

**IIV CONGRESSO NAZIONALE DI ECOCARDIOGRAFIA  
MILANO 10-12 MARZO 2010**

**Come valutare la disfunzione associata ad  
insufficienza aortica.  
*Un argomento centrale nella scelta del timing  
chirurgico nel quale i dati storici prevalgono  
ancora.***

**Alberto Barosi**

*Niguarda Hospital, Milano, Italy*



# DAL PASSATO AL PRESENTE

ANNI  
70

- STORIA NATURALE IAO

ANNI  
80-90

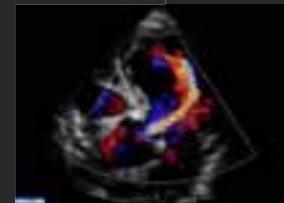
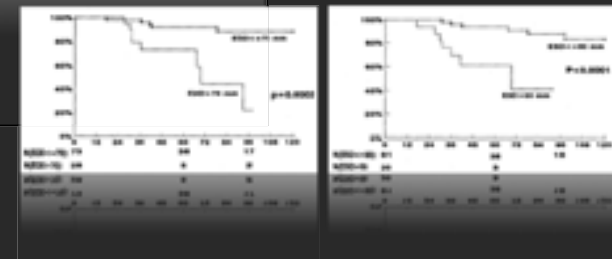
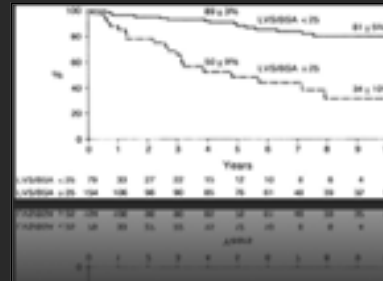
- INDICAZIONE CHIRURGICA
- PROGnosi POSTOPERAT.

ANNI  
90-2000

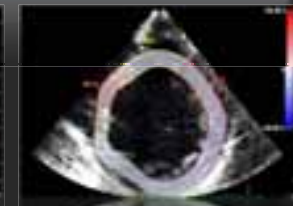
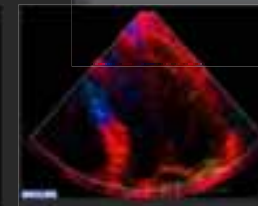
- SVILUPPO IMAGING
- PARAMETRI ECO PREDITTIVI
- NUOVE TECNICHE CCH

ANNI  
2000

- NUOVE TECNOLOGIE

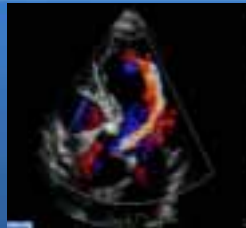


	COMPENSATO	TRANSIZIONE	SCOMPENSATO
DTD mm	<65	65-70	>70
DTS mm	<45	45-50	>50
VTD ml/m <sup>2</sup>	<120	130-160	>170
VTS ml/m <sup>2</sup>	<50	50-60	>60
FE (%)	>55	50-55	<50



# ADATTAMENTI DEL VENTRICOLO AL SOVRACCARICO CRONICO DI VOLUME

SOVRACCARICO DI VOLUME



DILATAZIONE COMPENSATA

- IPERTROFIA ECCENTRICA
- SFERICIZZAZIONE

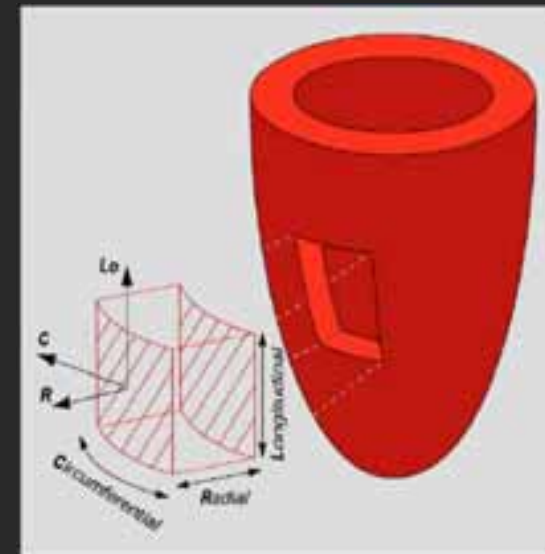
↑ STRESS ( $\sigma$ )  
↑ MASSA

DILATAZIONE SEVERA

- IPERTROFIA INADEGUATA
- DEPRESSIONE CONTRATTILE
- FIBROSI MORTE CELLULARE

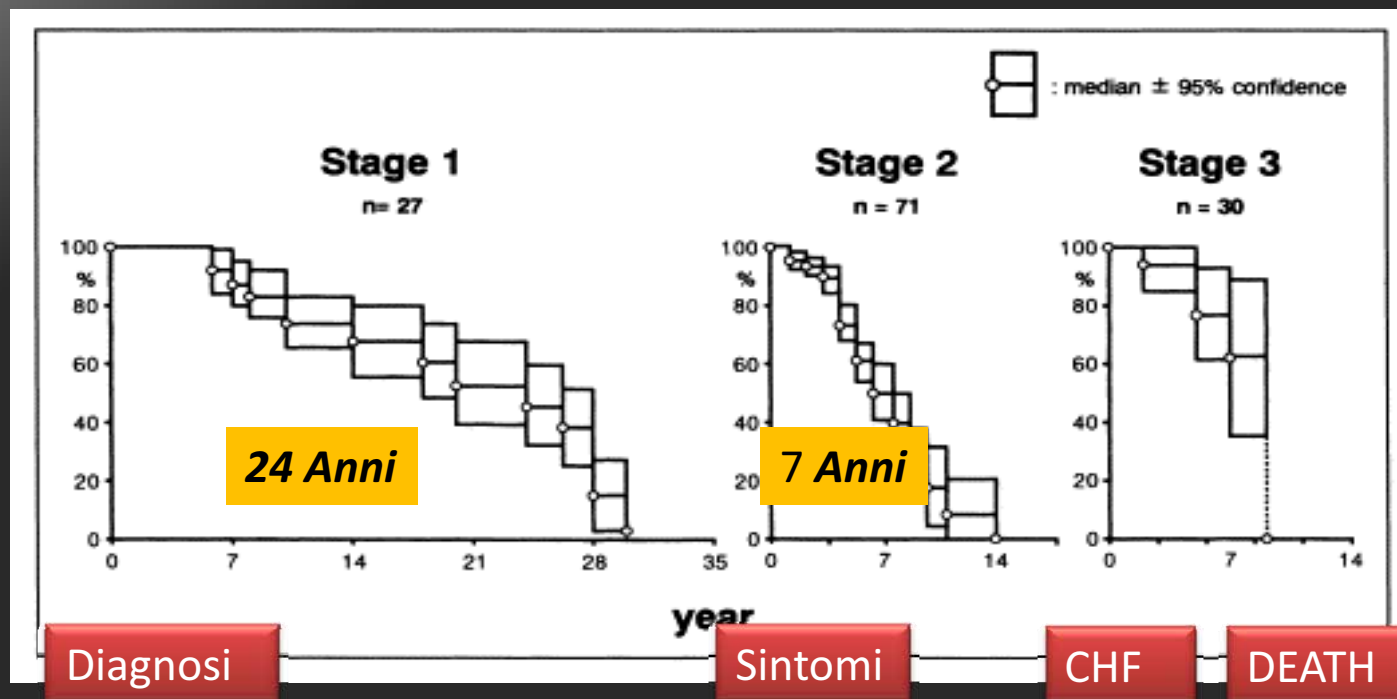
↑ LVEDP  
↑ ESVind  
↓ FE

Volumi cavitari (↑ → ↑ $\sigma$ )  
Spessore di parete (↓ → ↑ $\sigma$ )



