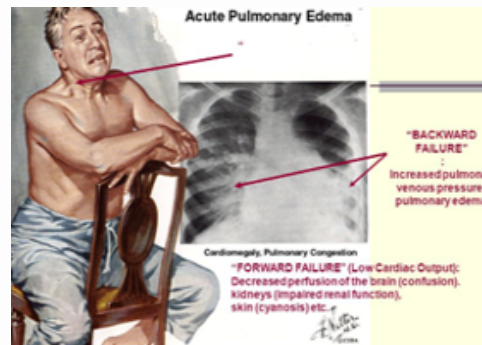
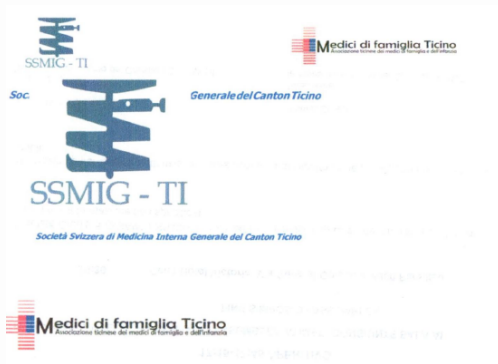
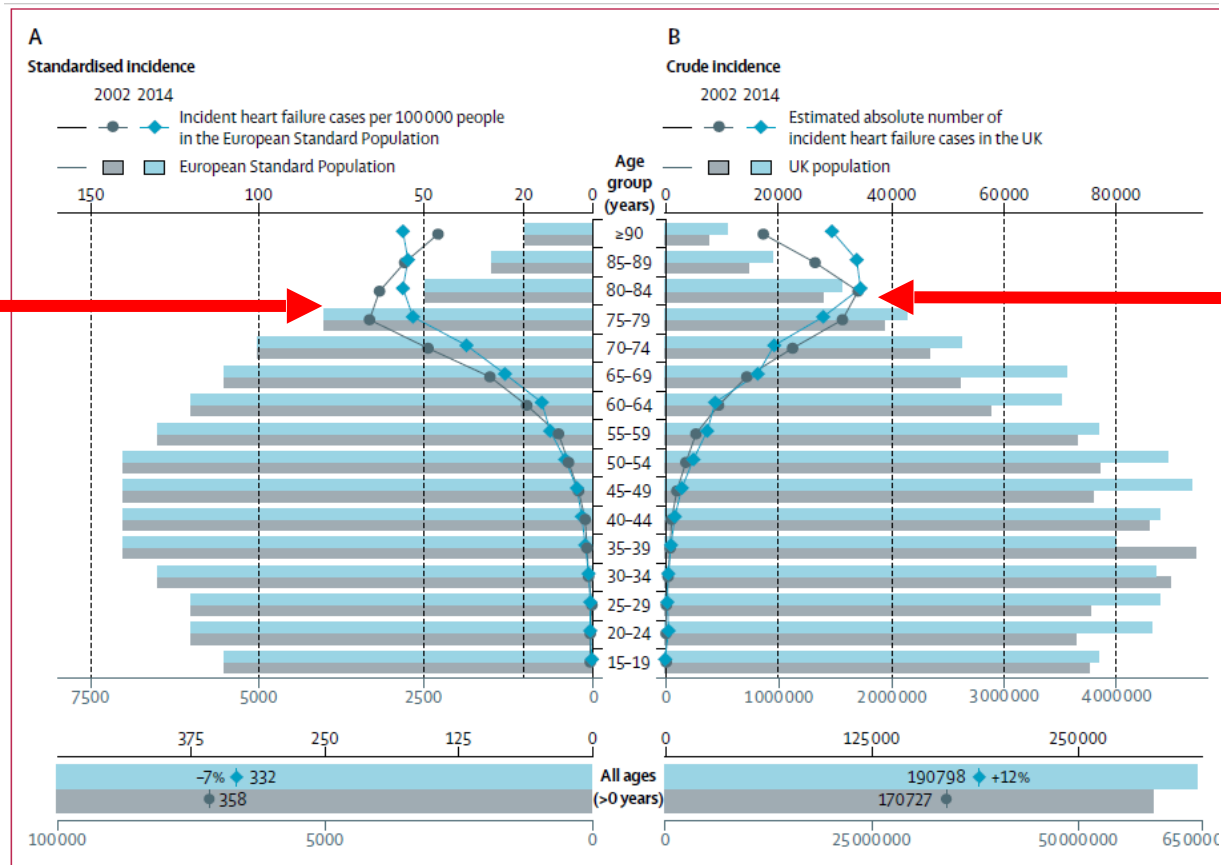


Terapia dell'insufficienza cardiaca



Giovanni B. Pedrazzini,

IS IT A FREQUENT CONDITION?



