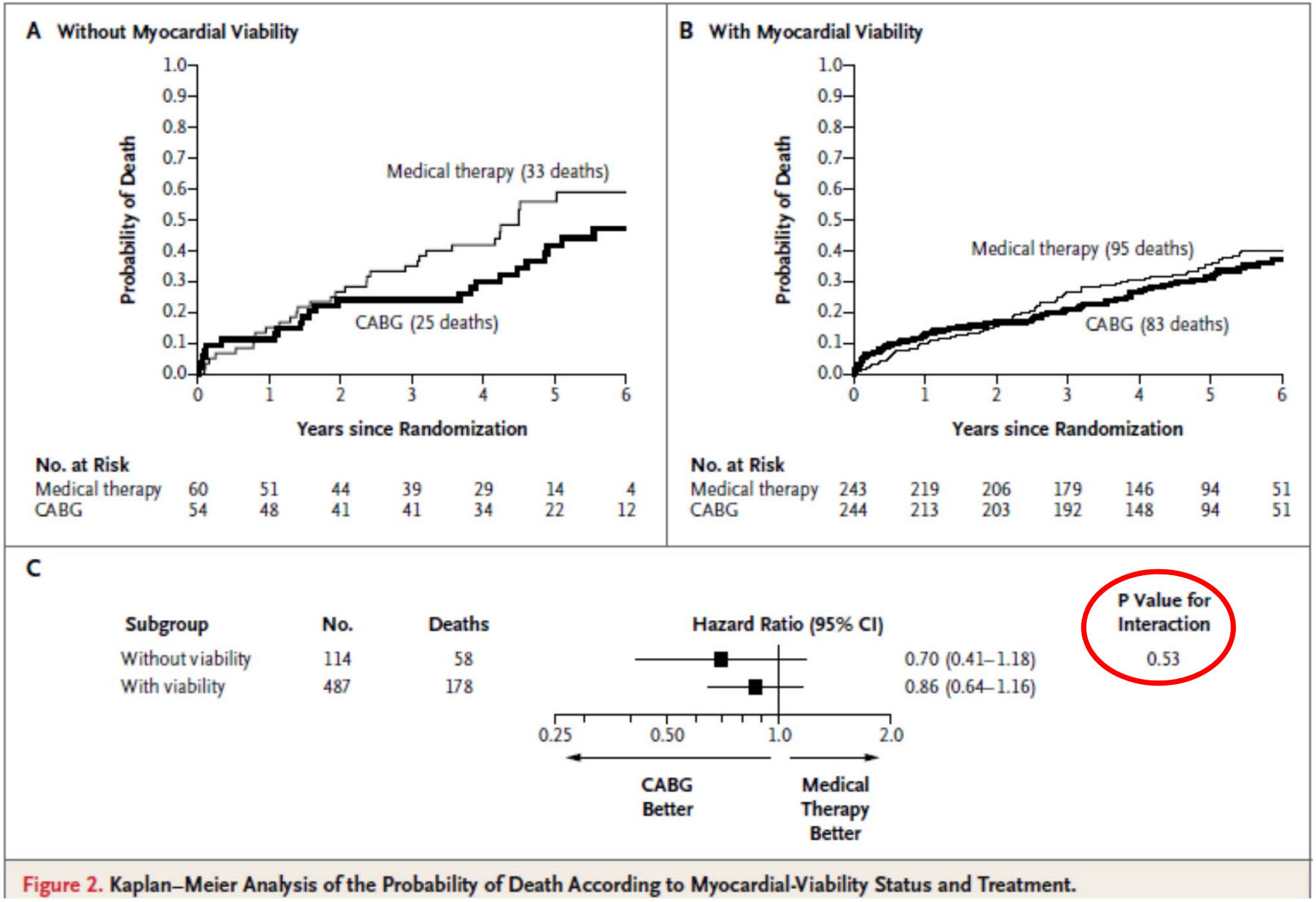


Figure 2. Kaplan–Meier Analysis of the Probability of Death According to Myocardial-Viability Status and Treatment.

Bonow RO et al. N Engl J Med 2011;364:1617-25.

