Secondary Mitral Regurgitation

Time to Re-think

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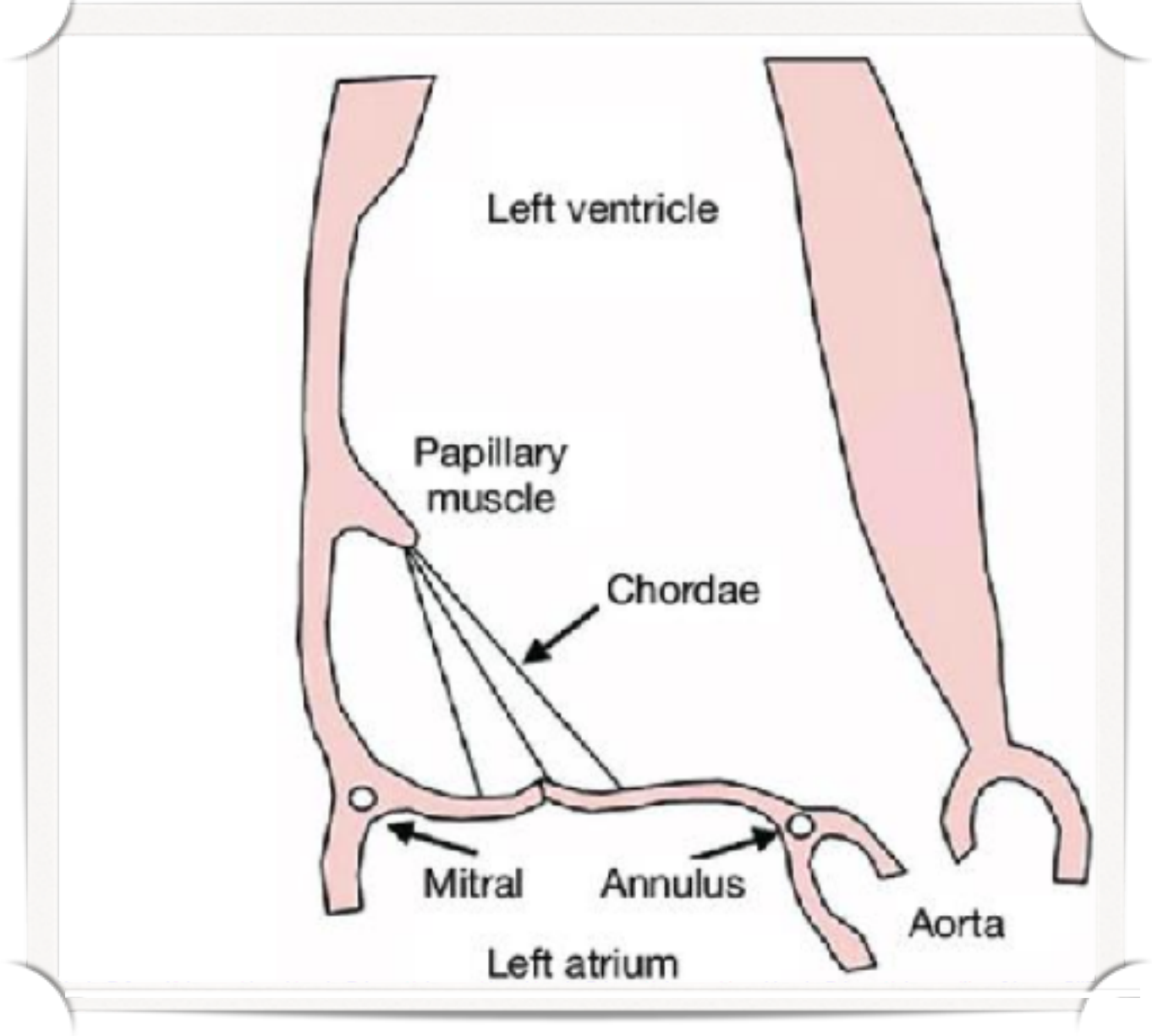
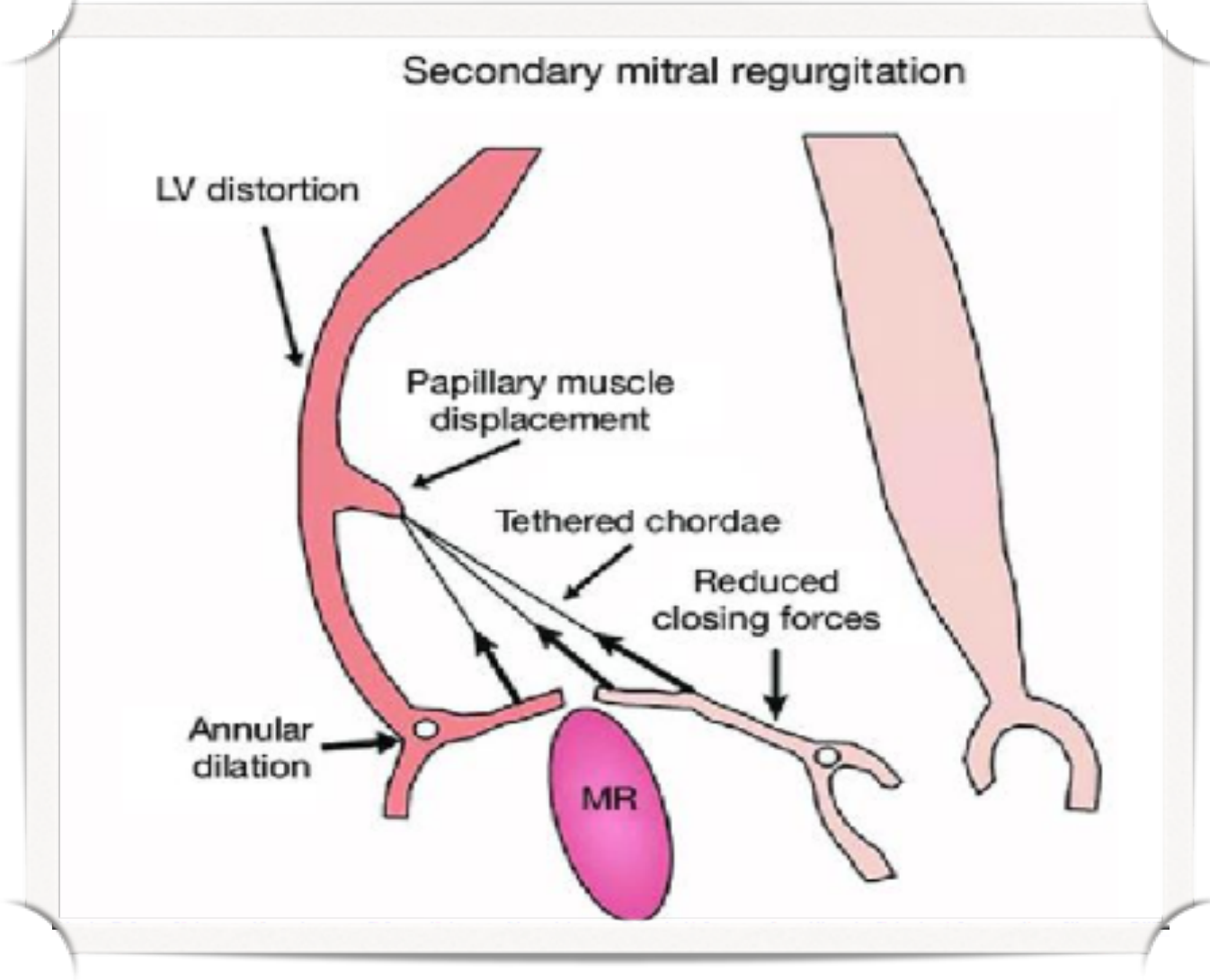
The Mitral Valve and Left Ventricle



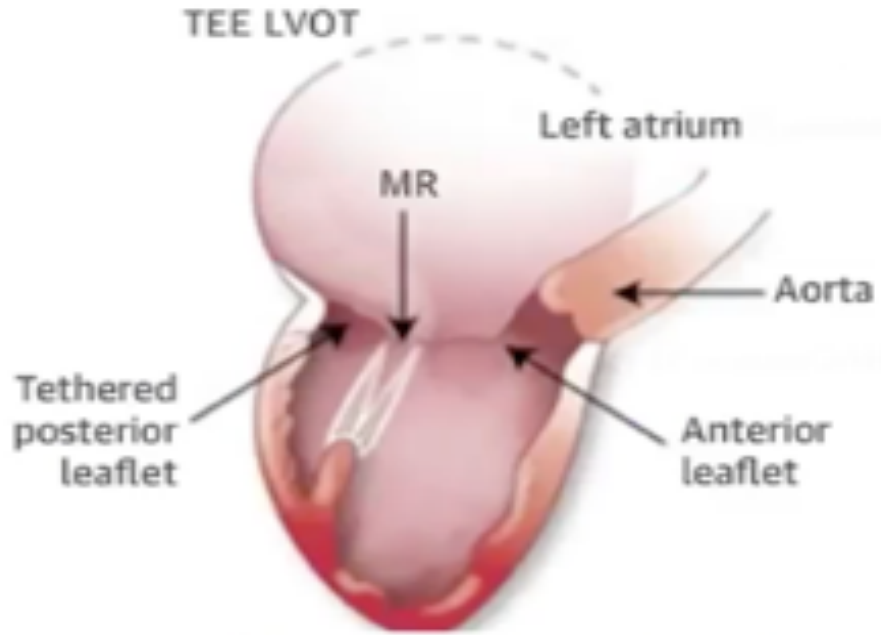
Secondary Mitral Regurgitation is a Disease of the Left Ventricle



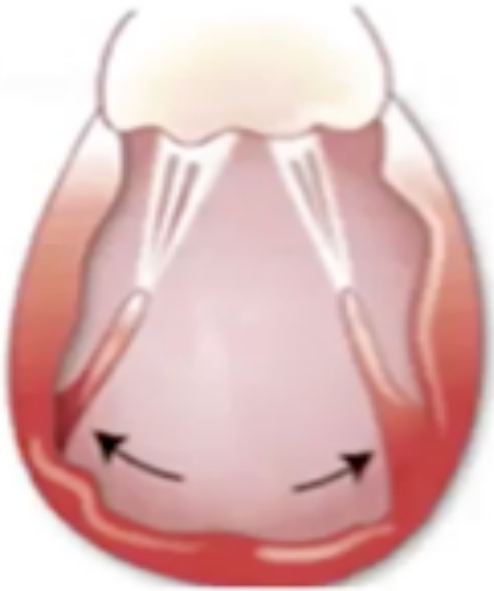
Secondary Mitral Regurgitation

Pathophysiology

Ischaemic CM



Dilated CM

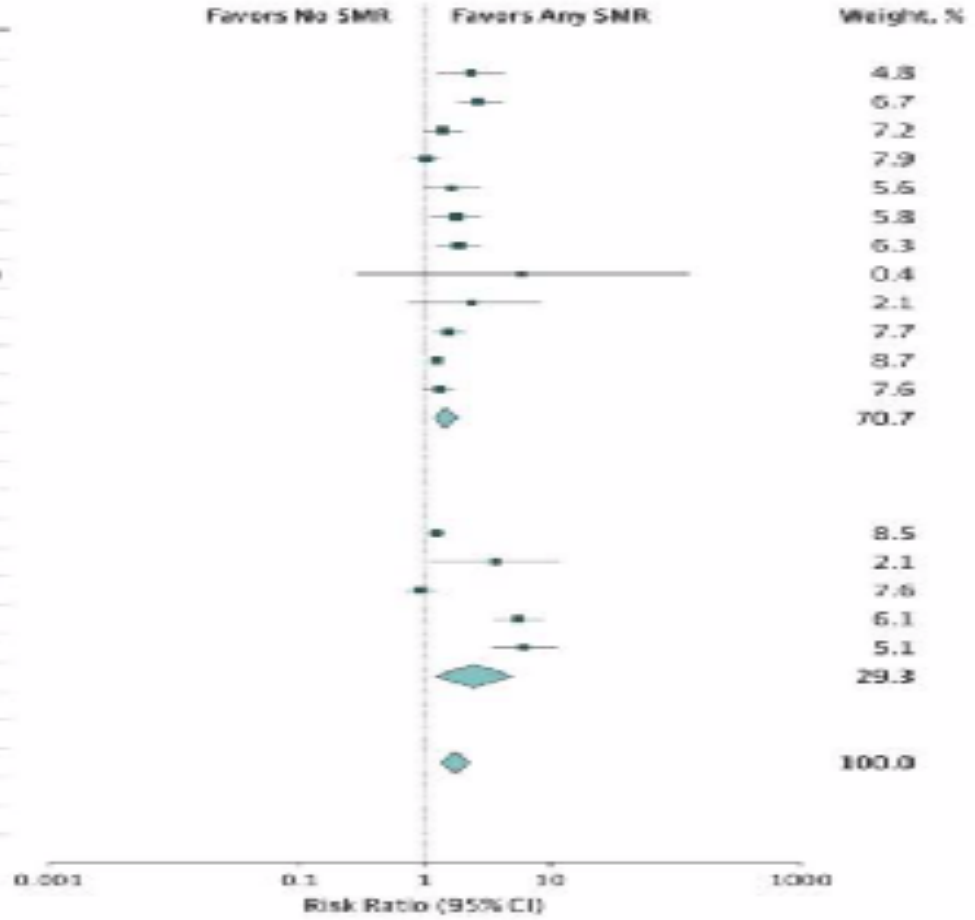


- Papillary muscle displacement
- Tethered Chordae
- Restricted leaflet closure
- Annular dilation

} changes in LV geometry and function

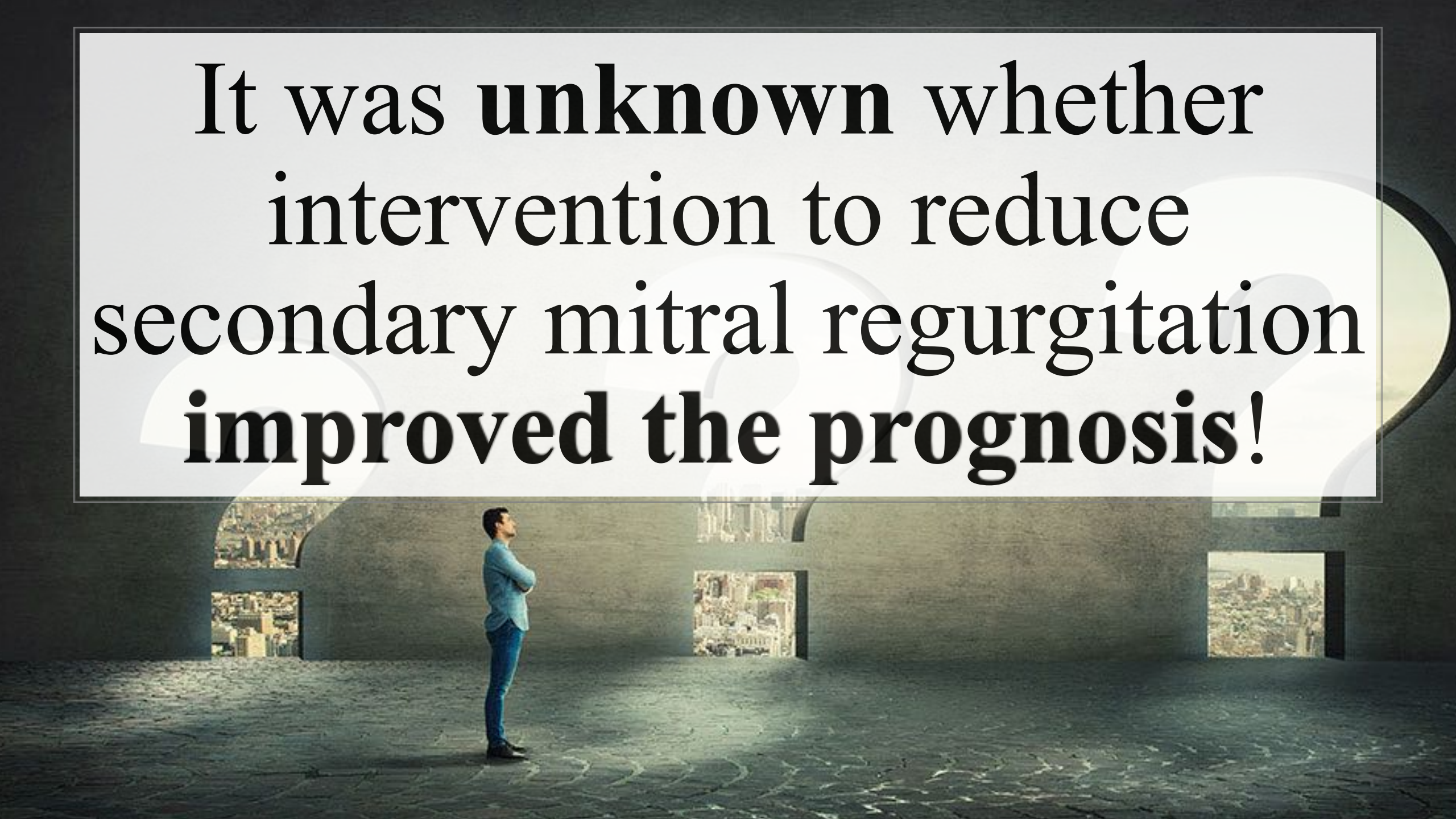
Secondary Mitral Regurgitation
Prognosis

Source	Log Risk Ratio (SE)	SMR	No SMR	Risk Ratio (SE)
SMR Present vs Absent at Echocardiography				
Agricola et al,[26] 2011	0.8538 (0.3182)	126	70	2.35 (1.26-4.38)
Aronson et al,[8] 2006	1.0188 (0.1977)	548	642	2.77 (1.88-4.08)
Barra et al,[27] 2012	0.3507 (0.1638)	358	438	1.42 (1.03-1.96)
Calafiore et al,[7] 2008	0.0296 (0.1226)	1421	2805	1.03 (0.81-1.31)
Ergström et al,[30] 2010	0.5365 (0.2636)	121	26	1.71 (1.02-2.87)
Faris et al,[31] 2002	0.5878 (0.2513)	NA	NA	1.80 (1.10-2.95)
Grigioni et al,[3] 2001	0.6313 (0.2165)	194	109	1.88 (1.23-2.87)
MacHaalany et al,[43] 2014	1.8183 (1.5567)	79	95	6.16 (0.29-130.24)
Nesković et al,[46] 1999	0.9060 (0.6158)	81	50	2.47 (0.74-8.27)
Pastorius et al,[48] 2007	0.4511 (0.1371)	289	420	1.57 (1.20-2.05)
Trichon et al,[53] 2003	0.2070 (0.0433)	1156	501	1.23 (1.13-1.34)
Upadhyay et al,[55] 2015	0.2852 (0.1404)	368	71	1.33 (1.01-1.75)
Subtotal (95% CI)		4743	5627	**1.56 (1.31-1.85)**
Heterogeneity: $\tau^2 = 0.05$; $\chi^2 = 33.07$; ($P < .001$); $I^2 = 67\%$				
Test for overall effect: $Z = 5.08$, ($P < .001$)				
SMR Present vs Absent at Ventriculography				
Hickey et al,[36] 1988	0.2231 (0.0746)	2443	9405	1.25 (1.08-1.45)
Lehmann et al,[41] 1992	1.3083 (0.6189)	27	179	3.70 (1.10-12.45)
Malidi et al,[9] 2004	−0.0429 (0.1420)	163	326	0.96 (0.73-1.27)
Pellizzon et al,[3] 2004	1.7297 (0.2303)	250	1726	5.64 (3.59-8.86)
Tcheng et al,[52] 1992	1.8160 (0.2947)	255	1215	6.15 (3.45-10.95)
Subtotal (95% CI)		3138	12851	**2.58 (1.29-5.17)**
Heterogeneity: $\tau^2 = 0.54$; $\chi^2 = 73.55$; ($P < .001$); $I^2 = 95\%$				
Test for overall effect: $Z = 2.67$, ($P = .008$)				
Total (95% CI)		7881	18478	**1.79 (1.47-2.18)**
Heterogeneity: $\tau^2 = 0.12$; $\chi^2 = 107.97$; ($P = .001$); $I^2 = 85\%$				
Test for overall effect: $Z = 5.71$, ($P < .001$)				
Test for subgroup differences: $\chi^2 = 1.89$; ($P = .17$); $I^2 = 47.2\%$				

