OMT Is Always the Default Choice

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Disclosures

- Grant from NHLBI for ISCHEMIA Trial
- I am a preventive cardiologist

What Is OMT for Stable Ischemic Heart Disease?

- GDMT = Multiple Risk Factor Intervention = Secondary Prevention
- Guidelines are based primarily on *single* risk factor intervention trials vs. placebo or usual care
- There have been few *multiple* risk factor intervention trials of OMT vs usual care*
- I will 4 review trials in which OMT is recommended to *all* patients with or without invasive management
- **There is no debate that OMT is always the default choice for patients with SIHD. The question is: under what circumstances should revascularization be added to OMT?**

*MRFIT. JAMA. 1982;248:1465-1477.
Lifestyle Heart. Ornish et al. Lancet. 1990;336:129-33.
SCRIP. Haskell et al. Circulation 1994;89;975-990.
Steno. Gaede et al. N Engl J Med 2003;348:383-93.

Definition of OMT in ISCHEMIA

ISCHEMIA

Risk Factor	Goal
Behavioral	
Smoking	Smoking cessation
Physical Activity	≥30 minutes ≥5 times per week
Saturated Fat	<7% calories
Physiologic	
Blood pressure	Systolic BP <140 mmHg (↓ to <130 mmHg in April 2018)
LDL-C	LDL <70 mg/dL (1.8 mmol/L)
BMI	Initial BMI — Weight Loss Goal 25-27.5 — BMI <25 >27.5 — 10% relative weight loss
Pharmacologic Targets	
Aspirin	Aspirin 75-162 mg daily
Statin	Maximum tolerated dose of high-intensity statin
Ezetimibe	If LDL-C >70 on maximally tolerated statin
ACEi/ARB	If hypertension, diabetes, eGFR <60 or LVEF <40%
Beta blocker	If history of MI or LVEF <40%

Maron DJ, Hochman JS, et al. Am Heart J 2018;201:124-135.

Randomized Clinical Strategy Trials of Revascularization in SIHD: OMT Era

Randomized After Cath:

- COURAGE (2007)
- BARI 2D (2009)
- FAME 2 (2012)

Randomized Before Cath:

- ISCHEMIA (2020)

COURAGE

The NEW ENGLAND JOURNAL of MEDICINE

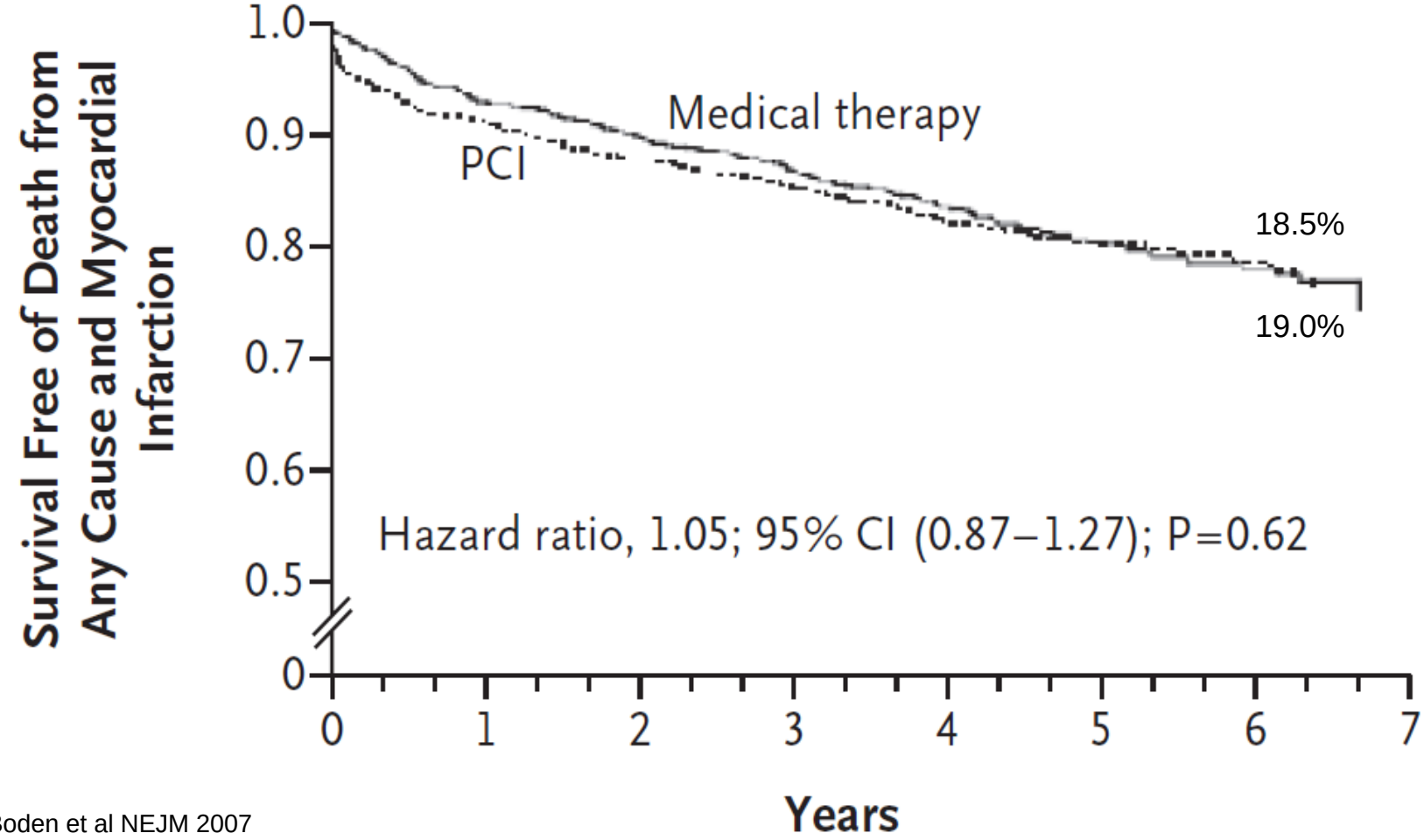
ESTABLISHED IN 1812 APRIL 12, 2007 VOL. 356 NO. 15