2014 ESC/EACTS Guidelines on myocardial revascularization

Indications for revascularization in patients with stable angina or silent ischaemia

Extent of CAD (anatomical and/or functional)		Class[b]	Level[c]
For prognosis	Left main disease with stenosis >50%[a]	I	A
	Any proximal LAD stenosis >50%[a]	I	A
	Two-vessel or three-vessel disease with stenosis > 50%[a] with impaired LV function (LVEF<40%)[a]	I	A
	Large area of ischaemia (>10% LV)	I	B
	Single remaining patent coronary artery with stenosis >50%[a]	I	C
For symptoms	Any coronary stenosis >50%[a] in the presence of limiting angina or angina equivalent, unresponsive to medical therapy	I	A

CAD = coronary artery disease; FFR = fractional flow reserve; LAD = left anterior descending coronary artery; LV = left ventricular.

[a]With documented ischaemia or FFR ≤ 0.80 for diameter stenosis <90%.

[b]Class of recommendation.

[c]Level of evidence.

ESC Guidelines European Heart Journal (2014) 35, 2541–2619

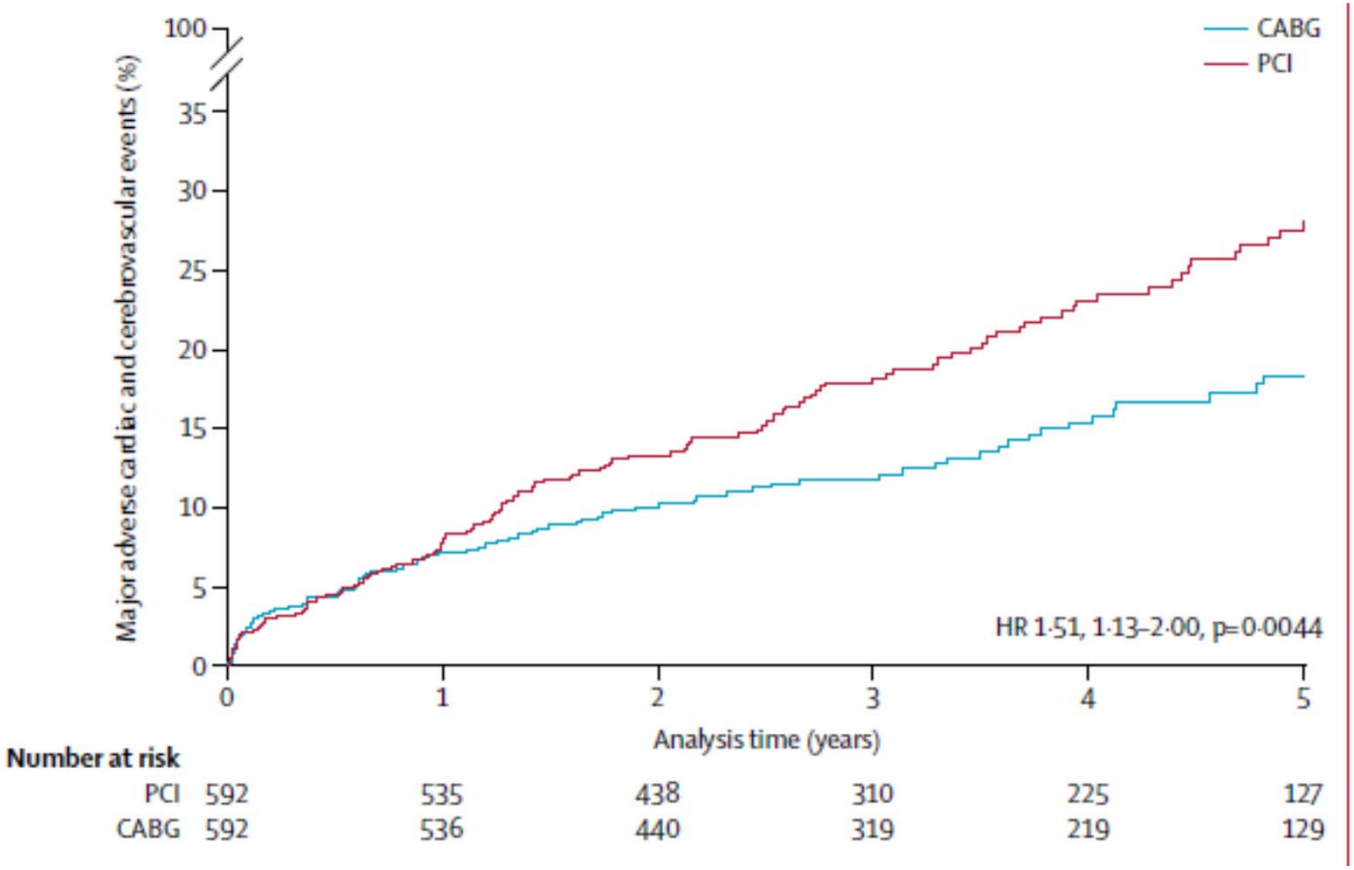
ESC Revascularization Guidelines 2014

Recommendation for the type of revascularization (CABG or PCI) in patients with SCAD with suita for both procedures and low predicted surgical mortality