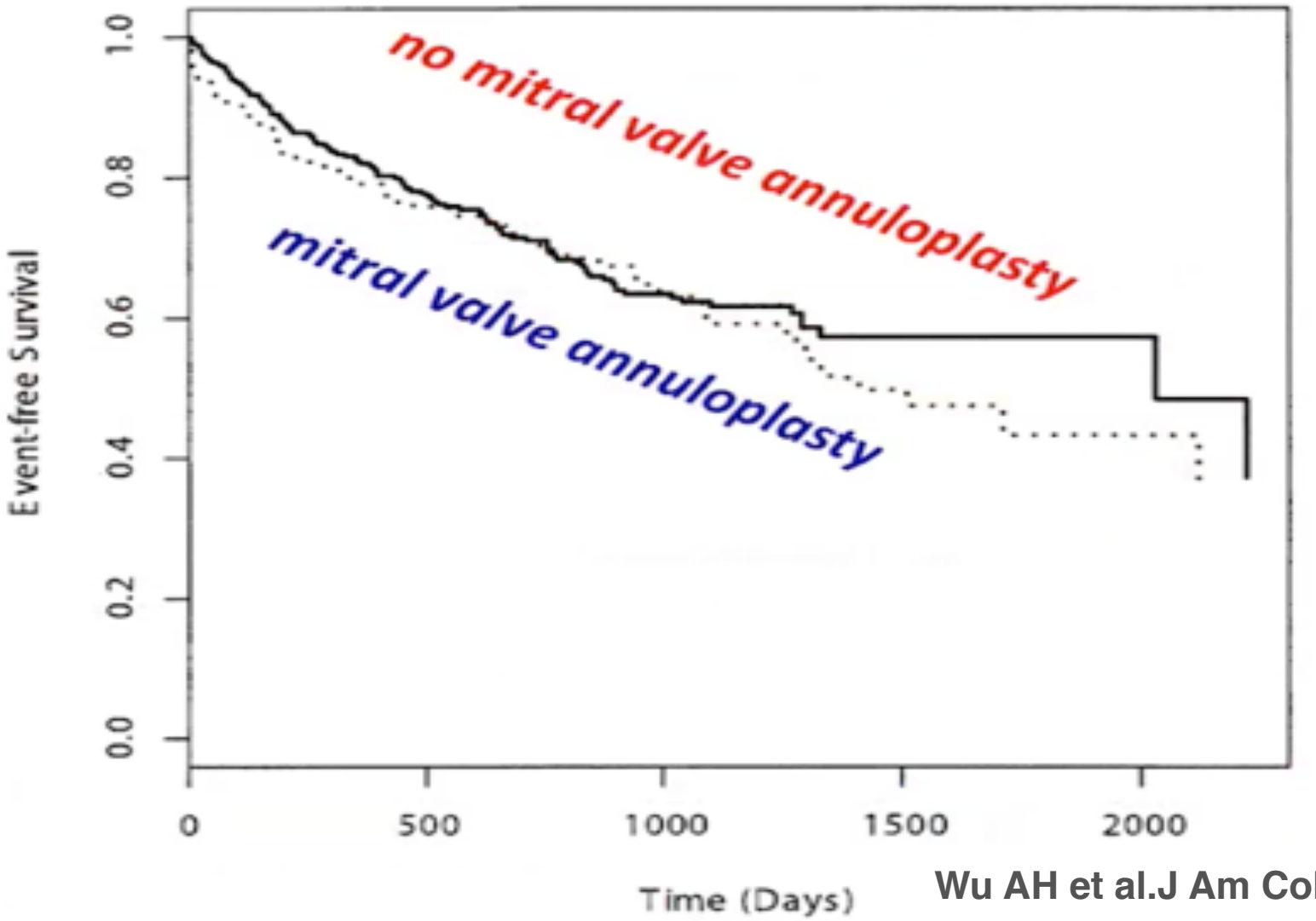


Meta-analysis of 17 studies, 26,359 patients Sannino et al JAMA Cardiol, 2017 oct 1;2(10):1130-1139 RR, 1.96; 95% CI, 1.67-2.31; $P < .001$

It was **unknown** whether intervention to reduce secondary mitral regurgitation **improved the prognosis**!

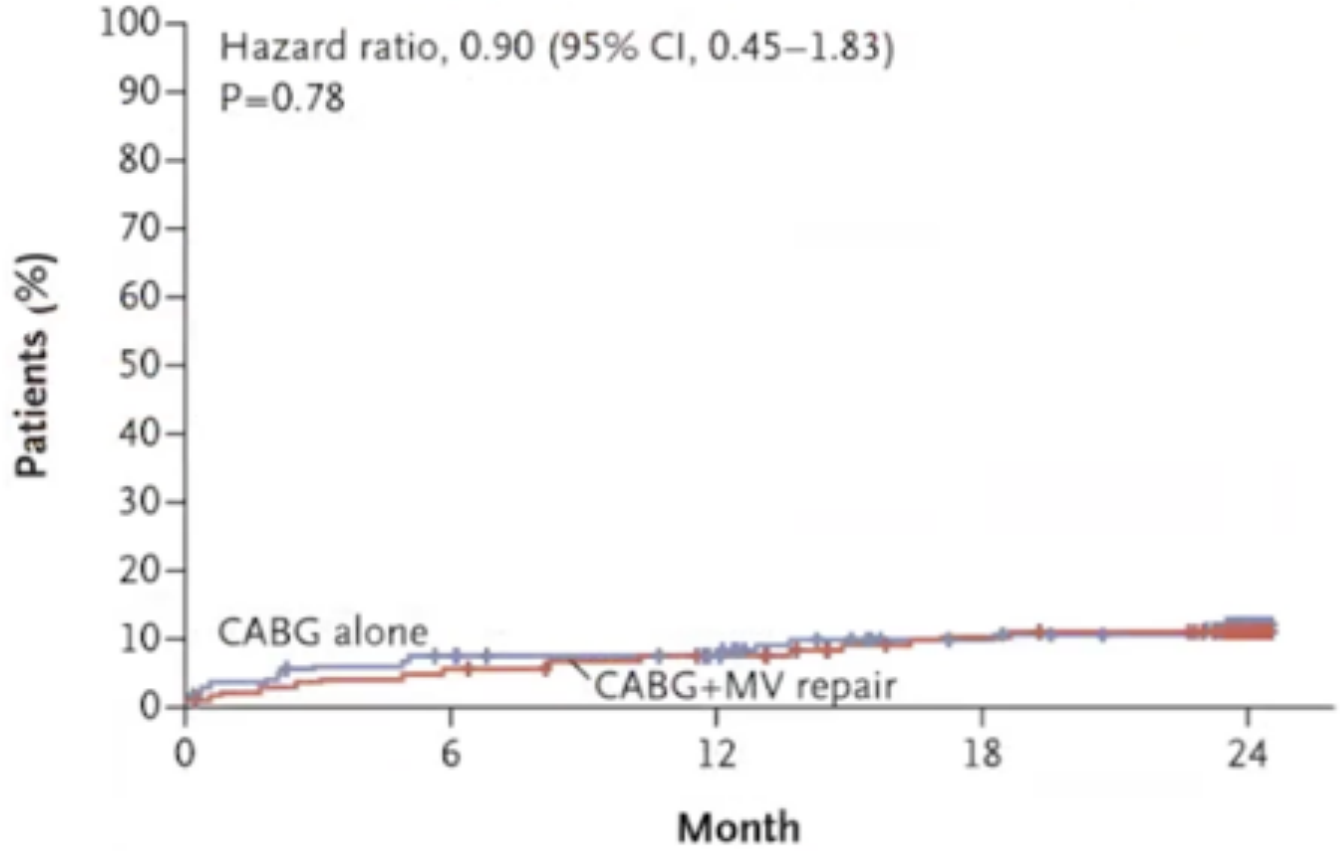


Surgery for Patients with Secondary Mitral Regurgitation



Wu AH et al.J Am Coll Cardiol 2005;45:381-387

Surgery for Patients with Secondary Mitral Regurgitation



No. at Risk					
CABG alone	151	138	132	117	66
CABG+MV repair	150	142	136	126	80

Mechler RE et al.J NEJM 2016;374(20):1932-1941

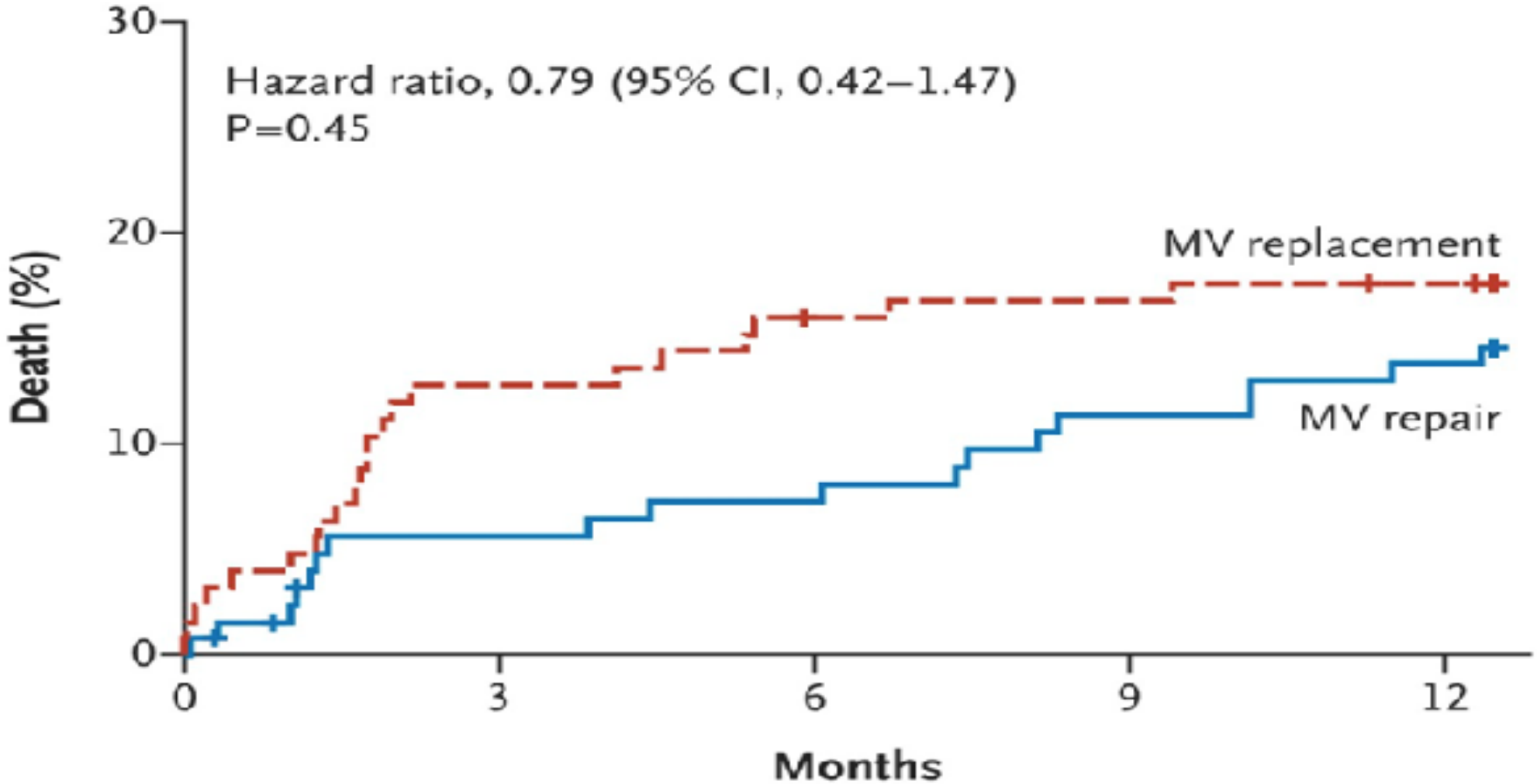
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Mitral-Valve Repair versus Replacement for Severe Ischemic Mitral Regurgitation

Michael A. Acker, M.D., Michael K. Parides, Ph.D., Louis P. Perrault, M.D., Alan J. Moskowitz, M.D., Annetine C. Gelijns, Ph.D., Pierre Voisine, M.D., Peter K. Smith, M.D., Judy W. Hung, M.D., Eugene H. Blackstone, M.D., John D. Puskas, M.D., Michael Argenziano, M.D., James S. Gammie, M.D., Michael Mack, M.D., Deborah D. Ascheim, M.D., Emilia Bagiella, Ph.D., Ellen G. Moquete, R.N., T. Bruce Ferguson, M.D., Keith A. Horvath, M.D., Nancy L. Geller, Ph.D., Marissa A. Miller, D.V.M., Y. Joseph Woo, M.D., David A. D'Alessandro, M.D., Gorav Ailawadi, M.D., Francois Dagenais, M.D., Timothy J. Gardner, M.D., Patrick T. O'Gara, M.D., Robert E. Michler, M.D., and Irving L. Kron, M.D., for the CTSN*

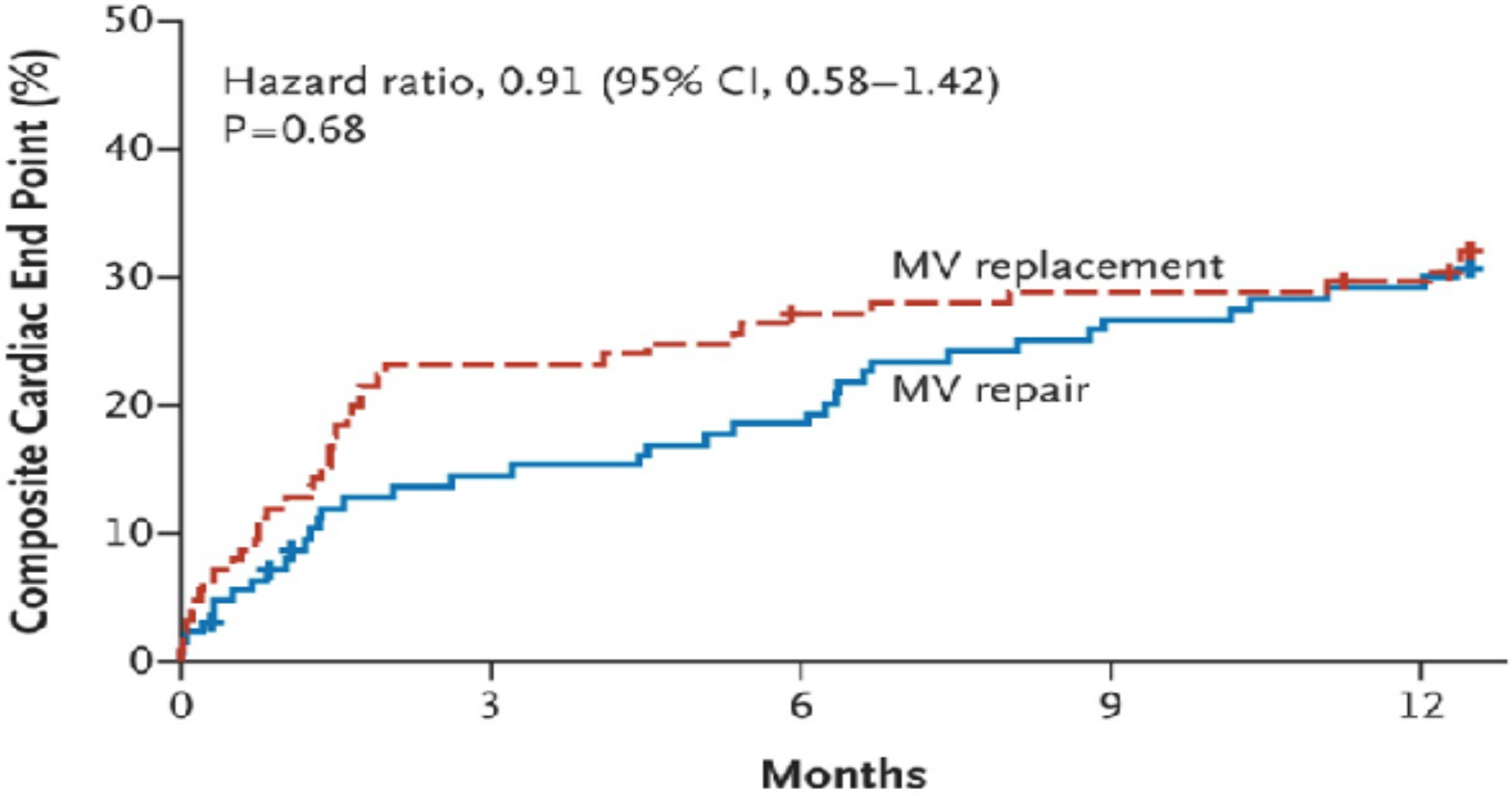
A **Death**



No. at Risk

MV repair	126	116	114	109	106
MV replacement	125	109	104	103	101

B **Composite Cardiac End Point**



No. at Risk

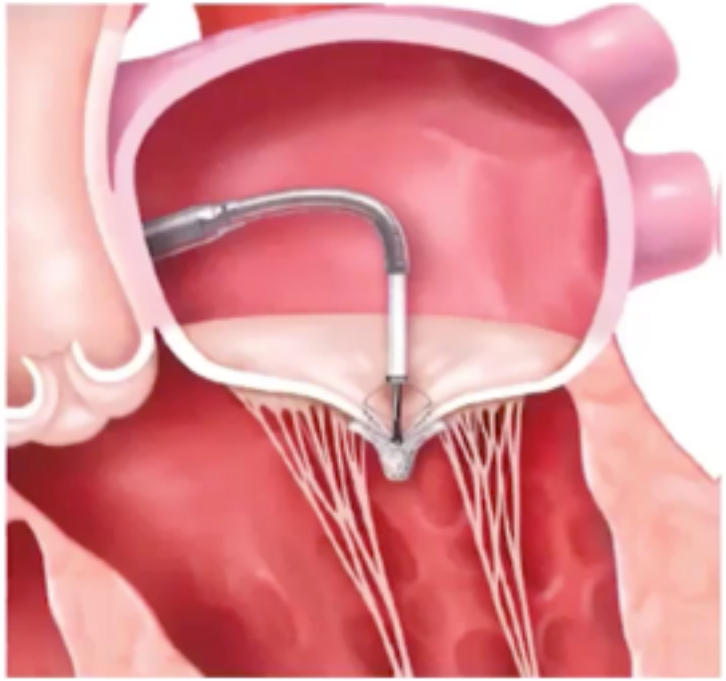
MV repair	126	105	100	90	87
MV replacement	125	96	90	88	86

