

# Insufficienza mitralica severa asintomatica e chirurgia precoce Contro

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Alessandria

**ECOCARDIOGRAFIA 2015**  
**XVII Congresso Nazionale SIEC**  
**Hotel Royal Continental**  
**Napoli, 16-18 Aprile 2015**



# **ECOCARDIOGRAFIA 2015**

## **XVII Congresso Nazionale SIEC**

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Nessun conflitto d'interesse



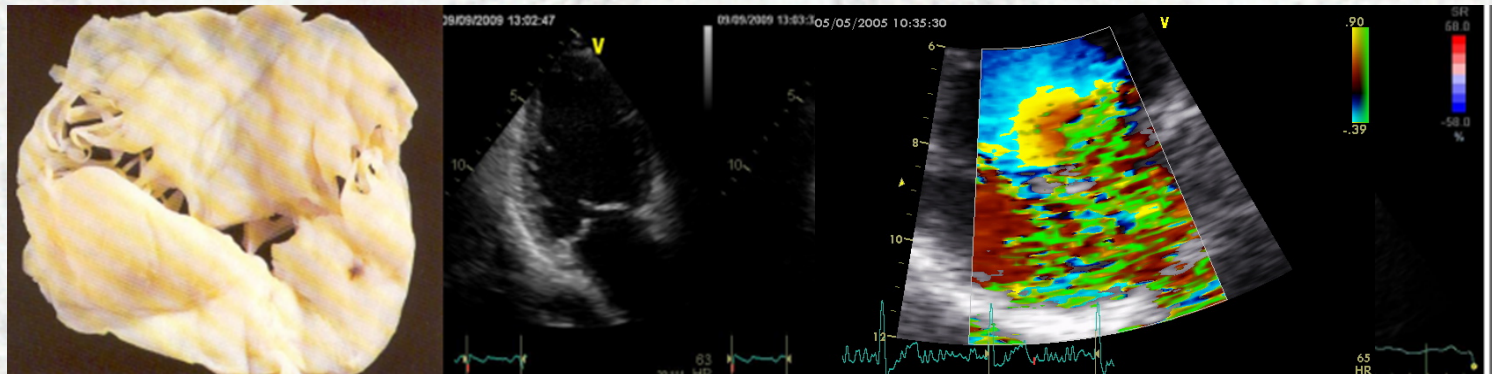


**Primum non nocere**

# Insufficienza mitralica severa asintomatica

**Table 15. Stages of *Primary* MR**

Grade	Definition	Valve Anatomy	Valve Hemodynamics*	Hemodynamic Consequences	Symptoms
C	<u>Asymptomatic</u> <u>severe MR</u>	<ul style="list-style-type: none"> <li>Severe mitral valve prolapse with loss of coaptation or flail leaflet</li> <li>Rheumatic valve changes with leaflet restriction and loss of central coaptation</li> <li>Prior IE</li> <li>Thickening of leaflets with radiation heart disease</li> </ul>	<ul style="list-style-type: none"> <li>Central jet MR &gt;40% LA or holosystolic eccentric jet MR</li> <li>Vena contracta <math>\geq 0.7</math> cm</li> <li>Regurgitant volume <math>\geq 60</math> mL</li> <li>Regurgitant fraction <math>\geq 50\%</math></li> <li>ERO <math>\geq 0.40</math> cm<sup>2</sup></li> <li>Angiographic grade 3–4+</li> </ul>	<ul style="list-style-type: none"> <li>Moderate or severe LA enlargement</li> <li>LV enlargement</li> <li>Pulmonary hypertension may be present at rest or with exercise</li> <li>C1: LVEF &gt;60% and LVESD &lt;40 mm</li> <li>C2: LVEF <math>\leq 60\%</math> and LVESD <math>\geq 40</math> mm</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>



## AHA/ACC Guideline

### 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease

A Report of the American College of Cardiology/American Heart  
Association Task Force on Practice Guidelines



