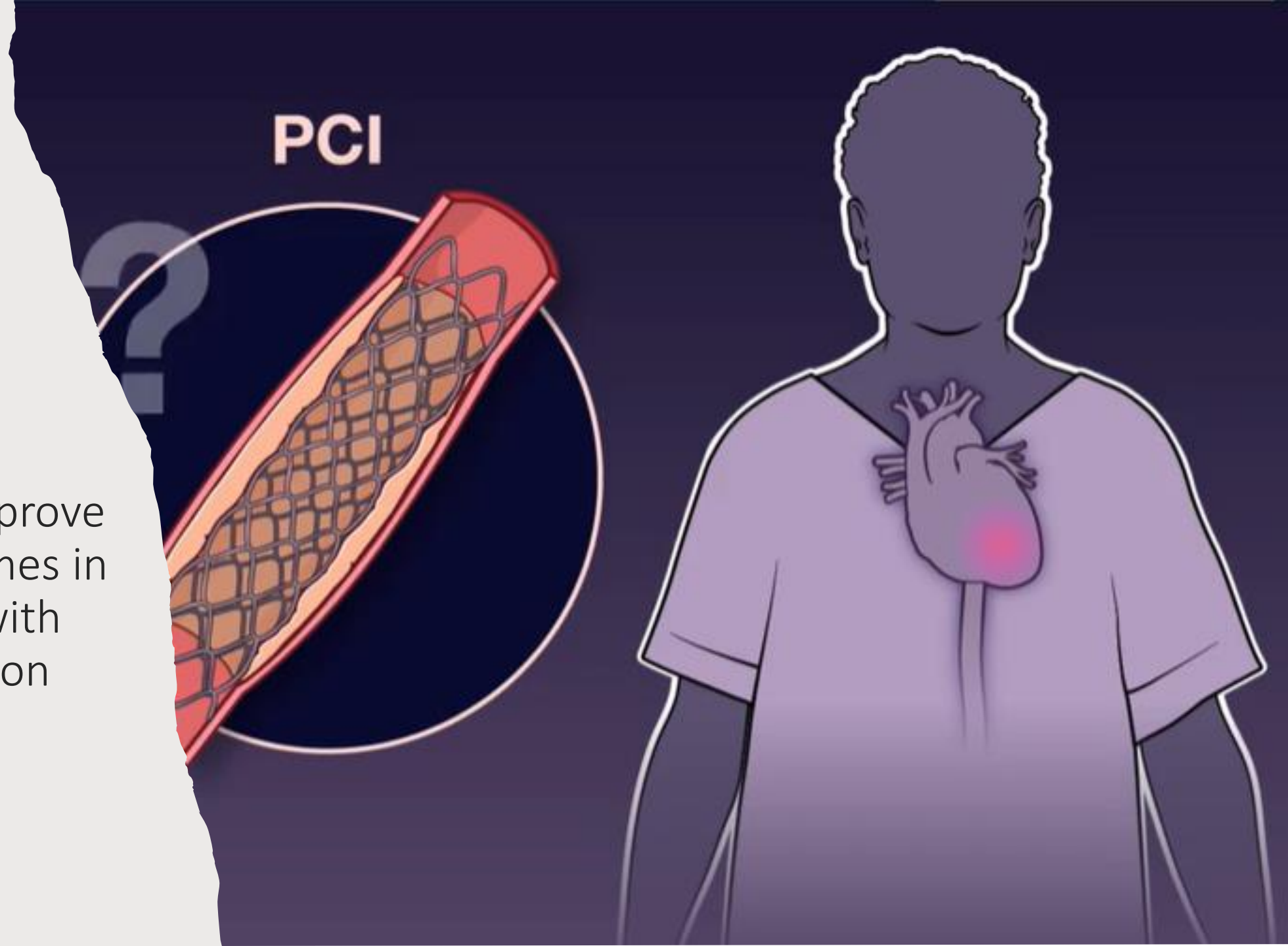
Top 5 Pearls in Interventional Cardiology

Abhas Khurana, PGY-6

1. Does PCI Improve Clinical Outcomes in Heart Failure with Reduced Ejection Fraction



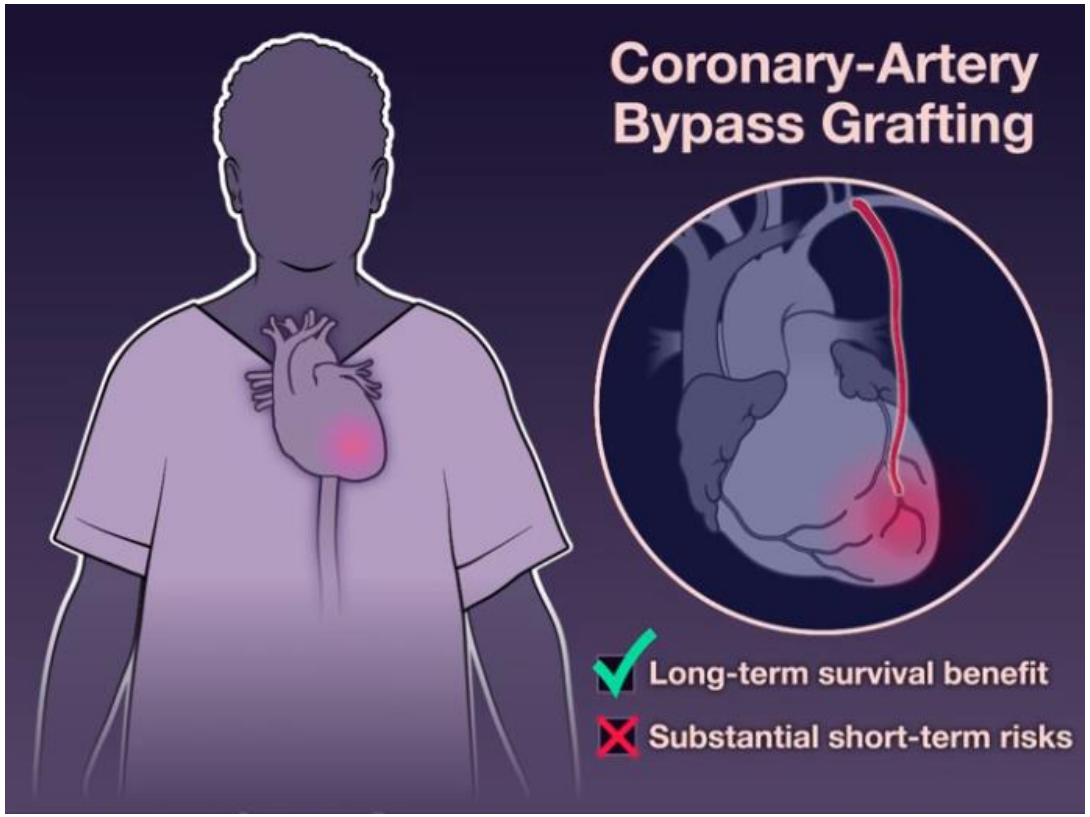
REVIVED-BCIS2

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 OCTOBER 13, 2022 VOL. 387 NO. 15

Percutaneous Revascularization for Ischemic Left Ventricular Dysfunction

Divaka Perera, M.D., Tim Clayton, M.Sc., Peter D. O'Kane, M.D., John P. Greenwood, Ph.D., Roshan Weerackody, Ph.D., Matthew Ryan, Ph.D., Holly P. Morgan, M.B., B.Ch., Matthew Dodd, M.Sc., Richard Evans, B.A., Ruth Canter, M.Sc., Sophie Arnold, M.Sc., Lana J. Dixon, Ph.D., Richard J. Edwards, Ph.D., Kalpa De Silva, Ph.D., James C. Spratt, M.D., Dwayne Conway, M.D., James Cotton, M.D., Margaret McEntegart, Ph.D., Amedeo Chiribiri, Ph.D., Pedro Saramago, Ph.D., Anthony Gershlick, M.D., Ajay M. Shah, M.D., Andrew L. Clark, M.D., and Mark C. Petrie, M.D., for the REVIVED-BCIS2 Investigators*



PCI + Optimal Medical Therapy
N=347

Optimal Medical Therapy
N=353

Primary Composite Outcome

Death from any cause

Hospitalization for heart failure

LV Ejection Fraction ≤ 35%
Extensive Coronary Disease (BCIS-JS ≥6)

↓

Viable Myocardium
on CMR, DSE, SPECT or PET
PCI feasible to lesions subtending ≥4 dysfunctional but viable segments

↓

RANDOMISE

↓

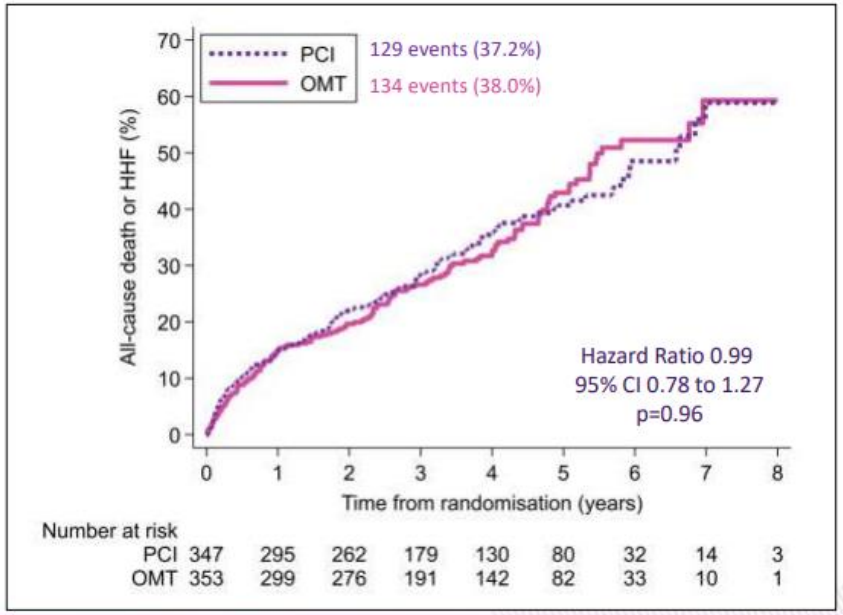
PCI | Optimal Medical Therapy

↓

Echocardiography at 6m, 12m
Clinical, ICD, biochemical follow up at 6m, 12m, 24m+

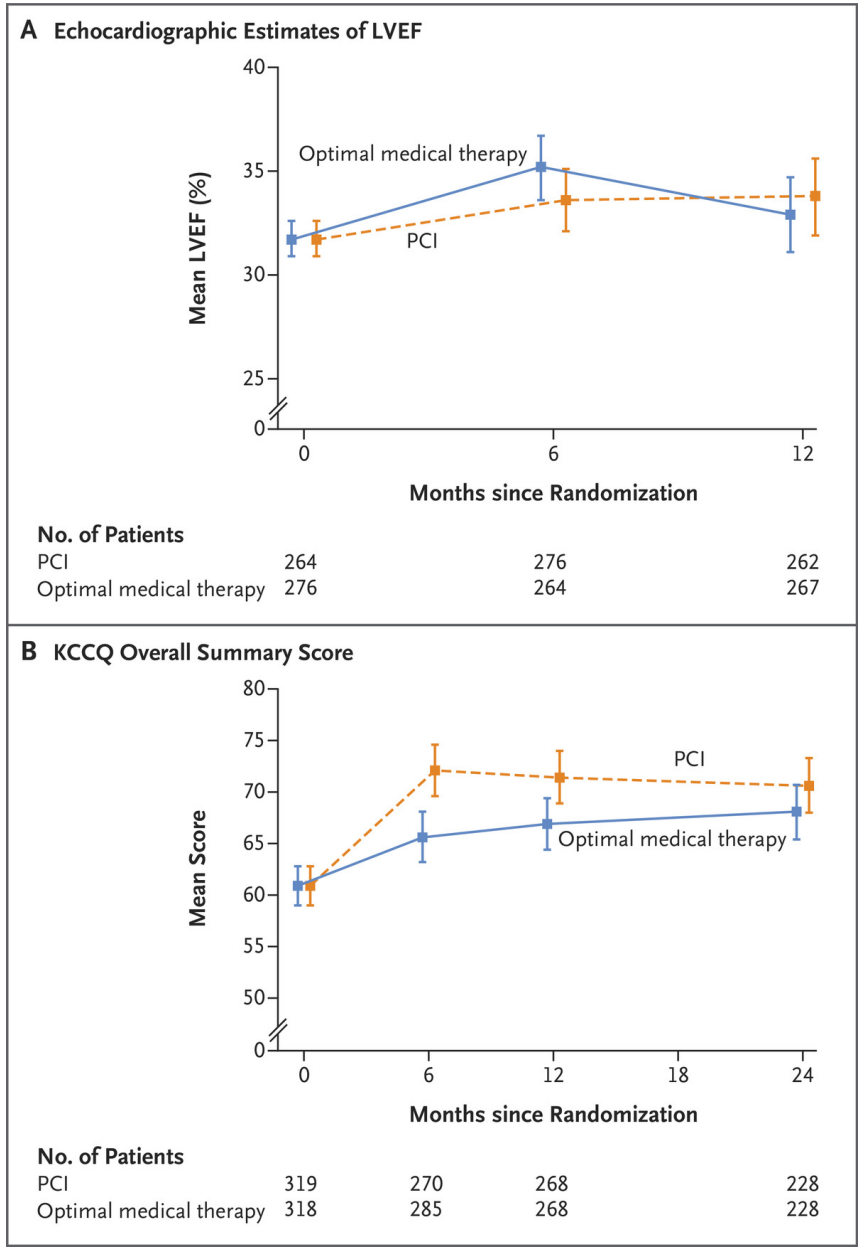
Primary Outcome
All-cause death or hospitalisation for heart failure