Optimal Medical Therapy with or without PCI for Stable Coronary Disease

William E. Boden, M.D., Robert A. O'Rourke, M.D., Koon K. Teo, M.B., B.Ch., Ph.D., Pamela M. Hartigan, Ph.D., David J. Maron, M.D., William J. Kostuk, M.D., Merril Knudtson, M.D., Marcin Dada, M.D., Paul Casperson, Ph.D., Crystal L. Harris, Pharm.D., Bernard R. Chaitman, M.D., Leslee Shaw, Ph.D., Gilbert Gosselin, M.D., Shah Nawaz, M.D., Lawrence M. Title, M.D., Gerald Gau, M.D., Alvin S. Blaustein, M.D., David C. Booth, M.D., Eric R. Bates, M.D., John A. Spertus, M.D., M.P.H., Daniel S. Berman, M.D., G.B. John Mancini, M.D., and William S. Weintraub, M.D., for the COURAGE Trial Research Group*

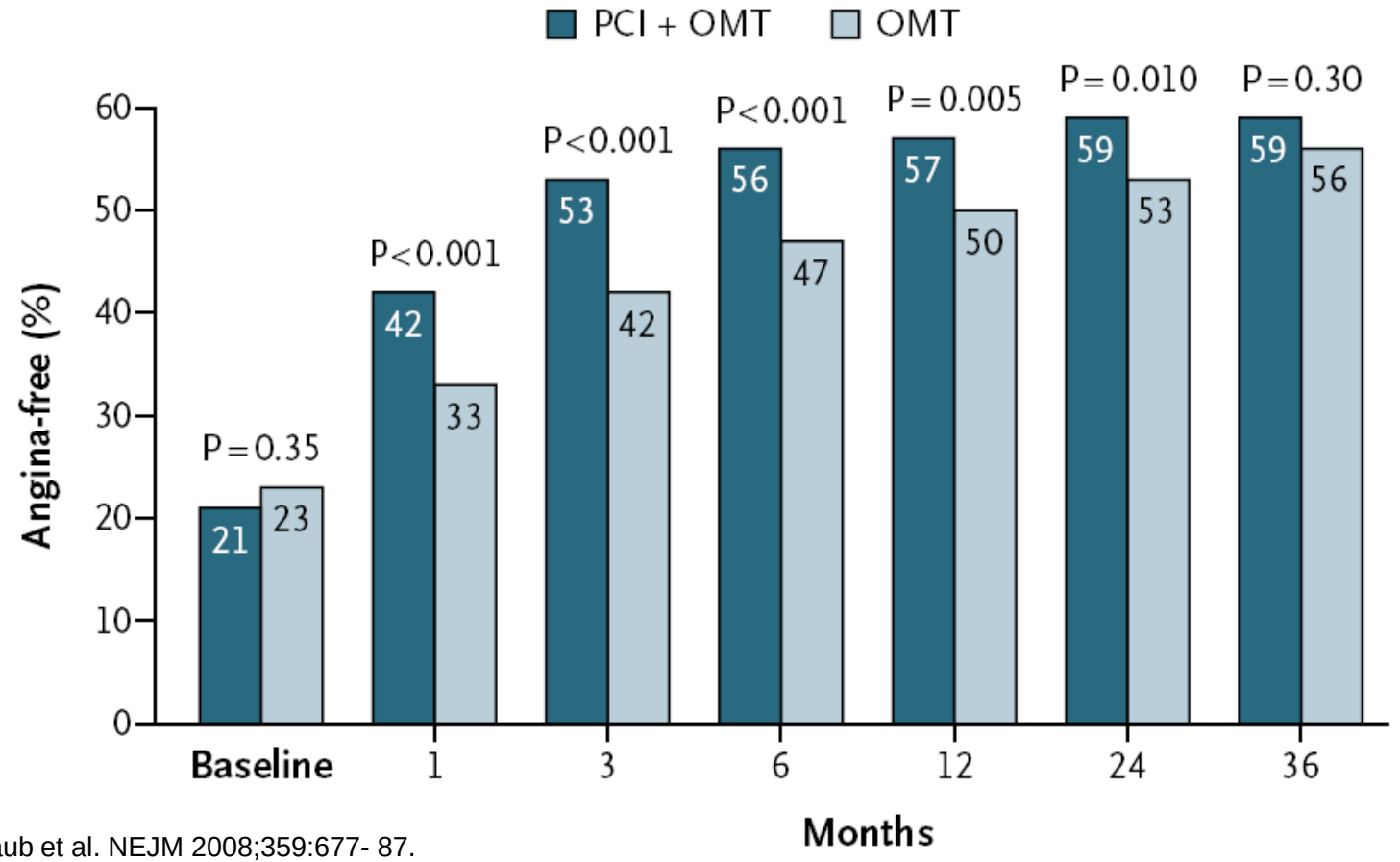
- 2287 patients with stable CAD: PCI + OMT vs. OMT alone
- Primary endpoint: death or MI

COURAGE



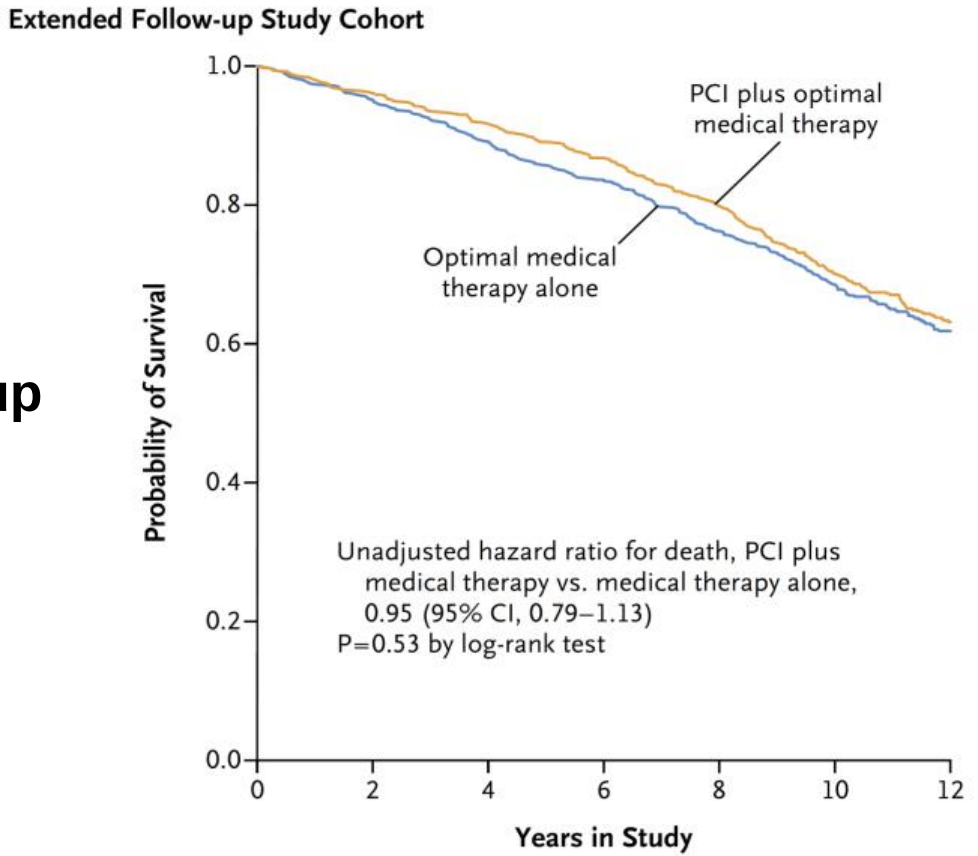
Boden et al NEJM 2007

Freedom from Angina During COURAGE



Weintraub et al. NEJM 2008;359:677- 87.

