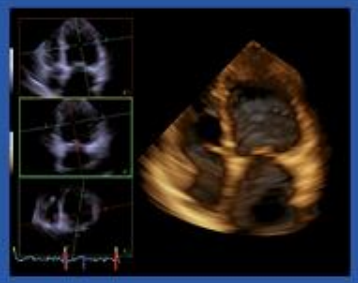


EuroValve

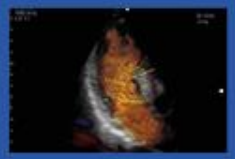
November 8-9, 2013

New Insights in the Evaluation of LV function

Mitral Regurgitation

Dr Julien Magne
University of Liege, CHU Sart Tilman, Belgium



EACVI

www.eurovalvecongress.com

Faculty Disclosure

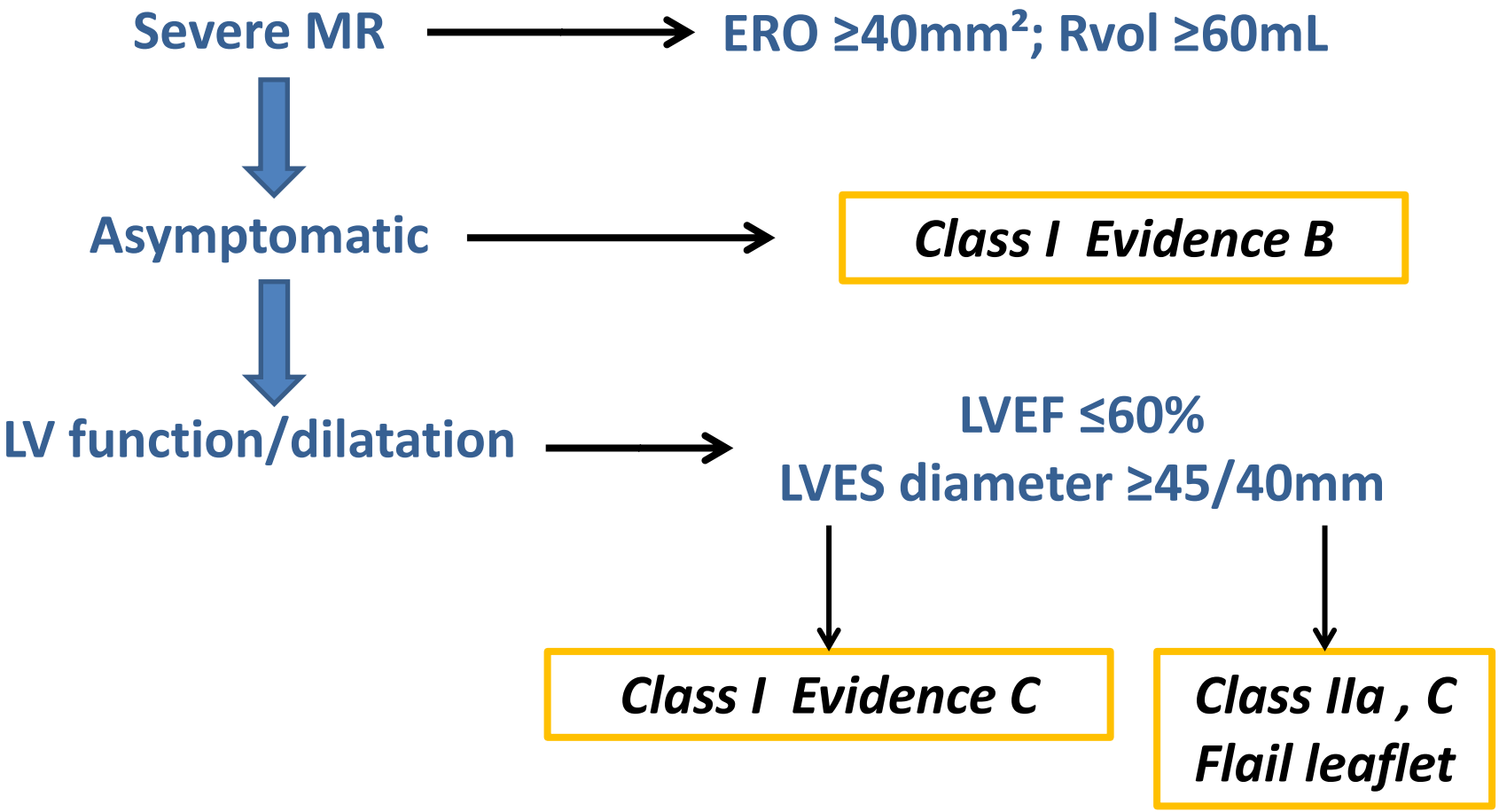
Julien Magne

I disclose the following financial relationships:

I have **no financial relationships** to disclose.