European Heart Journal (2012) 33, 2451–2496  
doi:10.1093/eurheartj/ehs109

ESC/EACTS GUIDELINES

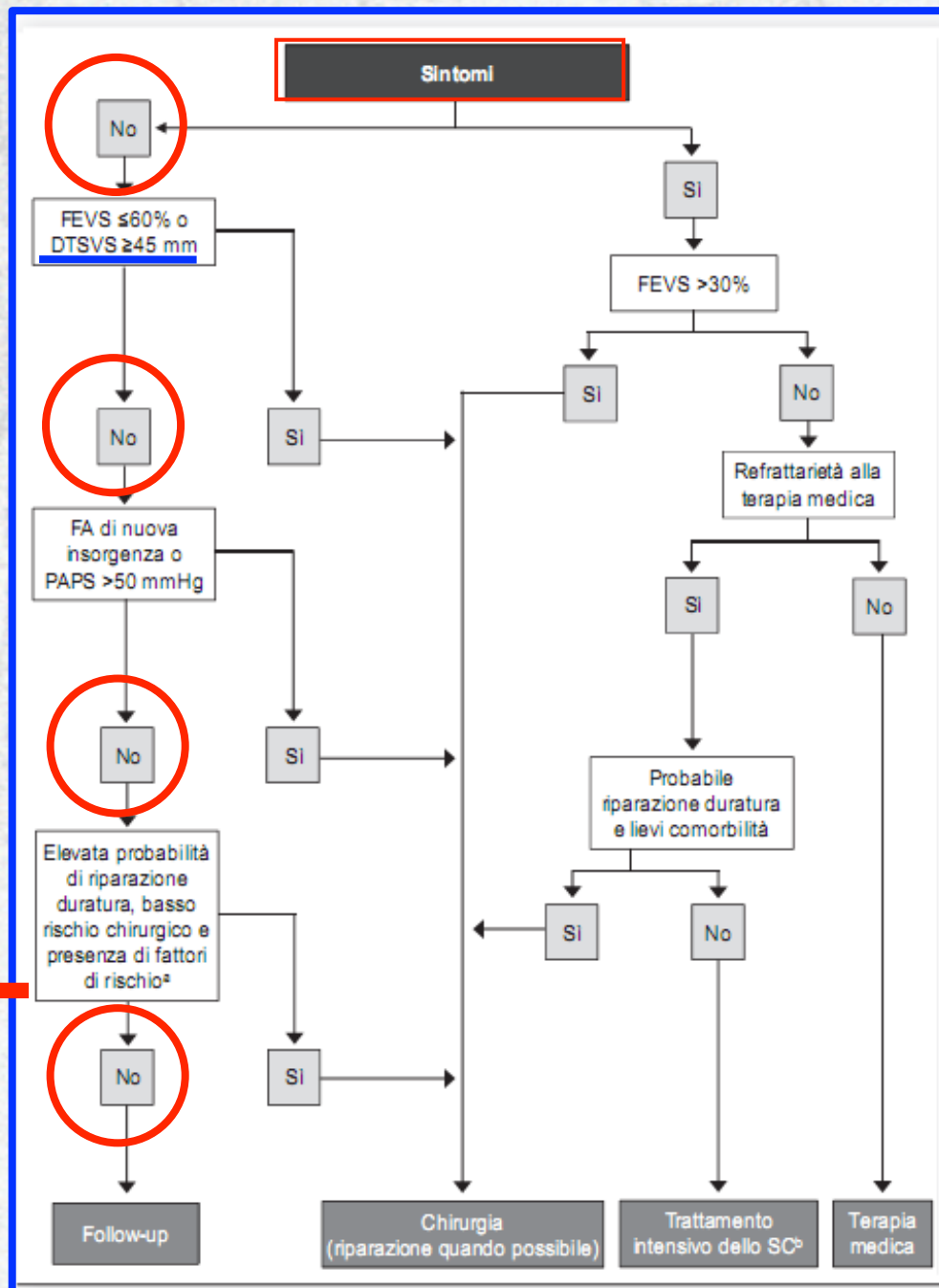


## Guidelines on the management of valvular heart disease (version 2012)

The Joint Task Force on the Management of Valvular Heart Disease  
of the European Society of Cardiology (ESC) and the European  
Association for Cardio-Thoracic Surgery (EACTS)

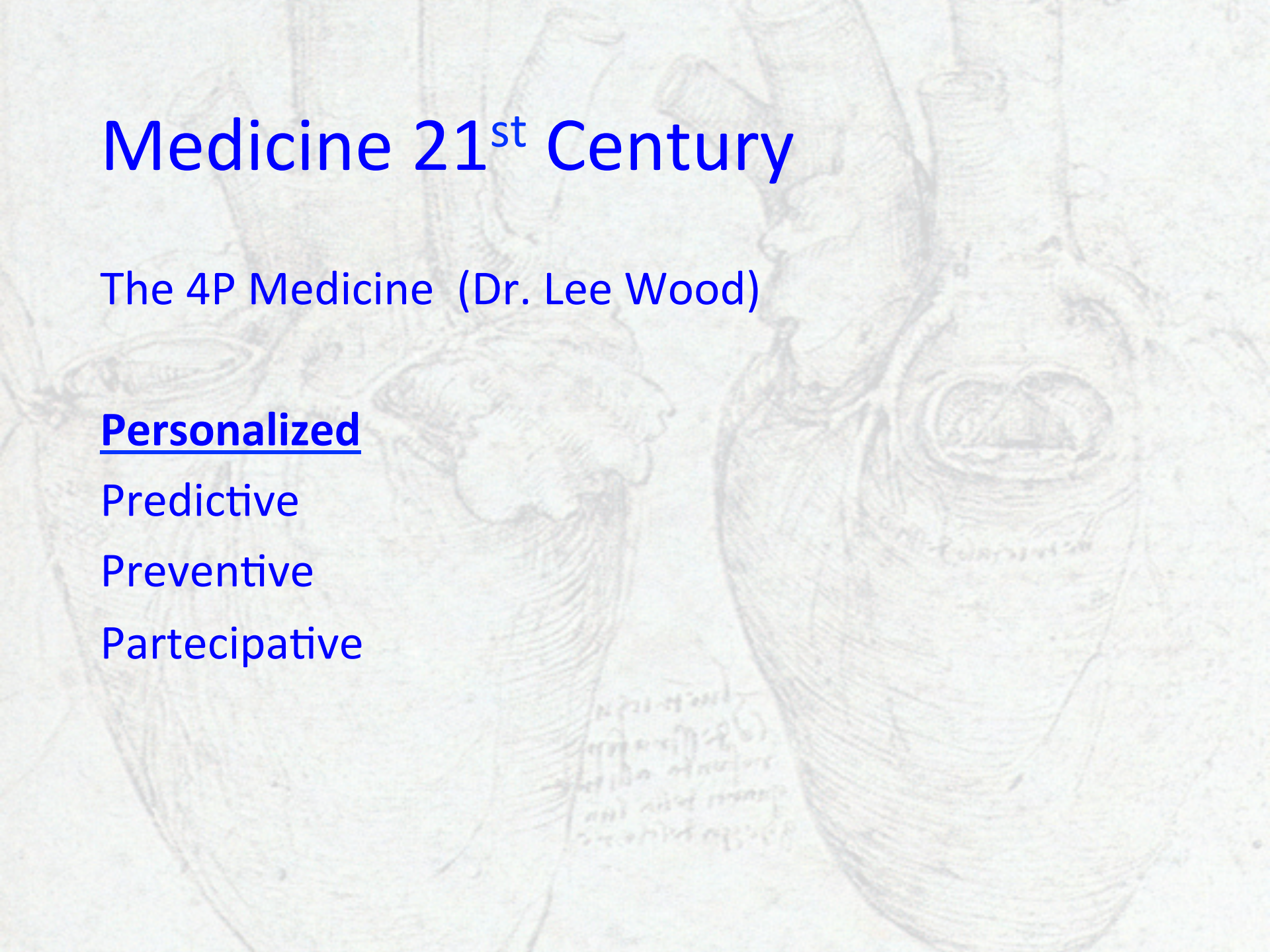
Recommendations	COR	LOE	References
MV surgery is recommended for symptomatic patients with chronic severe primary MR (stage D) and LVEF >30%	I	B	365,376
MV surgery is recommended for asymptomatic patients with chronic severe primary MR and LV dysfunction (LVEF 30%–60% and/or <u>LVEDD ≥40 mm</u> , stage C2)	I	B	359–362,392–394
MV repair is recommended in preference to MVR when surgical treatment is indicated for patients with chronic severe primary MR limited to the posterior leaflet	I	B	87,364,395–409
MV repair is recommended in preference to MVR when surgical treatment is indicated for patients with chronic severe primary MR involving the anterior leaflet or both leaflets when a successful and durable repair can be accomplished	I	B	86,407–413
Concomitant MV repair or replacement is indicated in patients with chronic severe primary MR undergoing cardiac surgery for other indications	I	B	414
MV repair is reasonable <u>in asymptomatic patients</u> with chronic severe primary MR (stage C1) with preserved LV function (LVEF >60% and LVEDD <40 mm) in whom the likelihood of a successful and durable repair without residual MR is <u>&gt;95%</u> with an expected mortality rate of <u>&lt;1%</u> when performed at a Heart Valve Center of Excellence	IIa	B	39,86,415–419
MV repair is reasonable <u>for asymptomatic patients</u> with chronic severe nonrheumatic primary MR (stage C1) and preserved LV function in whom there is a high likelihood of a successful and durable repair with <u>1) new onset of AF or 2) resting pulmonary hypertension (PA systolic arterial pressure &gt;50 mmHg)</u>	IIa	B	363,415,420–425
Concomitant MV repair is reasonable in patients with chronic moderate primary MR (stage B) undergoing cardiac surgery for other indications	IIa	C	N/A
MV surgery may be considered in symptomatic patients with chronic severe primary MR and LVEF ≤30% (stage D)	IIb	C	N/A
MV repair may be considered in patients with rheumatic mitral valve disease when surgical treatment is indicated if a durable and successful repair is likely or if the reliability of long-term anticoagulation management is questionable	IIb	B	86,406,413
Transcatheter MV repair may be considered for severely symptomatic patients (NYHA class III/IV) with chronic severe primary MR (stage D) who have a reasonable life expectancy but a prohibitive surgical risk because of severe comorbidities	IIb	B	426
MVR should not be performed for treatment of isolated severe primary MR limited to less than one half of the posterior leaflet unless MV repair has been attempted and was unsuccessful	III: Harm	B	87,407–409