COURAGE Trial
Long-term Follow-up

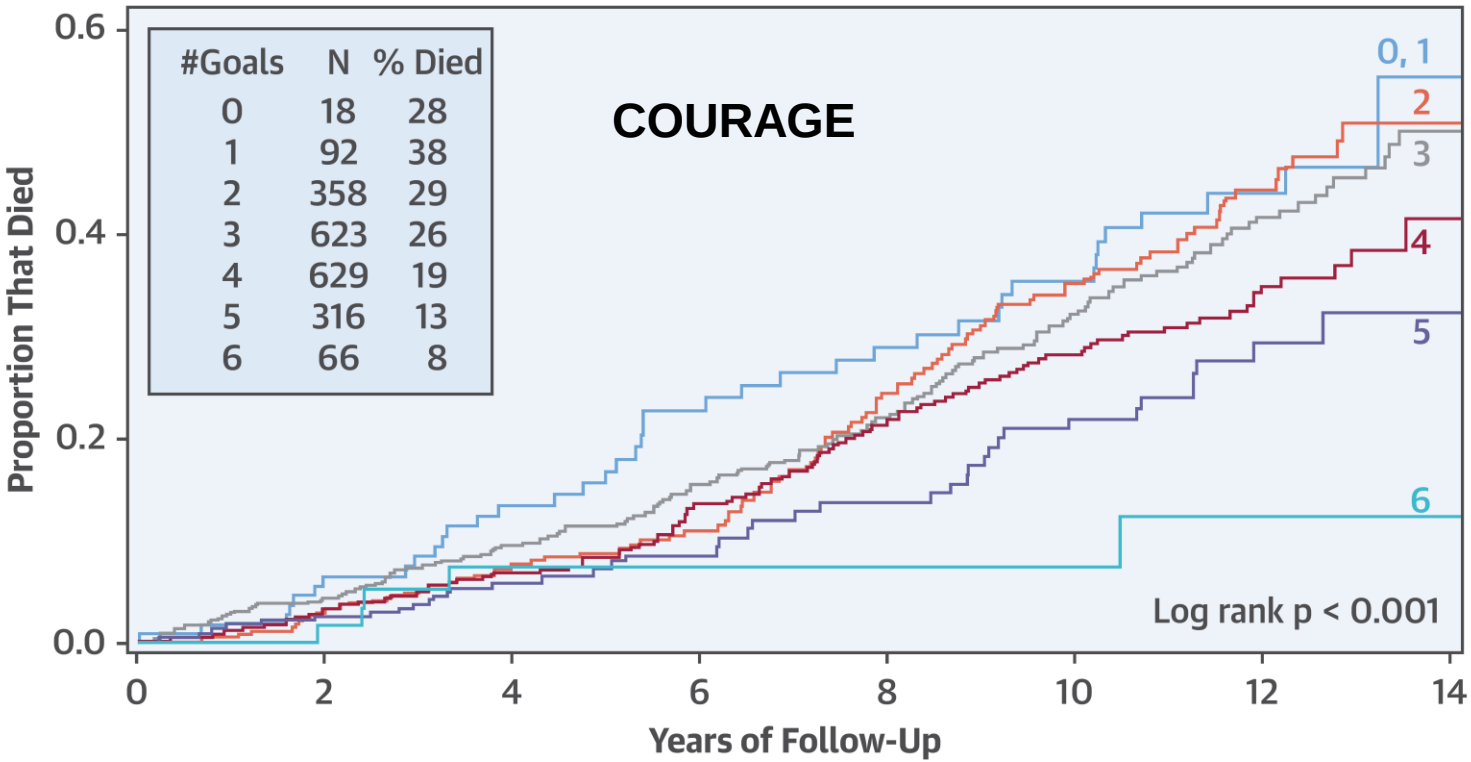


No. at Risk

Optimal medical therapy	598	569	533	500	455	403	280
PCI plus optimal medical therapy	613	589	561	529	486	416	302

Sedlis et al. NEJM 2015; 373:1937-46.

CENTRAL ILLUSTRATION **Multiple Risk Factor Control Predicts Improved Survival: Time to Death by Count of Goals Achieved**



RF goals: LDL <85 mg/dL, SBP <130 mmHg, BMI <25 (or ≥10% weight loss if baseline BMI >27.5), no smoking, ≥150 min. moderate physical activity/week, and AHA Step 2 diet.

Kaplan-Meier curves of time to death for COURAGE participants according to number of risk factor goals achieved by 1 year after randomization. Follow-up for mortality began 1 year after randomization. COURAGE = Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation.

Maron et al. JACC 2018;72:2297-305.