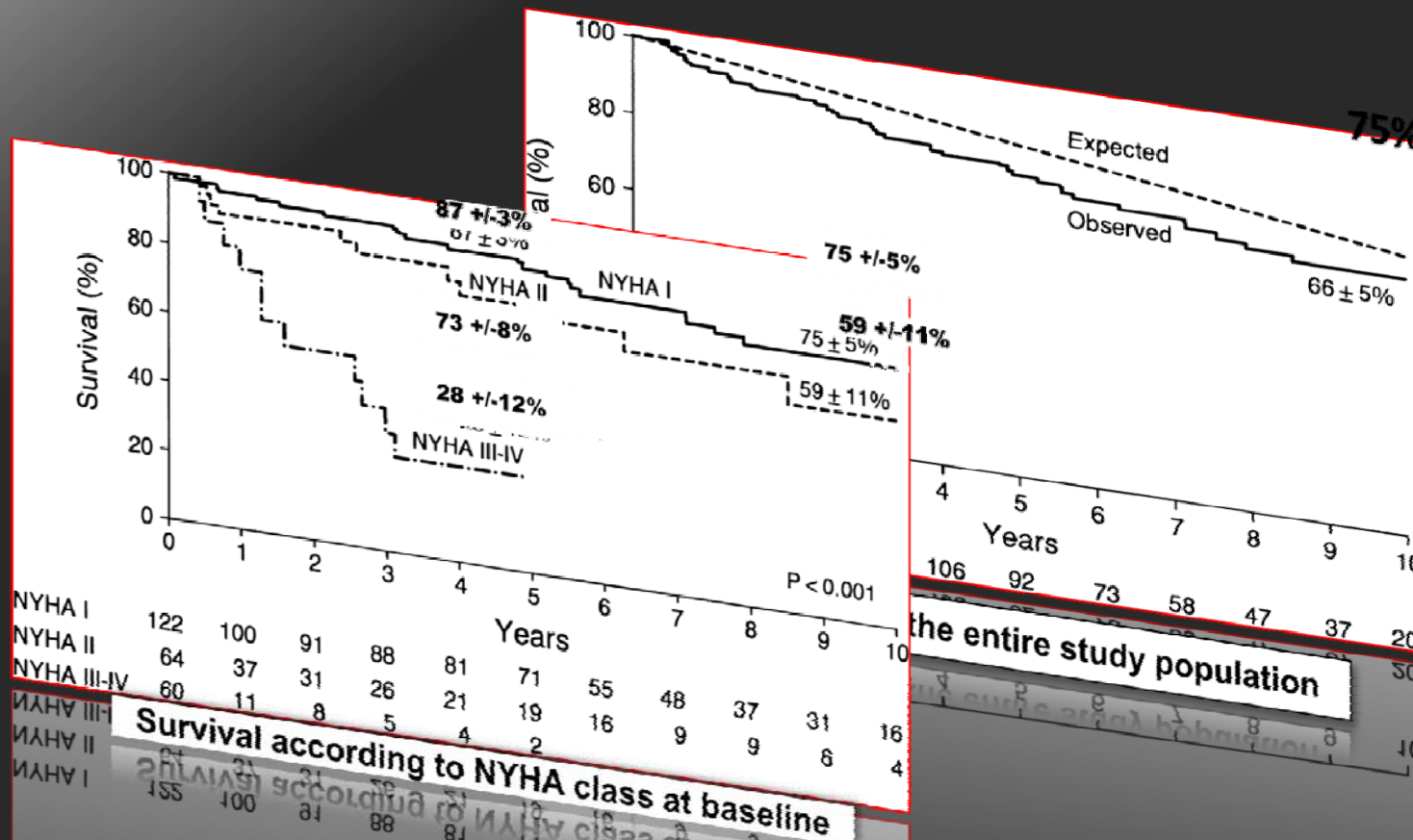
# STORIA NATURALE DELLA MALATTIA

## RISPOSTA DEL VS AL SOVRACCARICO DI VOLUME



Dujardin KS, Circulation. 1999;99:1851-1857.)

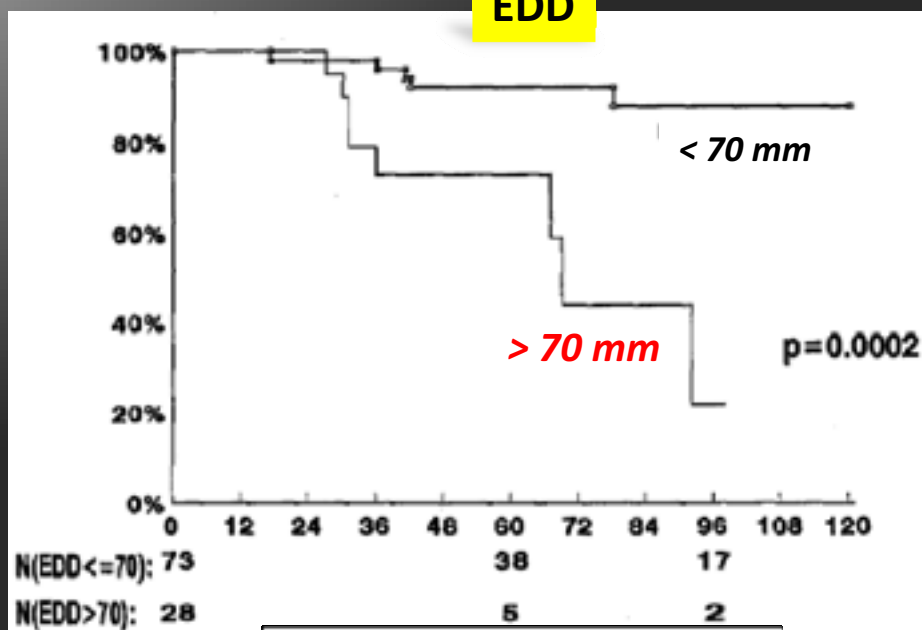
# VARIABILI CLINICHE DI SOPRAVVIVENZA: CLASSE NYHA



Dujardin KS, Circulation. 1999;99:1851-1857.)