AF indicates atrial fibrillation; COR, Class of Recommendation; LOE, Level of Evidence; LV, left ventricular; LVEF, left ventricular ejection fraction; LVEDD, left ventricular end-systolic dimension; MR, mitral regurgitation; MV, mitral valve; MVR, mitral valve replacement; N/A, not applicable; NYHA, New York Heart Association; and PA, pulmonary artery.



a fronte di un'elevata probabilità di riparazione duratura e di un basso rischio chirurgico, l'intervento riparativo deve essere preso in considerazione (IIaC) nei pazienti che presentano *flail di uno dei lembi e un DTSVS =40 mm*; la riparazione valvolare può eventualmente essere presa in considerazione (IIbC) in presenza di una delle seguenti condizioni: *volume atriale sinistro =60 ml/m2* di BSA e ritmo sinusale, o *ipertensione polmonare da sforzo (PAPS =60 mmHg)*.

# Medicine 21<sup>st</sup> Century



The 4P Medicine (Dr. Lee Wood)

**Personalized**

Predictive

Preventive

Partecipative



# Storia naturale

- Nell'IM cronica severa asintomatica, è stata riportata un'incidenza a 5 anni di morte per tutte le cause, morte cardiovascolare ed eventi cardiaci (morte per cause cardiovascolari, SC, nuova FA in corso di terapia medica) pari a, risp.  $0.8 \pm 3\%$

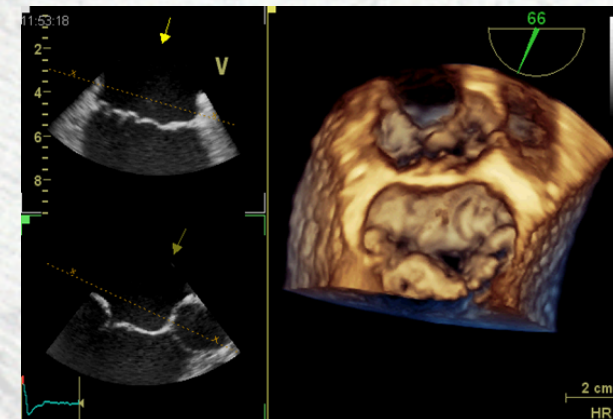
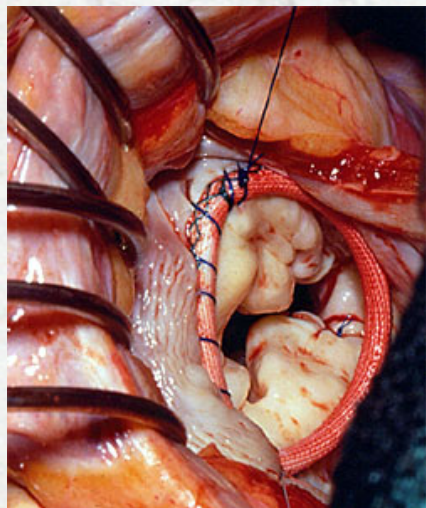
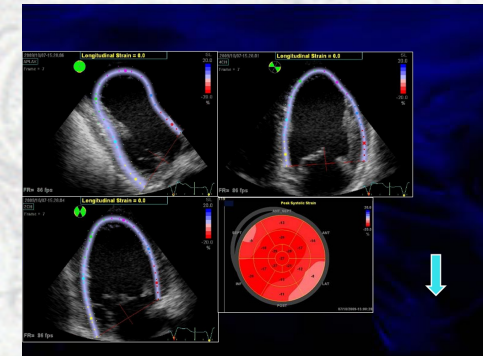
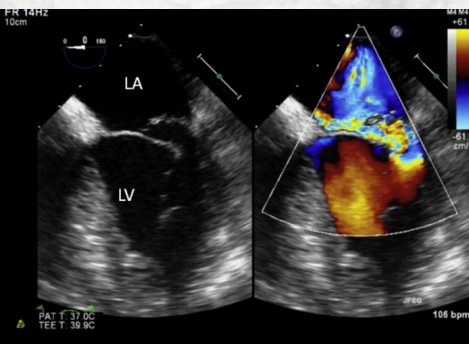
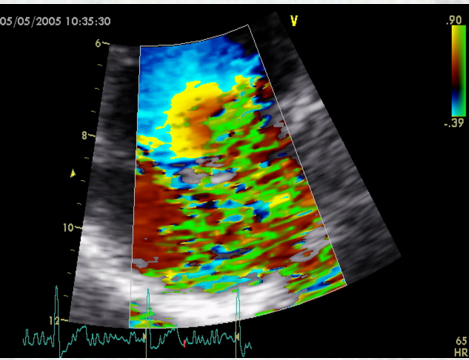
**0.8%/anno**

