When and how for percutaneous treatment?

Francesco Maisano MD, FESC
Valve Center
IRCCS San Raffaele University Hospital

OSPEDALE
SAN RAFFAELE

Disclosure Statement of Financial Interest and Potential for Conflicts of Interest

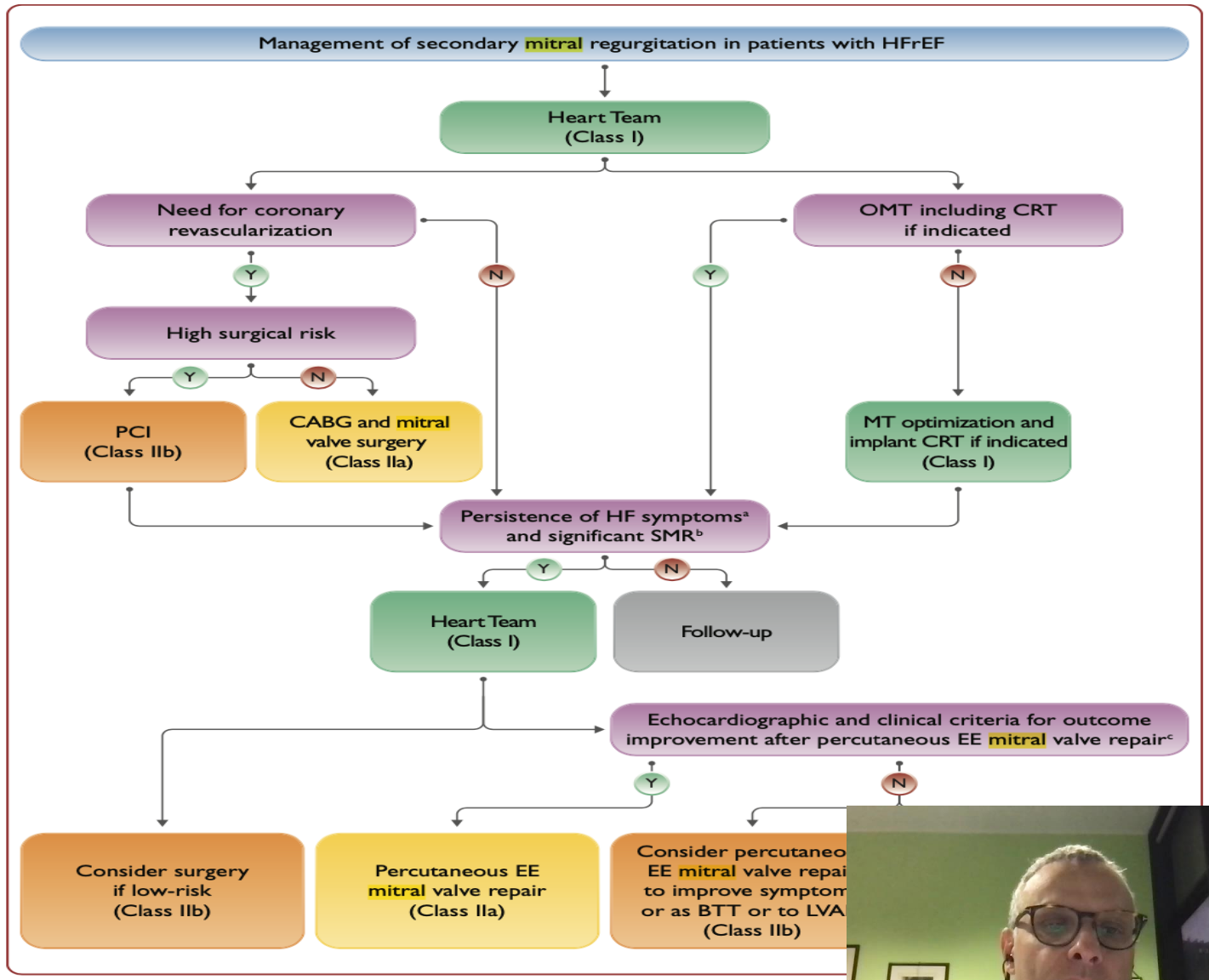
I, Francesco Maisano, have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation

Grant and/or Research Support	Abbott (Steering Committee of EXPAND G4 and CoPI EXPAND); Medtronic; Edwards Lifesciences; Biotronik; Boston Scientific Corporation, NVT, Terumo
Consulting fees, Honoraria:	Abbott; Medtronic; Edwards Lifesciences; Swissvortex; Perifect; Xeltis; Transseptal solutions; Cardiovalve. Magenta
Royalty Income/IP Rights	Edwards Lifesciences (FMR surgical annuloplasty)
shareholder of	Cardiovalve, Magenta, SwissVortex, Transseptalsolutions,Occlufit, 4Tech, Perifect

OSPEDALE
SAN RAFFAELE

ESC HF guidelines 2021

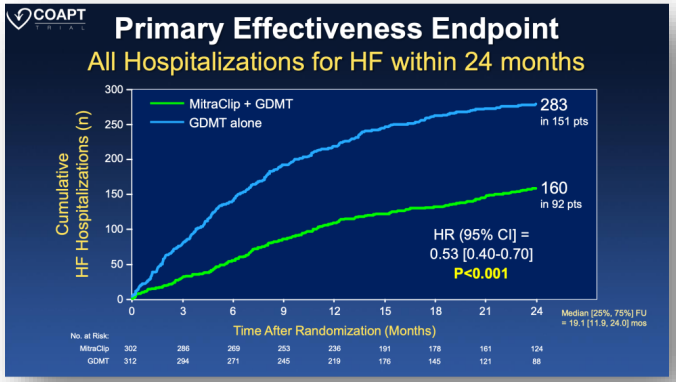
Secondary mitral regurgitation		
Percutaneous edge-to-edge mitral valve repair should be considered in carefully selected patients with secondary mitral regurgitation, not eligible for surgery and not needing coronary revascularization, who are symptomatic[c] despite OMT and who fulfil criteria[d] for achieving a reduction in HF hospitalizations.[612]	IIa	B
In patients with HF, severe secondary mitral regurgitation and CAD who need revascularization, CABG and mitral valve surgery should be considered.	IIa	C
Percutaneous edge-to-edge mitral valve repair may be considered to improve symptoms in carefully selected patients with secondary mitral regurgitation, not eligible for surgery and not needing coronary revascularization, highly symptomatic despite OMT and who do not fulfil criteria for reducing HF hospitalization.[617]	IIb	C

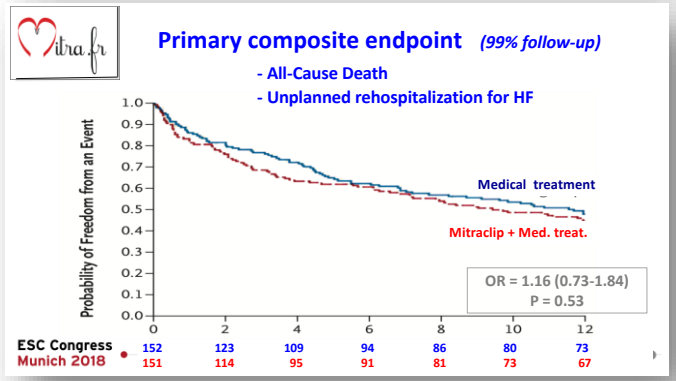


OSPEDALE SAN RAFFAELE

HF and VHD guidelines are in line

Two randomized trials, MITRA-FR and COAPT, evaluated the effectiveness of percutaneous edge-to-edge mitral valve repair plus OMT compared to OMT alone, in symptomatic patients with reduced LVEF (15–40% in MITRA-FR and 20–50% in COAPT) and moderate-to-severe or severe SMR [effective regurgitant orifice area (EROA) ≥ 20 mm^2 in MITRA-FR and EROA ≥ 30 mm^2 in COAPT].[610–612] MITRA-FR failed to show any benefit from the intervention on all-cause mortality or HF hospitalization at 12 months (primary endpoint; HR 1.16, 95% CI 0.73–1.84) and at 24 months.[610,611] In contrast, COAPT showed a significant reduction in hospitalization for HF at 24 months (primary endpoint; HR 0.53, 95% CI 0.40–0.70) and mortality (secondary endpoint; HR 0.62, 95% CI 0.46–0.82).[612] Differences in patient selection, concomitant MT, echocardiographic assessment, procedural issues and severity of SMR in relation to the degree of LV dilatation may be responsible for the diverging results of the MITRA-FR and COAPT trials.[613–615] Thus, percutaneous edge-to-edge mitral valve repair should be considered for outcome improvement only in carefully selected patients who remain symptomatic (NYHA class II–IV) despite OMT, with moderate-to-severe or severe SMR (EROA ≥30 mm^2), favourable anatomical conditions, and fulfilling the inclusion criteria of the COAPT study (i.e. LVEF 20–50%, LV end-systolic diameter <70 mm, systolic pulmonary pressure <70 mmHg, absence of moderate or severe RV dysfunction, absence of severe TR, absence of haemodynamic instability) (*Figure 17*).[615,616]





TEER should be considered in selected symptomatic patients, not eligible for surgery and fulfilling criteria suggesting an increased chance of responding to the therapy.	**IIa**
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 trans-catheter valve therapy if applicable, after careful evaluation for ventricular assist device or heart transplant.	**IIb**

OSPEDALE SAN RAFFAELE

Key elements of the decision

- Functional MR resistant to GDMT
- high risk or inoperable
- Severe regurgitation
- EF>20%
- LVESD<70 mm

OSPEDALE
SAN RAFFAELE

Functional or Secondary MR and Heart Failure.

CLINICAL PRACTICE

Caren G. Solomon, M.D., M.P.H., *Editor*

Secondary Mitral Regurgitation

Patrick T. O'Gara, M.D., and Michael J. Mack, M.D.

This Journal *feature begins with a case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the authors' clinical recommendations.*

A 75-year-old man presents with dyspnea and fatigue that occur with less than moderate physical activity. He had an ST-segment elevation myocardial infarction involving the inferior and posterior segments of the left ventricle 10 years ago, and since then the left ventricular ejection fraction (LVEF) has decreased from 40% to 25%, accompanied by increasing mitral regurgitation. An implantable cardioverter–defibrillator (ICD) was placed for primary prevention 6 months ago. His medications include metoprolol succinate, spironolactone, and torsemide. How would you further evaluate and treat this patient?

O'Gara et al. N Engl J Med 2020;383:1458-67.

ESC European Society of Cardiology

European Journal of Heart Failure (2021)
doi:10.1002/ejhf.2115

POSITION PAPER

Universal definition and classification of heart failure:

A report of the Heart Failure Society of America, Heart Failure Association of the European Society of Cardiology, Japanese Heart Failure Society and Writing Committee of the Universal Definition of Heart Failure

Endorsed by Canadian Heart Failure Society, Heart Failure Association of India, the Cardiac Society of Australia and New Zealand, and the Chinese Heart Failure Association.

Biykem Bozkurt* (Chair) (USA), Andrew J.S. Coats (Co-Chair) (UK and Australia), Hiroyuki Tsutsui (Co-Chair) (Japan), Ca Magdy Abdelhamid (Egypt), Stamatis Adamopoulos (Greece), Nancy Albert (USA), Stefan D. Anker (Germany), John Atherton (Australia), Michael Böhm (Germany), Javed Butler (USA), Mark H. Drazner (USA), G. Michael Felker (USA), Gerasimos Filippatos (Greece), Mona Fiuzat (USA), Gregg C. Fonarow (USA), Juan-Esteban Gomez-Mesa (Colombia), Paul Heidenreich (USA), Teruhiko Imamura (Japan), Ewa A. Jankowska (Poland), James Januzzi (USA), Prateeti Khazanie (USA), Koichiro Kinugawa (Japan), Carolyn S.P. Lam (Singapore), Yuya Matsue (Japan), Marco Metra (Italy), Tomohito Ohtani (Japan), Massimo Francesco Piepoli (Italy), Piotr Ponikowski M.C. Rosano (Italy), Yasushi Sakata (Japan), Petar Seferović Starling (USA), John R. Teerlink (USA), Orly Vardeny (USA (Japan), Clyde Yancy (USA), Jian Zhang (China), Shelley Zie

Received 2 January 2021; revised 27 January 2021; accepted 27 January 2021

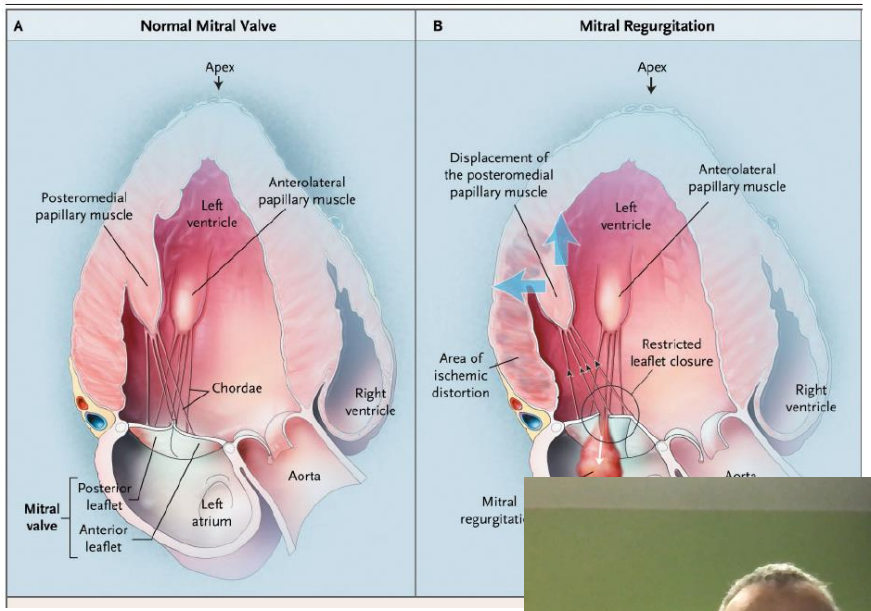
Bozkurt et al. European Journal of He

OSPEDALE SAN RAFFAELE

Functional mitral regurgitation

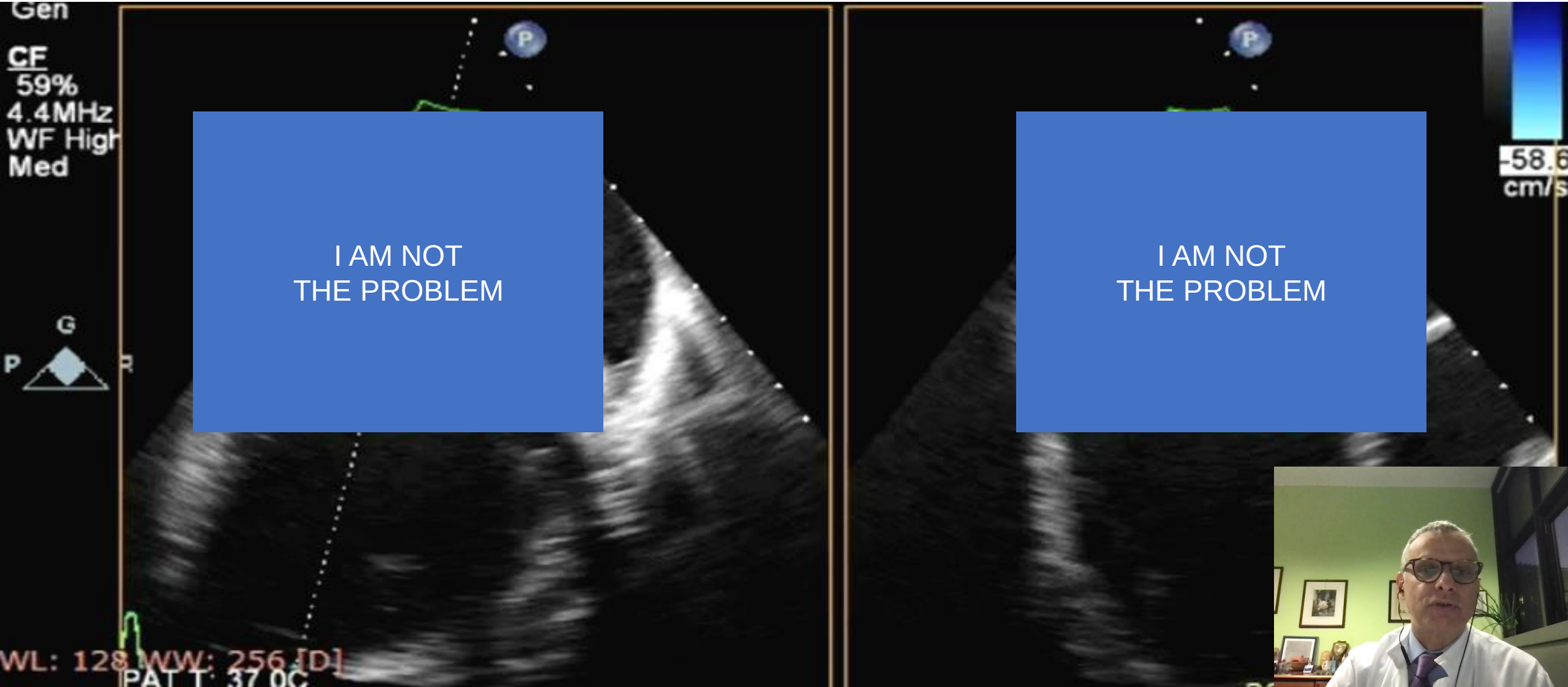
Valve structure is preserved (not really)
Left ventricular and/or atrial function/shape are abnormal

Phenotypes	Etiology	Mechanisms
Ischemic acute MR	Acute AMI	Regional motiona abnormalities, Papillary muscle rupture (complete or partial)
PM dysfunction	Permanent or transitory ischemia of PM	Lack of PM contraction
Ischemic regional chronic MR	Previous Infero-posterior AMI	Asymmetric tethering
Ischemic global chronic MR	Previous massive AMI or multiple AMIs	Mostly symmetric tethering, annular dilation, reduced closing forces
Non-ischemic functional MR	Dilatated Cardiomyopathy	Mostly symmetric tethering, annular dilation, reduced closing forces
PM dissynchrony	Left bundle branch block or PM induced dyssynchrony	Dissynchrony between PMs and wall motion
Atrial functional MR	Atrial fibrillation	Annular dilation and disfunction Atriogenic annular tethering



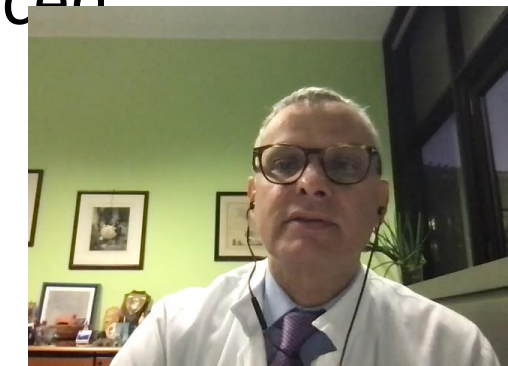
SAN RAFFAELE

Functional mitral regurgitation: a disease of the ventricle….a secondary problem



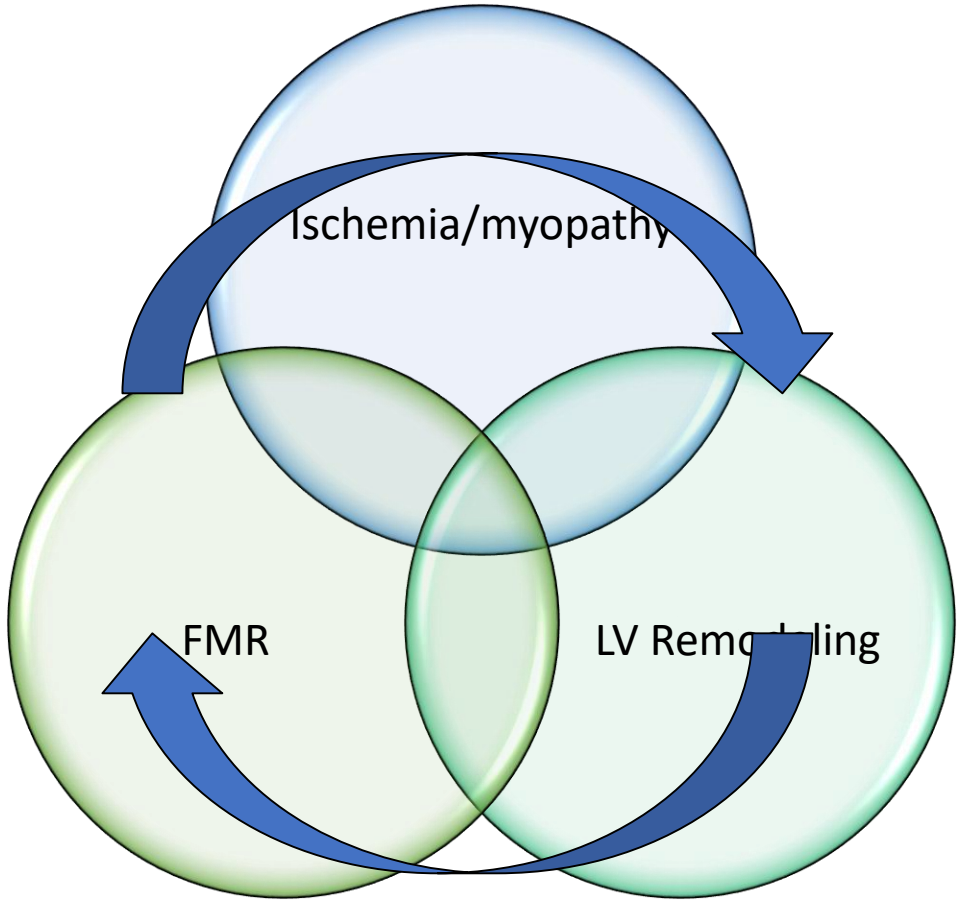
The Consequences of FMR

- Reduced cardiac output
- Ongoing volume overload stress-induced remodeling
- Left atrial remodeling and structural derangement (Afib)
- Increased pulmonary vascular resistance
- Compliance to therapy
- Acute decompensations
- 30% decrease of work efficiency energy spent/work produced