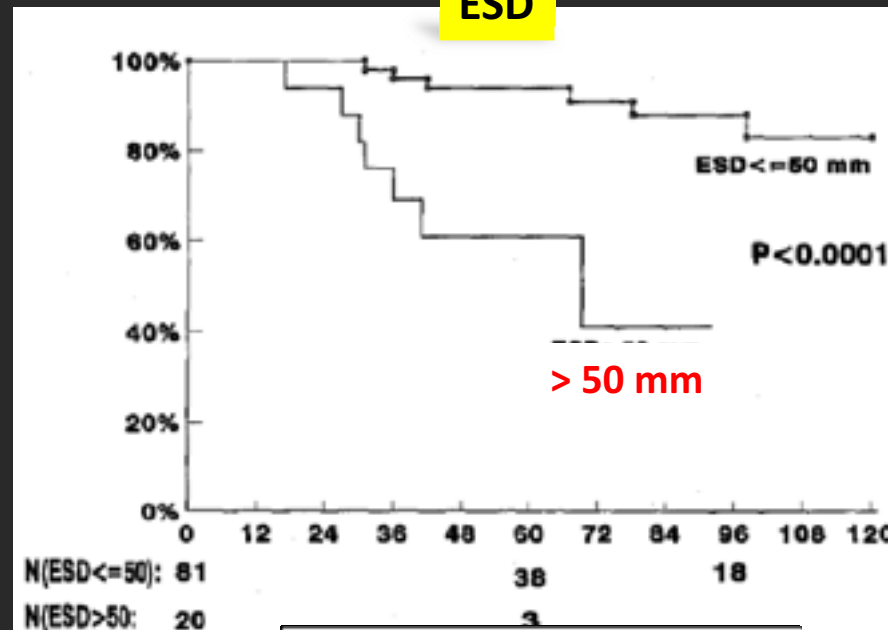
# VARIABILI ECO PREDITTIVE DI IMMINENTE DETERIORAMENTO

**EDD**



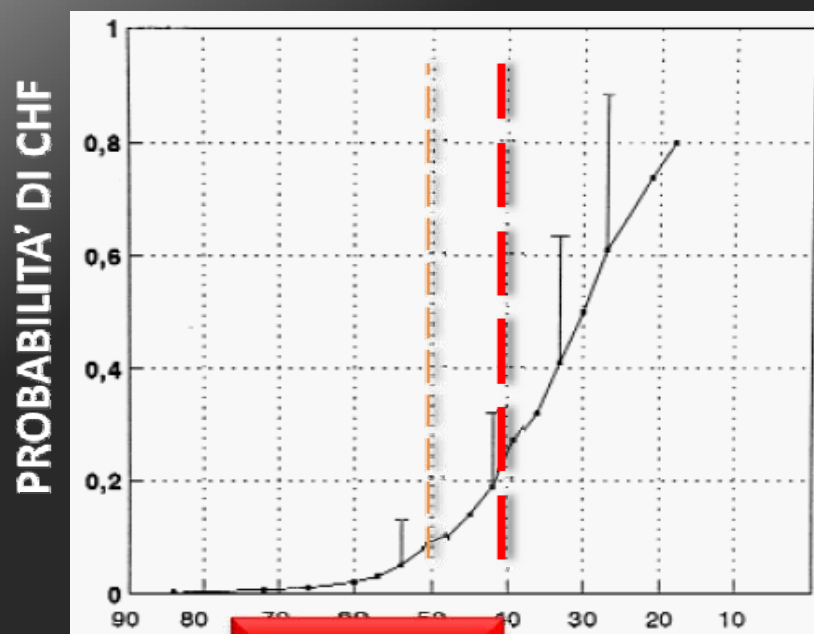
Kaplan-Mayer curve Risk of surgery

**ESD**



Kaplan-Mayer curve Risk of surgery

# VARIABILI ECO PREDITTIVE DI CHF POSTOPERATORIO

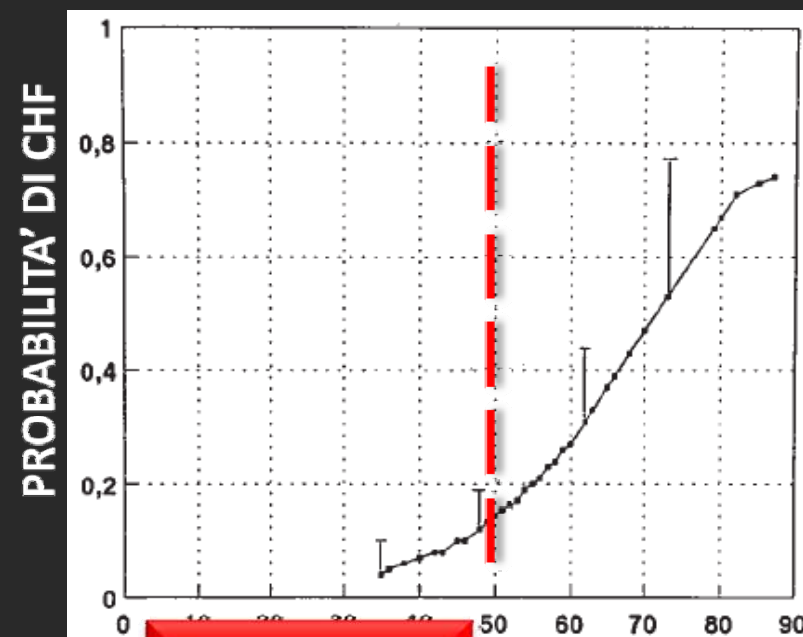


**REF < 40%**

REF < 40%

**EF < 55%**

EF < 55%



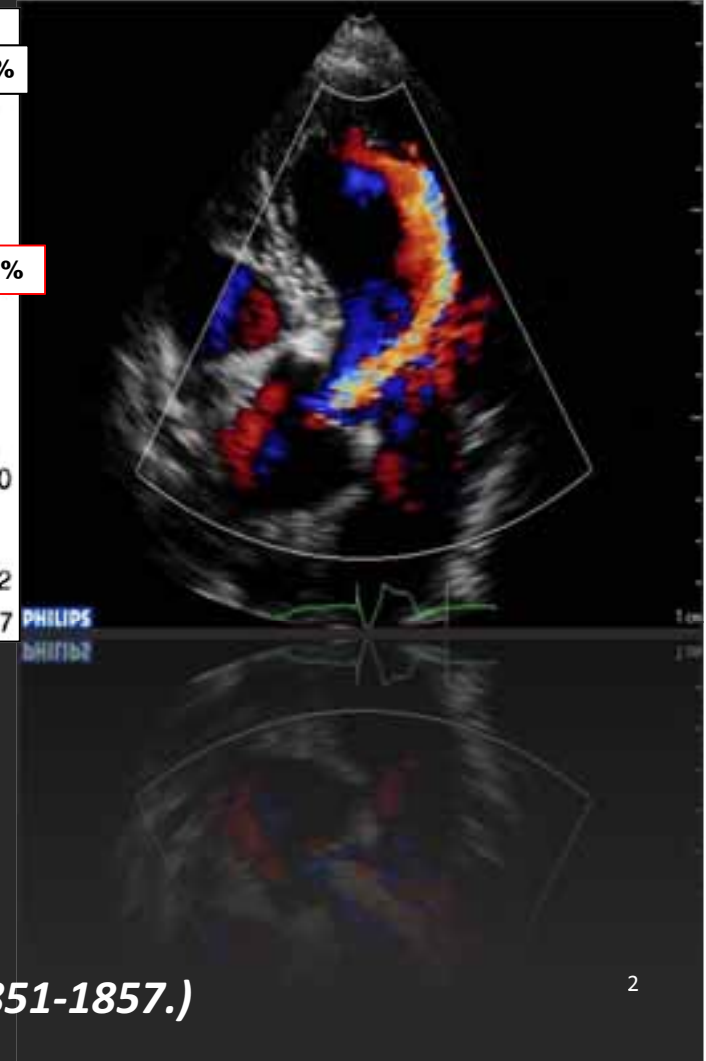
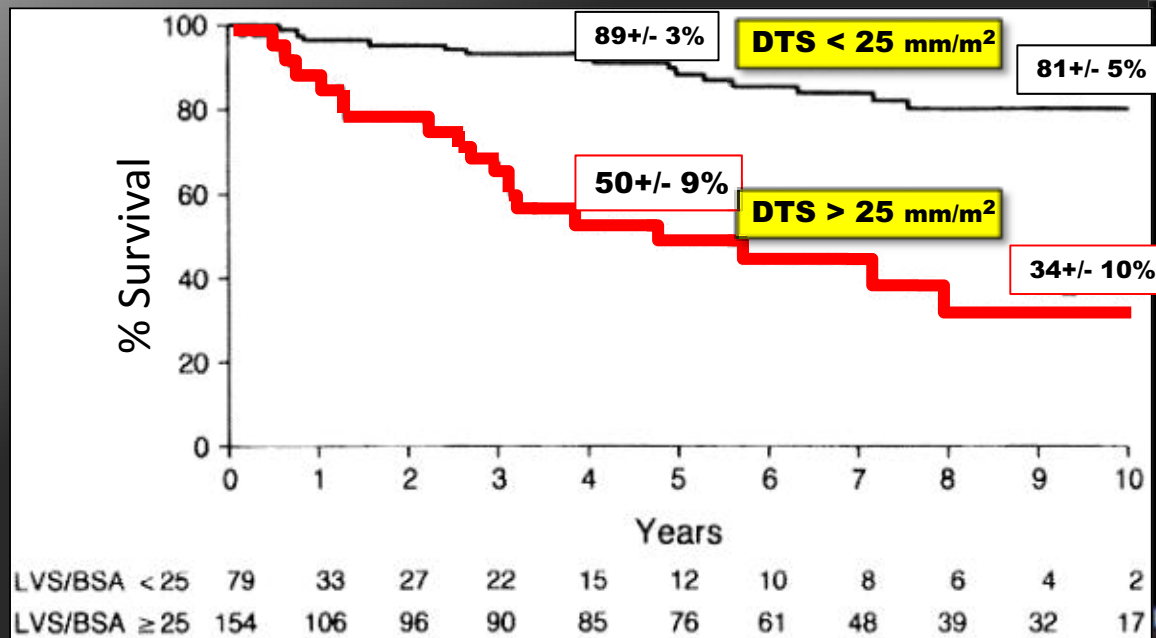
**ESD > 50 mm**