BARI 2D

The NEW ENGLAND JOURNAL of MEDICINE

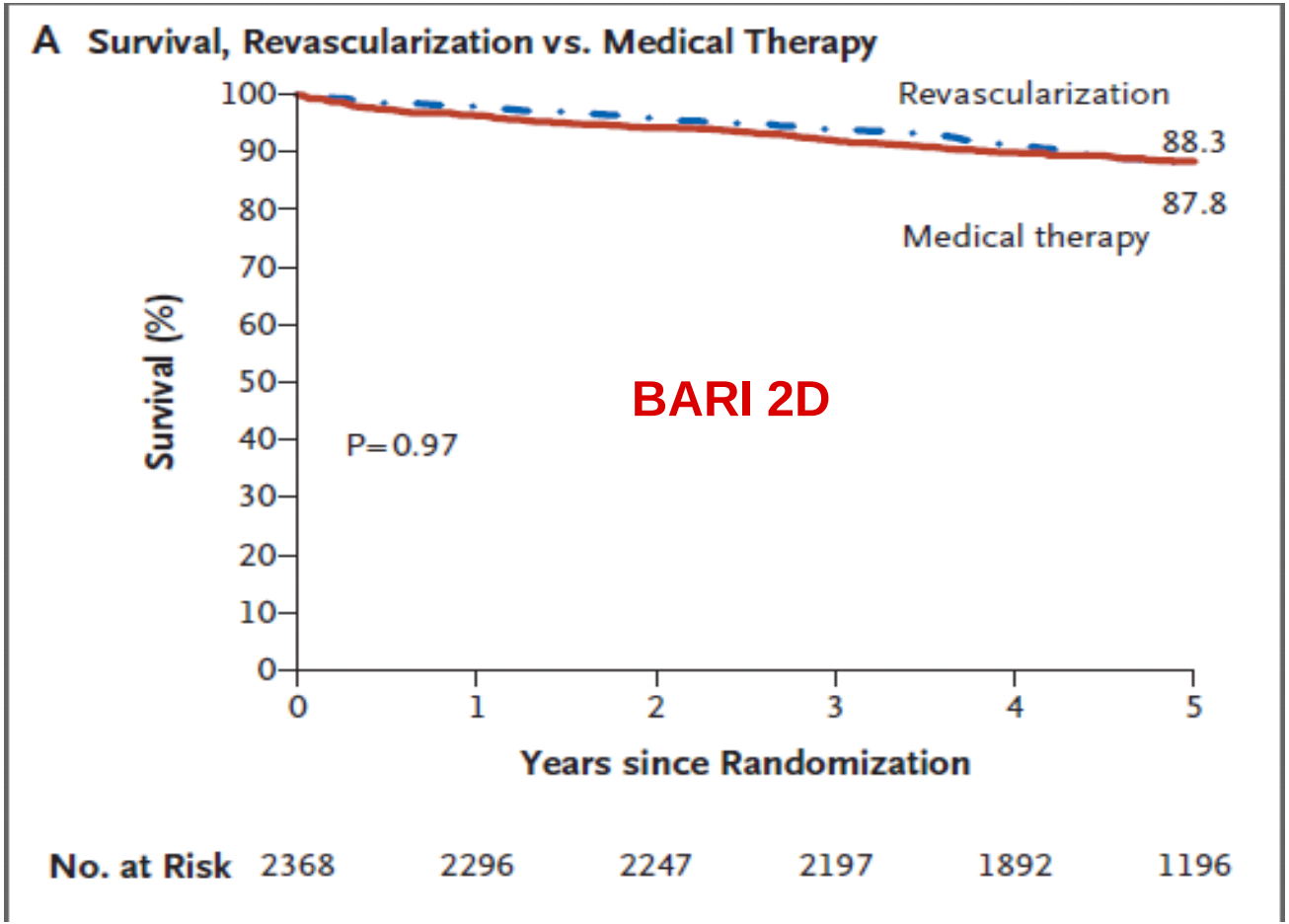
ESTABLISHED IN 1812 JUNE 11, 2009 VOL. 360 NO. 24

A Randomized Trial of Therapies for Type 2 Diabetes and Coronary Artery Disease

The BARI 2D Study Group*

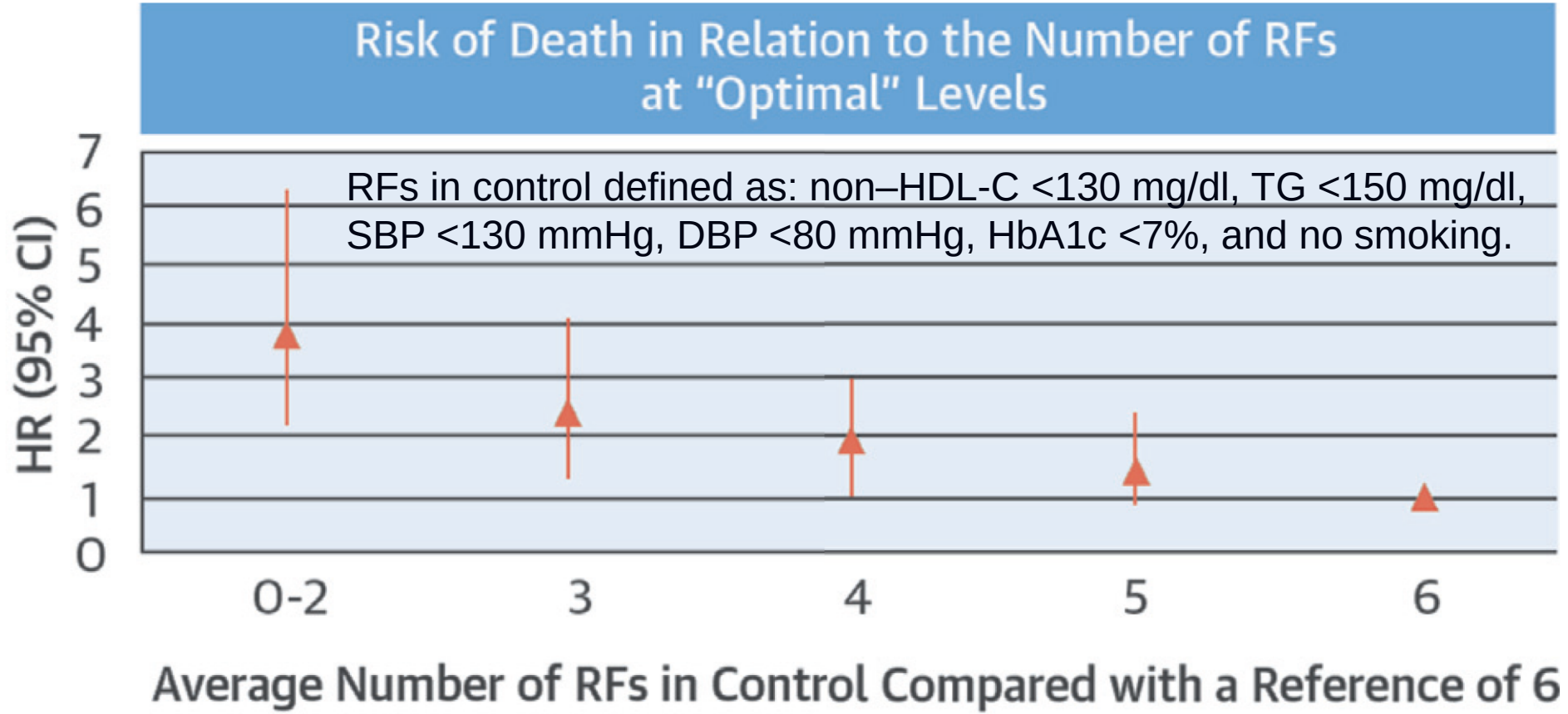
- 2368 patients with type 2 diabetes and stable CAD: revascularization + OMT vs. OMT alone
- Primary endpoint: all-cause death

BARI 2D Study Group. *N Engl J Med* 2009;360:2503-2515.