Indication for Surgery: ESC Guidelines

3 Steps of Evaluation



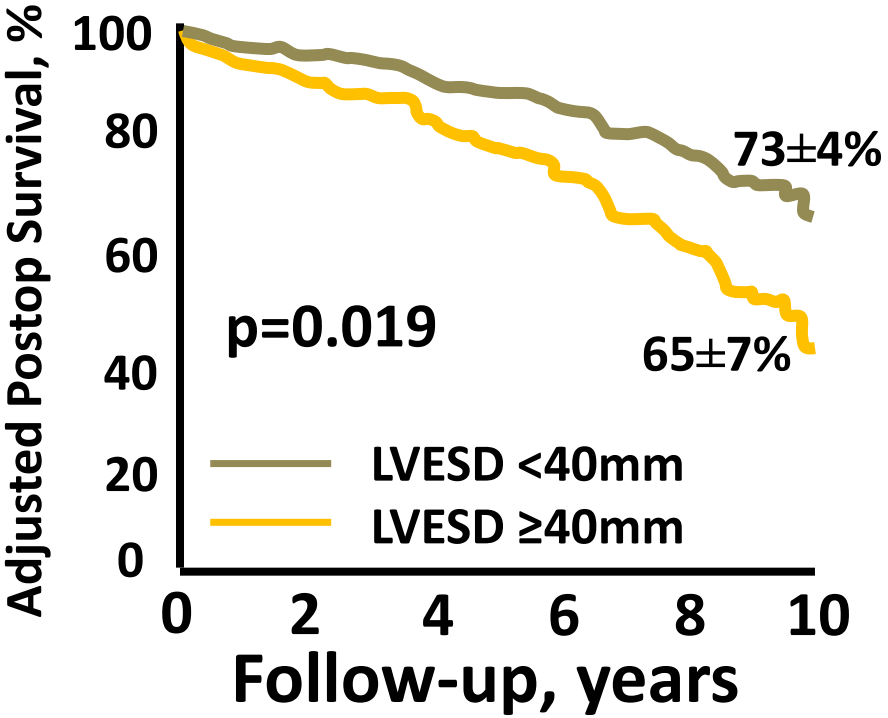
Bonow et al. Circulation, 2006

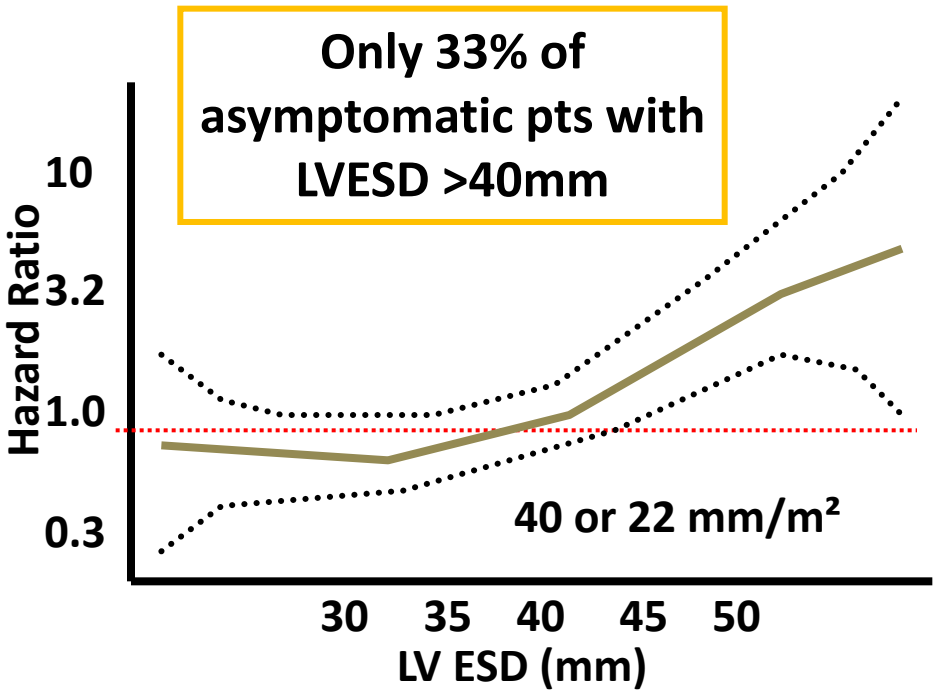
Vahanian et al. Eur Heart J, 2012

Impact of LV Dilatation on Survival

MIDA registry

739 patients with flail leaflet, follow-up: 6.1±3.7 years



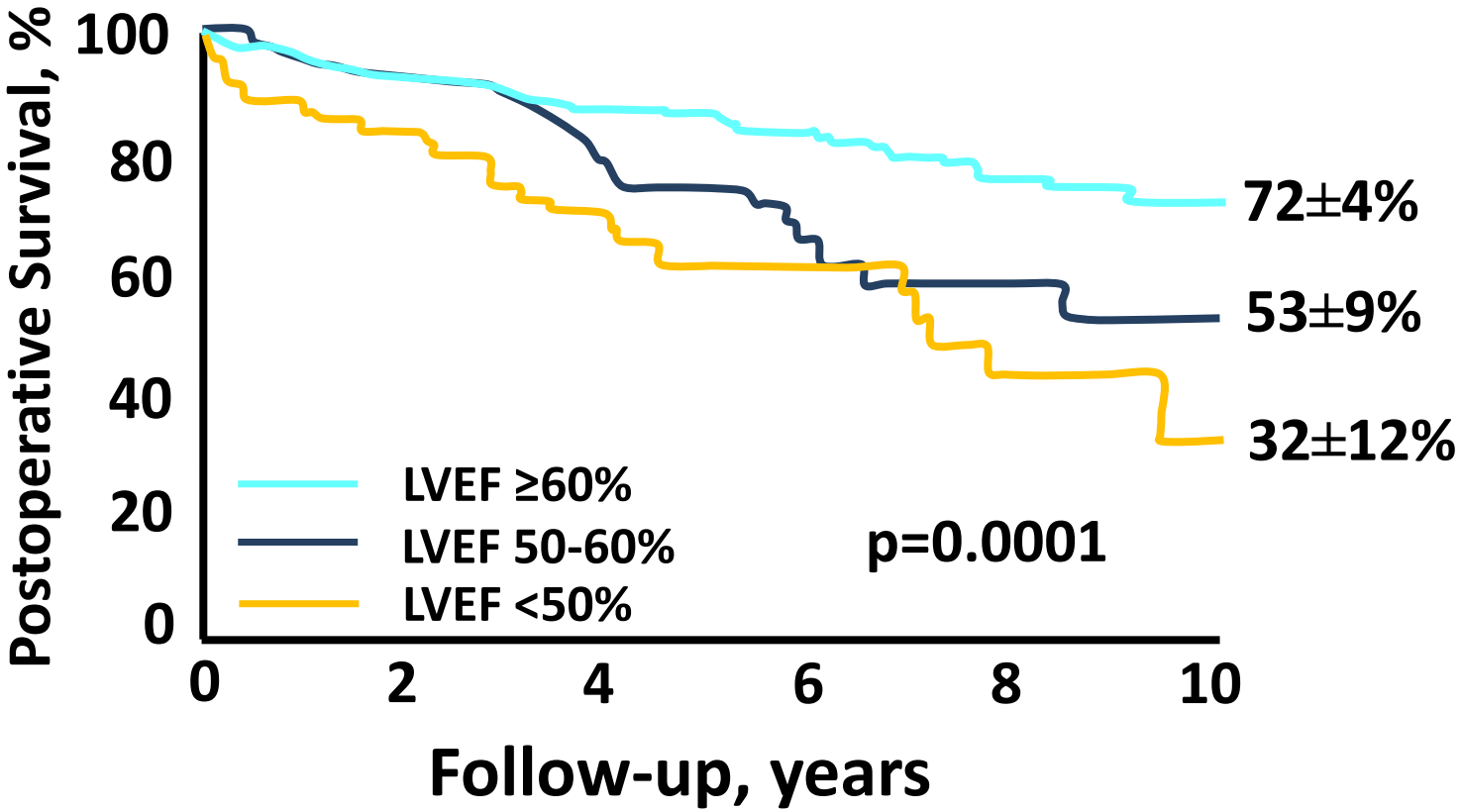


Tribouilloy et al. JACC, 2009;54:1961–8

Editorial: Pierard and Magne, JACC, 2009

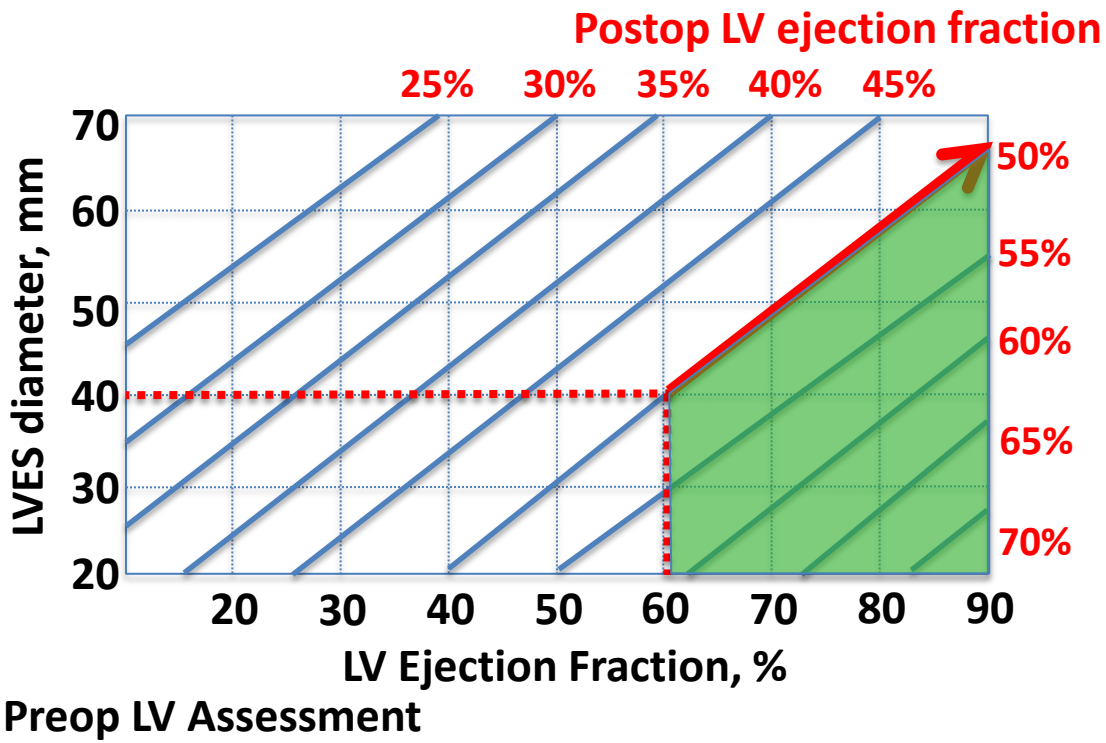
Impact of LVEF on Postoperative Outcome

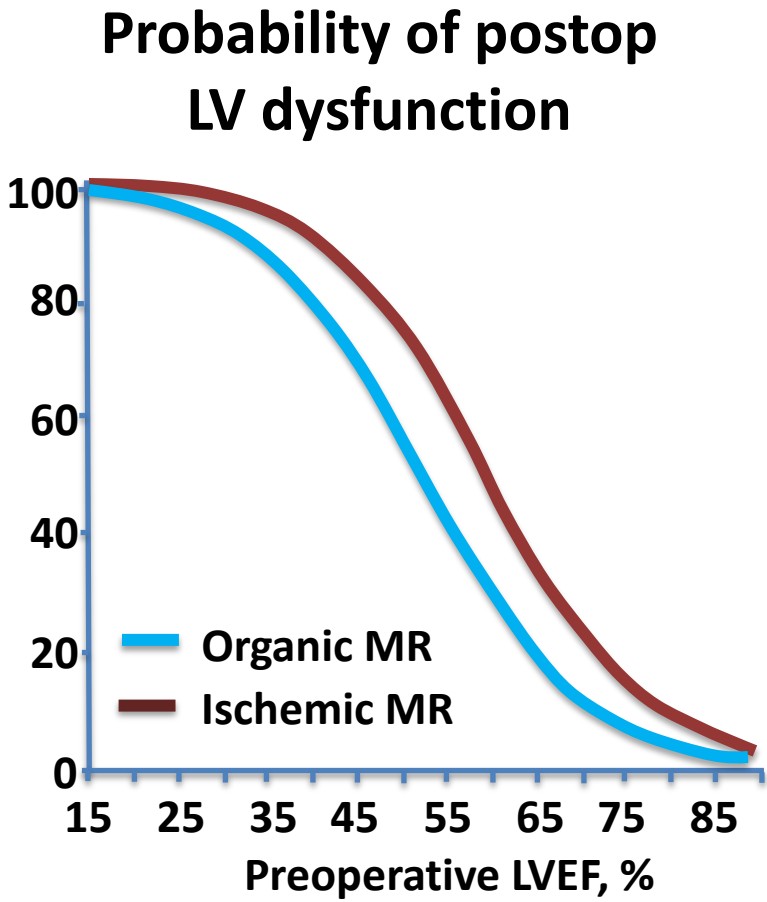
LVEF ≥60% ⇒ Excellent survival as compared to reference population



