

**UNIVERSITÀ  
DI TORINO**

Department of Medical Sciences  
Division of Internal Medicine  
Hypertension Unit

Società Italiana  
dell'Ipertensione Arteriosa  
Lega Italiana contro  
l'Ipertensione Arteriosa



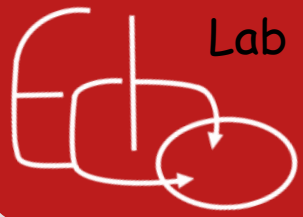
# **Ruolo del danno d'organo cardiaco nel paziente ad elevato rischio CV**

Lorenzo Airale – Torino

**EVENTO FORMATIVO INTERREGIONALE SIIA**

**Piemonte – Liguria – Valle d'Aosta**

**TORINO 22.10.2022**



Lab

# Sig.ra Luciana, 57 anni



In **DEA** per

- PAO 220/85 mmHg
- Cefalea



**Sovrappeso (BMI 27)**

**APR**

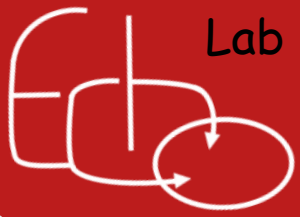
fumo

ensione di grado 2 da 10 anni

idismo in terapia sostitutiva

me ansioso-depressiva

- Ramipril 5mg l co
- Lercanidipina 10 mg l co
- Levotiroxina 75 mcg l co



# Sig.ra Luciana, 57 anni

## In DEA

- **PAO** 200/65 mmHg
- Agli **ematochimici** si segnala:

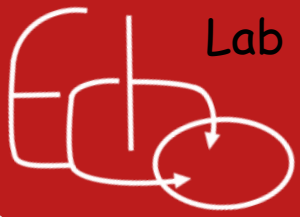
**Hb** 11.1 g/dl

**Creatinina** 1.1 mg/dl (eGFR 62 ml/min)

**LDL** 79 mg/dl

**NTproBNP** 4142

- **TC cranio:** ndr
- **Visita cardiologica:** **NYHA I**



# Sig.ra Luciana, 57 anni

... in visita 48 h dopo c/o nostro ambulatorio



All'**EO** si segnala

**PAO** = 142/70 mmHg

**FC** = 76 bpm

**EOC** = toni validi ritmici, soffio  
sistolico dolce medio-apicale

**EOP** = murmure vescicolare diffuso,  
non rumori aggiunti



# Sig.ra Luciana, 57 anni

... in visita 48 h dopo c/o nostro ambulatorio



**EF** = 64%

**VS<sub>n</sub>: LVM<sub>i</sub>** 87 g/m<sup>2</sup>, **RWT** 0.38

**LAV<sub>i</sub>** = 32 ml/m<sup>2</sup> (no **LAe**)

**E/e'** = 15

**Std<sub>i</sub>E** = 5.4 cm/s

**Ltd<sub>i</sub>E** = 5.5 cm/s

**TR** = 2.6 m/s



## SCORE 2 – Rischio di popolazione moderato

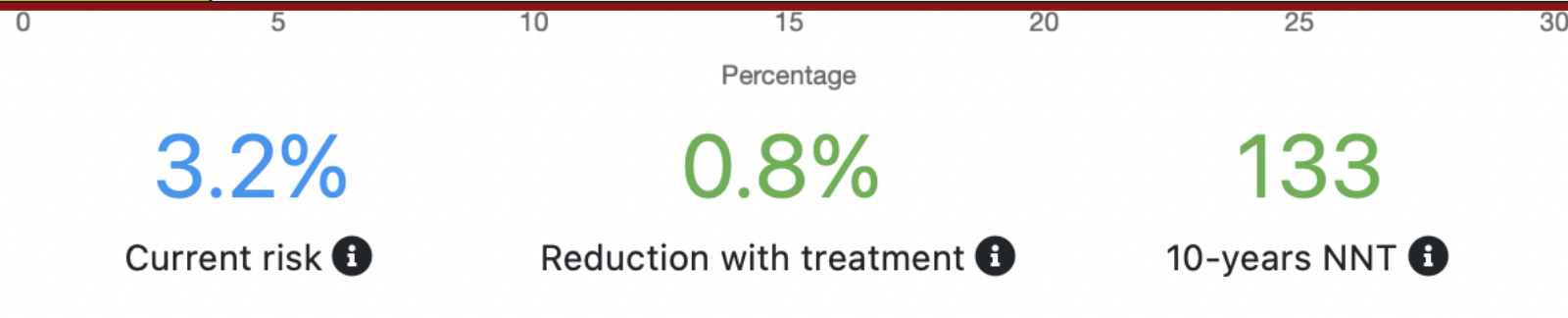
10-years risk

Current 10-year risk of myocardial infarction, stroke

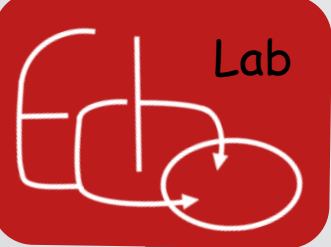
### Moderate risk

#### People with:

- A calculated 10 year SCORE of  $\geq 1$  to  $<5\%$
- Grade 2 hypertension
- Many middle-aged people belong to this category