The Leaflet Approximation Technique

Replication of Surgical Technique

ALFIERI - SURGICAL

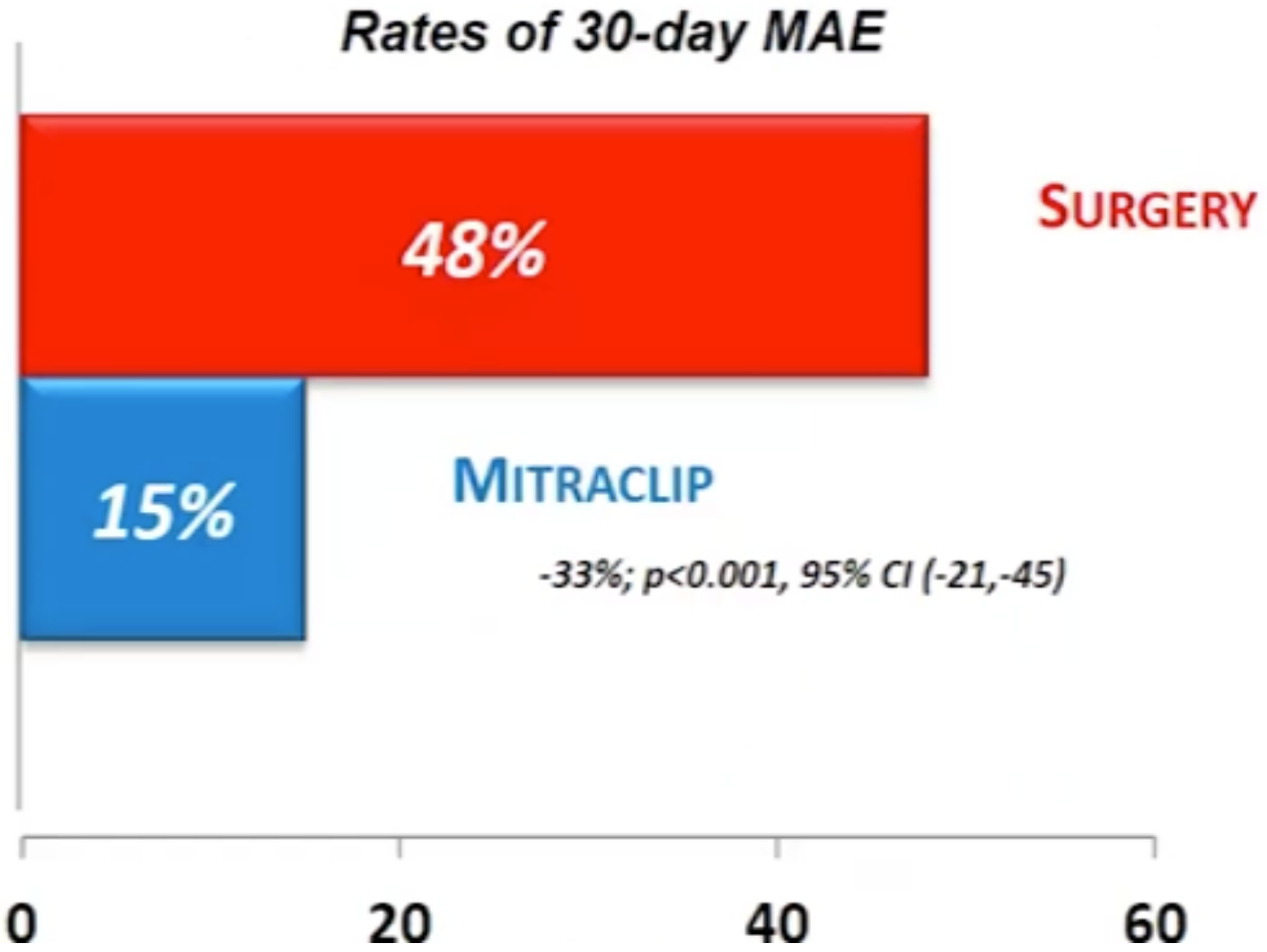
MITRACLIP- TRANSCATHETER



PASCAL- TRANSCATHETER

Mitral Clip Safety Profile

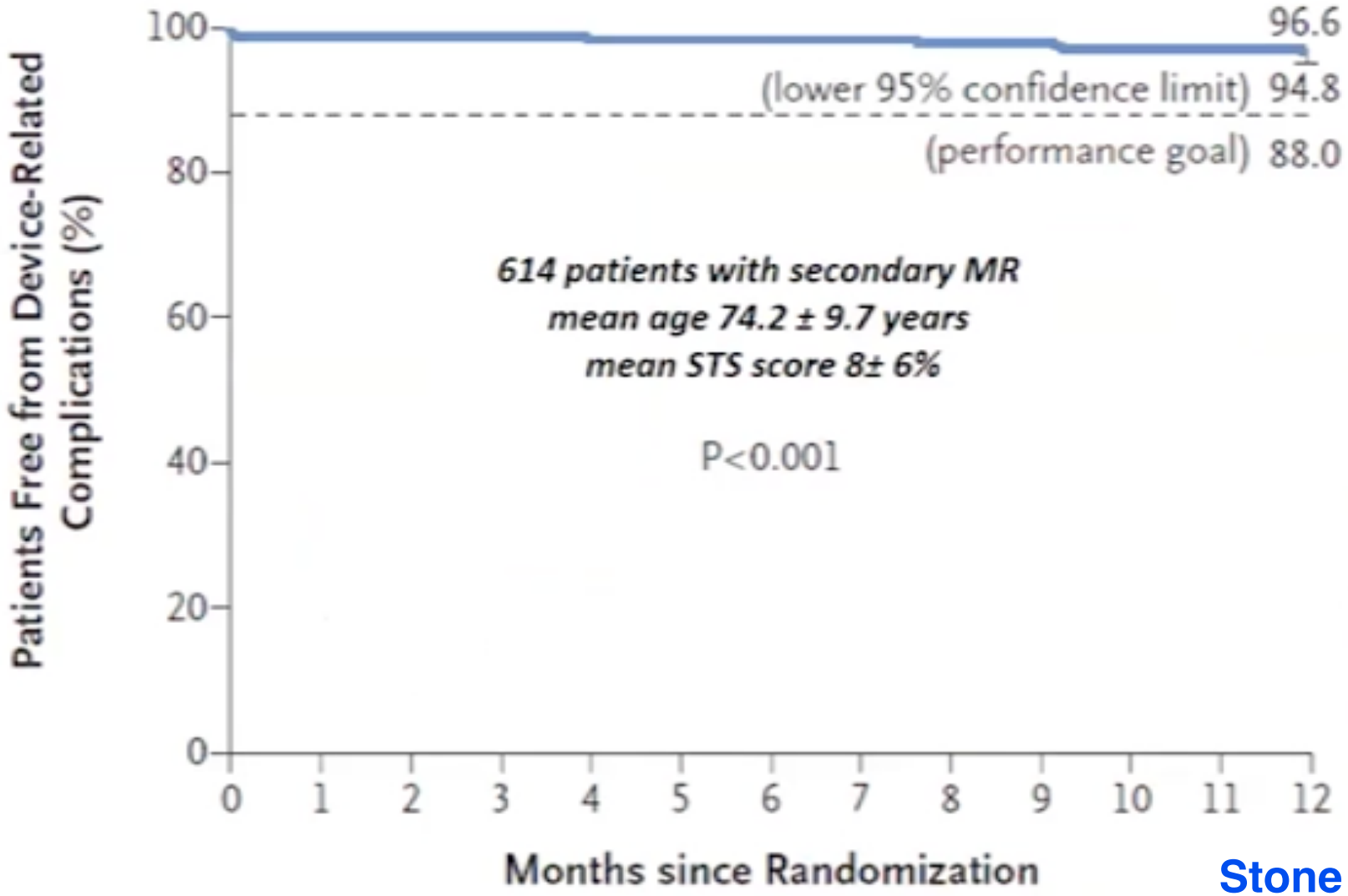
Everest II RCT



Feldman et al. N Engl J Med 2011

Mitral Clip Safety Profile

COAPT RCT



Stone et al. N Engl J Med 2018

Percutaneous Repair with the MitraClip Device for Severe Secondary Mitral Regurgitation

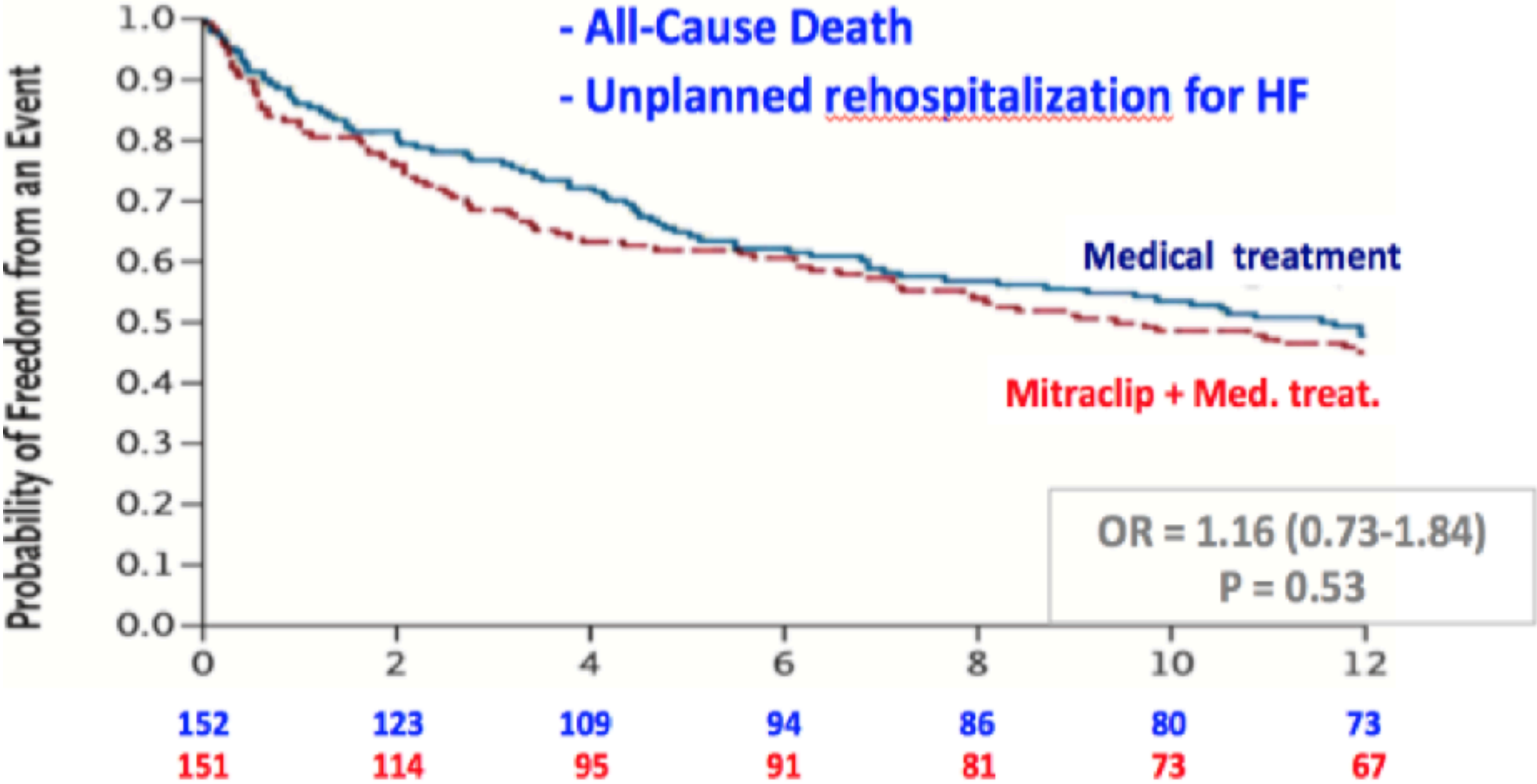
MITRA-FR

Percutaneous Repair with the MitraClip Device for Secondary MR

Multicenter, randomized, open-label, phase 3 trial
in 304 patients with symptomatic heart failure, ↓ LVEF (15-40%)
and severe secondary MR (EROA >20 mm^2, RV 30 ml/beat)
conducted in France (37 centers)

Primary endpoint: all-cause death + unplanned hospit. for HF at 12m

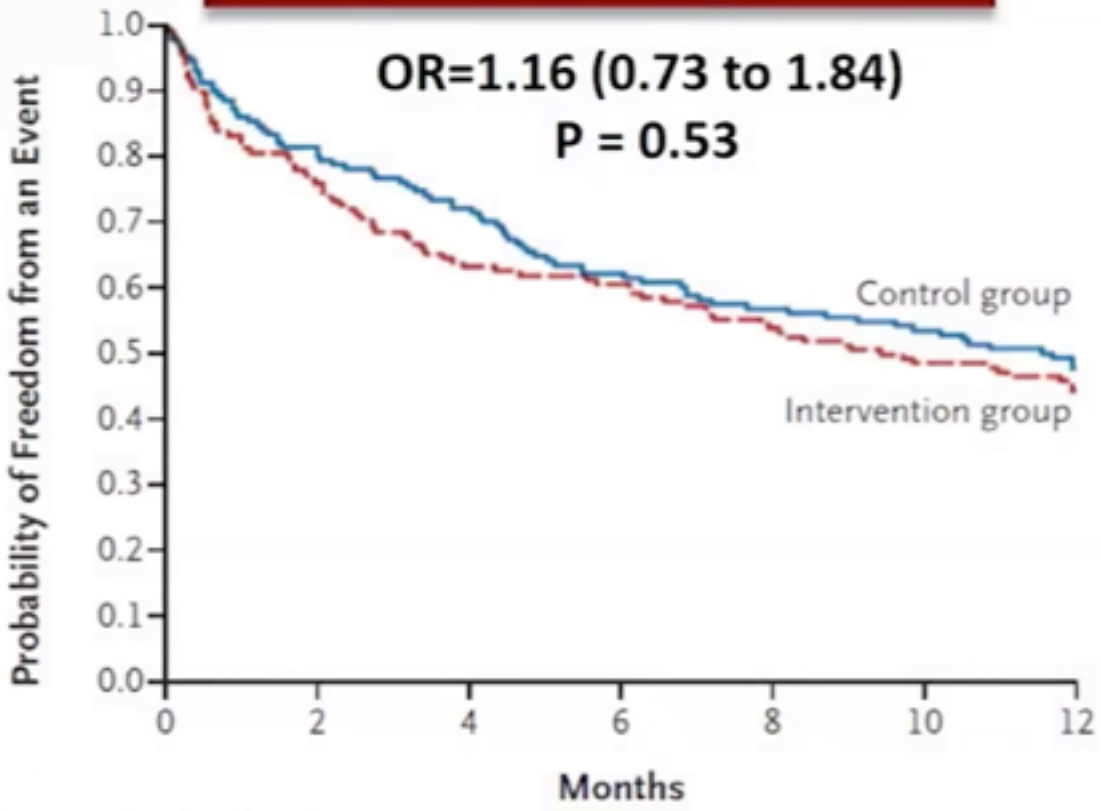
Primary composite endpoint *(99% follow-up)*