Temporal trends and patterns in heart failure incidence: a population-based study of 4 million individuals

Lancet 2018 Feb 10;391(10120):572-580

Temporal trends and patterns in heart failure incidence: a population-based study of 4 million individuals

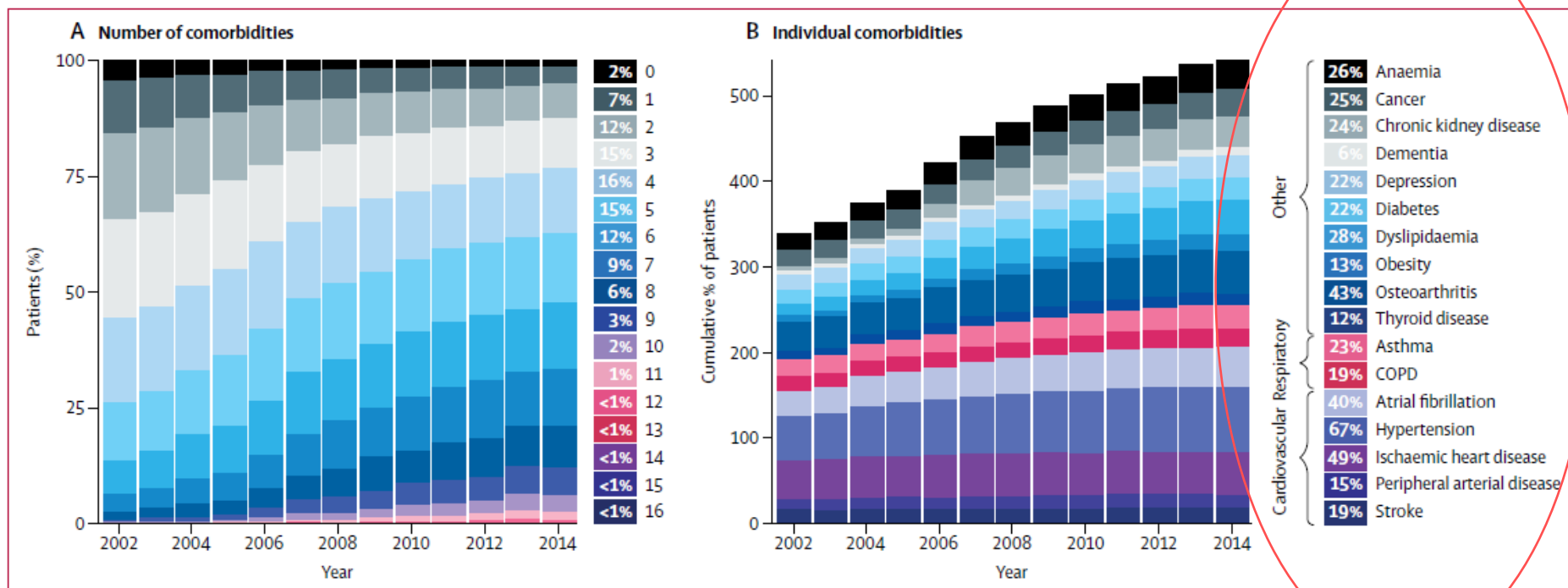


Figure 2: Temporal trends in comorbidities among patients diagnosed with incident heart failure, from 2002 to 2014

(A) Number of comorbidities, out of 17 major conditions, affecting patients with incident heart failure, over time. (B) Cumulative percentage of patients affected by individual comorbidities, over time. COPD=chronic obstructive pulmonary disease.

Lancet 2018 Feb 10;391(10120):572-580

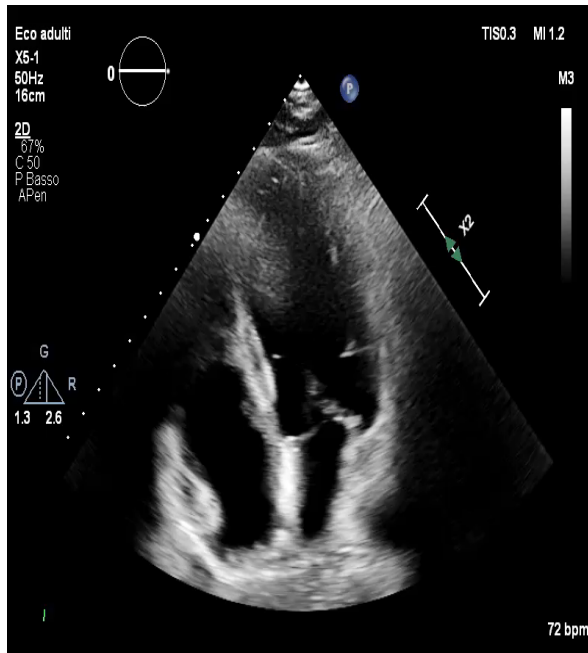
WHAT ABOUT MORTALITY?

	NUMBER (UK)	Chance of dying over 3 years
Breast Cancer	110.000	20%
Bowel cancer	64.000	25%
Cancer of Cervix	15.000	15%
Prostata Cancer	18.000	5%