• **LDL** 79 mg/dl

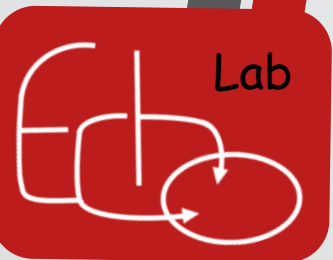


# Caso Clinico

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Very high risk | <p>People with any of the following:</p> <p><b>Documented CVD, either clinical or unequivocal on imaging.</b></p> <ul style="list-style-type: none"><li>• <b>Clinical CVD</b> includes acute myocardial infarction, acute coronary syndrome, coronary or other arterial revascularization, stroke, TIA, intermittent claudication, PAD</li><li>• <b>Unequivocal</b> documented CVD on angiography or ultrasound; it does not include aortic aneurysm</li><li>• <b>Diabetes mellitus</b> with end-organ damage such as grade 3 retinopathy, nephropathy or neuropathy</li><li>• <b>Severe CKD</b> (eGFR <math>\leq 30</math> mL/min/1.73 m<sup>2</sup>)</li><li>• <b>A calculated 10 year SCORE of <math>\geq 10\%</math></b></li></ul> |
| High risk      | <p>People with any of the following:</p> <ul style="list-style-type: none"><li>• <b>Marked elevation</b> of total cholesterol (LDL-C <math>\geq 190</math> mg/dL or 4.9 mmol/L) or triglycerides (e.g. familial hypercholesterolaemia)</li><li>• <b>Most other people</b> with CVD or with multiple risk factors without major risk factors</li></ul> <p>Hypertensive LVH</p> <p>Moderate CKD eGFR 30-59 mL/min/1.73 m<sup>2</sup>)</p> <p>A calculated 10 year SCORE of 5-10%</p>                                                                                                                                                                                                                                                     |

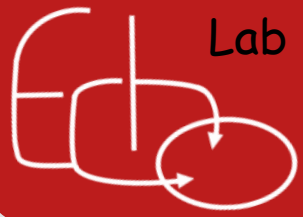
Moderate risk

- No **CKD**
- No **LVH**
- No **Diabete**
- No **CVD**

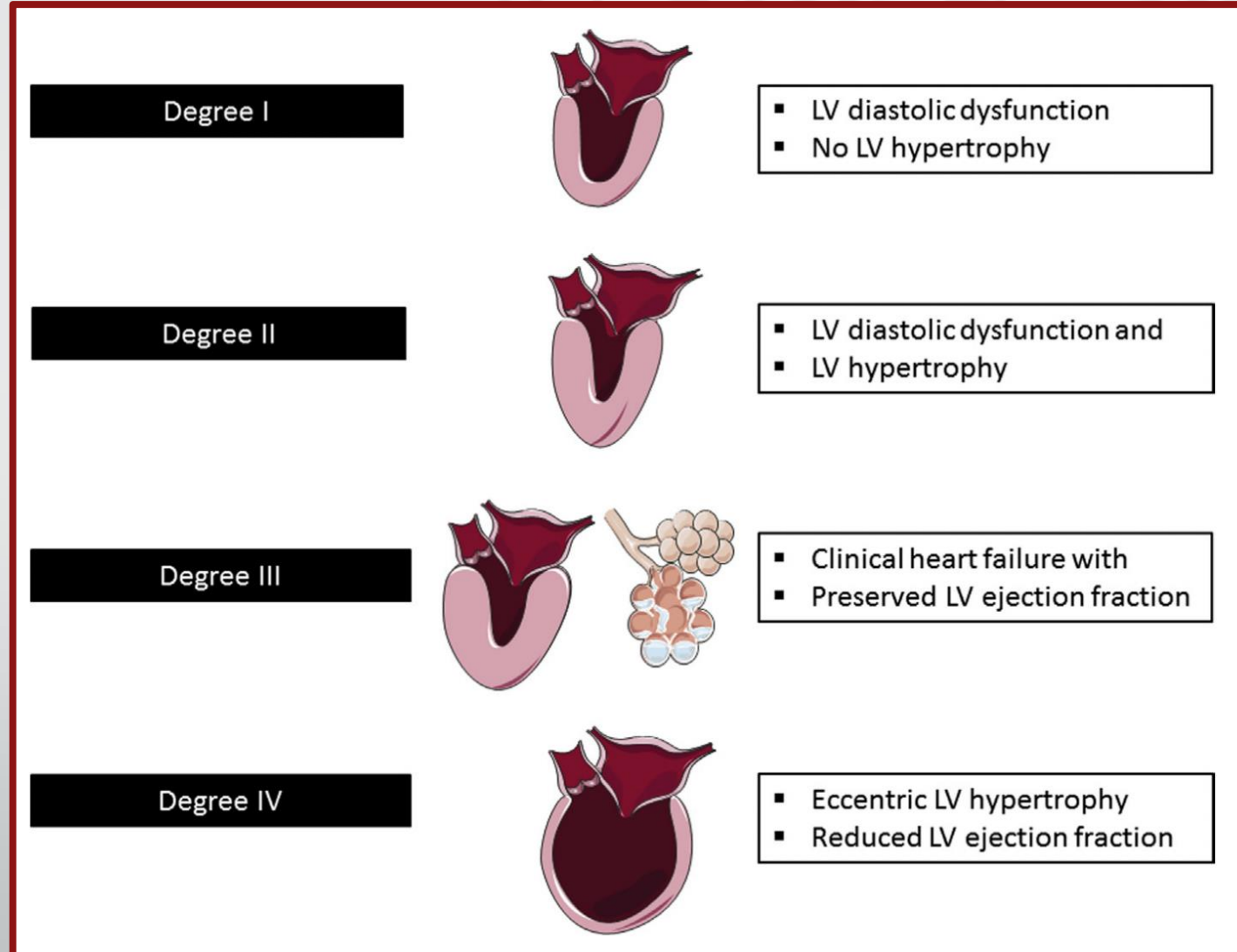


**ULTERIORI INSIGHT?**

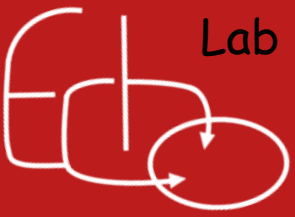




# Cardiopatía Hipertensiva

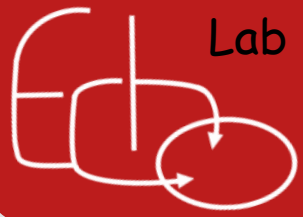


**Progressione**



# Cardiopatia Ipertensiva

- **LVH: 40%** degli ipertesi
- **Disfunzione diastolica: 40-85%** degli ipertesi