BARI 2D Study Group. *N Engl J Med* 2009;360:2503-2515.

BARI 2D Risk of Death in Relation to Risk Factor Control



Bittner et al. JACC; 2015:765–73.

FAME 2

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 SEPTEMBER 13, 2012 VOL. 367 NO. 11

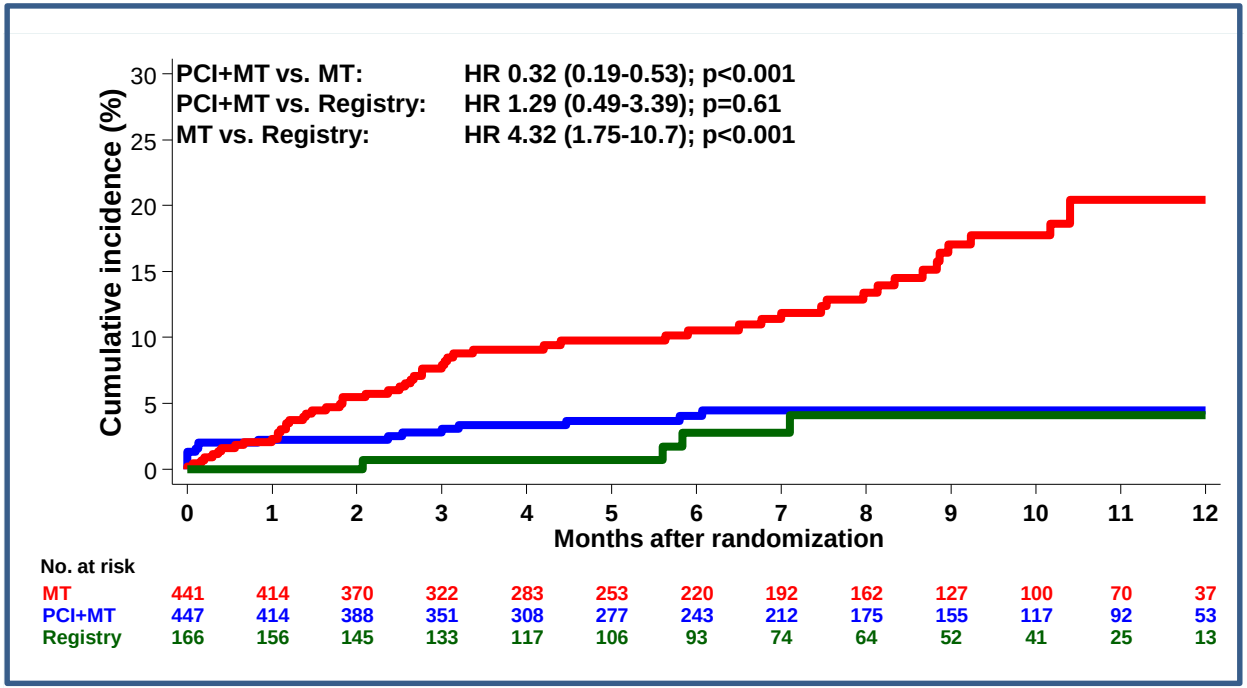
Fractional Flow Reserve–Guided PCI versus Medical Therapy in Stable Coronary Disease

Bernard De Bruyne, M.D., Ph.D., Nico H.J. Pijls, M.D., Ph.D., Bindu Kalesan, M.P.H., Emanuele Barbato, M.D., Ph.D., Pim A.L. Tonino, M.D., Ph.D., Zsolt Piroth, M.D., Nikola Jagic, M.D., Sven Mobius-Winckler, M.D., Gilles Rioufol, M.D., Ph.D., Nils Witt, M.D., Ph.D., Petr Kala, M.D., Philip MacCarthy, M.D., Thomas Engström, M.D., Keith G. Oldroyd, M.D., Kreton Mavromatis, M.D., Ganesh Manoharan, M.D., Peter Verlee, M.D., Ole Frobert, M.D., Nick Curzen, B.M., Ph.D., Jane B. Johnson, R.N., B.S.N., Peter Jüni, M.D., and William F. Fearon, M.D., for the FAME 2 Trial Investigators*

- 888 SIHD patients scheduled for 1, 2 or 3 vessel DES-PCI
- Randomized to FFR-guided PCI + MT or MT alone
- Primary endpoint: death, MI, or urgent revascularization

