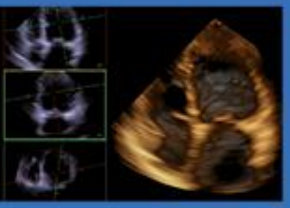


EuroValve
April 26-27, 2018

Valvular heart failure

prevalence & treatment approaches

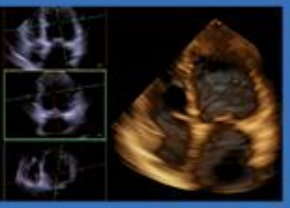
Madalina Garbi MD MA FRCP

Consultant Cardiologist

King's College Hospital NHS Foundation Trust

KING'S HEALTH PARTNERS

www.eurovalvecongress.com



EuroValve

April 26-27, 2018

I have **no financial relationships** to disclose

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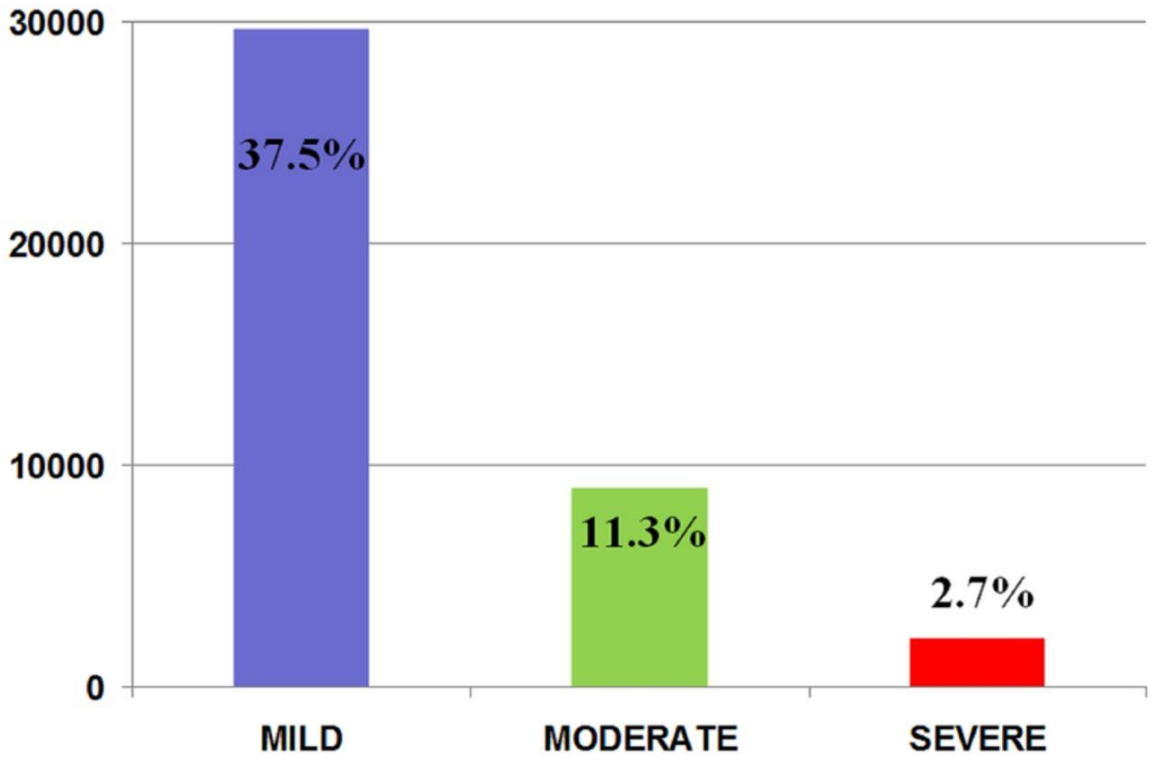
Valve disease prevalence in HF

12.5% MR / 10% AS

LVSD 3%mild, 4%moderate, 5%severe

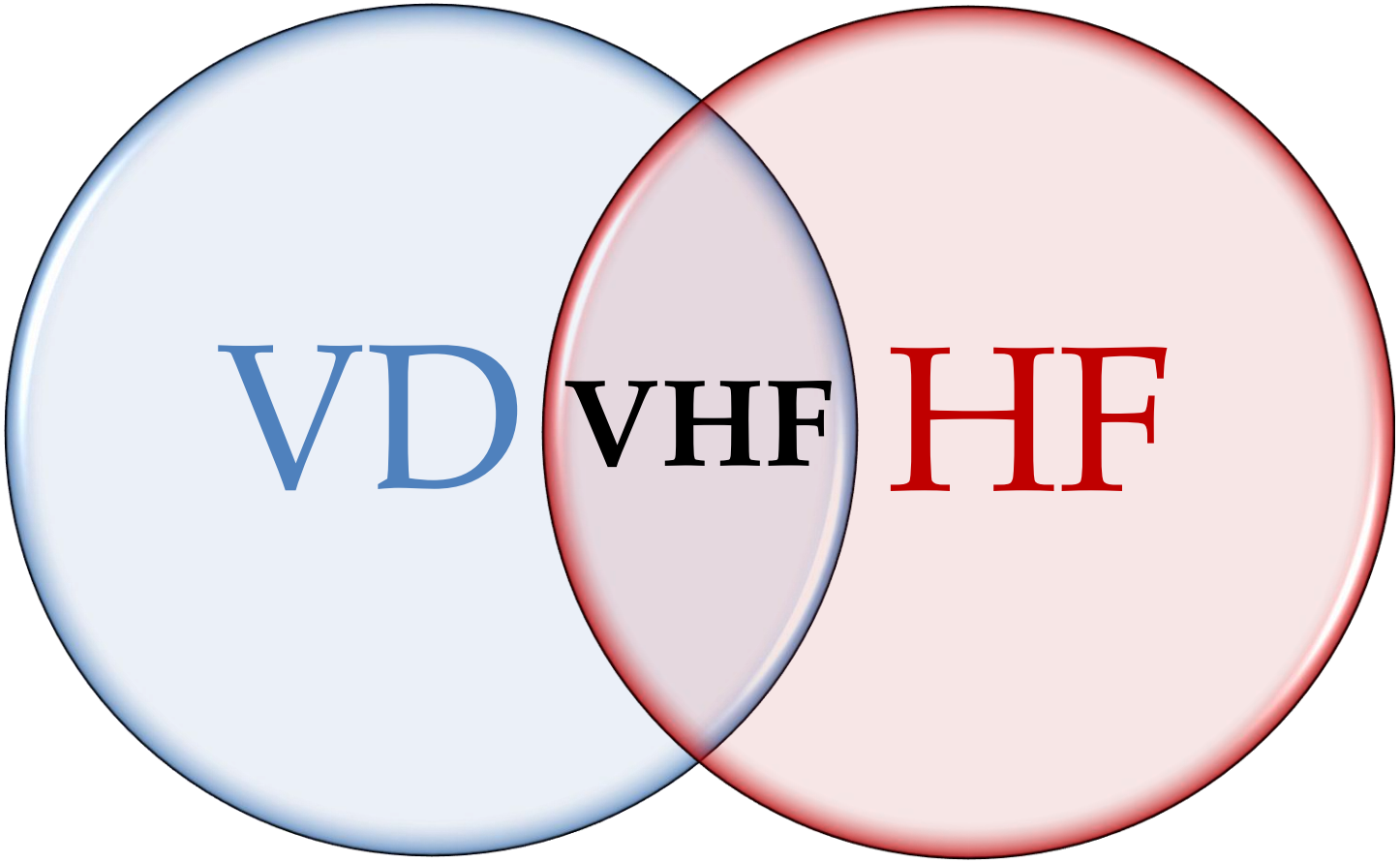


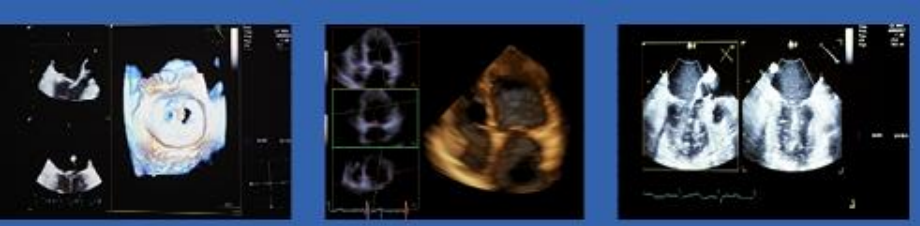
79 043 patients with HF symptoms, signs & elevated BNP