Recommendations according to extent of CAD	CABG		PCI	
	Class[a]	Level[b]	Class[a]	Level[b]
One or two-vessel disease without proximal LAD stenosis.	IIb	C	I	C
One-vessel disease with proximal LAD stenosis.	I	A	I	A
Two-vessel disease with proximal LAD stenosis.	I	B	I	C
Left main disease with a SYNTAX score ≤ 22.	I	B	I	B
Left main disease with a SYNTAX score 23–32.	I	B	IIa	B
Left main disease with a SYNTAX score >32.	I	B	III	B
Three-vessel disease with a SYNTAX score ≤ 22.	I	A	I	B
Three-vessel disease with a SYNTAX score 23–32.	I	A	III	B
Three-vessel disease with a SYNTAX score >32.	I	A	III	B

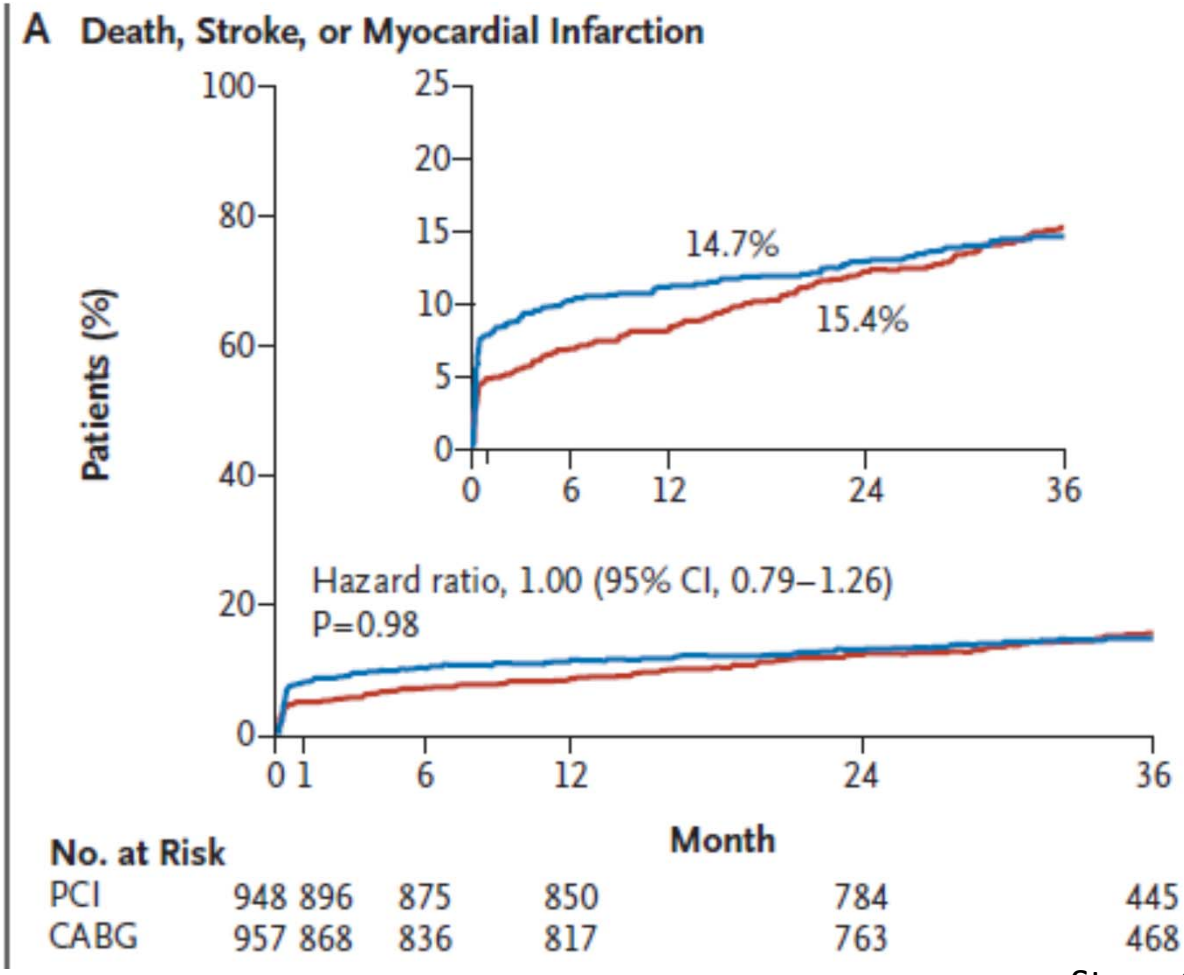
ESC Guidelines European Heart Journal (2014) 35, 2541–2619