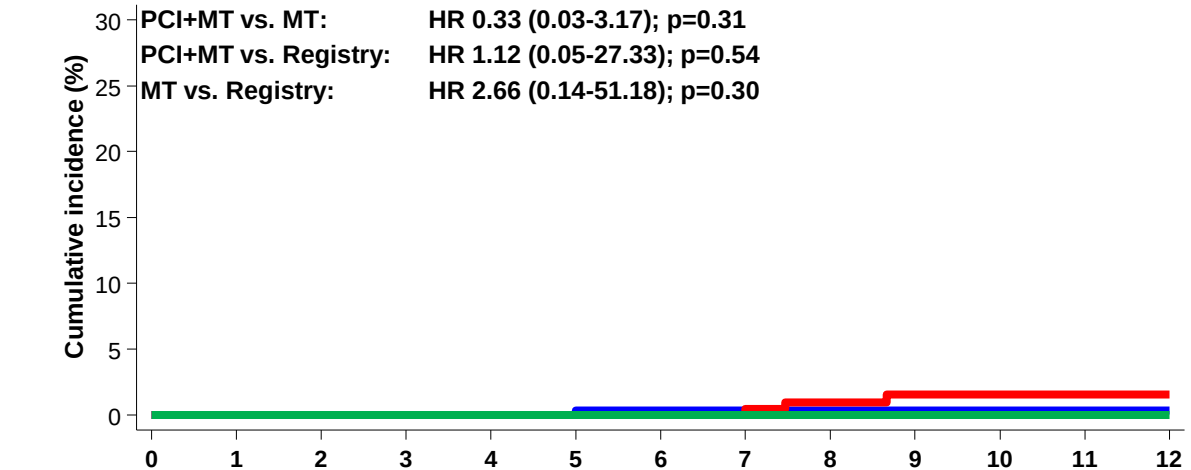
Primary Outcome

All-cause death, MI, or urgent revascularization

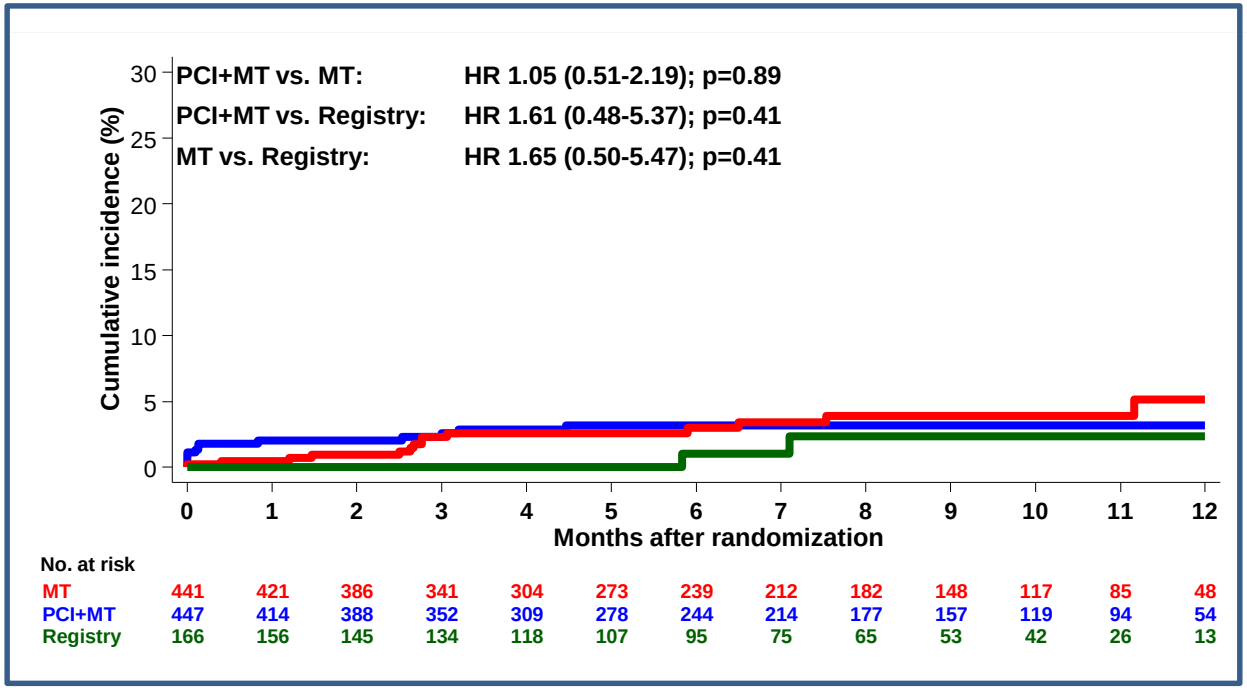


De Bruyne B et al. *NEJM* 2012:on-line

Death from any Cause



Myocardial Infarction



ISCHEMIA

ORIGINAL ARTICLE

Initial Invasive or Conservative Strategy for Stable Coronary Disease

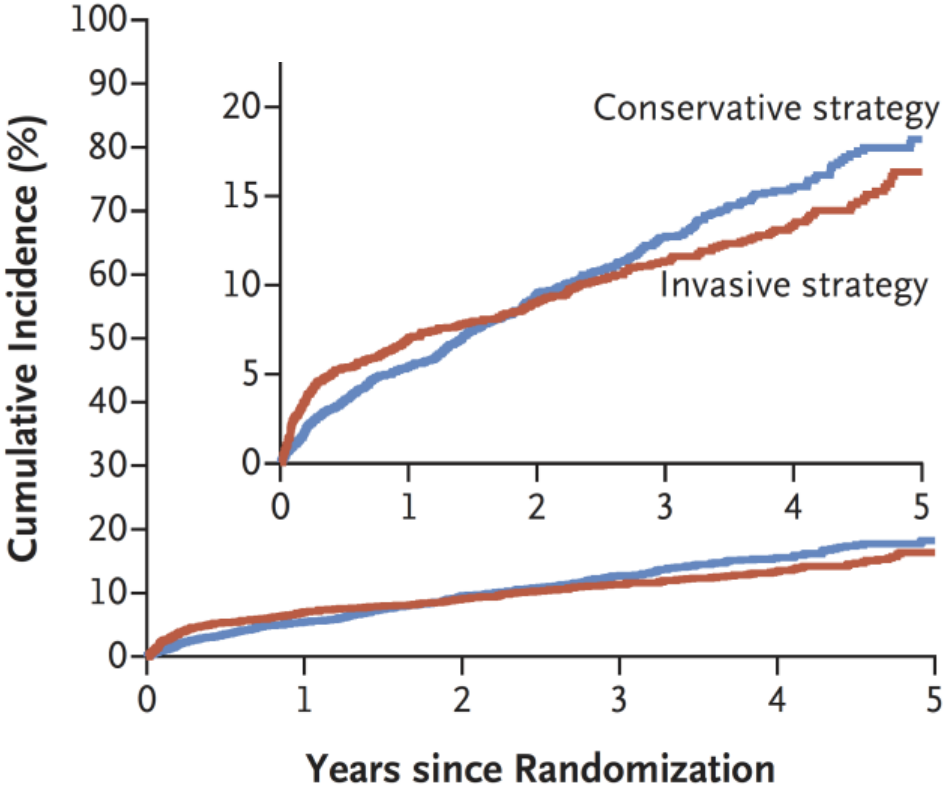
D.J. Maron, J.S. Hochman, H.R. Reynolds, S. Bangalore, S.M. O'Brien, W.E. Boden, B.R. Chaitman, R. Senior, J. López-Sendón, K.P. Alexander, R.D. Lopes, L.J. Shaw, J.S. Berger, J.D. Newman, M.S. Sidhu, S.G. Goodman, W. Ruzyllo, G. Gosselin, A.P. Maggioni, H.D. White, B. Bhargava, J.K. Min, G.B.J. Mancini, D.S. Berman, M.H. Picard, R.Y. Kwong, Z.A. Ali, D.B. Mark, J.A. Spertus, M.N. Krishnan, A. Elghamaz, N. Moorthy, W.A. Hueb, M. Demkow, K. Mavromatis, O. Bockeria, J. Peteiro, T.D. Miller, H. Szwed, R. Doerr, M. Keltai, J.B. Selvanayagam, P.G. Steg, C. Held, S. Kohsaka, S. Mavromichalis, R. Kirby, N.O. Jeffries, F.E. Harrell, Jr., F.W. Rockhold, S. Broderick, T.B. Ferguson, Jr., D.O. Williams, R.A. Harrington, G.W. Stone, and Y. Rosenberg, for the ISCHEMIA Research Group*