Major Secondary Outcome
Left ventricular ejection fraction at 6- and 12-months

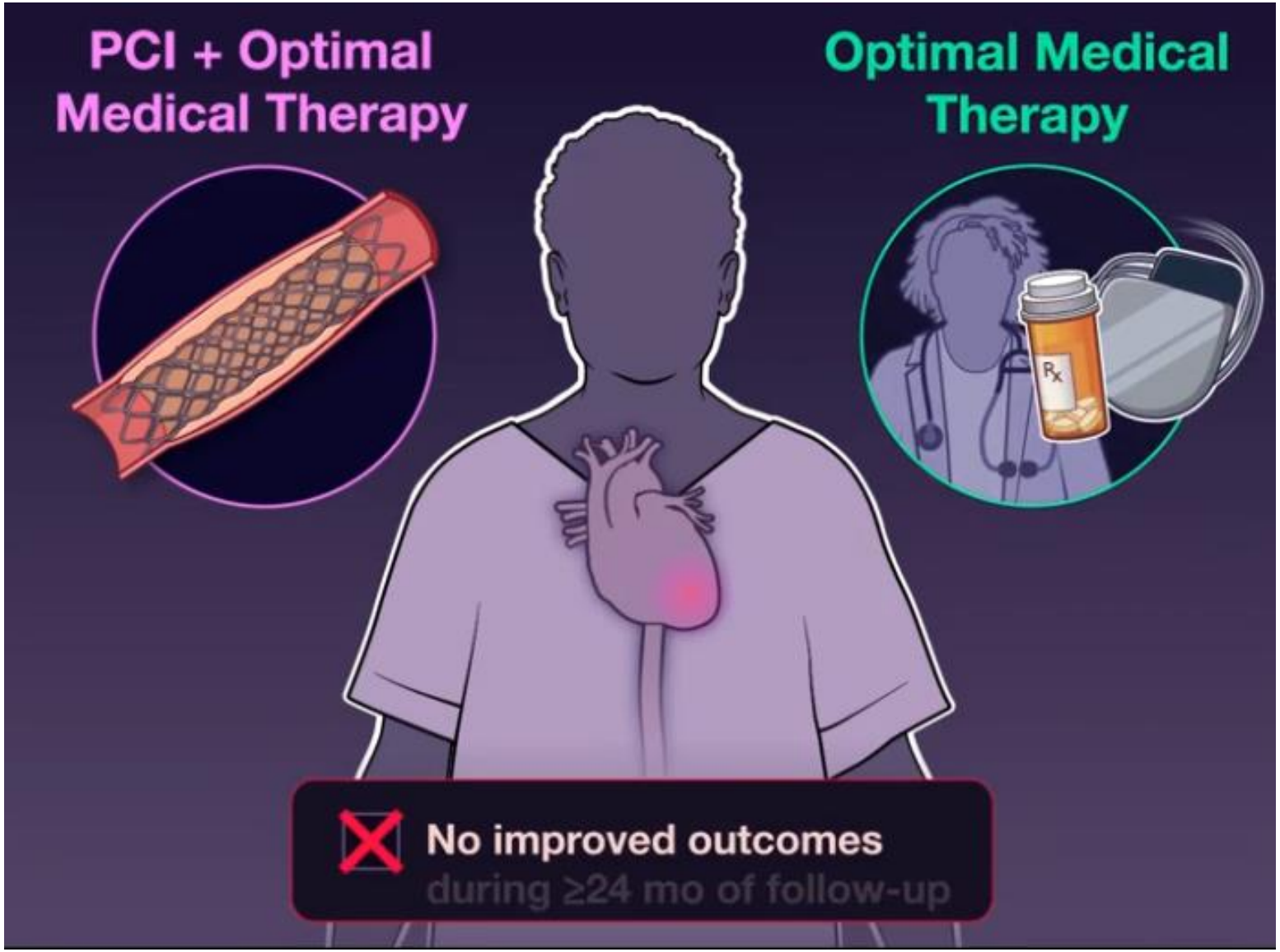


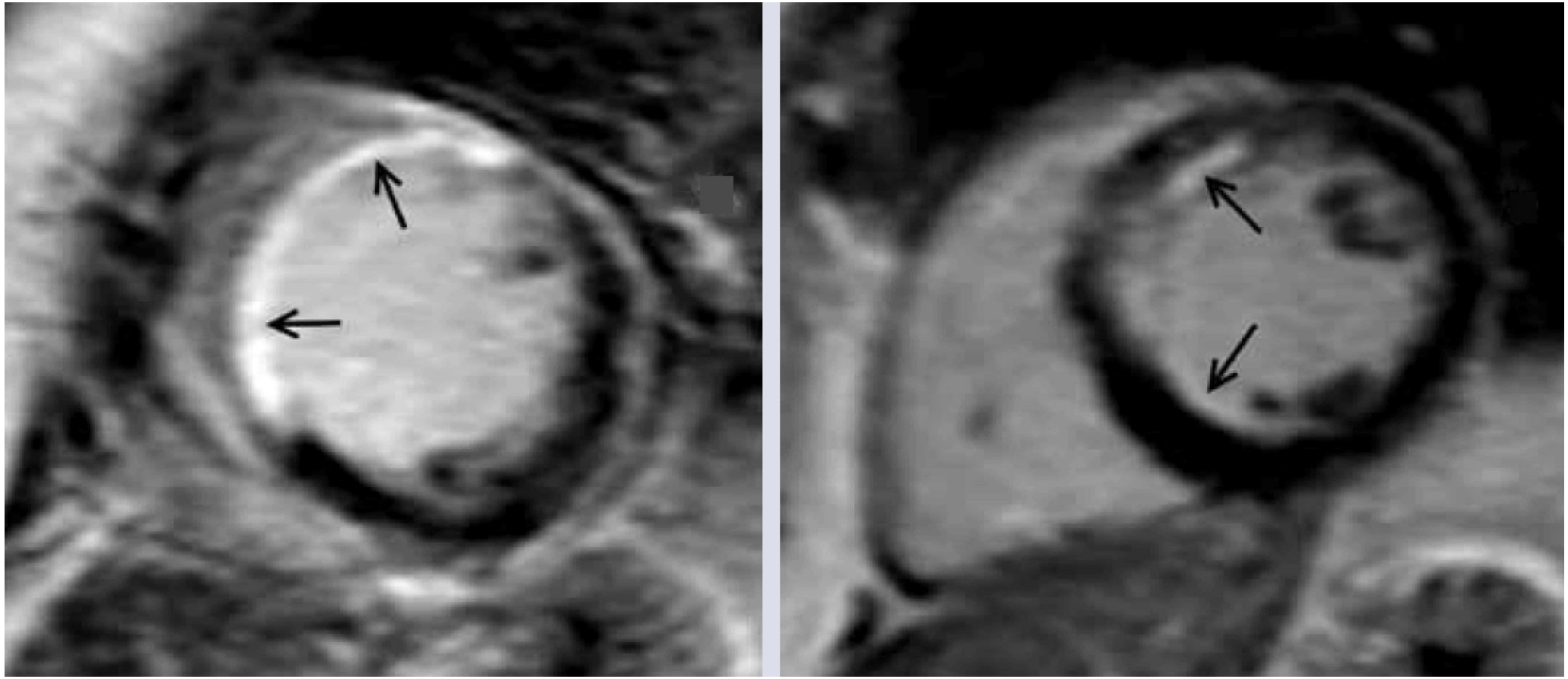
REVIVED-BCIS2

REVIVED-BCIS2: Secondary Outcome



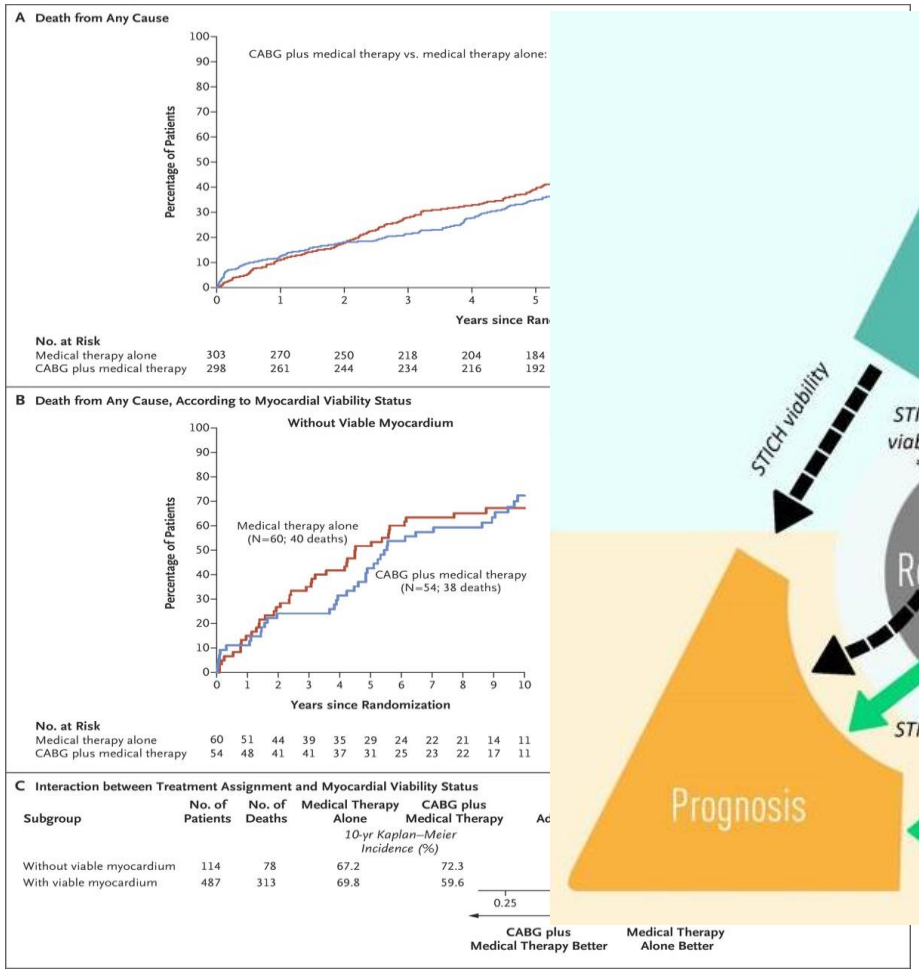
REVIVED-BCIS2: Conclusion

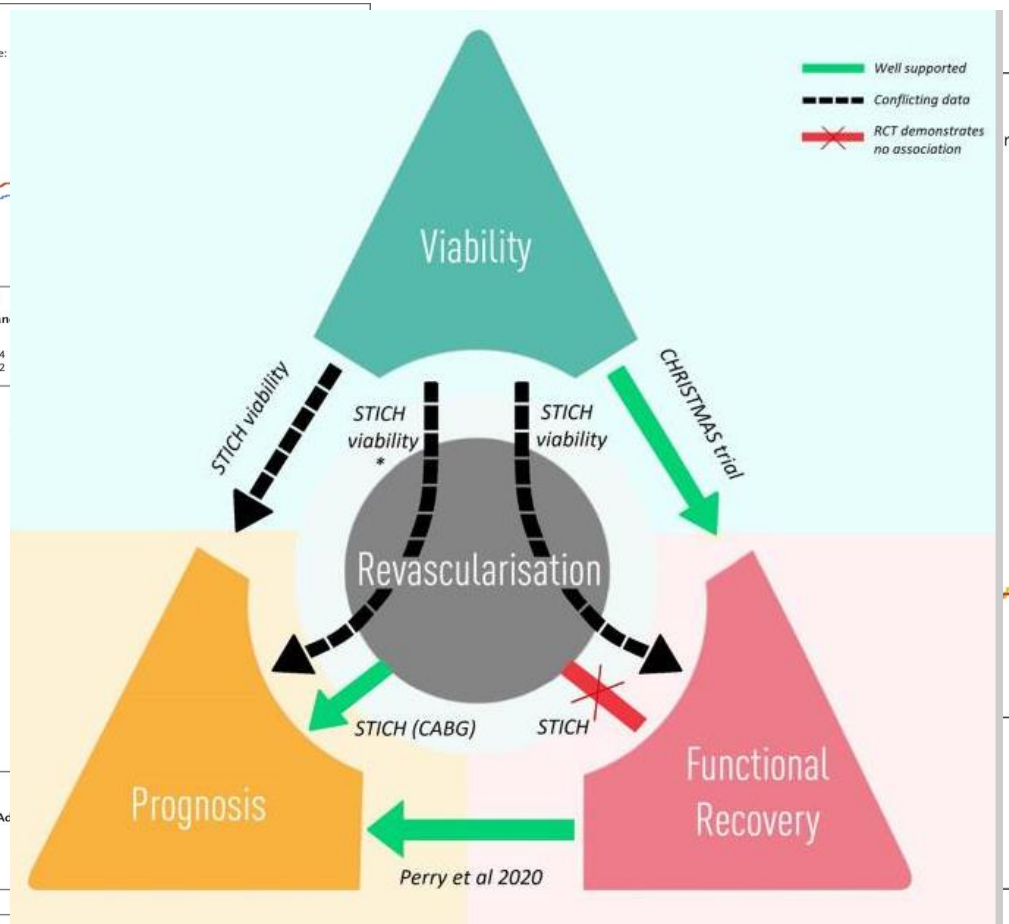


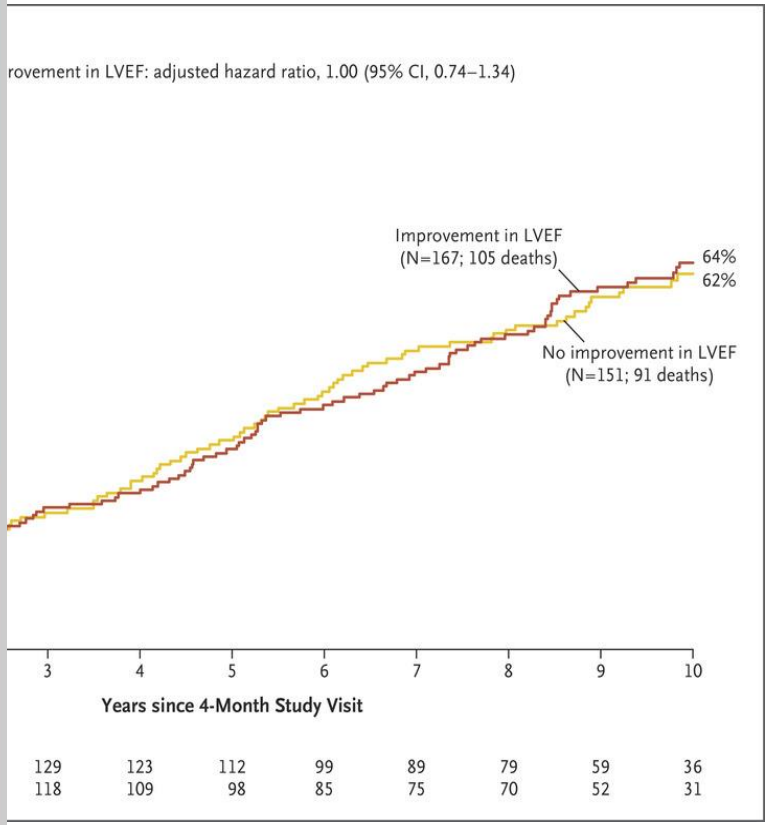


2. Role of Viability before PCI?

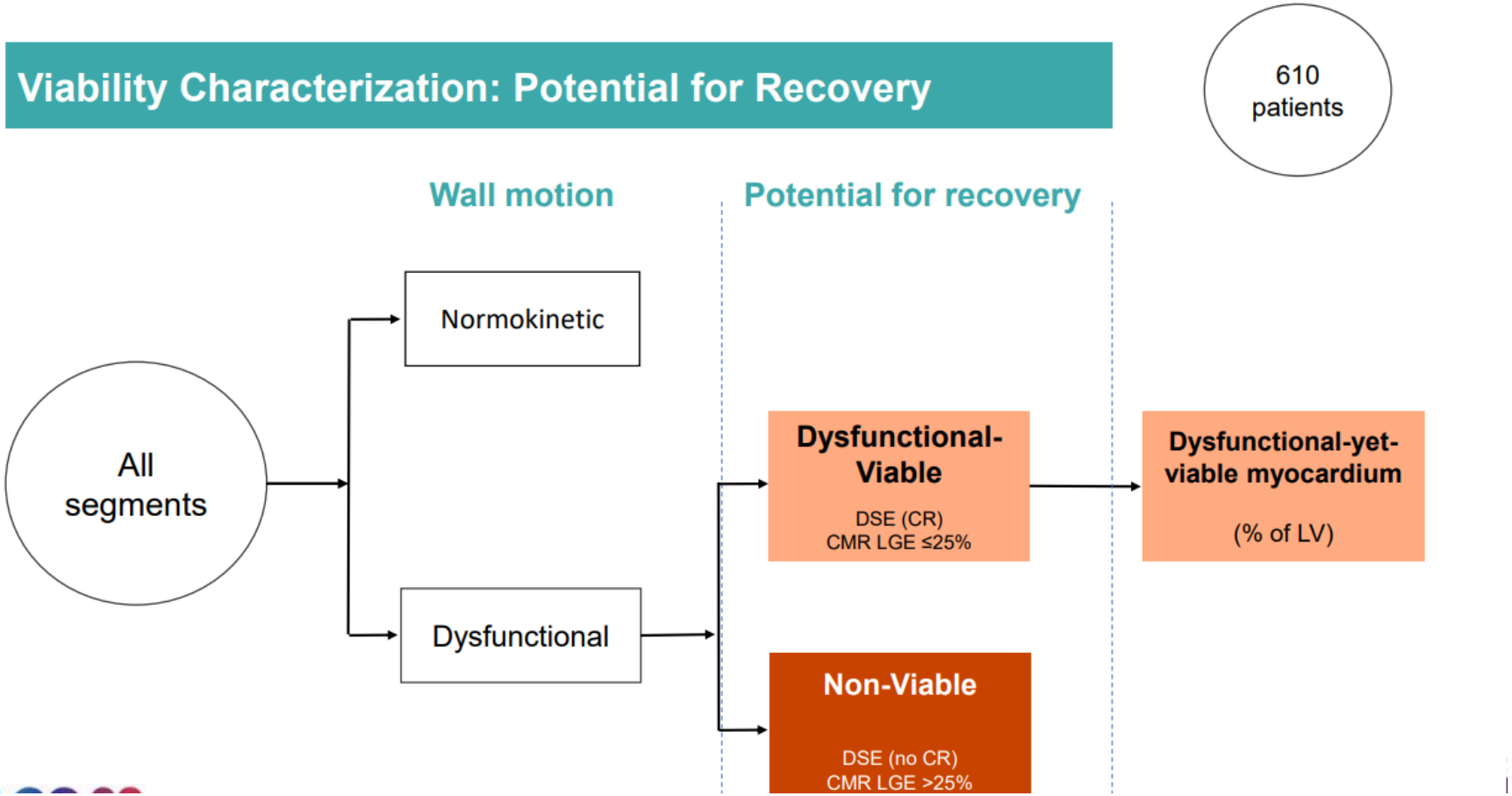
Effect of Myocardial Viability on Functional Recovery: Stitched?