- 0.8% / anno

**ESITI**

**CHIRURGIA**

**ECOCARDIOGRAFIA**



# **CONTRO**

## **Outcome of Watchful Waiting in Asymptomatic Severe Mitral Regurgitation**

Raphael Rosenhek, MD; Florian Rader, MD; Ursula Klaar, MD; Harald Gabriel, MD; Marcel Krejc, PhD;  
Daniel Kalbeck, PhD; Michael Schemper, PhD; Gerald Maurer, MD; Helmut Baumgartner, MD

*Circulation. 2006;113:2238-2244*

- **132 pz**
- **Follow-up 1 anno, 3 o 6 mesi**
- **Chirurgia se trigger (clinici, eco)**

# PRO

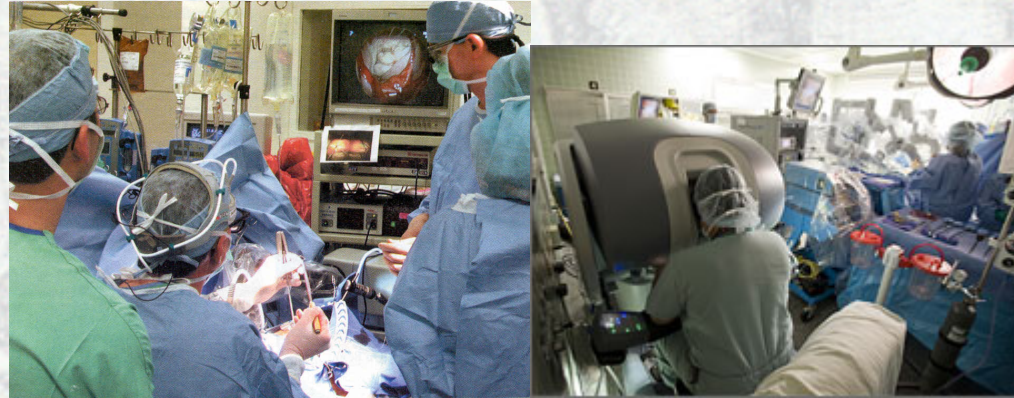
- **No** studi prospettici randomizzati
- Caratteristiche dei due gruppi non sempre sono ben definite
- Pz asintomatici in **terapia** convenzionale ???
- **Follow –up**
  - diverse modalità
  - tempistica
  - FU post op IM residua??

*Non differenze tra pz sottoposti a chirurgia profilattica e pz operati dopo la comparsa di segni/sintomi trigger*

# ESITI (OUTCOME)

## Evoluzione nel tempo

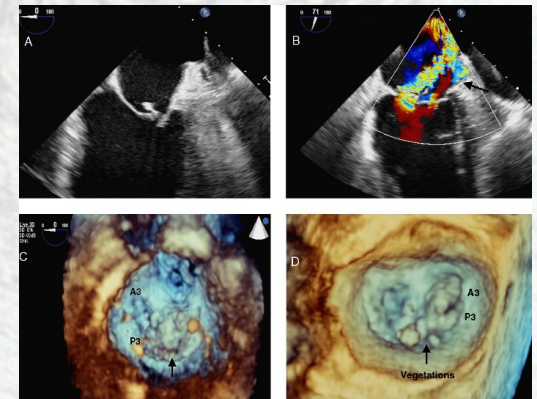
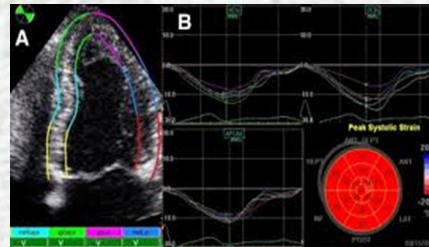
### Chirurgia



### Diagnostica

ECOCARDIO

parametri  
modalità



Non paragonabili i pz di 20 anni fa con quelli valutati ora e non più etico valutarli solo con alcuni parametri

## ESITI (OUTCOME)

In entrambe le categorie di lavori la libertà da segni/ sintomi trigger è

dai 2 agli 8 anni

92% → 55%

**No** intervento a medio termine

# CHIRURGIA

Il miglior trattamento chirurgico per l'insufficienza mitralica severa è la plastica valvolare

**MA**

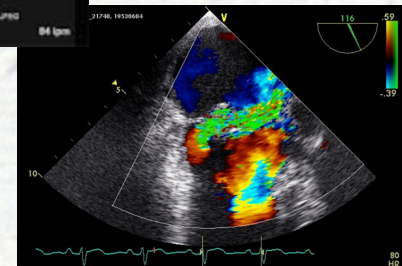
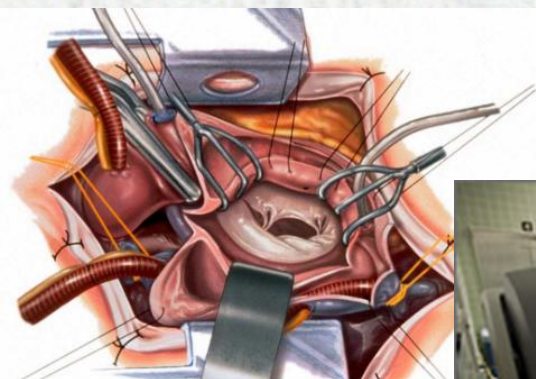
solo 80-83% di quelle previste sono state effettuate

**CHIRURGIA**

**ESPERIENZA**

**Chirurgica**

**Cardiologica**







# ‘We Must Do Better’

- Surgeon factor
  - Most surgeons do not routinely repair mitral valves
  - Non repair surgeons do not routinely refer to repair surgeons
- Cardiologist factor
  - Many cardiologists are indifferent whether a repair or a replacement is performed

Ben Bridgewater

Cardiac surgeon and lead clinician, UHSM, Manchester  
Honorary Reader, Manchester University and Manchester Academic Health Science Centre  
Clinical Lead for SCTS, NICOR, UCL  
Chair SCTS database committee