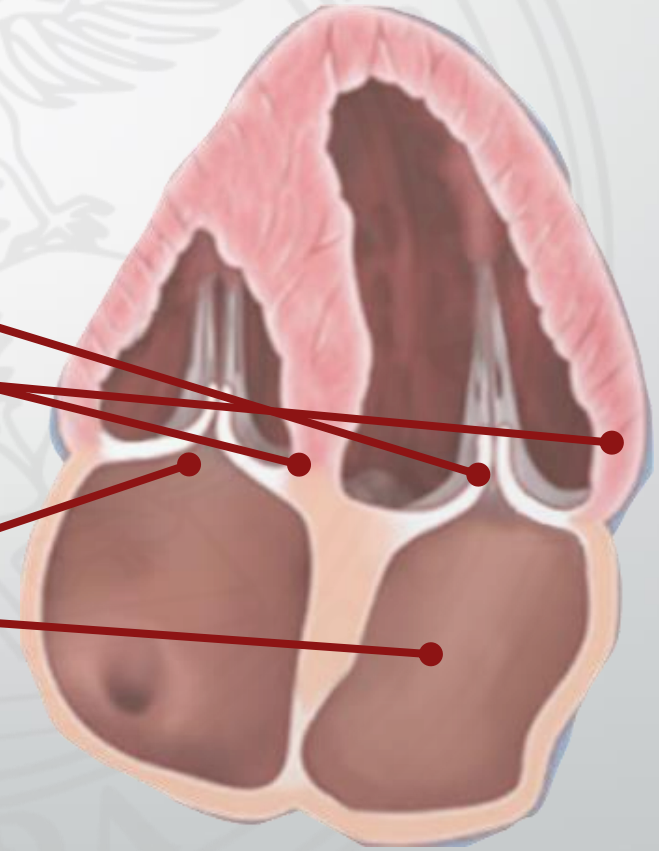


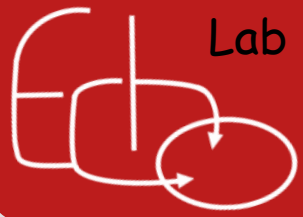
Lab

# Funzione Diastolica

## Stima della **funzione diastolica**:

1. Doppler pulsato trans-mitralico → **TmE**
2. Doppler tissutale (TDI) settale e laterale → **StdiE** & **LtdiE**
3. Dimensioni atriali → **LAVi**
4. Reflusso tricuspidalico → **TR**





# Funzione Diastolica

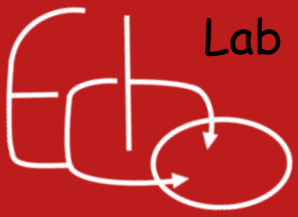
## Pazienti a normale EF

1.  $E/e' \geq 14$
2.  $StdiE < 7$  cm/s OR  $LtdiE < 10$  cm/s
3.  $TR \geq 2.8$  m/s
4.  $LAVi \geq 34$  ml/m<sup>2</sup>