Marciniak et al, BMJ Open 2017

VHF

= VD with HF symptoms, signs, serum biomarkers





HF ↔ VHD

VHD ← HF

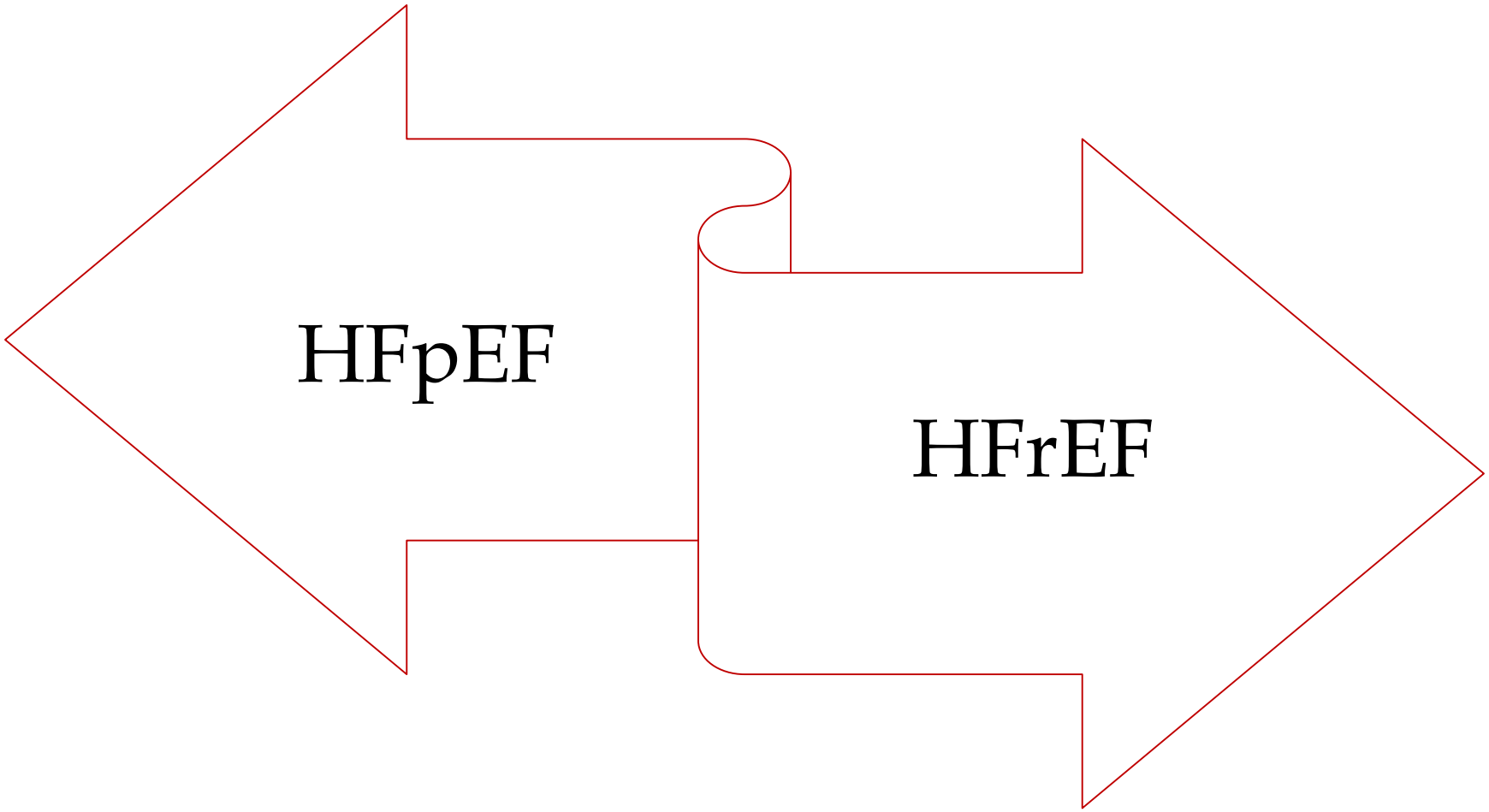
Secondary MR / TR

VHD → HF

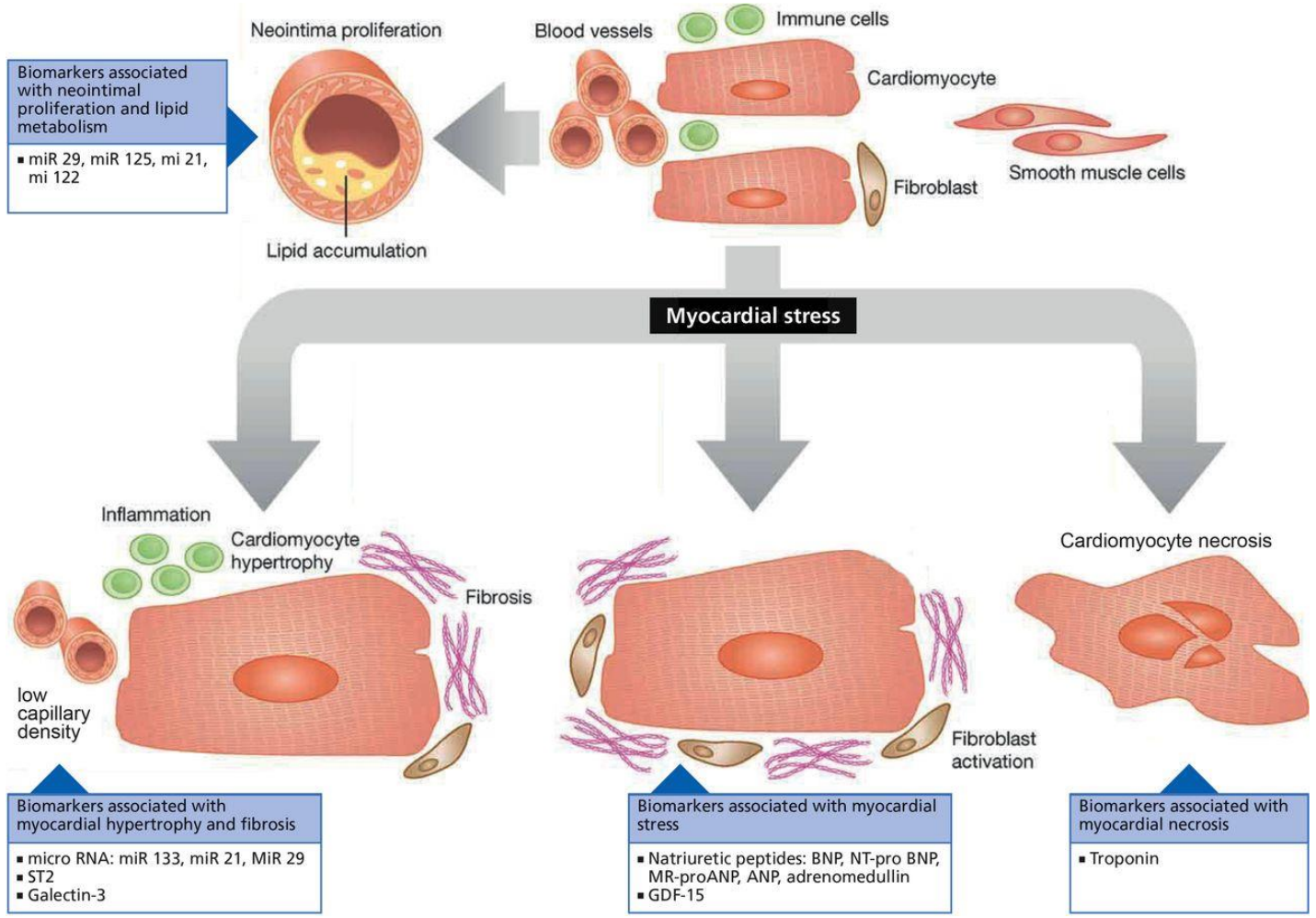
AS / AR / Primary MR / TR

VHF

disease of the valve and of the ventricle

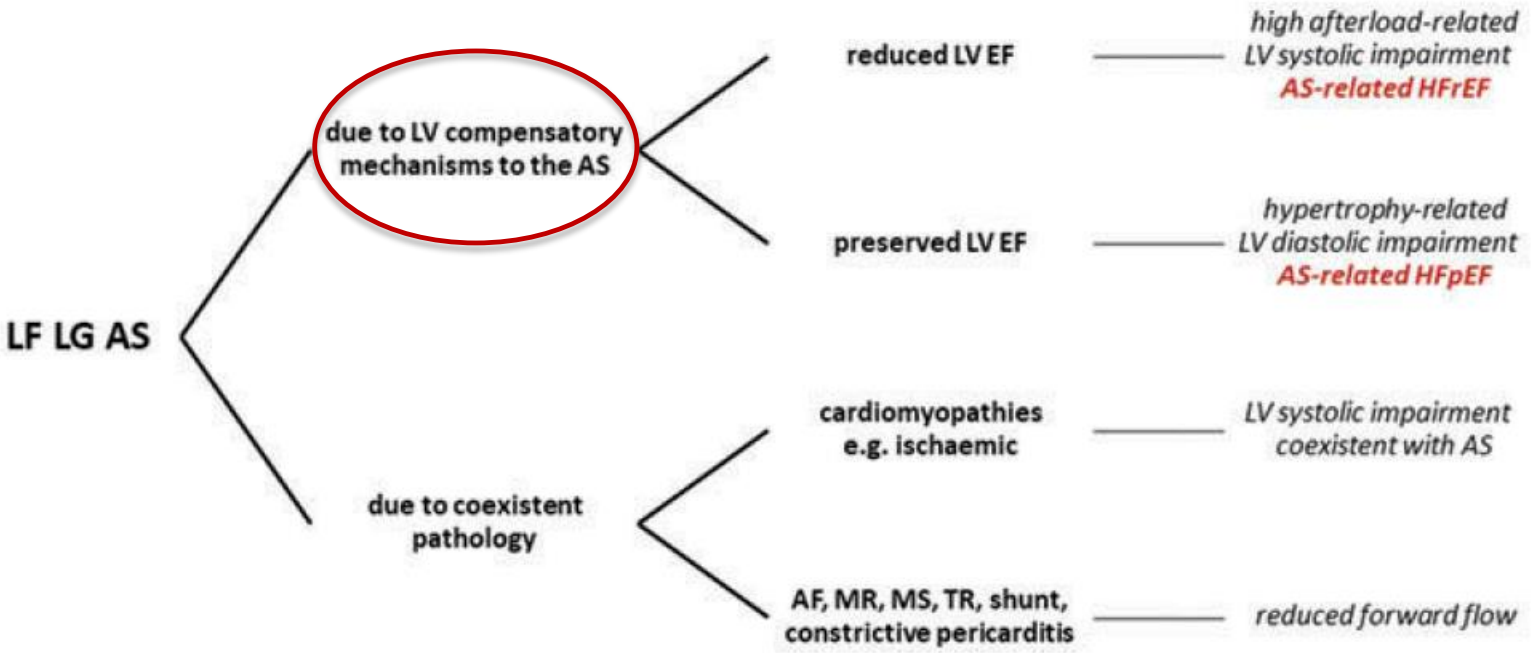


Serum biomarkers in VHD ? predicting VHF



Syed et al. Heart 2018

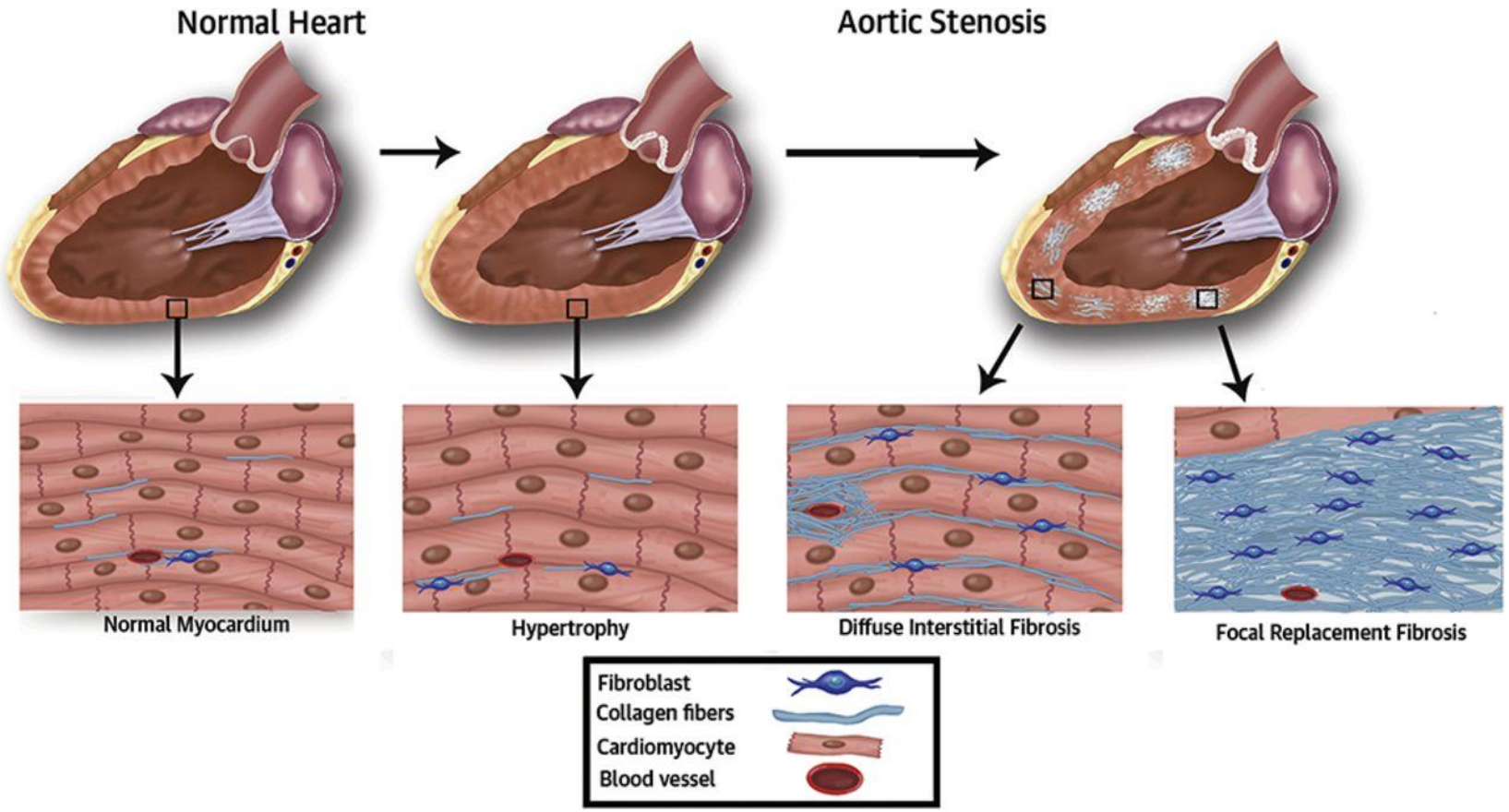
AS-related VHF



Garbi et al, Structural Heart, 2017

AS-related HFpEF

LVH + myocardial fibrosis → diastolic dysfunction → HFpEF

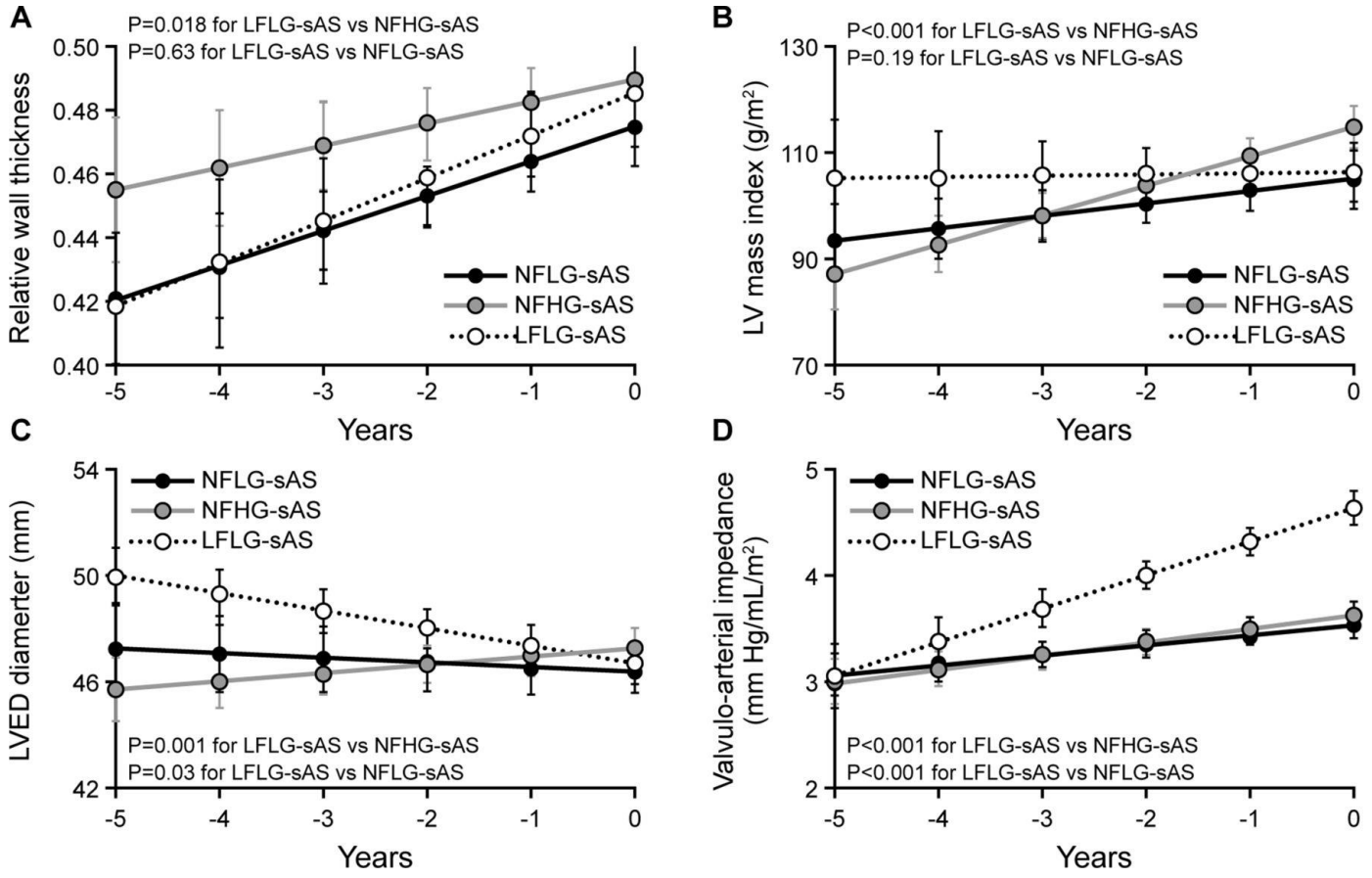


Picture from Kampaktsis et al. Heart 2017

Paradoxical LF LG AS (HFpEF) = distinct entity

serial LV changes parallel with AV changes, not a late stage of disease

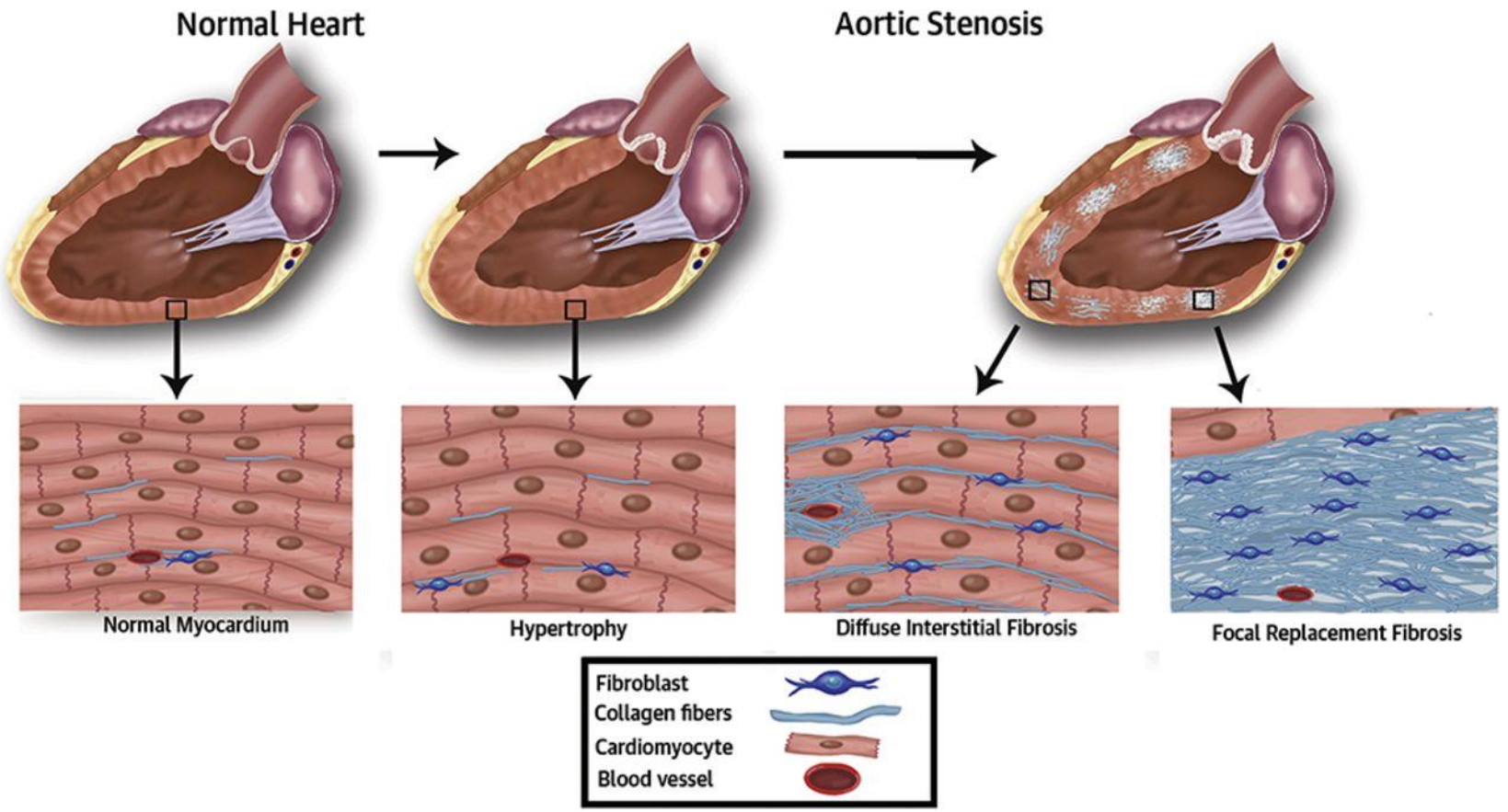
20-25% AS patients



Dahl et al. (Pellikka) Heart 2015

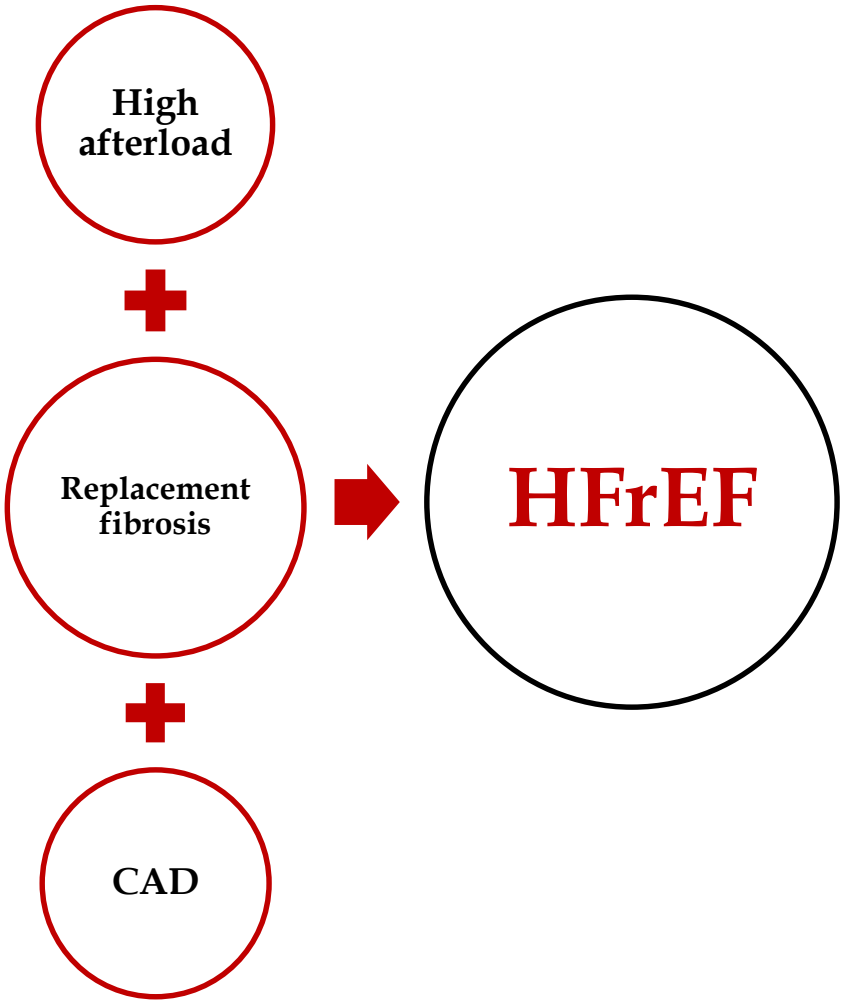