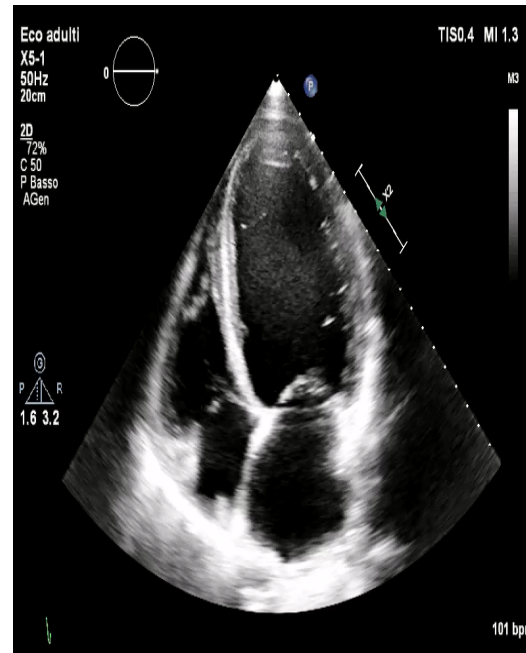
THE 2 MAIN FORMS OF HF

74 y old male

57 y old female

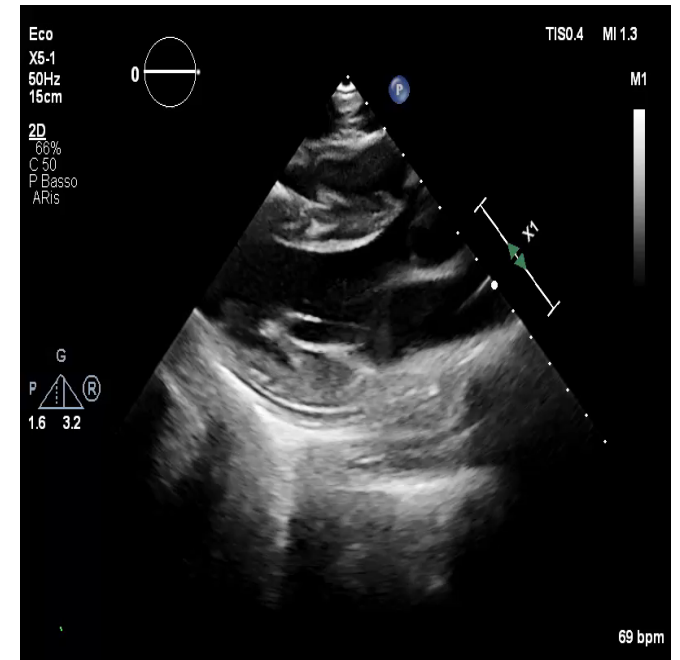


NYHA I



NYHA III

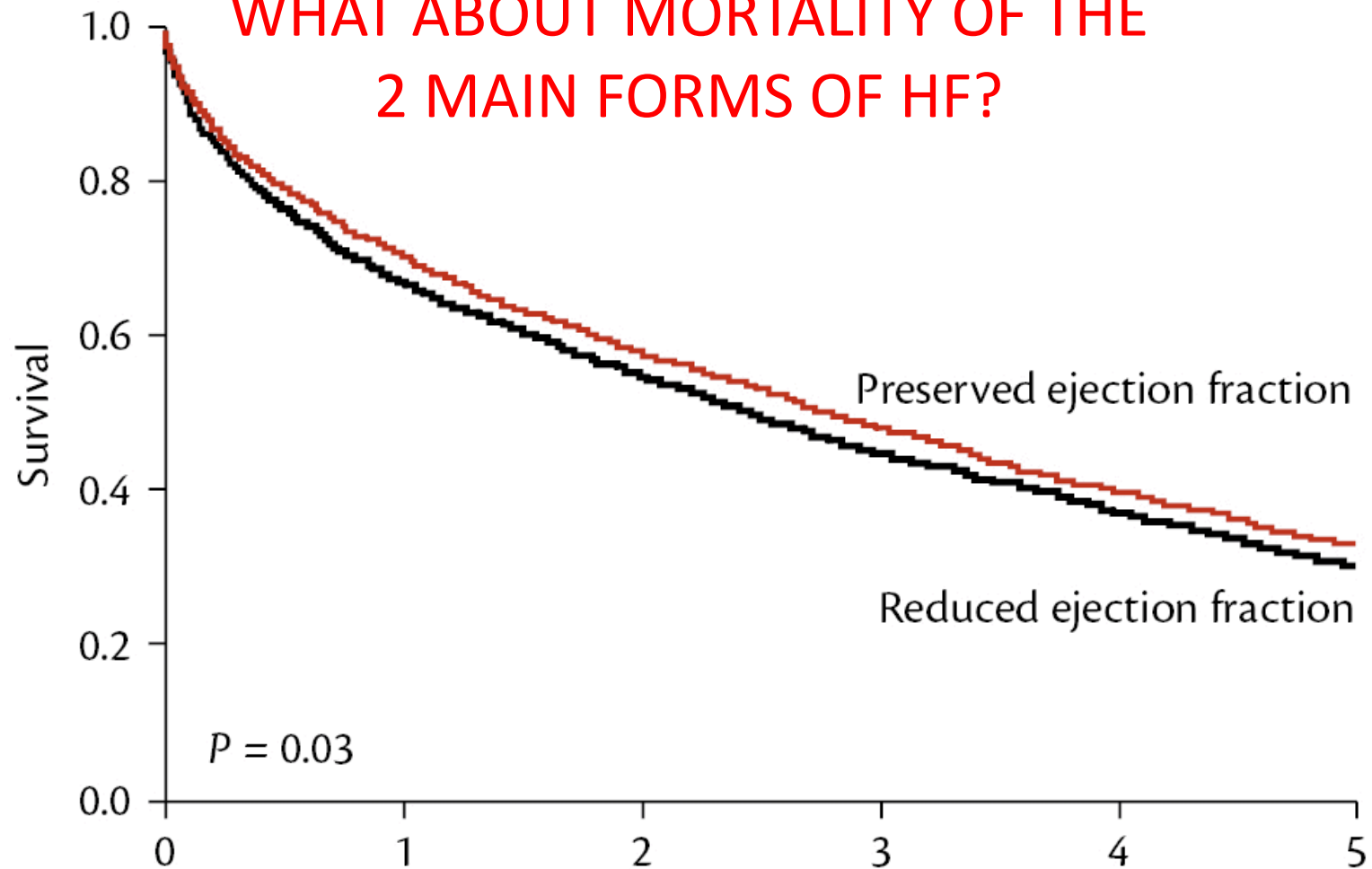
Heart Failure with
reduced Ejection Fraction
(HFrEF)