**CHIRURGIA**

**MORTALITA'**

**PLASTICA**

**SOSTITUZIONE**

**0-1%**

**3.2%**

**> volume > n° plastiche > propensione ad eseguirla**

**MORBILITA'**

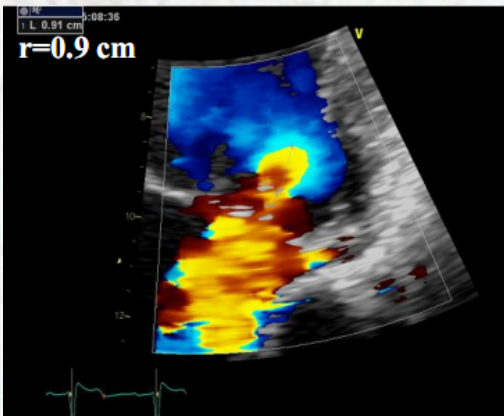
- **Stroke > nei pz operati**
- **Emorragie**
- **Endocardite**

**1-2%**

**IM residua > se plastica complessa**

# ECOCARDIOGRAFIA

- Pitfalls nella quantizzazione dell'insufficienza
- Approccio multiparametrico
- ETE definizione della fattibilità della riparazione



## PARAMETRI

- Diametri DTDVS DTSVS
- Volumi VTDVS VTSVS
- FE
- PISA EROA
- Atrio sn
- PAPs
- **Test da sforzo**
- **Strain**

# Test da Sforzo Strain

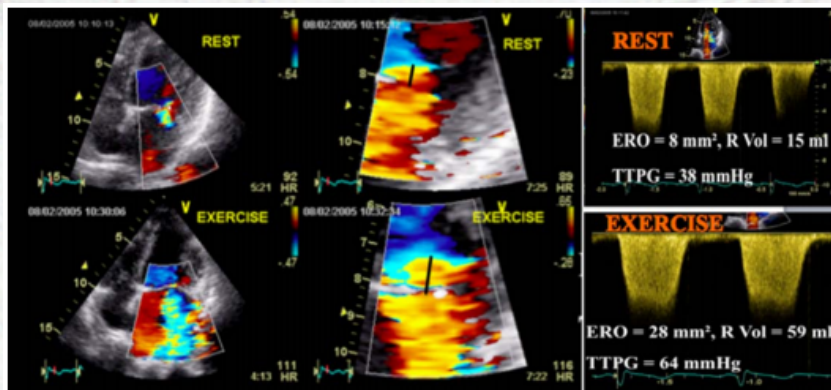
- La determinazione della capacità funzionale mediante test da sforzo cardiopolmonare può contribuire ad una migliore valutazione

*Cardiopulmonary exercise testing determination of functional capacity in mitral regurgitation: physiologic and outcome implications*  
Messika-Zeitoun D et al J Am Coll Cardiol 2006;47:2521-7

- In mani esperte, l'ecocardiografia da sforzo è utile per quantificare le **modificazioni dell'IM**, della **pressione sistolica polmonare** e della **funzione VS** indotte dall'esercizio

- *The emerging role of exercise testing and stress echocardiography in valvular heart disease. Picano E et al J Am Coll Cardiol*  
2009;54:2251-60

*Exercise-induced changes in degenerative mitral regurgitation Magne J, Lancellotti P, Piérard LA, J Am Coll Cardiol* 2010;56:3009



L'impiego di nuovi strumenti, quali il test da sforzo cardiopolmonare, lo **strain longitudinale globale** (misurato mediante tecnica speckle tracking) e le variazioni di volume VS, FEVS e strain globale indotte dall'esercizio possono verosimilmente **predire il rischio di disfunzione VS postoperatoria**

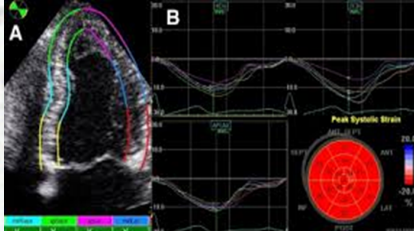
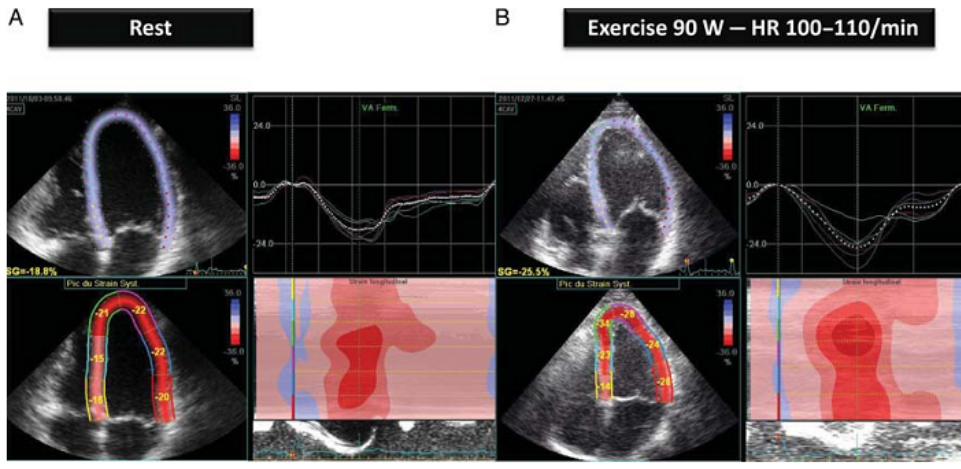
Importance of left ventricular longitudinal function and functional reserve in patients with degenerative mitral regurgitation: assessment by two-dimensional speckle tracking Lancellotti P et al.. J Am Soc Echocardiogr 2008;21: 1331-6.

Tradotto da Vahanian A, Alfieri O, Andreotti F, et al. Guidelines on the management of valvular heart disease (version 2012). The Joint Task Force on the Management of Valvular Heart Disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS). Eur Heart J 2012;33:2451-98.

**RCVS (riserva contrattile del ventricolo sinistro)** può essere assente in circa la metà dei pz con IM severa asintomatica e la mancanza di incremento valutata con lo strain longitudinale durante sforzo è associate ad un rischio di eventi cardiovascolari almeno doppio

Left ventricular contractile reserve in asymptomatic primary mitral regurgitation Magne J et al. European Heart Journal (2014) 35, 1608–1616

Questi parametri ci permettono una migliore stratificazione del rischio



**Figure 1** Assessment of global longitudinal strain at rest and during submaximal exercise in a patient with severe organic mitral regurgitation. Global longitudinal strain in the apical four-chamber view increased from -18.8 to -25.5% in this example.