AS-related HFrEF

replacement fibrosis → reduction of contractile myocardial mass → HFrEF



Picture from Kampaktsis et al. Heart 2017

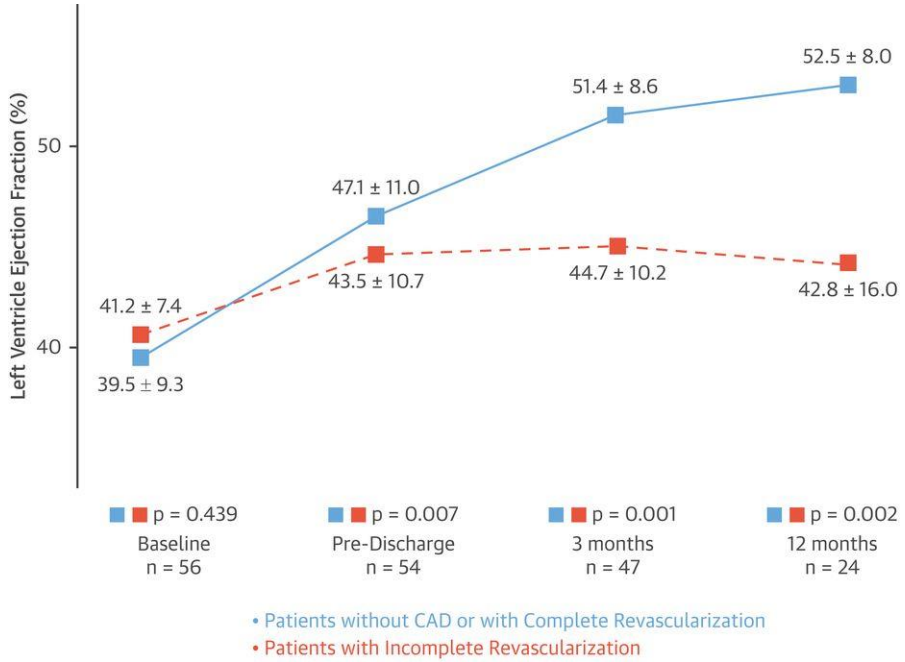
AS-related HFrEF



AS-related HFrEF

EF response to (T)AVR

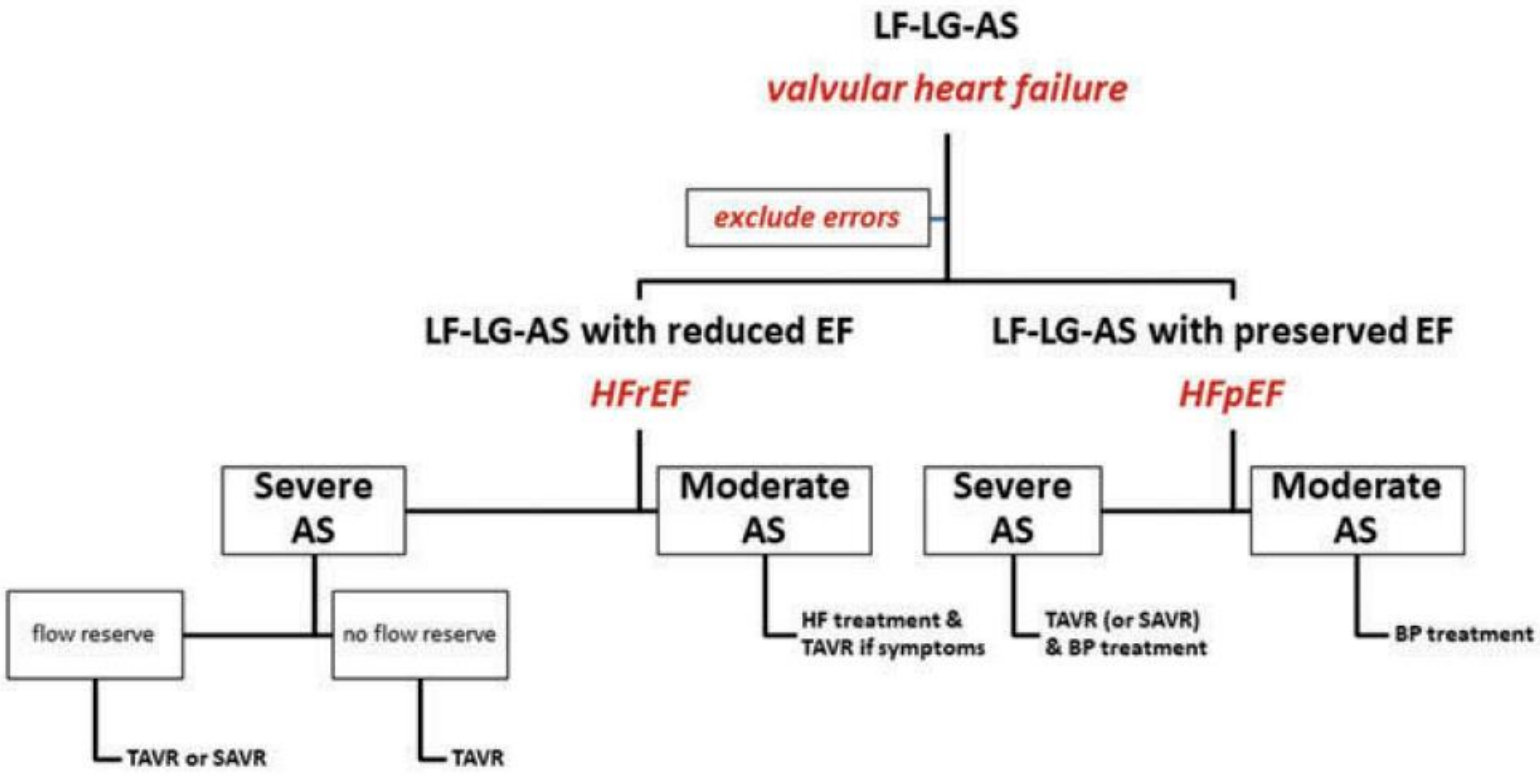
Depends on revascularisation of co-existent CAD & on severity of fibrosis



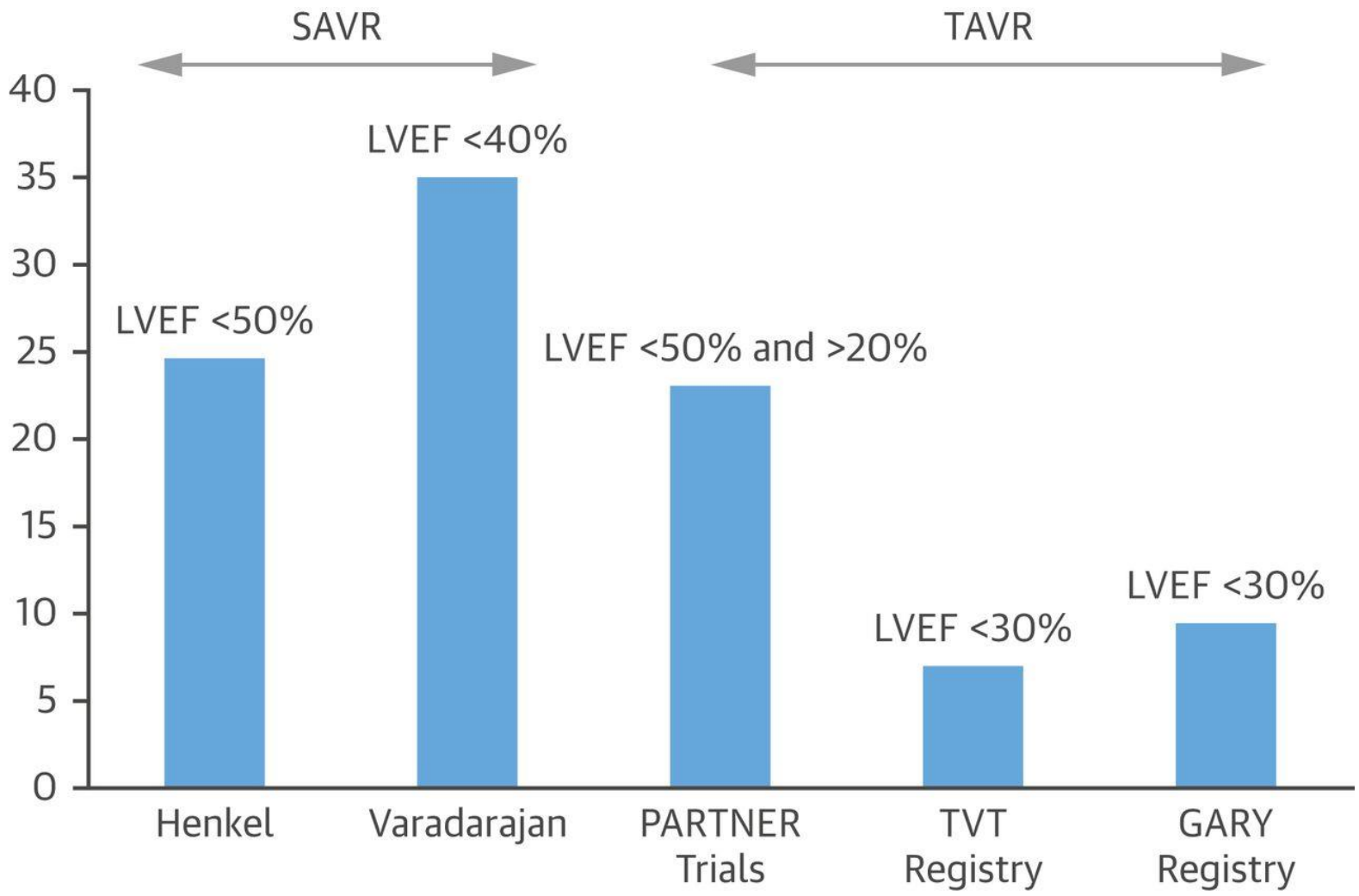
Steiner et al. JACC 2017

Adapted from Barone-Rochet et al. & Freixa et al.

Management of AS-related **VHF**

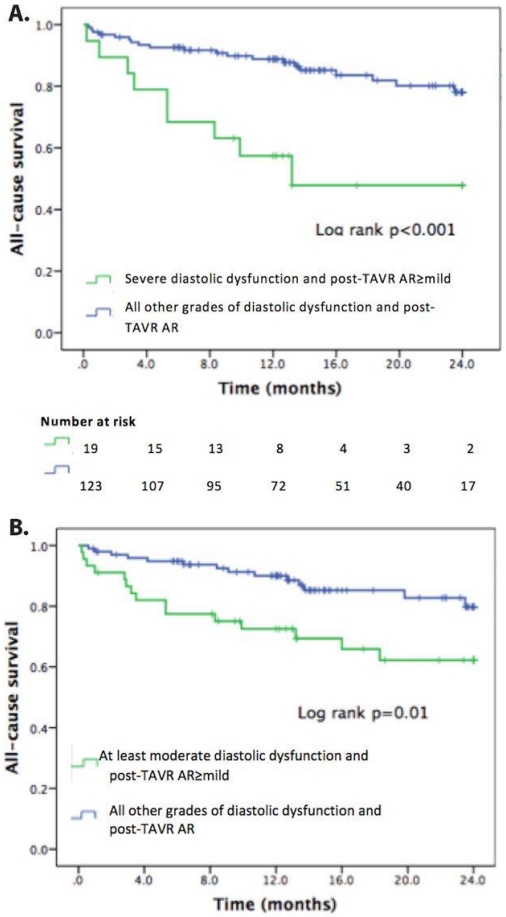


Garbi et al. Structural Heart, 2017



Steiner et al. JACC 2017

Survival impact of diastolic dysfunction (HFpEF) post (T)AVR



Kampaktsis et al. Heart 2017

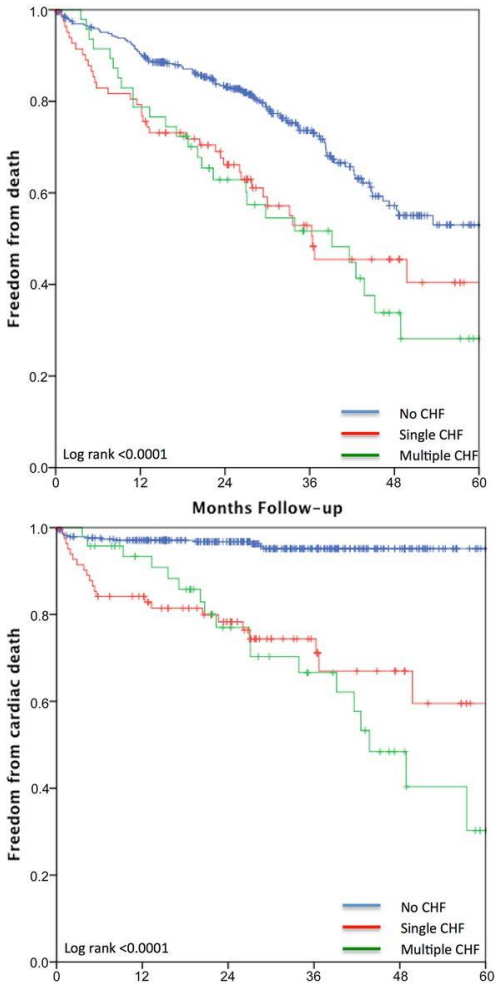
We need better timing!

- When HFpEF develops
  - LVH
  - Fibrosis
- In diastolic dysfunction
  - Diastolic SE

Minimise risk of AR!