OSPEDALE
SAN RAFFAELE

Functional MR is one of many components of the CHF complex

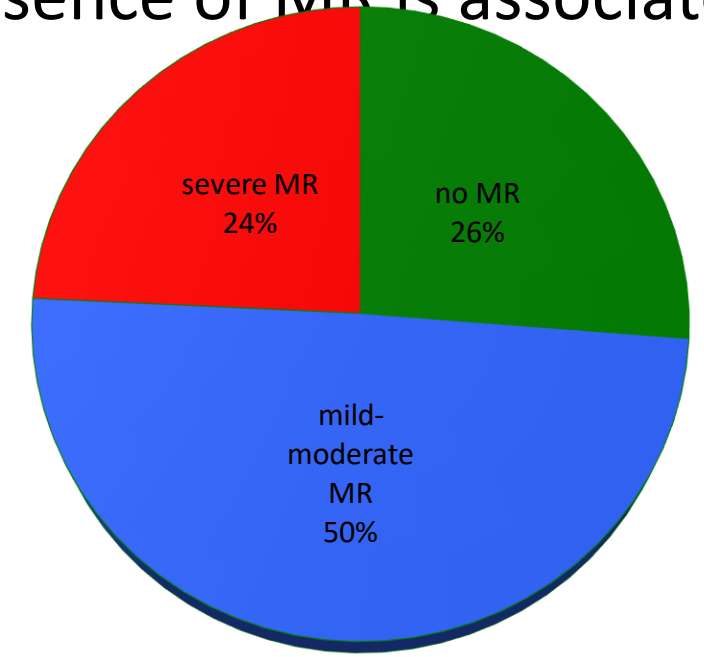


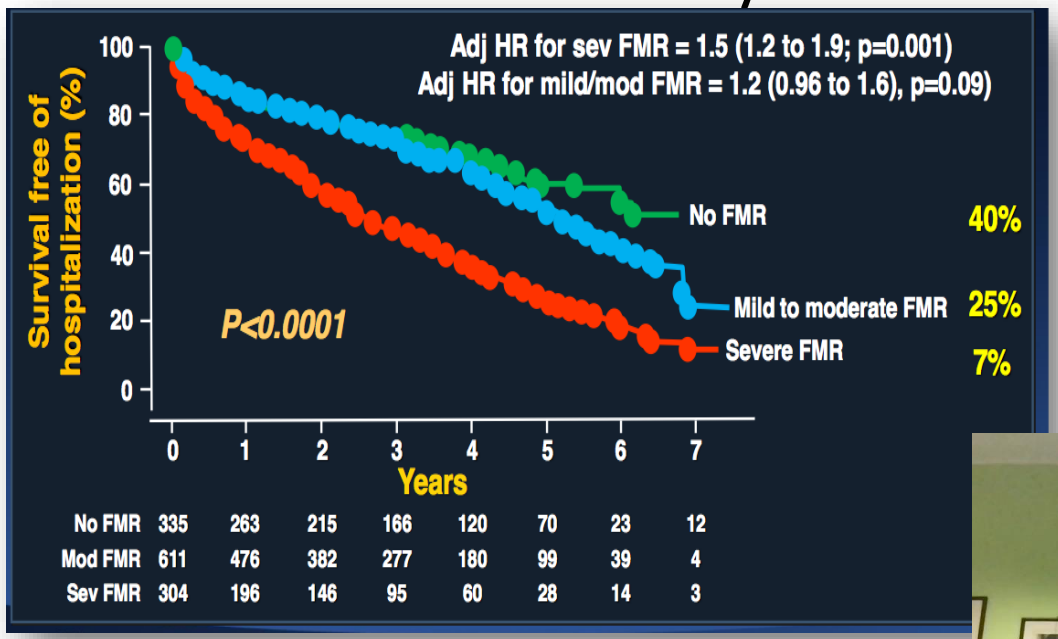
- Ischemia - stunning
- Hybernation
- Fibrosis
- Dilatation -Remodeling
- Functional MR
- Atrial Fibrillation
- LV Dyssynchrony
- Malignant arrythm
- Neurohumoral de

OSPEDALE SAN RAFFAELE

FMR in heart failure

- 1256 pts with ischemic or non-ischemic DCM (mean EF 32%) from 4 Italian istitutions, retrospective analysis
- Presence of MR is associated with increased mortality

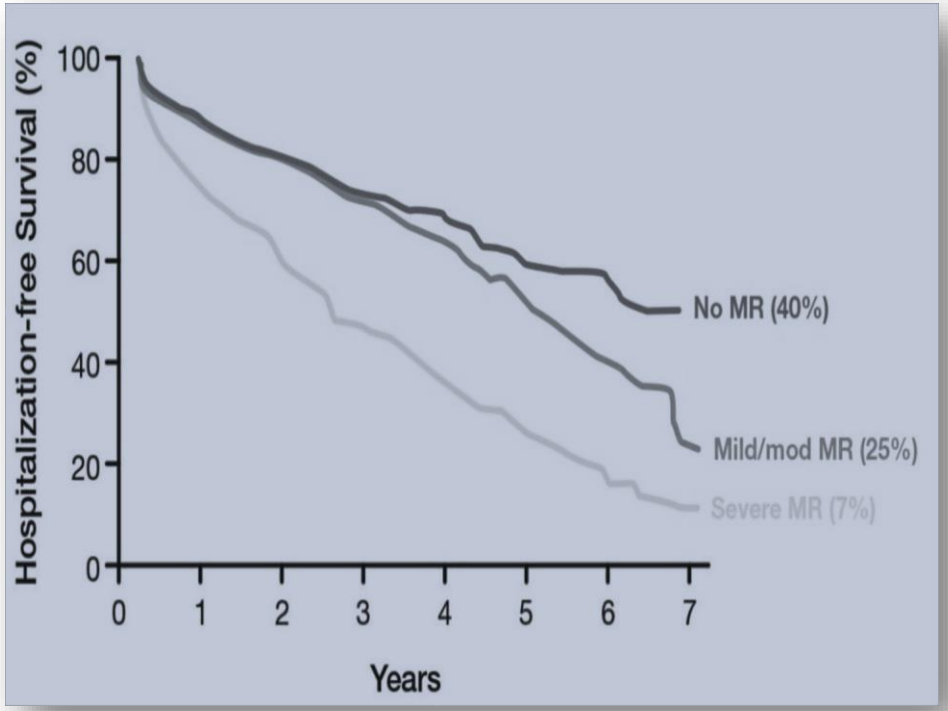


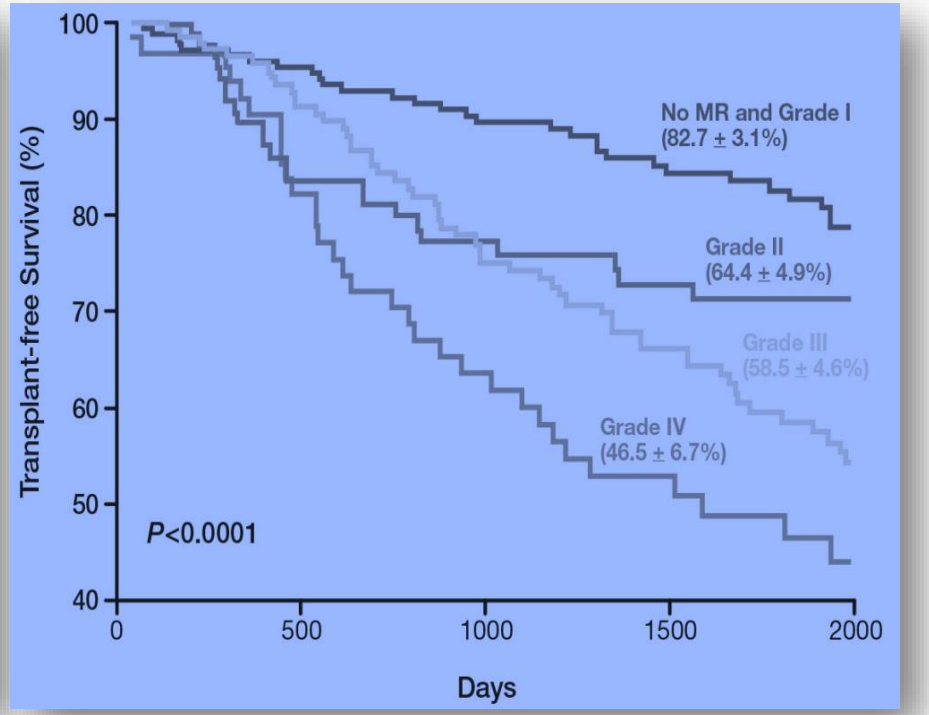


OSPEDALE
SAN RAFFAELE

Rossi A et al. Heart 2011;97:1675-1680

Morbidity is proportional to the degree of MR in FMR





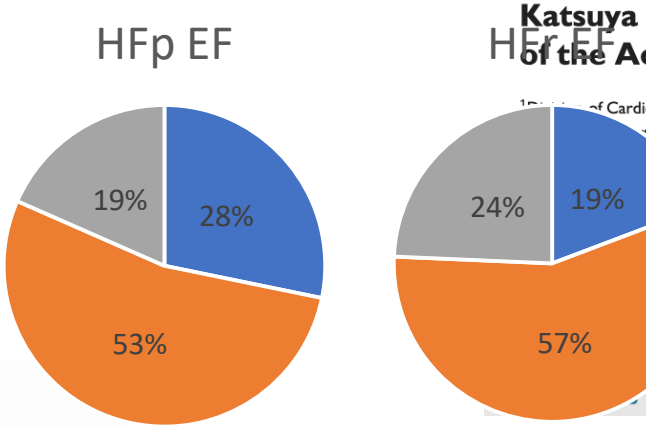
Rossi 2011[1]: Hospitalization-free survival decreased with increased MR severity.

Bursi 2010[2]: Transplant-free survival decreased wi increased MR severity.

1. Rossi A, Dini FL, Faggiano P, et al. Independent prognostic value of functional mitral regurgitation in patients with heart failure: a quantitative analysis of 1256 patients with ischemic and non dilated cardiomyopathy. *Heart.* 2011;97(20):1675-1680.
2. Bursi F, Barbieri A, Grigioni F, et al. Prognostic implications of functional mitral regurgitation according to the severity of the underlying chronic heart failure: a long-term outcome study. *Eur J Heart Fail.* 2010;12(4):382-388.

OSPEDALE SAN RAFFAELE

ATTEND registry



No MR Mild MR Mod-Severe MR

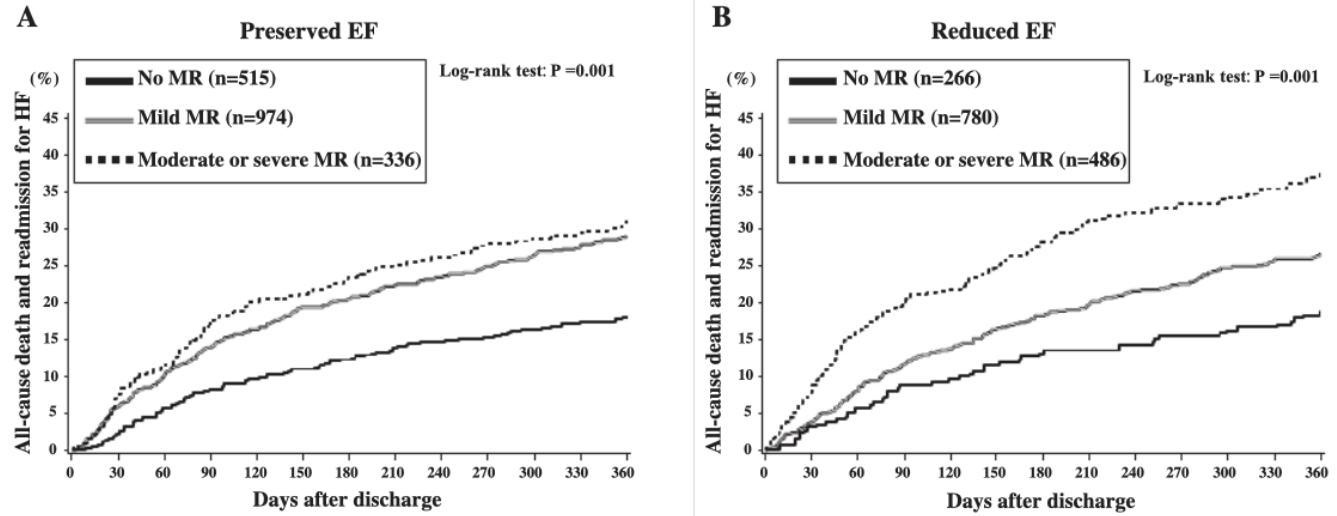
European Journal of Hear
doi:10.1002/ejhf.562

Functional m and outcome for acute dec a preserved

Katsuya Kajimoto[1]*, N of the Acute Decompe

of Cardiology, Sekikawa Hospital, Toky
tment of Internal Medicine, Ni

015; revised 26 February



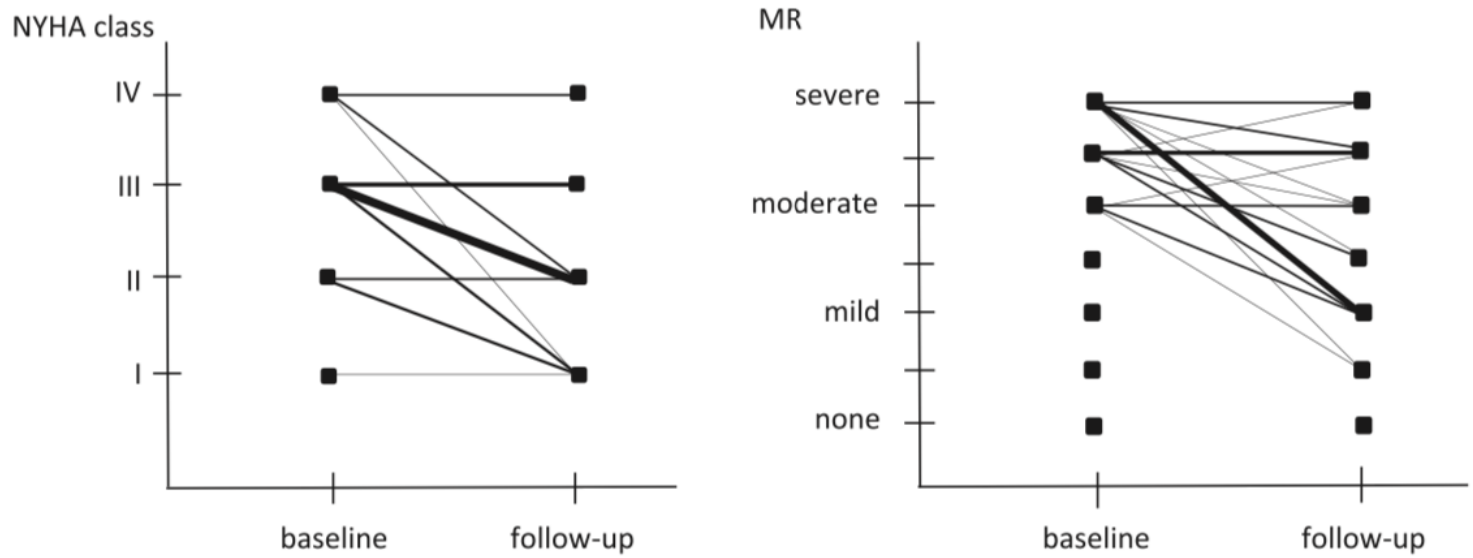
The relationship between functional mitral regurgitation (FMR), left ventricular ejection fraction (EF), and outcomes is unclear in acute decompensated heart failure (HF) patients. The aim of this study was to evaluate the relationship between FMR and post-discharge outcomes in HF patients with a preserved or reduced EF.

Of the 4842 patients enrolled in the Acute Decompensated Heart Failure Syndromes (ATTEND) registry, 3357 patients were evaluated to assess the association among FMR (none, mild, or moderate/severe) at discharge, a

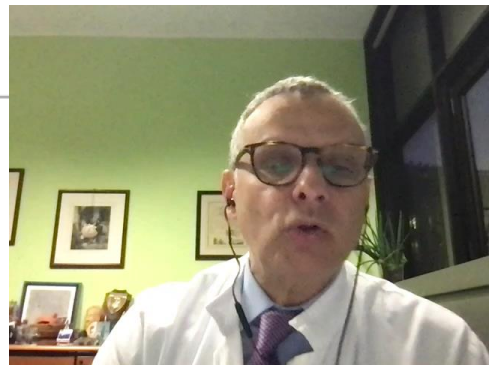
Kajimoto et al. European Journal of Heart Failure

50% of patient have improvement of FMR with uptitration of GDMT

Figure 3 New York Heart Association (NYHA) class (left) and mitral regurgitation (MR) (right) response to optimize treatment. Thickness of the line corresponds to the number of patients.



Lotte E. de Groot
ESC Heart Failure 2019; **6**: 936–943



OSPEDALE
SAN RAFFAELE

ARNI and FMR, the PRIME STUDY

Circulation

ORIGINAL RESEARCH ARTICLE

Angiotensin Receptor Neprilysin Inhibitor for Functional Mitral Regurgitation

PRIME Study

Editorial, see p 1366

BACKGROUND: The morbidity and mortality of patients with functional mitral regurgitation (MR) remain high, but no pharmacological therapy has been proven effective. The hypothesis of this study was that sacubitril/valsartan would be superior to valsartan alone in improving functional MR via dual inhibition of the renin-angiotensin system and neprilysin.