NOBLE: "CABG was superior to PCI."



Mäkikallio T et al. Lancet 2016; 388: 2743–52.

EXCEL: "PCI may thus be considered an acceptable or even preferred revascularization modality for selected patients with LM CAD."



Stone GW et al. N Engl J Med 2016;375:2223-35.

ICU **take-home** messages

- Komplexe Datenlage zur Revaskularisierung bei herabgesetzter LVEF
- Evidenz nur bedingt auf die ICU anwendbar
- Revaskularisierung verbessert Outcome bei isch. Herzinsuffizienz
- Alter / Diabetes / Vitalitätstests stehen nicht im Vordergrund

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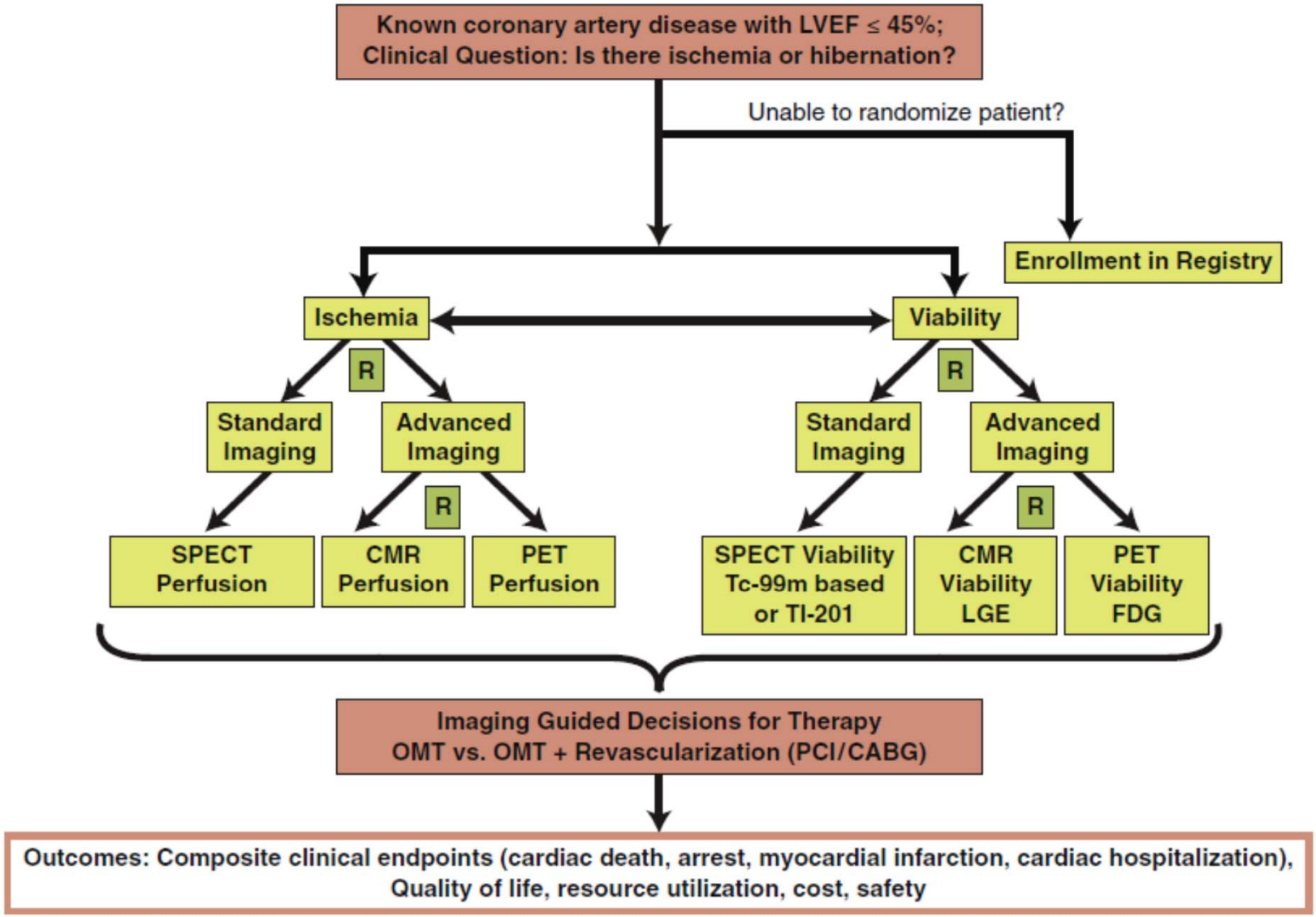
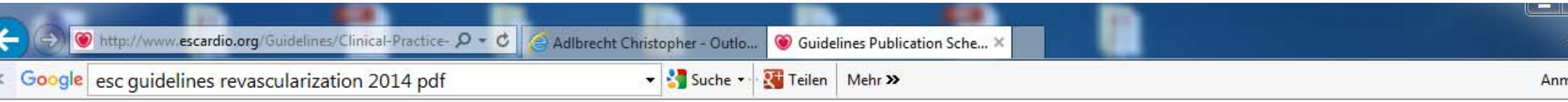
Can Functional Testing for Ischemia and Viability Guide Revascularization?