- Select morphology
- Use TOE guidance

Survival impact of congestive HF (*HFrEF) post (T)AVR



Durand et al. JACC CIN 2017

Optimise HF meds post (T)AVR

HF ↔ MR

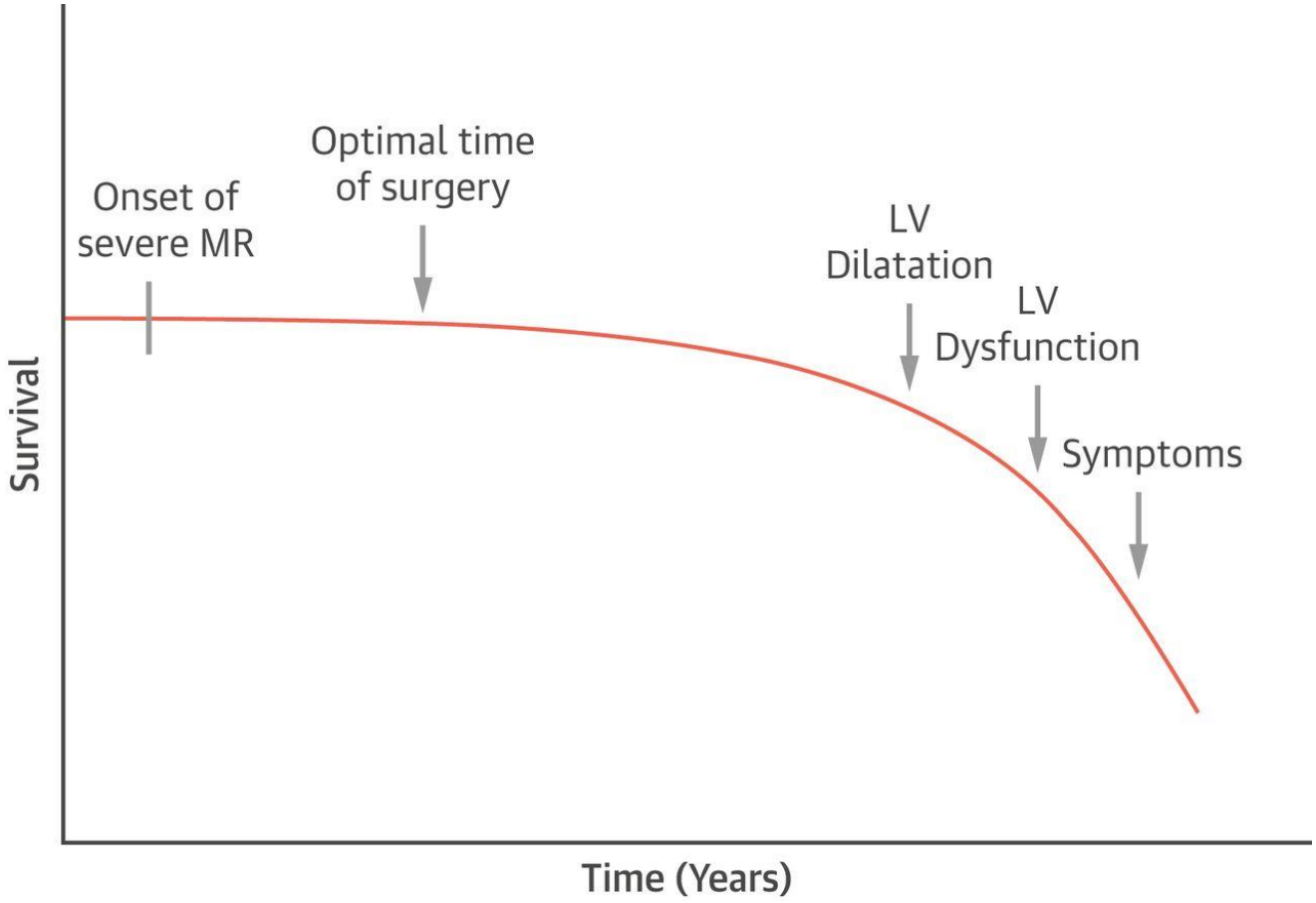
MR ← HF

SECONDARY MR

MR → HF

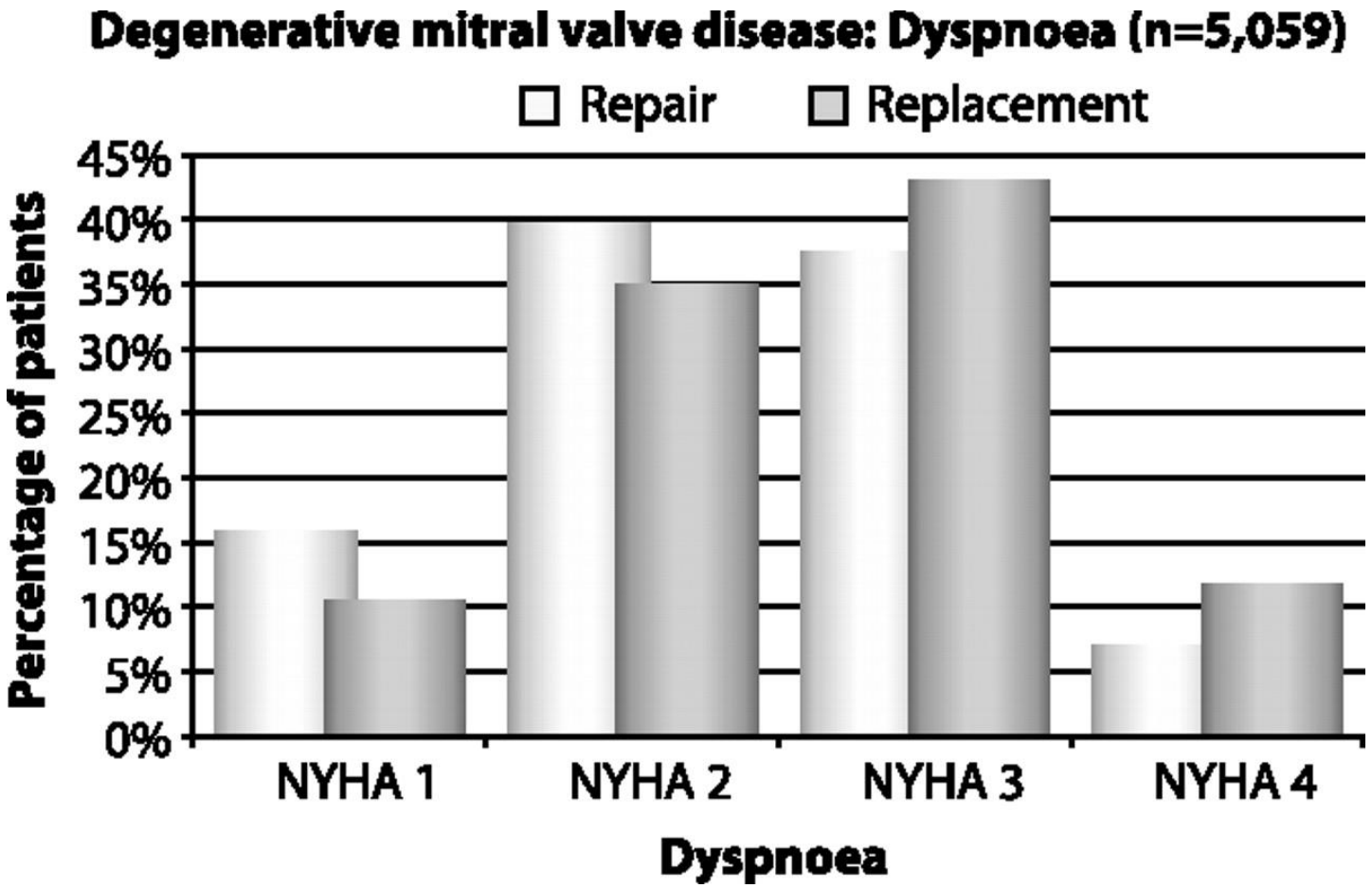
PRIMARY MR

Primary MR natural history = progression to HF



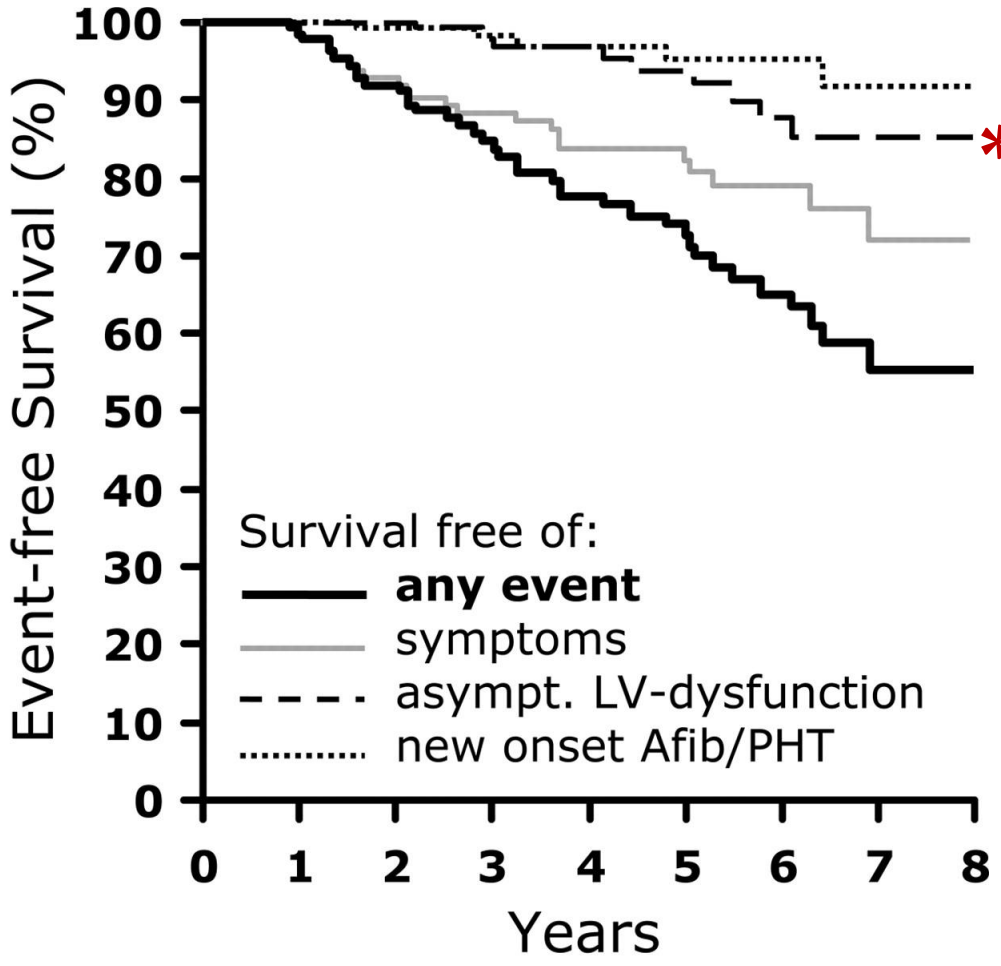
El Sabbagh et al. JACC CVI 2018

Primary MR - **HF symptoms at diagnosis**



J L d'Arcy et al. Heart 2011;97:91-93

Primary MR – development of LVSD

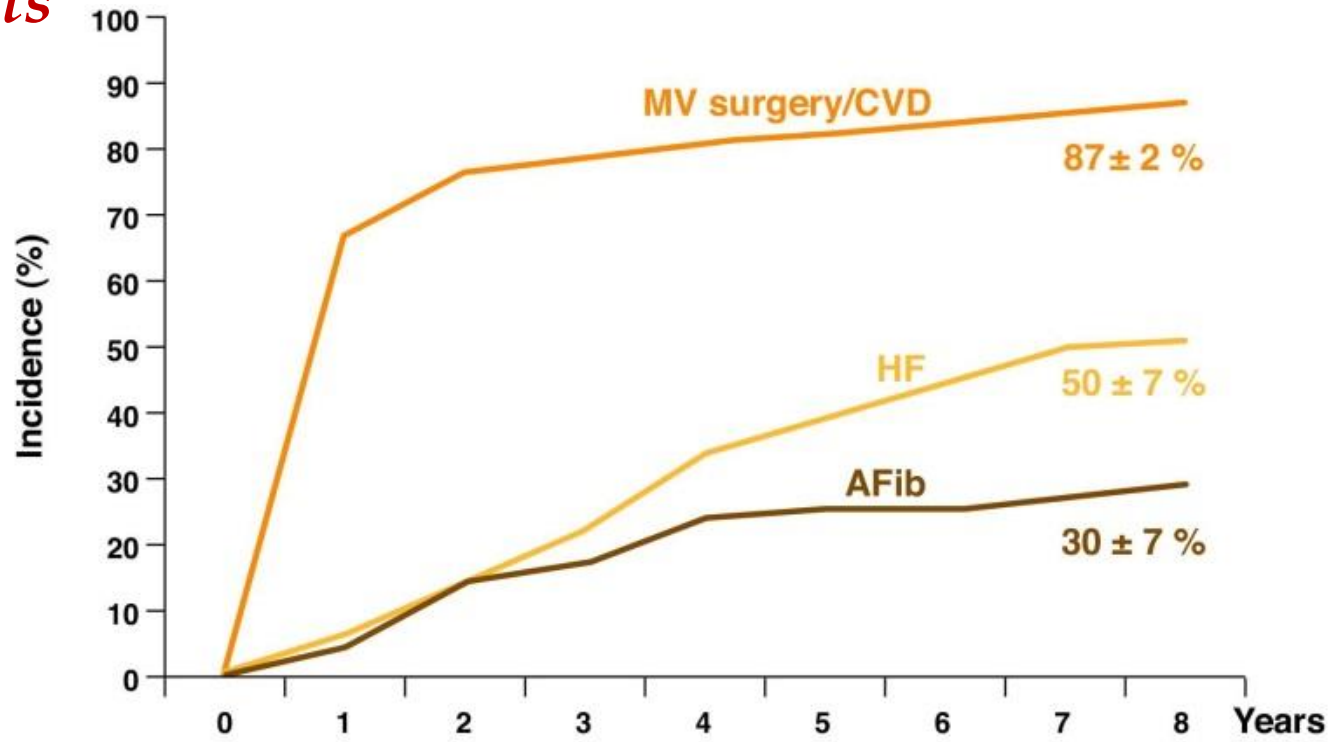


129 patients

Watchful waiting **Rosenhek et al. Circ, 2006**

Primary MR – development of **HF**

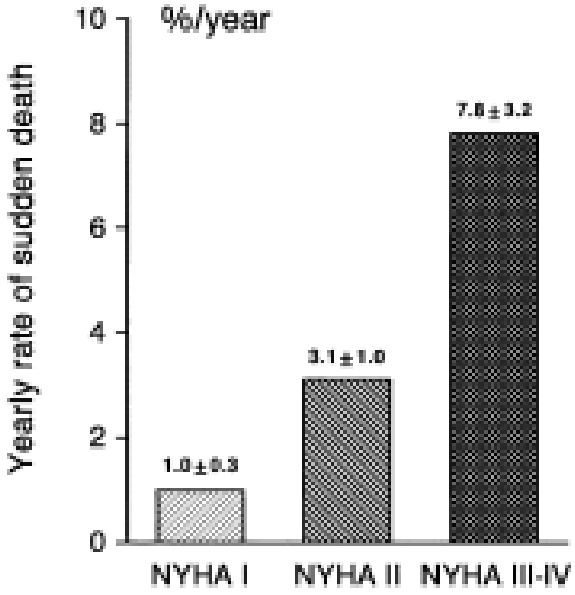
394 patients

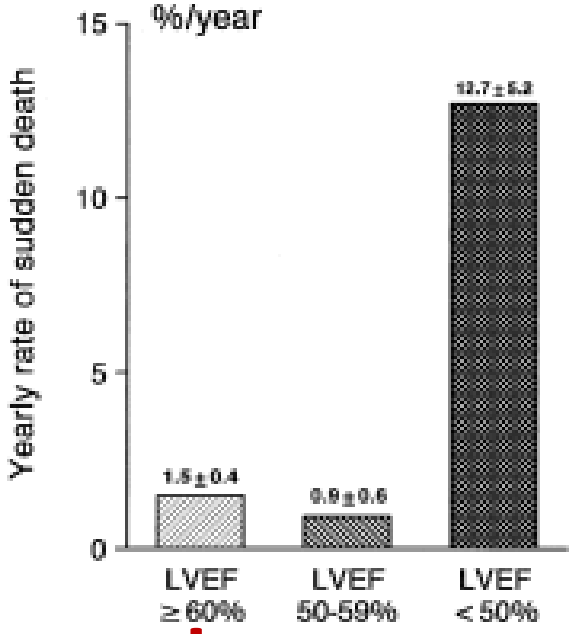


Patients at risk (n):	0	1	2	3	4	5	6	7	8
MV surgery/CVD	115	82	59	47	34	29	19	13	
HF	112	75	55	37	27	23	15	12	
Afib	97	68	47	36	28	24	16	11	