METHODS: In this double-blind trial, we randomly assigned 118 patients with heart failure with chronic functional MR secondary to left ventricular (LV) dysfunction to receive either sacubitril/valsartan or valsartan, in addition to standard medical therapy for heart failure. The primary end

Duk-Hyun Kang, MD, PhD*
Sung-Ji Park, MD, PhD*
Sung-Hee Shin, MD, PhD
Geu-Ru Hong, MD, PhD
Sahmin Lee, MD, PhD
Min-Seok Kim, MD, PhD
Sung-Cheol Yun, PhD
Jong-Min Song, MD, PhD
Seung-Woo Park, MD, PhD
Jae-Joong Kim, MD, PhD

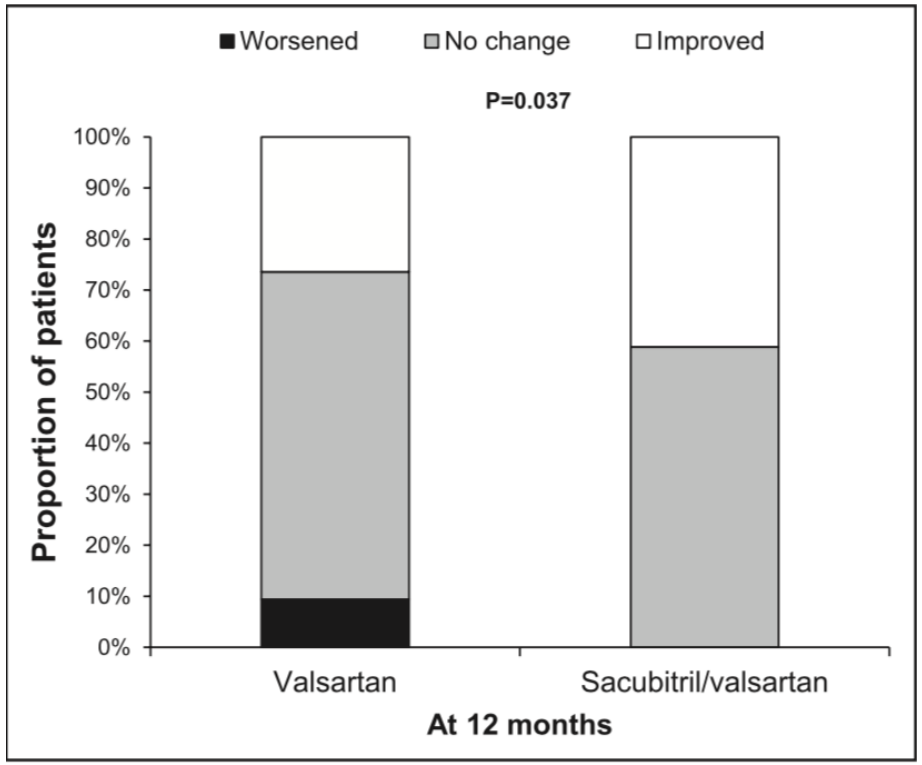


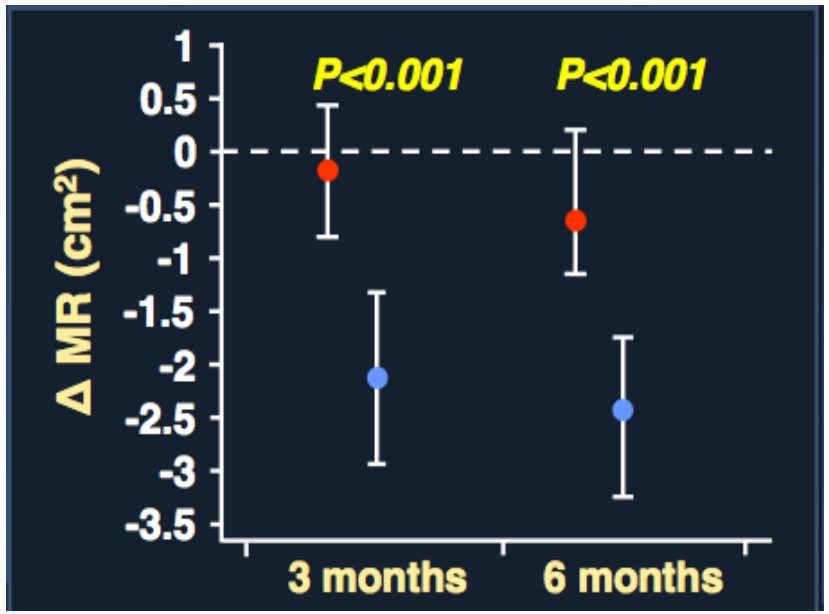
Table 4. Outcomes in Completers

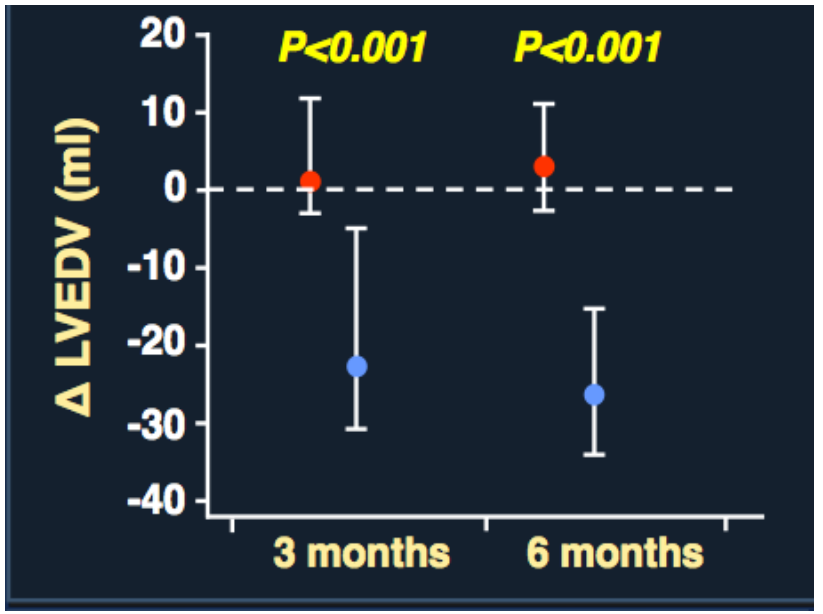
Outcome	Baseline			12 Months			Change			
	Valsartan (n=53)	Sacubitril/ Valsartan (n=51)	*P* Value	Valsartan (n=53)	Sacubitril/ Valsartan (n=51)	*P* Value	Valsartan (n=53)	Sacubitril/ Valsartan (n=51)	Difference (95% CI)	*P*
Primary end point										
EROA of MR, cm^2	0.208±0.109	0.200±0.099	0.70	0.178±0.151	0.123±0.074	0.021	–0.030±0.096	–0.077±0.080	–0.047 (–0.081 to –0.013)	

OSPEDALE SAN RAFFAELE

CRT therapy can improve MR in selected patients

- MIRACLE trial (450 pts with LVEF < 35% and QRS>130 sec)

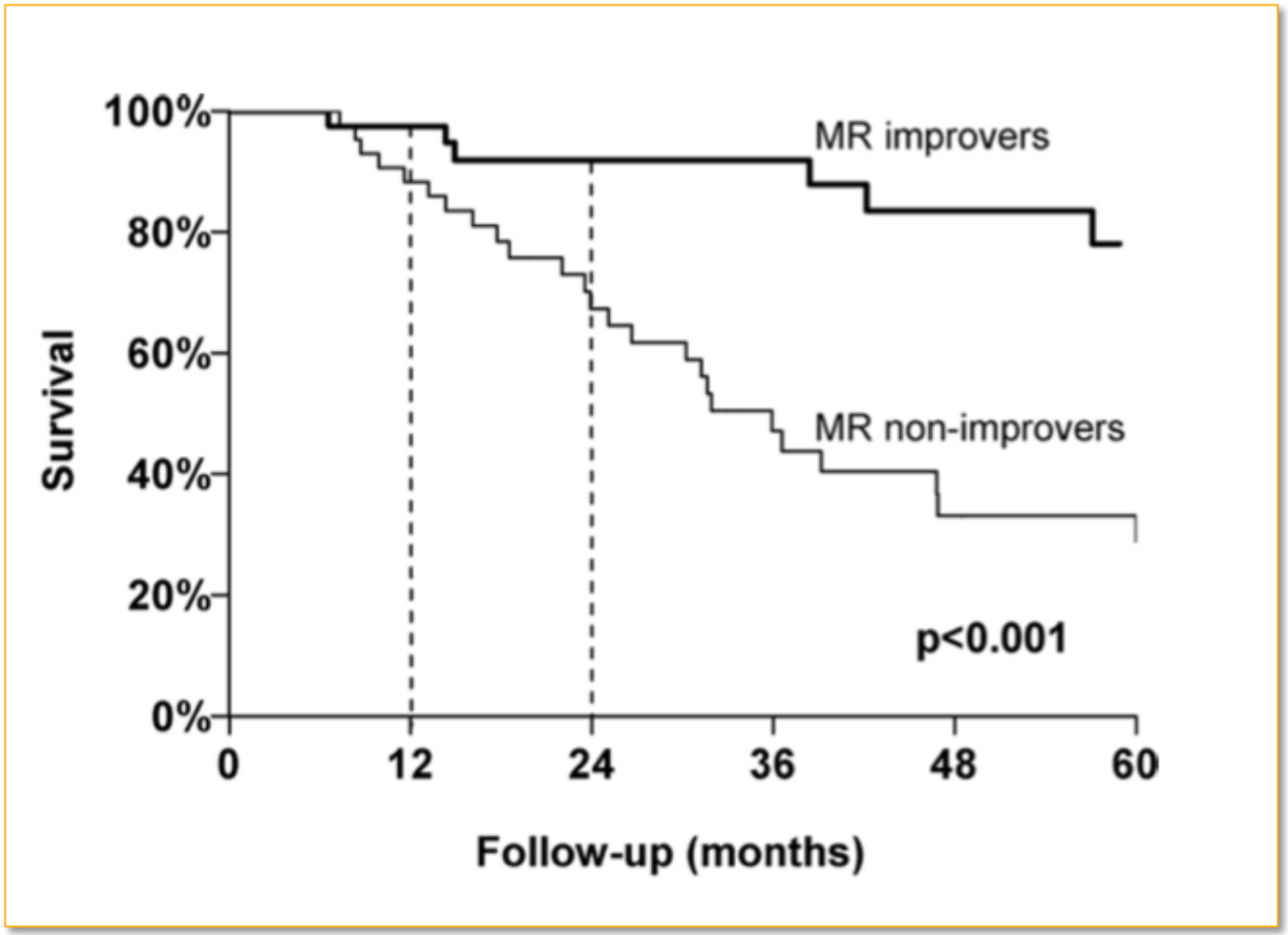




- St John Sutton et al, Circulation

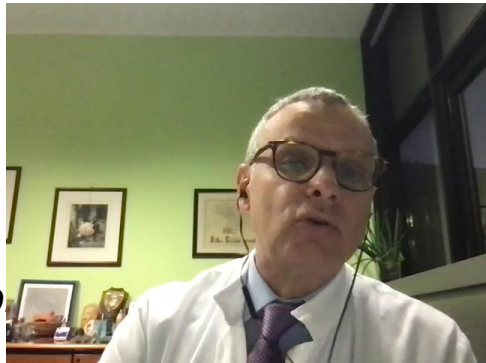
OSPEDALE
SAN RAFFAELE

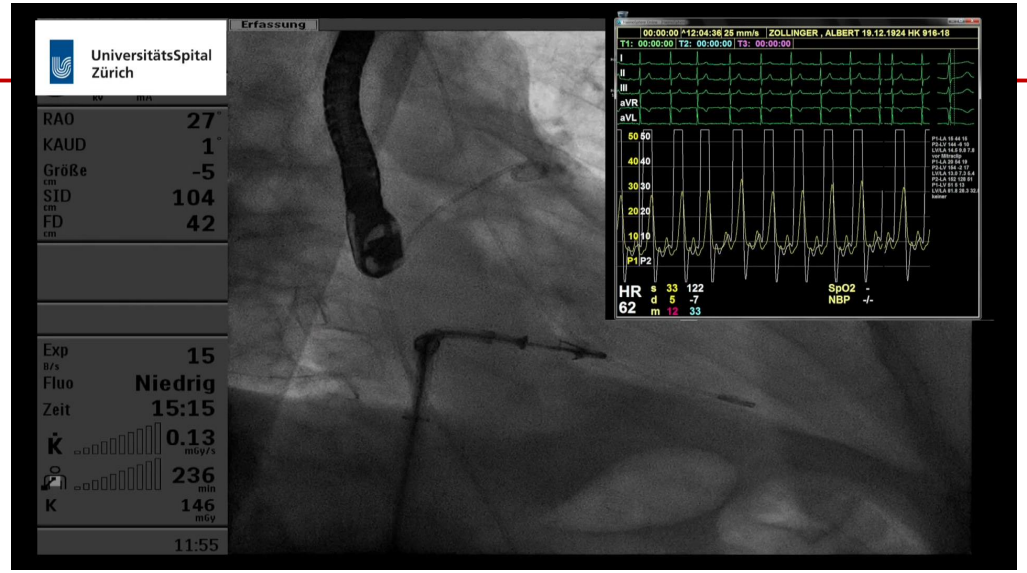
Non responder to CRT are at high risk of mortality if MR remains untreated

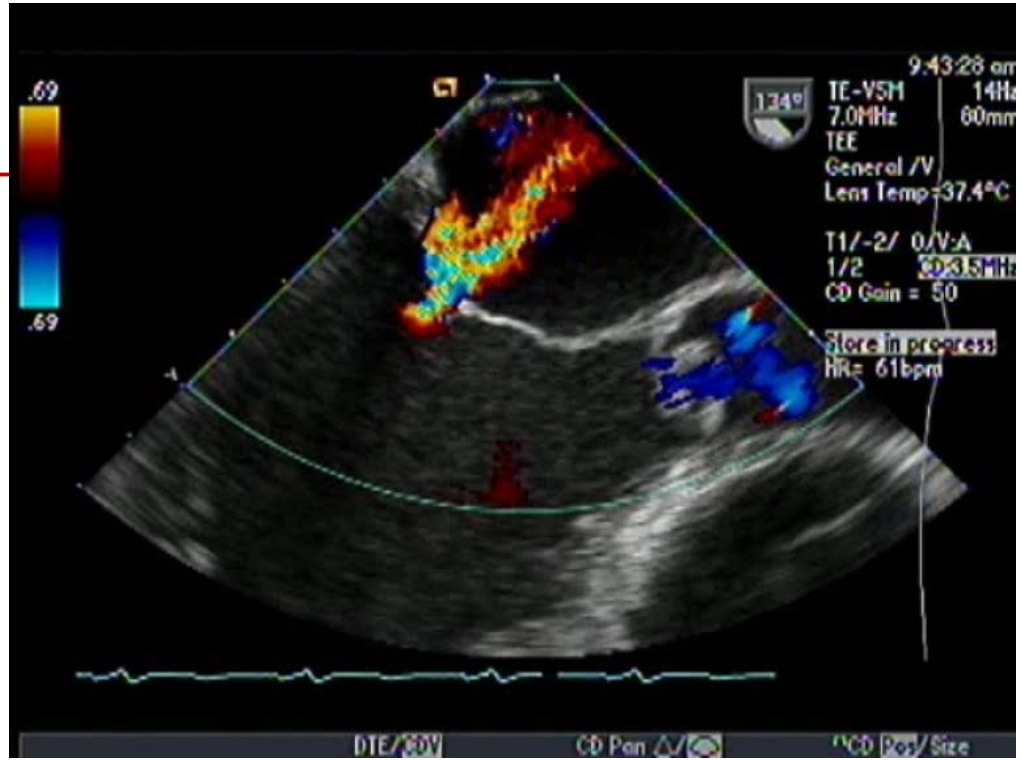


Van Bommel Circulatio

OSPEDALE
SAN RAFFAELE







V wave

37

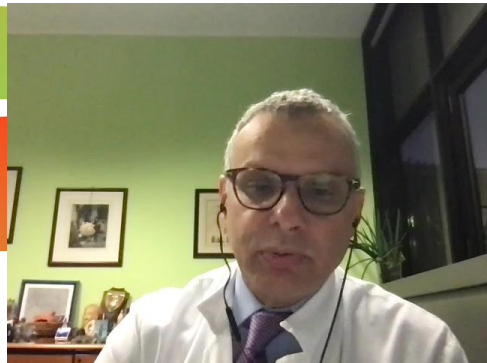
17

Mean LAP

12

LV pressure

122



OSPEDALE SAN RAFFAELE

About 10 years of FMR treatment in Europe

Journal of the American College of Cardiology
© 2013 by the American College of Cardiology Foundation
Published by Elsevier Inc.

Vol. 62, No. 12, 2013
ISSN 0735-1097/$36.00
http://dx.doi.org/10.1016/j.jacc.2013.02.094

CLINICAL RESEARCH **Interventional Cardiology**

Percutaneous Mitral Valve Interventions in the Real World

Early and 1-Year Results From the ACCESS-EU, A Prospective, Multicenter, Nonrandomized Post-Approval Study of the MitraClip Therapy in Europe

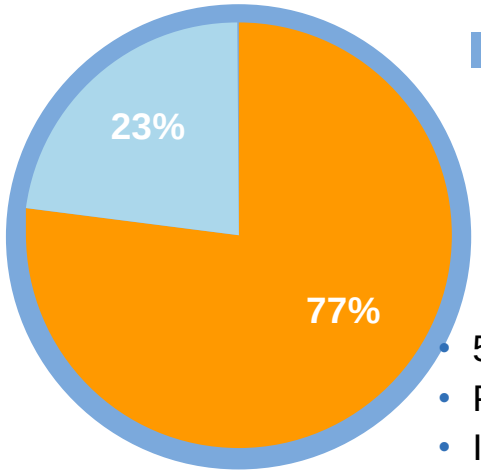
Francesco Maisano, MD,* Olaf Franzen, MD,† Stephan Baldus, MD,‡ Ulrich Schäfer, MD,§ Jörg Hausleiter, MD,‖ Christian Butter, MD,¶ Gian Paolo Ussia, MD,#** Horst Sievert, MD,†† Gert Richardt, MD,‡‡ Julian D. Widder, MD,§§ Tiziano Moccetti, MD,‖‖ Wolfgang Schillinger, MD¶¶

Milan, Italy; Copenhagen, Denmark; Hamburg, Munich, Berlin, Frankfurt, Bad Segeberg, Hannover, and Göttingen, Germany; Catania, Italy; and Lugano, Switzerland

Objectives The purpose of this article is to report early and mid-term outcomes of the ACCESS-EU study (ACCESS-Europe A Two-Phase Observational Study of the MitraClip System in Europe), a European prospective, multicenter, nonrandomized post-approval study of MitraClip therapy (Abbott Vascular, Inc., Santa Clara, California).

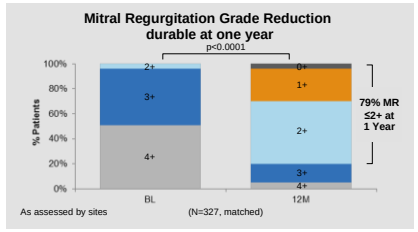
Background MitraClip has been increasingly performed in Europe after approval; the ACCESS-EU registry provides a snapshot of the real-world clinical demographic data and outcomes.