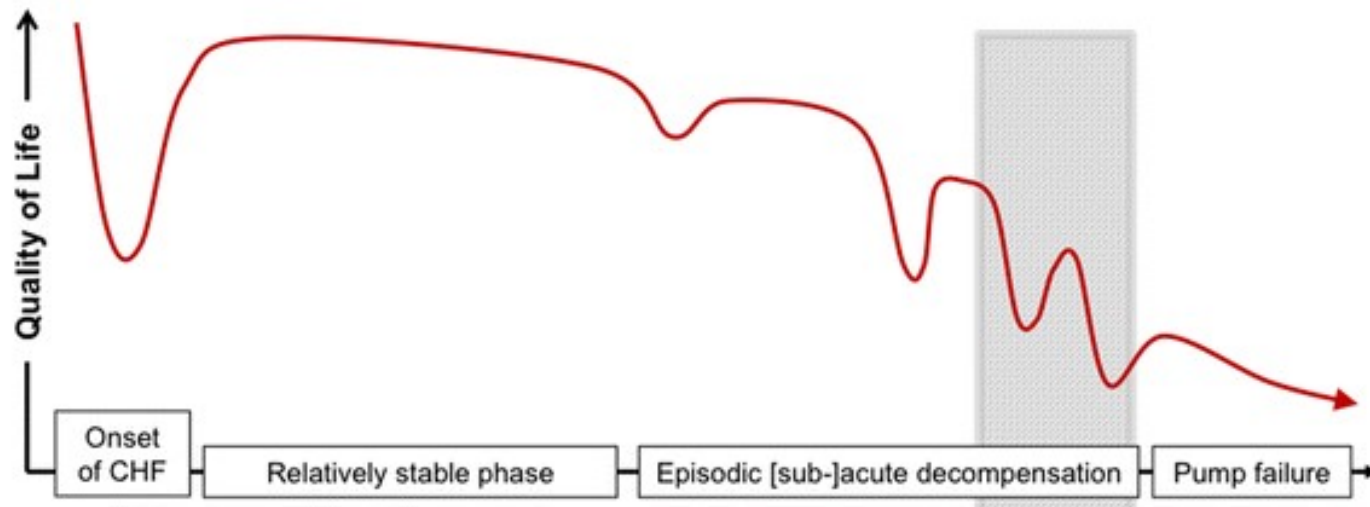
NYHA III

Heart Failure with
preserved Ejection Fraction
(HFpEF)

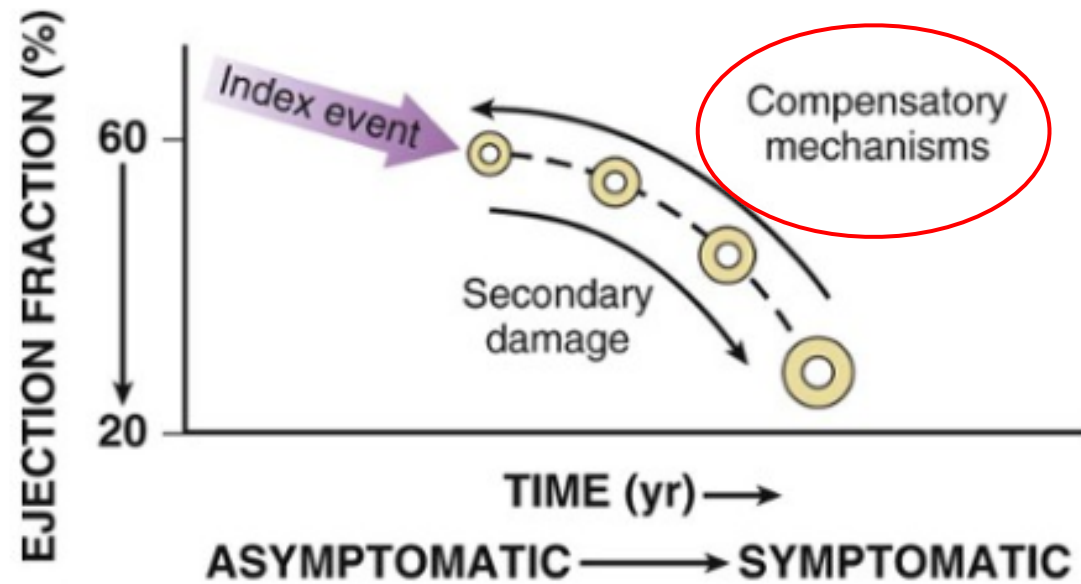
WHAT ABOUT MORTALITY OF THE 2 MAIN FORMS OF HF?