Lisa M. Mielniczuk, MD,[a] Gabor G. Toth, MD,[b] Joe X. Xie, MD,[c] Bernard De Bruyne, MD,[d]
Leslee J. Shaw, MD,[c] Rob S. Beanlands, MD[a]

FIGURE 5 Study Design of the AIMI-HF Trial



Mielniczuk LM et al. J Am Coll Cardiol Img 2017;10:354–64.



Publications planned in 2018

- **Syncope**
  Chairpersons: Michele Brignole & Angel Moya
- **Fourth Universal Definition of MI and Myocardial Injury**
  Chairpersons: Kristian Thygesen, Joseph Alpert & Harvey White
- **Myocardial Revascularization**
  Chairpersons: Franz Joseph Neumann & Pieter Kappetein
- **CVD During Pregnancy**
  Chairpersons Vera Regitz-Zagrosek & Jolien Roos-Hesselink
- **Arterial Hypertension**
  Chairpersons Bryan Williams & Giuseppe Mancia

STICH & beyond: Der Patient mit schlechter LVEF & KHK auf der ICU

Wer profitiert von der Revaskularisation?

05.Mai 2017

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Table 1. Baseline Characteristics of the Patients.*

Variable	Medical Therapy (N=602)	CABG (N=610)
Age — yr		
Median	59	60
Interquartile range	53–67	54–68
Female sex — no. (%)	75 (12)	73 (12)
Race or ethnic group — no. (%)†		
White	402 (67)	389 (64)
Hispanic, Latino, or nonwhite	200 (33)	221 (36)
Body-mass index‡		
Median	27	27
Interquartile range	24–30	24–30
Medical history — no. (%)		
Previous myocardial infarction	472 (78)	462 (76)
Hyperlipidemia	370 (61)	360 (59)
Hypertension	370 (61)	358 (59)
Diabetes	238 (40)	240 (39)
Previous percutaneous coronary intervention	74 (12)	82 (13)
Chronic renal insufficiency	45 (7)	49 (8)
Previous stroke	41 (7)	51 (8)
Previous CABG	14 (2)	22 (4)
Current smoker	122 (20)	130 (21)
Current CCS angina class§		
0	225 (37)	217 (36)
I	91 (15)	96 (16)
II	260 (43)	265 (43)
III	23 (4)	25 (4)
IV	3 (<1)	7 (1)
Current NYHA class		
I	74 (12)	65 (11)
II	307 (51)	319 (52)
III	205 (34)	207 (34)
IV	16 (3)	19 (3)
Systolic blood pressure — mm Hg		
Median	120	120
Interquartile range	110–130	110–130
Pulse — beats/min		
Median	72	74
Interquartile range	65–80	66–82
Left ventricular ejection fraction, median (25th, 75th), %	28 (21, 34)	27 (22, 33)