Enriquez-Sarano et al. Circulation , 1994

Postoperative LV dysfunction

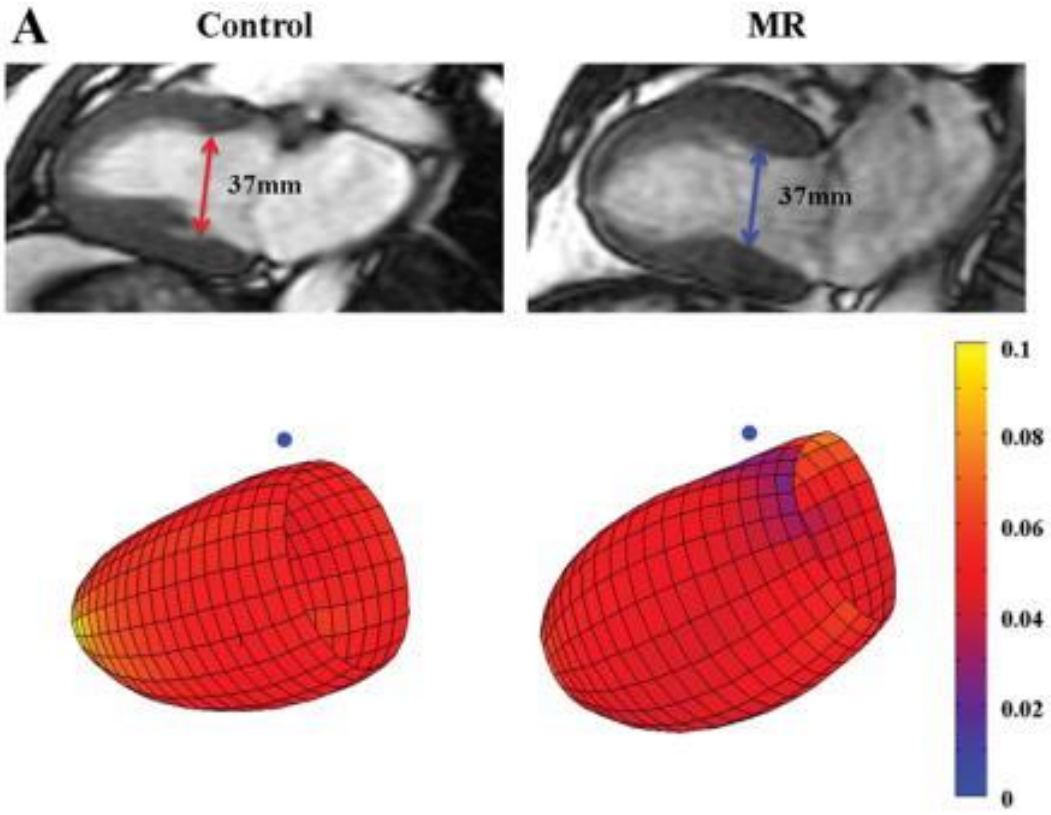


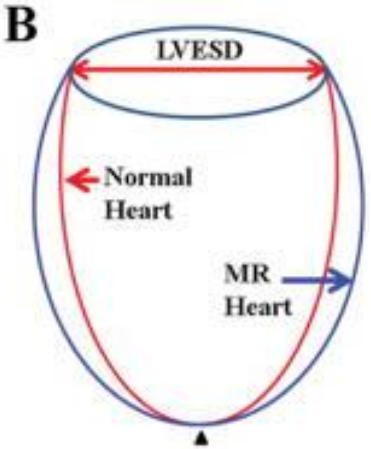


Enriquez-Sarano et al. JACC, 1994

LV Remodeling in Primary MR

n=94 MR patients, LVEF>60%, LVES d<40mm
Control group: n=51





	Control (n=51)	LVES Dimension <37 mm (n=48)
LVES length, cm	6.81±0.86	6.73±0.87
LVES sphericity index	1.95±0.26	1.82±0.23*
LVES volume index, mL/m^2	25±6	34±9*
2D LV apex curvature, 1/cm‡	2.93±1.13	1.89±0.48*

Schiros et al. Circulation, 125:2334-2342; 2012

LVEF in Patients with MR

Editorial Comment

Left Ventricular Systolic Function in Ischemic Mitral Regurgitation: Time to Look beyond Ejection Fraction

Julien Magne, PhD, and Philippe Pibarot, DVM, PhD, FASE, *Liège, Belgium; Quebec, Quebec, Canada*

JASE, 2013 Oct;26(10):1130-4

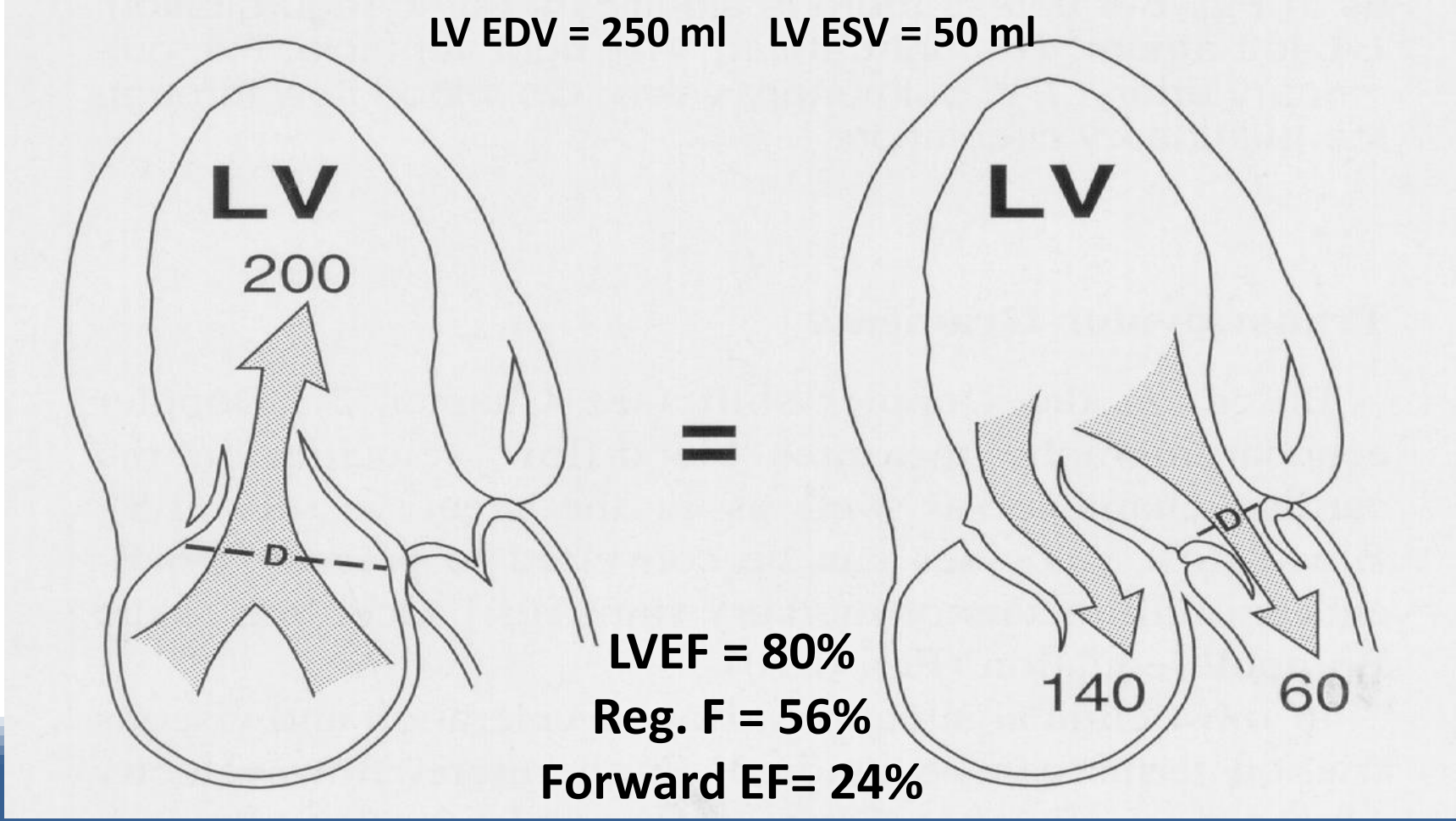
LV ejection fraction: highly load sensitive

Index of contractile function but not an index of the contractility (ie inotropic state)