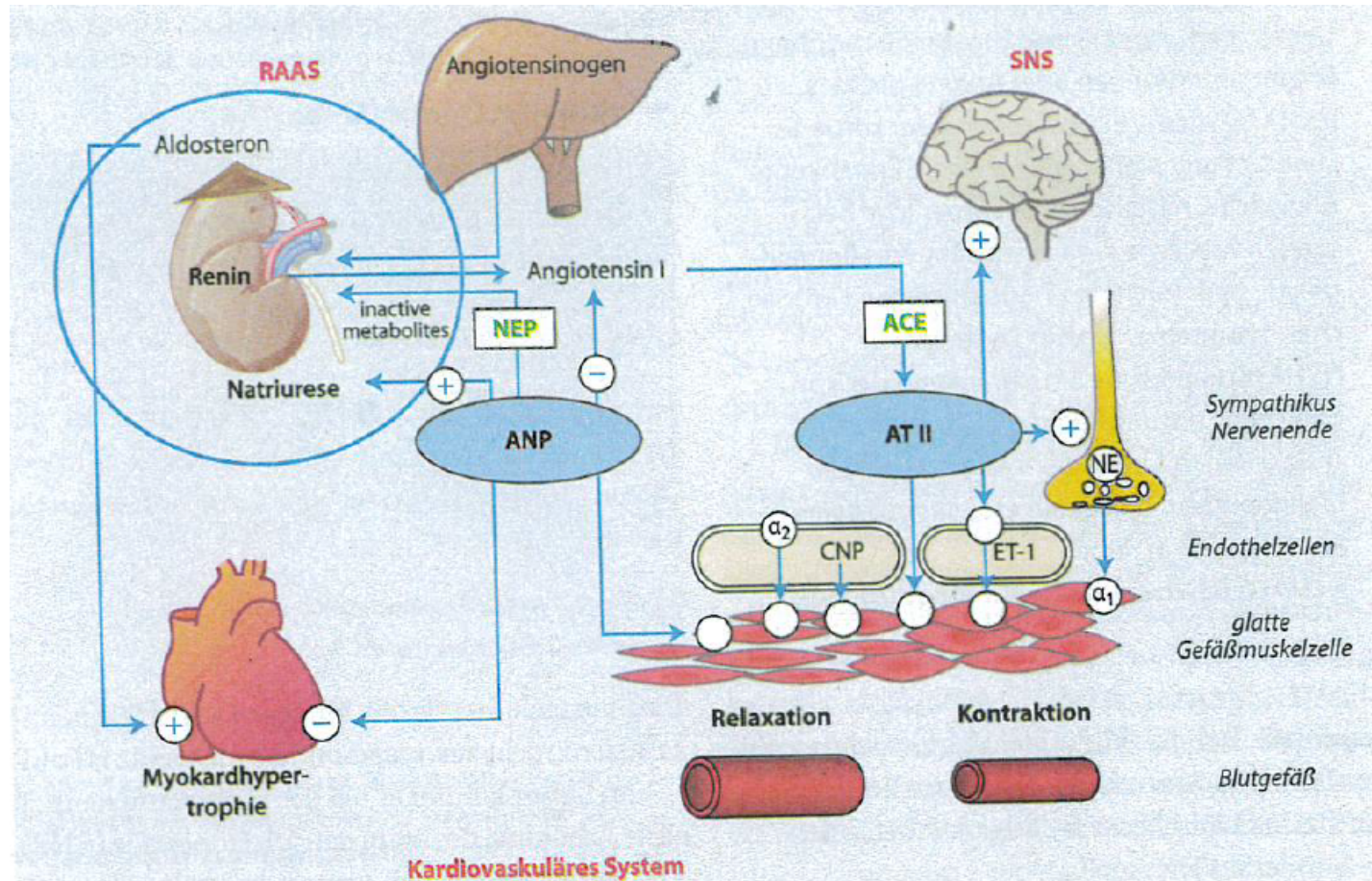
HF IS A CHRONIC DISEASE THAT TENDS TO PROGRESS ...



COMPENSATORY MECHANISM



NEUROHUMORAL COMPENSATION

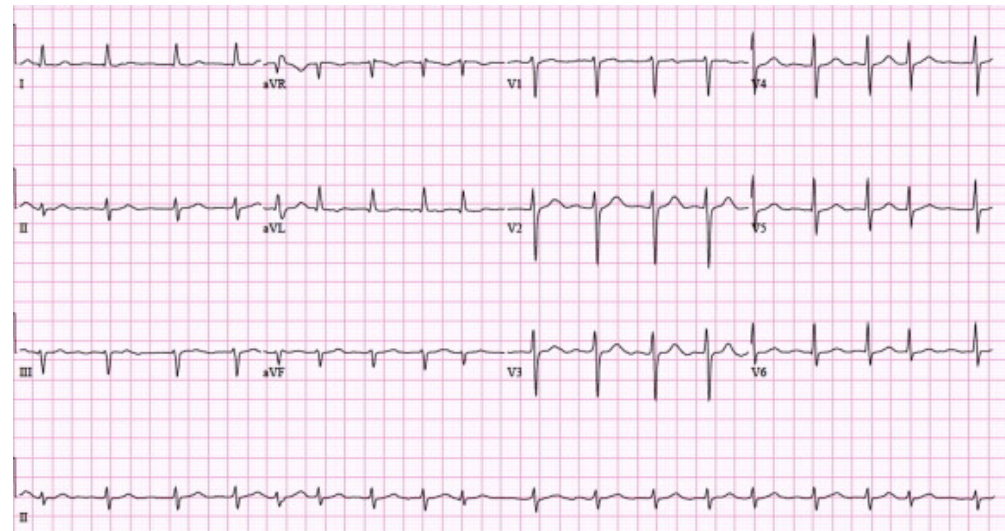


CLINICAL HISTORY (2019)