ESD > 50 mm

MP Tornos, Am. Heart J 1998; 136:681-7.



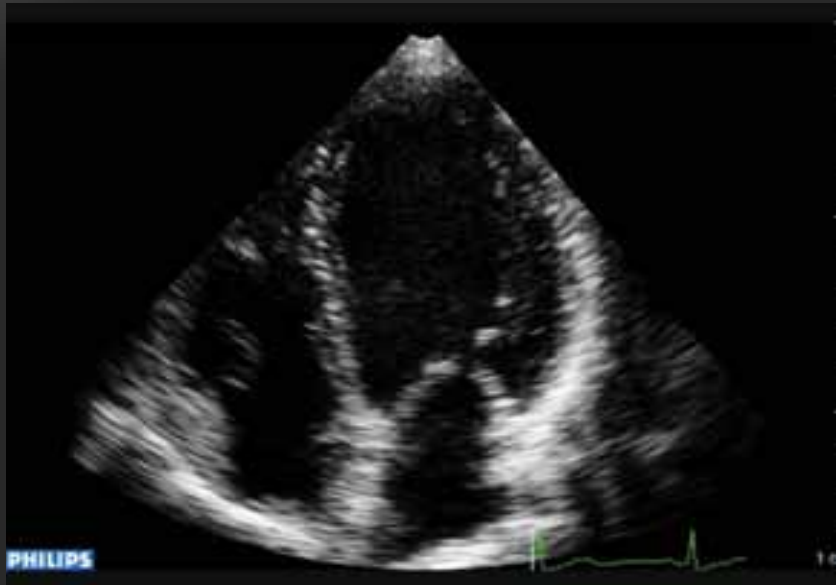
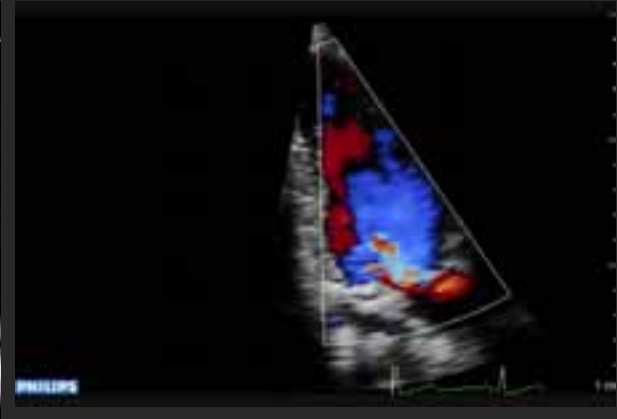
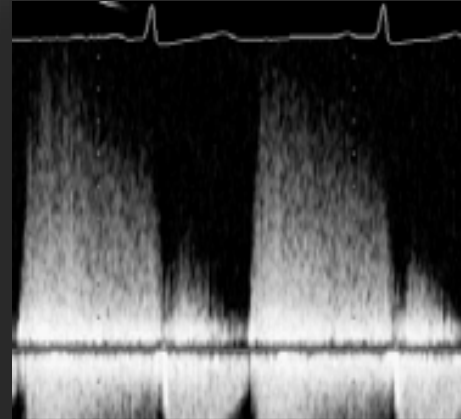
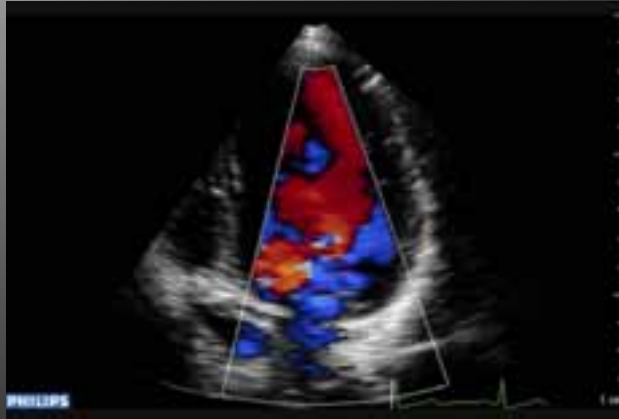
# Mortality and Morbidity of Aortic Regurgitation in Clinical Practice



*Dujardin KS, Circulation. 1999;99:1851-1857.)*



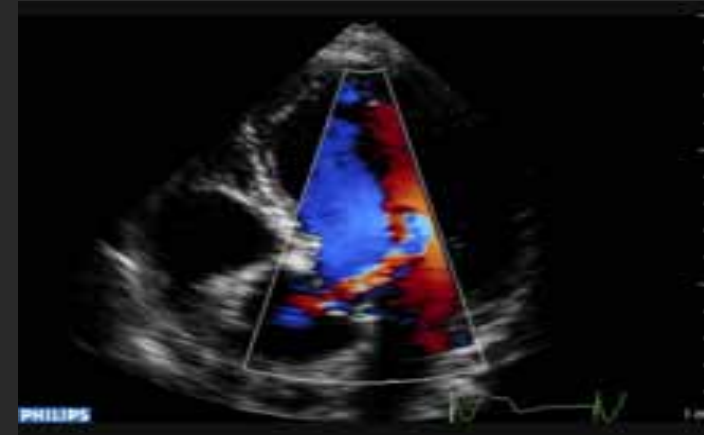
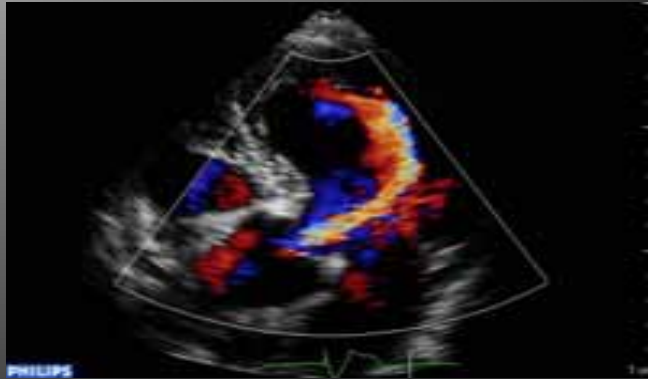
# STRATIFICAZIONE DEL RISCHIO: VARIABILI ECOCARDIOGRAFICHE