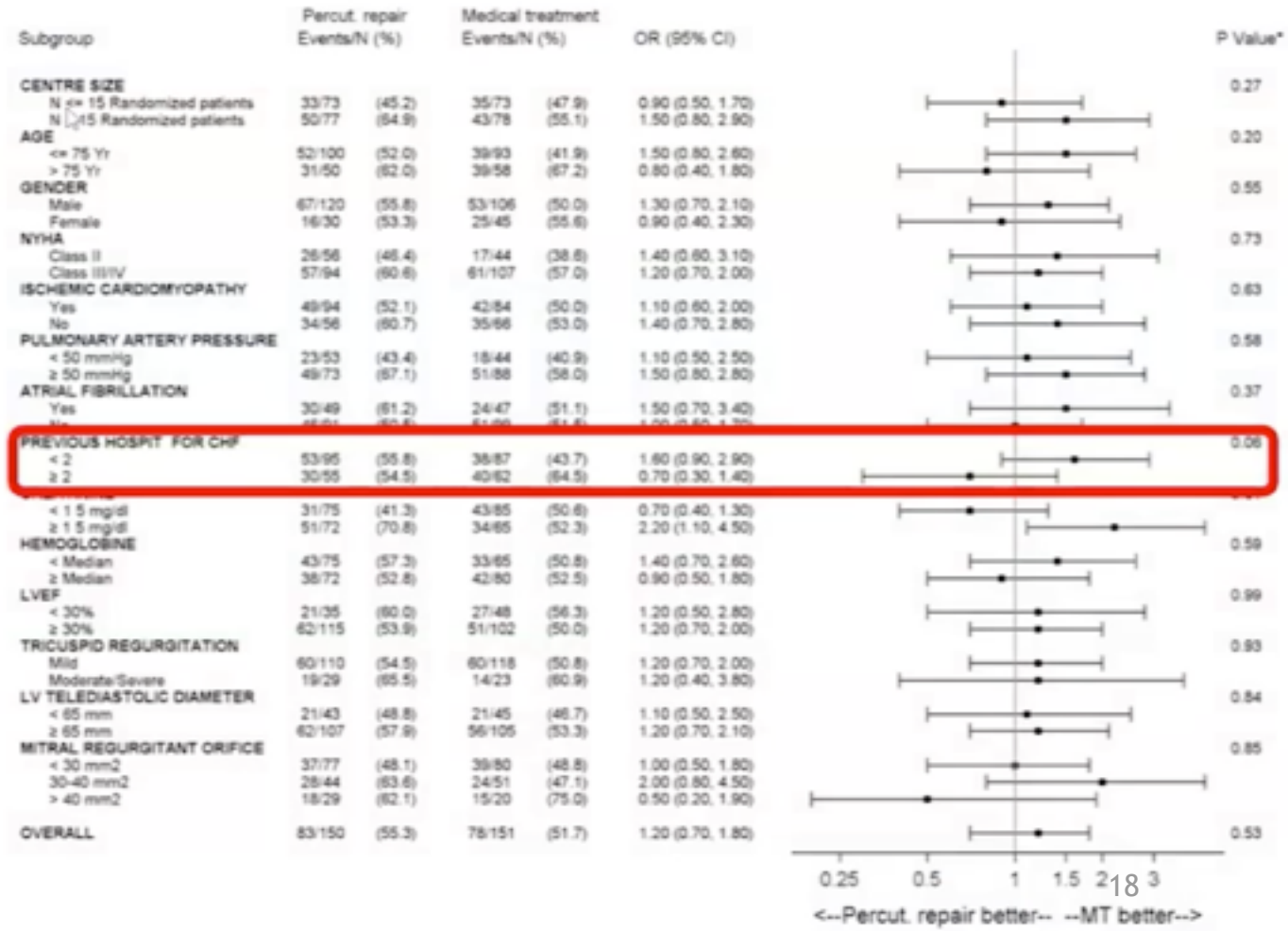


MITRA-FR – MITRACLIP VS MEDICAL TREATMENT FOR SECONDARY MR: PRIMARY ENDPOINT AND SUBGROUPS

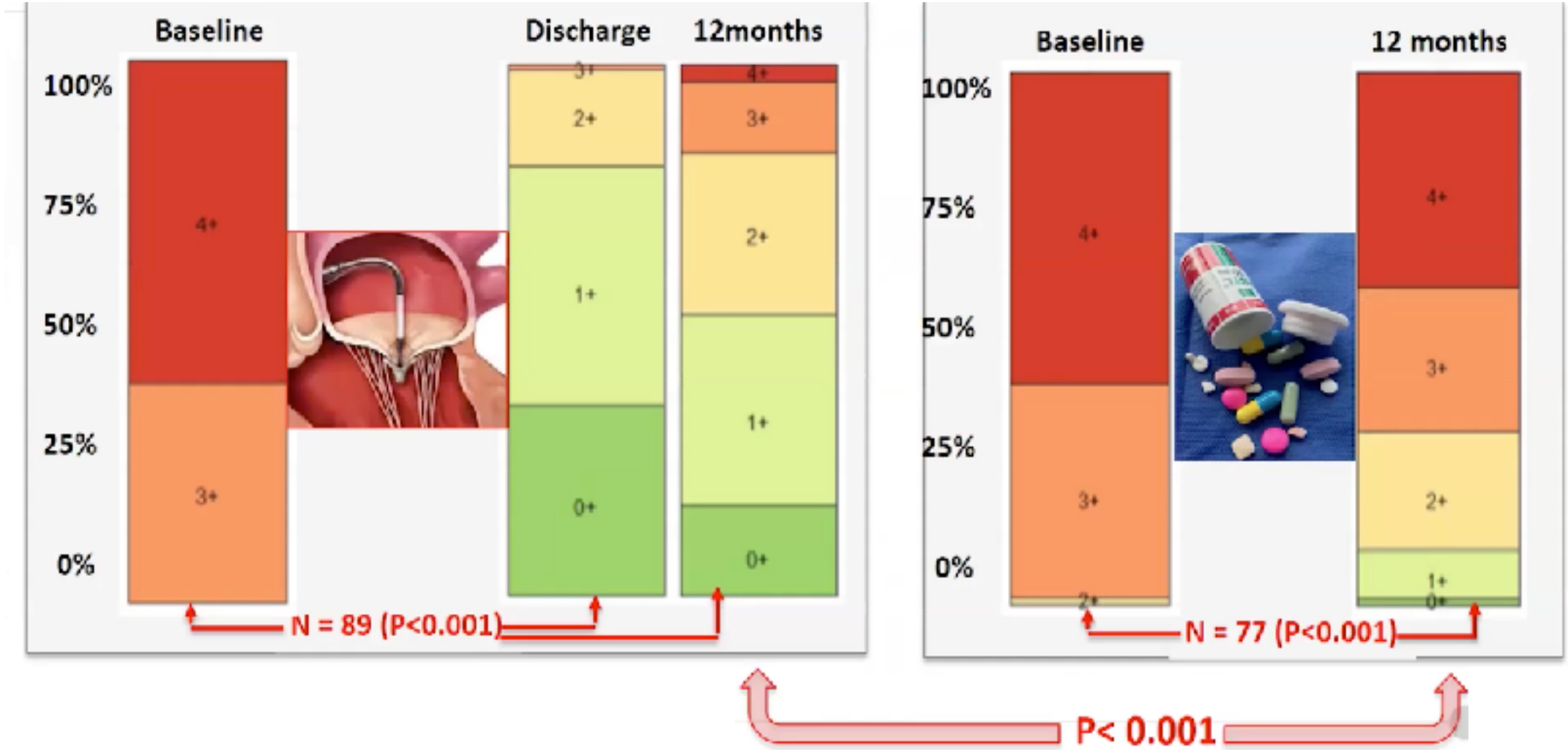
Obadia JF et al. *N Engl J Med* 2018

Primary Endpoint
All-Cause Death and Re-hosp for Heart Failure @ 1 Year





Mitral Regurgitation Grade Evolution in Both Groups Mitra-FR



Q: Is percutaneous correction of secondary mitral regurgitation by mitral clip safe and effective?

YES

Q: Does correction of secondary mitral regurgitation change the prognosis?

NO

Echocardiographic Criteria for the Definition of Severe Mitral Regurgitation

	Aortic regurgitation	Mitral regurgitation		Tricuspid regurgitation
Qualitative				
Valve morphology	Abnormal/flail/large coaptation defect	Flail leaflet/ruptured papillary muscle/ large coaptation defect		Abnormal/flail/large coaptation defect
Colour flow regurgitant jet	Large in central jets, variable in eccentric jets[a]	Very large central jet or eccentric jet adhering, swirling, and reaching the posterior wall of the left atrium		Very large central jet or eccentric wall impinging jet[a]
CW signal of regurgitant jet	Dense	Dense/triangular		Dense/triangular with early peaking (peak <2 m/s in massive TR)
Other	Holodiastolic flow reversal in descending aorta (EDV >20 cm/s)	Large flow convergence zone[a]		–
Semiquantitative				
Vena contracta width (mm)	>6	≥7 (>8 for biplane)[b]		≥7[b]
Upstream vein flow[c]	–	Systolic pulmonary vein flow reversal		Systolic hepatic vein flow reversal
Inflow	–	E-wave dominant ≥1.5 m/s[d]		E-wave dominant ≥1 m/s[e]
Other	Pressure half-time <200 ms[f]	TVI mitral/TVI aortic >1.4		PISA radius >9 mm[g]
Quantitative		Primary	Secondary[h]	
EROA (mm^2)	≥30	≥40	≥20	≥40
R.Vol (ml/beat)	≥60	≥60	≥30	≥45
+ enlargement of cardiac chambers/vessels	LV	LV, LA		RV, RA, inferior vena cava

The COAPT Trial

Cardiovascular Outcomes Assessment of the MitraClip Percutaneous Therapy for Heart Failure Patients with Functional Mitral Regurgitation

A parallel-controlled, open-label, multicenter trial in 614 patients with heart failure and moderate-to-severe (3+) or severe (4+) secondary MR who remained symptomatic despite maximally-tolerated GDMT

Randomize 1:1

MitraClip + GDMT
N=302

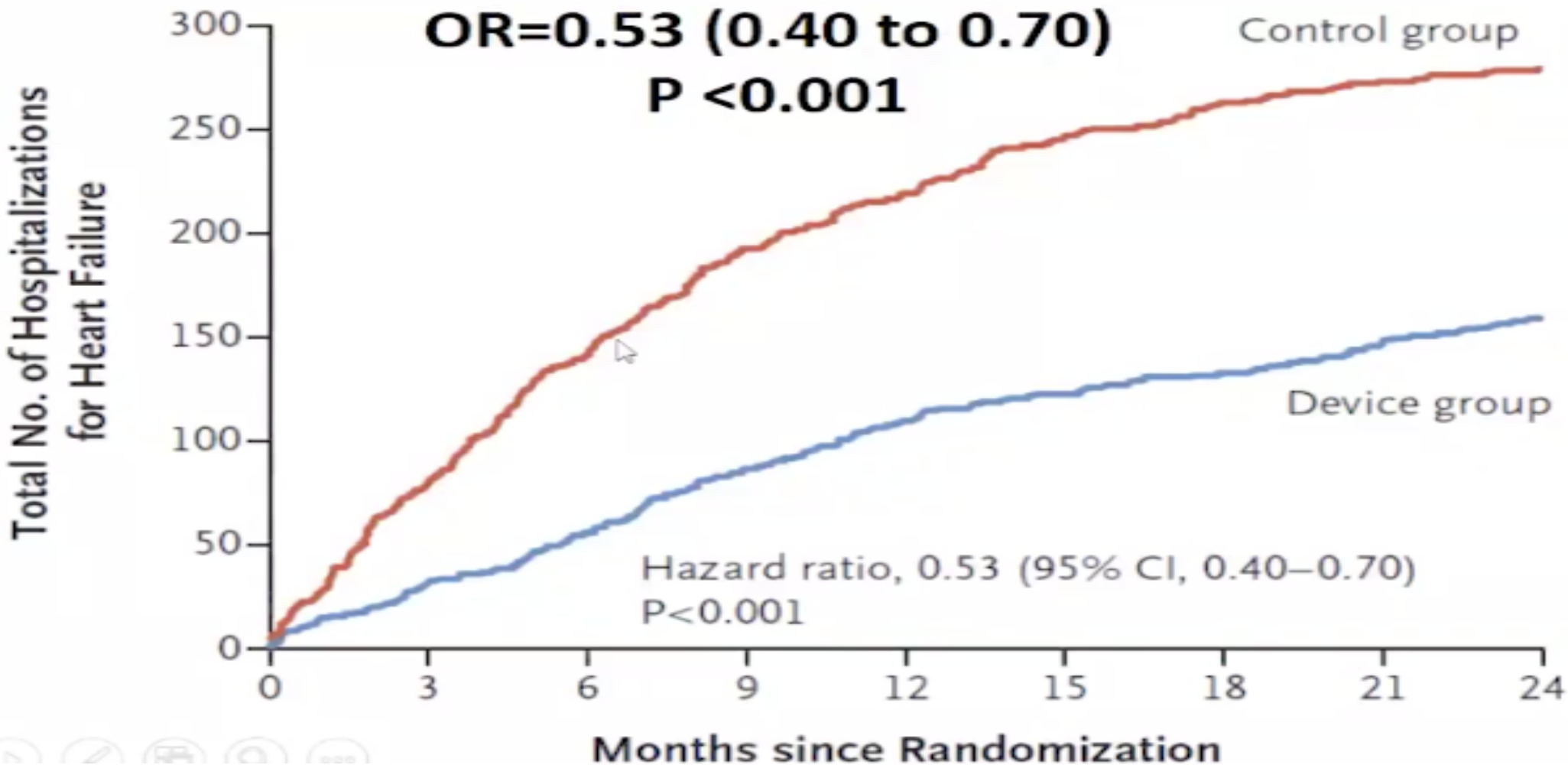
GDMT alone
N=312

Primary endpoints:

Effectiveness: All HF hospitalizations through 24 mos, analyzed when last pt completes 12-mo FU

Safety: Freedom from device-related complications through 12 months

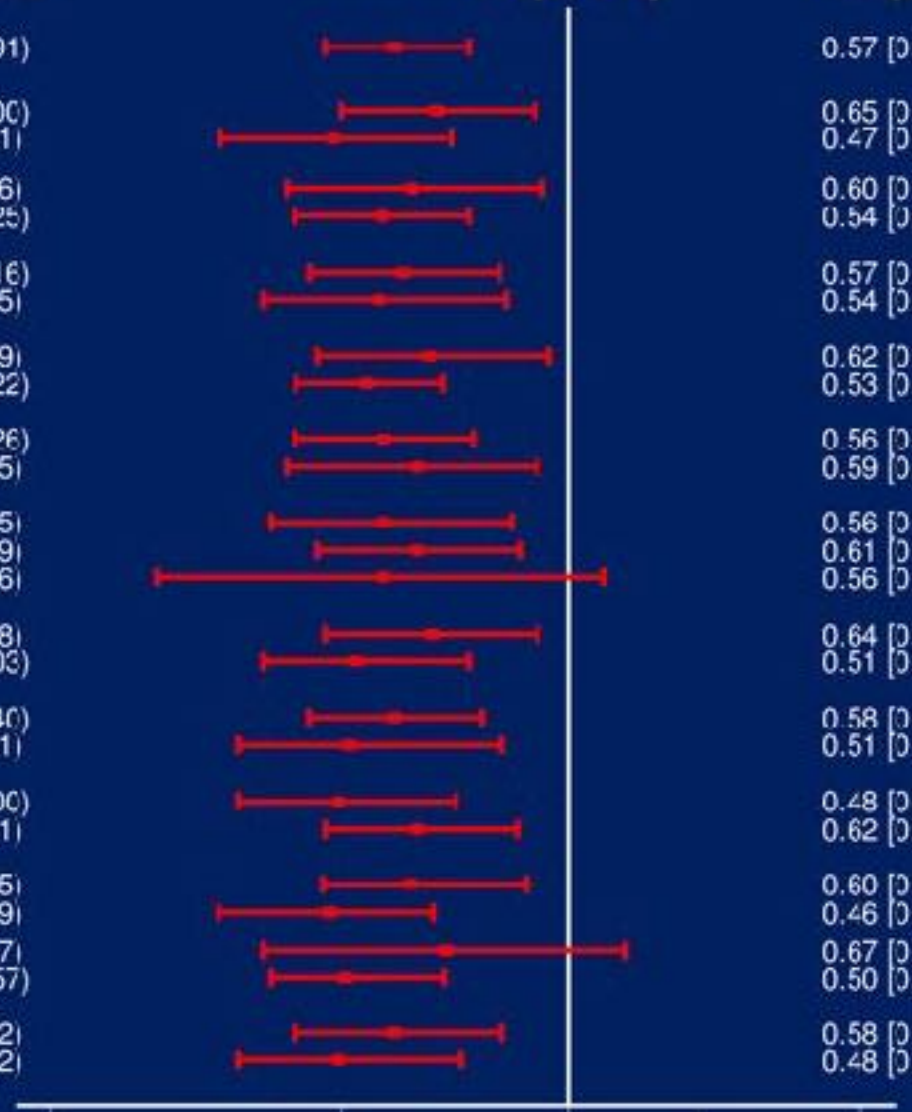
Primary Endpoint
All-Cause Hospitalisations for Heart Failure @ 2 Years



COAPT TRIAL

24-Month Death or HF Hospitalization

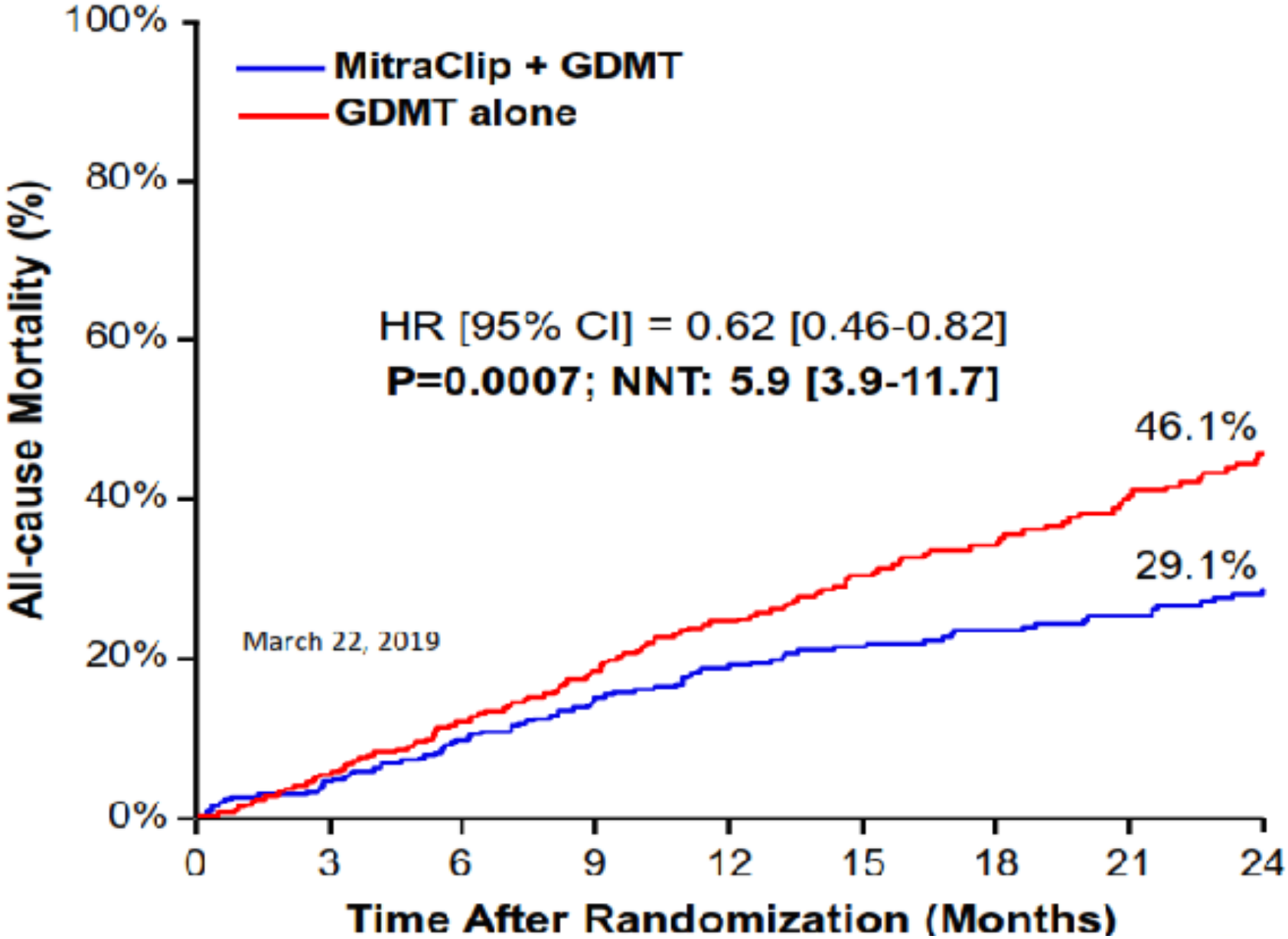
Subgroup	MitraClip + GDMT	GDMT alone	HR [95% CI]	P [Int]
All patients	45.7% (129)	67.9% (191)	0.57 [0.45, 0.71]	
Age (median)				
≥74 years (n=317)	52.1% (78)	70.2% (100)	0.65 [0.48, 0.88]	0.13
<74 years (n=297)	37.8% (51)	65.3% (91)	0.47 [0.33, 0.66]	
Sex				
Female (n=221)	43.2% (39)	59.4% (66)	0.60 [0.40, 0.89]	0.76
Male (n=393)	47.1% (90)	73.0% (125)	0.54 [0.41, 0.71]	
Etiology of cardiomyopathy				
Ischemic (n=373)	48.1% (84)	70.0% (116)	0.57 [0.43, 0.76]	0.79
Non-ischemic (n=241)	41.1% (45)	65.2% (75)	0.54 [0.37, 0.78]	
Prior CRT				
Yes (n=224)	50.2% (55)	68.4% (69)	0.62 [0.44, 0.89]	0.54
No (n=390)	42.9% (74)	67.4% (122)	0.53 [0.39, 0.71]	
HF hospitalization within the prior year				
Yes (n=407)	44.7% (86)	67.9% (126)	0.56 [0.42, 0.73]	0.79
No (n=207)	47.6% (43)	67.8% (65)	0.59 [0.40, 0.86]	
Baseline NYHA class				
I or II (n=240)	41.1% (50)	66.9% (65)	0.56 [0.39, 0.81]	0.92
III (n=322)	46.6% (67)	65.3% (99)	0.61 [0.44, 0.83]	
IV (n=51)	68.3% (12)	84.4% (26)	0.56 [0.28, 1.12]	
STS replacement score				
≥8% (n=262)	54.1% (65)	71.4% (88)	0.64 [0.46, 0.88]	0.41
<8% (n=352)	39.2% (64)	65.0% (103)	0.51 [0.37, 0.70]	
Surgical risk status*				
High (n=423)	49.7% (95)	71.5% (140)	0.58 [0.45, 0.75]	0.69
Not high (n=188)	35.8% (32)	58.7% (51)	0.51 [0.33, 0.80]	
Baseline MR grade				
3+ (n=320)	37.5% (51)	65.3% (100)	0.48 [0.34, 0.67]	0.29
4+ (n=293)	53.4% (78)	71.4% (91)	0.62 [0.45, 0.83]	
Baseline LVEF				
≥30% (median; n=301)	44.1% (62)	61.2% (85)	0.60 [0.43, 0.84]	0.32
<30% (median; n=274)	46.4% (56)	77.8% (99)	0.46 [0.33, 0.64]	
>40% (n=103)	49.7% (22)	56.2% (27)	0.67 [0.38, 1.17]	0.31
≤40% (n=472)	44.2% (96)	71.9% (157)	0.50 [0.39, 0.65]	
Baseline LVEDV (median)				
≥181 mL (n=238)	48.9% (43)	68.0% (92)	0.58 [0.42, 0.80]	0.42
<181 mL (n=237)	41.5% (54)	69.5% (92)	0.48 [0.34, 0.67]	