Grigioni et al for MIDA Registry, JACC CVI 2008

Primary MR – **HF** related sudden death

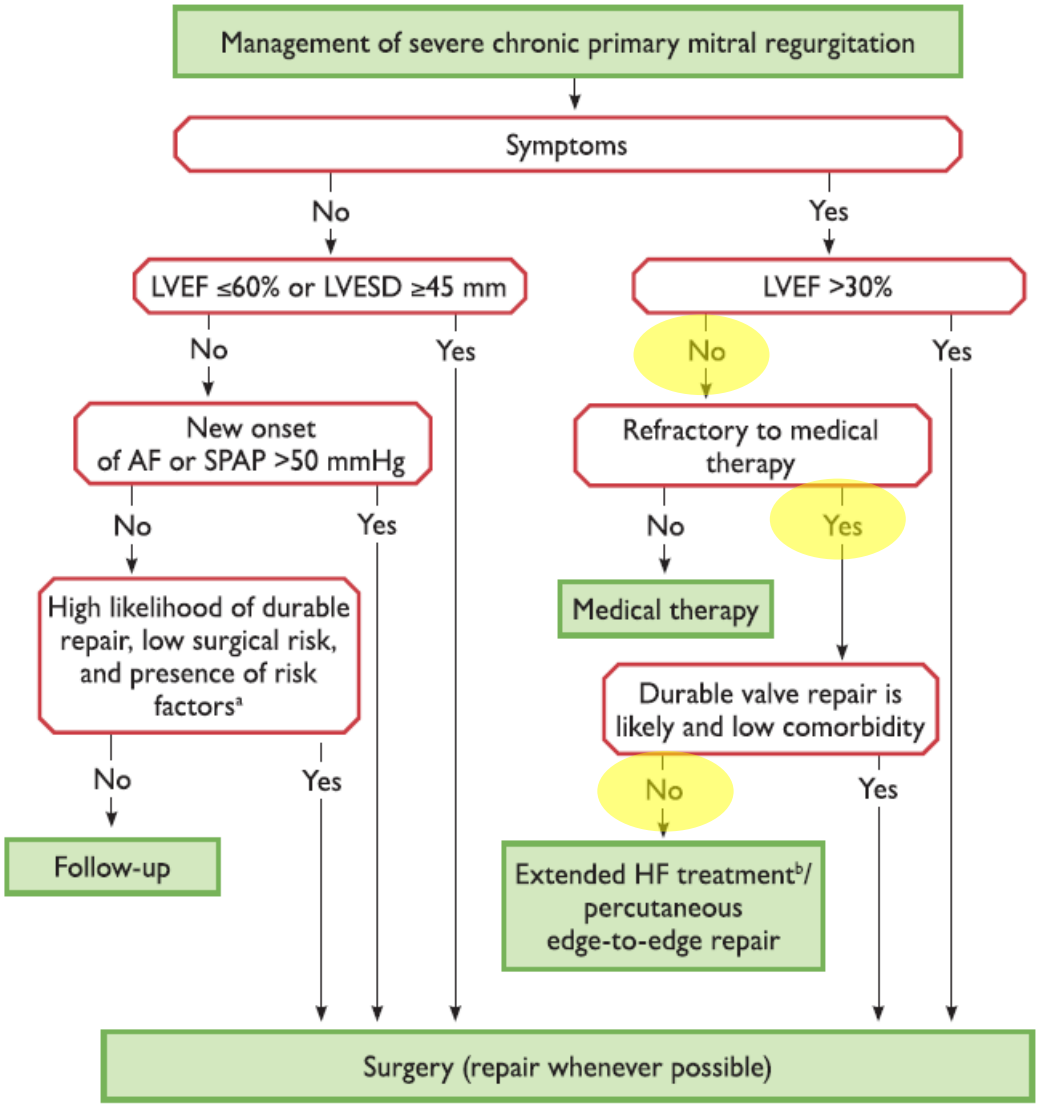




? in sedentary patients

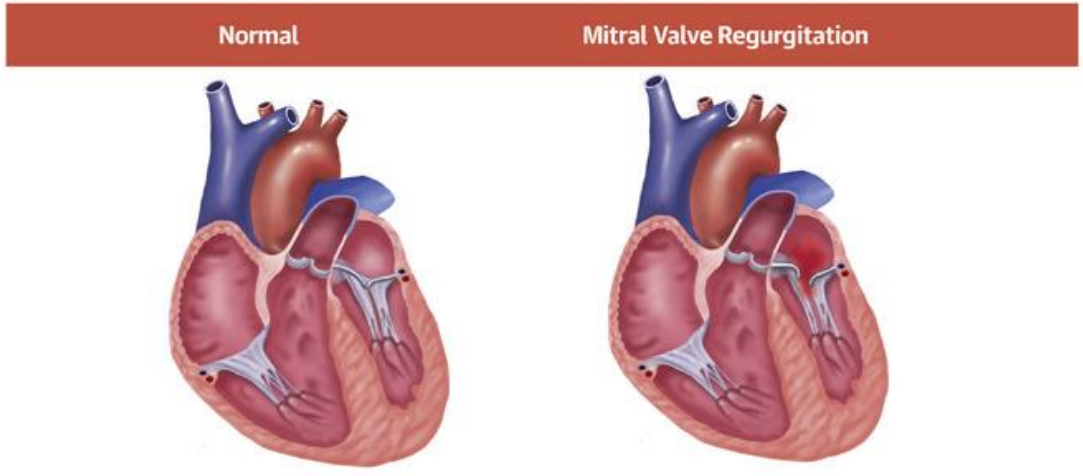
not negligible

Grigioni et al, JACC 1999



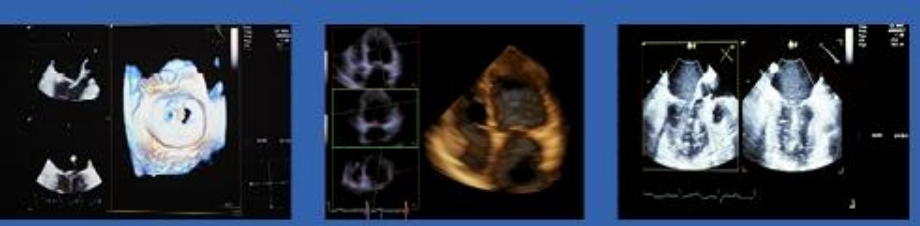
VHD Guidelines 2017

Surgery **vs** MitraClip
Primary **vs** Secondary MR



Etiology	MitraClip	Surgery	p Value for Interaction
1 Year			
Secondary MR	26/48 (54.2%)	12/24 (50.0%)	0.02
Primary MR	74/133 (55.6%)	53/65 (81.5%)	
4 Years			
Secondary MR	15/44 (34.1%)	5/22 (22.7%)	0.02
Primary MR	49/117 (41.9%)	34/41 (66.7%)	

Asgar, A.W. et al. J Am Coll Cardiol. 2015; 65(12):1231-48.



Ischaemic secondary MR

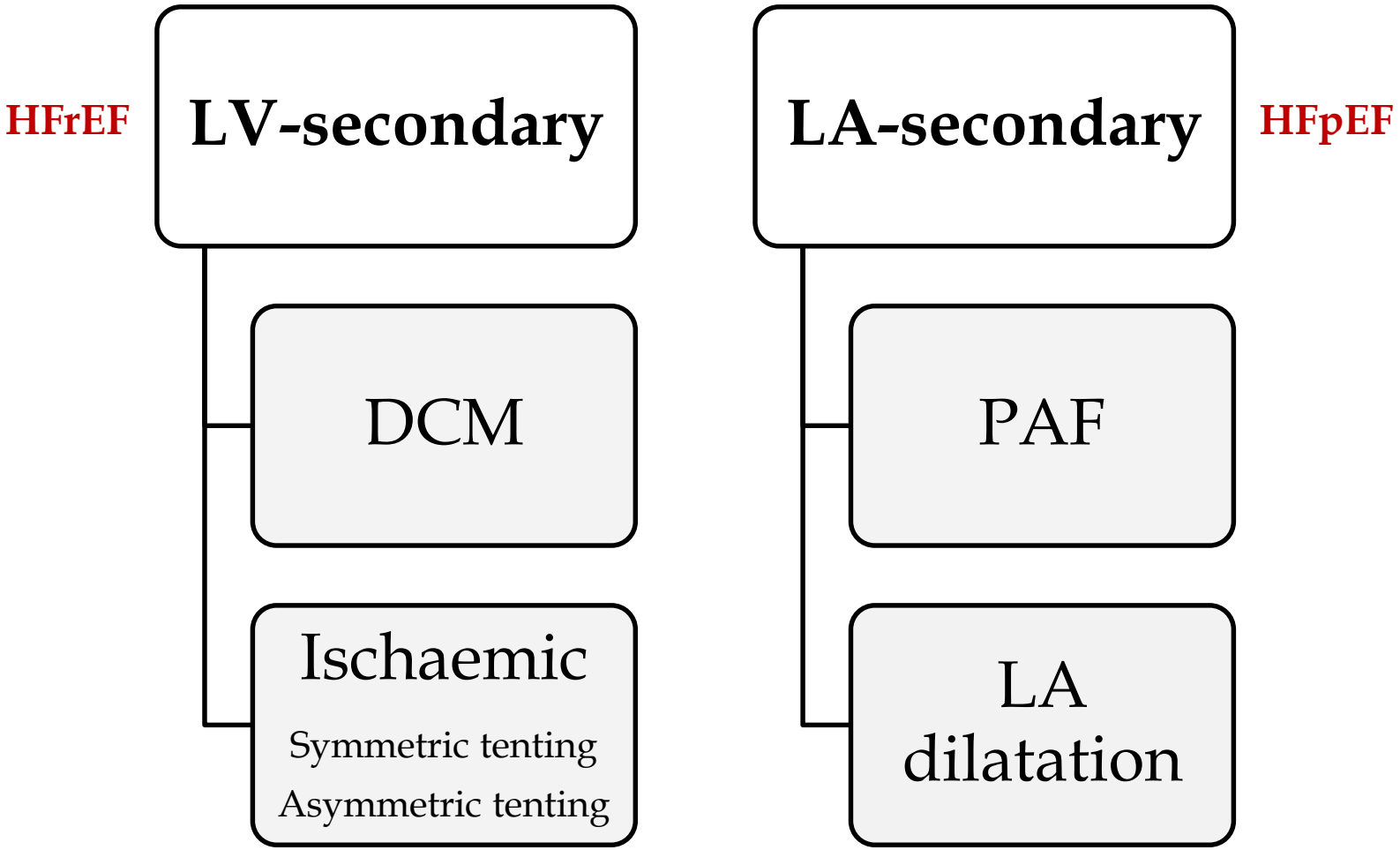
*basal-posterior aneurysm

Table 3. Selected 1-Year Outcomes of MV Repair Versus Replacement for Severe Ischemic MR (From the Cardiothoracic Surgical Trials Network)

	MV Repair (n = 126)	MV Replacement (n = 125)	p Value
LVESVI (ml/m^2; primary endpoint)	54.6 ± 25.0	60.7 ± 31.5	0.18*
Recurrent moderate/severe MR	32.6%	2.3%	<0.001
Moderate	28.4%	2.3%	—
Severe	4.2%	0%	—
Death	14.3%	17.6%	0.45
MV reoperation	2.4%	0%	0.25
Major adverse cardiac events†	32.5%	33.6%	0.86
New York Heart Association functional class III/IV	9.0%	14.0%	0.28
Minnesota Living With Heart Failure score	24.5 ± 23.1	19.6 ± 19.4	0.12

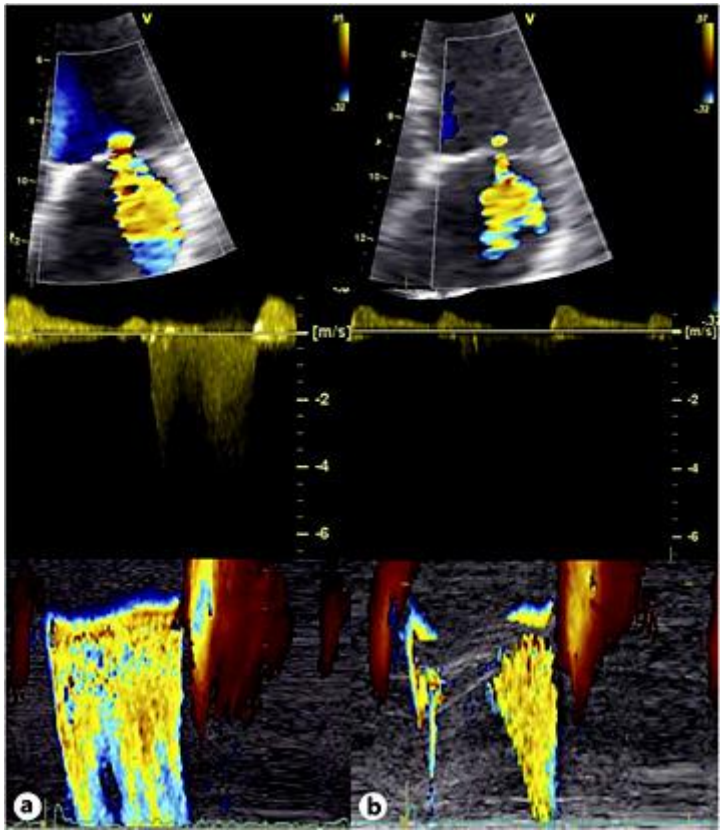
Asgar et al, JACC 2015 / Acker et al CTSN Investigators, NEJM 2014

Secondary MR

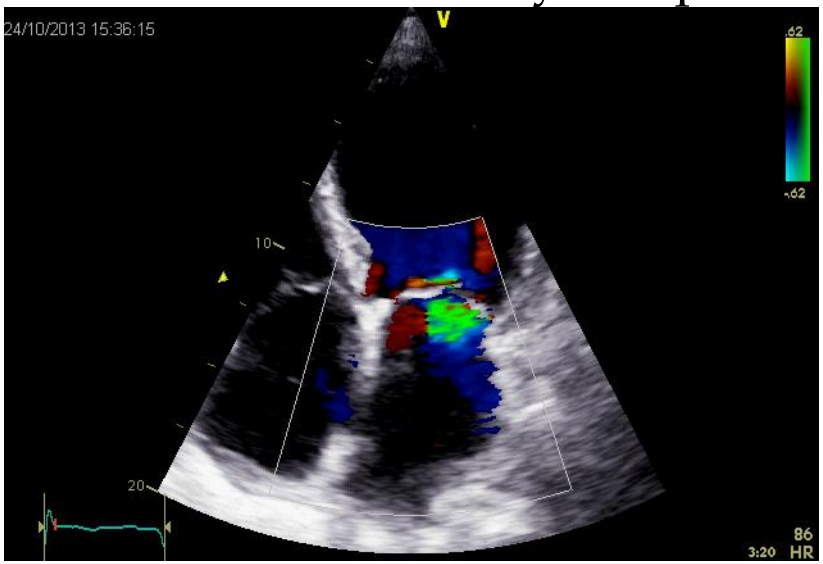


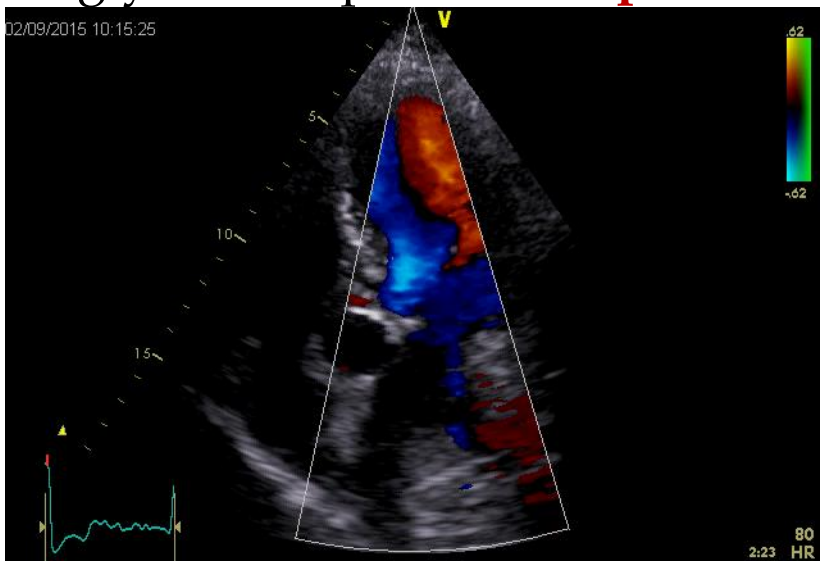
Secondary MR

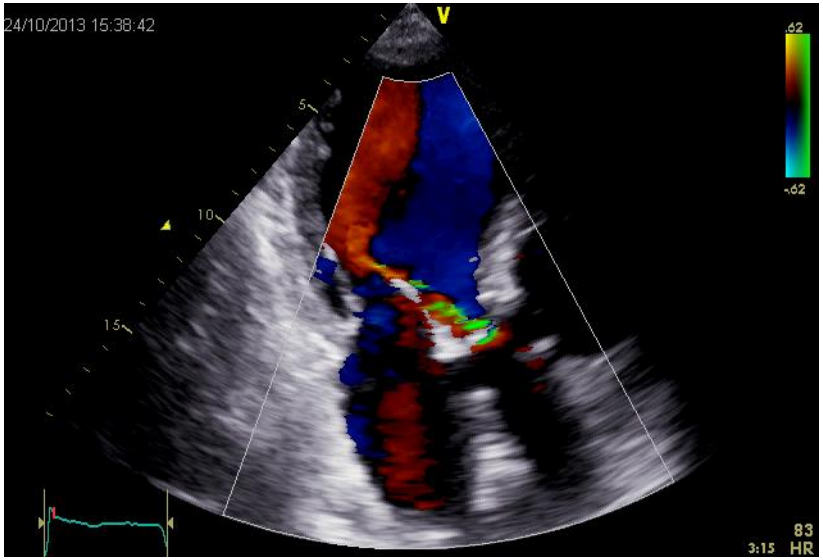
consequence of HF → **responds to HF treatment**