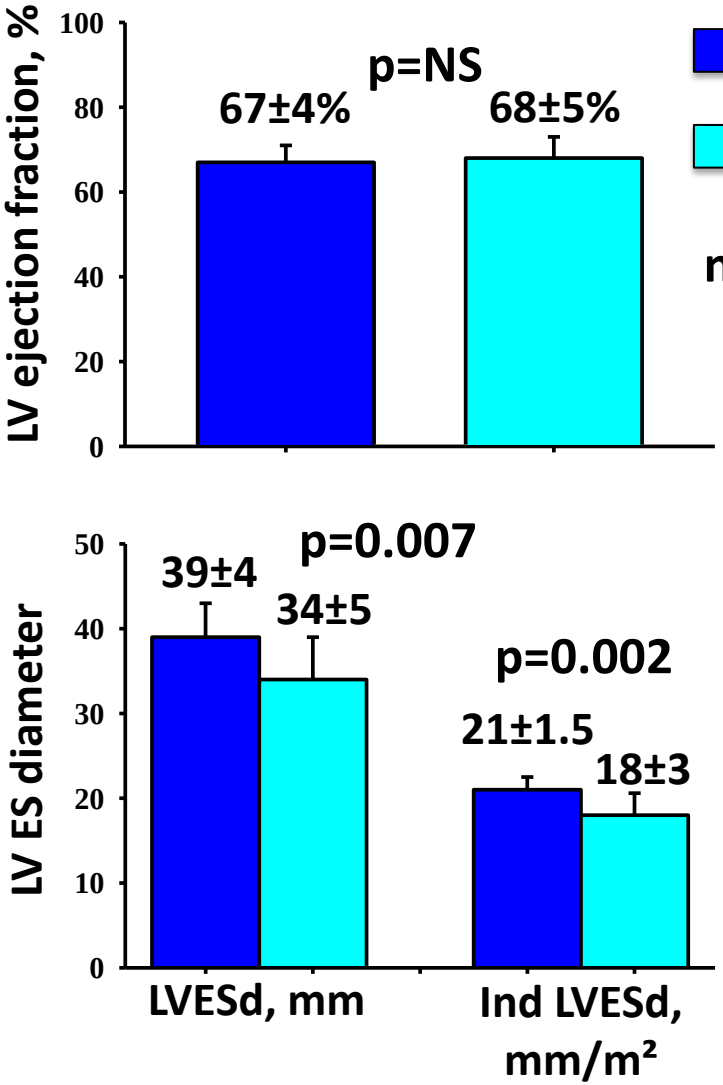
MR → ↗ Preload + →↘ Afterload → ↗LVEF

LVEF in Patients with MR

LVEF= Regurgitant fraction + Forward ejection fraction



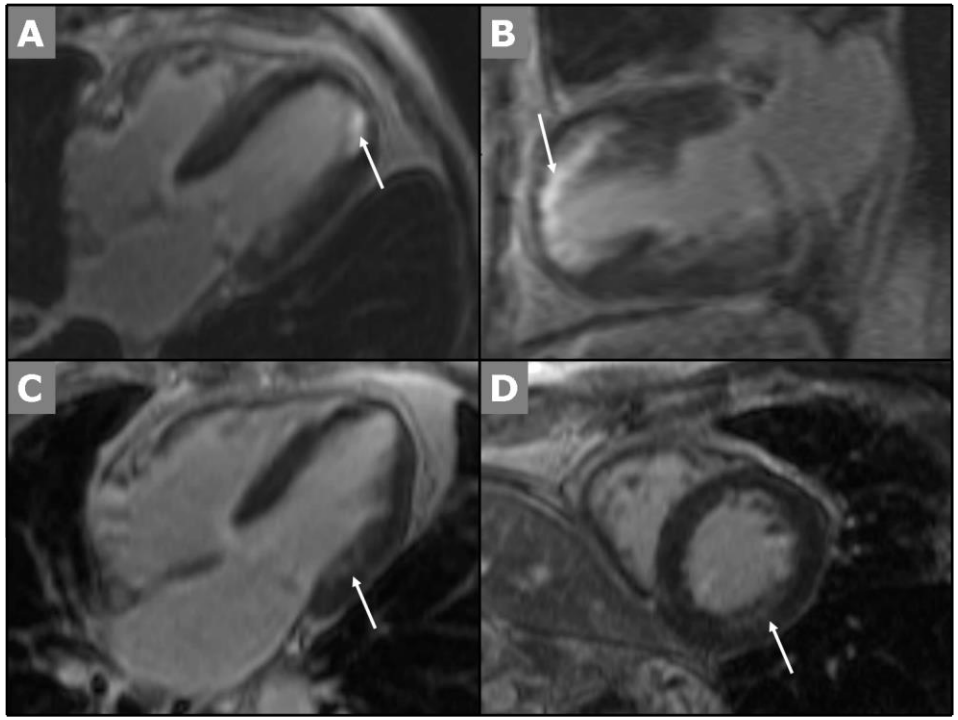
Primary MR and LV Myocardial Fibrosis



LV fibrosis (n=11, 30%)

No LV fibrosis (n=29, 70%)

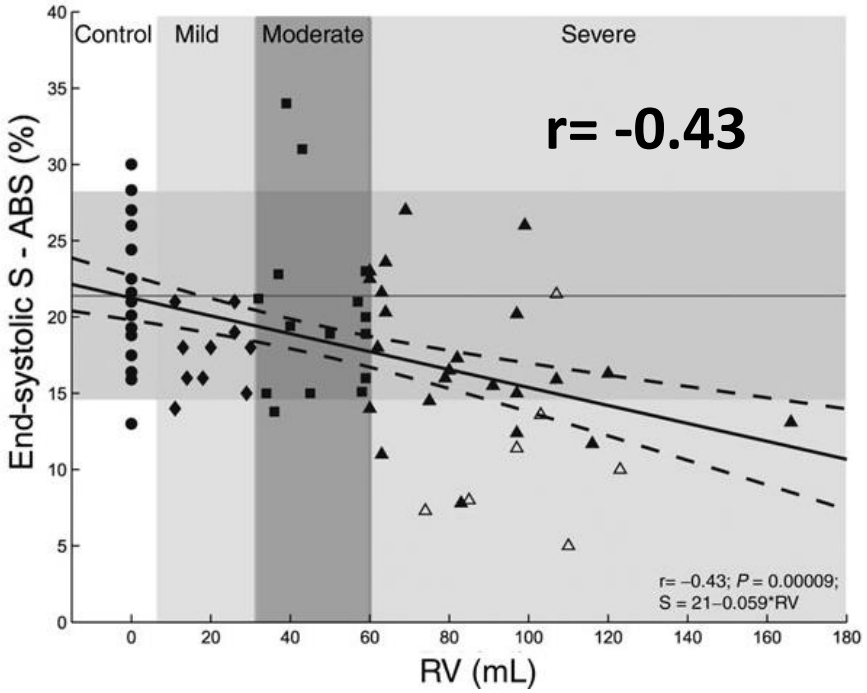
n=40 asymptomatic pts, LVEF>60%, LVESd<45mm