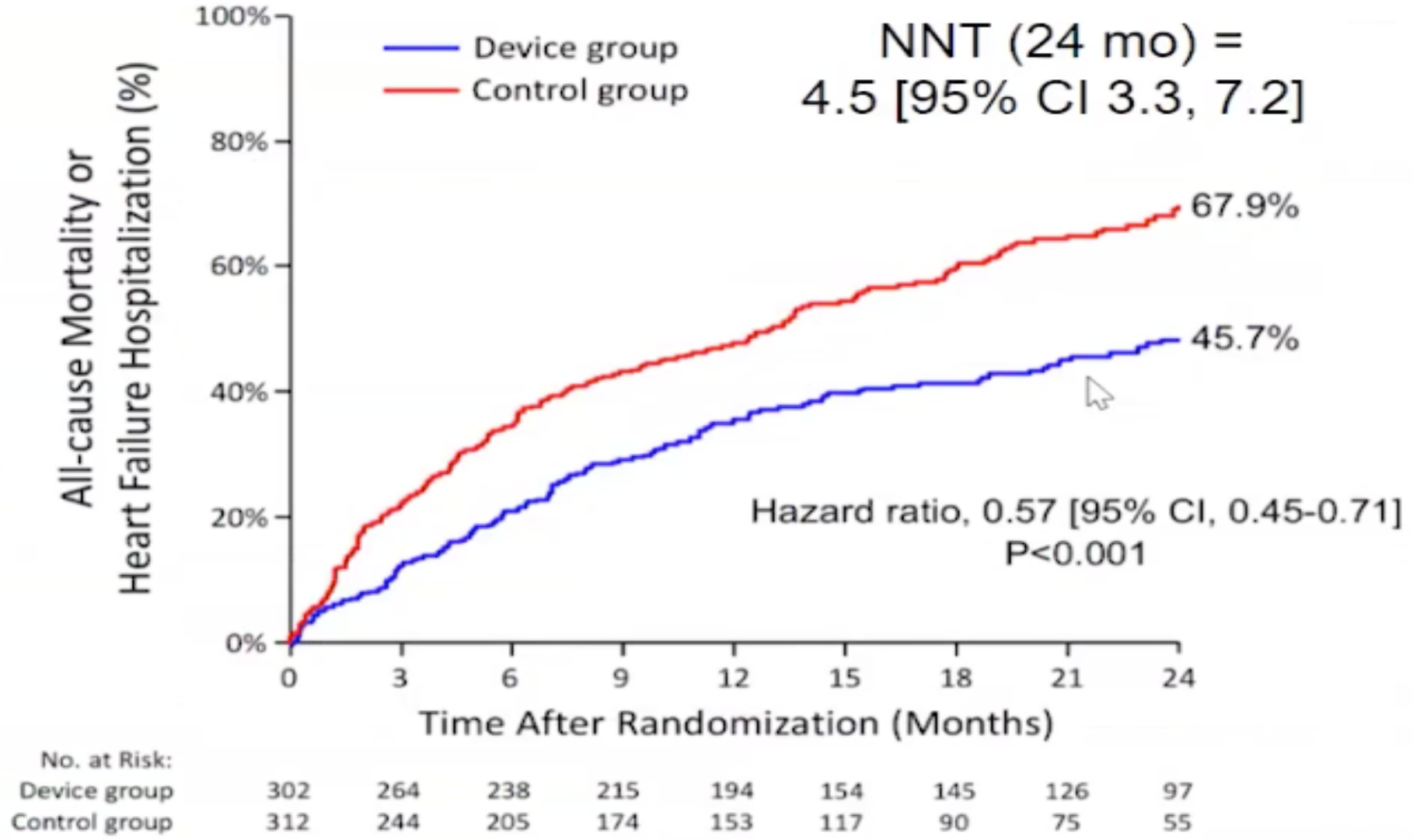
KM time-to-first event rates

*Central eligibility committee assessment

All-Cause Mortality



Mortality and HF Hospitalization



- **TEER with the MitraClip was:**
  - Safe.
  - Provided durable reduction in MR.
  - reduced the rate of HF hospitalizations.
  - Significant reduction in all cause mortality.
  - Improved quality-of-life and functional capacity. during 24-month follow-up.
- **MitraClip** is the first therapy shown to improve the prognosis of patients with HF by reducing secondary MR due to LV dysfunction.

ACC/AHA Guidelines: Chronic Secondary MR

Grade	Definition	Valve Anatomy	Valve Hemodynamics*	Associated Cardiac Findings	Symptoms
A	At risk of MR	• Normal valve leaflets, chords, and annulus in a patient with coronary disease or cardiomyopathy	• No MR jet or small central jet area <20% LA on Doppler • Small vena contracta <0.30 cm	• Normal or mildly dilated LV size with fixed (infarction) or inducible (ischemia) regional wall motion abnormalities • Primary myocardial disease with LV dilation and systolic dysfunction	• Symptoms due to coronary ischemia or HF may be present that respond to revascularization and appropriate medical therapy
B	Progressive MR	• Regional wall motion abnormalities with mild tethering of mitral leaflet • Annular dilation with mild loss of central coaptation of the mitral leaflets	• ERO <0.40 cm^2† • Regurgitant volume <60 mL • Regurgitant fraction <50%	• Regional wall motion abnormalities with reduced LV systolic function • LV dilation and systolic dysfunction due to primary myocardial disease	• Symptoms due to coronary ischemia or HF may be present that respond to revascularization and appropriate medical therapy
C	Asymptomatic severe MR	• Regional wall motion abnormalities and/or LV dilation with severe tethering of mitral leaflet • Annular dilation with severe loss of central coaptation of the mitral leaflets	• ERO ≥0.40 cm^2† • Regurgitant volume ≥60 mL • Regurgitant fraction ≥50%	• Regional wall motion abnormalities with reduced LV systolic function • LV dilation and systolic dysfunction due to primary myocardial disease	• Symptoms due to coronary ischemia or HF may be present that respond to revascularization and appropriate medical therapy
D	Symptomatic severe MR	• Regional wall motion abnormalities and/or LV dilation with severe tethering of mitral leaflet • Annular dilation with severe loss of central coaptation of the mitral leaflets	• ERO ≥0.40 cm^2† • Regurgitant volume ≥60 mL • Regurgitant fraction ≥50%	• Regional wall motion abnormalities with reduced LV systolic function • LV dilation and systolic dysfunction due to primary myocardial disease	• HF symptoms due to MR persist even after revascularization and optimization of medical therapy • Decreased exercise tolerance • Exertional dyspnea

*Several valve hemodynamic criteria are provided for assessment of MR severity, but not all criteria for each category will be present in each patient. Categorization of MR severity as mild, moderate, or severe depends on data quality and integration of these parameters in conjunction with other clinical evidence.

†The measurement of the proximal isovelocity surface area by 2D TTE in patients with secondary MR underestimates the true ERO because of the crescentic shape of the proximal convergence.

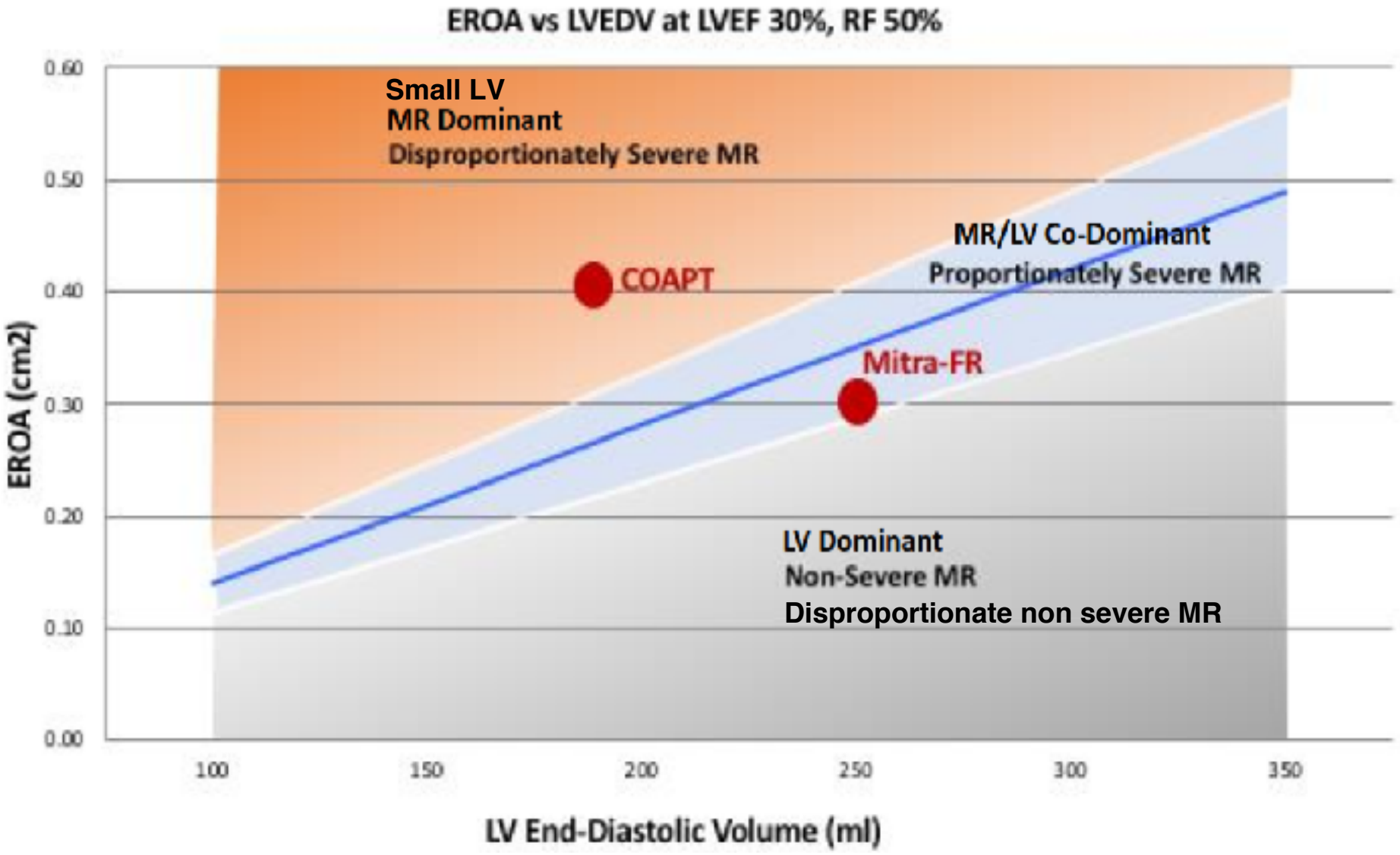
Diverging Guidelines: Chronic Secondary MR

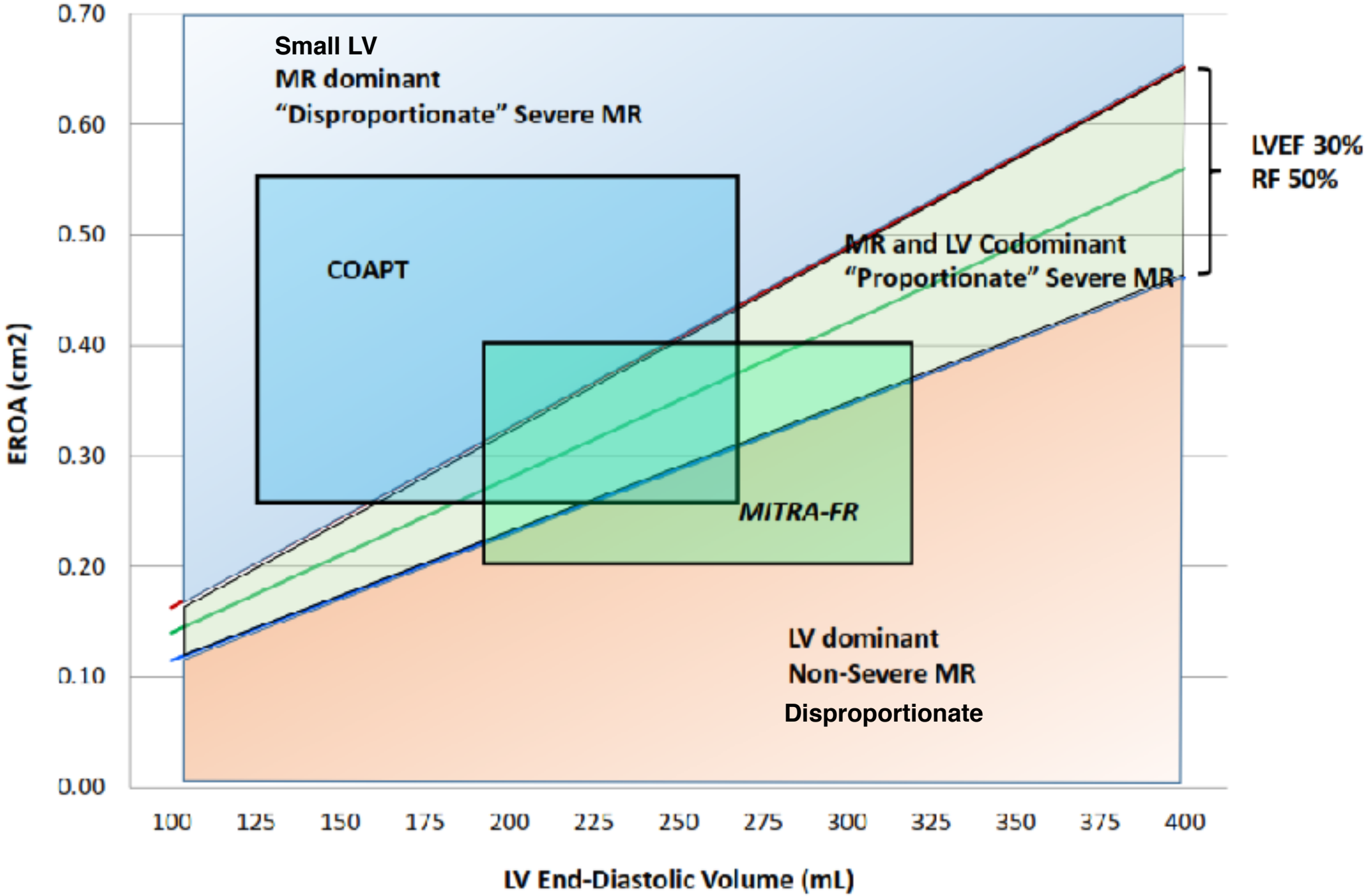
	2017 ESC guidelines		2017 AHA/ACC focused update	2017 ASE guidelines
Semi-quantitative criteria				
Vena contracta (mm)	≥7 (>8 for biplane*)		-	≥7
Pulmonary vein	Pulmonary vein systolic flow reversal		-	Pulmonary vein systolic flow reversal
Inflow	E-wave dominant ≥1.5m/s		-	-
Other	TVI mitral/TVI aortic >1.4		-	Central large jet > 50% of LA area
Quantitative criteria	**Primary**	**Functional**		
EROA (mm^2)	≥40	≥20	≥40	≥40 (or 30-39 with 3 severity criteria or elliptical orifice)
PISA radius	-	-	-	≥ 1.0 cm at Nyquist 30-40 cm/s
Regurgitant volume (ml)	≥60	≥30	≥60	≥60
Regurgitant fraction (%)	-	-	≥50	≥50

Traditional approaches to the characterization of secondary mitral regurgitation have largely ignored the critical importance of the left ventricle

Patients with secondary mitral regurgitation represent a heterogenous group, which can be usefully subdivided based on understanding that the **EROA** is dependent on the **LVEDV**

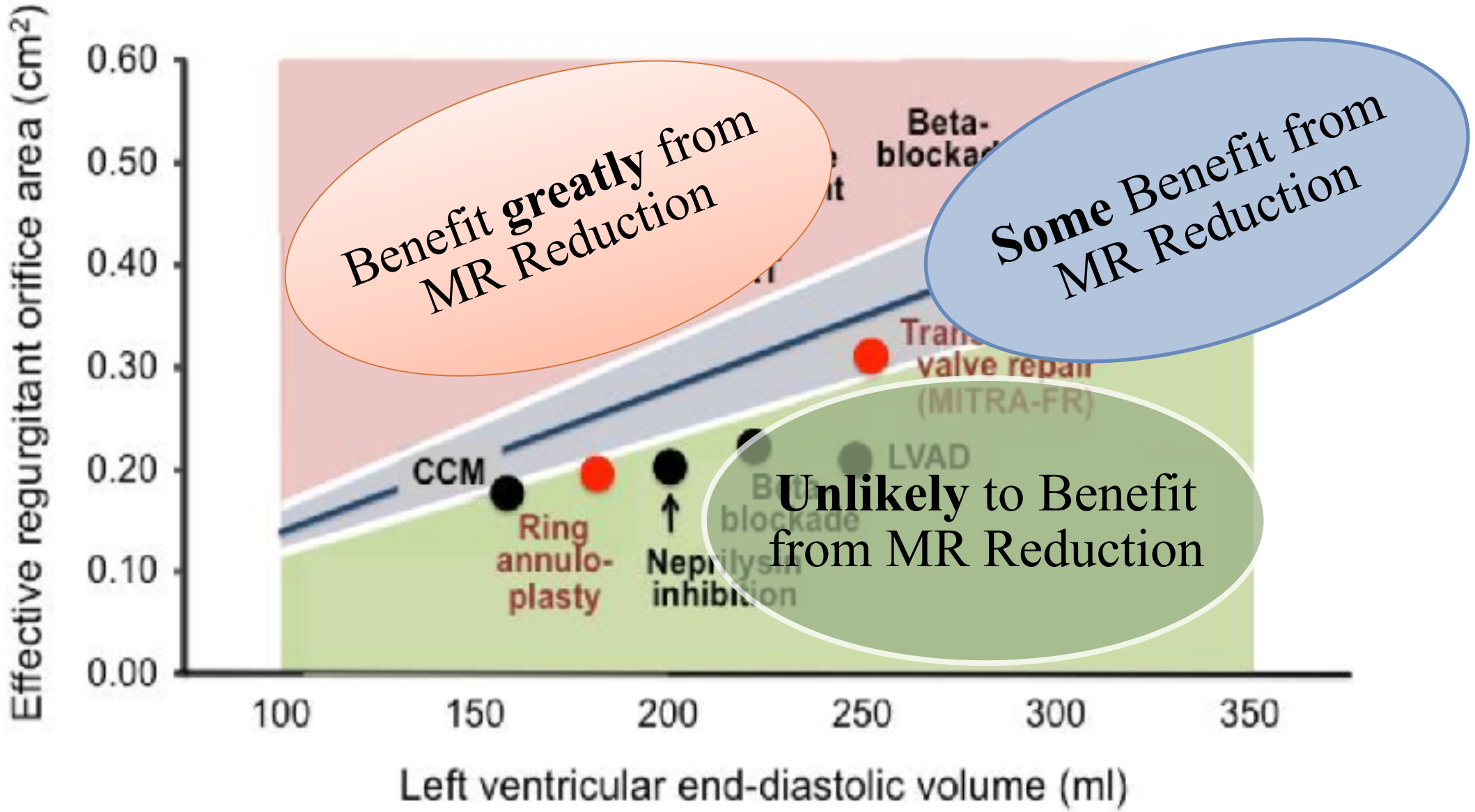
Disproportionate vs Proportionate Severe Secondary MR