	COMPENSATO
DTD mm	<65
DTS mm	<45
DTS i. mm/m <sup>2</sup>	<25
VTD mL/m <sup>2</sup>	<120
VTS mL/m <sup>2</sup>	<50
FE (%)	>55

GAASH WJ CHEST 1997 p. 1702 (modificata)

# STRATIFICAZIONE DEL RISCHIO: VARIABILI ECOCARDIOGRAFICHE



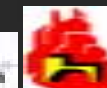
	SCOMPENSATO
DTD mm	>70
DTS mm	>50
DTS i. mm/m <sup>2</sup>	>25
VTD mL/m <sup>2</sup>	>170
VTS mL/m <sup>2</sup>	>60
FE (%)	<50

GAASH WJ CHEST 1997 p. 1702 (modificata)

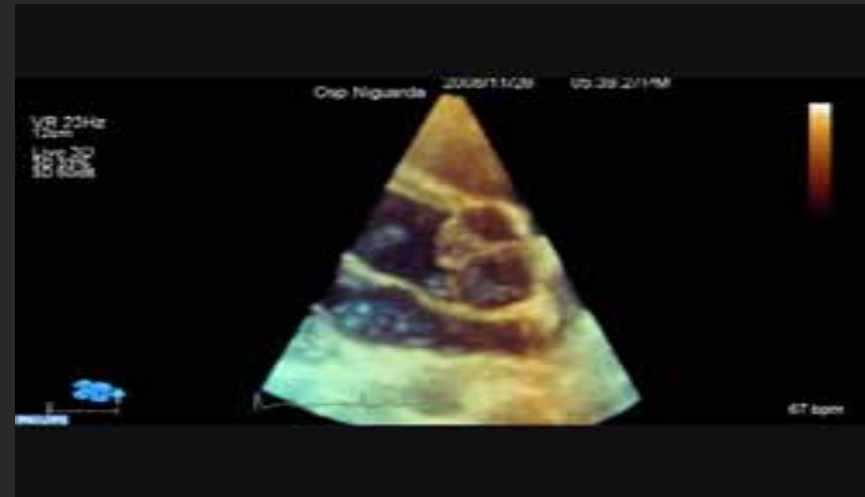
# Indications for surgery in aortic regurgitation: *ESC Committee for Practice Guidelines 2007*

	CLASSE
<b><u>IAo SEVERA</u></b>	
<b>Pz. Sintomatici</b>	<b>IB</b>
<b>Pz. Asintomatici con FE&lt;50%</b>	<b>IB</b>
In associazione a CABG o altra chir. valvolare e dell'ao asc.	<b>IC</b>
<b>Pz. Asintomatici con FE&gt;50% e severa dilatazione VS</b>	
<b>DTD V<sub>sx</sub> &gt;70 mm (75 mm) *</b>	<b>IlaC</b>
<b>DTS V<sub>sx</sub> &gt; 50 mm (&gt;25 mm/m<sup>2</sup> BSA) (&gt;55 mm) *</b>	<b>IlaC</b>
<b><u>QUALUNQUE IAo + PATOLOGIA DELLA RADICE Ao</u></b>	
≥45 mm (Marfan);	<b>IC</b>
≥50mm (Bicuspidia); ≥ 55mm (altri)	<b>IlaC</b>

\* considerare la superficie corporea del paziente.



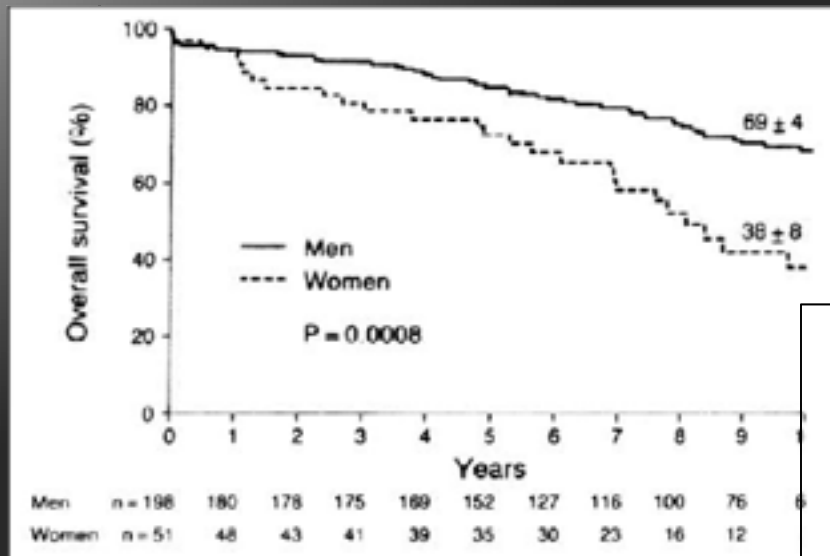
# SCHEMA DECISIONALE: cadenza dei controlli ECO



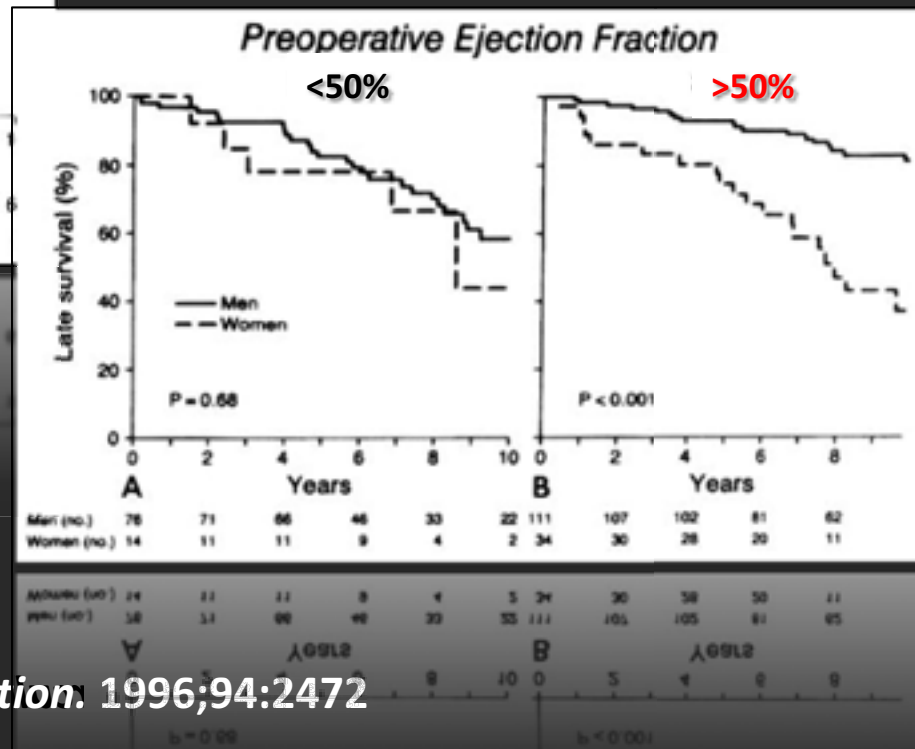
## CONSIDERARE :

- Donne
- Superficie Corporea
- Progressione malattia
- Variabilità inter/ intra op.