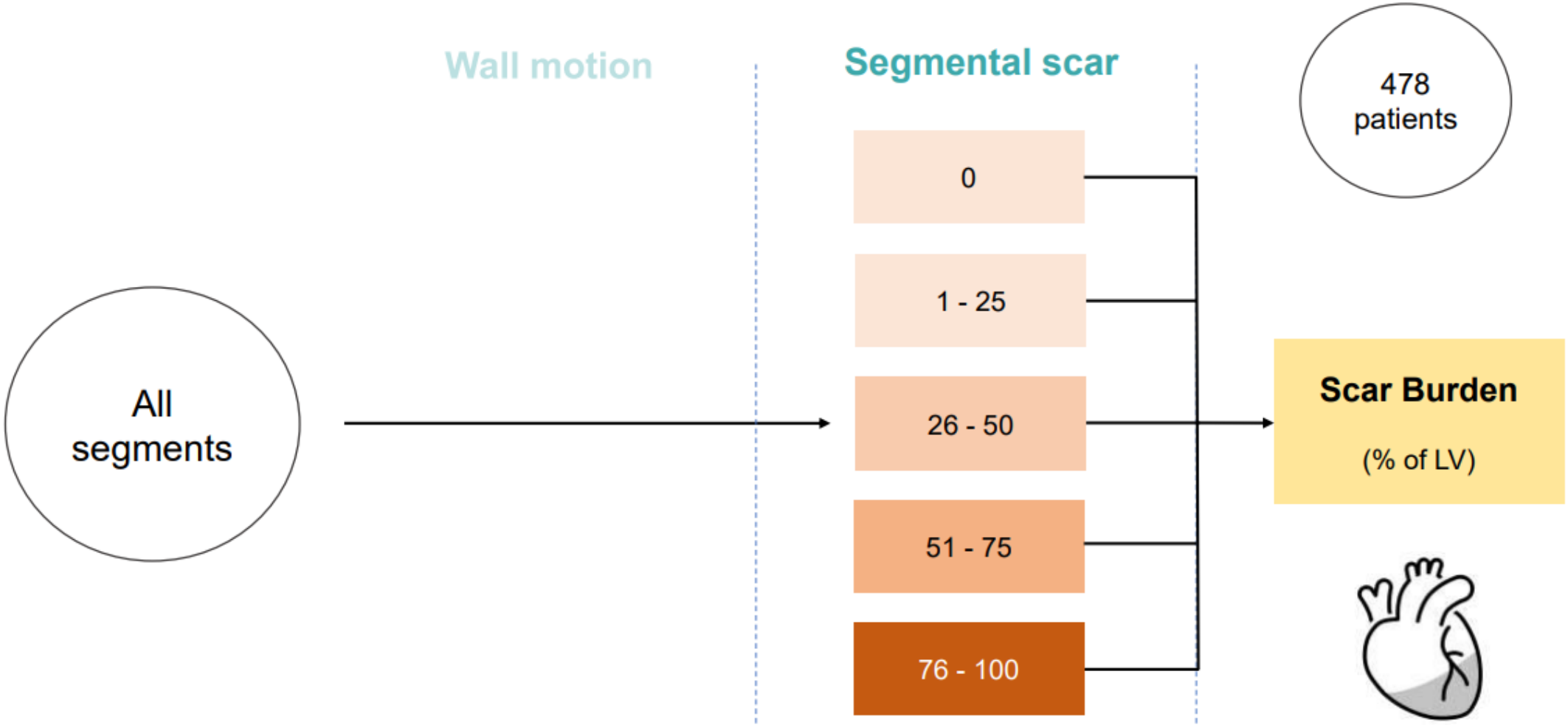




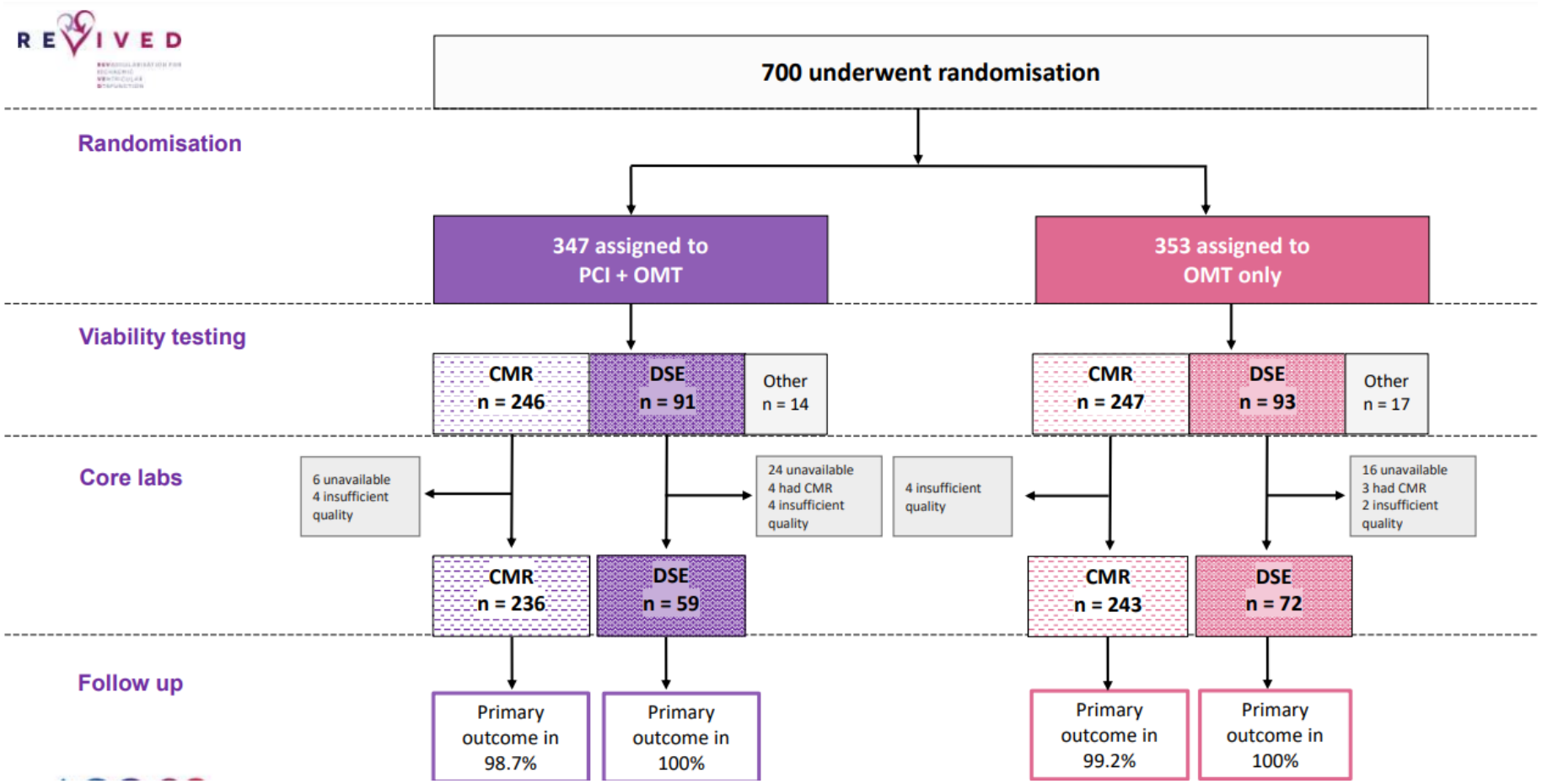
Effect of Myocardial Viability on Clinical Outcomes in the REVIVED-BCIS2 Trial



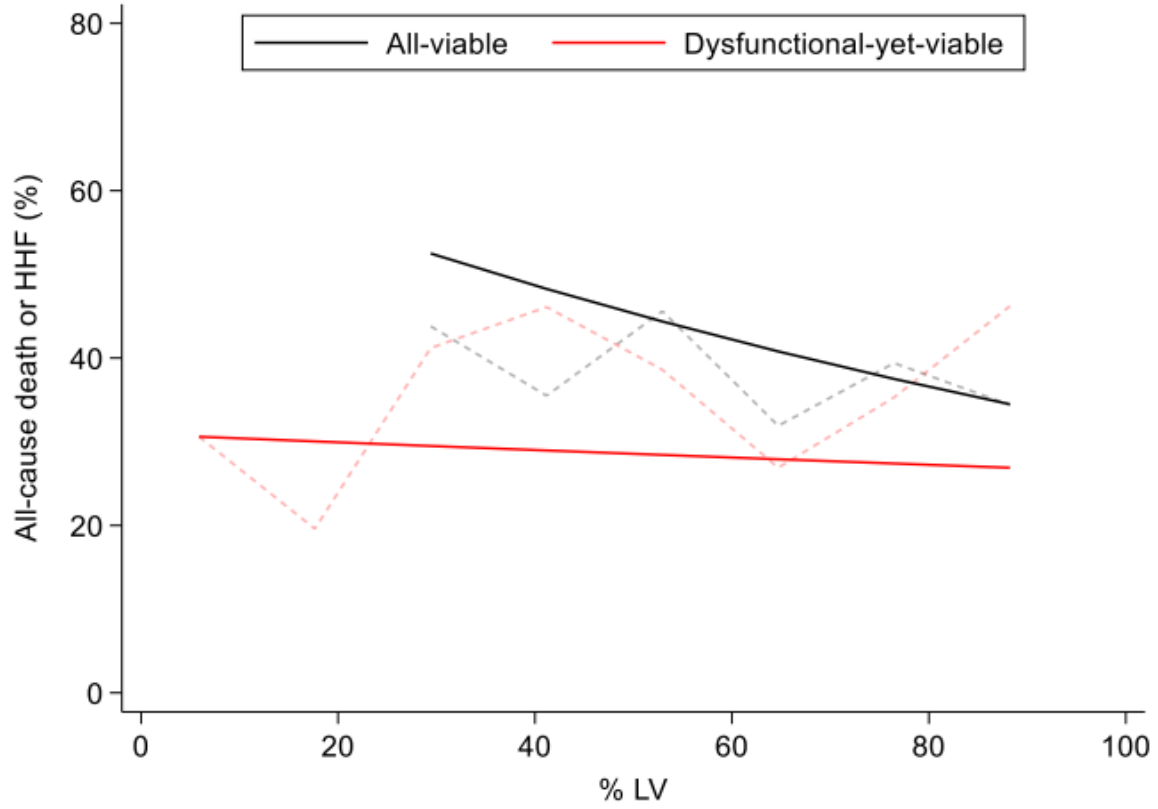
Viability Characterization: Scar Burden



REVIVED-BCIS2: Sub Study



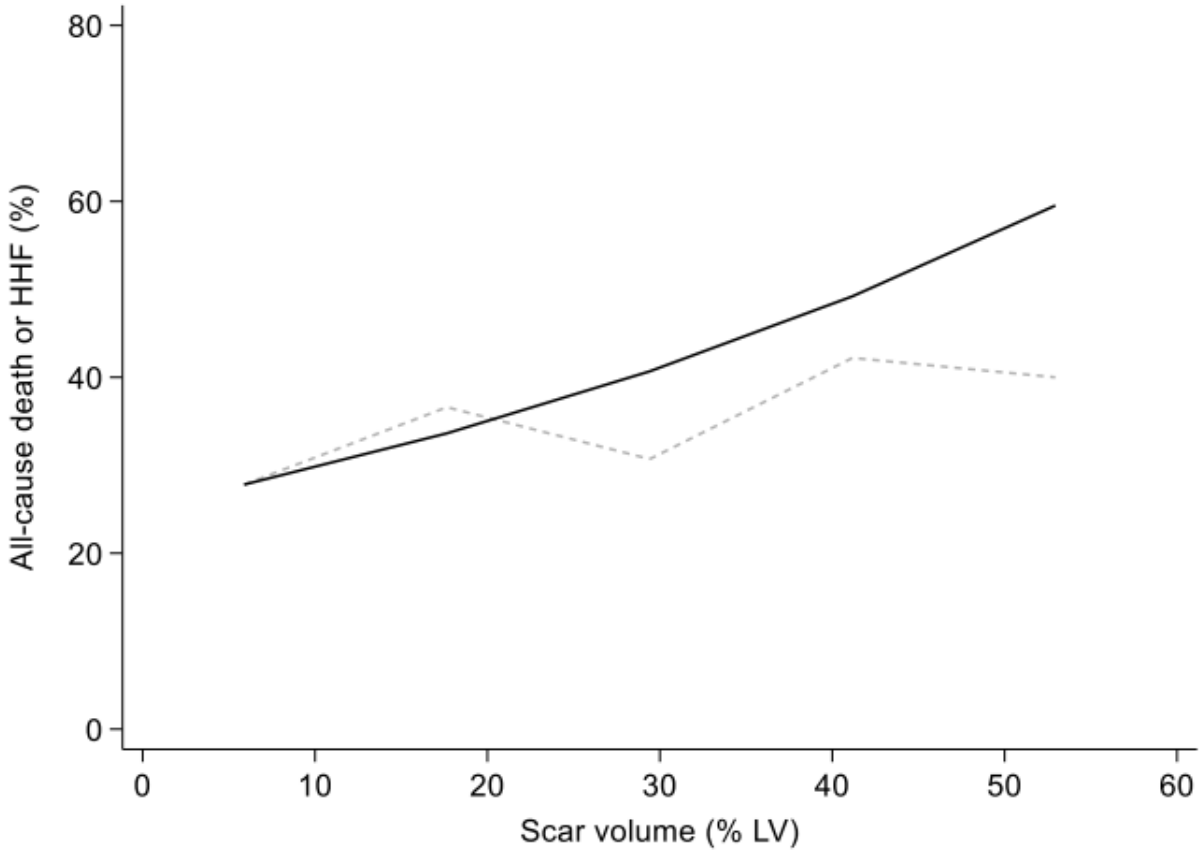
Death or HF by viability characterization



All-Viable Myocardium HR 0.93 (CI 0.87 to 1.00)* p=0.048

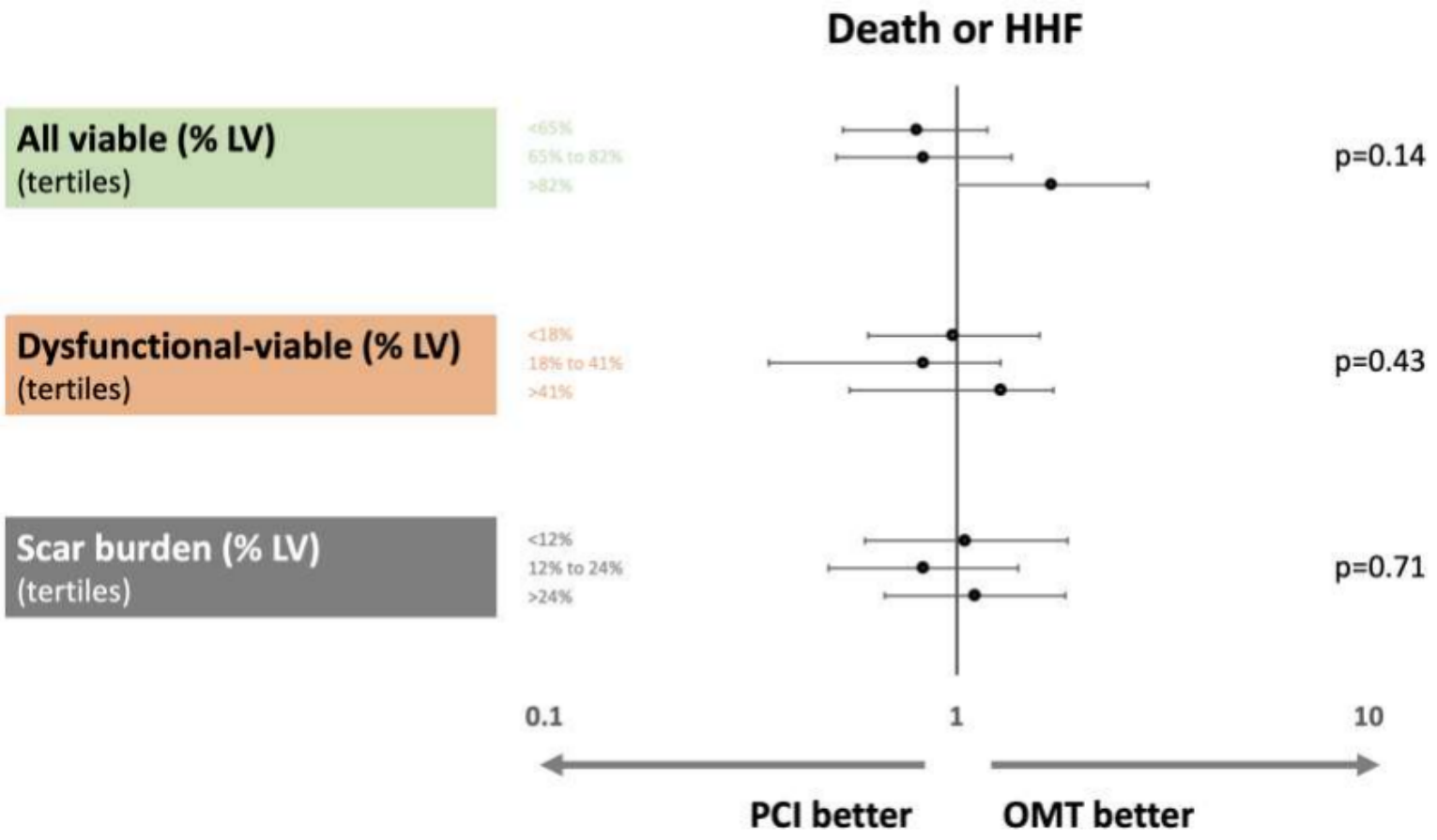
Dysfunctional-Viable Myocardium HR 0.98 (CI 0.93 to 1.04)* p=0.56