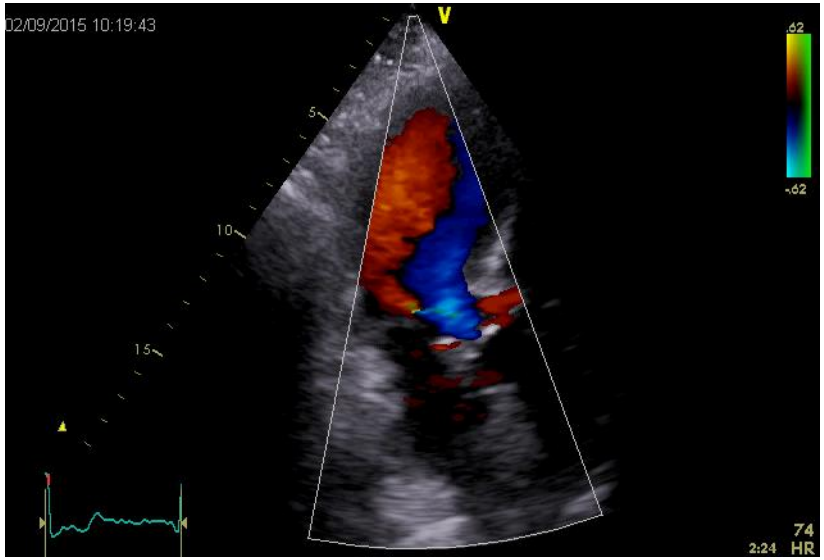


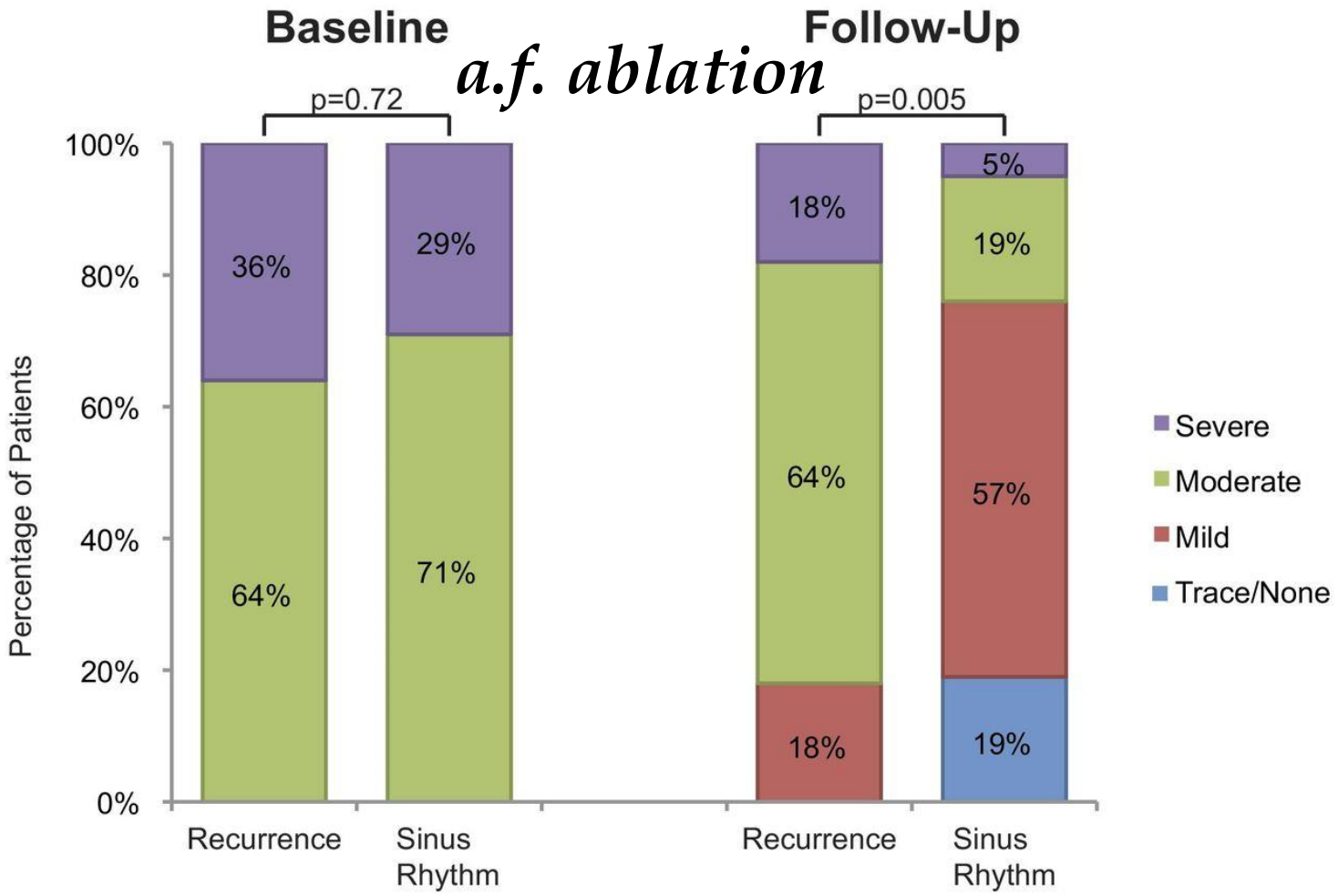
*MR with atrial secondary component - strongly load dependent – **"peekaboo"**











Gertz et al, JACC 2011

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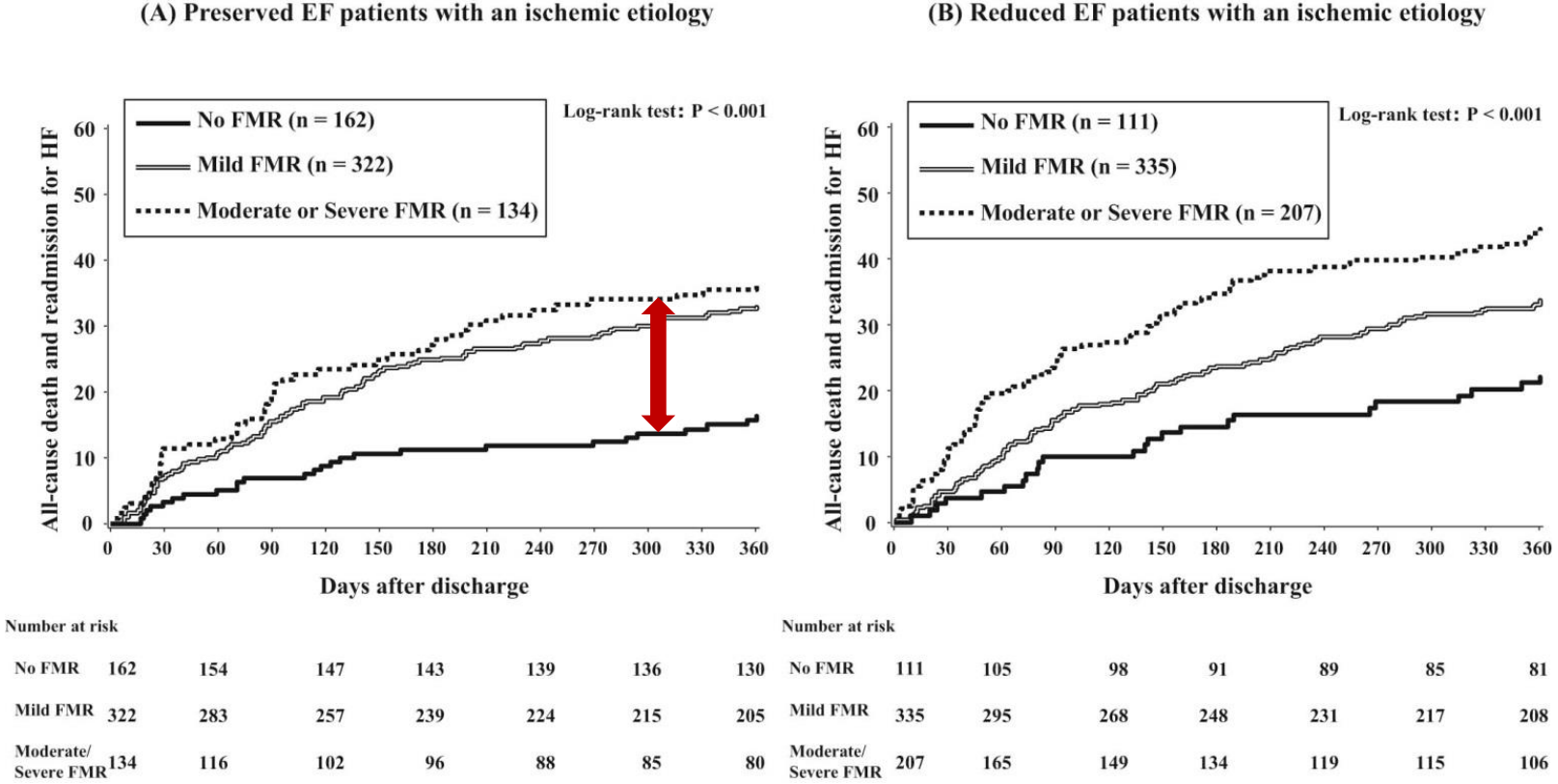
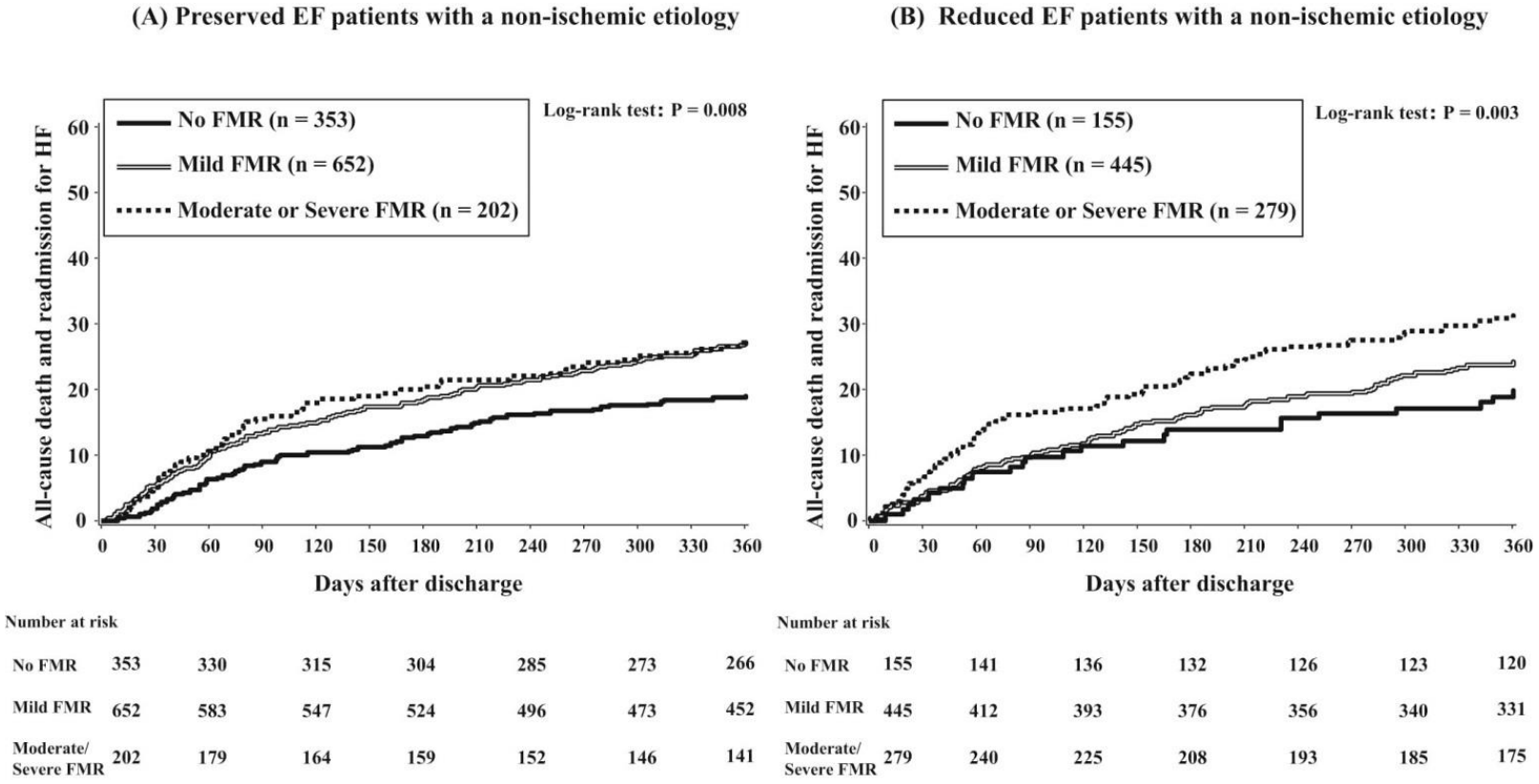
Secondary MR in **HFpEF**

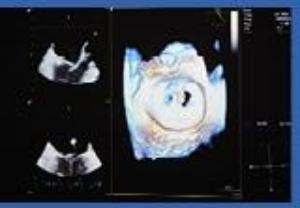
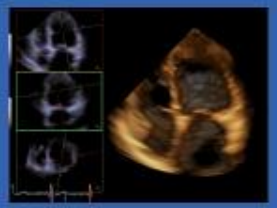


Kajimoto et al, Am J Cardiol 2017

Secondary MR in **HFpEF**



Kajimoto et al, Am J Cardiol 2017

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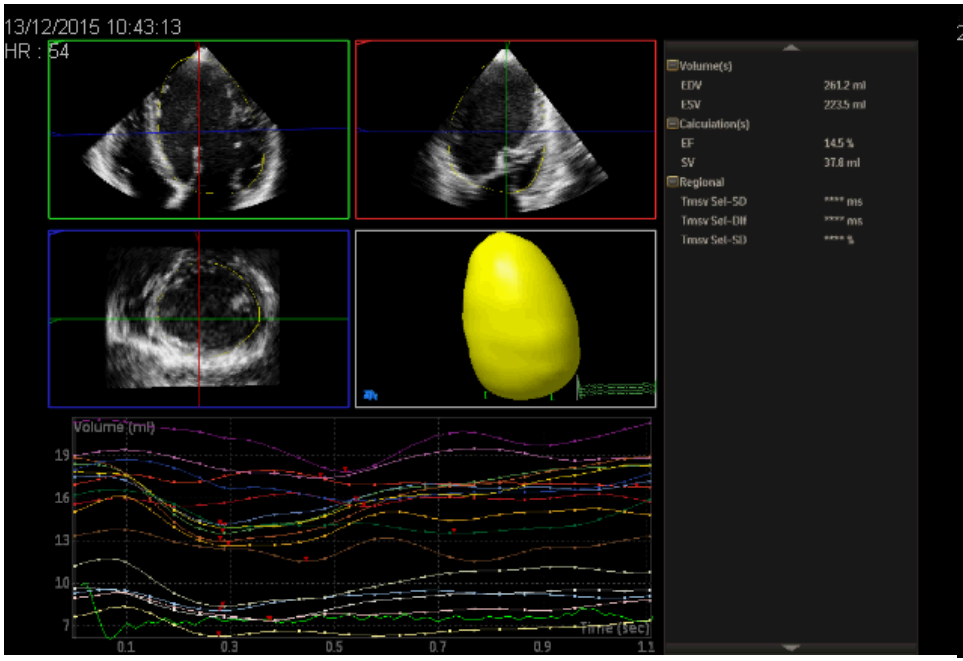
Secondary MR in **HFrEF** - prevalence