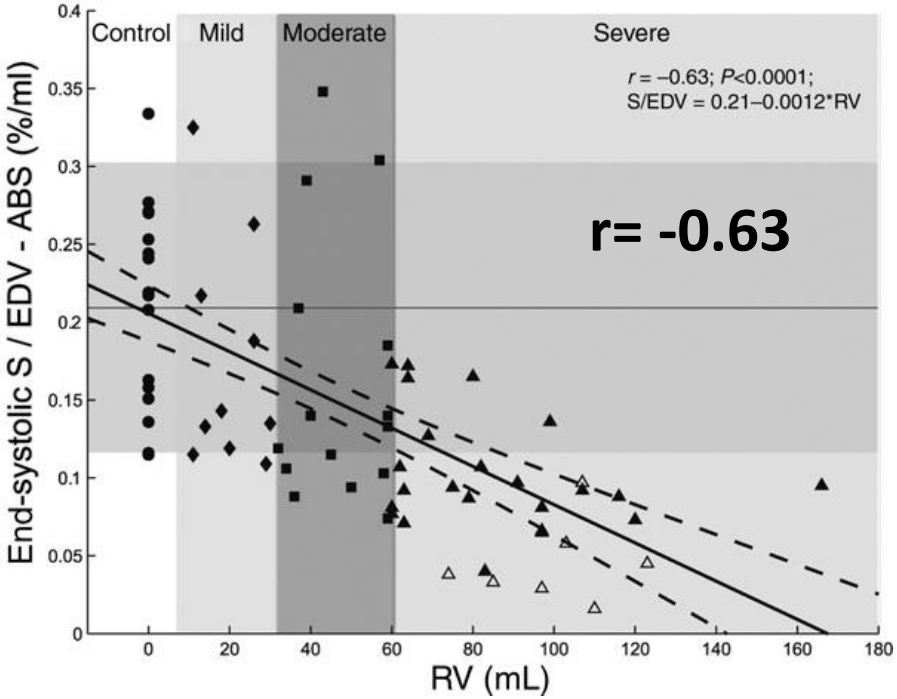


Van de Heyning et al. Submitted, 2013

Primary MR and LV Longitudinal Function

n=54 asymptomatic primary MR + 23 healthy control

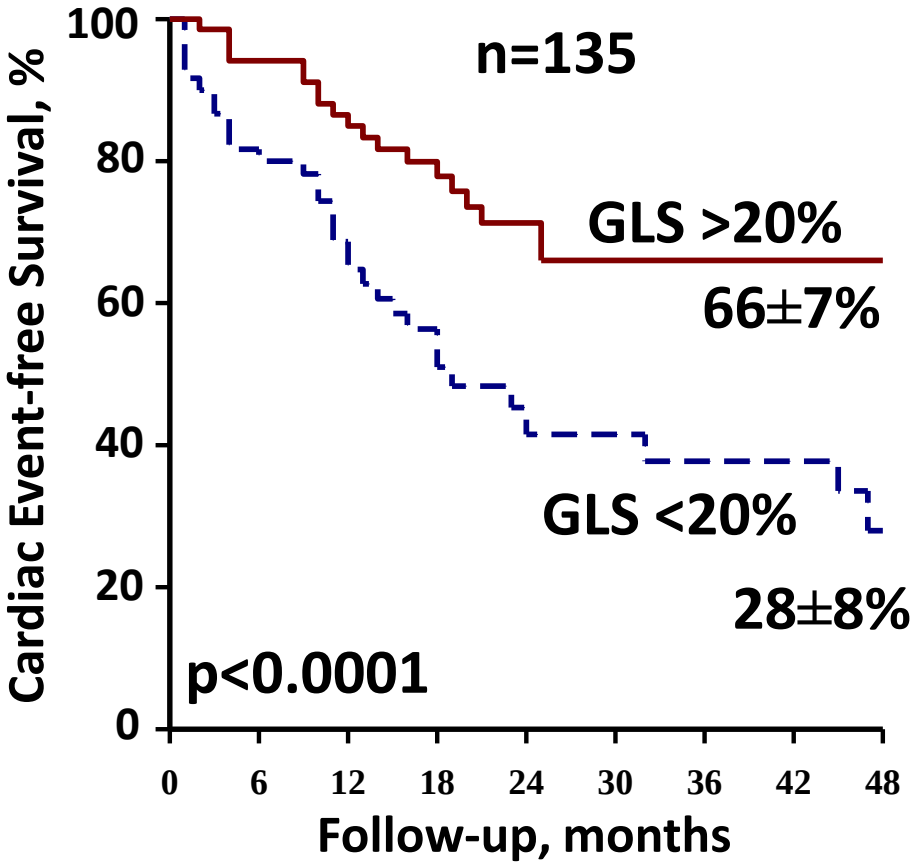




LV longitudinal strain: load and geometry dependent

Marciniak et al. EHJ, 2007

LV Longitudinal Function and Outcome



Adjusted HR=3.3 (1.1-9.9) p=0.03

Bi-centric study, n=135 asymptomatic MR (moderate & severe) with no LV dysfunction/dilatation

In asymptomatic degenerative MR, reduced LV longitudinal function is associated with 3-fold increase in risk of cardiac-event.

Magne et al. Heart 2012

Asymptomatic MR and LV Contractile Reserve

LV contractile reserve is the best predictor of postop. LV systolic dysfunction and exercise capacity

Data at inclusion	Cutoff value	AUC	Sensitivity	Specificity
Rest				
Left atrial volume (ml)	78	0.79	63.6%	86.7%
LV ejection fraction	67%	0.48	92.3%	29.4%
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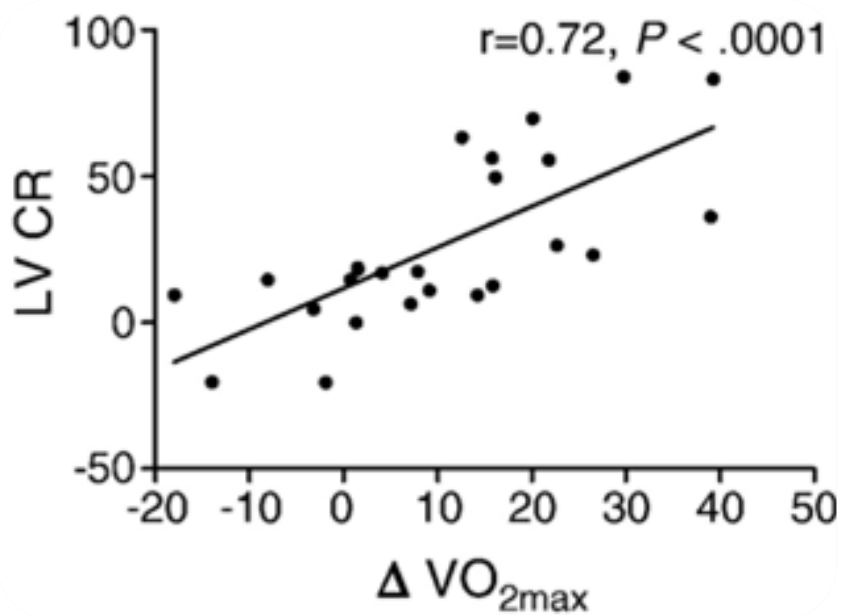
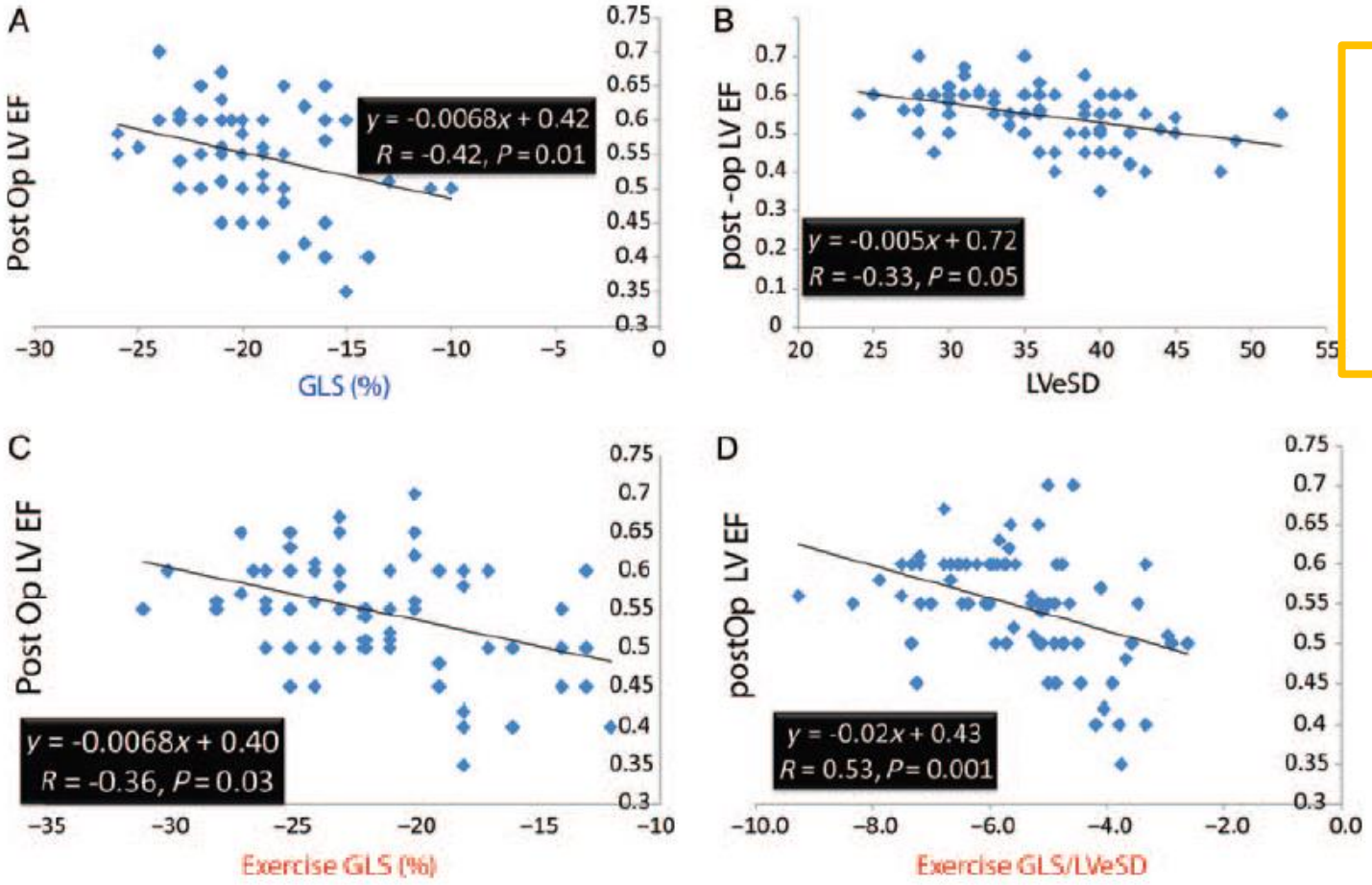
Exercise				
LV ejection fraction	70.4%	0.72	69.2%	70.4%
GLS	18.5%	0.82	84.6%	76.5%
Exercise-induced changes				
LV ejection fraction	6.6%	0.74	92.3%	52.9%
GLS	1.9%	0.80	92.3%	73.6%