**< 50%**  
**Normale**

**50%**  
**Indeterminato**

**>50%**  
**Disfunzione**  
**Diastolica**

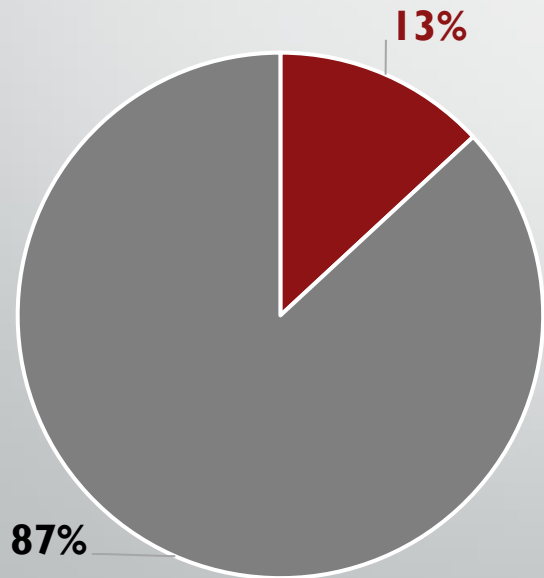


# Funzione Diastolica

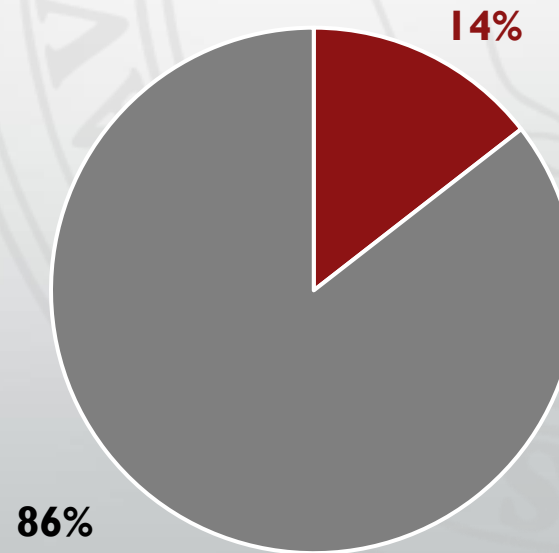


**Pazienti afferenti al nostro ambulatorio**

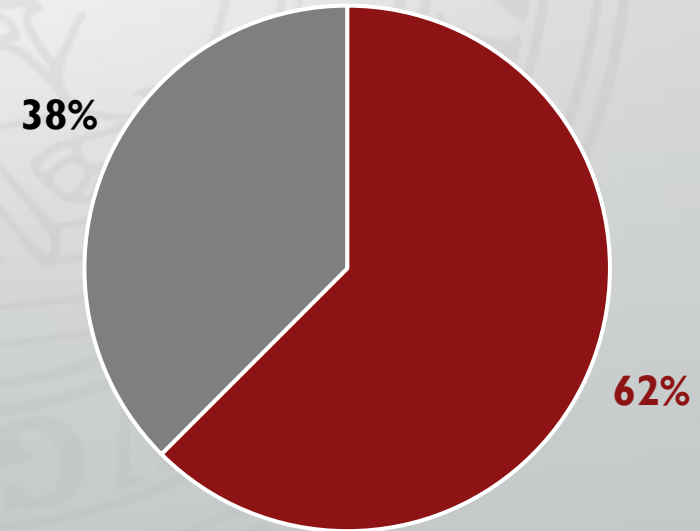
**LVH**

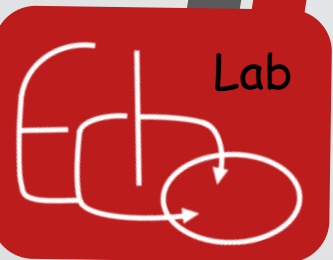


**LVDD conclamata**



**Alterazione Diastolica**





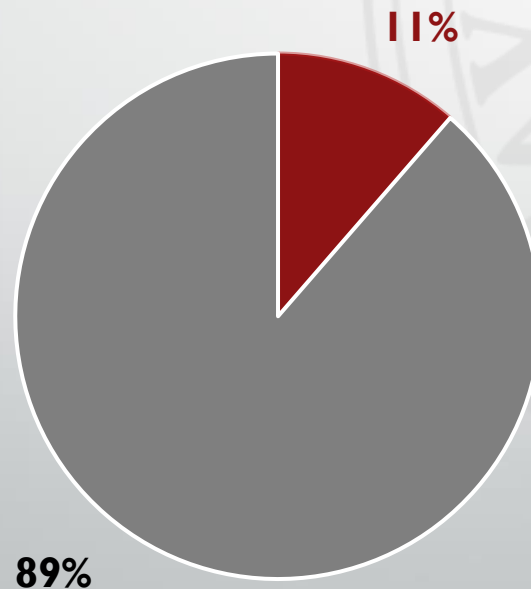
# Funzione Diastolica



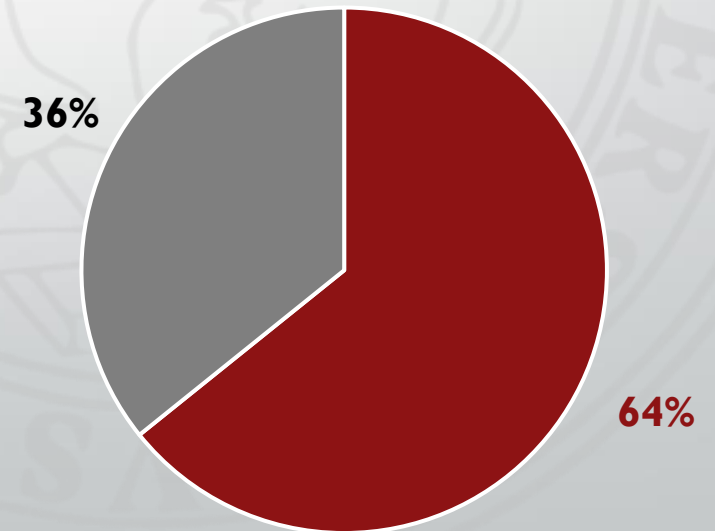
**Pazienti afferenti al nostro ambulatorio**