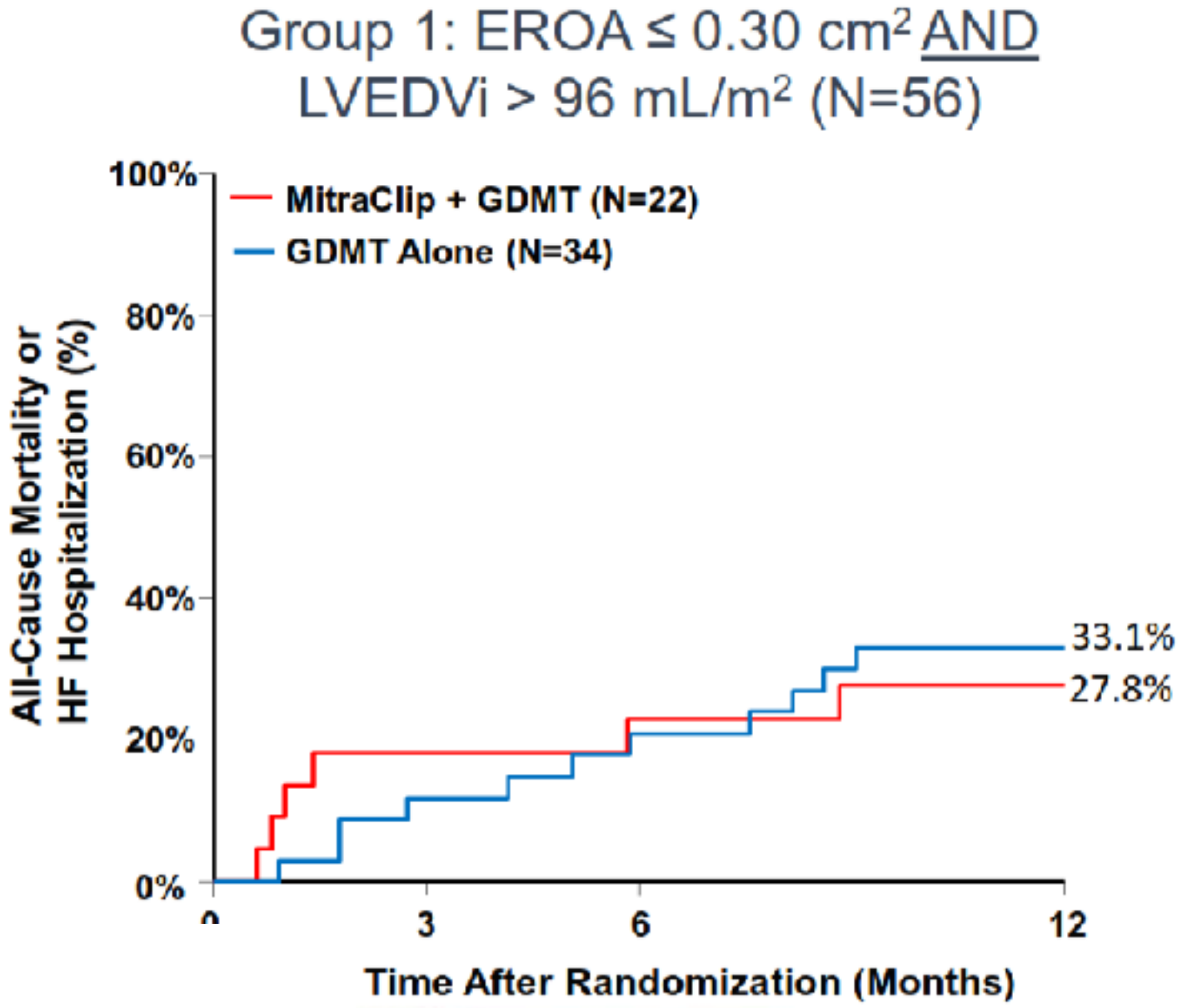

Small LV
MR dominant
"Disproportionate" Severe MR
COAPT
MR and LV Codominant
"Proportionate" Severe MR
LVEF 30%
RF 50%
MITRA-FR
LV dominant
Non-Severe MR
Disproportionate
EROA (cm2)
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
100
125
150
175
200
225
250
275
300
325
350
375
400
LV End-Diastolic Volume (mL)

Trials of HF Therapies and Secondary MR

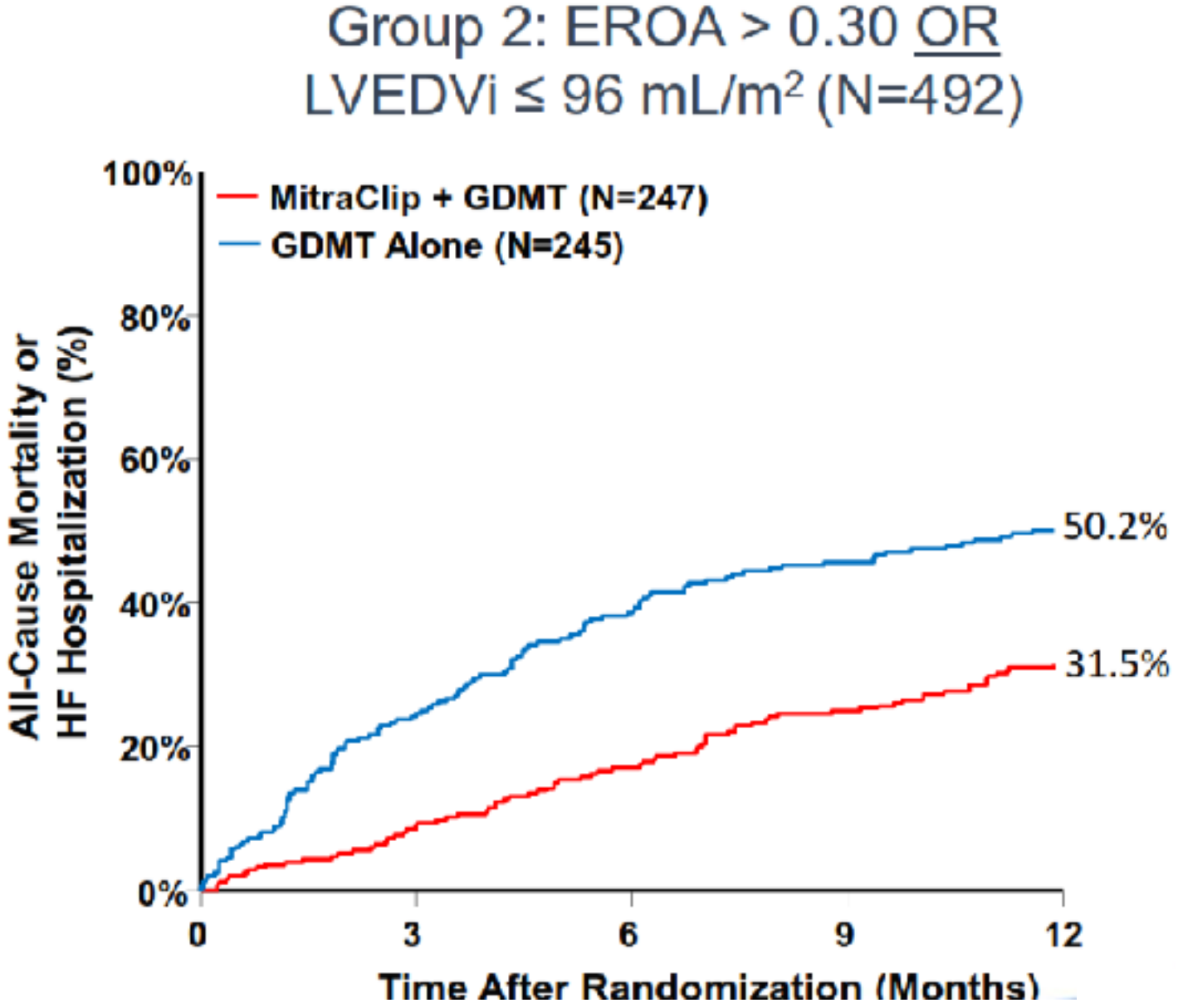
Benefit from MR reduction



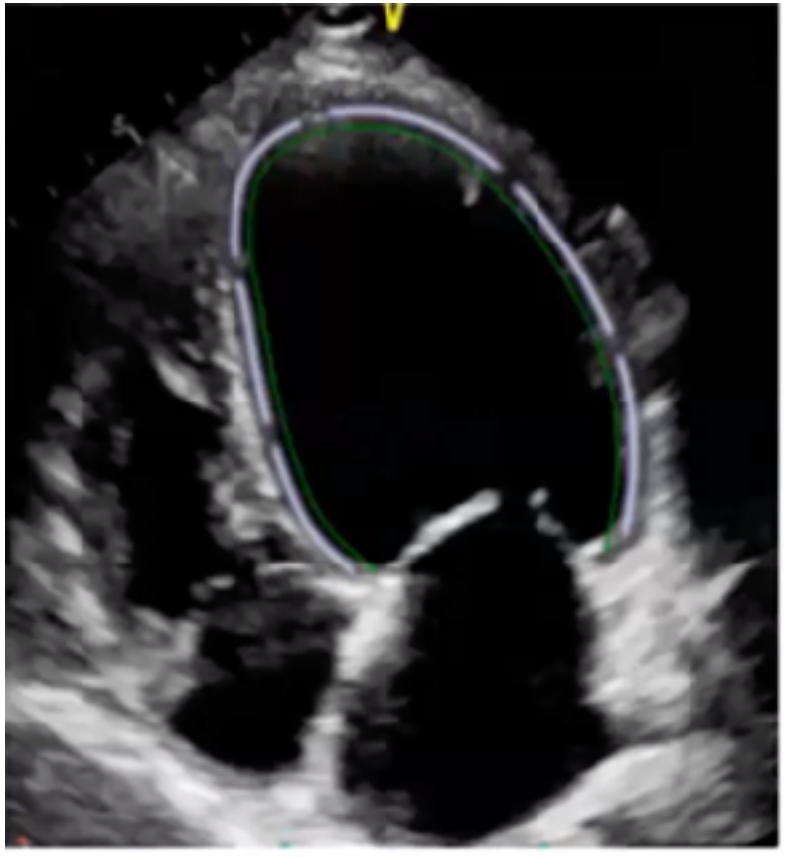
Mortality and HF Hospitalization at One Year



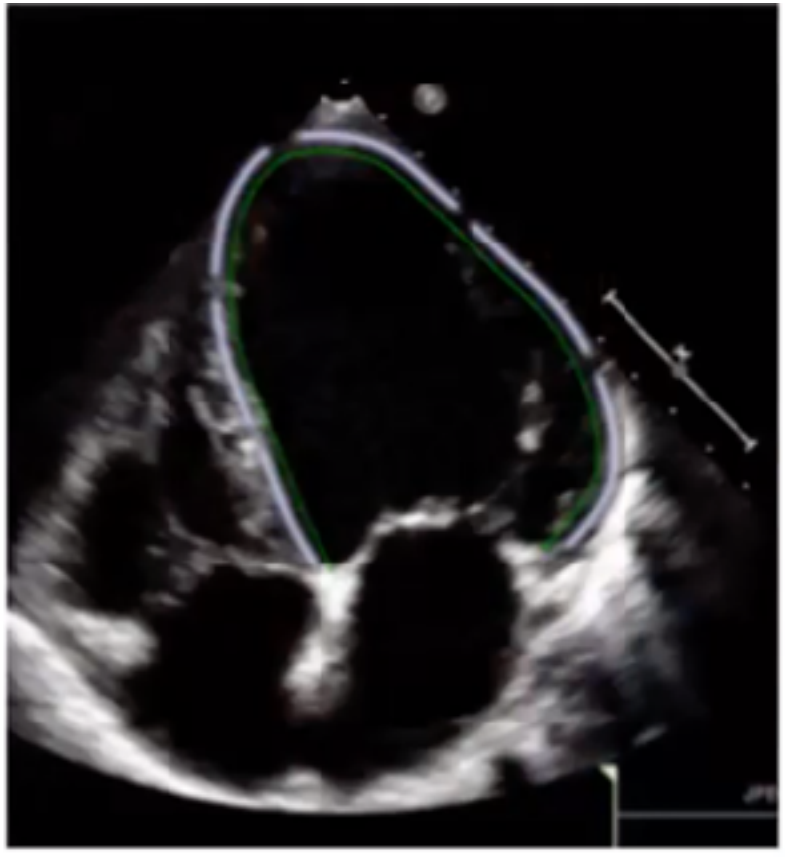
Mortality and HF Hospitalization at One Year



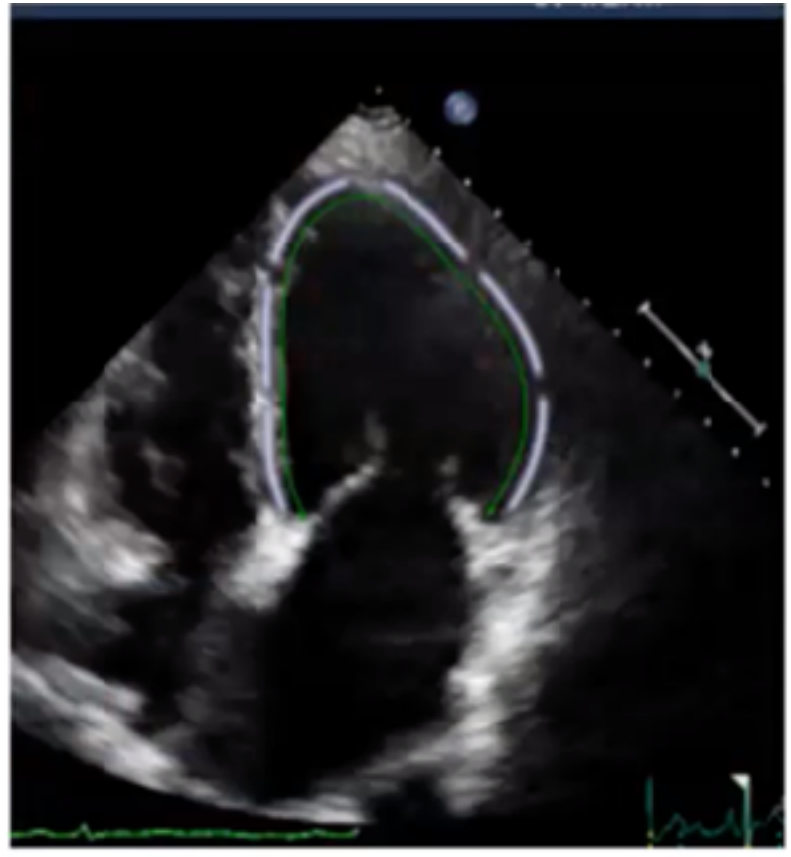
Three Patients with EROA of 30 mm2



LVEF 22%
LVEDV 310 mL
GLS -6.8%



LVEF 36%
LVEDV 197 mL
GLS -8.4%

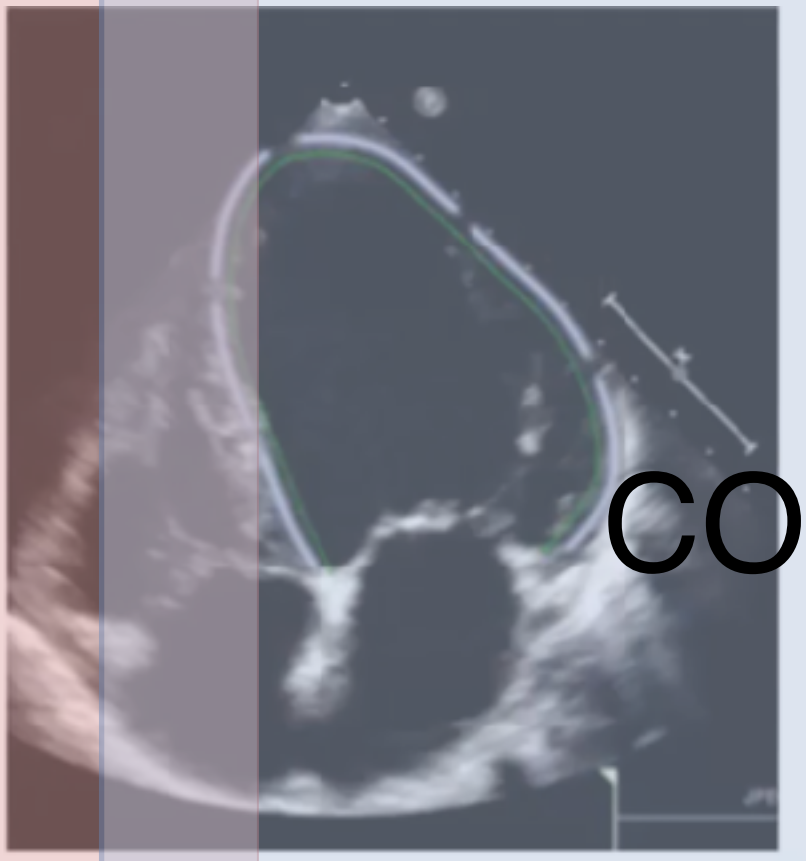


LVEF 60%
LVEDV 140 mL
GLS -20.3%

Three Patients with EROA of 30 mm2

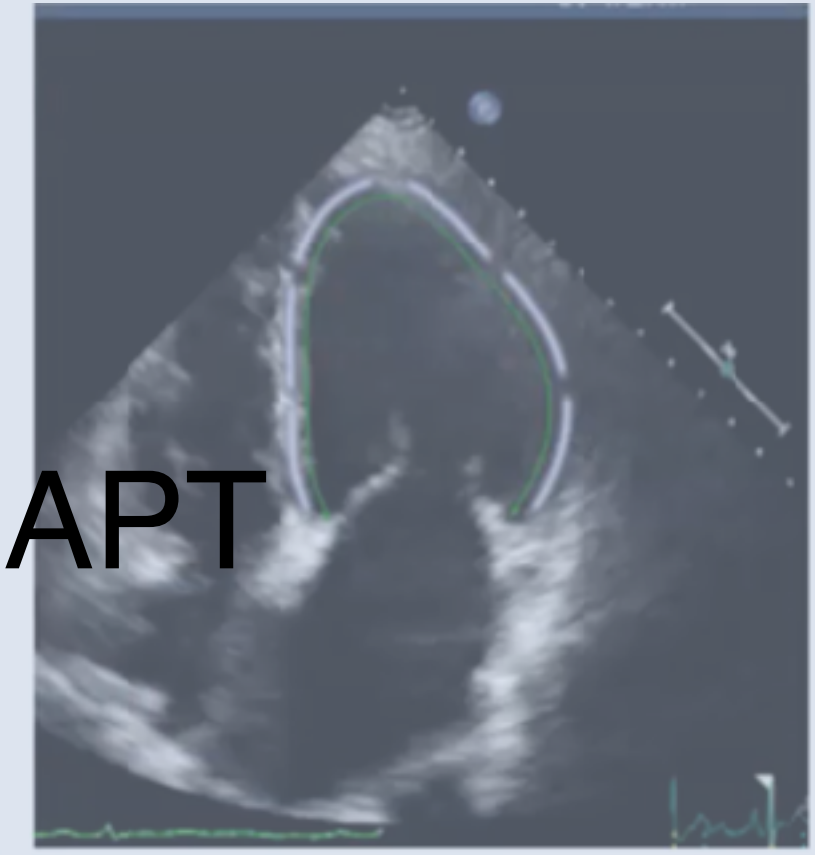
Mitra- FR

LVEF 22%
LVEDV 310 mL
GLS -6.8%



COAPT

LVEF 36%
LVEDV 197 mL
GLS -8.4%



LVEF 60%
LVEDV 140 mL
GLS -20.3%

Characterization of MR as proportionate or disproportionate **to LVEDV** appears to be critical to the selection of an optimal treatment for patients with chronic HF and systolic dysfunction