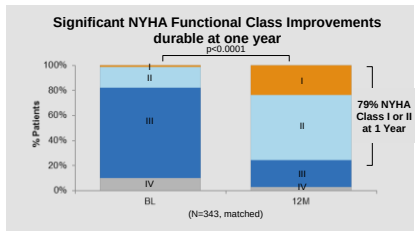
Methods A total of 567 patients with significant mitral valve regurgitation (MR) underwent MitraClip therapy at 14 European

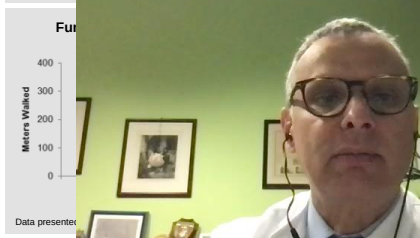


= DMR = FMR

- 567 patients
- Procedure time – 117 minutes
- Implant rate – 99%





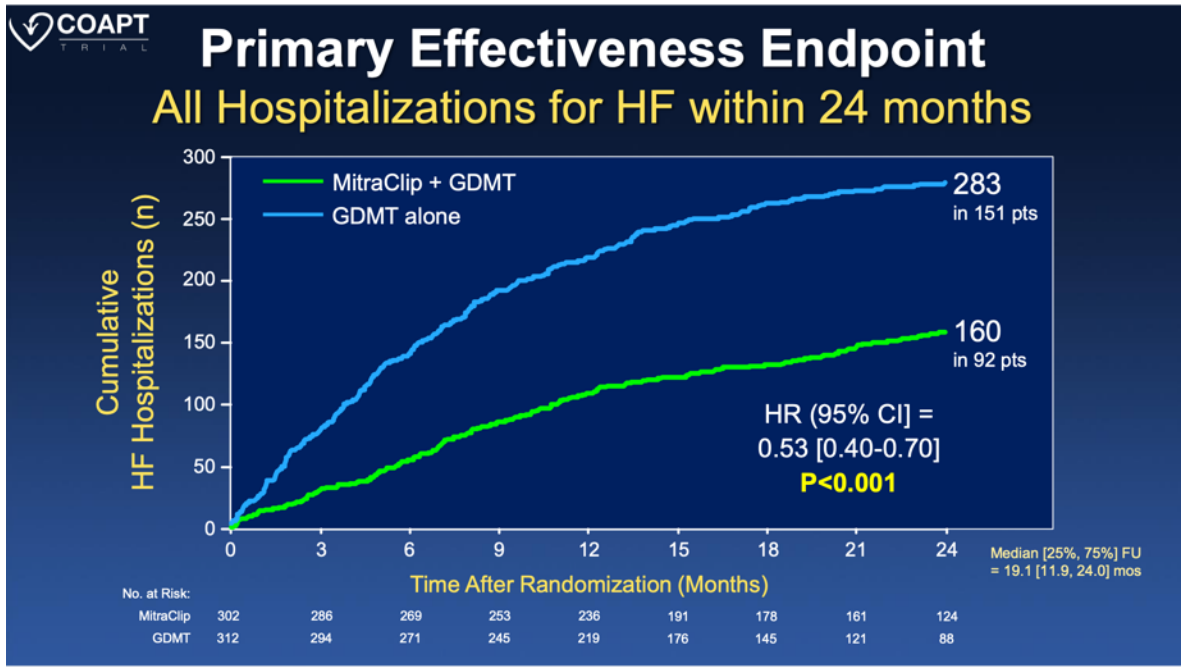


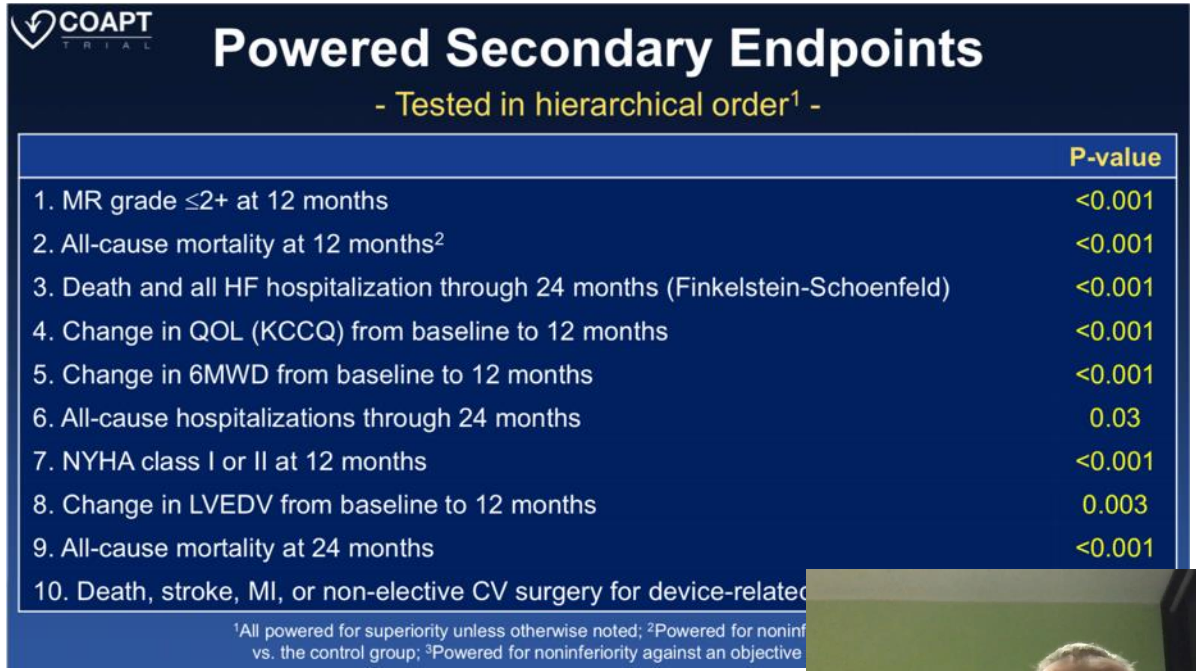
Source: Schillinger, W. ACCESS-EUROPE Phase I- ESC 2012; August 25-29, 2012; Munich, Germany.

© 2015 Abbott. All rights reserved. 9-EH-4-2405-01 07-2015 REV G
Information contained herein is for presentation for Europe, Middle East and Africa ONLY

OSPEDALE SAN RAFFAELE

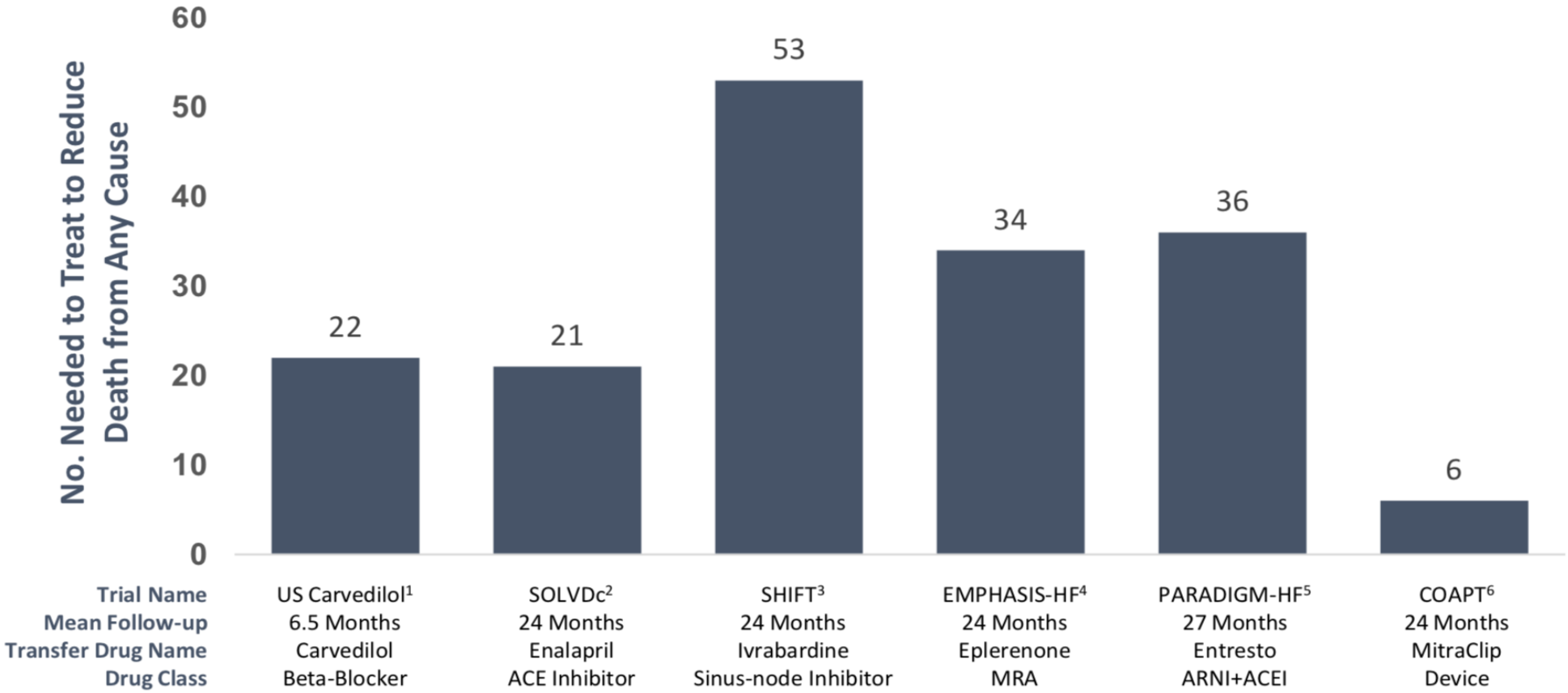
COAPT TRIAL
A leapfrog in the history of functional mitral valve treatment





OSPEDALE
SAN RAFFAELE

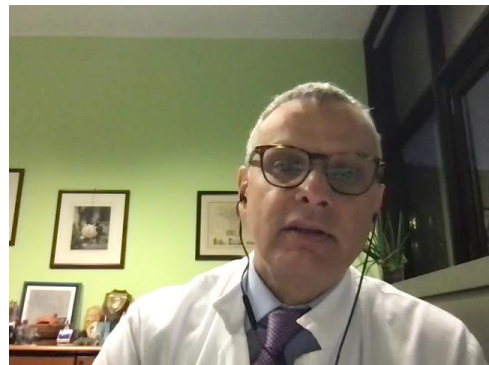
NNT TO PREVENT 1 ALL-CAUSE DEATH*



1. Packer M, Bristow MR, Cohn JN, et al. N Engl J Med 1996;334:1349-1355.
2. The SOLVD Investigators. N Engl J Med 1991;325:293-302.
3. Swedberg K, Komajda M, Bohm M, et al. Lancet 2010;376:1988.
4. Zannad F, McMurray JJV, Krum H, et al. N Engl J Med 2011;364:11-21.
5. McMurray JJV, Packer M, Desai AS, et al. N Engl J Med 2014;371:993-1004.
6. Stone G, Lindenfeld J, Abraham W, et al. DOI: 10.1056/NEJMoa1806640.

* Data from different trials
* Incremental benefits due to test drug/device above background therapy

OSPEDALE SAN RAFFAELE



COAPT TRIAL

COAPT

Three-Year Outcomes from a Randomized Trial of Transcatheter Mitral Valve Leaflet Approximation in Patients with Heart Failure and Secondary Mitral Regurgitation

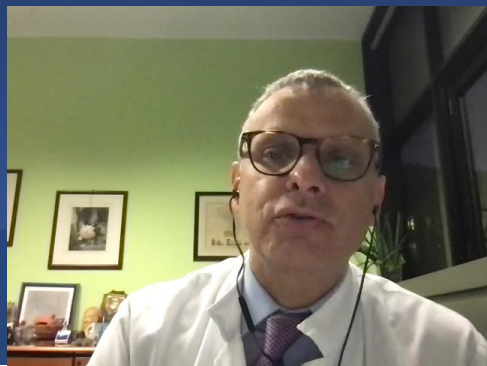
Michael Mack

William T. Abraham

JoAnn Lindenfeld

Gregg W. Stone

On behalf of the COAPT Investigators



tct2019

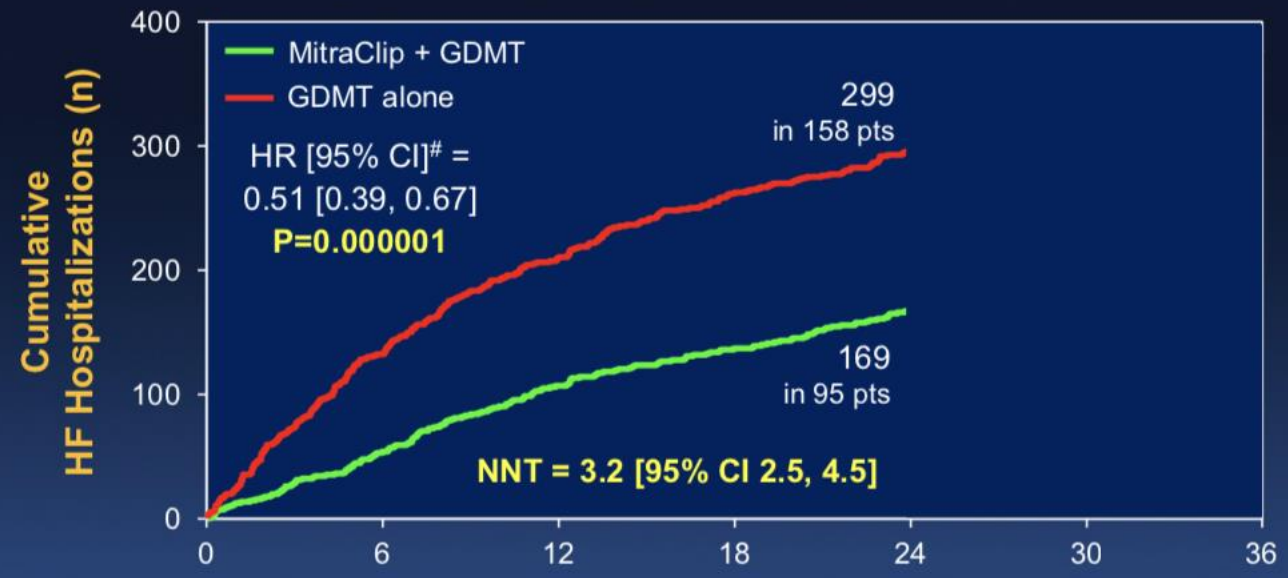
COAPT (NCT01626079)

COAPT TRIAL

Primary Effectiveness Endpoint

All Hospitalizations for HF within 36 months

All patients, ITT, including crossovers



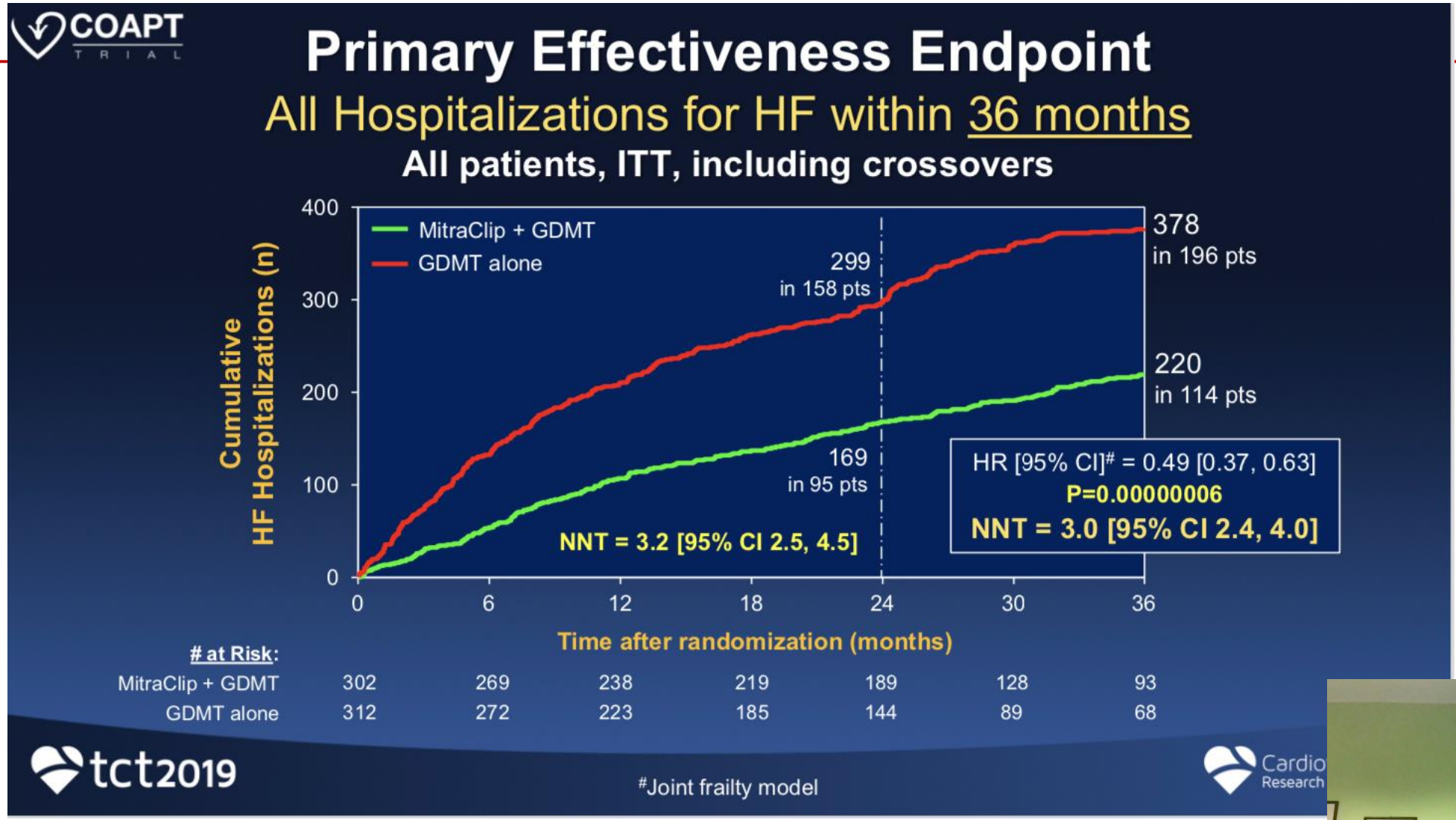
# at Risk:					
MitraClip + GDMT	302	269	238	219	189
GDMT alone	312	272	223	185	144

tct2019

#Joint frailty model

Cardio Research

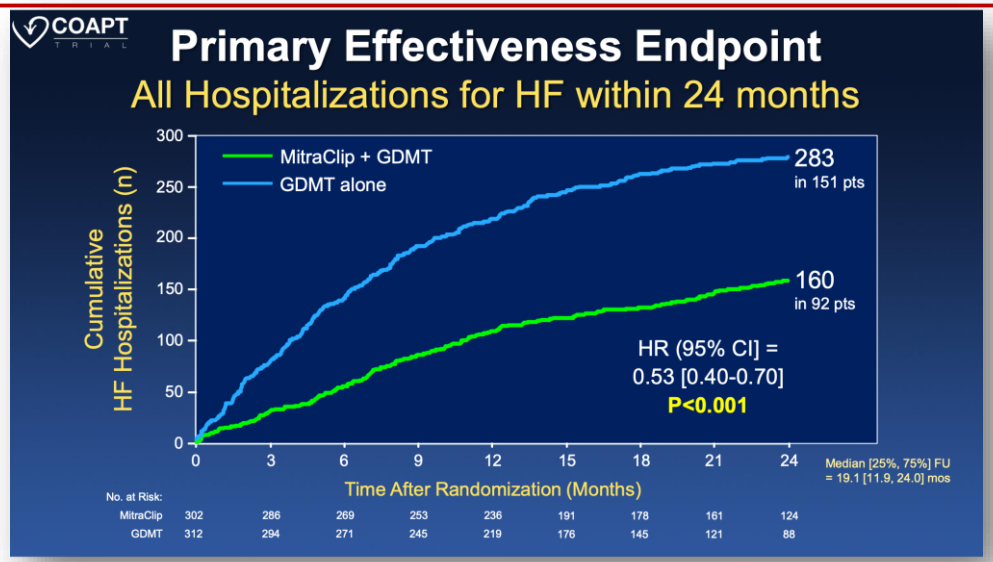
OSPEDALE SAN RAFFAELE

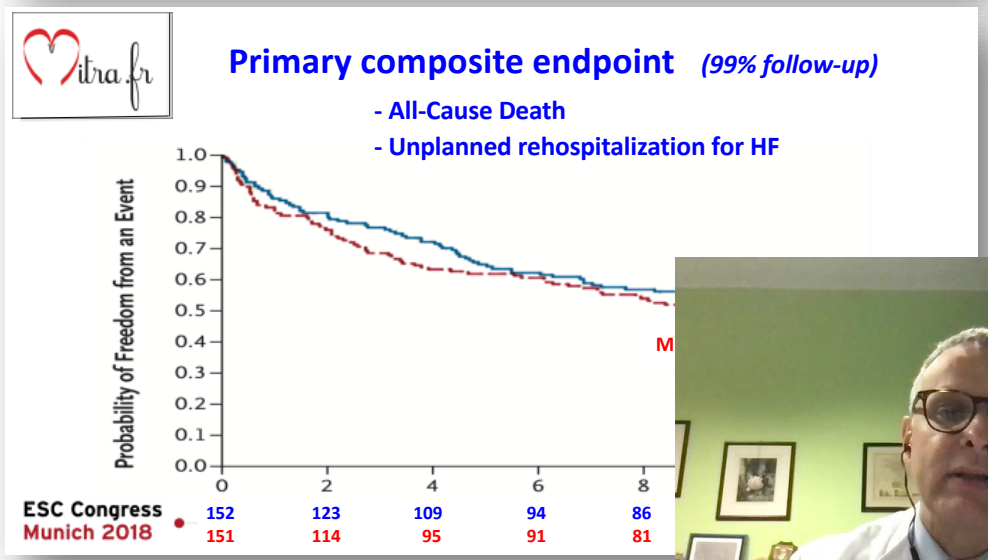


OSPEDALE SAN RAFFAELE

COAPT vs MitraFR

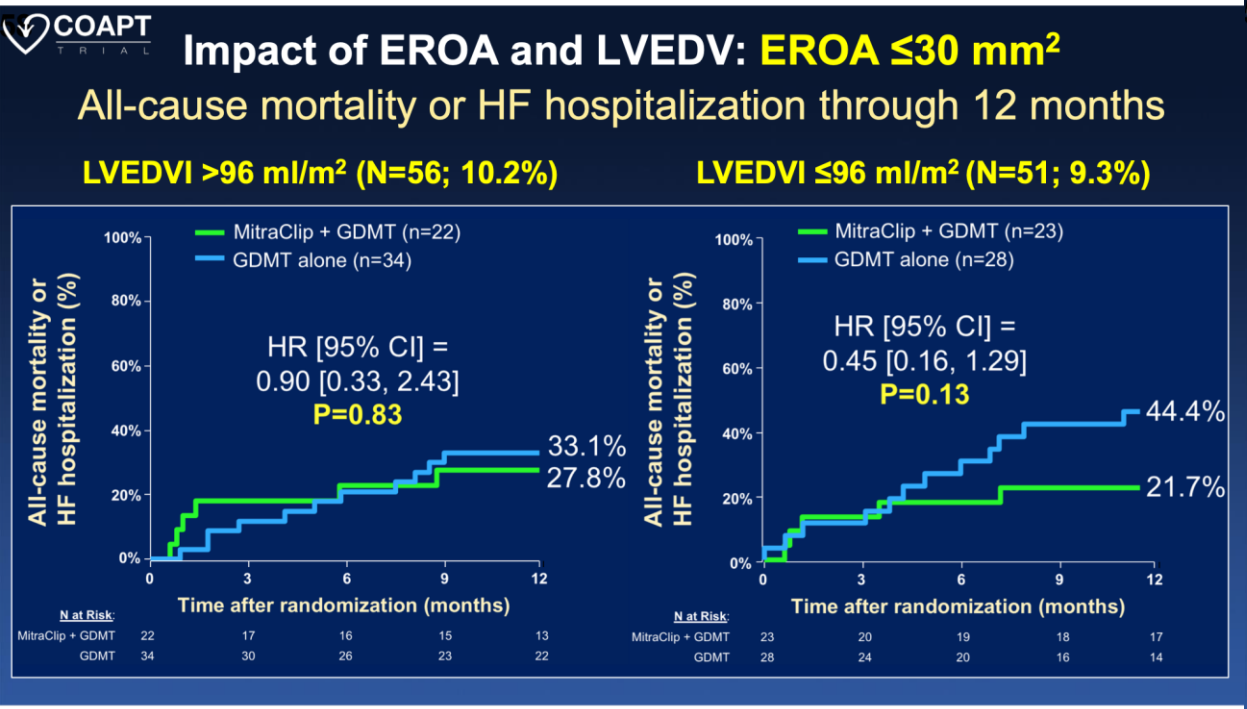
- Does the design of each trial impact the results?
- Is there a mechanistic explanation for each trial's results?
- What can we learn from the outcomes of the control group of the two trials?
- Is there a need for a tie-breaker?
- Would a meta-analysis of the two trials be meaningful?
- Do the differences in sample size, operator experience and trial follow-up explain the different results?
- Industry sponsored vs independent?