- 5179 patients with stable CAD and at least moderate ischemia: invasive (cath + OMT) vs. conservative (OMT alone)
- Primary endpoint: CV death, MI, hospitalization for UA, HF, resuscitated cardiac arrest

NEJM 2020

ISCHEMIA

Primary Composite Outcome (CV Death, MI, hospitalization for UA, HF or resuscitated cardiac arrest)

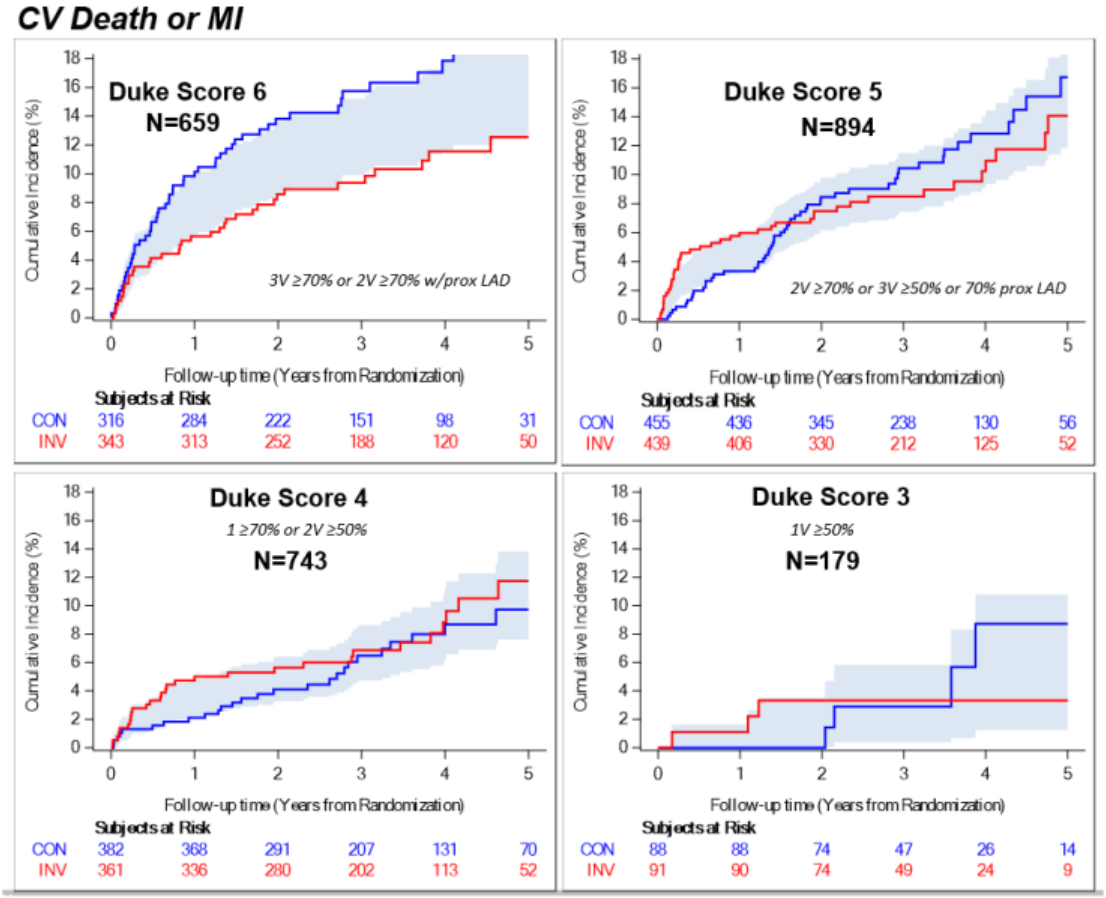


No. at Risk

Conservative strategy	2591	2431	1907	1300	733	293
Invasive strategy	2588	2364	1908	1291	730	271

Maron, Hochman, et al.
NEJM 2020.