EDITORIAL VIEWPOINT

Proportionate and Disproportionate Functional Mitral Regurgitation

A New Conceptual Framework That Reconciles the Results of the MITRA-FR and COAPT Trials

Paul A. Grayburn, MD, Anna Sannino, MD, Milton Packer, MD

Trans-catheter Edge to Edge Repair **(TEER)** vs Trans-catheter Mitral Valve Replacement **(TMVR)** for Secondary Mitral Regurgitation

Study Design

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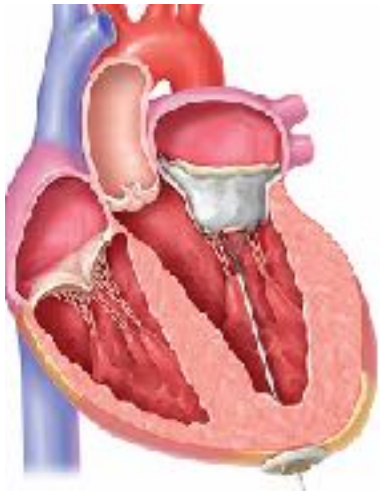
vs



TEER
(trans-catheter repair)

TMVI
(Trans-catheter replacement)

All-cause Death

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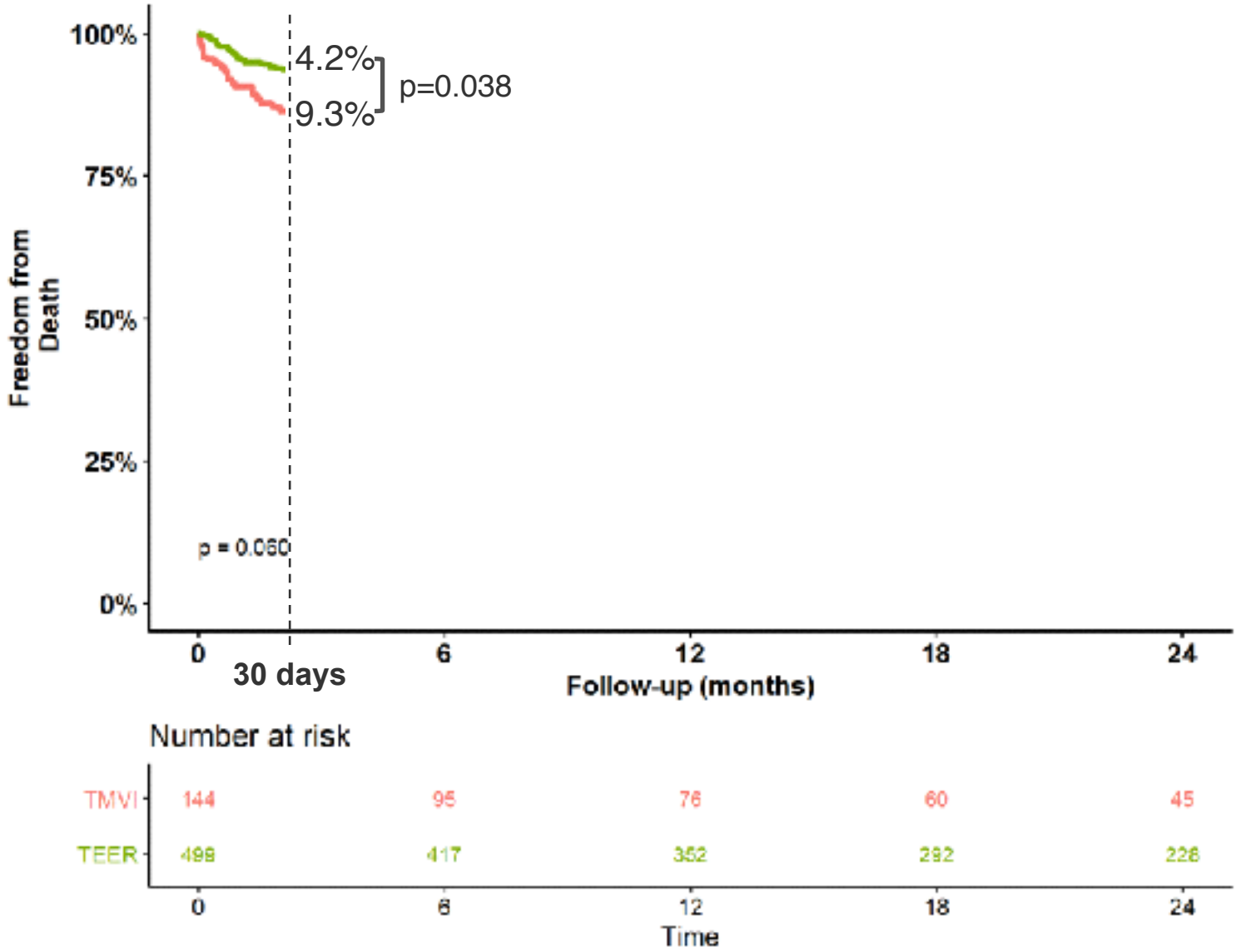
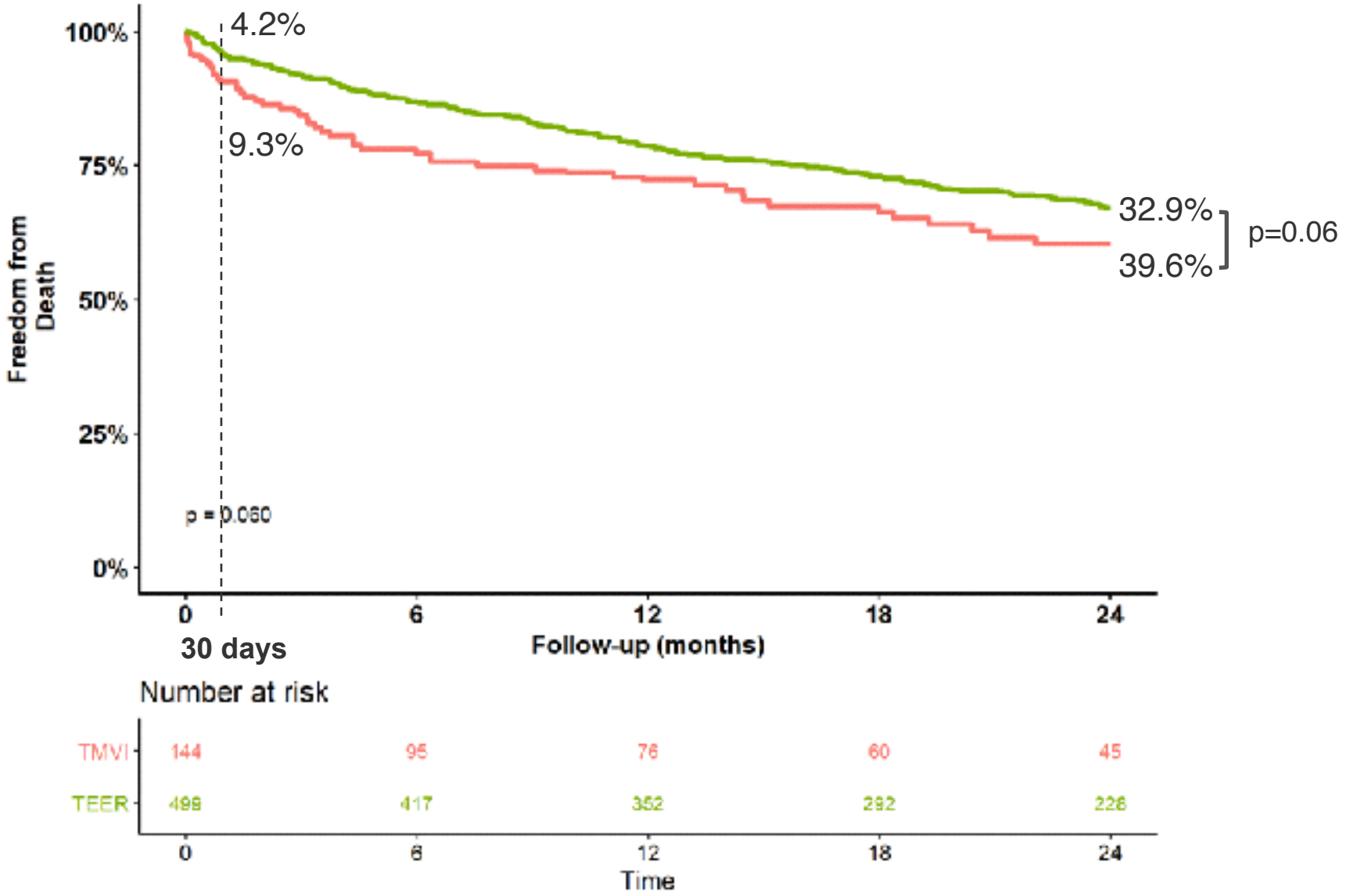
UKE Hamburg



All-cause Death

Universitäres
Herz- und Gefäßzentrum
UKE Hamburg



All-cause Death

Universitäres
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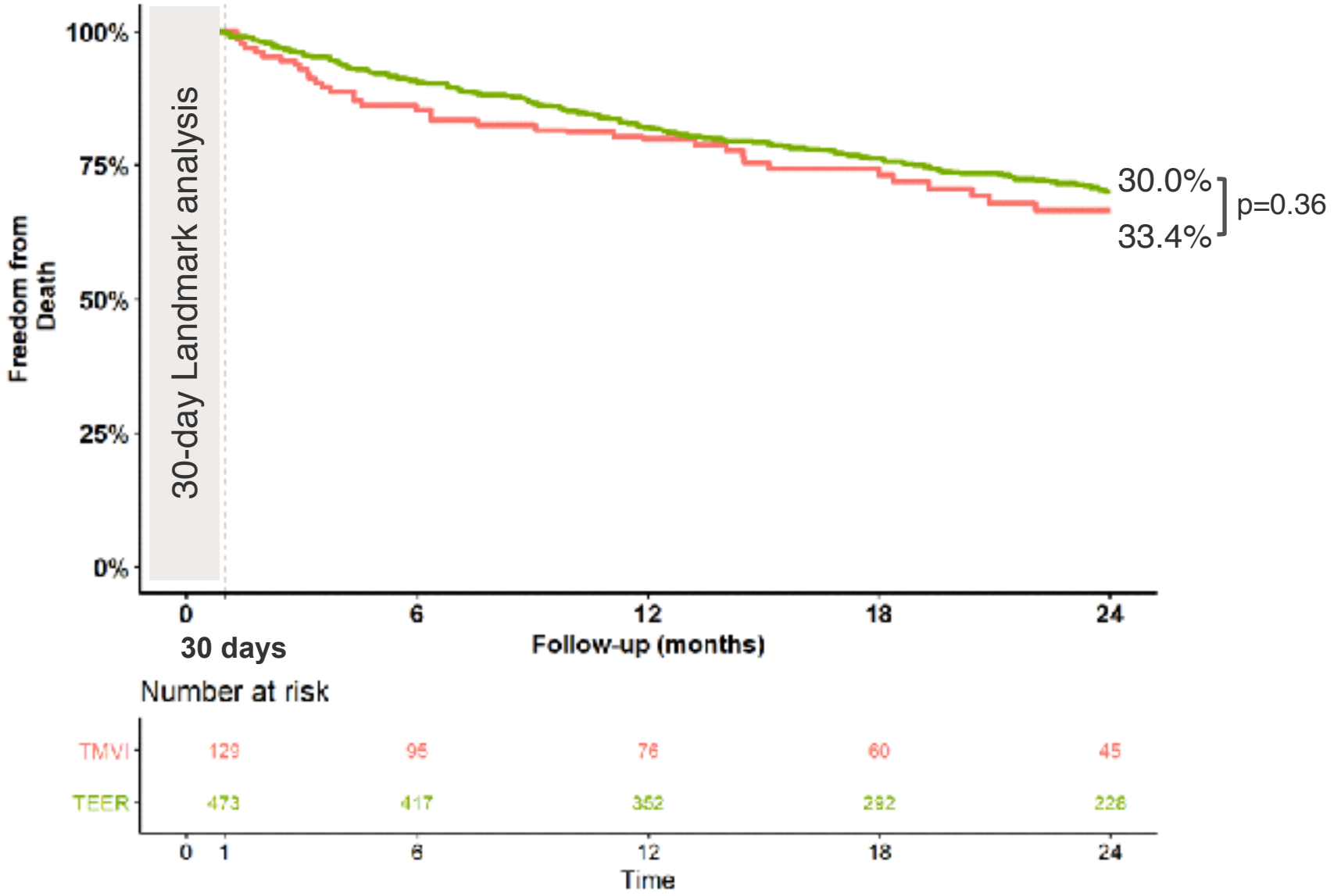
UKE Hamburg



Combined Endpoint

All-cause Death or HF Hospitalisation

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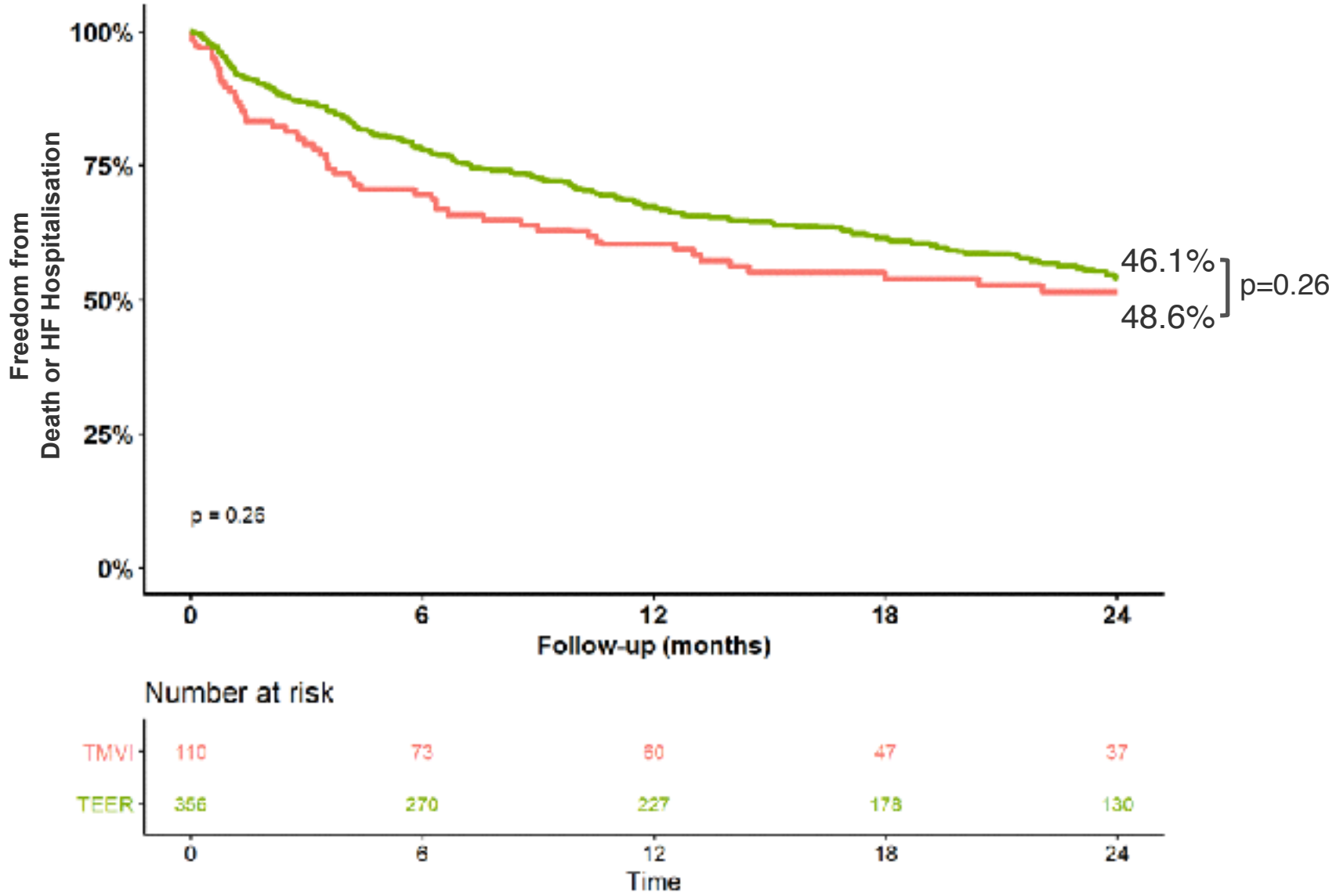

Subgroup Analysis

All-cause Death or HF Hospitalisation

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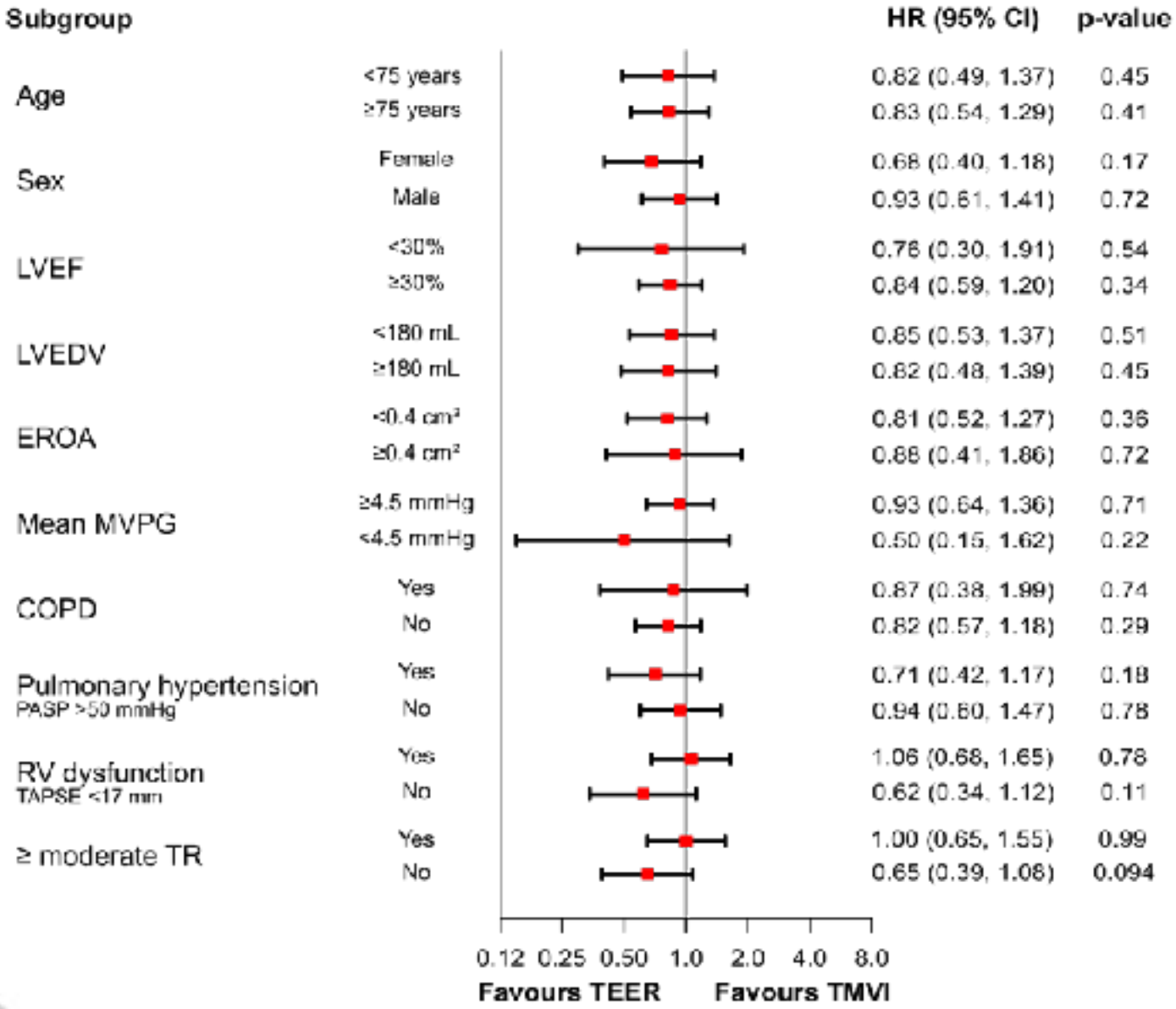

No difference

between TEER and TMVI regarding

- All-cause Death after 2 years.
- Combined Endpoint after 2 years.