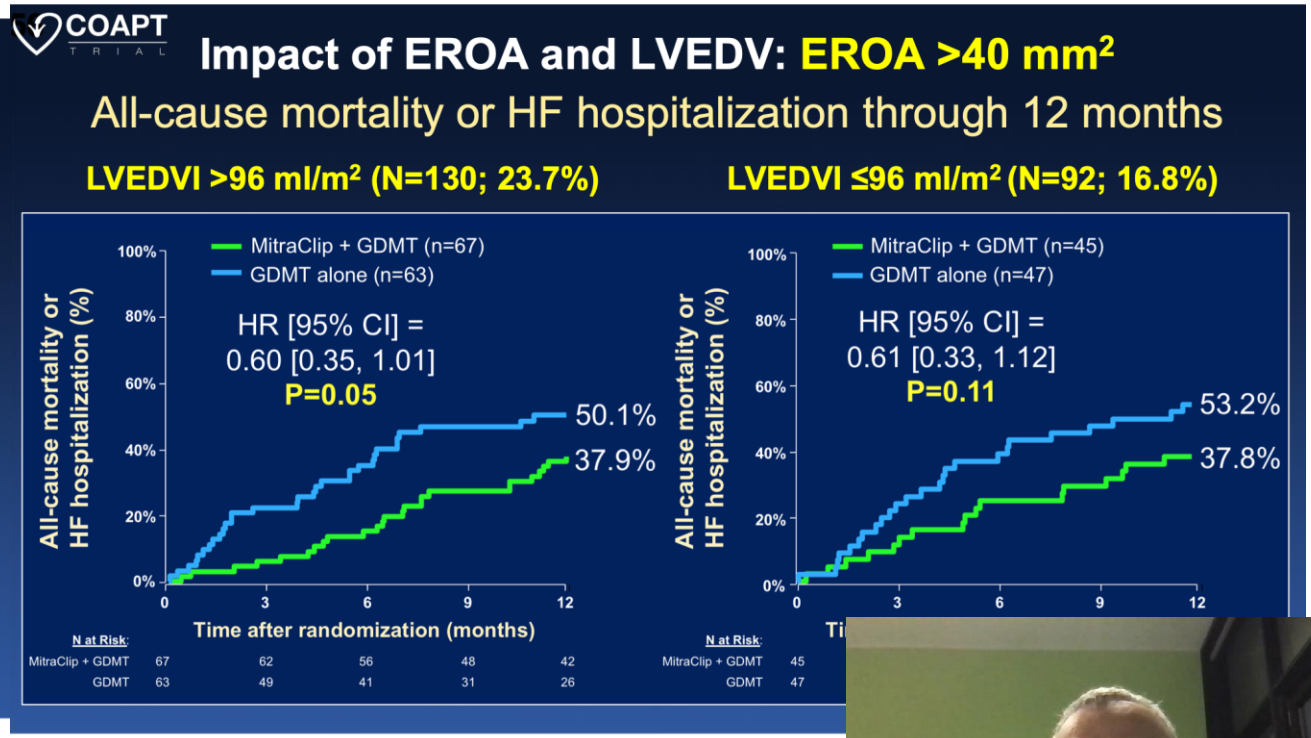




OSPEDALE SAN RAFFAELE

Patient selection:
According to COAPT and MitraFR, patients with larger degree of MR and smaller ventricles have higher chance of improvement





OSPEDALE SAN RAFFAELE

VHD guideoines 2021
Severity MR threshold in SMR (ERO from 0.2 to 0.4)

Table 7 **Severe mitral regurgitation criteria based on 2D echocardiography**

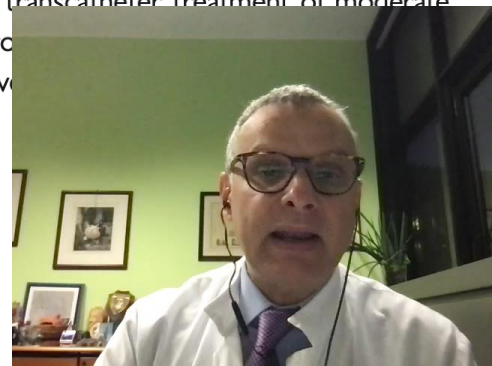
	Primary mitral regurgitation	Secondary mitral regurgitation
Qualitative		
Mitral valve morphology	Flail leaflet, ruptured papillary muscle, severe retraction, large perforation	Normal leaflets but with severe tenting, poor leaflet coaptation
Colour flow jet area	Large central jet (>50% of LA) or eccentric 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
Semiquantitative		
Vena contracta width (mm)	≥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
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

© ESC/EACTS 2021

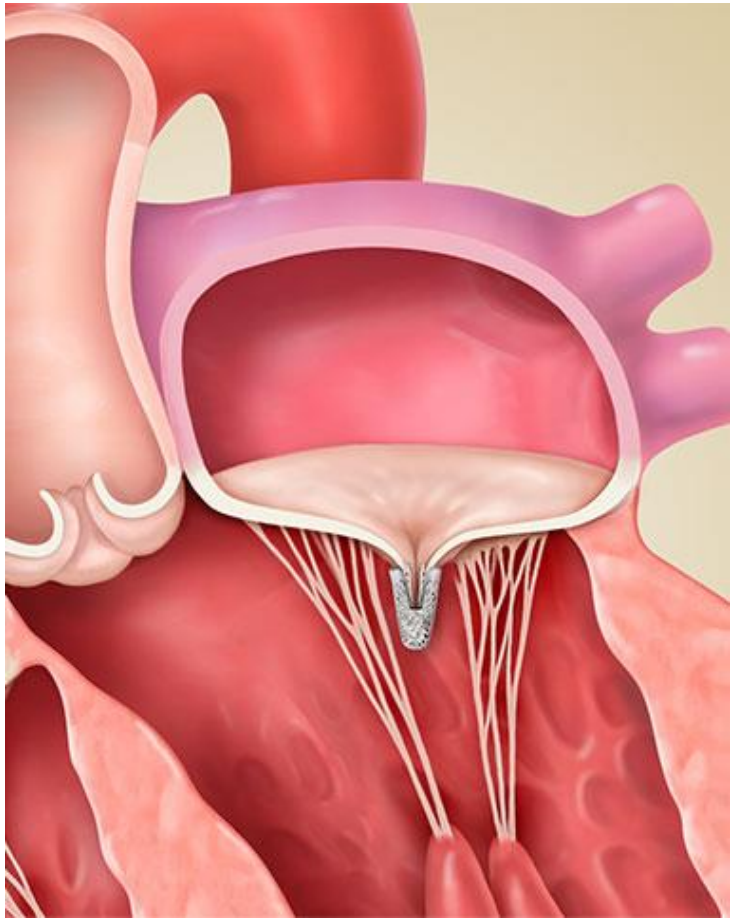
6.2.1 Evaluation

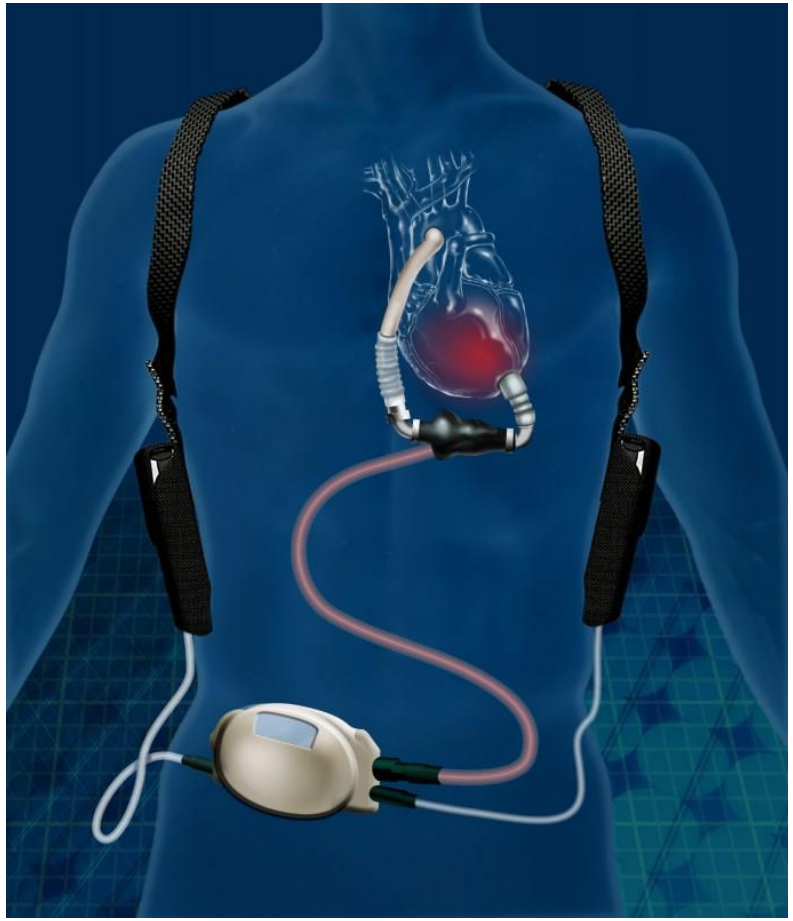
The echocardiographic criteria to define severe SMR do not differ from those used in PMR and an integrative approach should be used (*Table 7*).[24,268] However, it should be acknowledged that when quantifying EROA and regurgitant volume in SMR, lower thresholds may be applied to define severe SMR. In heart failure patients, the total forward LV stroke volume is lower and that may lead to lower estimated regurgitant volume (<60 mL/beat). Calculation of regurgitant fraction in those circumstances could account for lower flows and has shown prognostic implications.[320] In addition, the crescent shape of the regurgitant orifice, characteristic of SMR, may lead to underestimation of the vena contracta width and of the EROA. An EROA ≥30 mm^2 by 2D proximal isovelocity surface area (PISA) likely corresponds to severe SMR. In contrast, whether an EROA ≥20 mm^2 defines severe SMR remains controversial. In heart failure patients, even mild mitral regurgitation is associated with poor prognosis[321] and evidence that surgical or transcatheter treatment of moderate SMR does not seem to impro
the change in definition of sev

OSPEDALE
SAN RAFFAELE



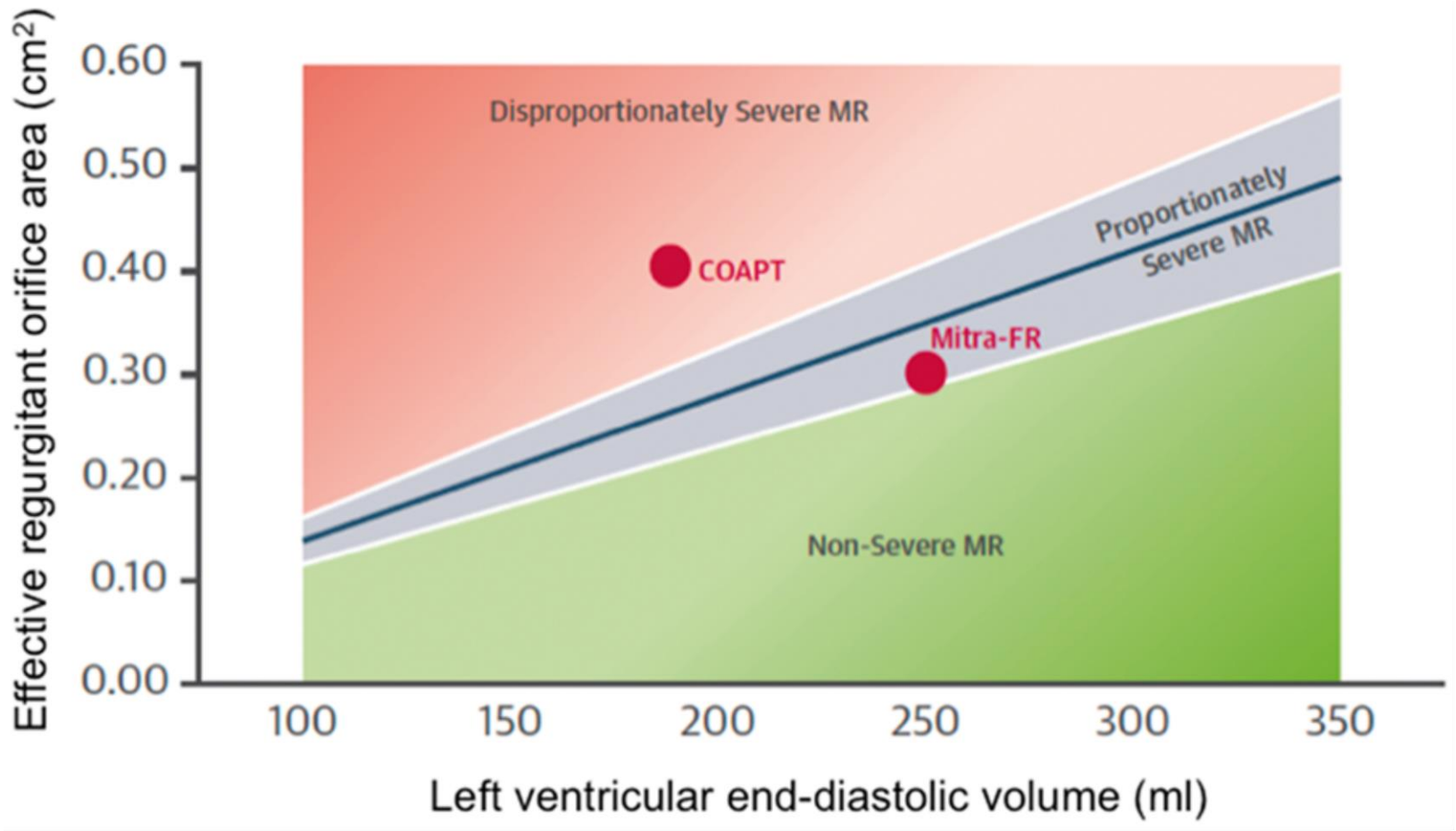
MitraClip therapy is not an alternative to ECMO, VAD or HTx





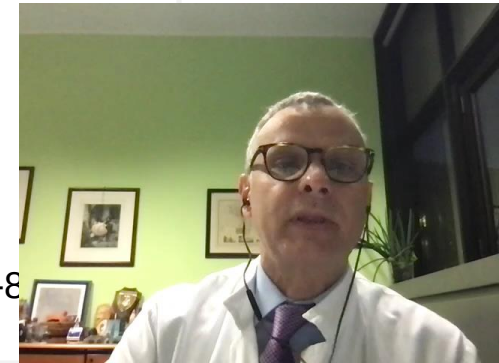
OSPEDALE
SAN RAFFAELE

Disproportionately Severe FMR

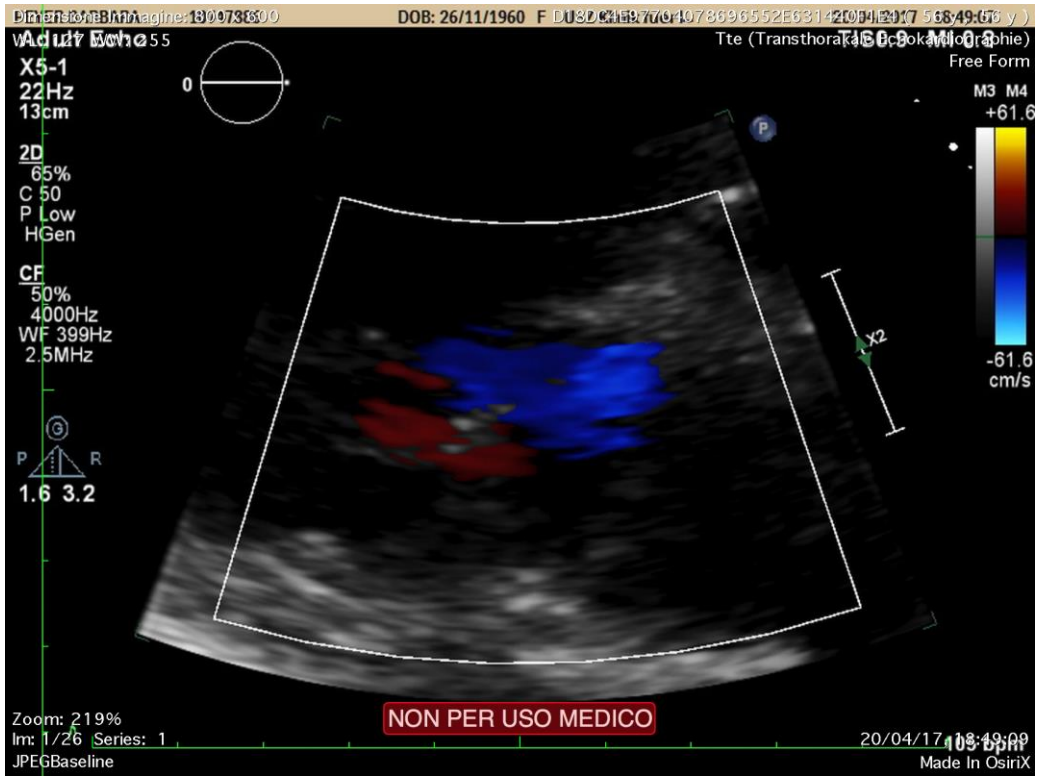


. Adapted from Graybun et al. JACC Cardiovasc Imaging. 2018 Dec 6. pii: S1936-8

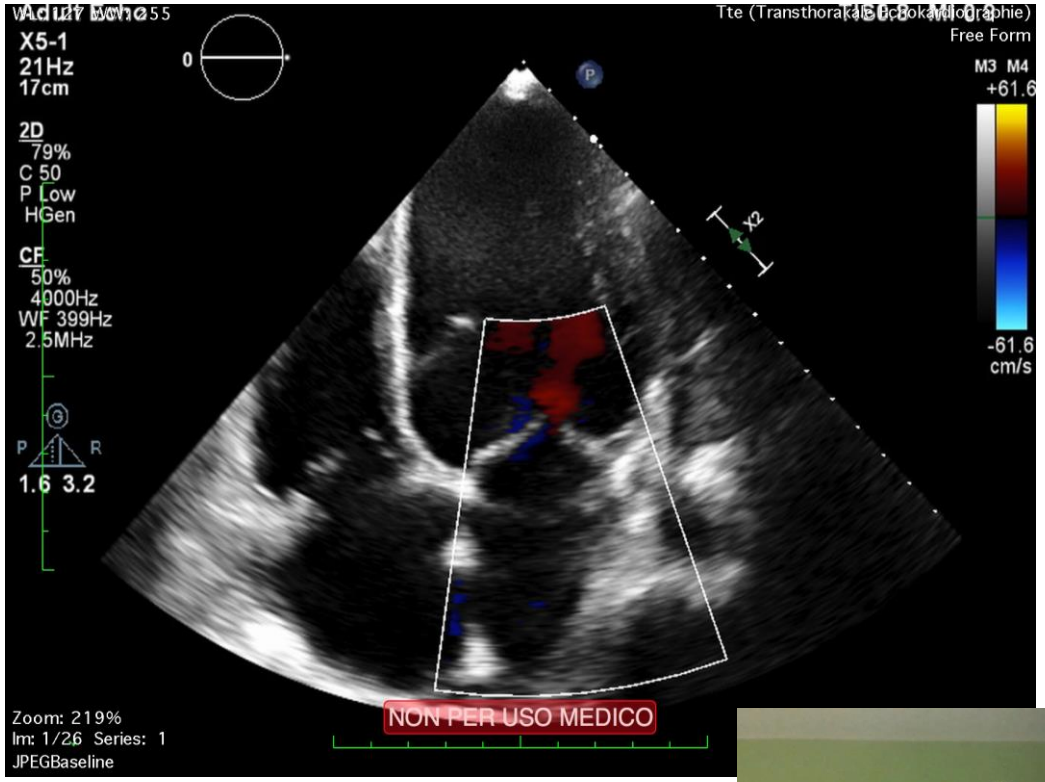
OSPEDALE
SAN RAFFAELE



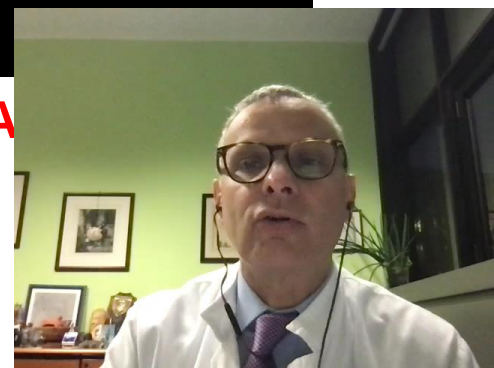
What is severe MR?