Death or HF by scar burden

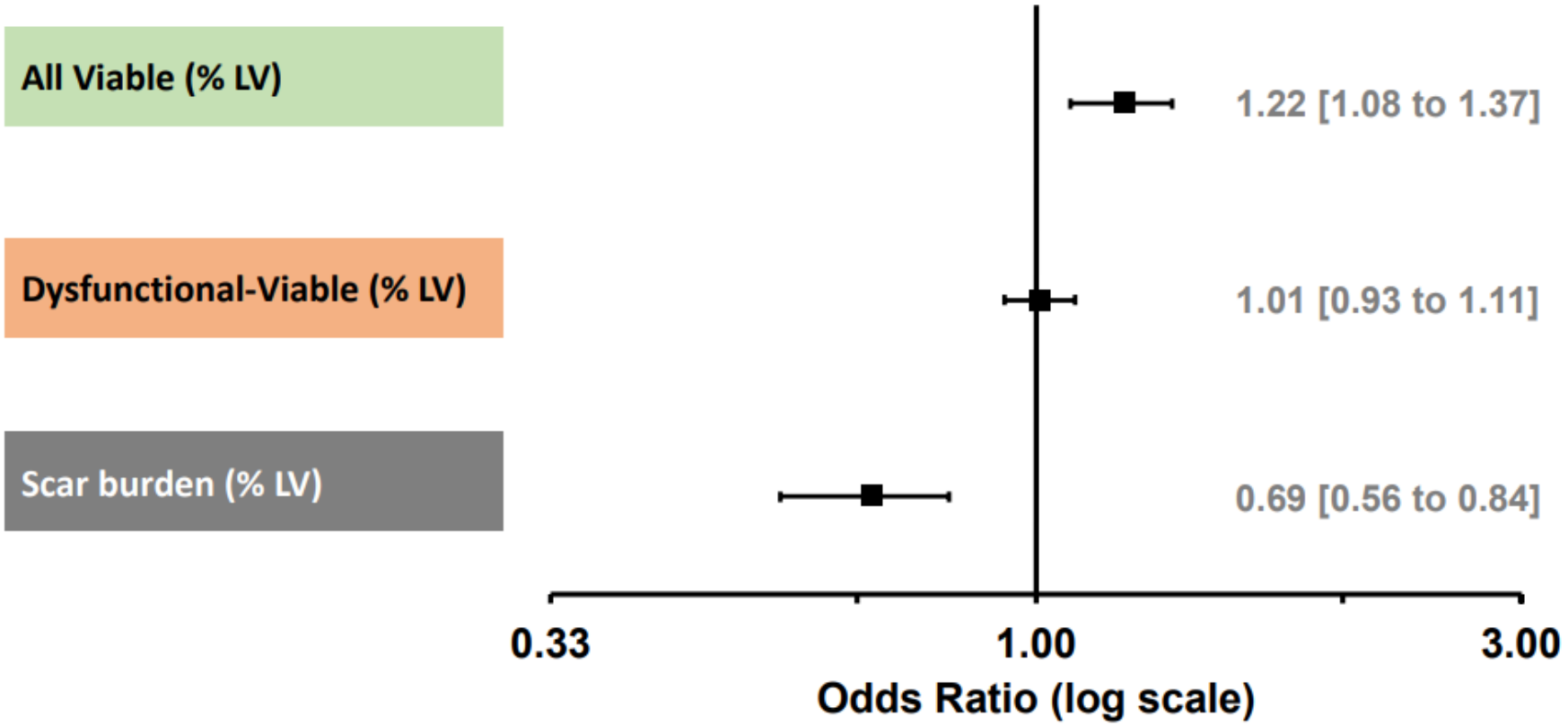


Scar burden HR 1.18 (CI 1.04 to 1.33) p=0.009

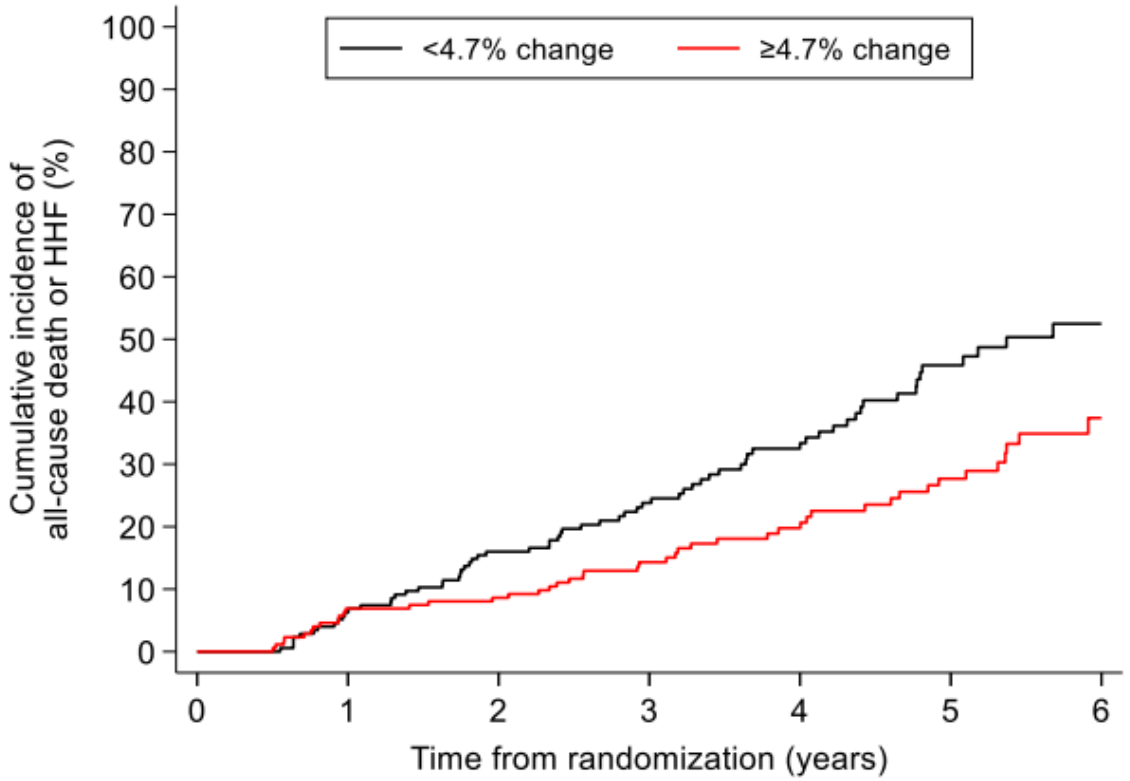
Treatment effect by viability characterization



Left ventricular recovery by viability characterization



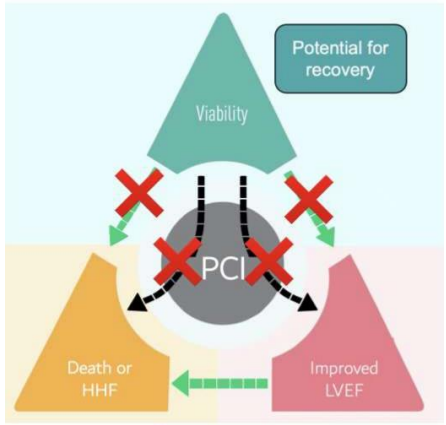
Death or HHF by LV recovery

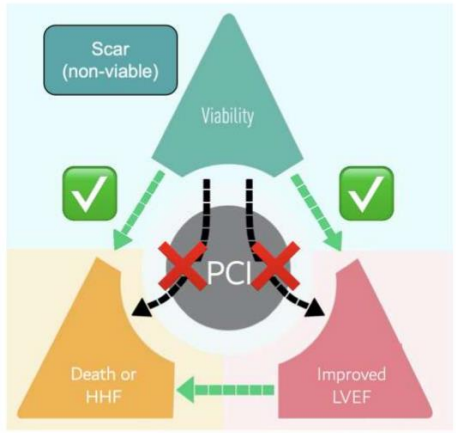


Number at risk							
<4.7% change	175	164	146	106	77	43	18
≥4.7% change	174	162	157	121	91	63	25

HR 0.62 (0.41 to 0.95) p=0.029

Conclusion



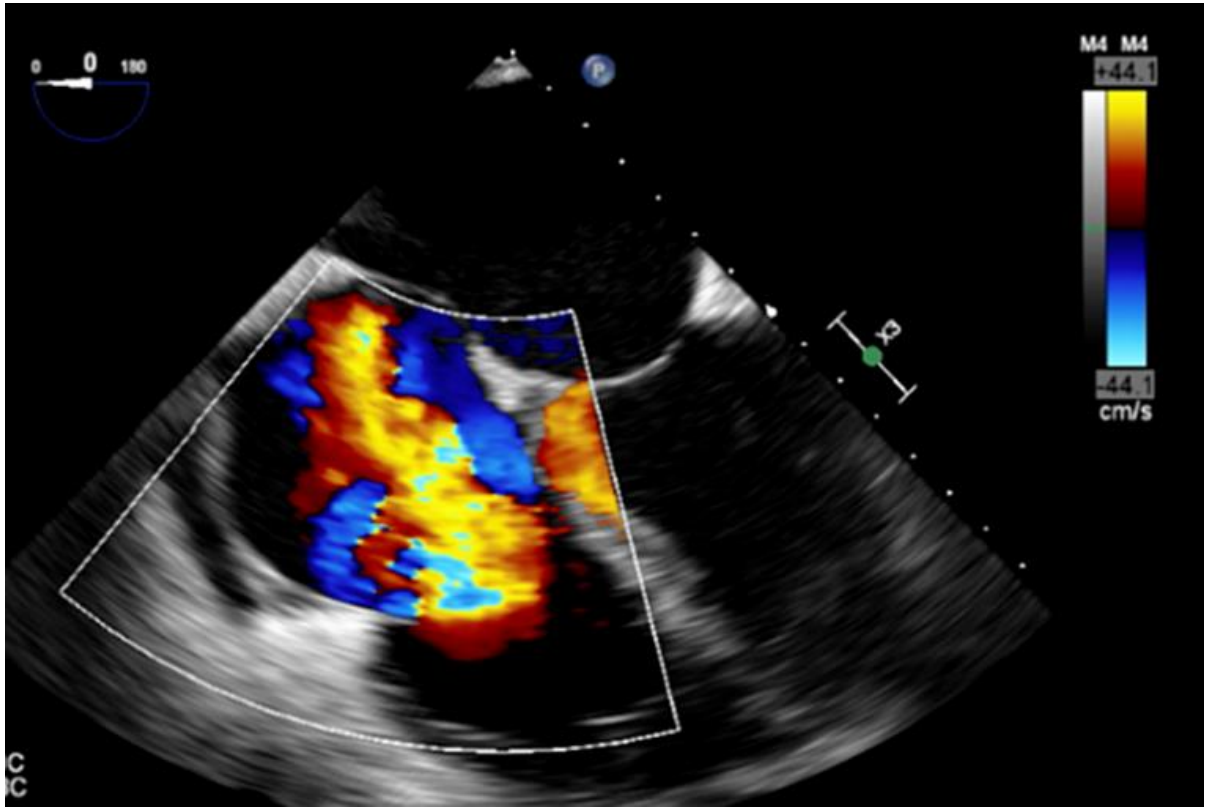


PCI does not improve prognosis or LV recovery in ICH, compared to OMT alone, regardless of viability characteristic at baseline

The abundance of dysfunctional- yet- viable segments was not associated with prognosis or likelihood of LV recovery

Scar burden predicts prognosis and likelihood of LV recovery in ICH, independent of baseline LVEF

3. Besides Diuretics what can we do for Patients with Severe Tricuspid Regurgitation?



TRILUMINATE Pivotal

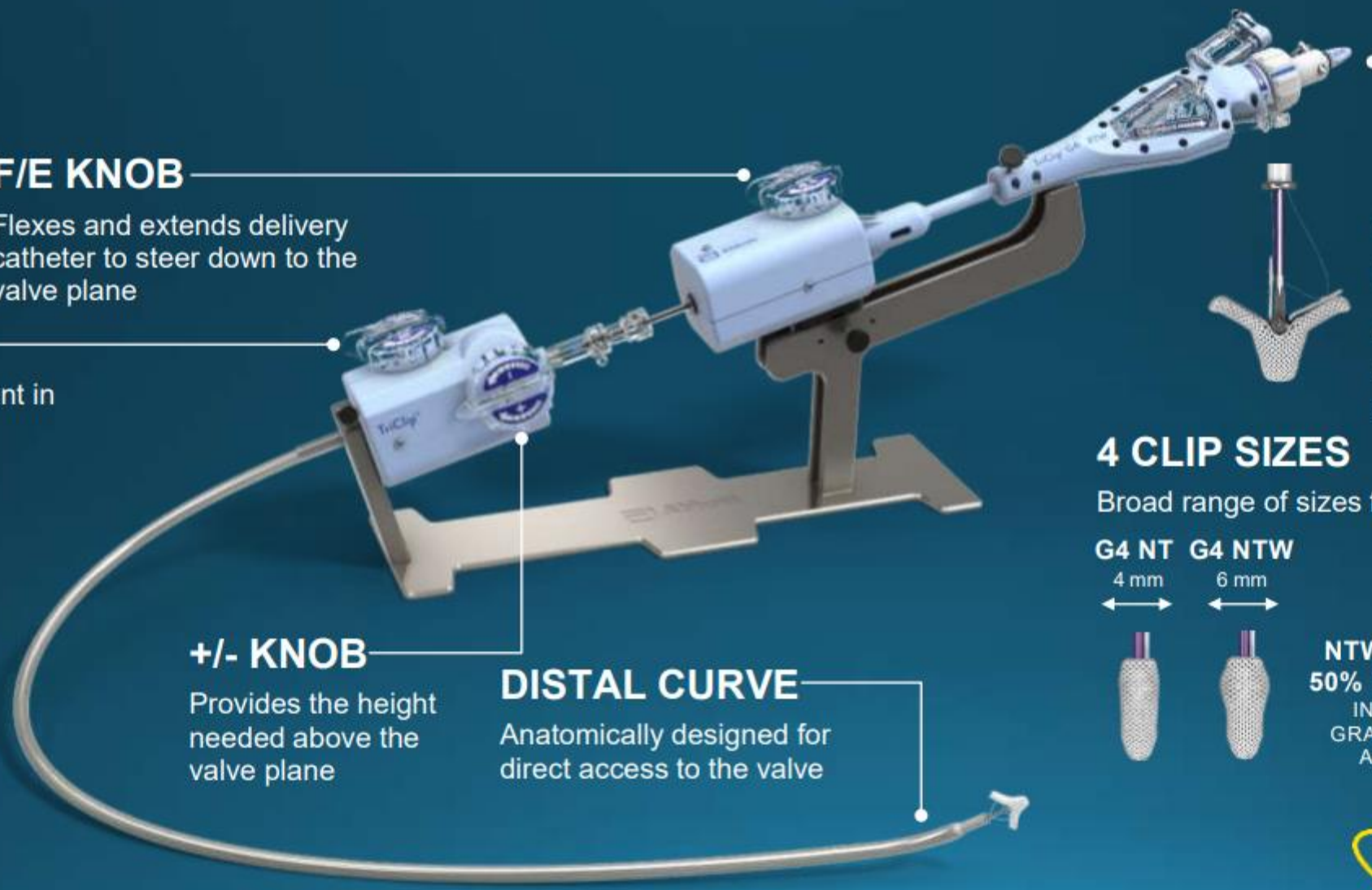
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Transcatheter Repair for Patients with Tricuspid Regurgitation