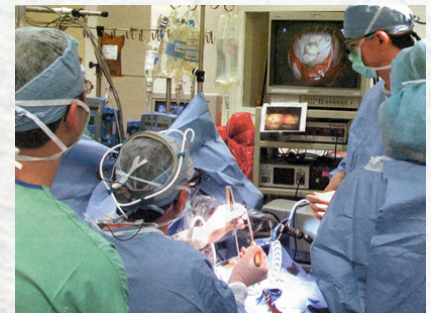
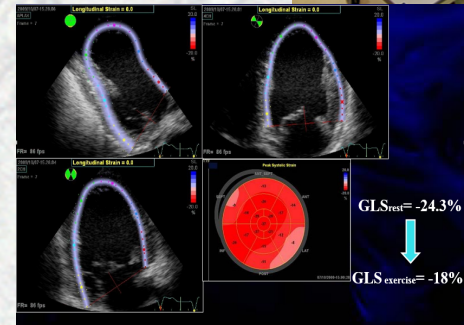


- Cautela

- Diagnostica di livello avanzato

- Follow-up ravvicinato

- Chirurgia in presenza di trigger ed in centri di eccellenza





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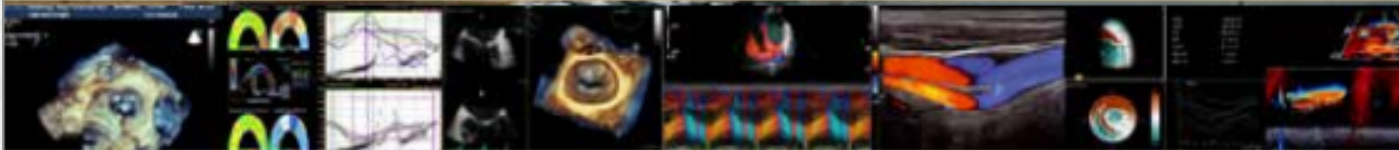
**GRAZIE**





**Società Italiana di Ecografia Cardiovascolare**

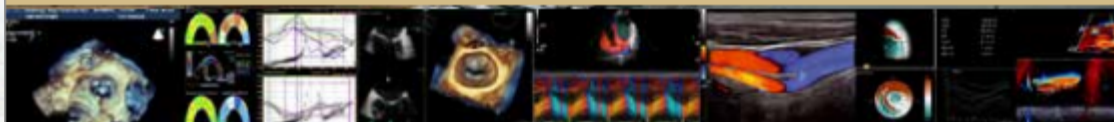
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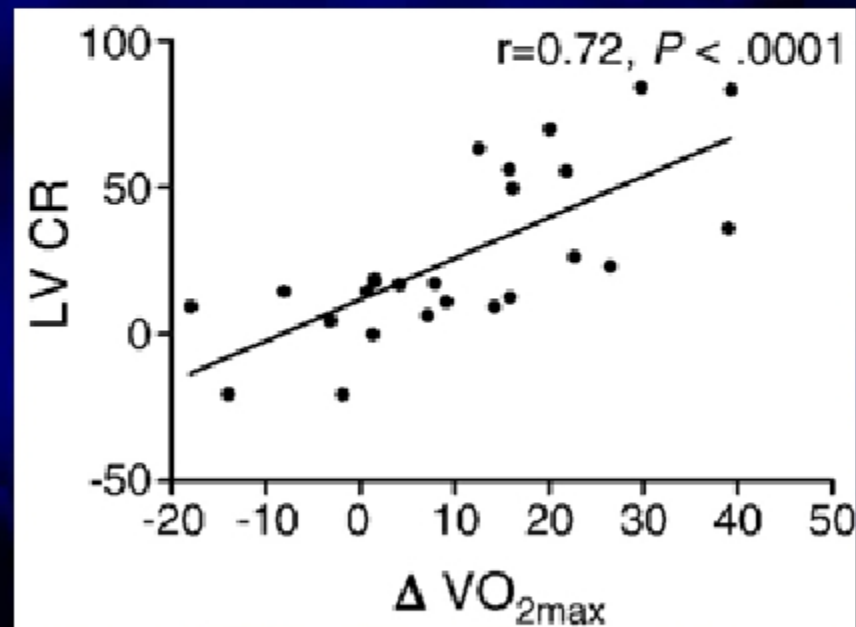
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# Asymptomatic MR and LV Contractile Reserve

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%
GLS	18.1%	0.69	76.9%	76.5%
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*

# BNP

- In alcuni studi che hanno valutato il ruolo dell'attivazione neurormonale nell'IM, elevati livelli di BNP così come una variazione delle concentrazioni di BNP sono risultati fattori predittivi di outcome. Un valore cut-off di BNP  $> 105$  pg/ml ottenuto in una coorte di derivazione è stato validato in una coorte prospettica indipendente, contribuendo ad identificare i pazienti asintomatici a più alto rischio di sviluppare SC, disfunzione VS o un evento fatale ad un follow-up a medio termine