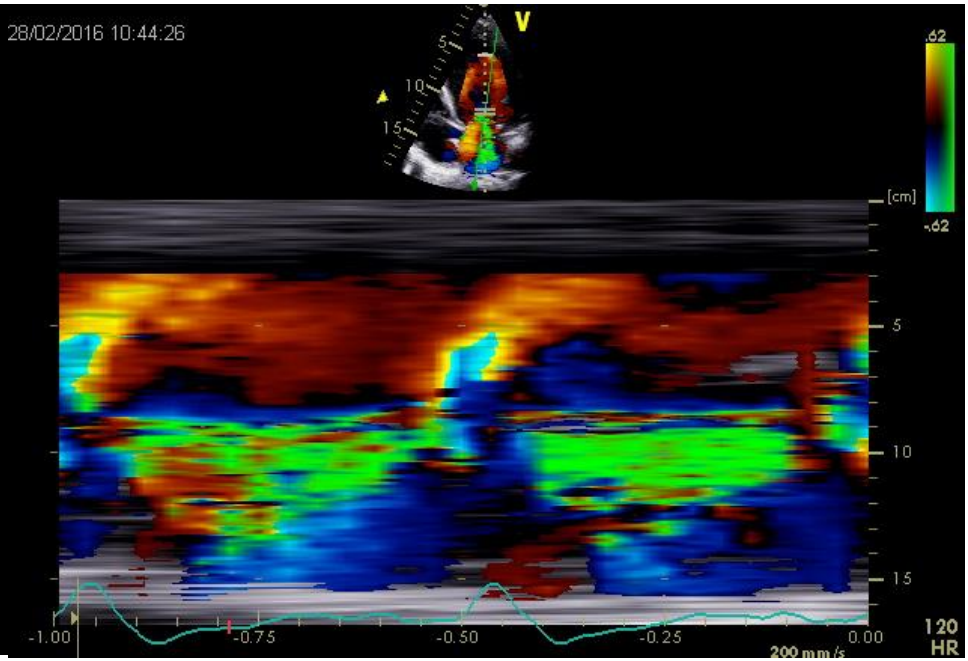
		N	Prevalence MR
Yiu et al	*Circulation* 2000	128	63%
Grigioni et al	*Circulation* 2001	303	64%
Koelling et al	*Am Heart J* 2002	1436	49% *
Trichon et al	*Am J Cardiol* 2003	2057	56%
Robbins et al	*Am J Cardiol* 2003	221	59%
Cleland et al	*N Engl J Med* 2004	605	50% *
Grayburn et al	*J Am Coll Cardiol* 2005	336	77%
Bursi et al	*Circulation* 2005	303	50%
Acker et al	*J Thorac CV Surg* 2006	300	66%
Di Mauro et al	*Ann Thorac Surg* 2006	239	75%
Rossi et al	*Heart* 2011	1300	74%
Deja et al	*Circulation* 2012	599	63%
Onishi et al	*Circ Heart Fail* 2013	277	48% *

*Patients with moderate to severe MR

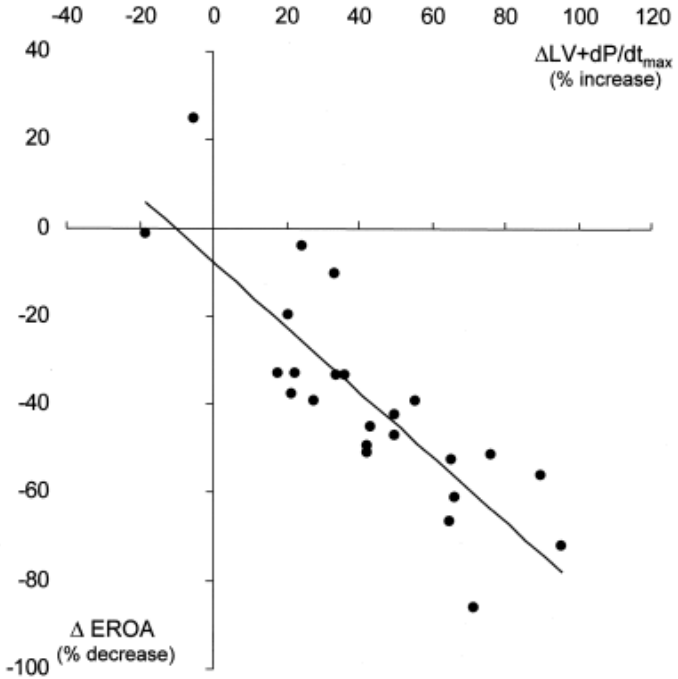
Bonow, 2016

Systolic + **diastolic** MR in LVSD with dyssynchrony





Add **CRT** to medical treatment

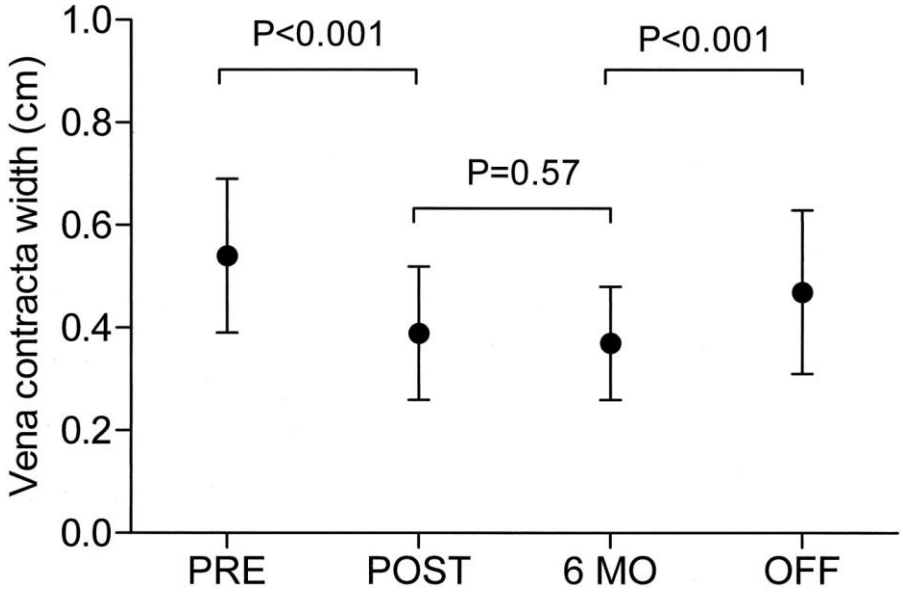


EROA % ↓ directly correlates to LV systolic function ↑

Acute effects of CRT on functional MR in advanced systolic heart failure

Breithardt et al, JACC, 2003

CRT effect

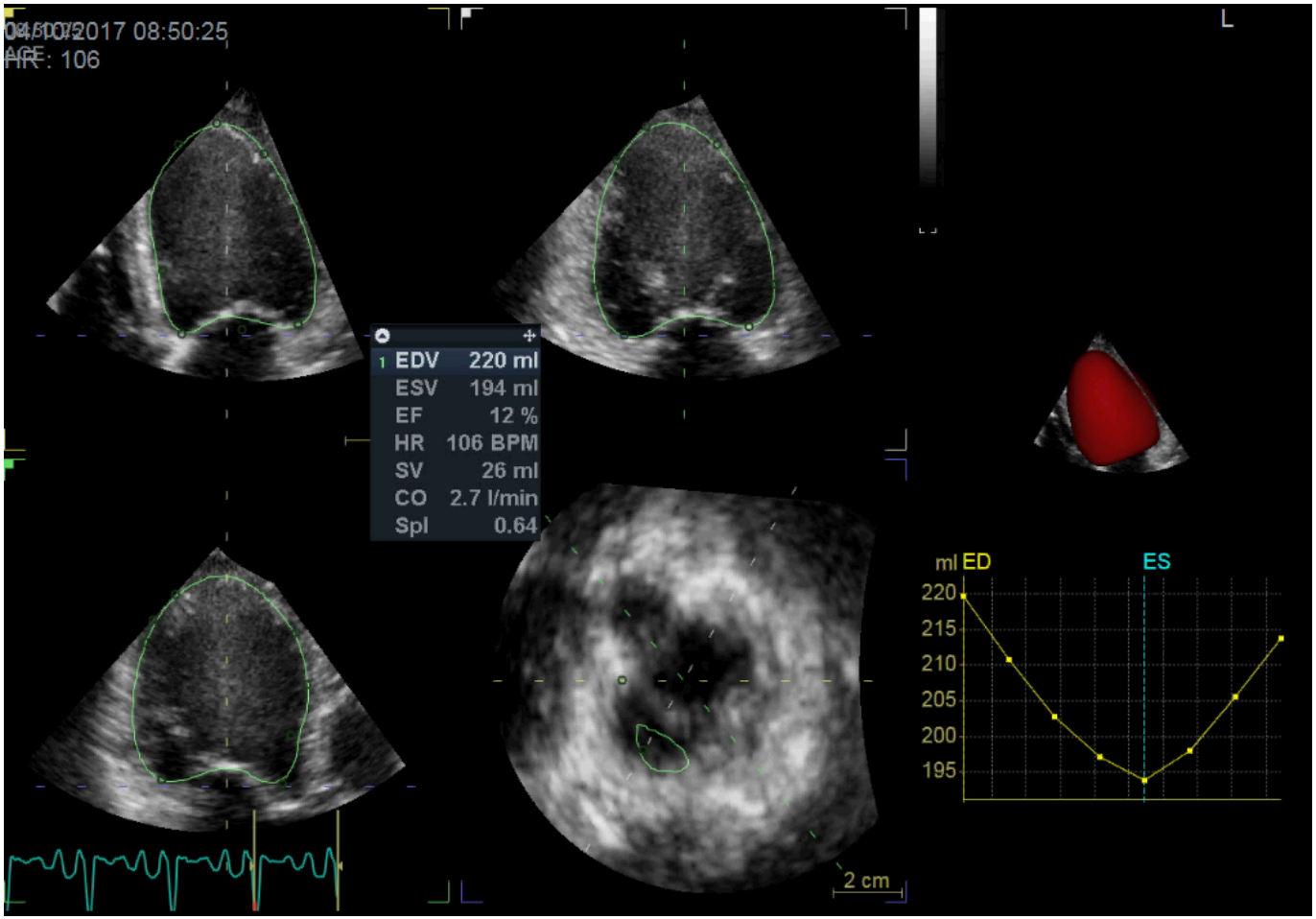


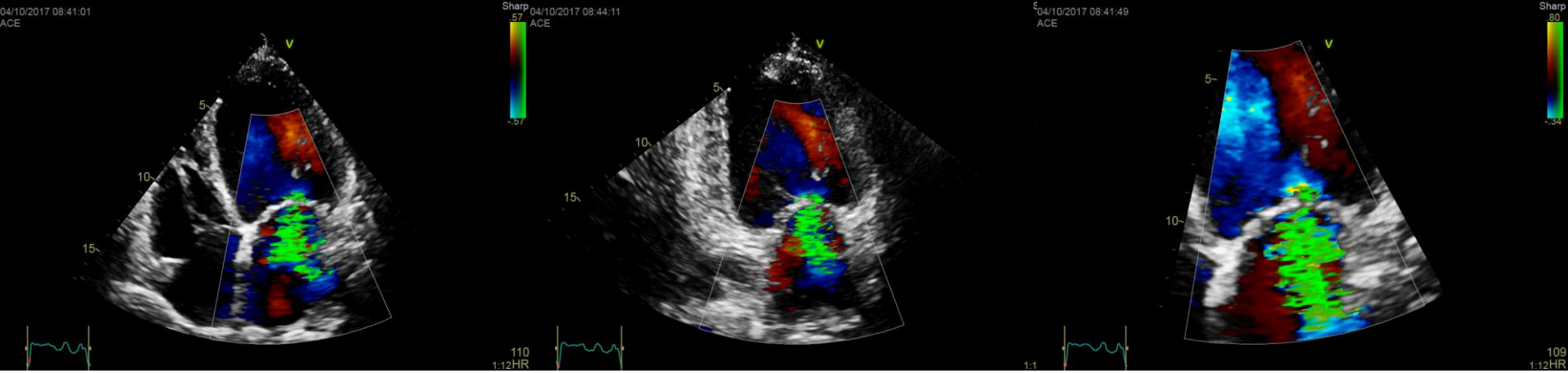
MR severity ↓ with CRT and ↑ with CRT interruption

Acute Effects of Initiation and Withdrawal of CRT on Papillary Muscle Dyssynchrony and MR

Ypenburg et al, JACC, 2007

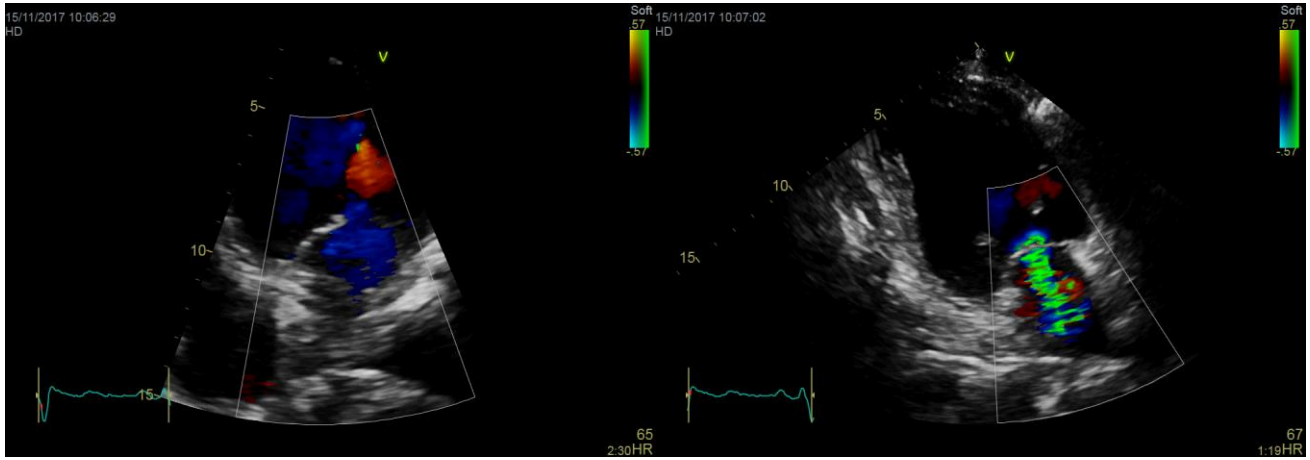
Case example 5z… male HF admission Oct 2017