Morning



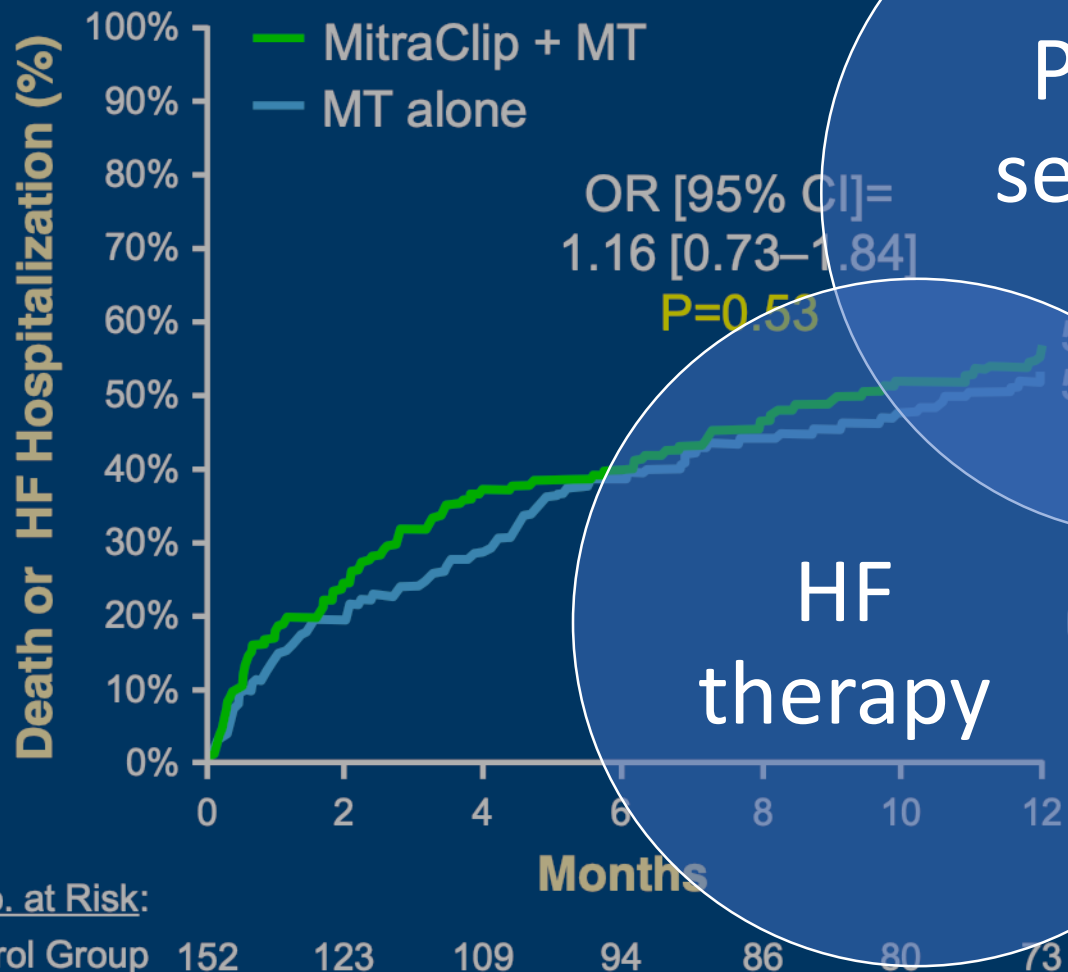
A



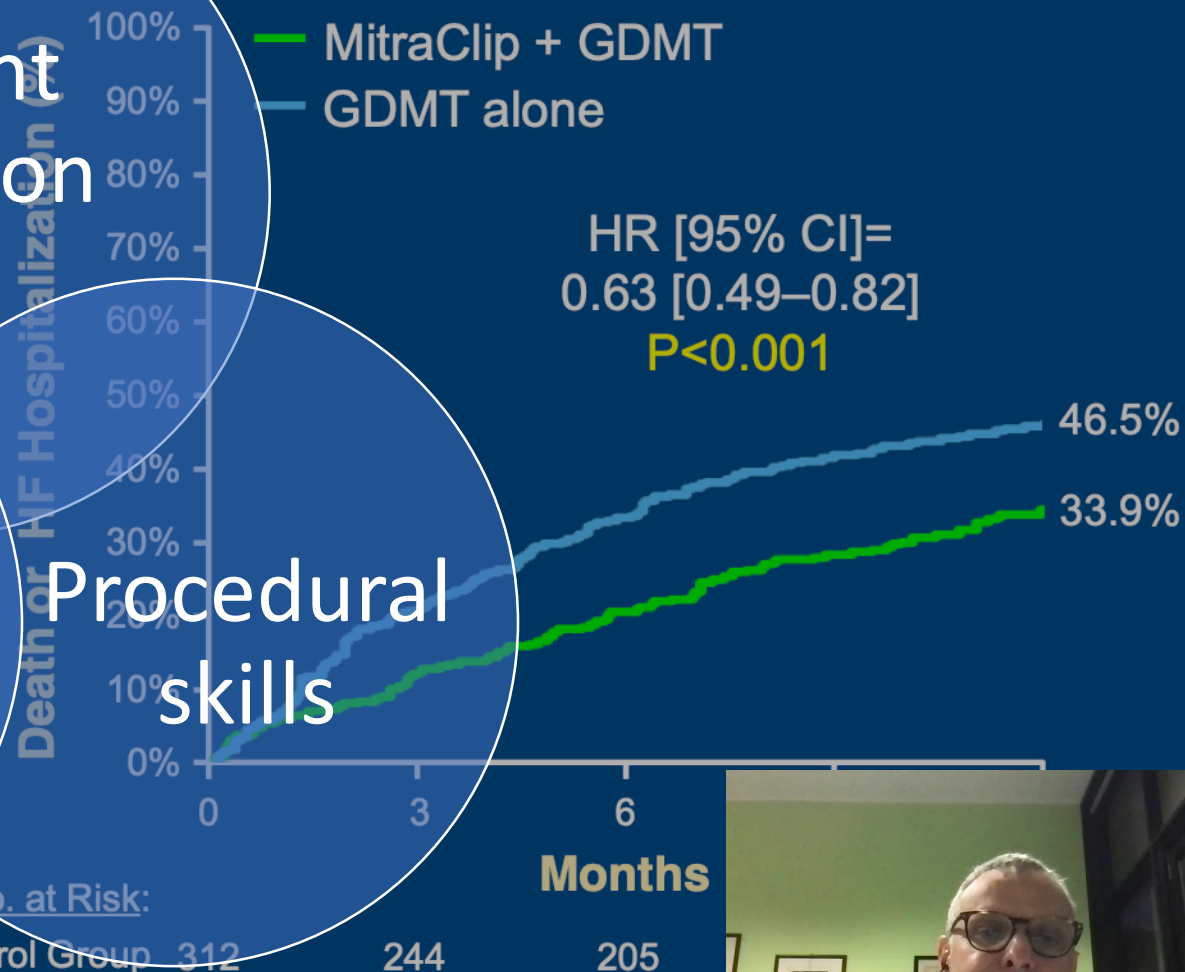
OSPEDALE
SAN RAFFAELE

COAPT vs. MITRA-FR: 12-Month Death or HF Hosp

MITRA-FR



COAPT



Patient selection

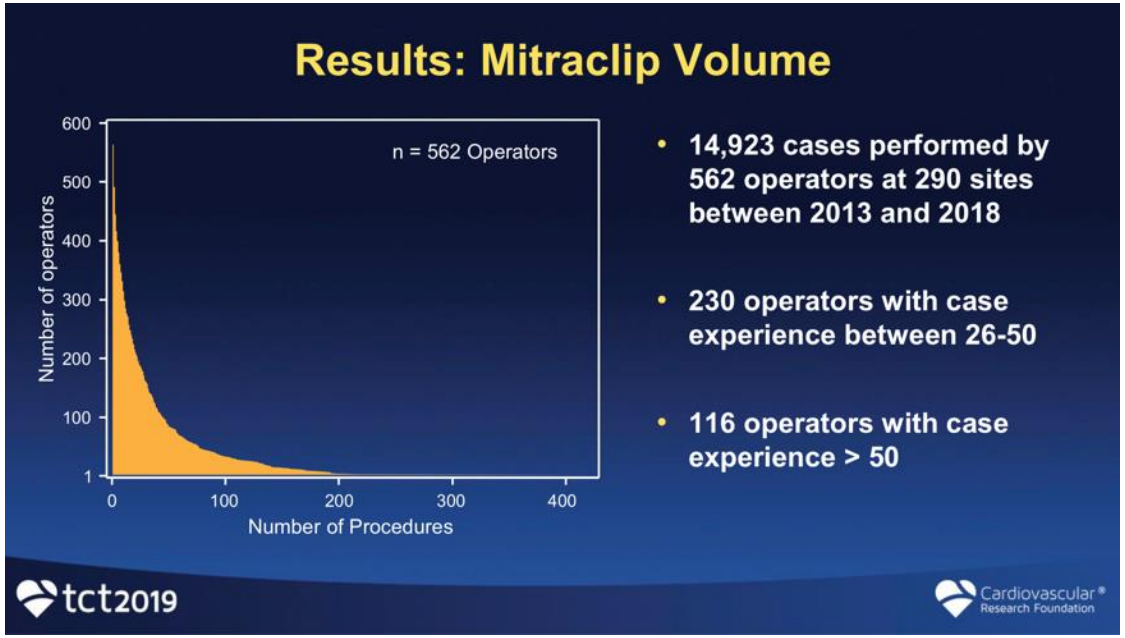
HF therapy

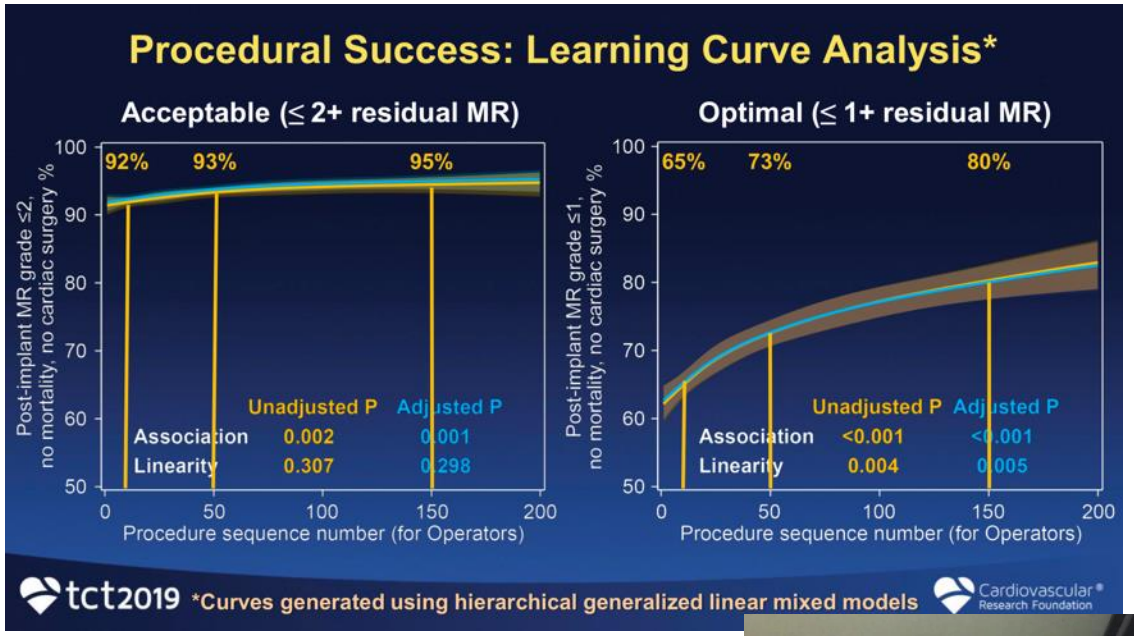
Procedural skills

Obadia JF et al. NEJM. 2018 Aug 27. doi: 10.1056/NEJMoa1805374

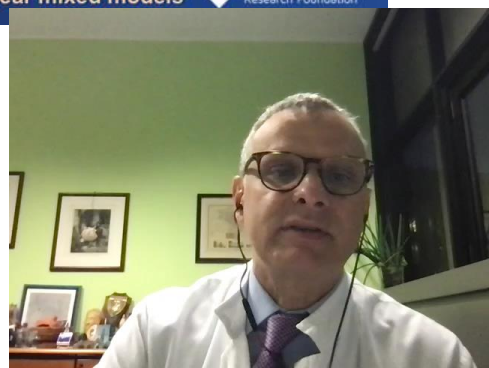
Stone GW et al. NEJM. 2

Learning Curve and Expertise (TVT registry)