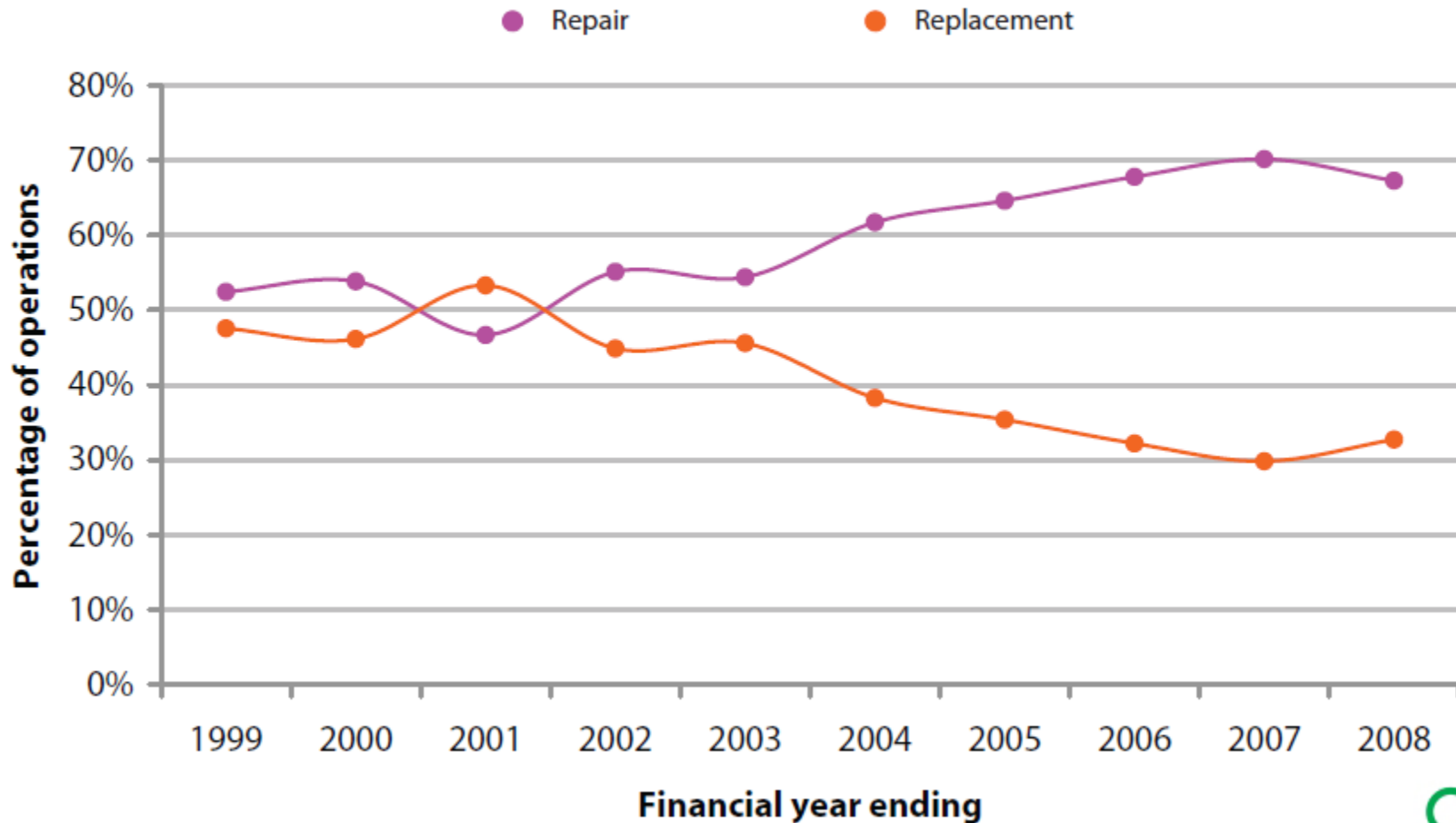
*Prospective validation of the prognostic usefulness of brain natriuretic peptide in asymptomatic patients with chronic severe mitral regurgitation Pizarro R et al J Am Coll Cardiol 2009;54:1099-106*

- Bassi livelli plasmatici di BNP hanno un valore predittivo negativo e possono facilitare il follow-up dei pazienti asintomatici

*Prognostic value of serial B-type natriuretic peptide measurement in asymptomatic organic mitral regurgitation. Klaar U et al Eur J Heart Fail 2011;13:163-9*



### Degenerative mitral valve disease: Changes in treatment over time; all operation classes included (n=7,207)





# Circulation

JOURNAL OF THE AMERICAN HEART ASSOCIATION

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**Influence of Hospital Procedural Volume on Care Process and Mortality for Patients Undergoing Elective Surgery for Mitral Regurgitation**  
James S. Gammie, Sean M. O'Brien, Bartley P. Griffith, T. Bruce Ferguson and Eric D. Peterson

**TABLE 2. Frequency of Adverse Outcomes by Category of Hospital Volume**

	Hospital Mitral Volume (Procedures/Year)				P*
	1–35	36–70	71–140	>140	
Operative mortality	3.08	2.31	2.02	1.11	<0.0001
Reoperation	8.19	8.65	8.85	6.59	0.8894
Renal failure	2.85	2.82	1.96	1.90	0.0264
Prolonged mechanical ventilation (>24 h)	7.19	5.98	6.05	4.01	0.0026
Stroke	1.12	1.55	1.41	1.22	0.7434
Mortality plus major morbidity	15.61	15.12	14.30	11.31	0.0364

\*Test of trend.

All values are percentages unless otherwise indicated.



# Circulation

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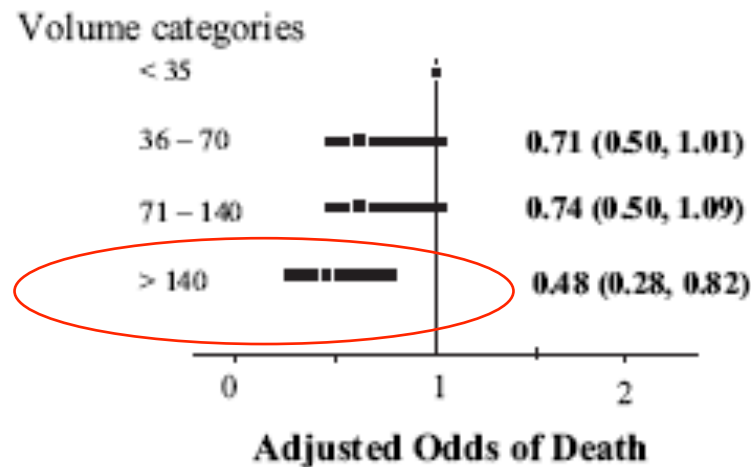


Figure 2. Relationship between annual volume of all mitral operations and risk-adjusted mortality among patients undergoing first-time elective surgery for mitral regurgitation.