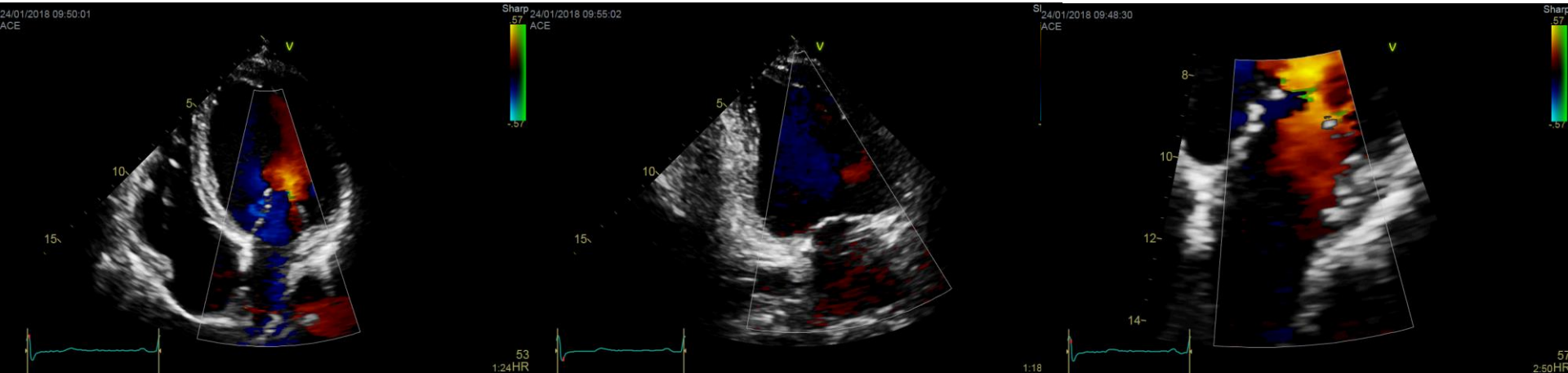
DIURETIC

6wks later

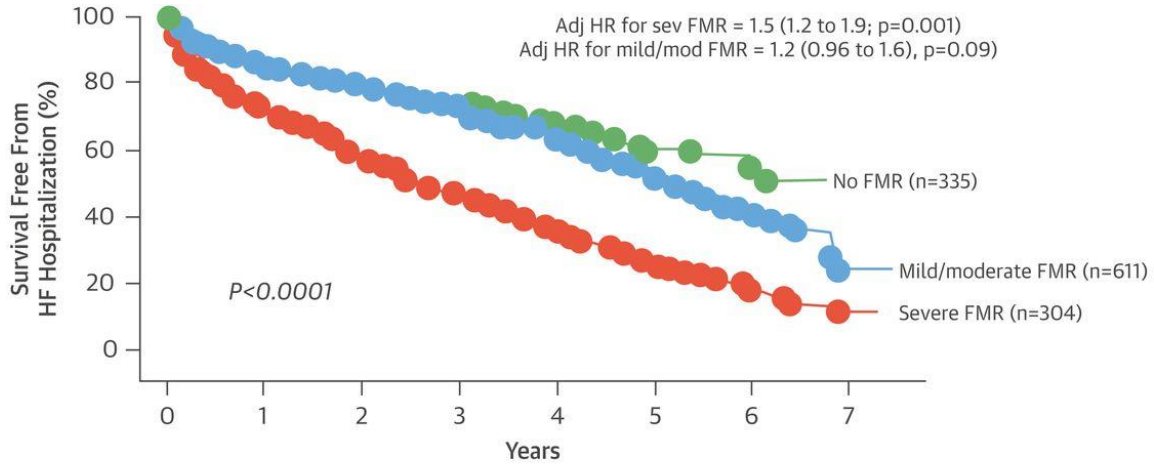


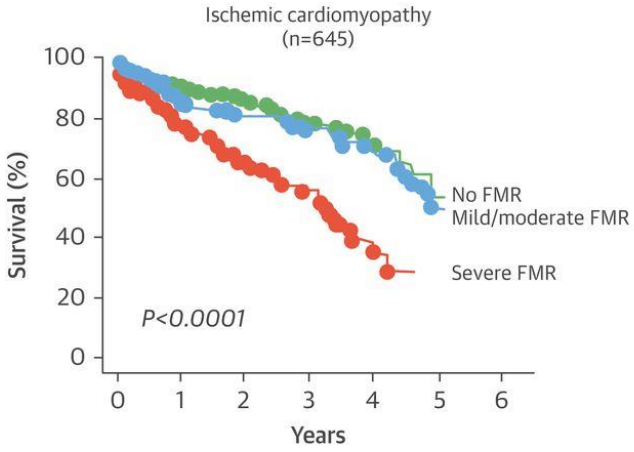
NO LBBB

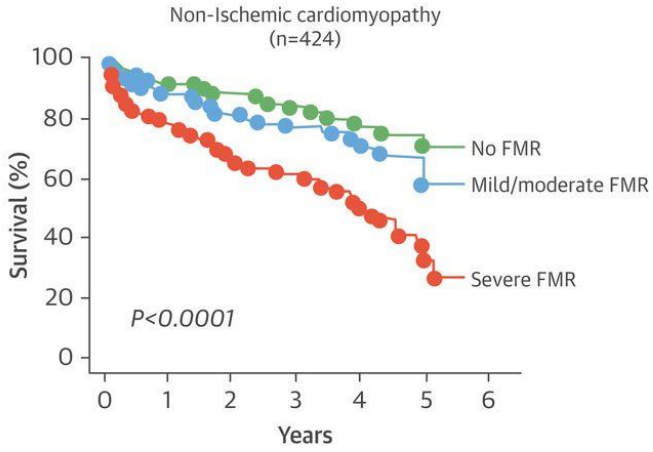
3 mo later



Secondary MR - *impact on outcome in* **HFrEF**



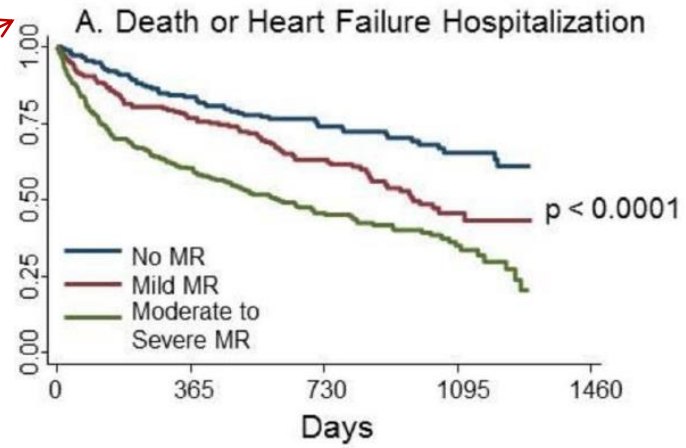


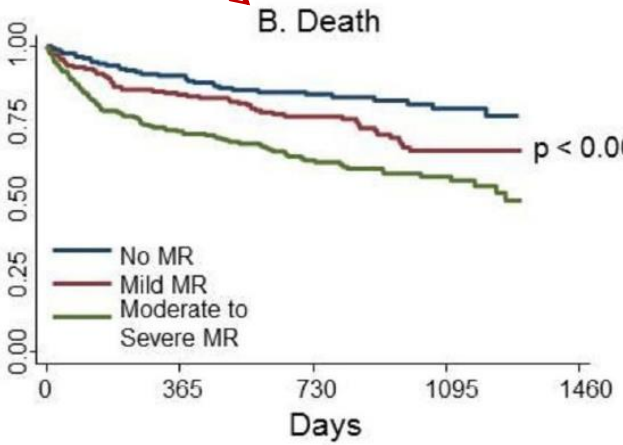


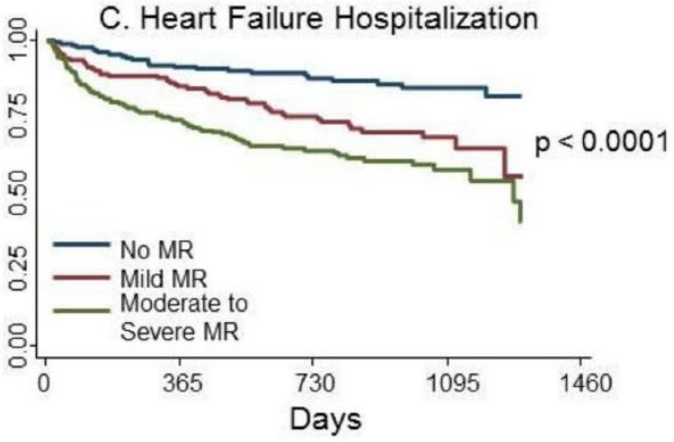
Asgar et al JACC 2015 / Rossi et al Heart 2011

Secondary MR - *impact on outcome in* **HFrEF**

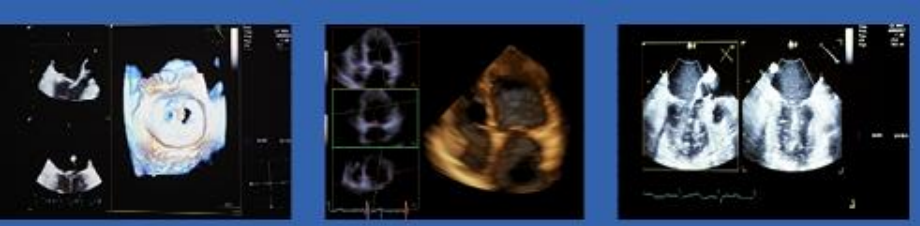
Age
Inpatient
TR
Diabetes
ACE
Diuretic
AF
LVEF
LVIDd
GFR







Mowakeaa et al, OpenHeart 2018

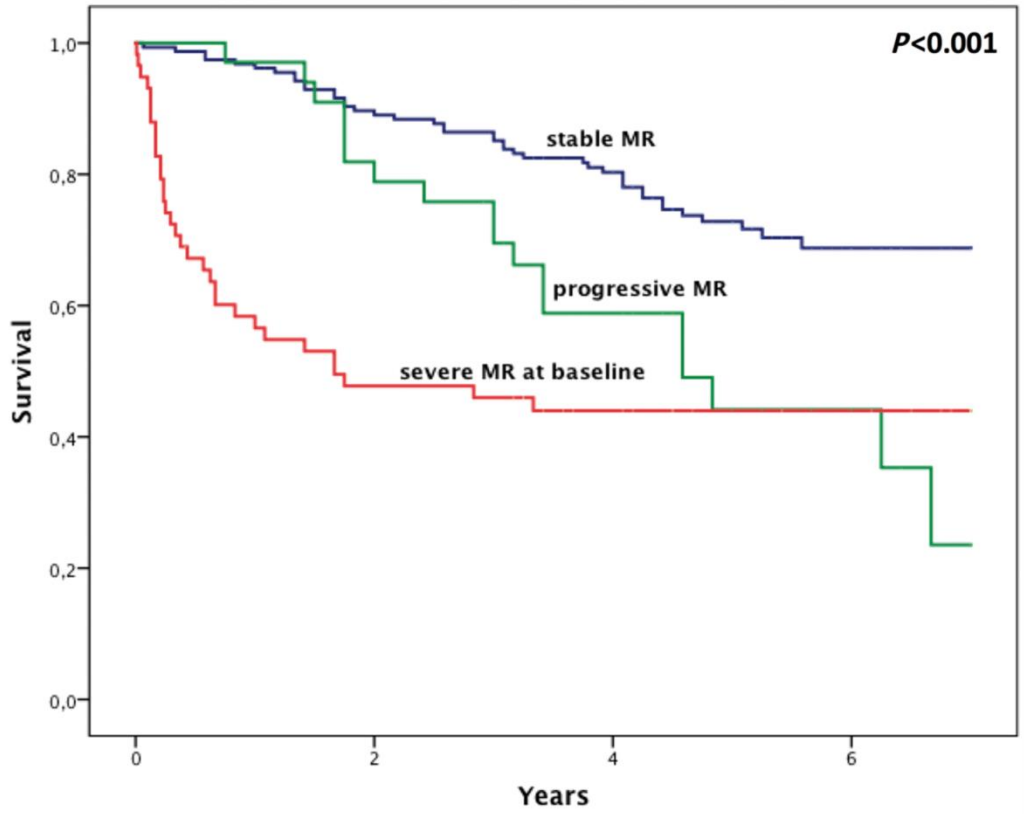


Ongoing MitraClip trials in **HF** with secondary MR

TABLE 5 Comparison of Ongoing Randomized Trials of the MitraClip in Patients With Heart Failure and Secondary Mitral Regurgitation

	COAPT	RESHAPE-HF	MITRA-FR
Number of patients and sites	430 patients at 75 U.S. and Canadian sites	800 patients at 50 E.U. sites	288 patients at 18 French sites
Secondary MR grade (core laboratory verified)	≥3+ (EROA ≥30 mm^2 and/or Rvol >45 ml)	≥3+ (EROA ≥30 mm^2 and/or Rvol >45 ml)	Severe (EROA >20 mm^2 + Rvol >30 ml)
NYHA functional class	II, III, or ambulatory IV	III or ambulatory IV	II-IV
LVEF	≥20% to ≤50%	≥15% to ≤40%	≥15% to ≤40%
Surgical criteria	Not appropriate for mitral valve surgery (heart team)	None	None
Left ventricular volume entry criterion	LV end-systolic dimension ≤70 mm	LV end-diastolic dimension ≥55 mm	None
Control arm	Guideline-directed medical therapy (+CRT, if indicated)	Guideline-directed medical therapy (+CRT, if indicated)	Guideline-directed medical therapy (+CRT, if indicated)
Primary efficacy endpoint (superiority)	Heart failure rehospitalizations at 1 yr	Death or heart failure hospitalization at 1 yr	Death or recurrent heart failure hospitalization at 1 yr
Primary safety endpoint (noninferiority)	The composite of: SLDA; device embolization; endocarditis requiring surgery; echocardiography core laboratory-confirmed mitral stenosis requiring surgery; LVAD implant; heart transplant; or any device-related complications requiring nonelective cardiovascular surgery at 12 months	None	None
Health economics	Assessed	Assessed	None
Follow-up, yrs	5	2	2

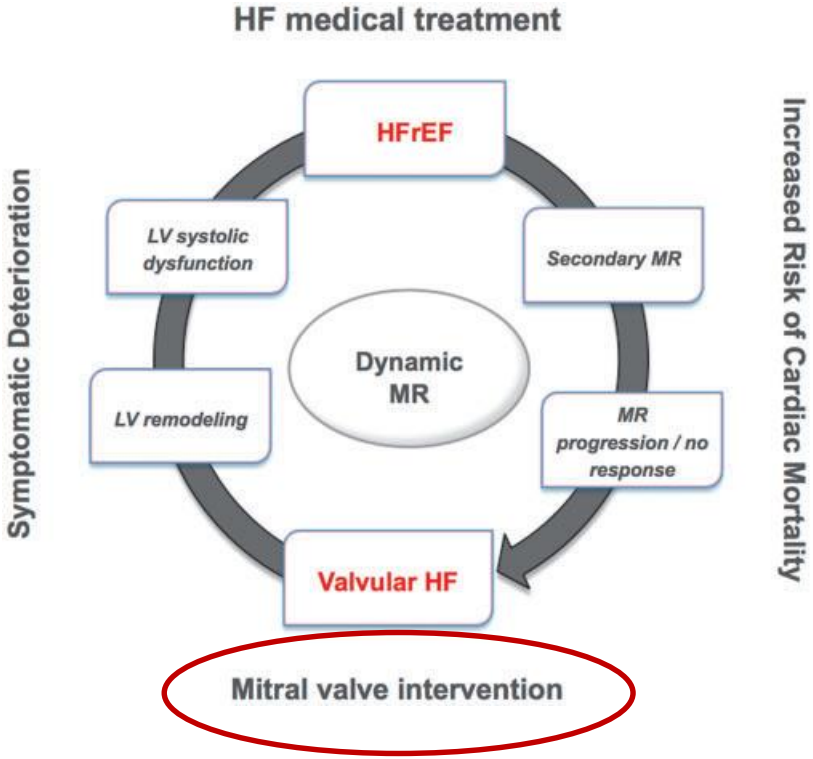
Secondary MR – **evolution** on optimal HF management



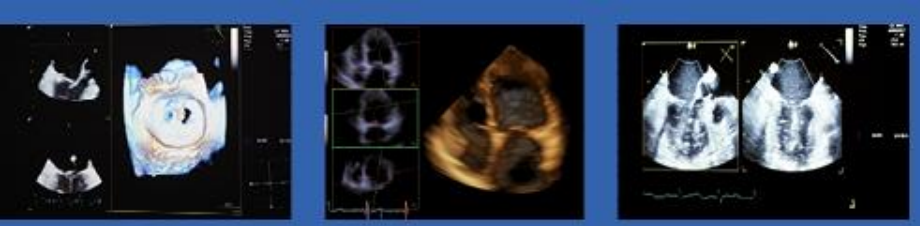
Stable MR	157	138	108	34
Progressive MR	34	27	16	6
Severe MR at baseline	58	27	19	9

Bartko et al (Harvard & Vienna) **EHJ CVI 2018**

MR progression ↔ HF



Lancellotti & Garbi EHJ CVI 2018



MR related **VHF** – when to intervene?

Primary MR

EF >30%

Always

EF < 30%

If refractory to medical treatment

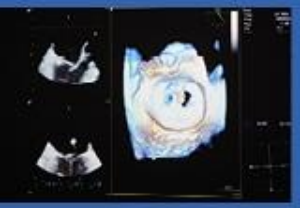
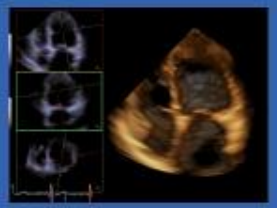
Secondary MR

HFpEF

If refractory to cardioversion, ablation, revasc

HFrEF

If refractory to medical treatment CRT

EuroValve
April 26-27, 2018

Conclusion

VHF

- high prevalence in the VHD population
- particularities of management
  - HF medical treatment
  - Benefit from the lower risk of transcatheter intervention