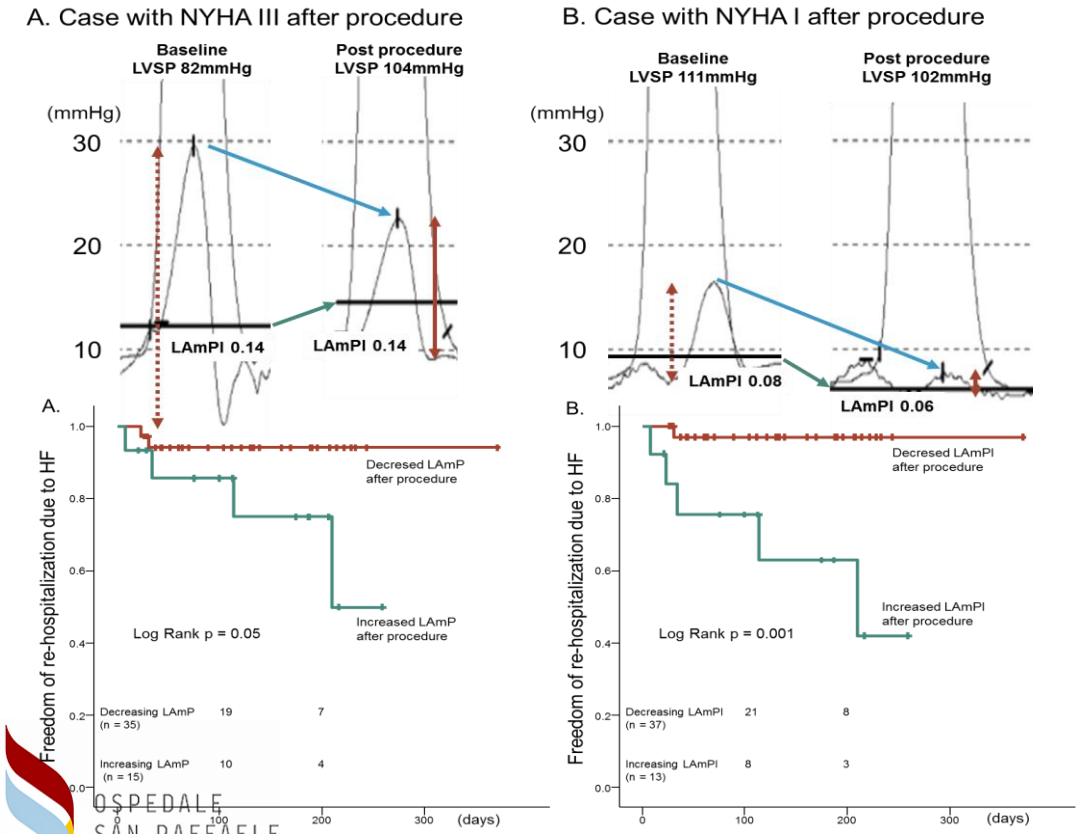


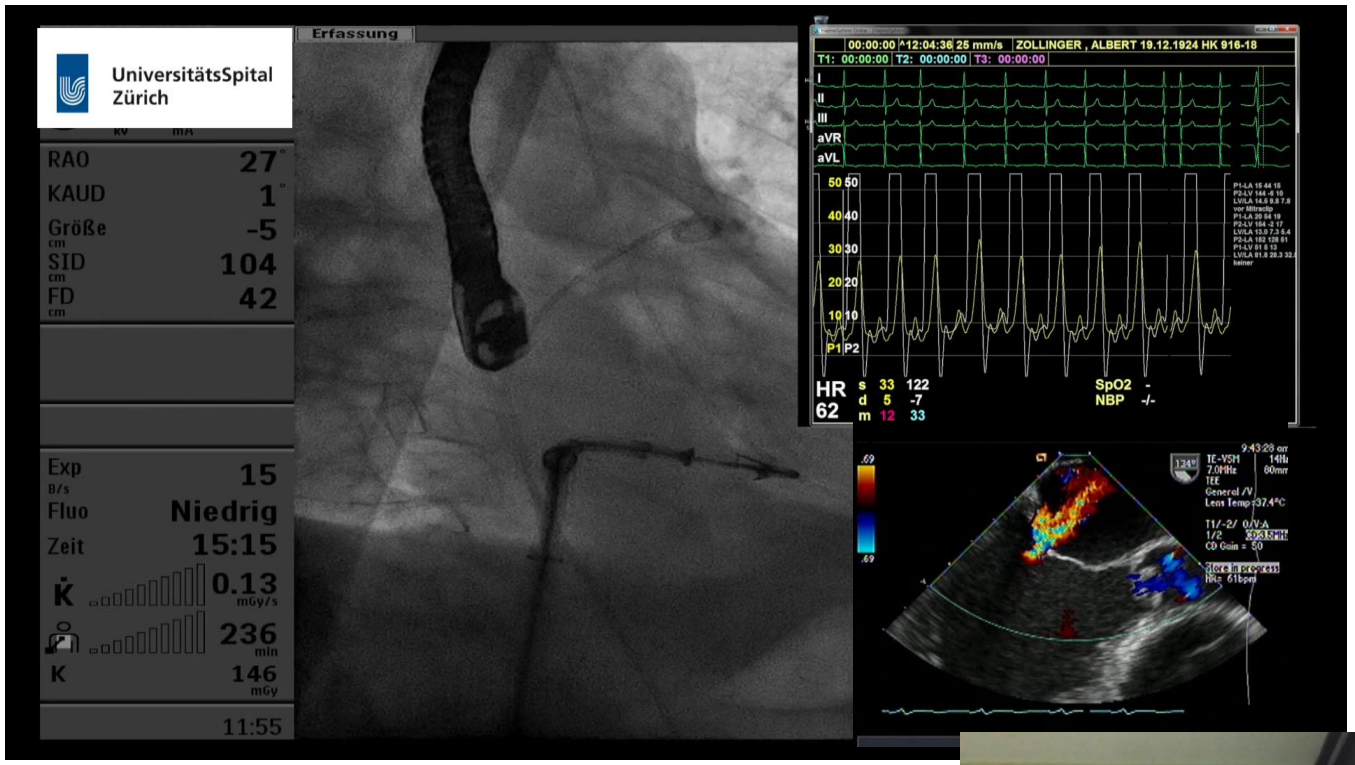
OSPEDALE SAN RAFFAELE



Hemodynamic assessment

- Continuous LAP measurements

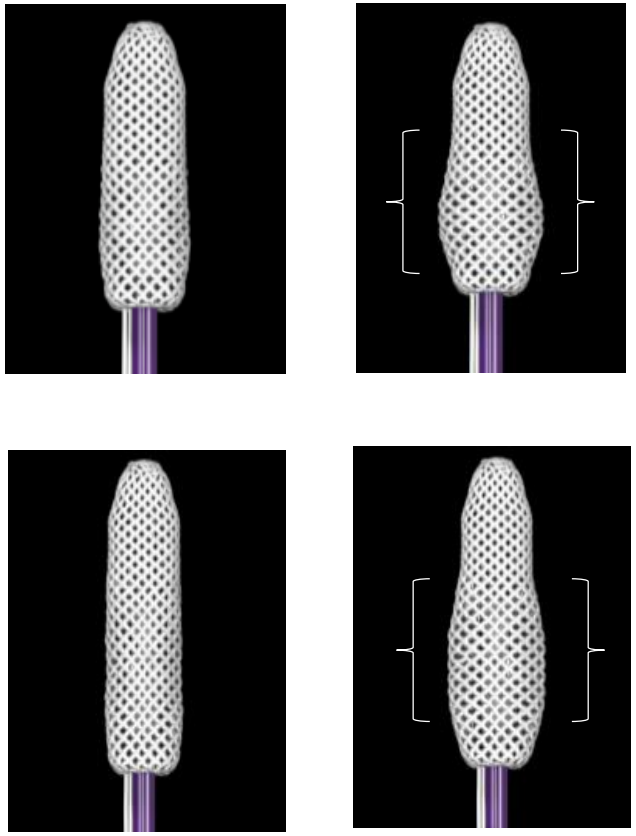


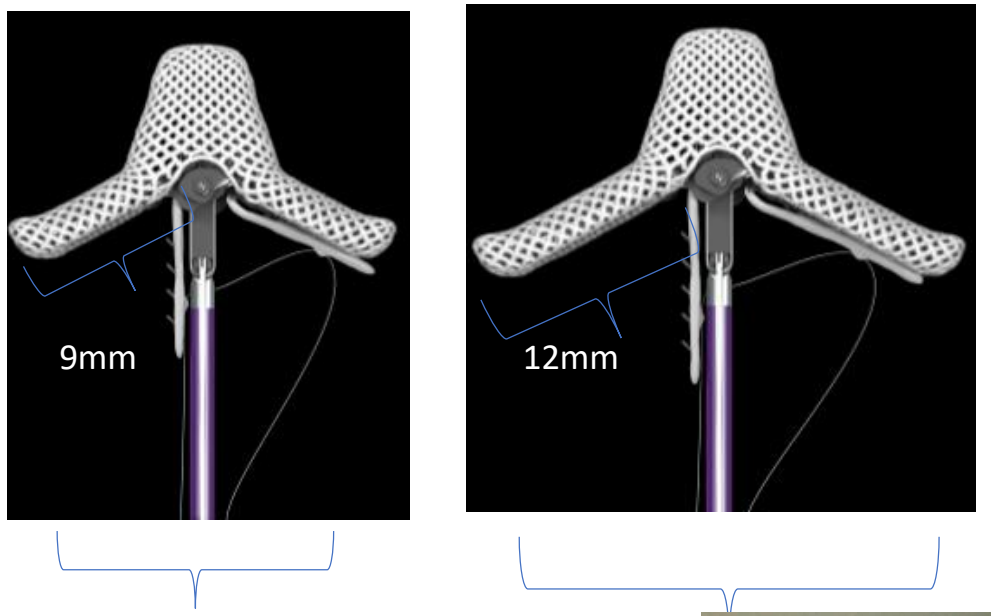


Kuwata et al, JACC In

OSPEDALE SAN RAFFAELE

MITRACLIP G4 DESIGN: 4th GENERATION SYSTEM EXPANDED CLIP OPTIONS





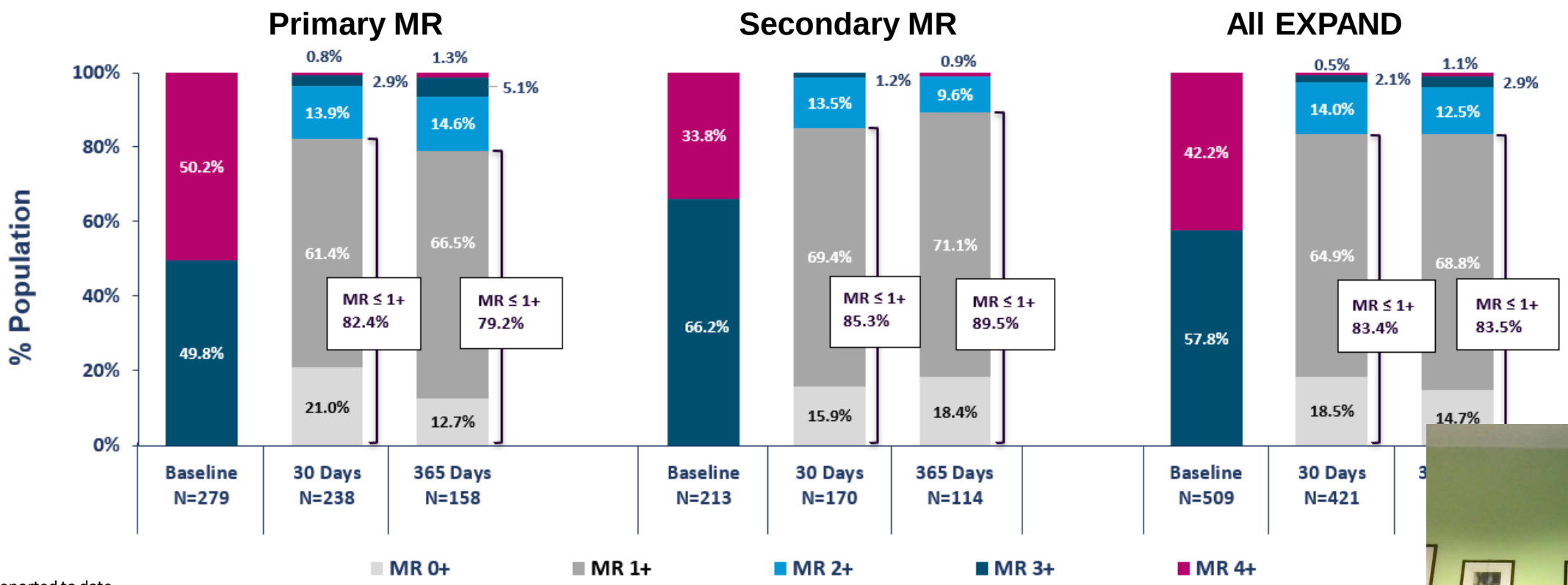
With Four Clip sizes of the MitraClip™ G4 system
you can choose the right Clip for each patient's mitral valve anatomy/pa

OSPEDALE SAN RAFFAELE

EXPAND TRIAL: MR REDUCTION BY MR ETIOLOGY

83.5% MR ≤ 1+ AT 1 YEAR IN SUBJECTS WITH BASELINE MR ≥ 3+

ECL Adjudicated MR Severity by Etiology

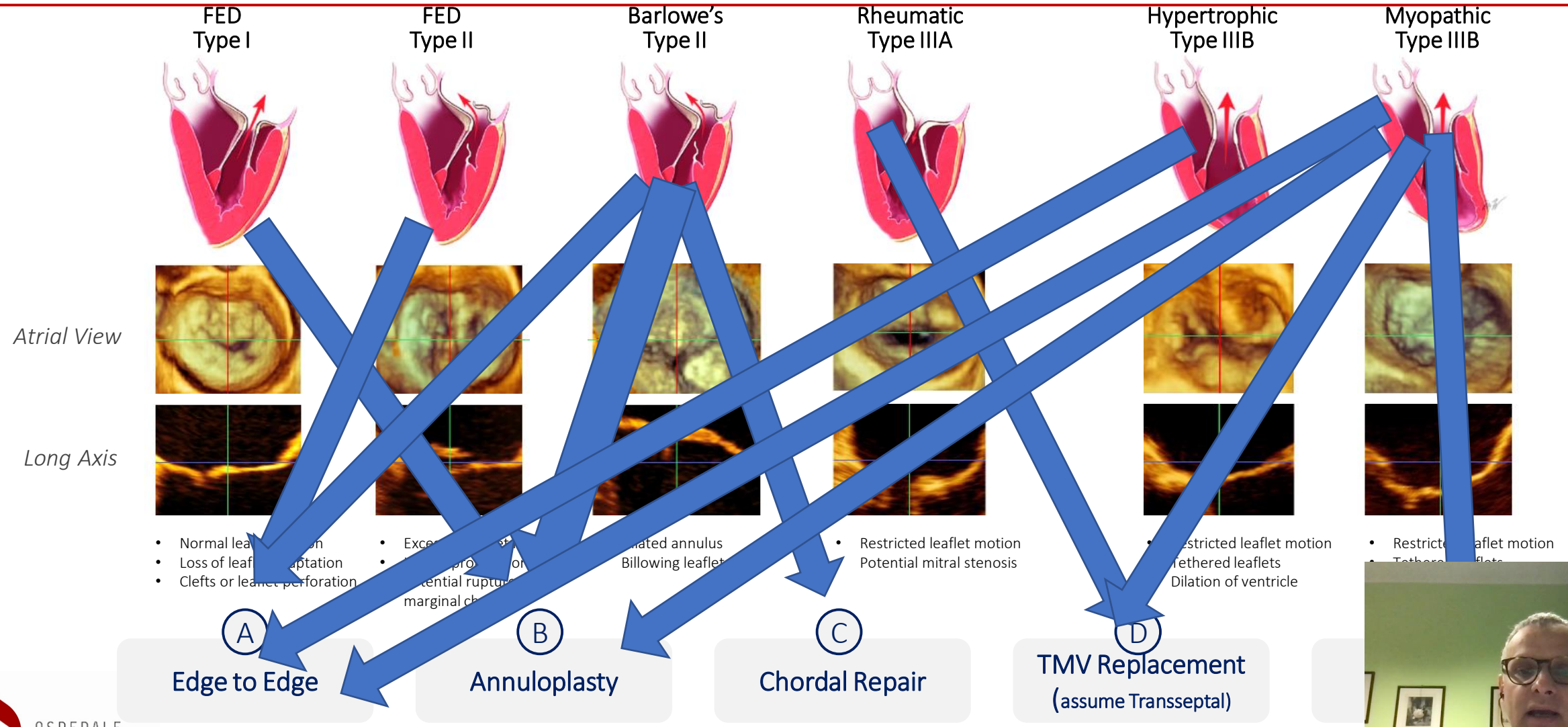


*Reported to date

Kar S. Core-Lab Adjudicated Contemporary Clinical Outcomes at 1 Year with MitraClip™ (NTR/XTR) System from Global EXPAND Study. Data presented at TCT 2020.

OSPEDALE SAN RAFFAELE

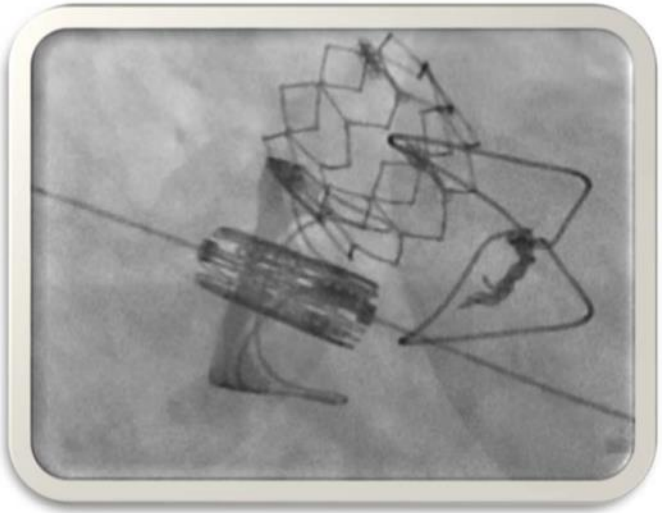
Mitral Valve Etiology, Pathology and Lesions

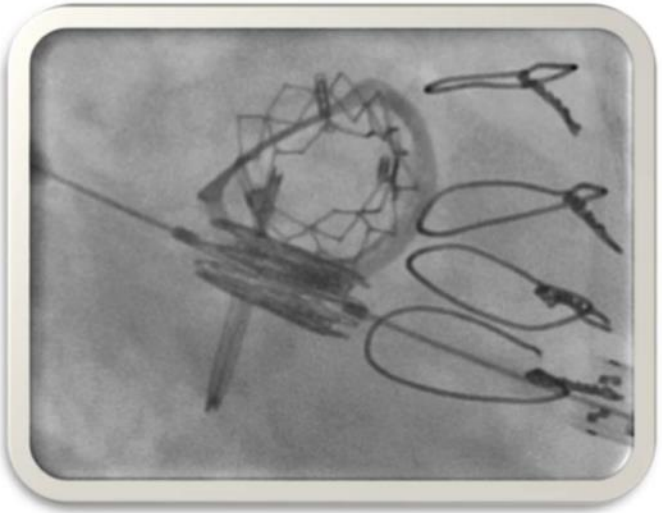


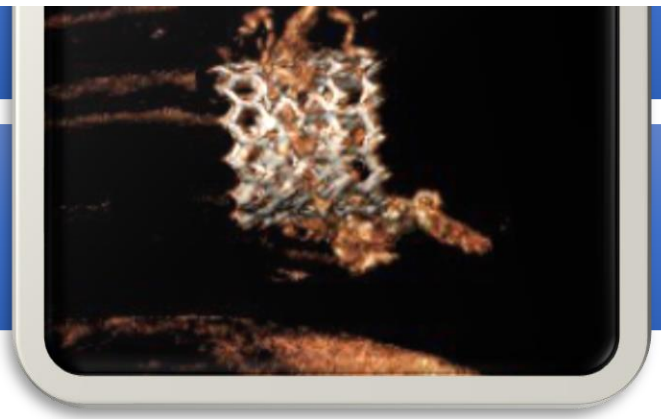
Source: Daniel Drake, "Axial Echocardiography", Michigan Society of Thoracic and Cardiovascular Surgeons