Paul Sorajja, M.D., Brian Whisenant, M.D., Nadira Hamid, M.D., Hursh Naik, M.D., Raj Makkar, M.D., Peter Tadros, M.D., Matthew Price, M.D., Gagan Singh, M.D., Neil Fam, M.D., Saibal Kar, M.D., Jonathan G. Schwartz, M.D., Shamir Mehta, M.D., Richard Bae, M.D., Nishant Sekaran, M.D., Travis Warner, M.D., Moody Makar, M.D., George Zorn, M.D., Erin Spinner, Ph.D., Phillip M. Trusty, Ph.D., Raymond Benza, M.D., Ulrich Jorde, M.D., Patrick McCarthy, M.D., Vinod Thourani, M.D., Gilbert H.L. Tang, M.D., Rebecca Hahn, M.D., and David H. Adams, M.D., for the TRILUMINATE Investigators*

TriClip™ G4 Delivery System



F/E KNOB

Flexes and extends delivery catheter to steer down to the valve plane

S/L KNOB

Enables movement in septal or lateral direction

+/- KNOB

Provides the height needed above the valve plane

DISTAL CURVE

Anatomically designed for direct access to the valve

CONTROLLED GRIPPER ACTUATION

Ability to optimize leaflet grasping if needed

4 CLIP SIZES

Broad range of sizes for tailored treatment

TRILUMINATE™
PIVOTAL TRIAL

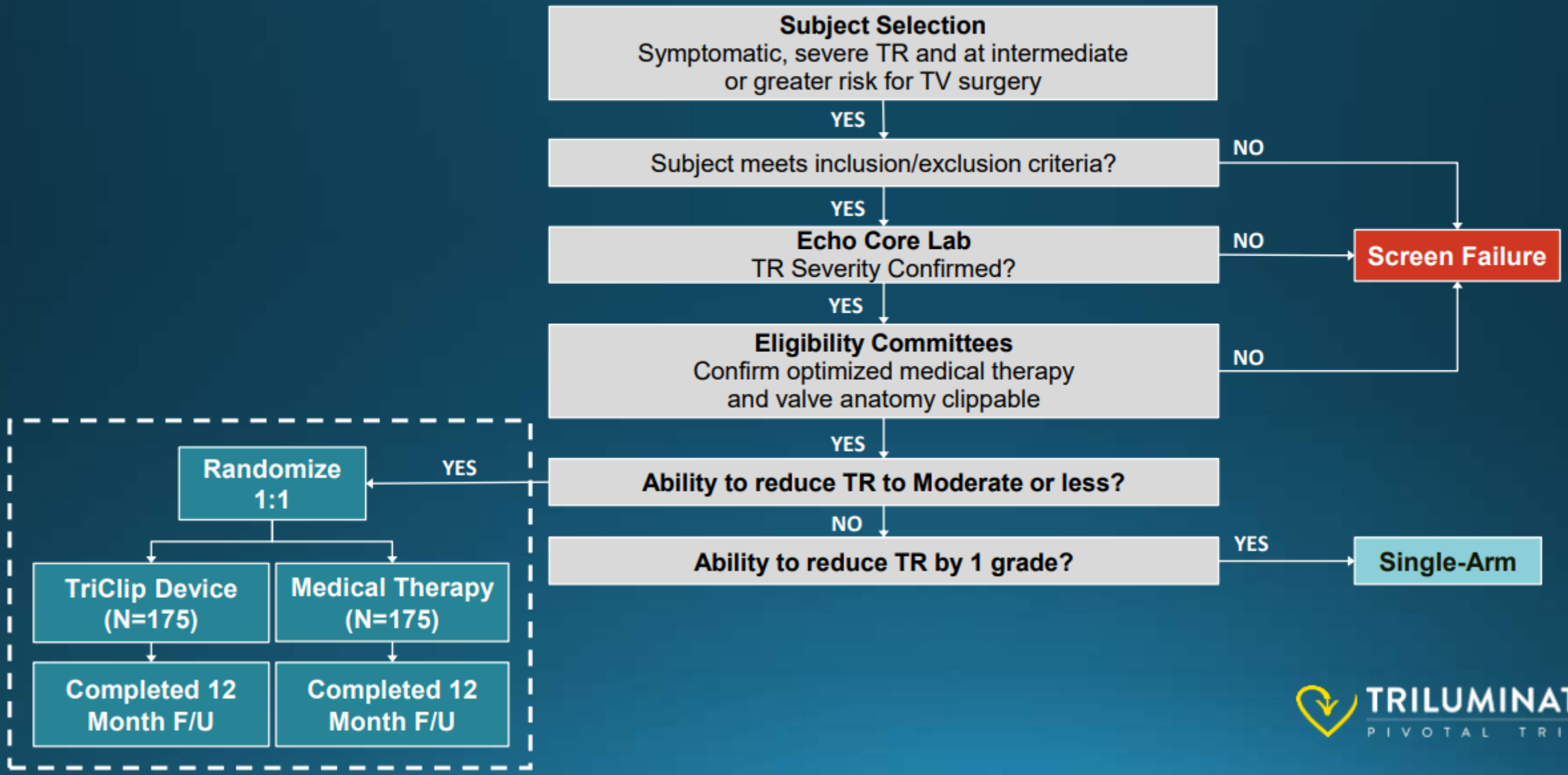
Broad Geographical Participation

 63  6  6

- Abbott Northwestern Hospital
- Allegheny General Hospital- ASRI
- Arizona Cardiovascular Research Center
- Aurora Medical Group
- Austin Heart
- Baptist Hospital of Miami
- Baylor Scott & White Heart & Vascular Hospital
- Beth Israel Deaconess Medical Center
- Brigham & Women's Hospital
- Buffalo General Hospital
- California Pacific Medical Center - Van Ness Campus
- Cardiovascular Institute of the South
- Cardiovascular Research Institute of Kansas
- Carolinas Medical Center
- Cedars-Sinai Medical Center
- Centennial Heart Cardiovascular Consultants
- Christ Hospital
- El Camino Hospital
- Hospital of the University of Pennsylvania
- Inova Fairfax Hospital
- Intermountain Medical Center
- JFK Medical Center
- Kansas University Medical Center
- Los Robles Regional Medical Center
- Manatee Memorial Hospital
- MedStar Health Research Institute
- Methodist Hospital of San Antonio
- Montefiore Medical Center - Moses Division
- Morton Plant Valve Clinic
- Mount Sinai Hospital
- New York-Presbyterian/Columbia University Medical Center
- North Shore University Hospital
- Northshore University HealthSystem
- Novant Health Heart and Vascular Research Institute
- Ohio Health Research Institute
- Phoenix Cardiovascular Research Group
- Piedmont Heart Institute
- Providence Heart & Vascular Institute
- Providence Medical Foundation
- Rush University Medical Center
- Scripps Health
- Sentara Norfolk General Hospital
- St. Thomas Hospital
- Sutter Medical Center, Sacramento
- Swedish Medical Center
- Tallahassee Research Institute
- The Cleveland Clinic Foundation
- The Methodist Hospital
- Tucson Medical Center
- University Hospital - Univ. of Alabama at Birmingham (UAB)
- University of California - Davis Medical Center
- University of Colorado Hospital
- University of Pittsburgh Medical Center
- University of Virginia Medical Center
- Yale New Haven Hospital
- Hamilton Health Science Centre
- Herzzentrum Leipzig GmbH
- Hospital Clínic de Barcelona
- Institut de Cardiologie de Montreal (Montreal Heart Inst.)
- Munchen Grosshadern
- Ospedale San Raffaele - Cardiac
- Ottawa Heart Institute
- St. Michael's Hospital
- St. Paul's Hospital
- Sunnybrook Health Sciences Centre
- Universitatsklinikum Bonn AdoR
- Universitatsmedizin der Johannes Gutenberg-Universitat Mainz

TRILUMINATE™
PIVOTAL TRIAL

Enrollment and Treatment Pathway



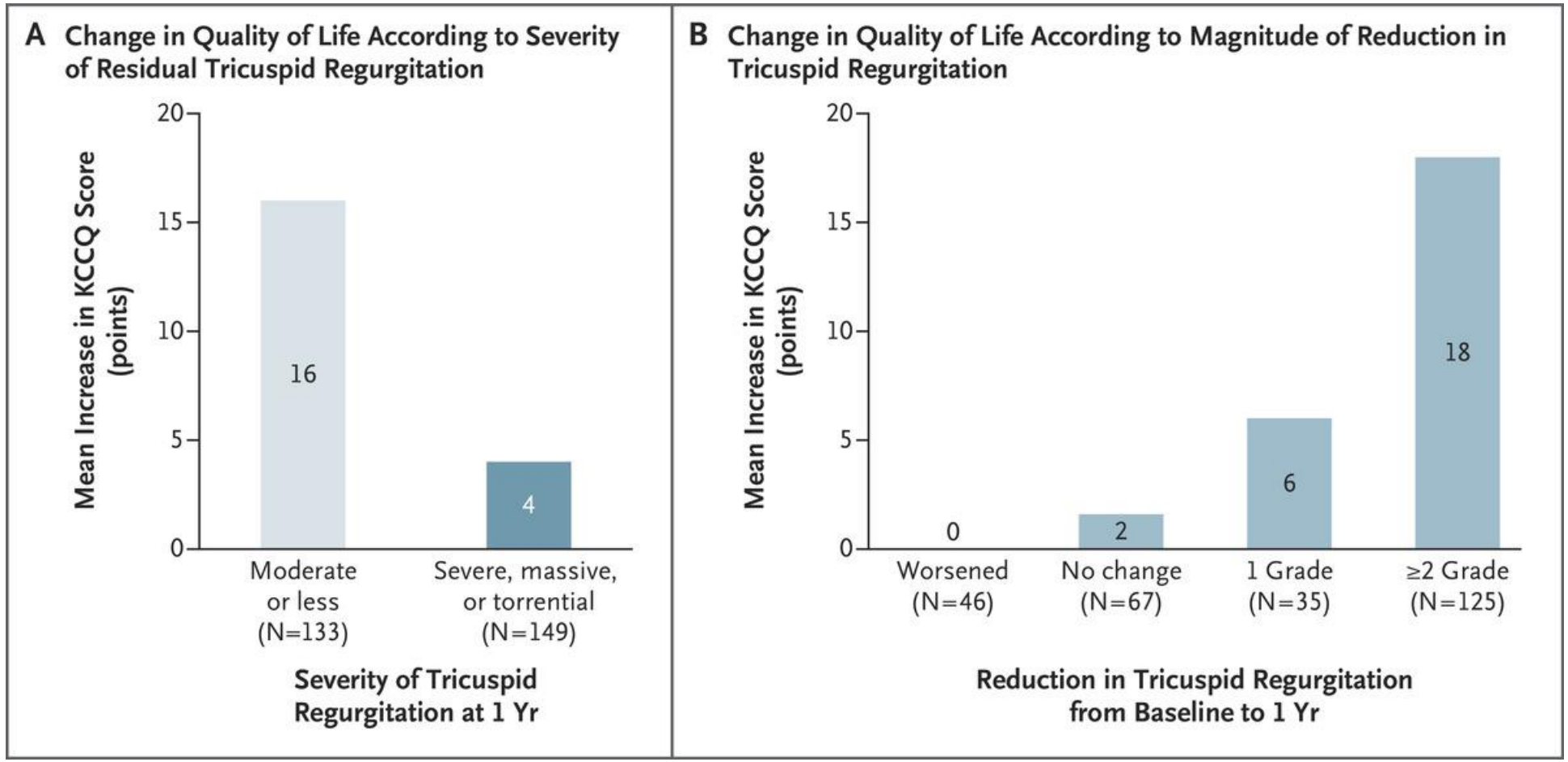
TRILUMINATE™ PIVOTAL TRIAL

Outcomes

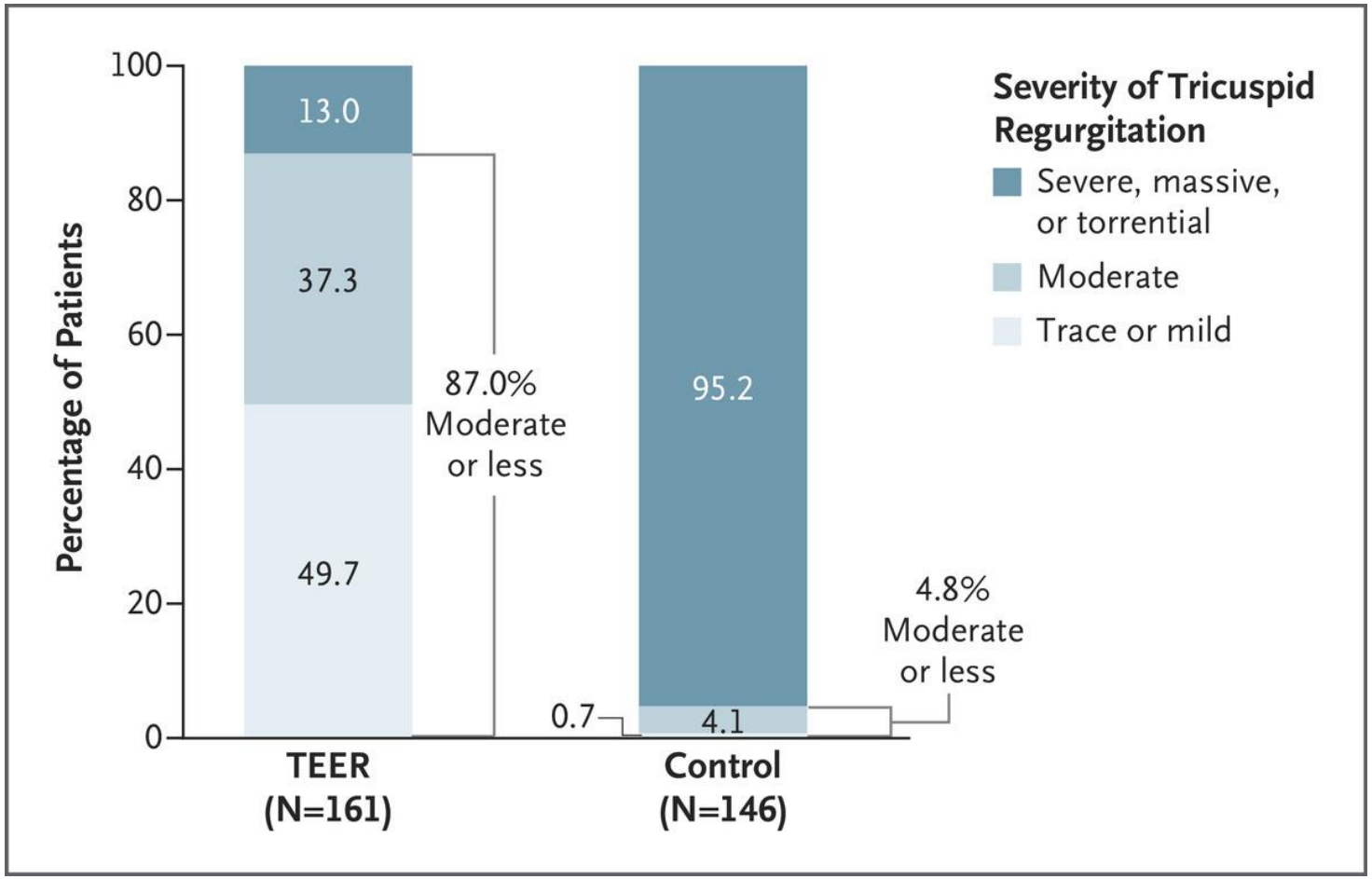
Table 2. Primary and Secondary End Points.*

End Point	TEER Group (N=175)	Control Group (N=175)	Difference (95% CI)	P Value
Primary				
Hierarchical composite of death from any cause or tricuspid-valve surgery; hospitalization for heart failure; and improvement of ≥15 points in KCCQ score at 1 yr — no. of wins†	11,348	7643	1.48 (1.06 to 2.13)	0.02
Secondary, listed in hierarchical order				
Kaplan–Meier estimate of percentage of patients with freedom from major adverse events through 30 days after the procedure (lower 95% confidence limit)‡	98.3 (96.3)	—	—	<0.001
Change in KCCQ score from baseline to 1 yr — points§	12.3±1.8	0.6±1.8	11.7 (6.8 to 16.6)	<0.001
Tricuspid regurgitation of no greater than moderate severity at 30-day follow-up — no. of patients/total no. (%)¶	140/161 (87.0)	7/146 (4.8)	—	<0.001
Change in 6-min walk distance from baseline to 1 yr — m‖	−8.1±10.5	−25.2±10.3	17.1 (−12.0 to 46.1)	0.25