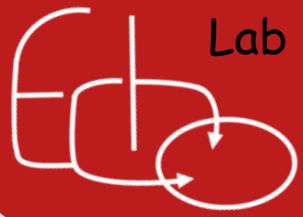
**Nei pazienti senza LVH:**

**LVDD conclamata**



**Alterazione  
Diastolica**





# Sig.ra Luciana, 57 anni

Pazienti a normale EF

- $E/e' = 15$
- $StdIE = 5.4 \text{ cm/s}$



Degree I

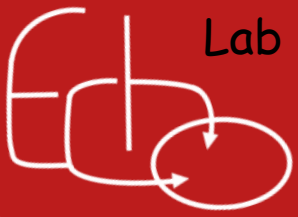


- LV diastolic dysfunction
- No LV hypertrophy

< 50%  
Normale

50%  
Indeterminato

>50%  
Disfunzione  
Diastolica



Lab

# Parametri Aggiuntivi

## Strain Atriale

Reservoir strain (**PALS**) < 20%

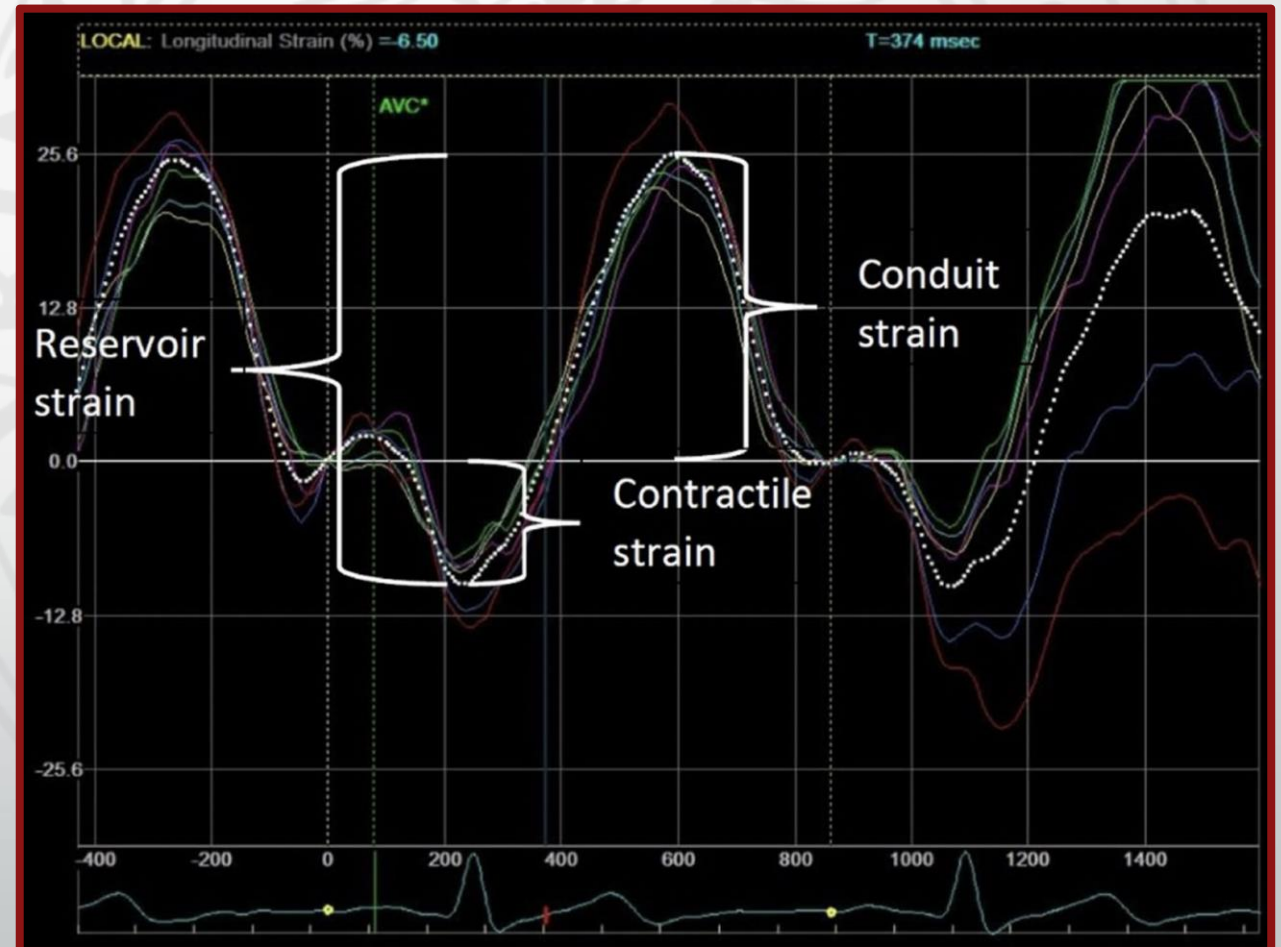
**Sens** 71%

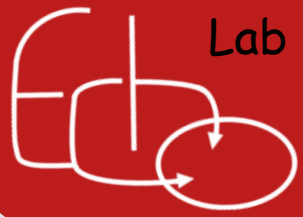
**Spec** 90%

**Acc** 91%

Nell'identificare **LVEDP > 15 mmHg** in pazienti a **EF conservata**

*Mandoli GE, et Al. Heart Fail Rev. 2020*



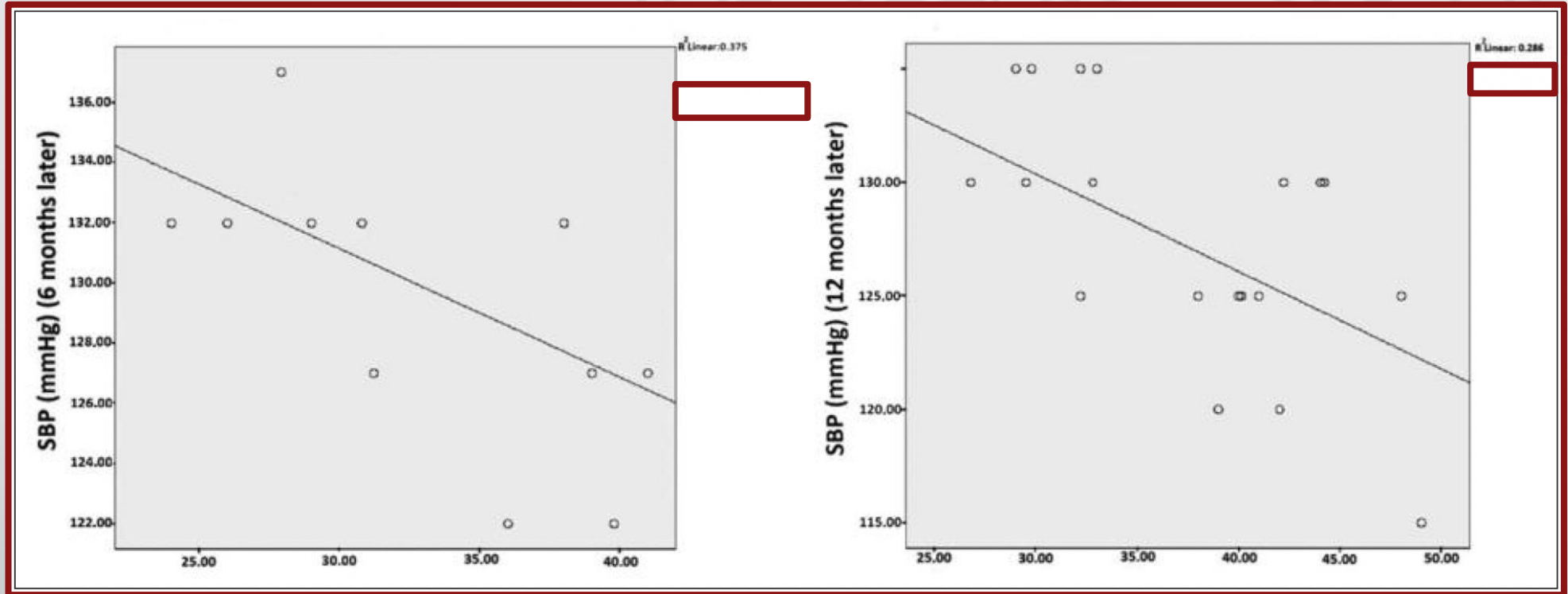


Lab

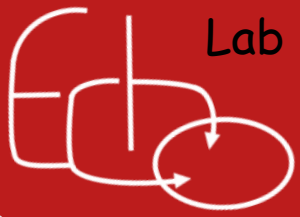
# Parametri Aggiuntivi

6 mesi

12 mesi



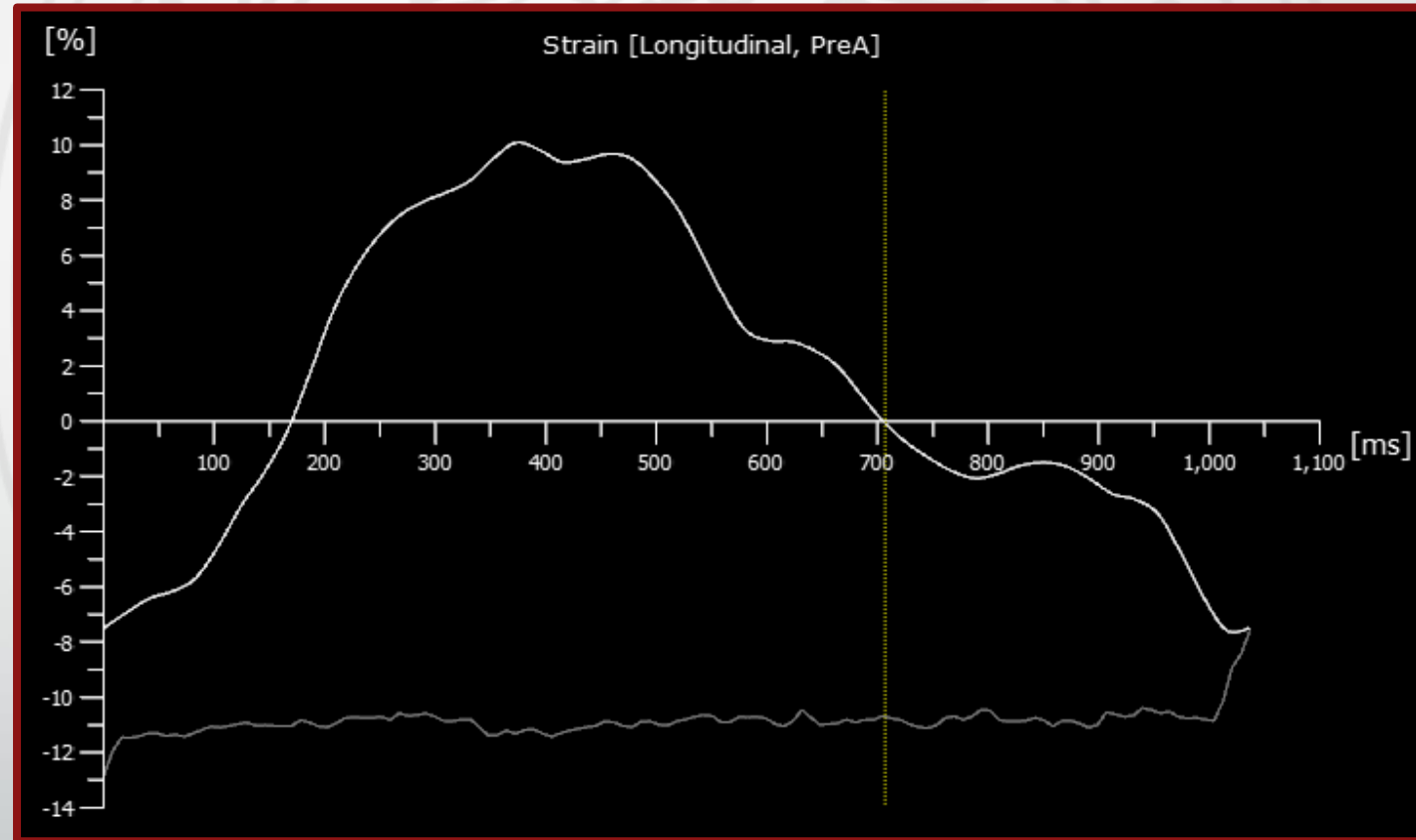
**Correlazione indiretta** tra riduzione di **SBP** in trattamento farmacologico e **LAstrain**