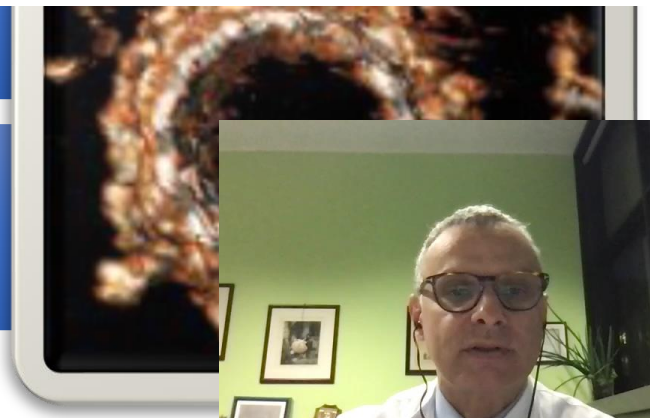
mitral valve replacement / implantation

- valve in valve
- valve in ring
- valve in MAC
- TMVI



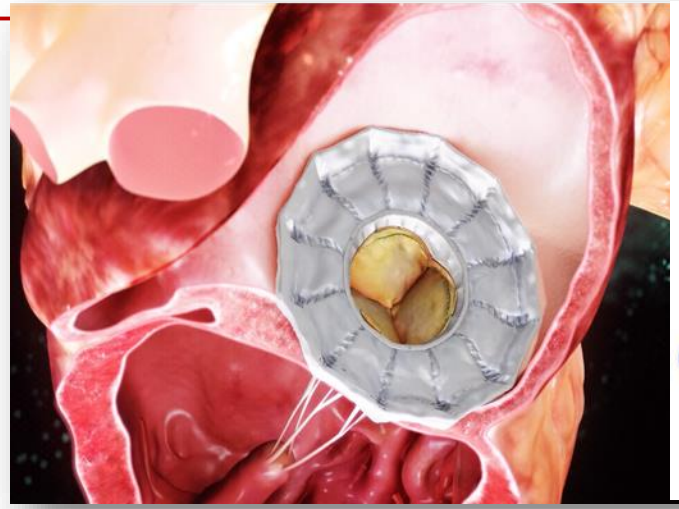


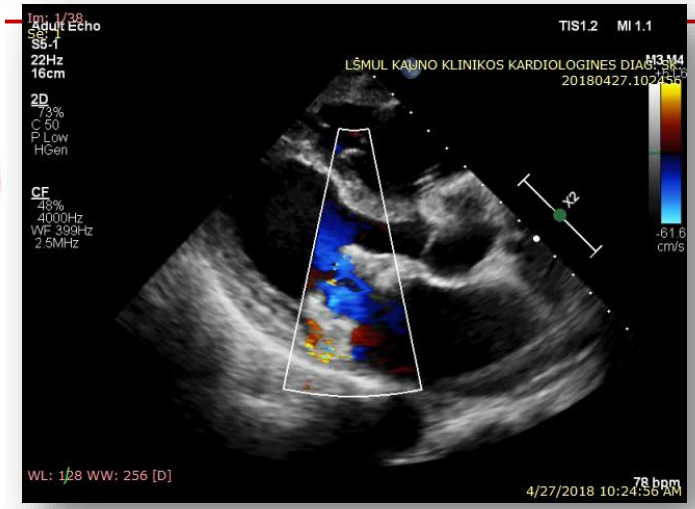


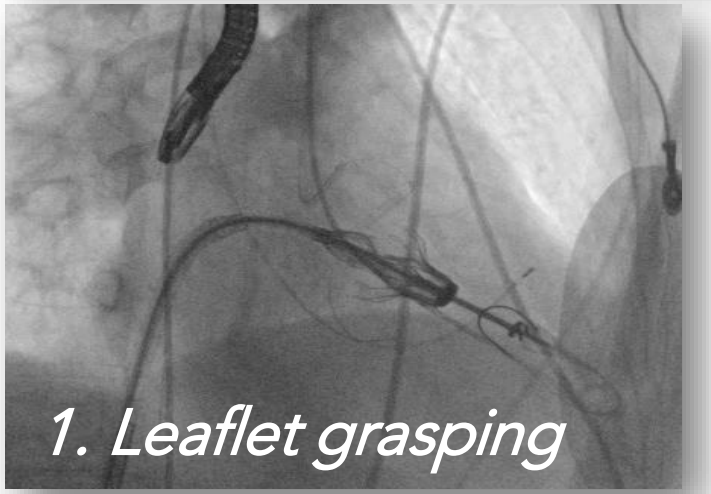


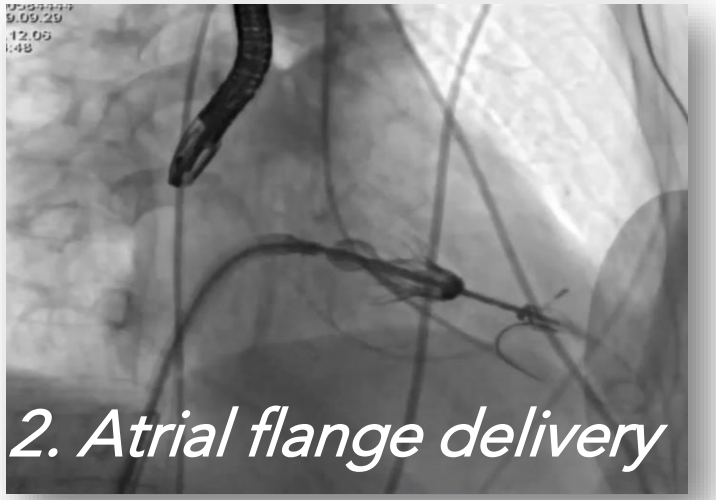
OSPEDALE
SAN RAFFAELE

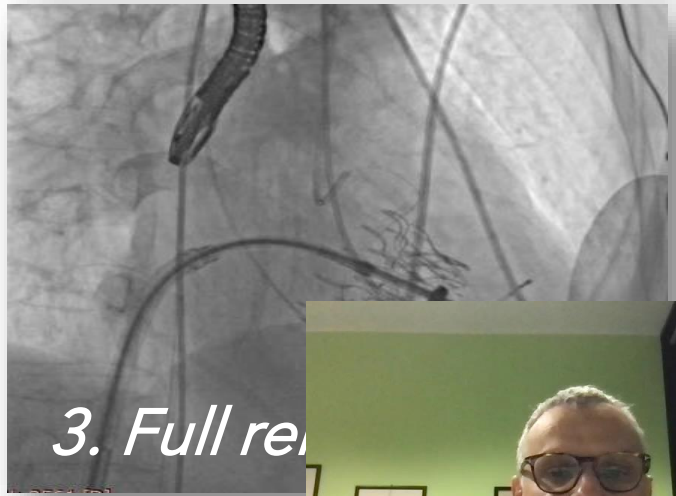
Cardiovalve TMVR: 1, 2, 3…





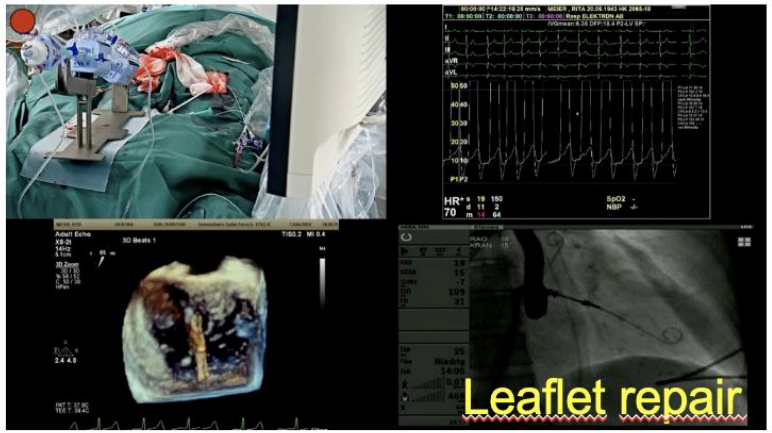


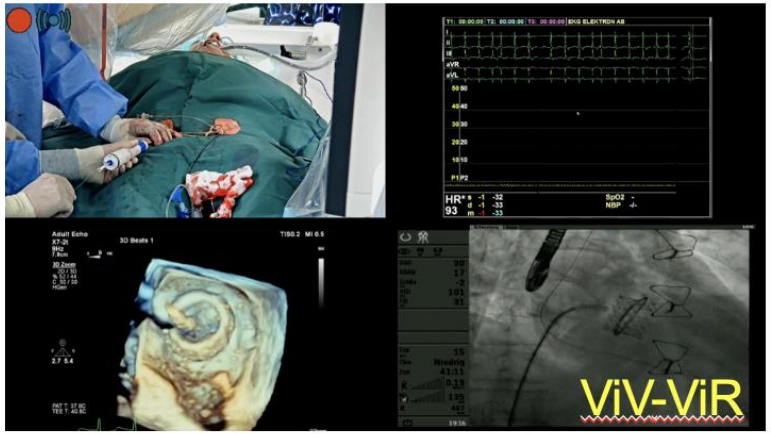


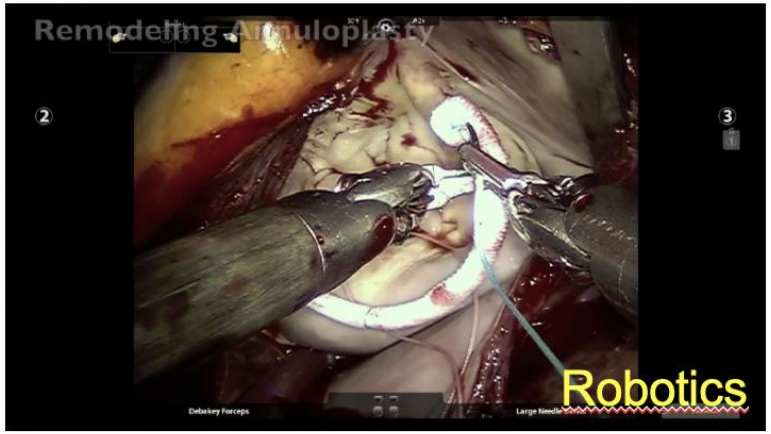


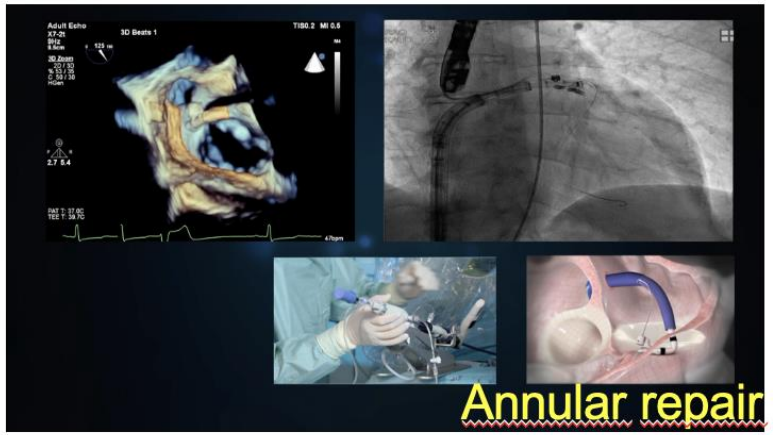
OSPEDALE
SAN RAFFAELE

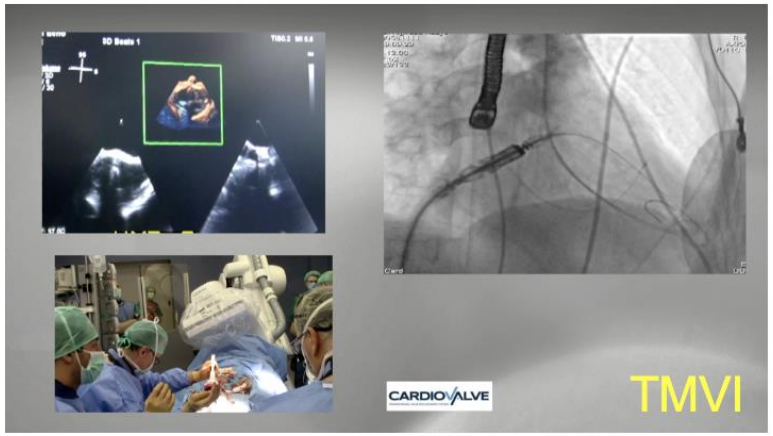
The full spectrum of mitral interventions

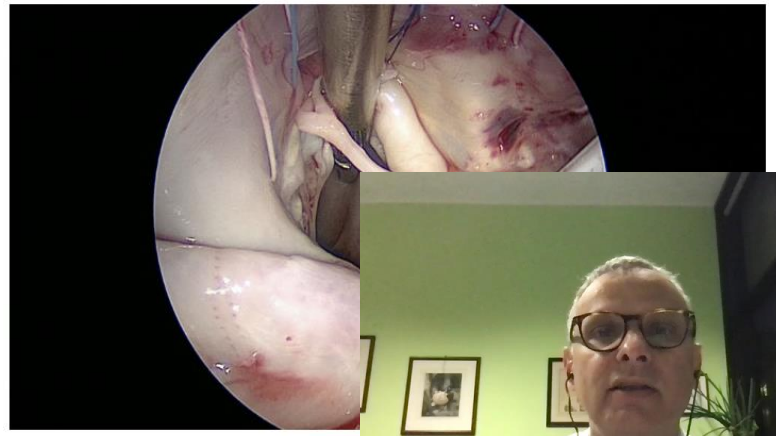




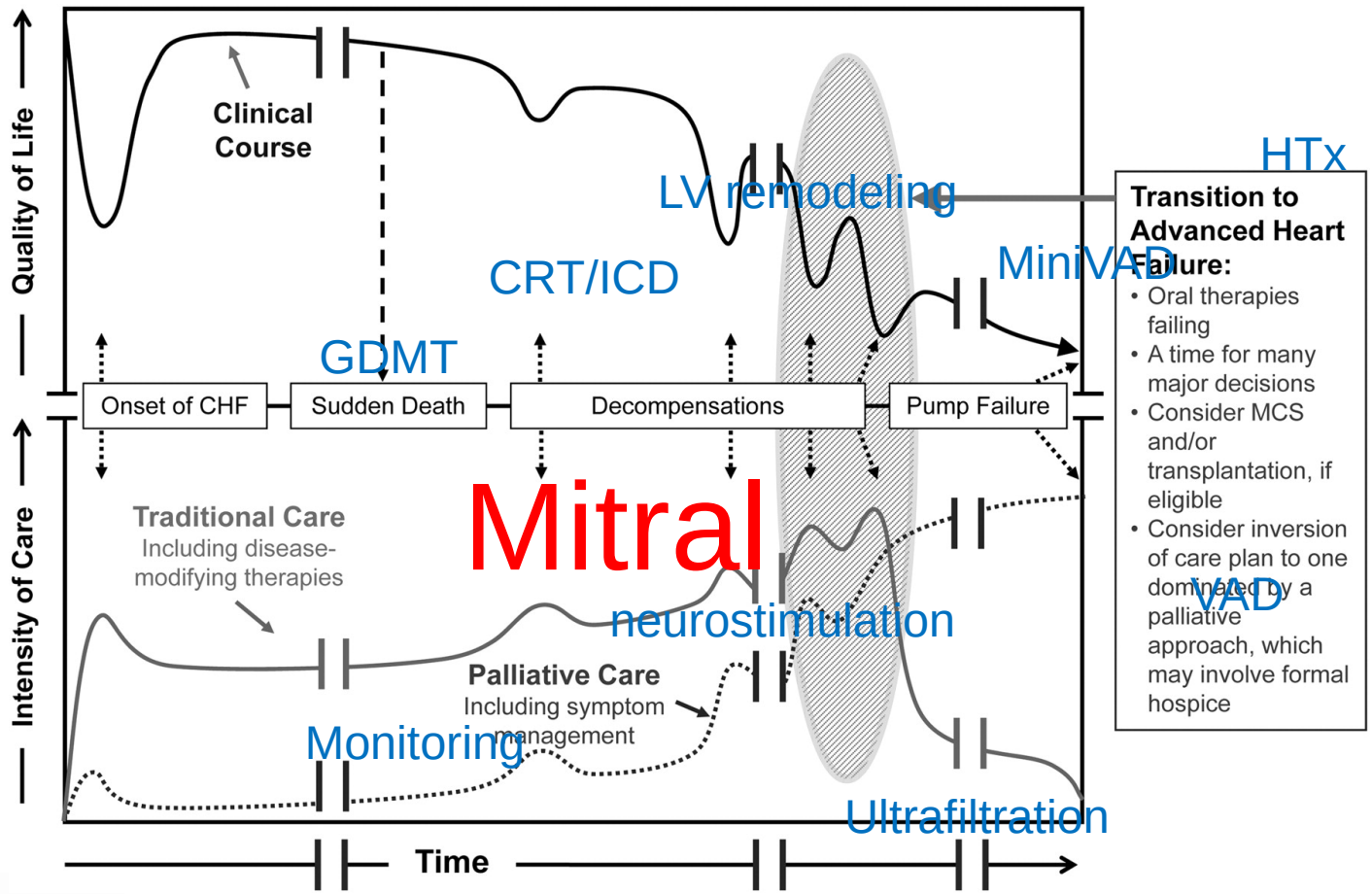








Continuum of care of patients with HF



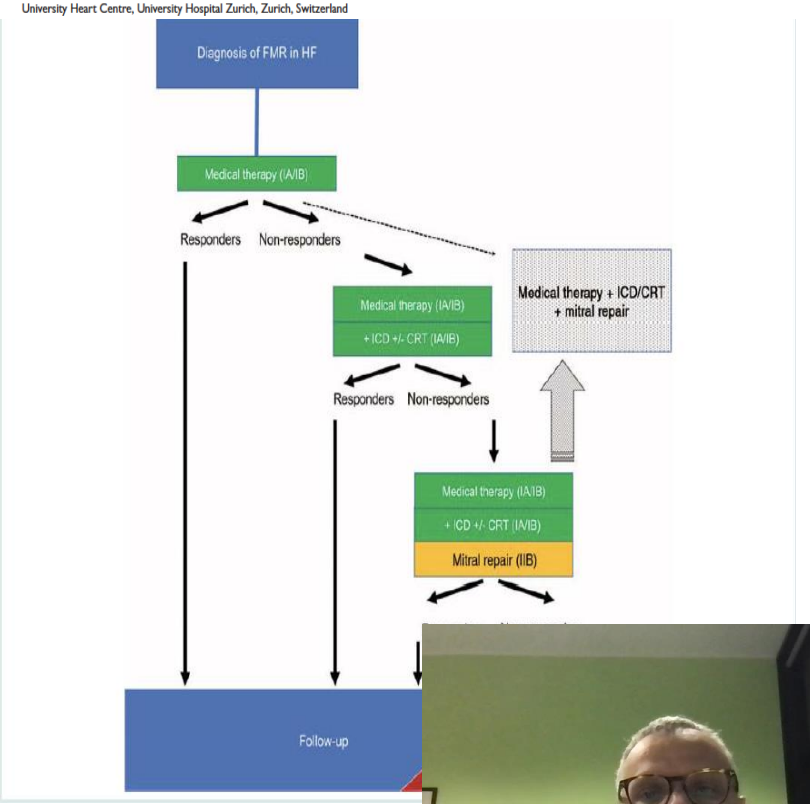
European Journal of Heart Failure (2017)
doi:10.1002/ejhf.951

EDITORIAL COMMENT

Mitral interventions in heart failure: time to deliver on the promise

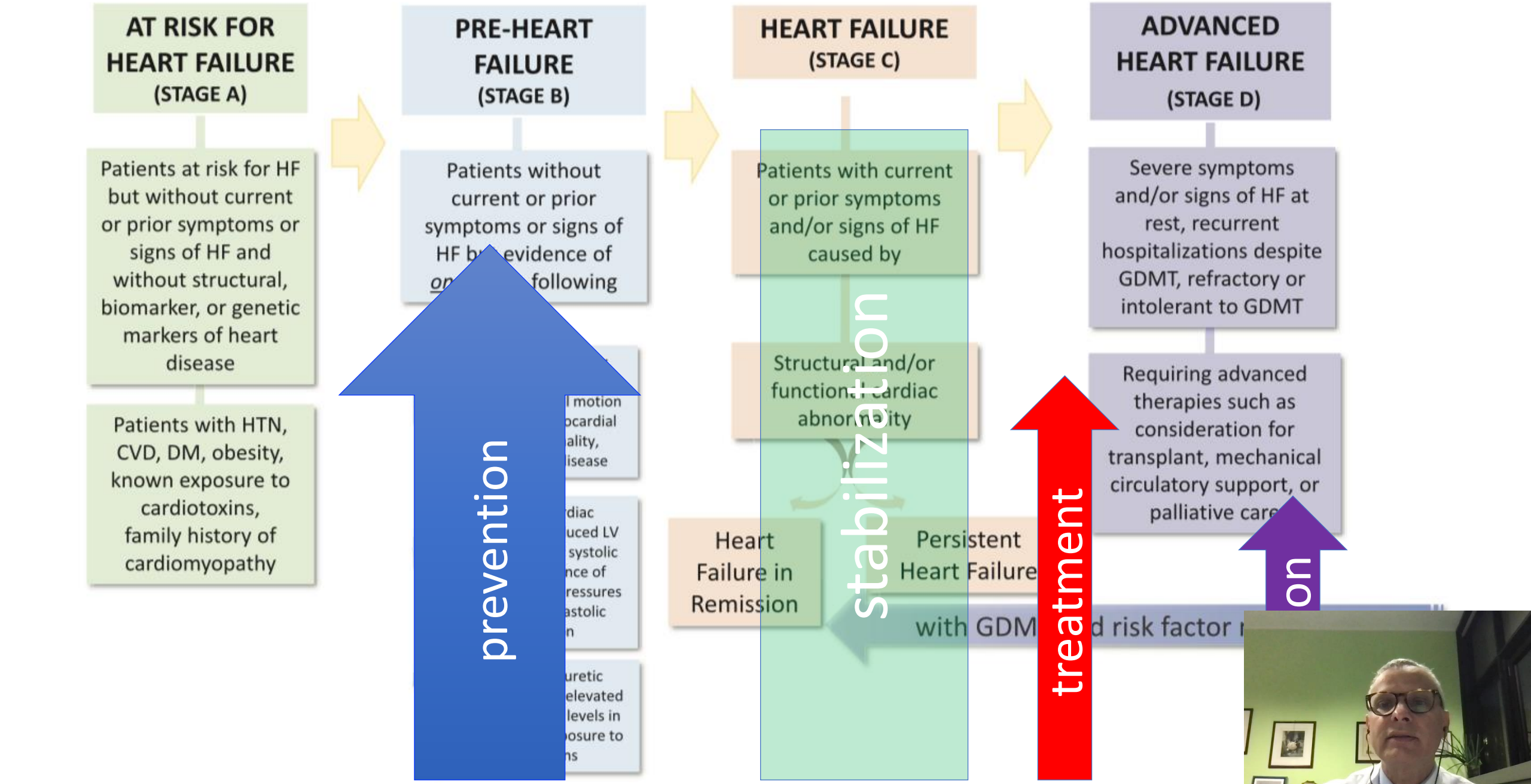
Francesco Maisano* and Frank Ruschitzka

University Heart Centre, University Hospital Zurich, Zurich, Switzerland



Mômdified from Allen et a

OSPEDALE SAN RAFFAELE


AT RISK FOR HEART FAILURE (STAGE A)
Patients at risk for HF but without current or prior symptoms or signs of HF and without structural, biomarker, or genetic markers of heart disease
Patients with HTN, CVD, DM, obesity, known exposure to cardiotoxins, family history of cardiomyopathy
PRE-HEART FAILURE (STAGE B)
Patients without current or prior symptoms or signs of HF
following
HEART FAILURE (STAGE C)
Patients with current or prior symptoms and/or signs of HF caused by
Structural and/or
ity
ADVANCED HEART FAILURE (STAGE D)
Severe symptoms and/or signs of HF at rest, recurrent hospitalizations despite GDMT, refractory or intolerant to GDMT
Requiring advanced therapies such as consideration for transplant, mechanical circulatory support, or palliative
prevention
stabilization
treatment
Heart Failure in Remission
Persistent Heart Failure
with GDM
risk factor

Clinical stabilization

(prevent Hospitalizations)

Improve quality of life and performance

Improve prognosis

Reverse remodeling

STOP the Disease

OSPEDALE SAN RAFFAELE

Patient-centred evaluation for intervention

Network	Heart Valve Centre	Heart Valve Clinic
Medical departments, referring cardiologists and primary care physicians	Centre of excellence in the treatment of VHD	Standardized organisation of care providing guideline-directed treatment of VHD

Clinical and imaging assessment	Symptoms related to VHD	Clinical evaluation, biomarkers, stress testing in asymptomatic patients
	Aetiology, lesion and mechanisms of VHD	Echocardiography (TTE and TOE), CCT
	Severity of VHD	Integrative echocardiography, CCT CMR, stress testing
	Life expectancy and quality of life	Age/estimated life expectancy, sex, country, comorbidities
Heart Team evaluation	Optimal local resources	Availability and expected outcomes of a given intervention at a given centre
	Benefits outweigh the risks	Operative risk, comorbidities, markers of progression in asymptomatic patients
	Treatment options	Individual anatomical and procedural factors
	Patient's goals	

Care

Treatment


Life-time
managemer