Outcomes

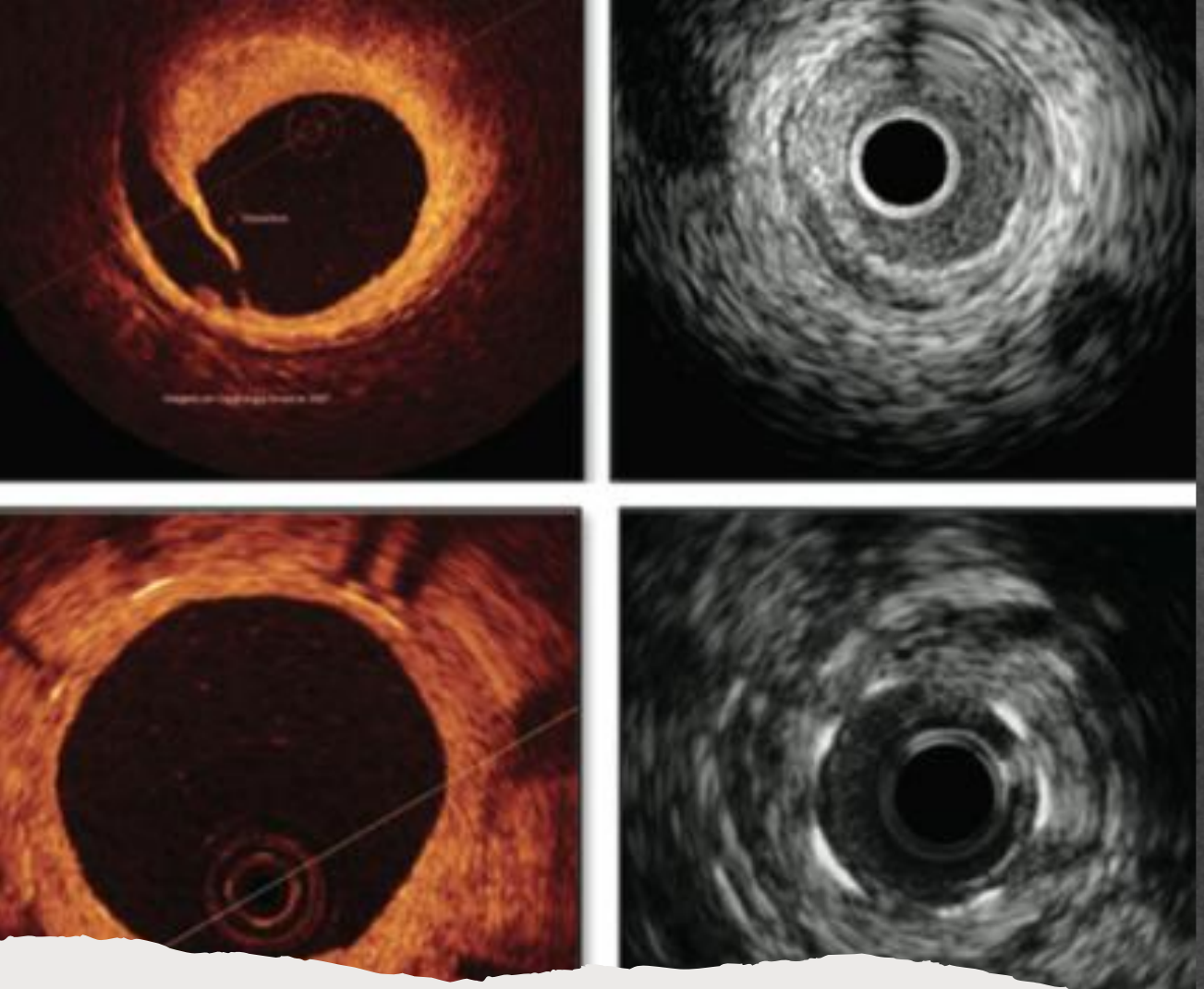

A Change in Quality of Life According to Severity of Residual Tricuspid Regurgitation
Mean Increase in KCCQ Score (points)
20
15
10
5
0
16
4
Moderate or less (N=133)
Severe, massive, or torrential (N=149)
Severity of Tricuspid Regurgitation at 1 Yr
B Change in Quality of Life According to Magnitude of Reduction in Tricuspid Regurgitation
Mean Increase in KCCQ Score (points)
20
15
10
5
0
0
2
6
18
Worsened (N=46)
No change (N=67)
1 Grade (N=35)
≥2 Grade (N=125)
Reduction in Tricuspid Regurgitation from Baseline to 1 Yr

Outcomes


Percentage of Patients
100
80
60
40
20
0
13.0
37.3
49.7
87.0%
Moderate
or less
95.2
0.7
4.1
4.8%
Moderate
or less
TEER
(N=161)
Control
(N=146)
Severity of Tricuspid Regurgitation
Severe, massive, or torrential
Moderate
Trace or mild

Conclusion

- The TriClip device was highly effective in reducing TR and led to significant improvements in quality of life at one year, without the high procedural risk often associated with tricuspid surgery.
- These results are very meaningful for a highly symptomatic population whose quality of life is impacted by TR
- With the excellent benefit-to-risk profile of the TriClip system, a historically untreated population will have a treatment option to improve their quality of life



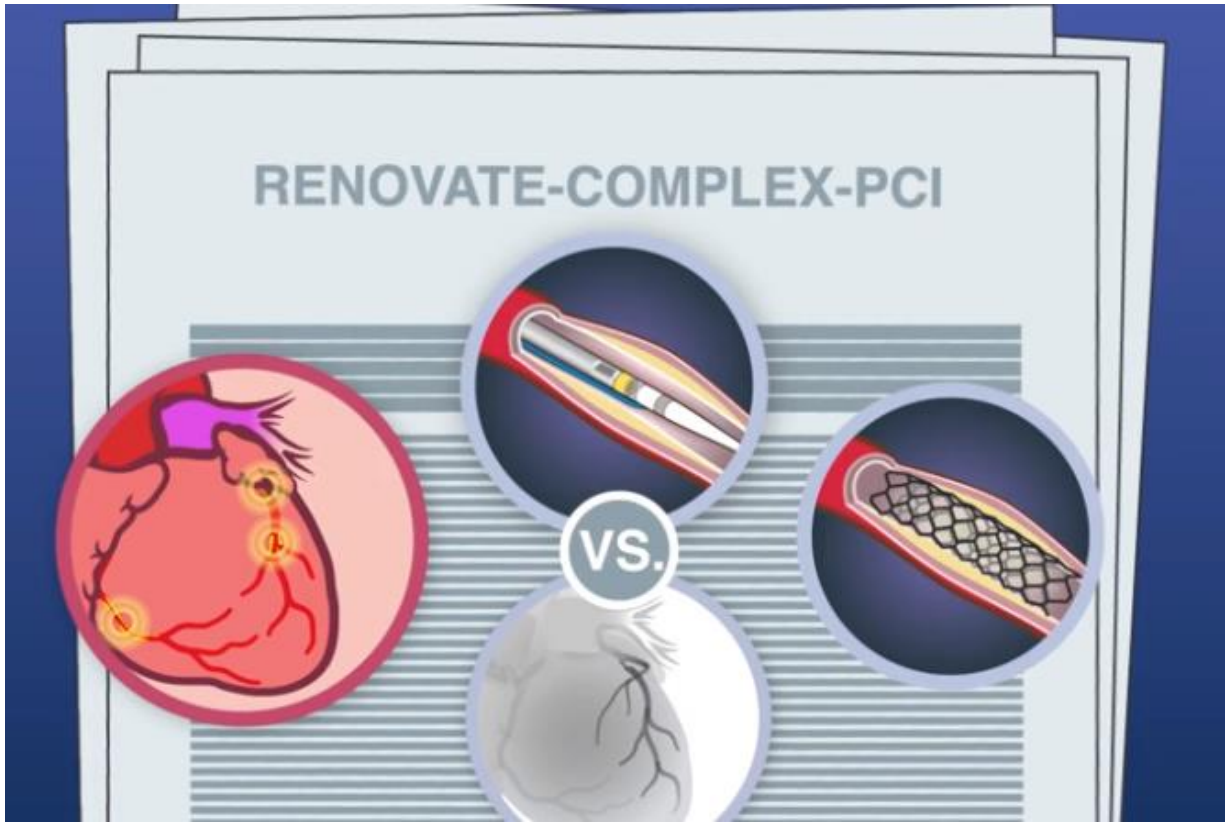
4. Role of Intravascular Imaging in Complex PCI

Intravascular Imaging-Guided Versus Angiography-Guided Complex PCI The RENOVATE-COMPLEX-PCI Trial

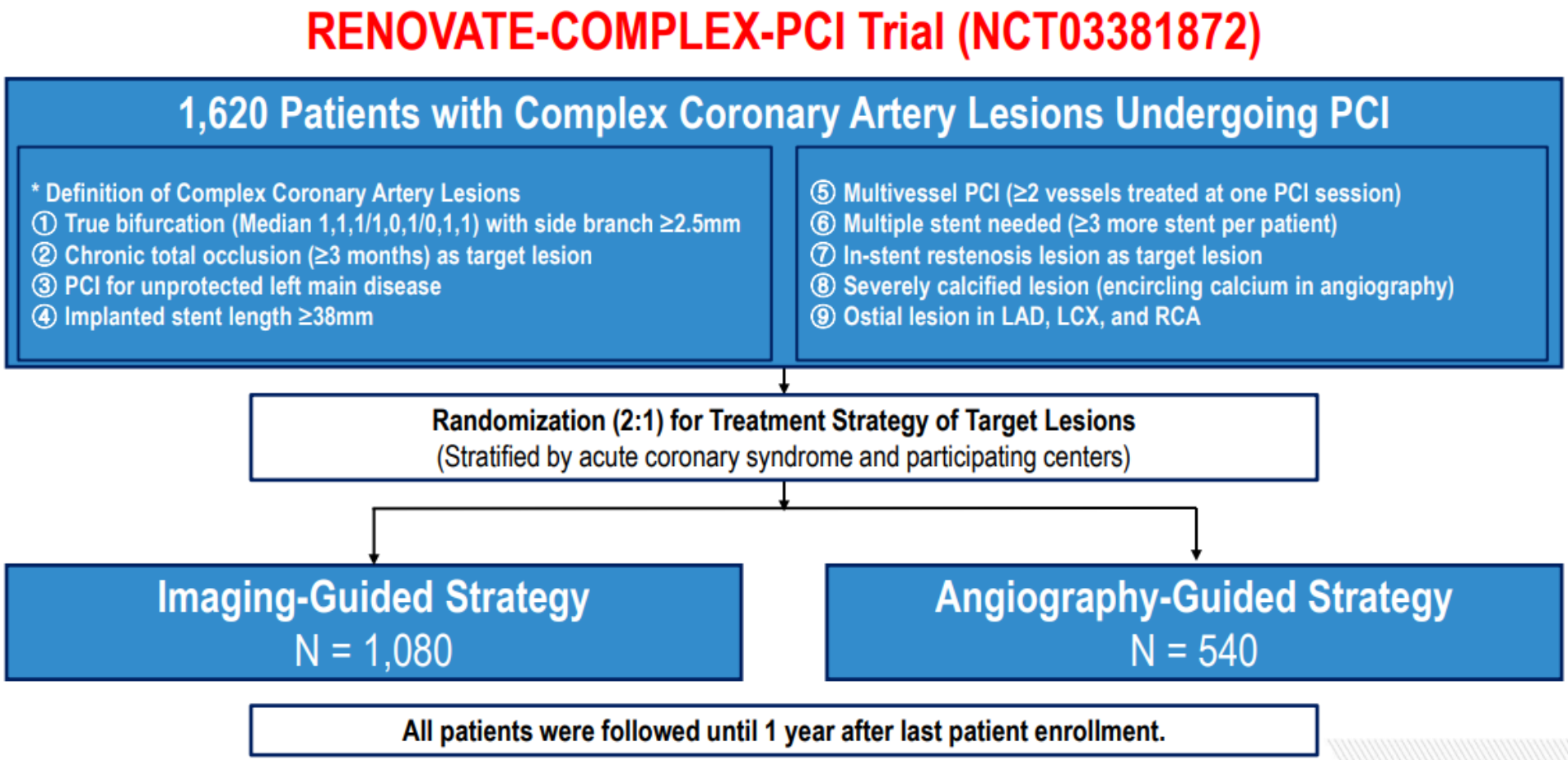
ORIGINAL ARTICLE

Intravascular Imaging–Guided or Angiography-Guided Complex PCI

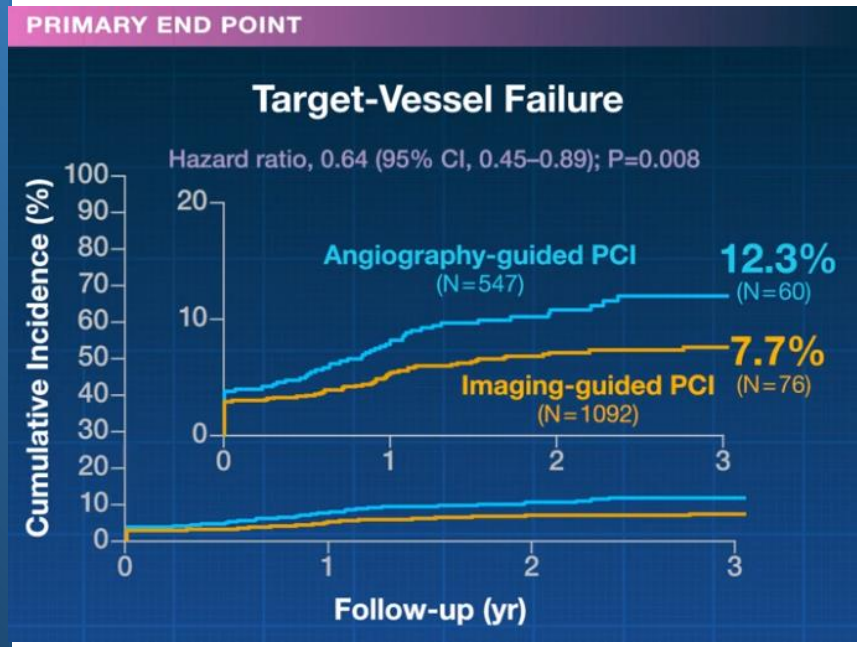
J. M. Lee, K. H. Choi, Y. B. Song, J.-Y. Lee, S.-J. Lee, S. Y. Lee, S. M. Kim, K. H. Yun, J. Y. Cho, C. J. Kim, H.-S. Ahn, C.-W. Nam, H.-J. Yoon, Y. H. Park, W. S. Lee, J.-O. Jeong, P. S. Song, J.-H. Doh, S.-H. Jo, C.-H. Yoon, M. G. Kang, J.-S. Koh, K. Y. Lee, Y.-H. Lim, Y.-H. Cho, J.-M. Cho, W. J. Jang, K.-J. Chun, D. Hong, T. K. Park, J. H. Yang, S.-H. Choi, H.-C. Gwon, and J.-Y. Hahn, for the RENOVATE COMPLEX-PCI Investigators*