# DONNE E INSUFFICIENZA AORTICA



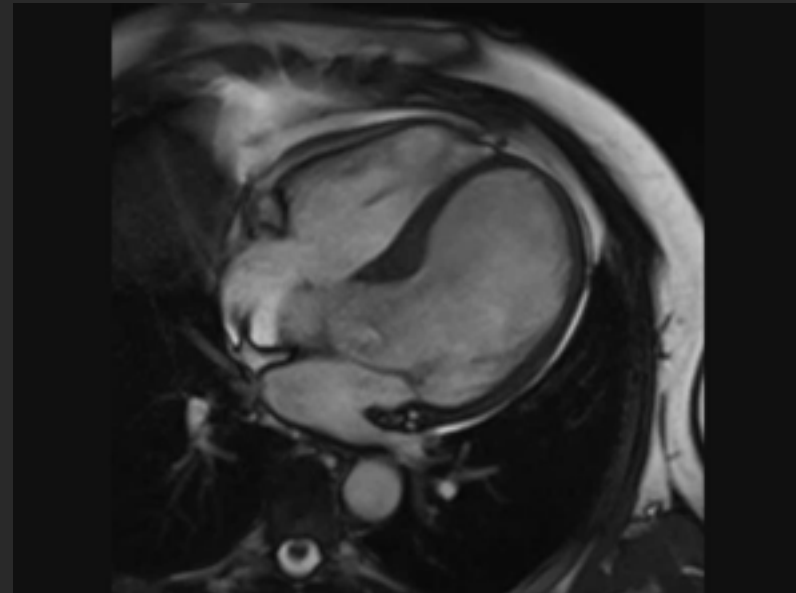
1. SOPRAVVIVENZA A 10 ANNI PEGGIORE 39% VS 72%
2. EVIDENTE SE FE > 50%
3. OPERATE IN STADI PIU' AVANZATI ALLA COMPARSA DI SINTOMI



— UOMINI  
- - - DONNE

KLODAS E. *Circulation*. 1996;94:2472

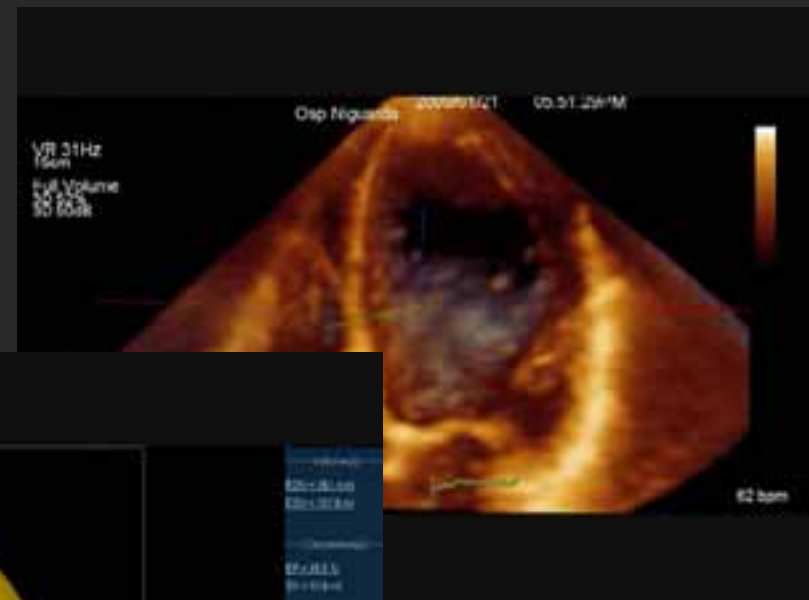
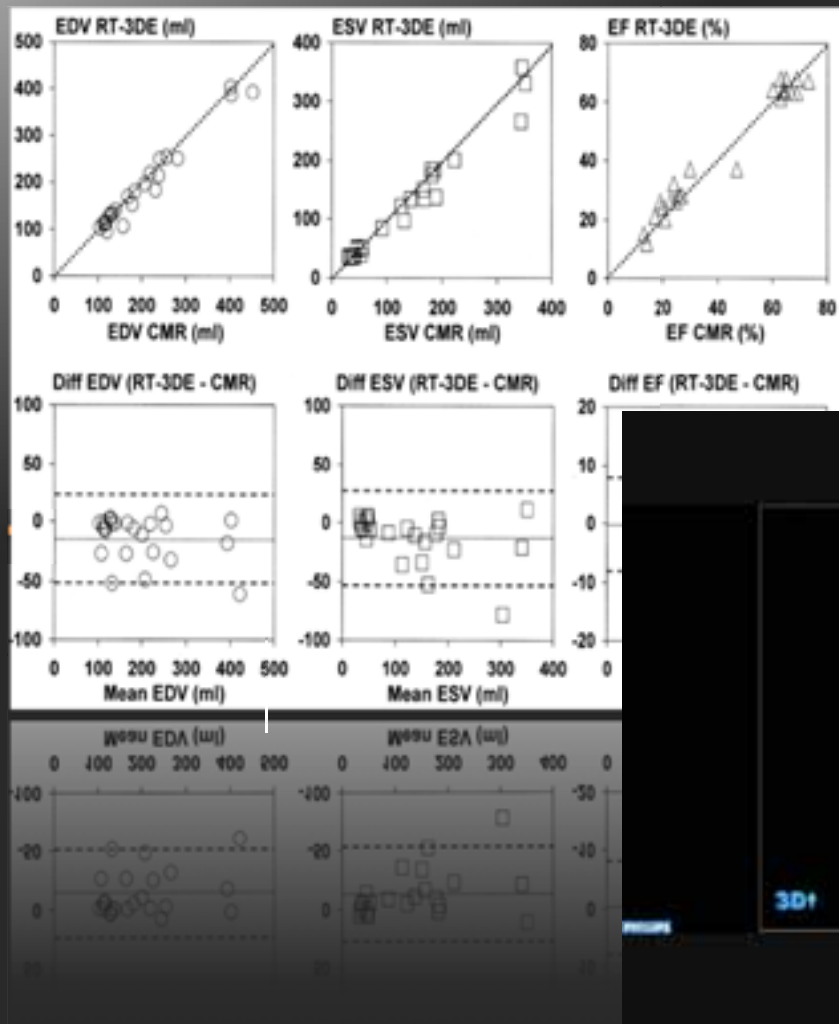
# PROGRESSIONE DELLA DISFUNZIONE E DELLA DILATAZIONE VENTRICOLARE



**.....Good-quality echocardiograms and data confirmation with repeated measurements are strongly recommended before surgery in asymptomatic patients.**



# VOLUMETRIA E FUNZIONE SISTOLICA: 3D-RT ECO



Harald P. Kuhl. *JACC* 43, No. 11, 2004.