- 74 years old man, old farmer (farm taken over now by his son), married, lives with his wife
- At the age of 71 large anterior myocardial infarction treated with primary PCI followed, 2 years later CABG, at that time ejection fraction 45%
- For about 6 months he has complained of breathlessness initially only by walking long distances, recently also by climbing 1 floor of stairs
- He hasn't been able to sleep on his back for a week now and he feels tired
- CVRF: smoke consume (1pack/year for more than 30 years), hypercholesterolaemia, family history of CVD
- He is on:
 - Aspirin
 - Enalapril 2x2.5 mg
 - Bisoprolol 2.5mg
 - Rosuvastatin 10mg

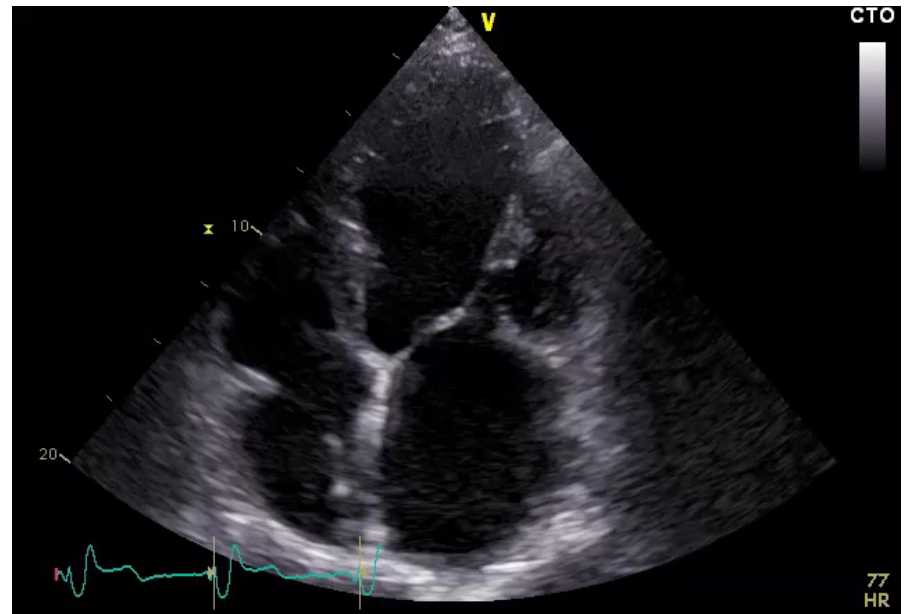


CHEST X-RAY AND ECG



Cardiomegaly, signs of pulmonary congestion, atrial fibrillation

TRANSTHORACIC ECHOCARDIOGRAPHY



EF 28%

Nt-ProBNP 2725 pg/ml (N< 180pg/ml)

CLASSIFICATION OF HEART FAILURE

Type of HF		HFrEF	HFmrEF	HFpEF
Criteria	1	Symptoms ± signs ^a	Symptoms ± signs ^a	Symptoms ± signs ^a
	2	LVEF ≤40%	LVEF 41–49% ^b	LVEF ≥50%
	3	–	–	Objective evidence of cardiac structural and/or functional abnormalities consistent with the presence of LV diastolic dysfunction/raised LV filling pressures, including raised natriuretic peptides ^c