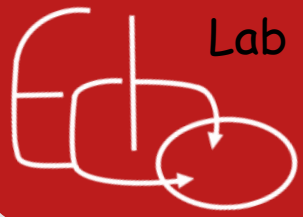


**Sig.ra Luciana, 57 anni**

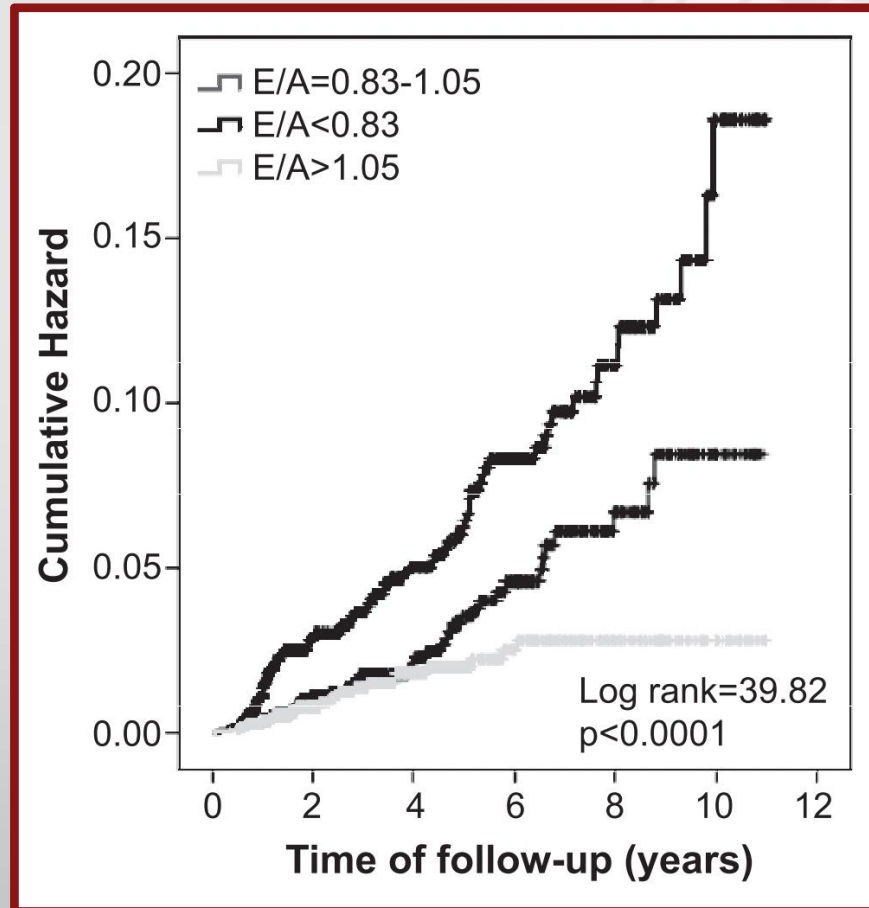
**PALS = 17.5%**

Conferma e rinforza i  
sospetti di **disfunzione  
diastolica**

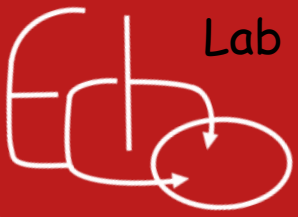




# Valore Prognostico

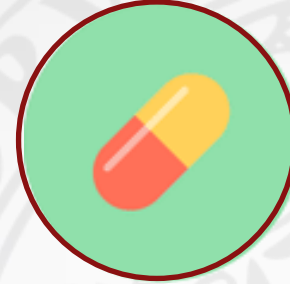


**Disfunzione diastolica**  
predice la comparsa di eventi  
avversi cardiovascolari  
maggiori (**MACEs**)



# Conclusioni

**Alla luce del quadro  
clinico-strumentale ...**



- Ramipril 5mg l co
- Lercanidipina 10 mg l co
- Nebivololo 5 mg l co

**Follow-up studio ERIDANO:**

Visita di **arruolamento**

Visita a **3 mesi**

Visita a **12 mesi**

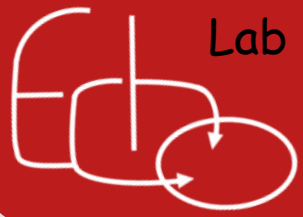
**Follow-up sig.ra Luciana:**

Visita di **arruolamento**

Visita a **3 mesi**

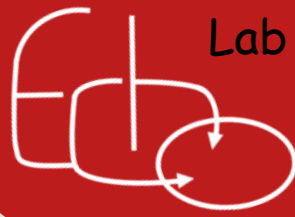
**Visita a 6 mesi**

Visita a **12 mesi**



# Conclusioni

- **Caso peculiare:** dissociazione completa tra dato funzionale e dato morfologico
- Le manifestazioni del danno d'organo CV possono essere **proteiformi** con un **grado variabile di espressione delle sue possibili declinazioni**
- Il danno d'organo cardiaco **DEVE essere monitorato** nel tempo