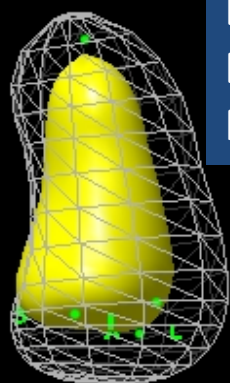


# VOLUMETRIA E FUNZIONE SISTOLICA: ECO vs RMC

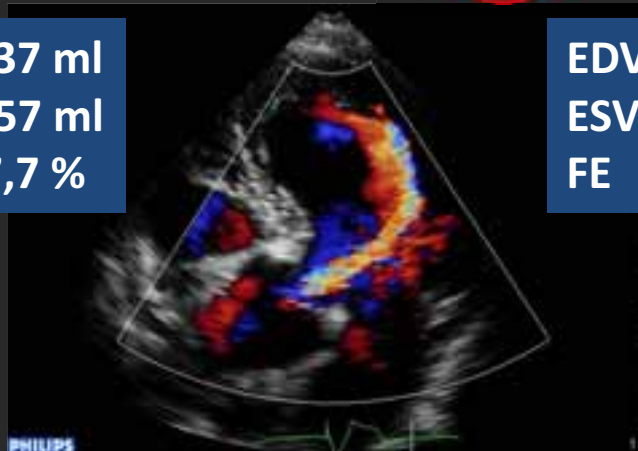
	LVEDV		LVESV		LVEF		LV mass	
	Intra	Inter	Intra	Inter	Intra	Inter	Intra	Inter
<b>MM</b>	4.5 ± 6.8	7.9 ± 8.5	4.6 ± 3.8	7.0 ± 4.6	4.8 ± 5.2	8.2 ± 6.8	4.3 ± 11.3	8.7 ± 13.2
<b>2D</b>	3.8 ± 6.1	6.5 ± 5.8	3.6 ± 4.0	5.5 ± 3.9	4.5 ± 4.2	6.8 ± 5.5	3.3 ± 12.5	7.3 ± 12.5
<b>3D</b>	<b>1.0 ± 5.2</b>	<b>3.2 ± 3.8</b>	<b>1.5 ± 2.8</b>	<b>3.3 ± 4.0</b>	<b>1.5 ± 4.1</b>	<b>1.8 ± 4.2</b>	<b>1.9 ± 11.2</b>	<b>4.5 ± 9.9</b>

# RIGURGITO SEVERO IN Pz. ASINTOMATICI BORDERLINE

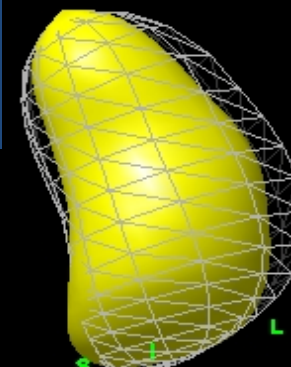
	COMPENSATO	TRANSIZIONE	SCOMPENSATO
DTD mm	<65	65-70	>70
DTS mm	<45	45-50	>50
VTD mL/m2	<120	130-160	>170
VTS mL/m2	<50	50-60	>60
FE (%)	>55	50-55	<50