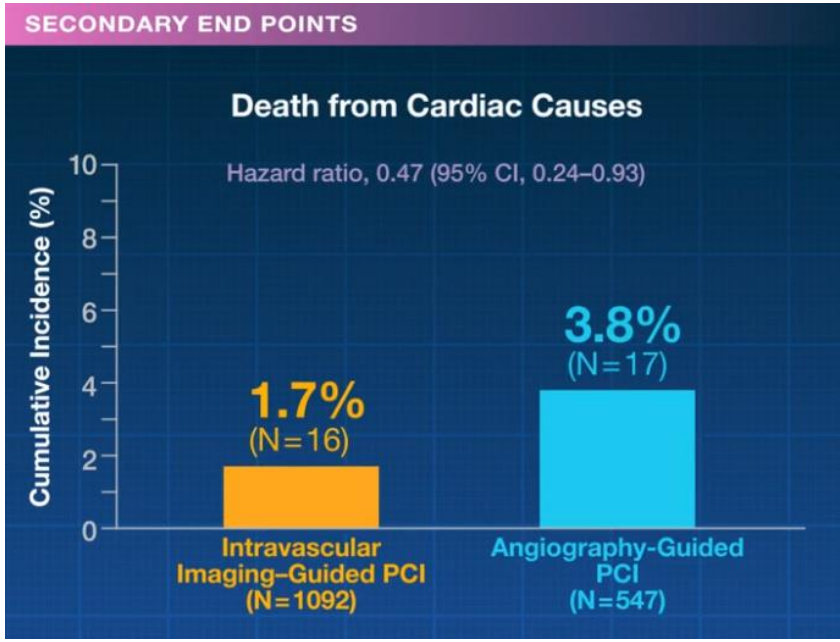


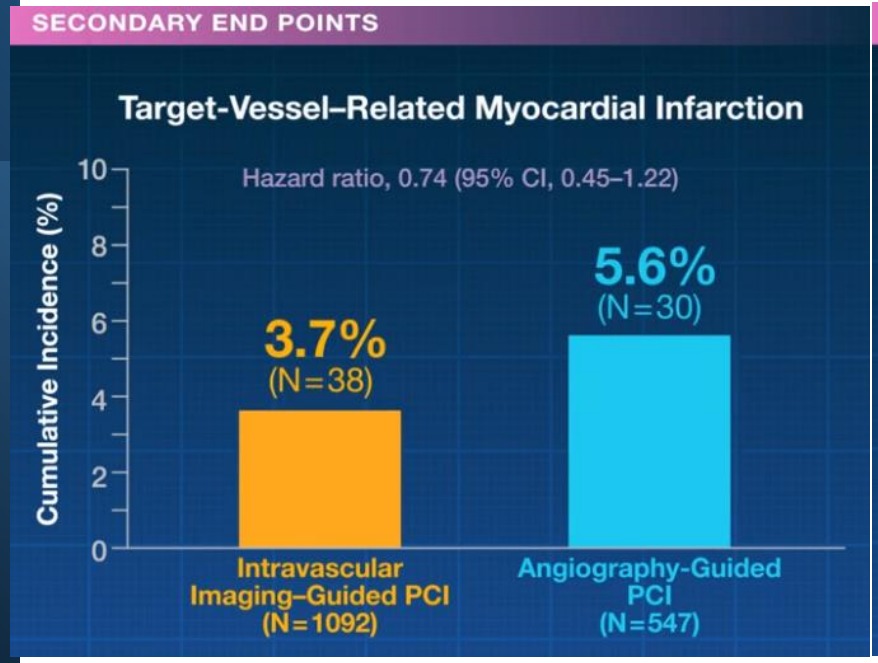
Study Design

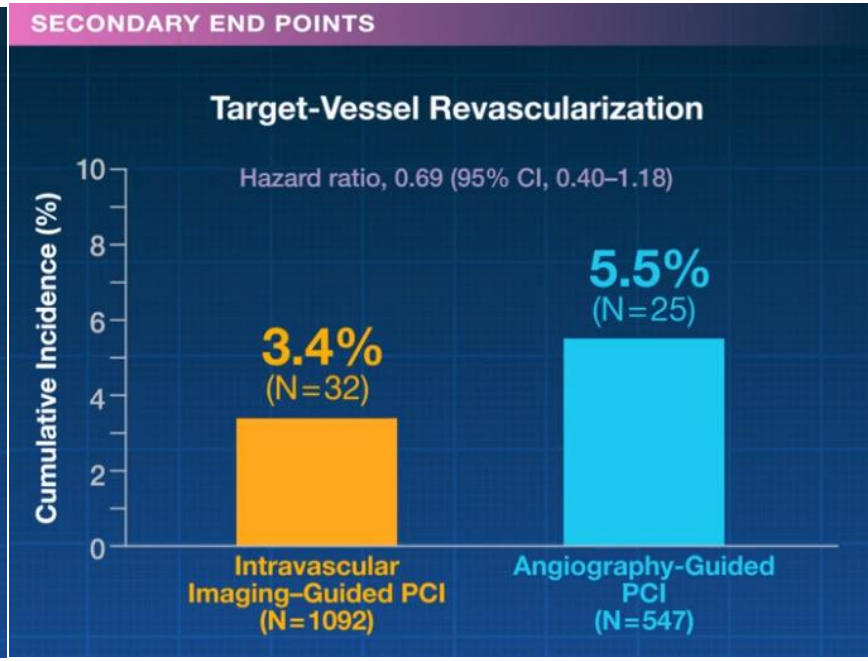


Results


PRIMARY END POINT
Target-Vessel Failure
Hazard ratio, 0.64 (95% CI, 0.45–0.89); P=0.008
Cumulative Incidence (%)
Angiography-guided PCI
(N=547)
12.3%
(N=60)
Imaging-guided PCI
(N=1092)
7.7%
(N=76)
Follow-up (yr)


SECONDARY END POINTS
Death from Cardiac Causes
Hazard ratio, 0.47 (95% CI, 0.24–0.93)
Cumulative Incidence (%)
1.7%
(N=16)
3.8%
(N=17)
Intravascular Imaging–Guided PCI (N=1092)
Angiography-Guided PCI (N=547)

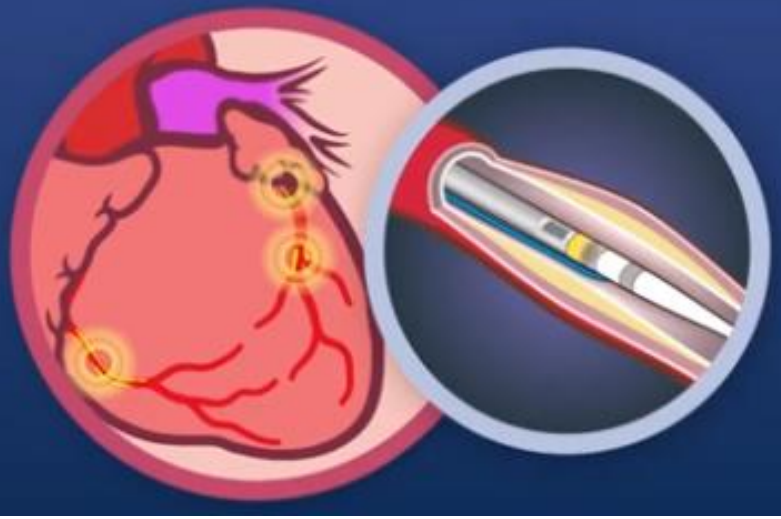

SECONDARY END POINTS
Target-Vessel–Related Myocardial Infarction
Hazard ratio, 0.74 (95% CI, 0.45–1.22)
Cumulative Incidence (%)
3.7%
(N=38)
5.6%
(N=30)
Intravascular Imaging–Guided PCI (N=1092)
Angiography-Guided PCI (N=547)


SECONDARY END POINTS
Target-Vessel Revascularization
Hazard ratio, 0.69 (95% CI, 0.40–1.18)
Cumulative Incidence (%)
3.4%
(N=32)
5.5%
(N=25)
Intravascular Imaging–Guided PCI (N=1092)
Angiography-Guided PCI (N=547)

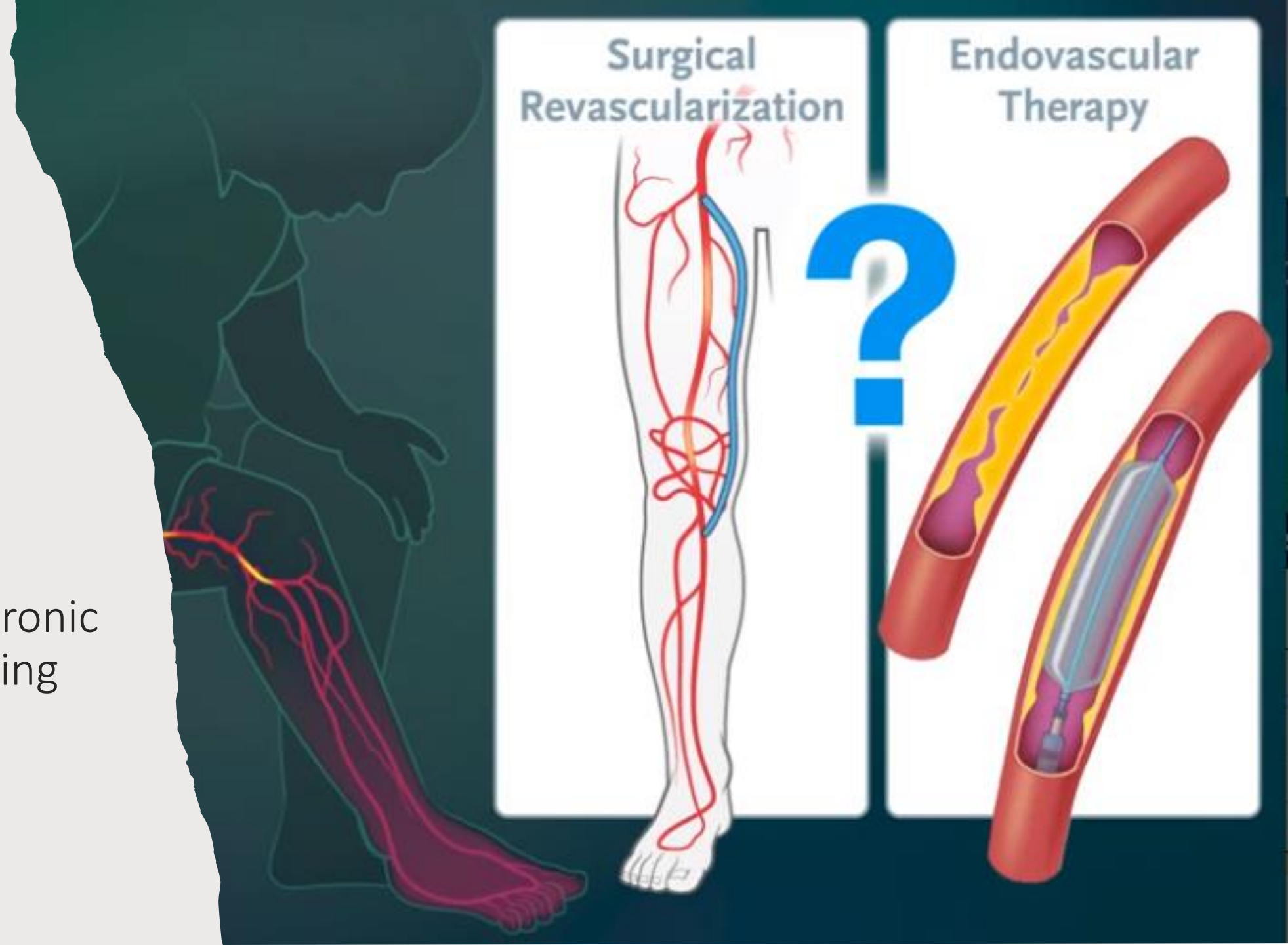
Conclusion

Intravascular imaging–guided PCI was associated with a lower incidence of a composite of:

- Death from cardiac causes
- Target-vessel–related myocardial infarction
- Clinically driven target-vessel revascularization



5. Surgery v/s Endovascular Therapy for Chronic Limb-Threatening Ischemia?



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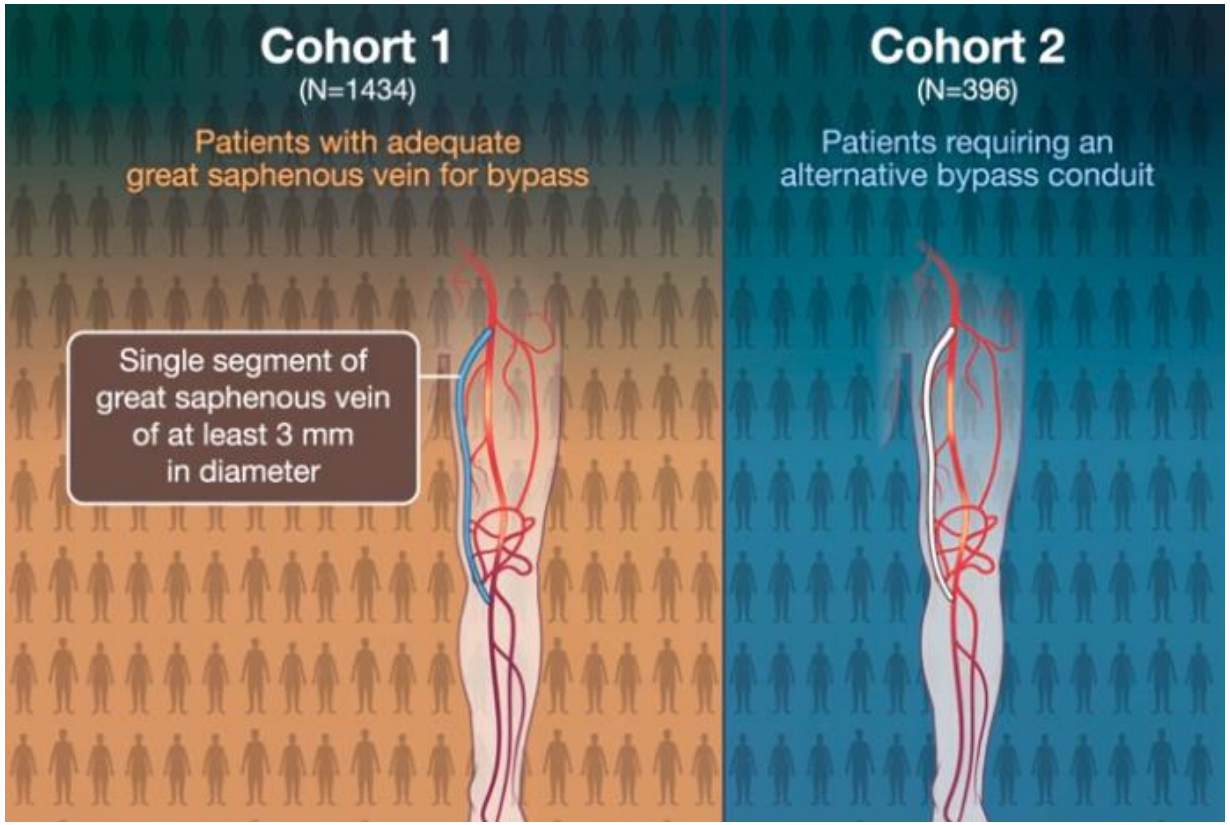
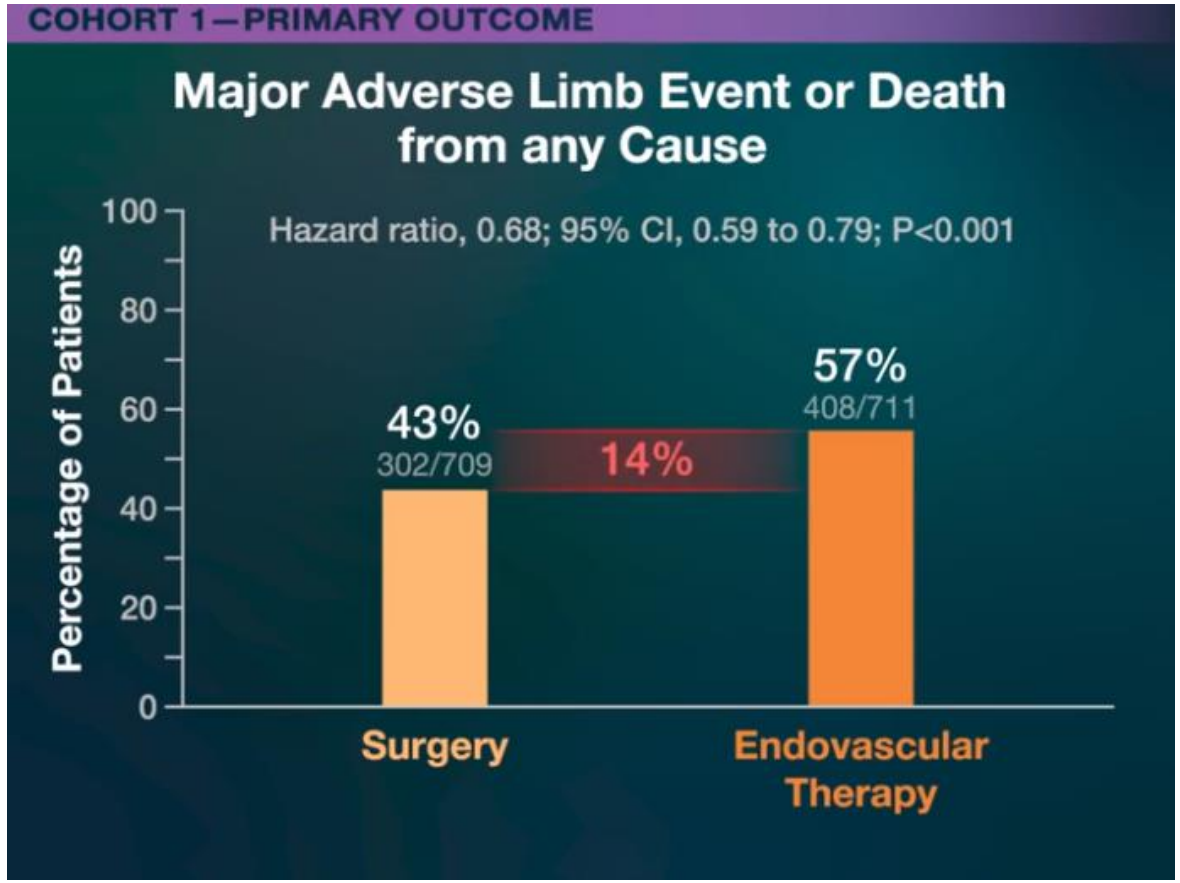
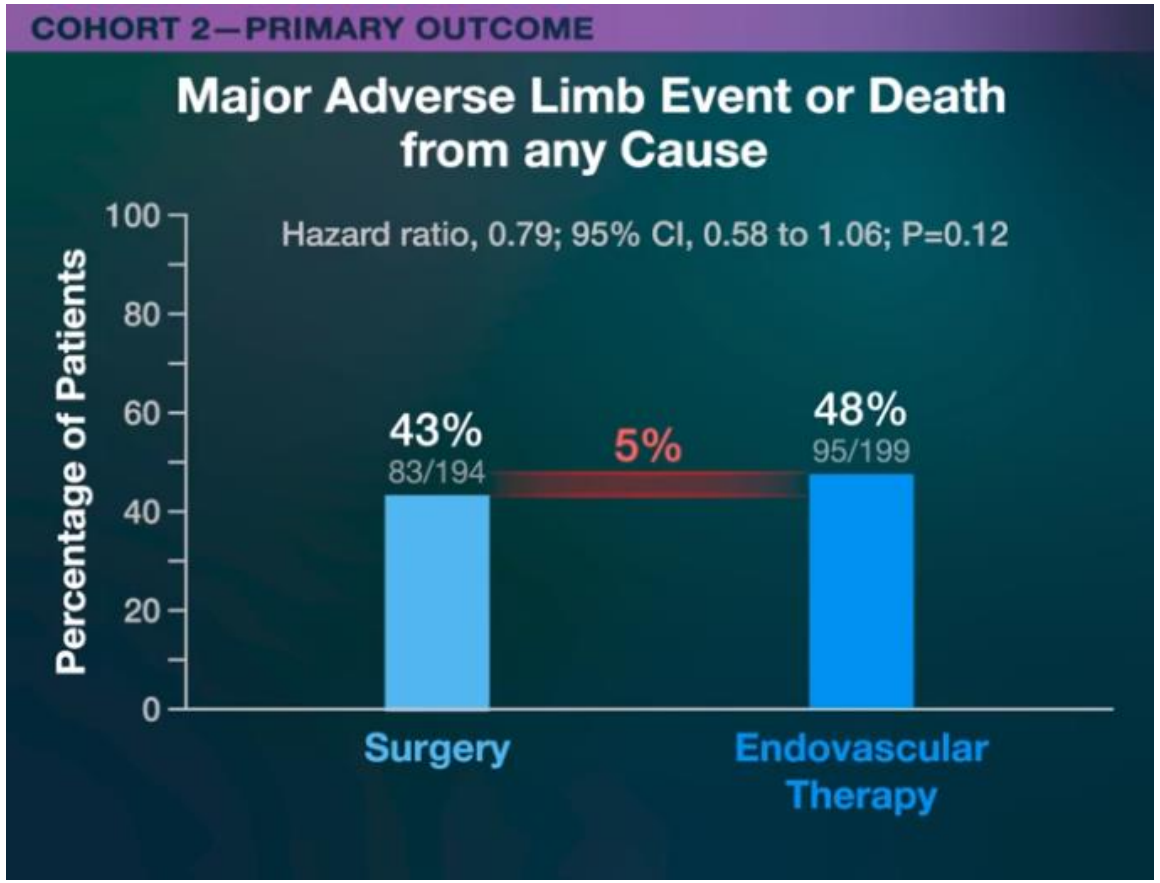
Surgery or Endovascular Therapy for Chronic Limb Threatening Ischemia