# Ringraziamenti

## **ECHO-LAB**

Dr. Alberto Milan

Dr. Dario Leone

Dr. Fabrizio Vallelonga

Dr.ssa Anna Astarita

Dr.ssa Giulia Mingrone

Dr. Marco Cesareo

Dr.ssa Cinzia Catarinella

Dr.ssa Simona Votta

Dr.ssa Anna Colomba

Arianna Palladino

Francesca Novello

## **Medicina Interna 4**

Prof. Franco Veglio

### **Staff Clinico**

Dr.ssa Chiara Bertello

Dr. Jacopo Burrello

Dr.ssa Simona Maule

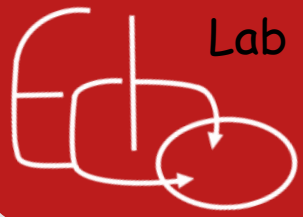
Dr.ssa Silvia Monticone

Prof. Paolo Mulatero

Dr.ssa Giulia Novelli

Dr. Franco Rabbia

Personale infermieristico e OSS

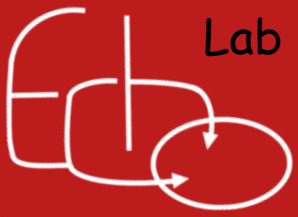


Lab

# Conclusioni

---



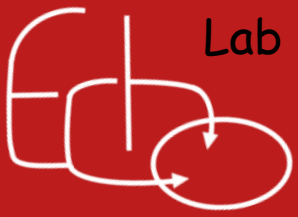


# Caso Clinico

---

Database matteo → quanti pazienti con dilatazione senza alterazioni morfologiche

Ripasso funzione parametri



Lab

## Caso Clinico

Possibile spiegare aumentate pressioni di riempimento  
in **ASSENZA** di **alterazioni morfologiche**?

# SHORTENING DEACTIVATION

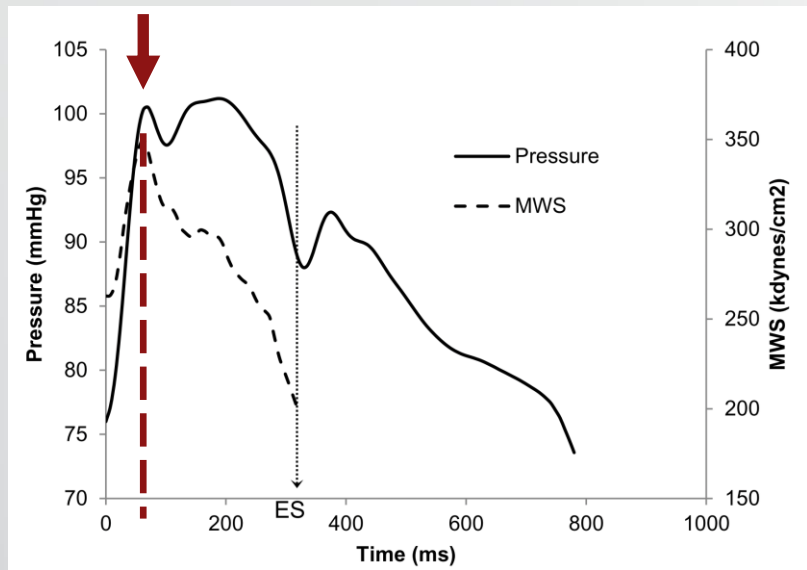


Lab

# Caso Clinico

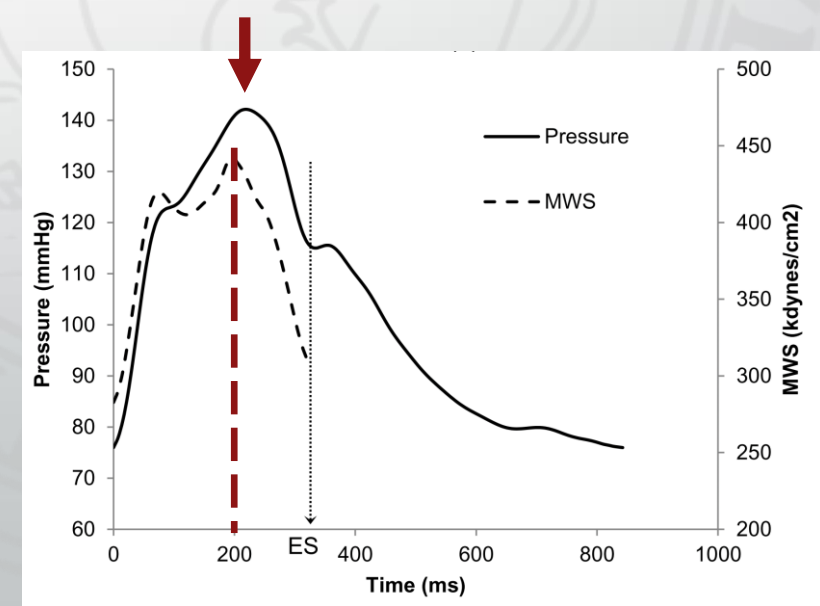
## Normale funzione diastolica

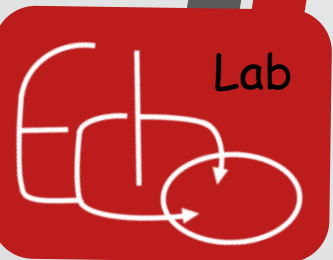
- Picco pressorio **precoce**
- Picco di **stress miocardico** precoce
- Successivo **rapido calo** nello stress = **rilasciamento**



## Funzione diastolica alterata

- Picco pressorio **tardivo**
- Picco di **stress miocardico** più tardivo
- Conseguente **calo nello stress più lento**





## SURROGATO DI PIU' FACILE COMPRENSIONE E RILEVAZIONE

$$\text{EF precoce} = \frac{(\text{LVEDV} - \text{LVVT}_1)}{\text{LVEDV}} \times 100$$