Lancellotti et al. JASE, 2008

Madaric et al. Am H J, 2007

Primary MR and Exercise LV Longitudinal Function

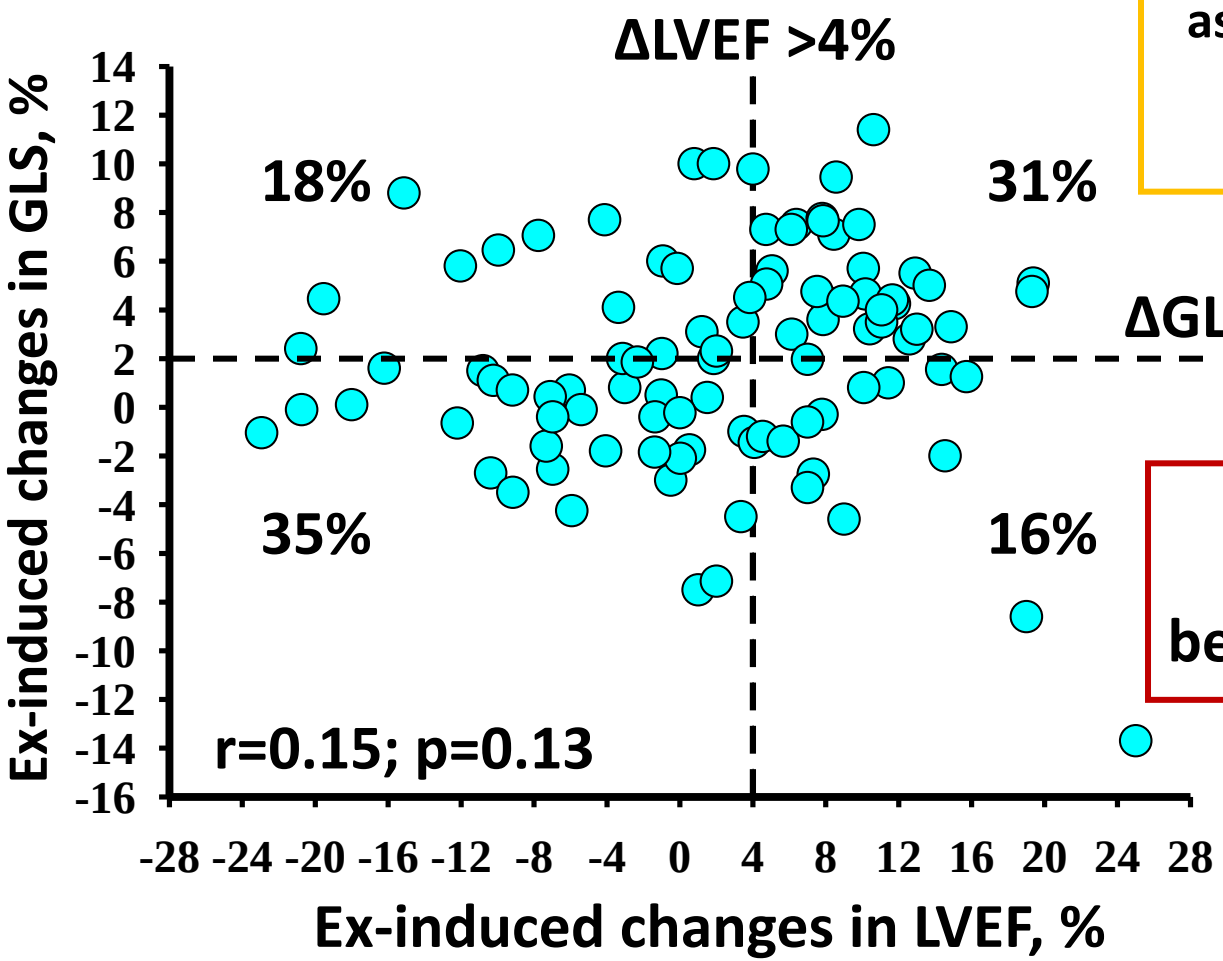


n=77 patients with primary MR 16% of 6-months postop. LV dysfunction

No significant correlation with preop LVEF

Donal et al. EHJ CV Img, 2012

Exercise-induced Changes in LVEF and GLS



From 2 centers:
asymptomatic primary MR
(n=112, 60% of severe),
preserved LV function

1/3 of discrepancy

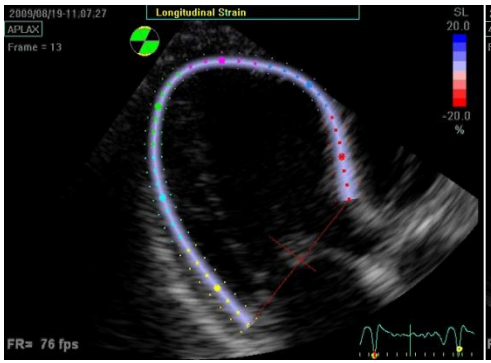
between the 2 methods

Magne et al., Eur H J 2013

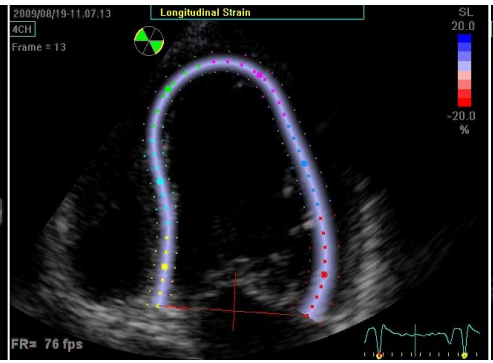
LV Longitudinal Function and Contractile Reserve