Anatomic Severity Was Independently Associated with CV Death or MI



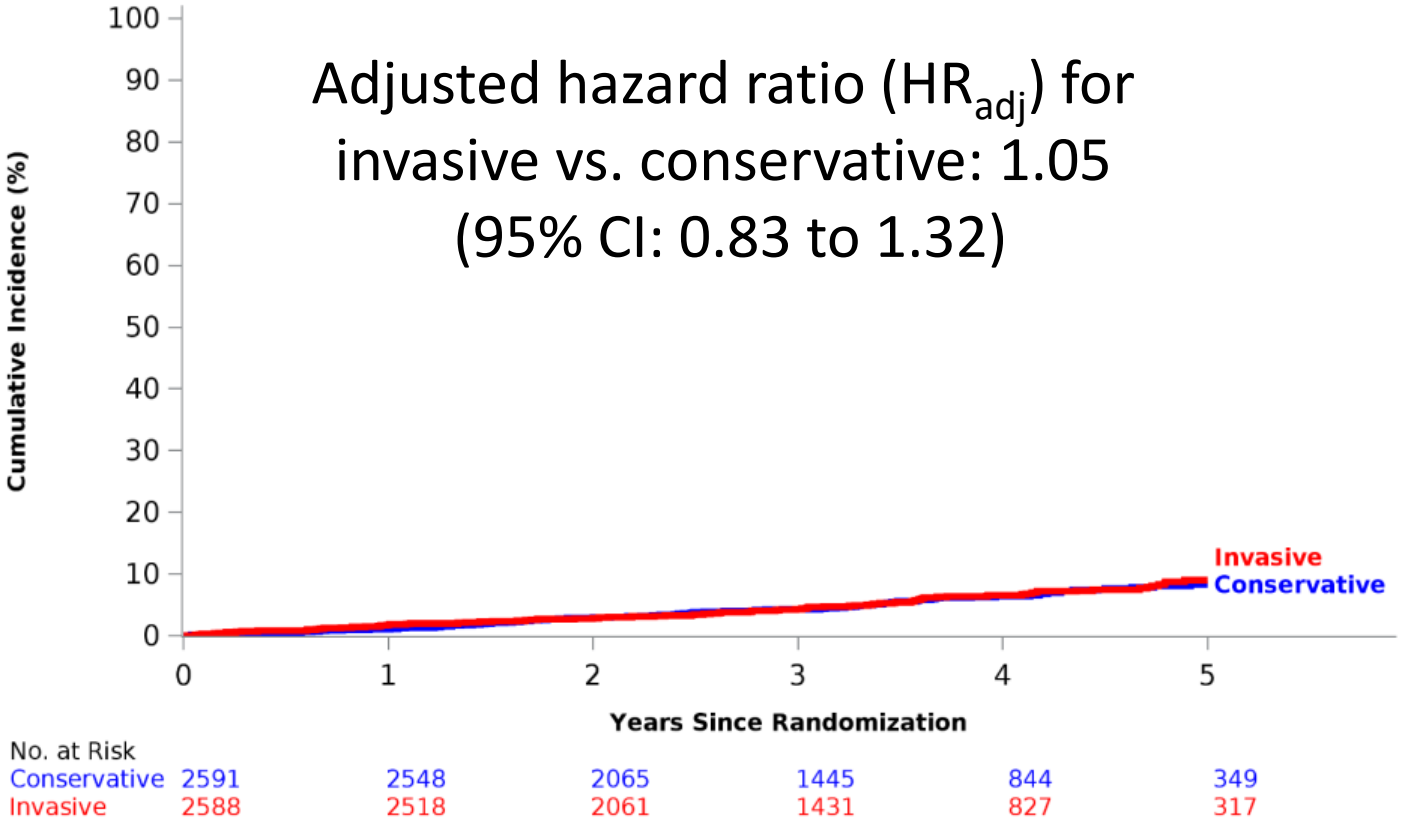
4-year event rate interaction p = 0.33

Shading indicates half width of confidence bands for INV vs. CON difference

Reynolds et al. Circulation 2021

All-Cause Death

Adjusted hazard ratio (HR_{adj}) for invasive vs. conservative: 1.05 (95% CI: 0.83 to 1.32)

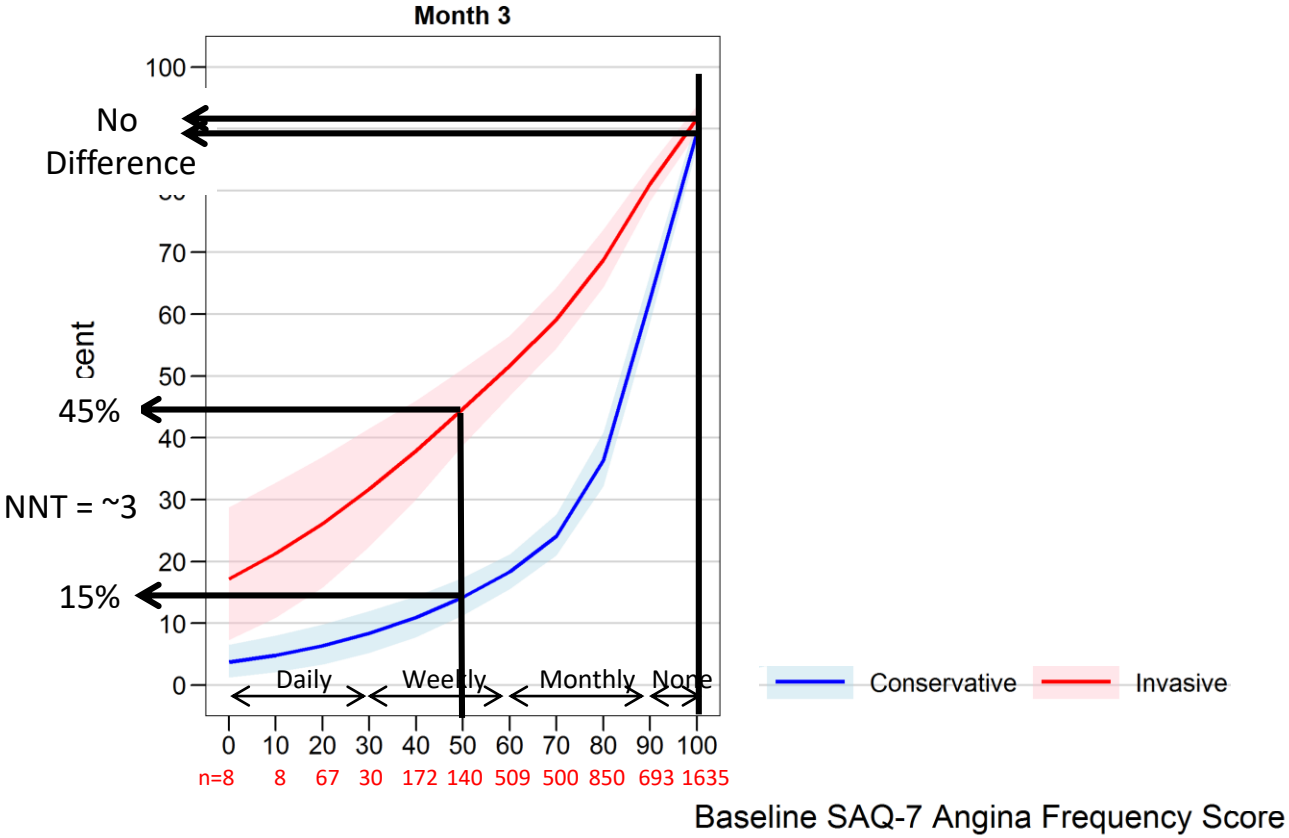


Maron, Hochman, et al. NEJM 2020.

HR adjusted for age, sex, eGFR, LVEF, and diabetes.

ISCHEMIA

Probability of Being Angina-Free By Treatment Group



Spertus, Jones, Maron, et al. NEJM 2020.

ISCHEMIA

Take Home Points

"Thus, provided there is strict adherence to guideline-based medical therapy, patients with stable ischemic heart disease who fit the profile of those in ISCHEMIA and do not have unacceptable levels of angina can be treated with an initial conservative strategy. However, an invasive strategy, which more effectively relieves symptoms of angina (especially in patients with frequent episodes), is a reasonable approach at any point in time for symptom relief."

Elliott M. Antman, M.D., and Eugene Braunwald, M.D.
NEJM 2020. Editorial accompanying ISCHEMIA.

Thank You