Farber, M.T. Menard, M.S. Conte, J.A. Kaufman, R.J. Powell, N.K. Choudhry, T.H. Hamza, S.F. A
M.A. Creager, M.J. Cziraky, M.D. Dake, M.R. Jaff, D. Reid, F.S. Siami, G. Sopko, C.J. White, M. va
. Strong, M.F. Villarreal, M. McKean, E. Azene, A. Azarbal, A. Barleben, D.K. Chew, L.C. Clavijo,
L. Findeiss, N. Garg, W. Gasper, K.A. Giles, P.P. Goodney, B.M. Hawkins, C.R. Herman, J.A. K
. Koopmann, I.A. Laskowski, C. Mena-Hurtado, R. Motaganahalli, V.L. Rowe, A. Schanzer, P.A.
J.J. Siracuse, M. Venermo, and K. Rosenfield, for the BEST-CLI Investigators†

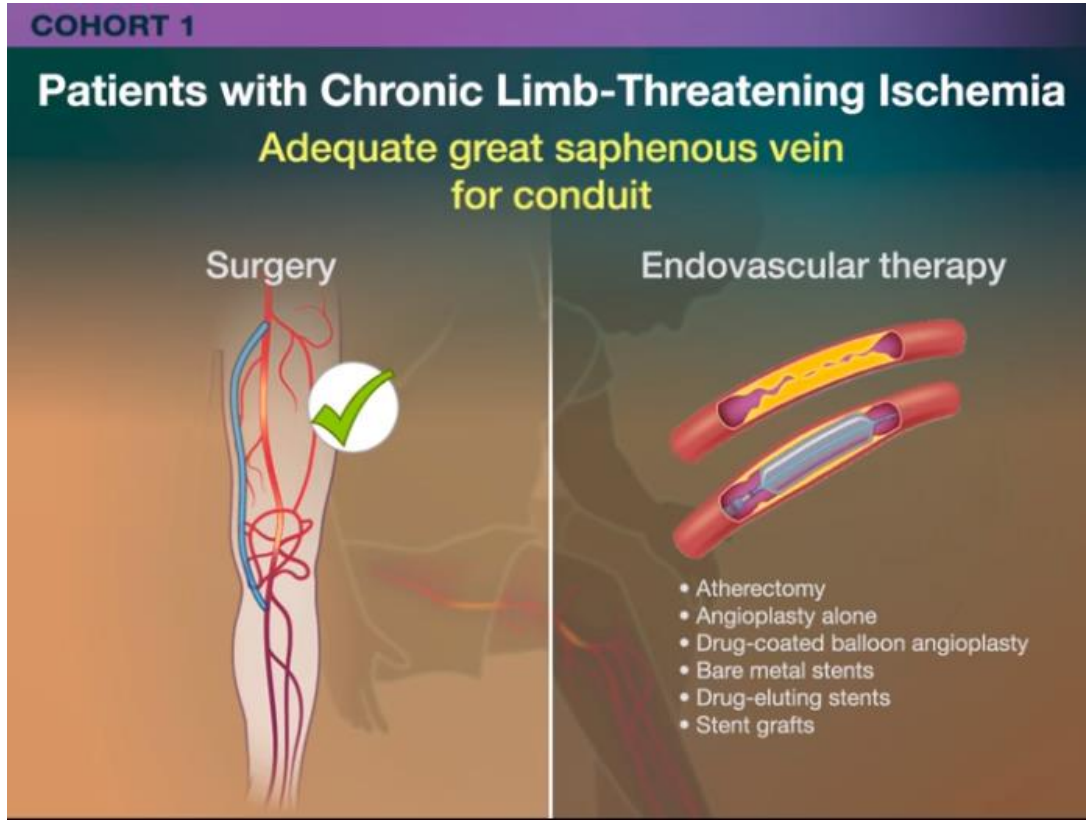


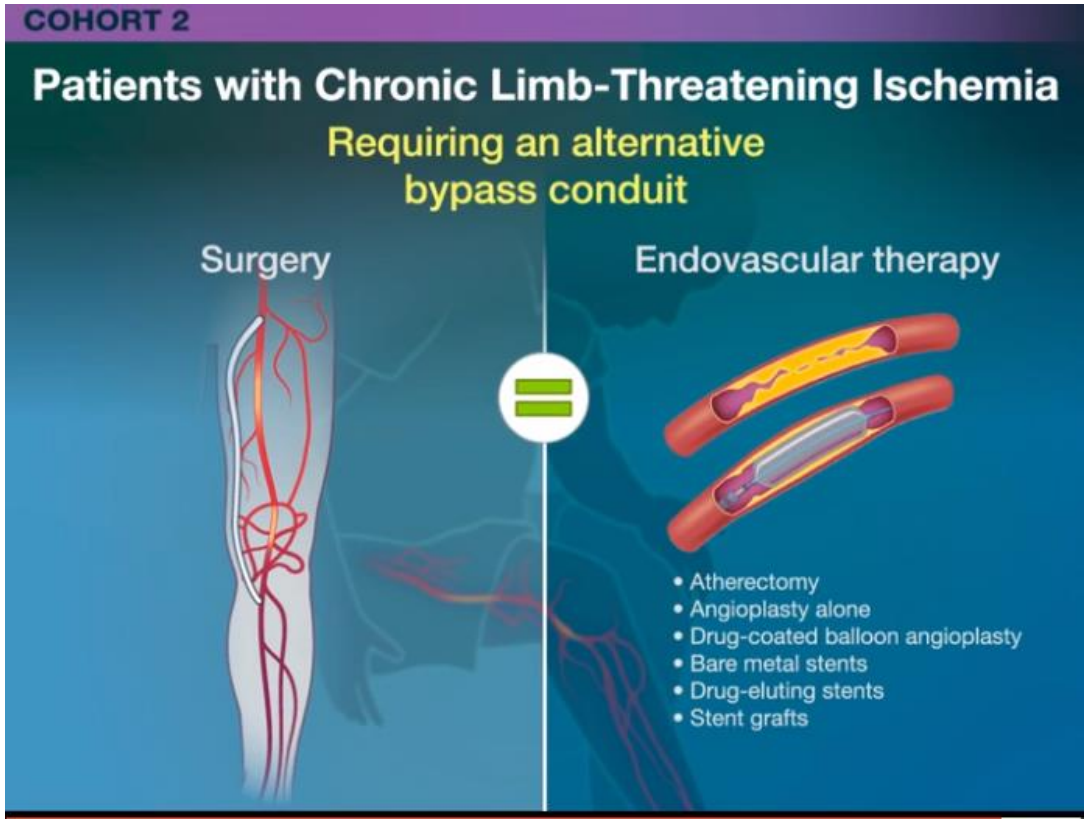
Outcomes


COHORT 1—PRIMARY OUTCOME
Major Adverse Limb Event or Death from any Cause
Hazard ratio, 0.68; 95% CI, 0.59 to 0.79; P<0.001
Percentage of Patients
100
80
60
40
20
0
43%
302/709
14%
57%
408/711
Surgery
Endovascular Therapy


COHORT 2—PRIMARY OUTCOME
Major Adverse Limb Event or Death from any Cause
Hazard ratio, 0.79; 95% CI, 0.58 to 1.06; P=0.12
Percentage of Patients
100
80
60
40
20
0
43%
83/194
5%
48%
95/199
Surgery
Endovascular Therapy

Conclusion


COHORT 1
Patients with Chronic Limb-Threatening Ischemia
Adequate great saphenous vein for conduit
Surgery
Endovascular therapy
• Atherectomy
• Angioplasty alone
• Drug-coated balloon angioplasty
• Bare metal stents
• Drug-eluting stents
• Stent grafts


COHORT 2
Patients with Chronic Limb-Threatening Ischemia
Requiring an alternative bypass conduit
Surgery
Endovascular therapy
• Atherectomy
• Angioplasty alone
• Drug-coated balloon angioplasty
• Bare metal stents
• Drug-eluting stents
• Stent grafts

BASIL-2

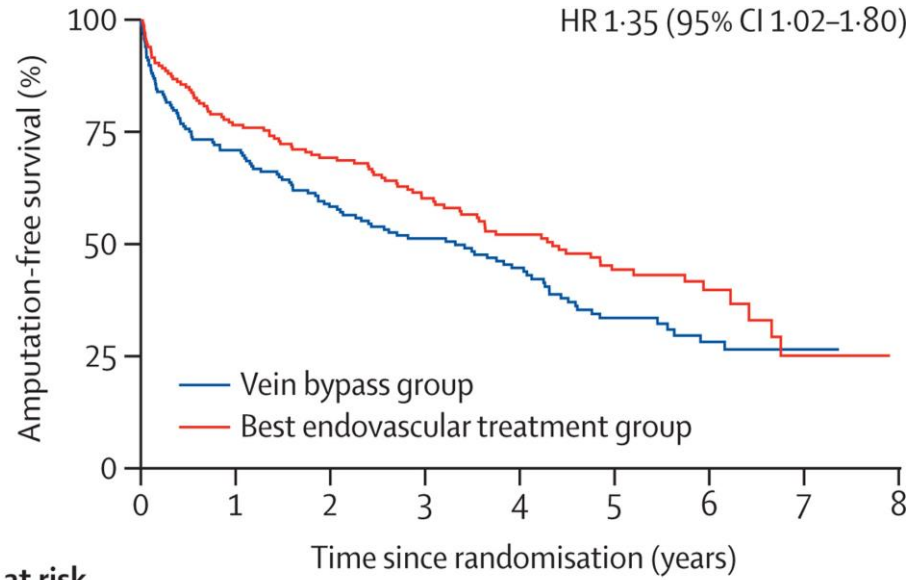
THE LANCET

ARTICLES | ONLINE FIRST

A vein bypass first versus a best endovascular treatment first revascularisation strategy for patients with chronic limb threatening ischaemia who required an infra-popliteal, with or without an additional more proximal infra-inguinal revascularisation procedure to restore limb perfusion (BASIL-2): an open-label, randomised, multicentre, phase 3 trial

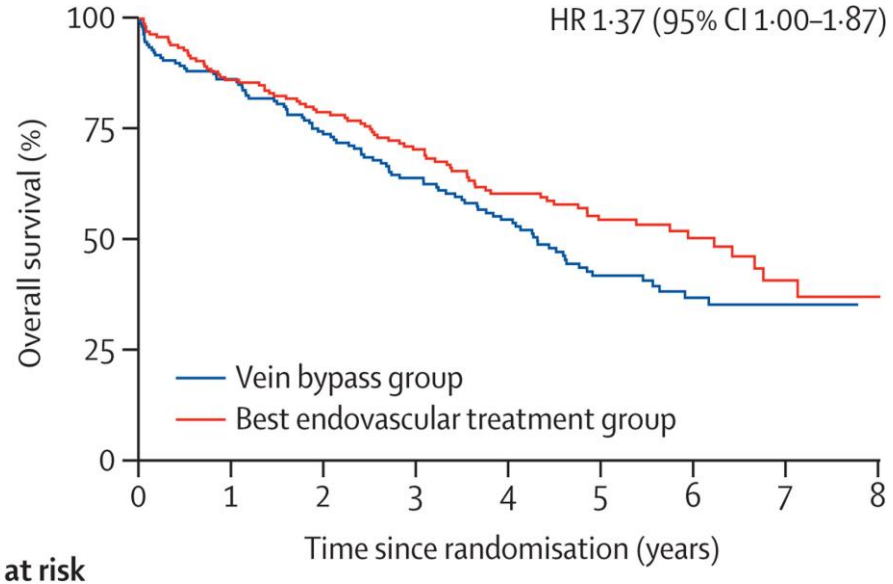
Prof Andrew W Bradbury, MD • Catherine A Moakes, MSc • Matthew Popplewell, MD • Lewis Meecham, FRCS • Gareth R Bate, PGDip • Lisa Kelly, PGDip • et al. Show all authors

Open Access • Published: April 25, 2023 • DOI: https://doi.org/10.1016/S0140-6736(23)00462-2 •



Number at risk

Vein bypass group	172	120	94	78	58	37	19	8	0
Best endovascular treatment group	173	127	112	91	67	47	19	5	0



Number at risk

Vein bypass group	172	141	116	94	72	46	25	14	0
Best endovascular treatment group	173	142	125	106	79	61	30	12	1

In the BASIL-2 trial, a best endovascular treatment first revascularization strategy was associated with a better amputation-free survival, which was largely driven by fewer deaths in the best endovascular treatment group

Thank You