Rest

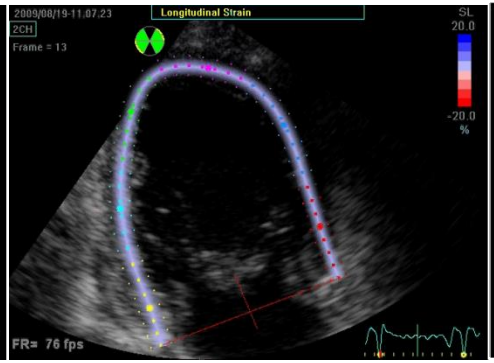
PSLA view



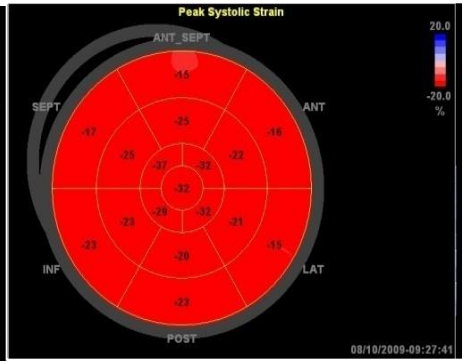
4ch view



2ch view



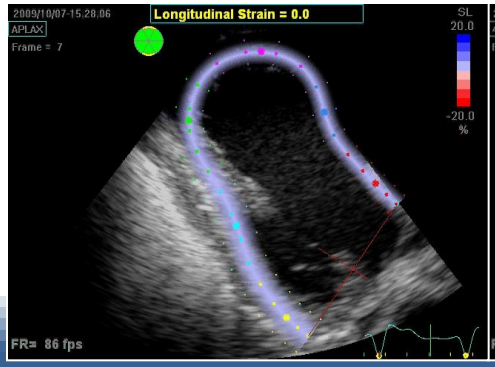
GLS= -24.3%

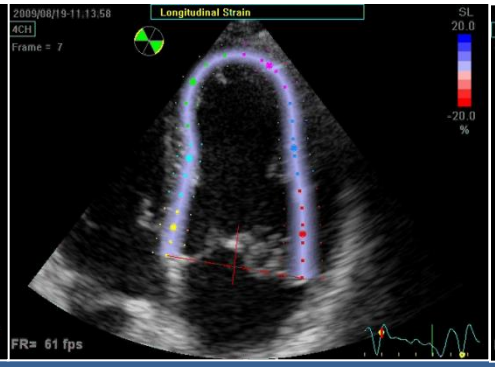


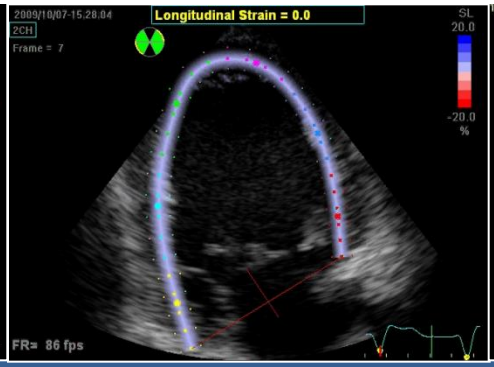
EDV=140ml, ESV=51ml LVEF= 64%

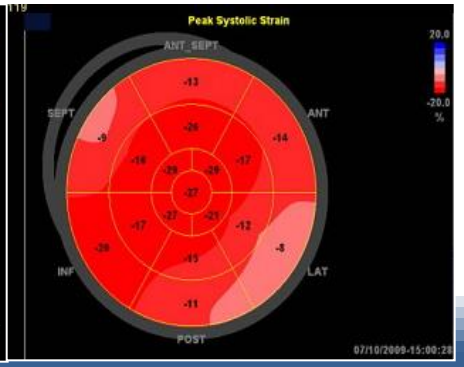
Exercise

GLS = -18%





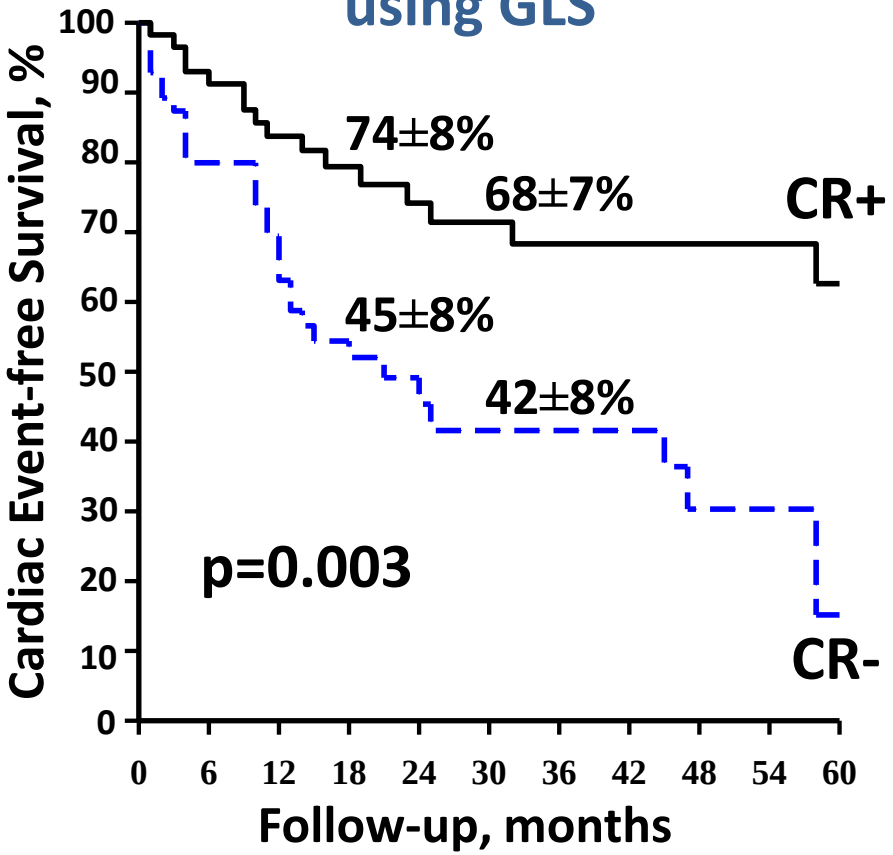




EDV=153ml, ESV=36ml LVEF= 76%

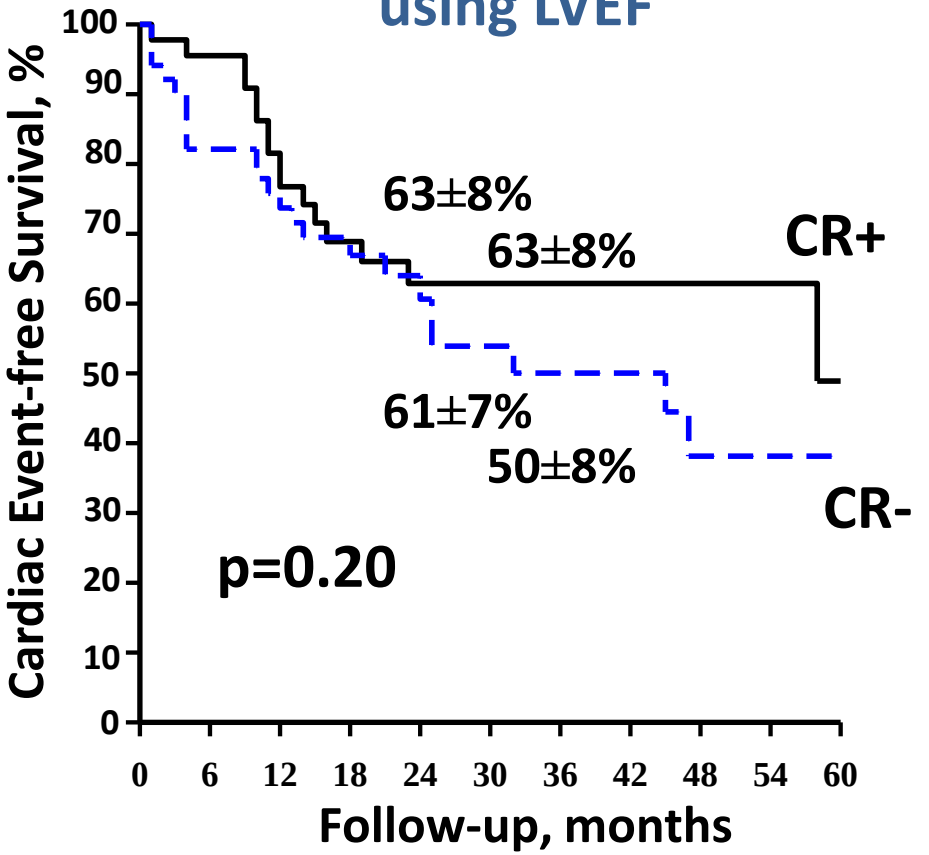
Impact of LVCR on Outcome

LV contractile reserve using GLS



Adjusted HR=2 (1.0-4.1) p=0.04

LV contractile reserve using LVEF



Adjusted HR=1.22 (0.9-1.7) p=0.23

Magne et al., Eur H J 2013

Take Home Messages

- ✓ **Assessment of LV function in patients with MR requires the measurement of both LV end-systolic diameter and LV ejection fraction (ESC and ACC/AHA guidelines)**

- ✓ **Advanced LV function assessment should include LV myocardial longitudinal strain**

- ✓ **Exercise stress echocardiography and the evaluation of LV contractile reserve provide independent incremental prognostic value**

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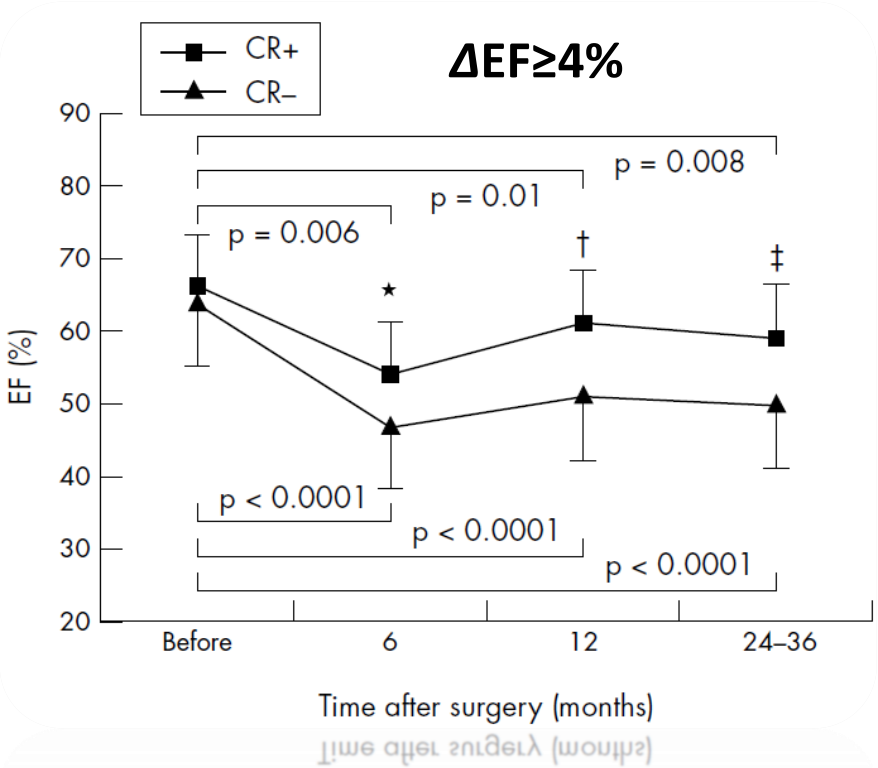
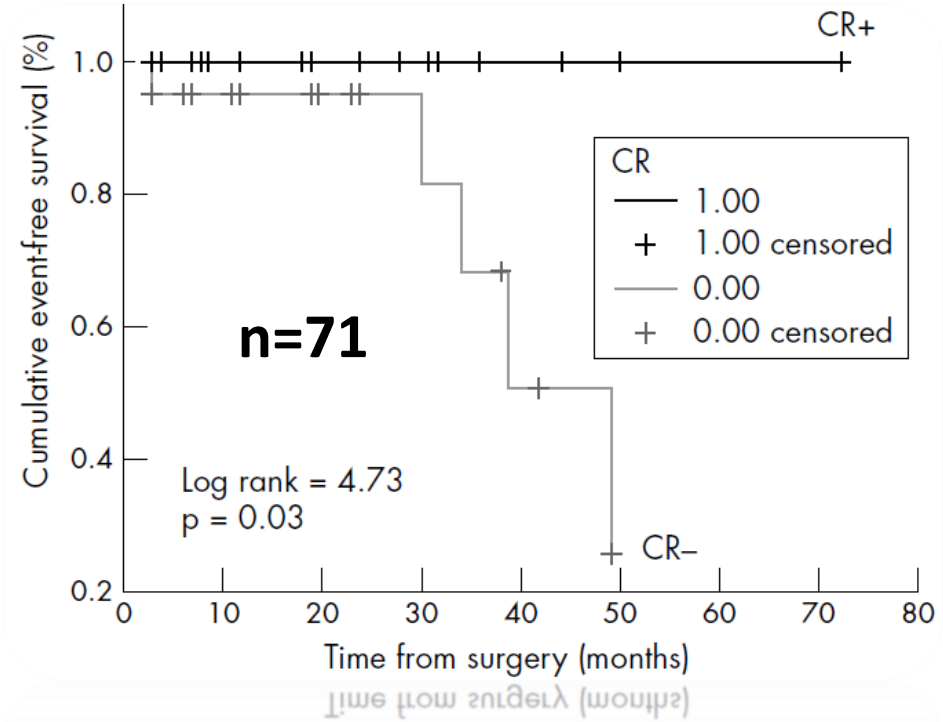
LV Contractile Reserve