CLASSIFICATION OF HEART FAILURE

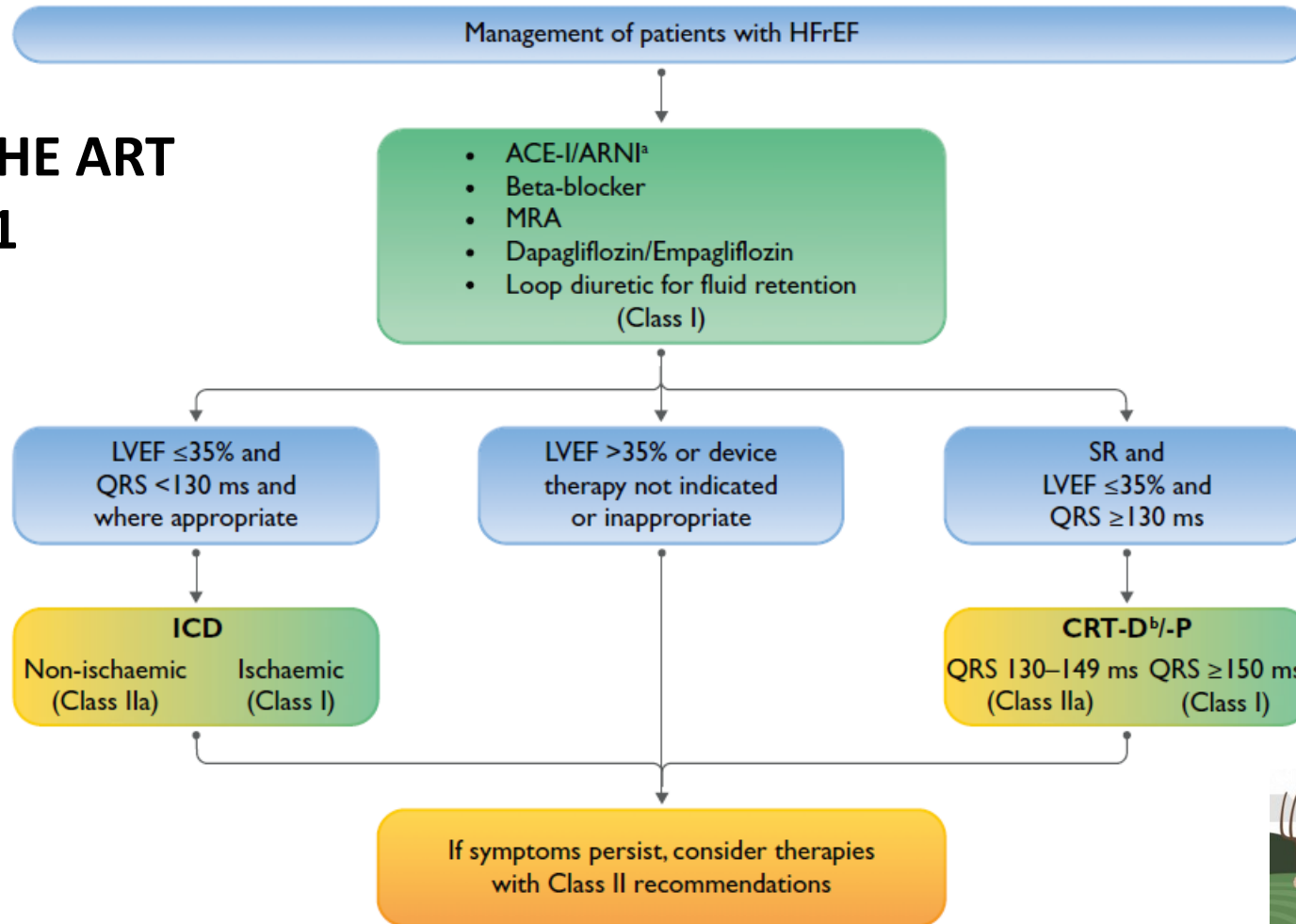
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	3	–	–	Objective evidence of cardiac structural and/or functional abnormalities consistent with the presence of LV diastolic dysfunction/raised LV filling pressures, including raised natriuretic peptides ^c

FINAL DIAGNOSIS

- ISCHEMIC CARDIOMYOPATHY
- HFrEF, NYHA III, CONGESTIVE HEART FAILURE



STATE OF THE ART 2021



<https://doi.org/10.1093/eurheartj/ehab368>



PHARMACOLOGICAL TREATMENT FOR HFrEF

Pharmacological treatments indicated in patients with (NYHA class II–IV) heart failure with reduced ejection fraction (LVEF \leq 40%)

Recommendations	Class ^a	Level ^b
An ACE-I is recommended for patients with HFrEF to reduce the risk of HF hospitalization and death. ^{110–113}	I	A
A beta-blocker is recommended for patients with stable HFrEF to reduce the risk of HF hospitalization and death. ^{114–120}	I	A
An MRA is recommended for patients with HFrEF to reduce the risk of HF hospitalization and death. ^{121,122}	I	A
Dapagliflozin or empagliflozin are recommended for patients with HFrEF to reduce the risk of HF hospitalization and death. ^{108,109}	I	A
Sacubitril/valsartan is recommended as a replacement for an ACE-I in patients with HFrEF to reduce the risk of HF hospitalization and death. ¹⁰⁵	I	B

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ACE-I = angiotensin-converting enzyme inhibitor; HF = heart failure; HFrEF = heart failure with reduced ejection fraction; LVEF = left ventricular ejection fraction; MRA = mineralocorticoid receptor antagonist; NYHA = New York Heart Association.

^aClass of recommendation.

^bLevel of evidence.

<https://doi.org/10.1093/eurheartj/ehab368>

PHARMACOLOGICAL TREATMENT FOR HFrEF

1° CHOICE- ACE-INHIBITORS

	Starting dose	Target dose
ACE-I		
Captopril ^a	6.25 mg <i>t.i.d.</i>	50 mg <i>t.i.d.</i>
Enalapril	2.5 mg <i>b.i.d.</i>	10–20 mg <i>b.i.d.</i>
Lisinopril ^b	2.5–5 mg <i>o.d.</i>	20–35 mg <i>o.d.</i>
Ramipril	2.5 mg <i>b.i.d.</i>	5 mg <i>b.i.d.</i>
Trandolapril ^a	0.5 mg <i>o.d.</i>	4 mg <i>o.d.</i>
ARNI		
Sacubitril/valsartan	49/51 mg <i>b.i.d.</i> ^c	97/103 mg <i>b.i.d.</i>

1° CHOICE- BETA-BLOCKERS

Beta-blockers		
Bisoprolol	1.25 mg <i>o.d.</i>	10 mg <i>o.d.</i>
Carvedilol	3.125 mg <i>b.i.d.</i>	25 mg <i>b.i.d.</i> ^e
Metoprolol succinate (CR/XL)	12.5–25 mg <i>o.d.</i>	200 mg <i>o.d.</i>
Nebivolol ^d	1.25 mg <i>o.d.</i>	10 mg <i>o.d.</i>