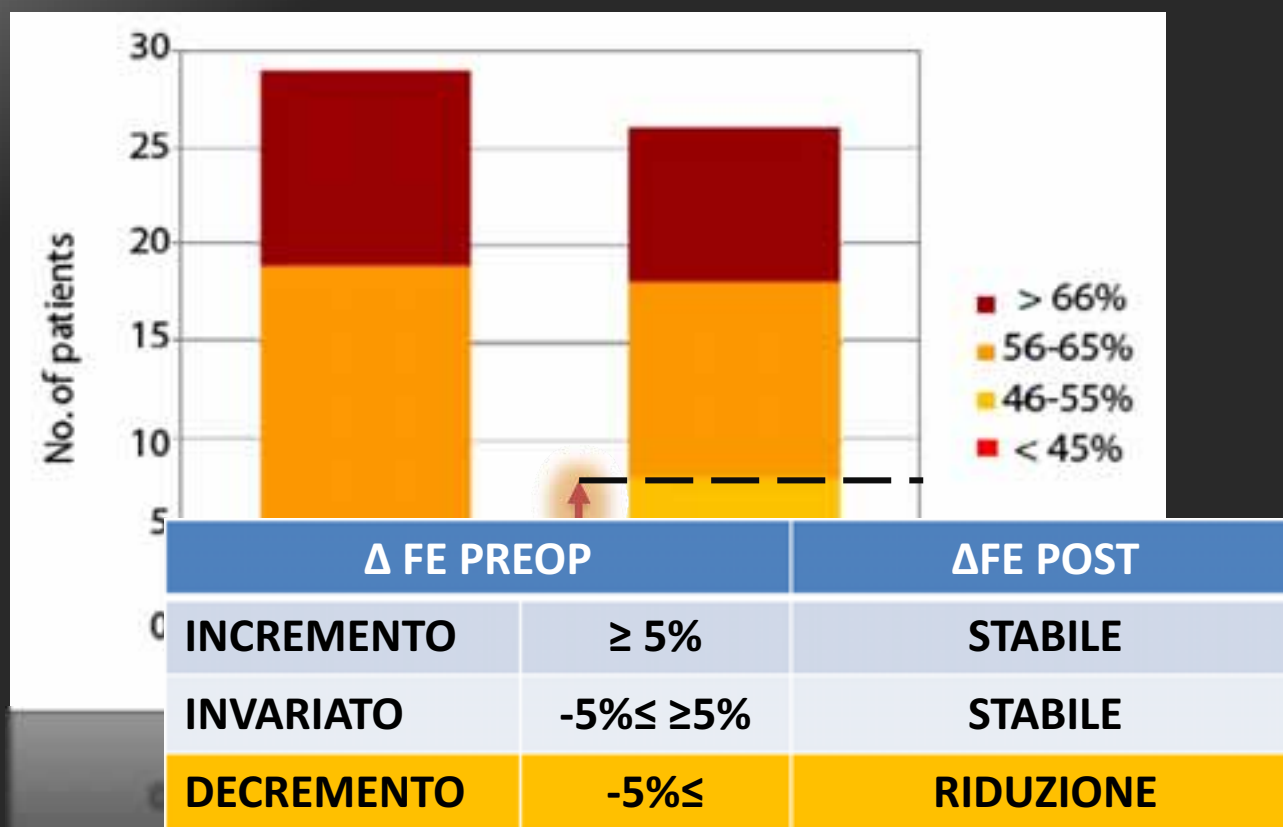
EDV 137 ml  
ESV 57 ml  
FE 67,7 %



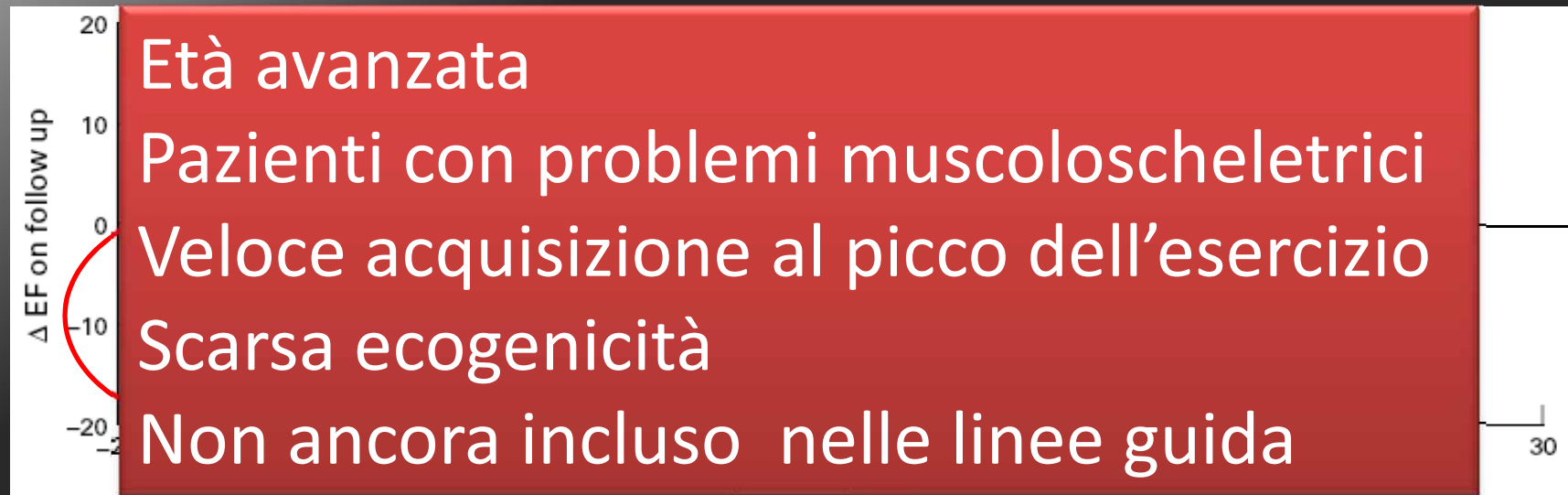
EDV 247 ml  
ESV 170 ml  
FE 30,7 %



# DISFUNZIONE VENTRICOLARE LATENTE: LA RISERVA CONTRATTILE



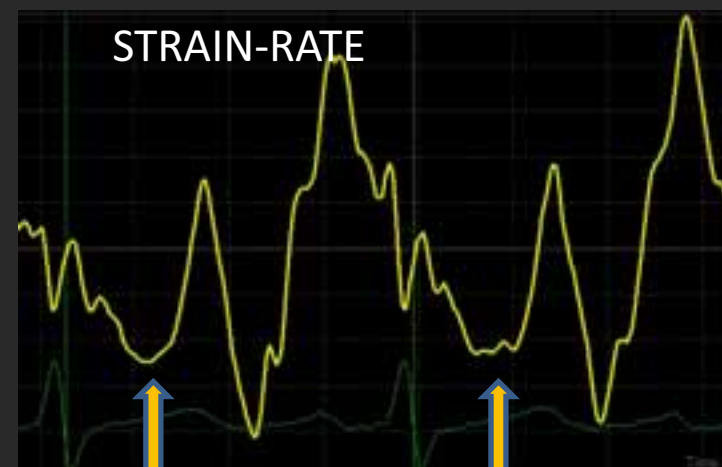
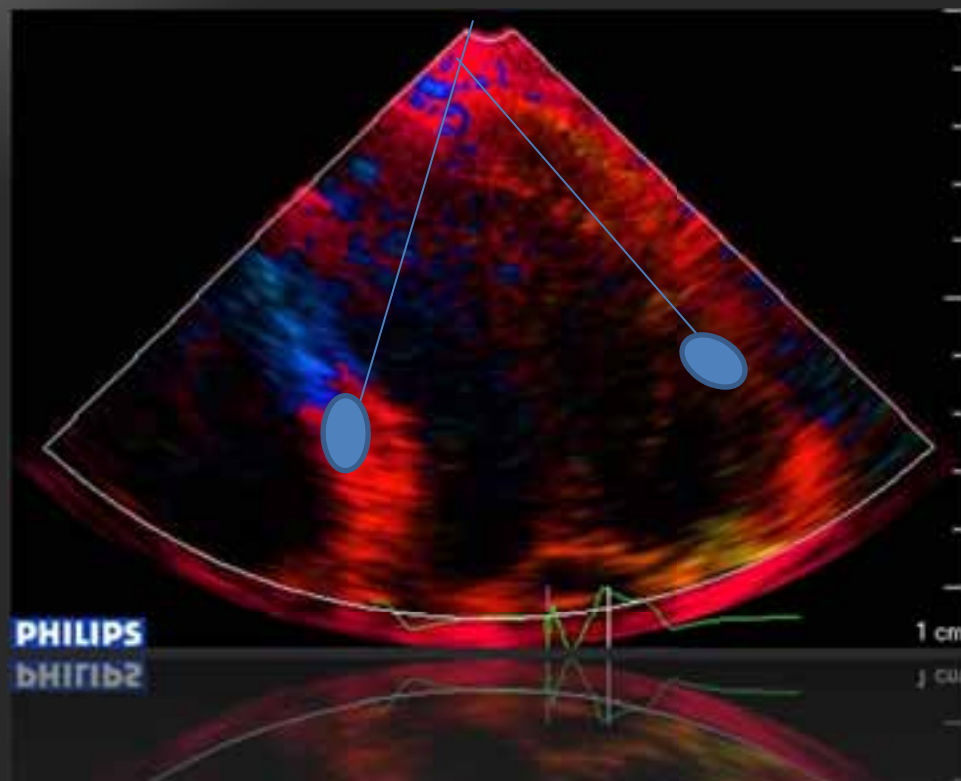
# DISFUNZIONE VENTRICOLARE LATENTE: LA RISERVA CONTRATTILE



CR- correla con una riduzione della FE al follow-up ecocardiografico indipendentemente dal trattamento medico o chirurgico

# STUDIO DELLA DEFORMAZIONE : STRAIN E STRAIN RATE

	STRAIN-RATE (S-1)	STREIN (-%)
SETTO	$1,54 \pm 0,32$	$21 \pm 6$
PARETE LAT.	$1,63 \pm 0,24$	$21 \pm 5$



# STUDIO DELLA DEFORMAZIONE : STRAIN E STRAIN RATE

SETTO	STRAIN-RATE (S-1)	STREIN (%)
CONTROLLI	1,54 ± 0,32	21±6
IAo 1+	1,67 ± 0,32	21 ± 4
IAo 2+	1,32 ± 0,28	18 ± 3
IAo 3+	1,11 ±0,42	14 ± 6

PARETE LAT.	STRAIN-RATE (S-1)	STREIN (%)
CONTROLLI	1,63 ± 0,24	21 ± 5
IAo 1+	1,64 ± 0,37	22 ± 4
IAo 2+	1,22 ± 0,33	19 ± 4
IAo 3+	1,08 ±0,42	15 ± 5

# CONCLUSIONI

- L'insufficienza valvolare aortica severa in pazienti asintomatici richiede un attento follow up clinico strumentale allo scopo di valutare la progressione della malattia e l'eventuale indicazione chirurgica.
- Le raccomandazioni in uso sono definite sulla base di misure quantitative di dimensioni e funzioni della camera ventricolare sinistra.



# CONCLUSIONI

- L'obiettivo futuro è la definizione degli stadi di disfunzione latente del ventricolo.
- L'ecografia da sforzo e lo studio della deformazione miocardica costituiscono le tecniche ecografiche più avanzate per la diagnosi delle fasi precoci della malattia, ma una validazione scientifica per un loro uso clinico routinario appare ancora necessaria