LV contractile reserve is associated with better LV function and outcomes after mitral valve surgery





63% of CR+ in patients with asymptomatic severe MR

Lee et al. Heart, 2005, 91: 1407-12

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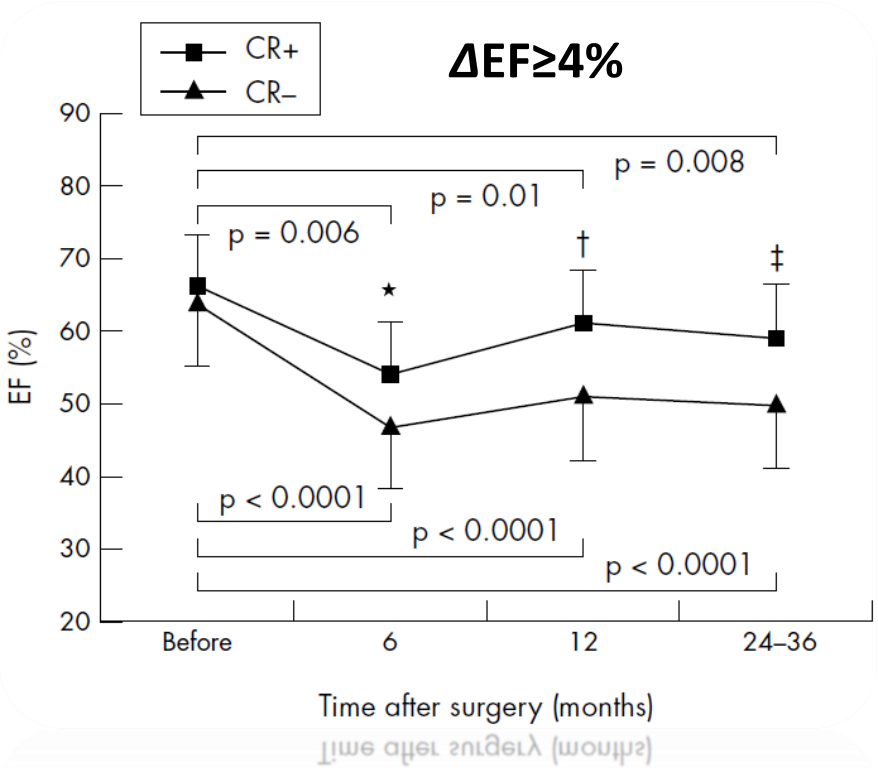

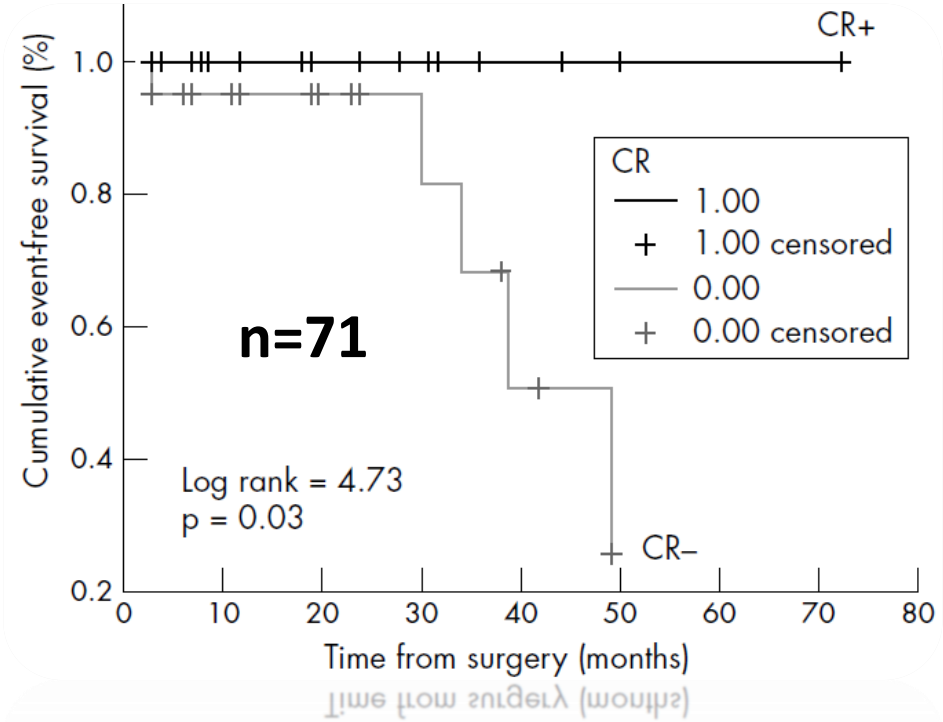

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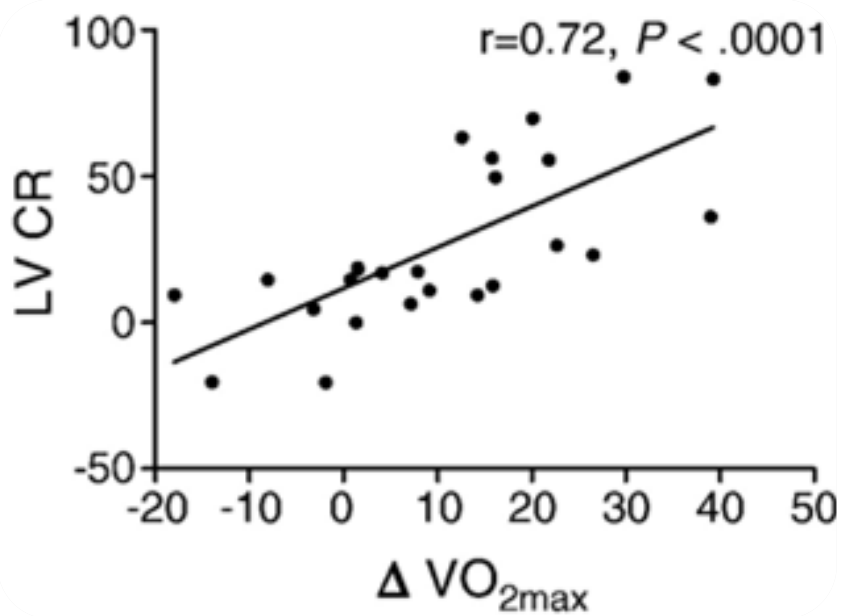


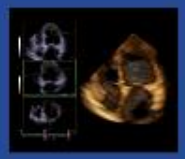
Lancellotti et al. JASE, 2008

Madaric et al. Am H J, 2007

Primary MR and LV Longitudinal Function

Parameter	*r*	*P*
LA diameter	−0.26	.006
LA volume	−0.27	.01
LA area	−0.27	.01
LVEDV	−0.31	<.001
LVESV	−0.36	<.001
LVEDD	−0.36	.001
LVESD	−0.46	<.001
LVEF	0.29	.03
LV GLS	−0.29	.007
LV GLS/LVESD	−0.45	<.001
sPAP	−0.16	.15

Mascle et al. JASE, 2012



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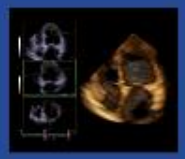

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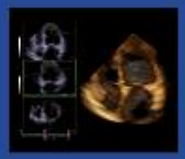

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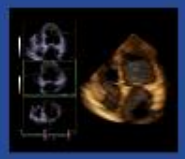

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