Perspective

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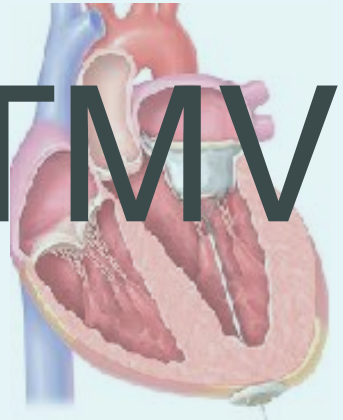
TEER	TMVI
	
<u>established</u> transcatheter therapy excellent safety profile	<u>novel</u> transcatheter therapy predictable MR elimination
residual or recurrent MR	elevated short-term mortality

Prospective randomised trials are needed to define the future role of TMVI among routine SMR treatment options.

Learning From Failure at the CUTTING-EDGE of Transcatheter Mitral Valve Therapies*

Alessandro Sticchi, MD,[a] Fabien Praz, MD,[a] David Reineke, MD,[b] Stephan Windecker, MD[a]

JACC: CARDIOVASCULAR INTERVENTIONS
VOL. 14, NO. 18, 27/ September 2021

CENTRAL ILLUSTRATION: Summary of the CUTTING-EDGE International Registry

Mitral Valve Surgery After Transcatheter Edge-to-Edge Repair (TEER): Mid-Term Outcomes From the CUTTING-EDGE International Registry, 34 Centers, 332 Patients

Index TEER Procedure

2005 - 2020

Number of Devices Used
1.7 ± 0.8

TEER Type	%
MC Classic	55.1 %
NT	15.5 %
NTR	14.2 %
XTR	20.3 %
G4	0.6 %
Pascal	1.3 %

Median Time:
3.5 months
(IQR 0.5 - 11.9)

MV Surgery

2009 - 2020

Median Follow-up:
9.0 months
(IQR 1.2 - 25.7)

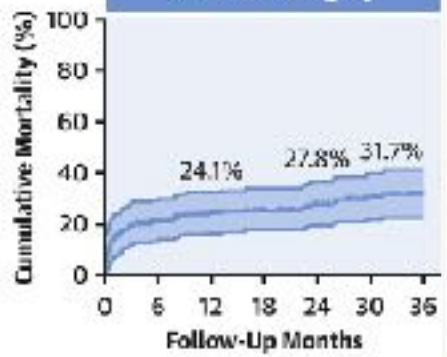
Elective 66.0% | Urgent 24.1% | Emergent

Aborted 21.2% | Acute 17.6% | Delayed 61.2%

MV Replacement 92.5% | MV Repair 7.5%

Tissue 93.5% | Mechanical 6.5%

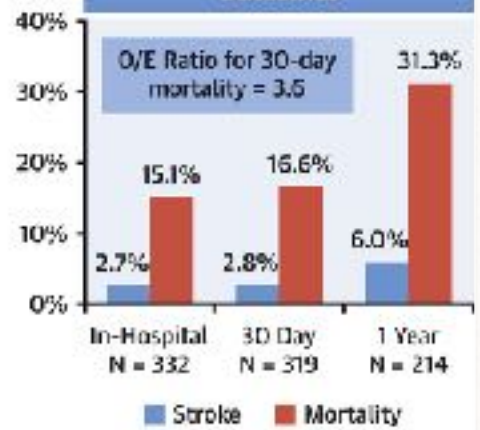
Overall Mortality After MV Surgery



No. at risk:

319	180	138	106	84	67	49

Outcomes



Kaneko, T. et al. J Am Coll Cardiol Intv. 2021;14(18):2010-2021.

- In this first report of the CUTTING-EDGE registry, the mortality and morbidity risks of MV surgery after TEER were not negligible, and only <10% of patients underwent MV repair.

- These registry data provide valuable insights for further research to improve these outcomes.

Severe mitral regurgitation criteria based on 2D echocardiography (1)

	Primary MR	Secondary MR
Qualitative		
Mitral valve morphology	Flail leaflet, ruptured papillary muscle, severe retraction, large perforation	Normal leaflets but with severe tenting, poor leaflet coaptation
Colour flow jet area	Large central jet (>50% of LA) or eccentric wall impinging jet of variable size	Large central jet (>50% of LA) or eccentric wall impinging jet of variable size
Flow convergence	Large throughout systole	Large throughout systole
Continuous wave Doppler jet	Holosystolic / dense / triangular	Holosystolic / dense / triangular

2021 ESC/EACTS Guidelines for the management of valvular heart disease
(European Heart Journal; 2021 – doi: 10.1093/eurheartj/ehab395; European Journal of Cardio-Thoracic Surgery; 2021 – doi: 10.1093/ejcts/ezab389)

Severe mitral regurgitation criteria based on 2D echocardiography (2)

	Primary MR	Secondary MR
Semiquantitative		
Vena contracta width	≥7 (≥8 mm for biplane)	≥7 (≥8 mm for biplane)
Pulmonary vein flow	Systolic flow reversal	Systolic flow reversal
Mitral inflow	E-wave dominant (>1.2 m/s)	E-wave dominant (>1.2 m/s)
TVI mitral/TVI aortic	>1.4	>1.4

2021 ESC/EACTS Guidelines for the management of valvular heart disease
(European Heart Journal; 2021 – doi: 10.1093/eurheartj/ehab395; European Journal of Cardio-Thoracic Surgery; 2021 – doi: 10.1093/ejcts/ezab389)

Severe mitral regurgitation criteria based on 2D echocardiography (3)

	Primary MR	Secondary MR
Quantitative		
EROA (2D PISA, mm^2)	≥40 mm^2	≥40 mm^2 (may be ≥30 mm^2 if elliptical regurgitant orifice area)
Regurgitant volume (mL/beat)	≥60 mL	≥60 mL (may be ≥45 mL if low flow conditions)
Regurgitant fraction (%)	≥50%	≥50%
Structural		
Left ventricle	Dilated (ESD ≥40 mm)	Dilated
Left atrium	Dilated (diameter ≥55 mm or volume ≥60 mL/m^2)	Dilated

Adapted from Lancellotti et al., *Eur Heart J Cardiovasc Imaging* (2013). DOI: 10.1093/ehjci/jet105 and Zoghbi et al., *J Am Soc Echocardiogr* (2017). DOI: 10.1016/j.echo.2017.01.007.

Recommendations on indications for mitral valve intervention in chronic severe secondary mitral regurgitation (1)

Recommendations	Class	Level
Valve surgery/intervention is recommended only in patients with severe SMR who remain symptomatic despite GDMT (including CRT if indicated) and has to be decided by a structured collaborative Heart Team.	I	B
Patients with concomitant coronary artery or other cardiac disease requiring treatment		
Valve surgery is recommended in patients undergoing CABG or other cardiac surgery.	I	B
In symptomatic patients, who are judged not appropriate for surgery by the Heart Team on the basis of their individual characteristics, PCI (and/or TAVI) possibly followed by TEER (in case of persisting severe SMR) should be considered.	IIa	C

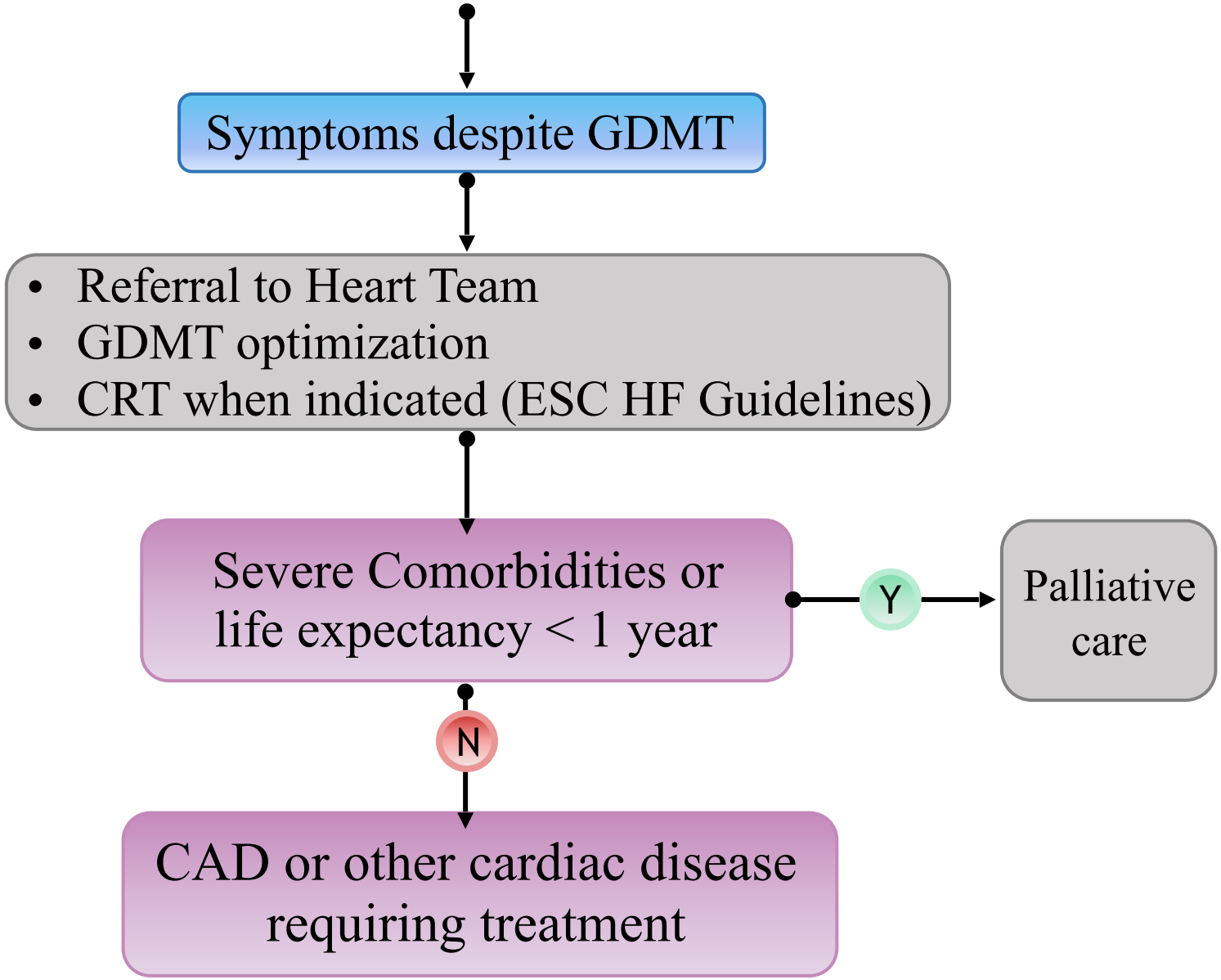
2021 ESC/EACTS Guidelines for the management of valvular heart disease
(European Heart Journal; 2021 – doi: 10.1093/eurheartj/ehab395; European Journal of Cardio-Thoracic Surgery; 2021 – doi: 10.1093/ejcts/ezab389)

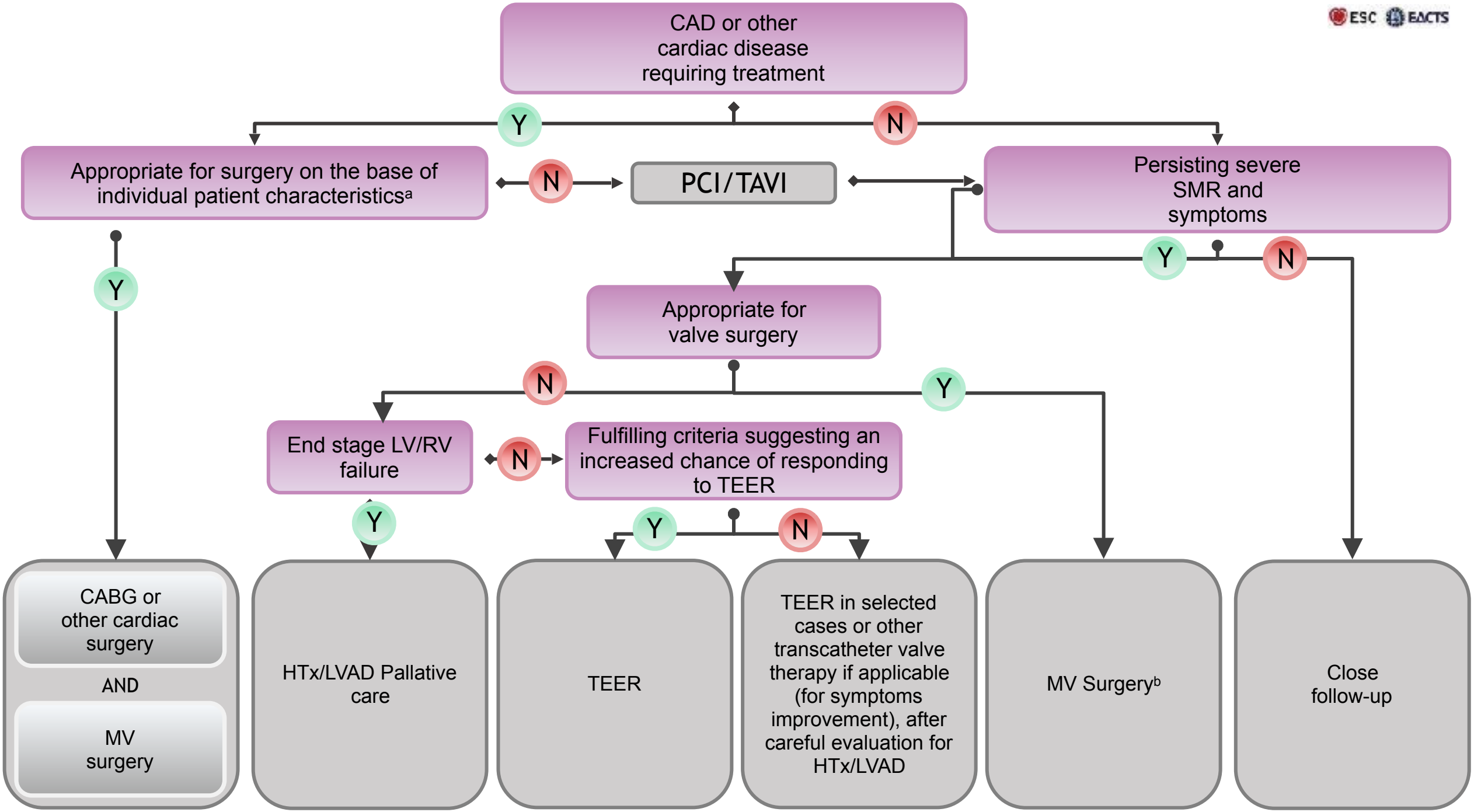
Recommendations on indications for mitral valve intervention in chronic severe secondary mitral regurgitation (2)

Recommendations	Class	Level
Patients without concomitant coronary artery or other cardiac disease requiring treatment		
TEER should be considered in selected symptomatic patients, not eligible for surgery and fulfilling criteria suggesting an increased chance of responding to the treatment.	IIa	B
Valve surgery may be considered in symptomatic patients judged appropriate for surgery by the Heart Team.	IIb	C
In high-risk symptomatic patients not eligible for surgery and not fulfilling the criteria suggesting an increased chance of responding to TEER, the Heart Team may consider in selected cases a TEER procedure or other transcatheter valve therapy if applicable, after careful evaluation for ventricular assist device or heart transplant.	IIb	C

2021 ESC/EACTS Guidelines for the management of valvular heart disease
(European Heart Journal; 2021 – doi: 10.1093/eurheartj/ehab395; European Journal of Cardio-Thoracic Surgery; 2021 – doi: 10.1093/ejcts/ezab389)

Management of patients with chronic severe secondary regurgitation



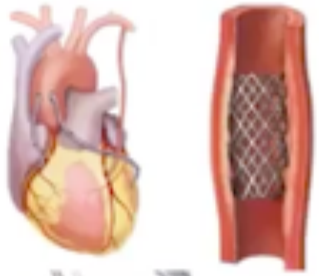

CAD or other cardiac disease requiring treatment
Y
N
Appropriate for surgery on the base of individual patient characteristics[a]
N
PCI/TAVI
Persisting severe SMR and symptoms
Y
N
Y
Appropriate for valve surgery
N
Y
End stage LV/RV failure
N
Fulfilling criteria suggesting an increased chance of responding to TEER
Y
Y
Y
N
CABG or other cardiac surgery
AND
MV surgery
HTx/LVAD Pallative care
TEER
TEER in selected cases or other transcatheter valve therapy if applicable (for symptoms improvement), after careful evaluation for HTx/LVAD
MV Surgery[b]
Close follow-up

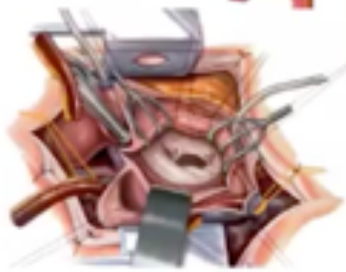
HEART FAILURE SPECIALIST

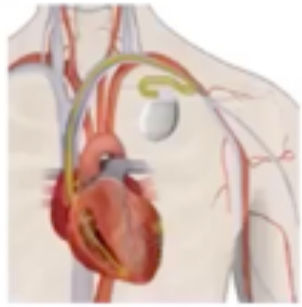
PATIENT WITH MR

INTERVENTIONAL CARDIOLOGIST/ CARDIAC SURGEON

HEART RHYTHM SPECIALIST







Conclusion

- SMR is a disease of the LV.
- Treat the LV dysfunction first with appropriate titration of medications known to improve survival in HFrEF.
- Consider MV intervention when severe MR persists after appropriate medical therapy, including CRT/PCI (COAPT-like patients).
- Patients in whom MR is the dominant lesion relative to LV dysfunction (Disproportionate SMR), appear to derive the largest benefit of MV intervention in terms of reduced mortality and HF hospitalization.


Thank
you!