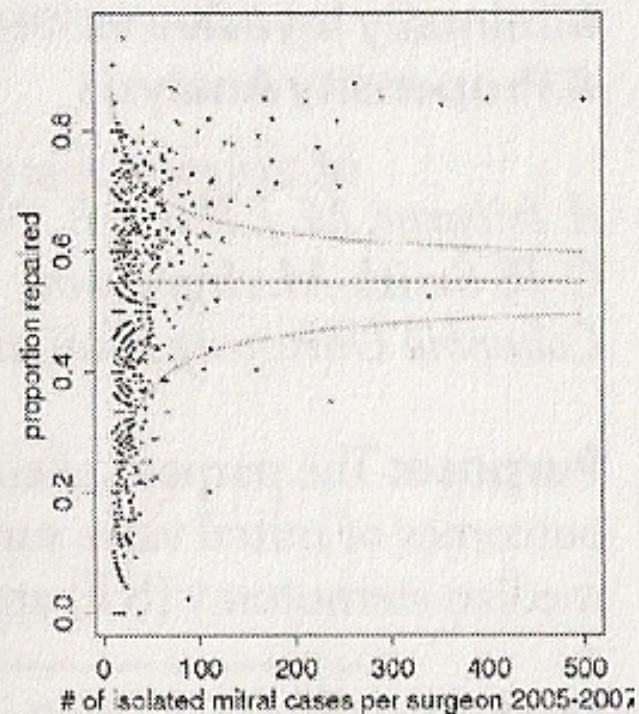
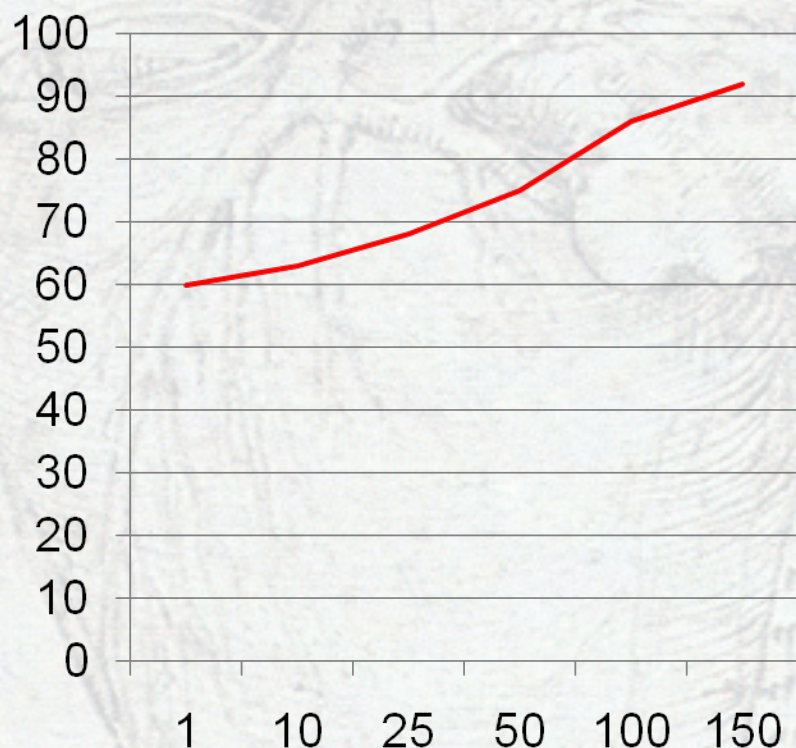


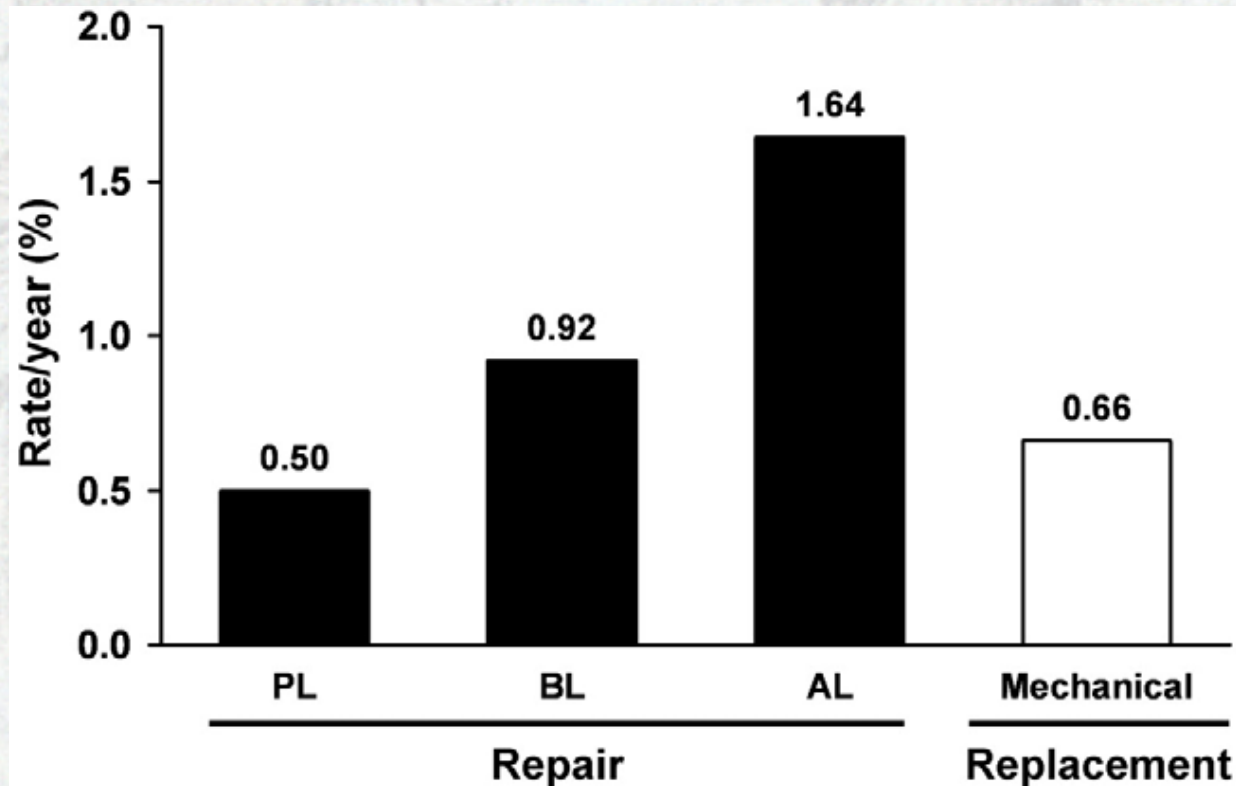
## Predictors of Mitral Valve Repair: Clinical and Surgeon Factors

*S. F. Bolling<sup>1</sup>, S. M. O'Brien<sup>3</sup>, J. Brennan<sup>3</sup>, S. Li<sup>3</sup>, R. L. Prager<sup>1</sup>, J. S. Gammie<sup>2</sup>*

<sup>1</sup>University of Michigan Hospital, Ann Arbor, MI; <sup>2</sup>University of Maryland, Baltimore, MD; <sup>3</sup>Duke University, Durham, NC

### Propensity to repair by surgeon volume





- Condivisione e confronto



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