1° CHOICE - MINERALOCORTICOIDS

MRA		
Eplerenone	25 mg <i>o.d.</i>	50 mg <i>o.d.</i>
Spironolactone	25 mg <i>o.d.</i> ^f	50 mg <i>o.d.</i>

1° CHOICE - SGLT2 INHIBITORS

SGLT2 inhibitor		
Dapagliflozin	10 mg <i>o.d.</i>	10 mg <i>o.d.</i>
Empagliflozin	10 mg <i>o.d.</i>	10 mg <i>o.d.</i>

2° CHOICE DRUGS

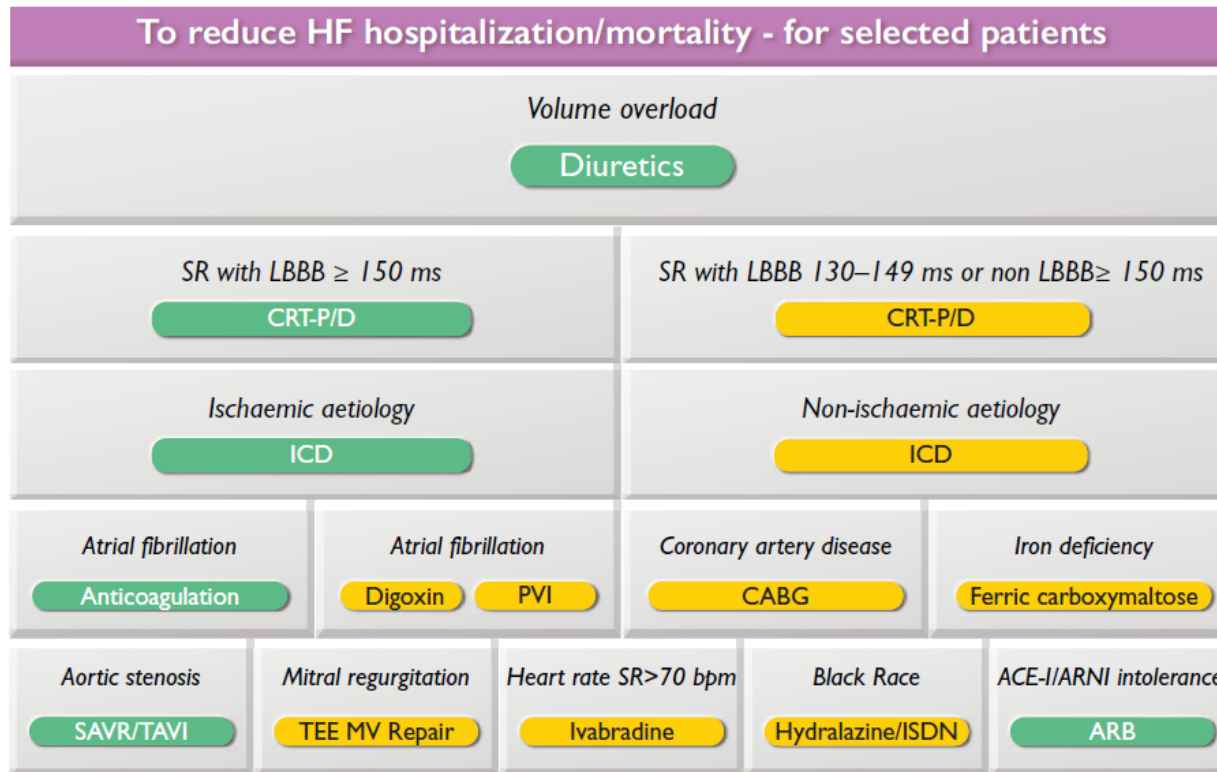
Other agents		
Candesartan	4 mg <i>o.d.</i>	32 mg <i>o.d.</i>
Losartan	50 mg <i>o.d.</i>	150 mg <i>o.d.</i>
Valsartan	40 mg <i>b.i.d.</i>	160 mg <i>b.i.d.</i>
Ivabradine	5 mg <i>b.i.d.</i>	7.5 mg <i>b.i.d.</i>
Vericiguat	2.5 mg <i>o.d.</i>	10 mg <i>o.d.</i>
Digoxin	62.5 µg <i>o.d.</i>	250 µg <i>o.d.</i>
Hydralazine/ Isosorbide dinitrate	37.5 mg <i>t.i.d.</i> /20 mg <i>t.i.d.</i>	75 mg <i>t.i.d.</i> /40 mg <i>t.i.d.</i>

Management of HFrEF



<https://doi.org/10.1093/eurheartj/ehab368>

Management of HFrEF



<https://doi.org/10.1093/eurheartj/ehab368>

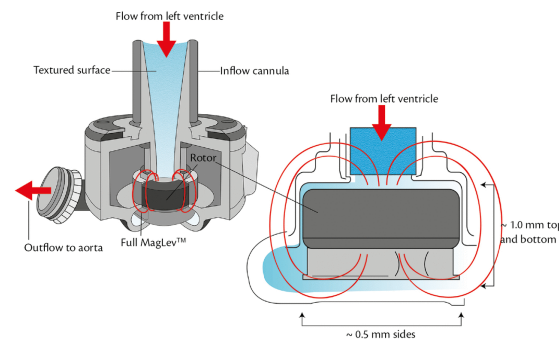
Management of HFrEF

For selected advanced HF patients

Heart transplantation

MCS as BTT/BTC

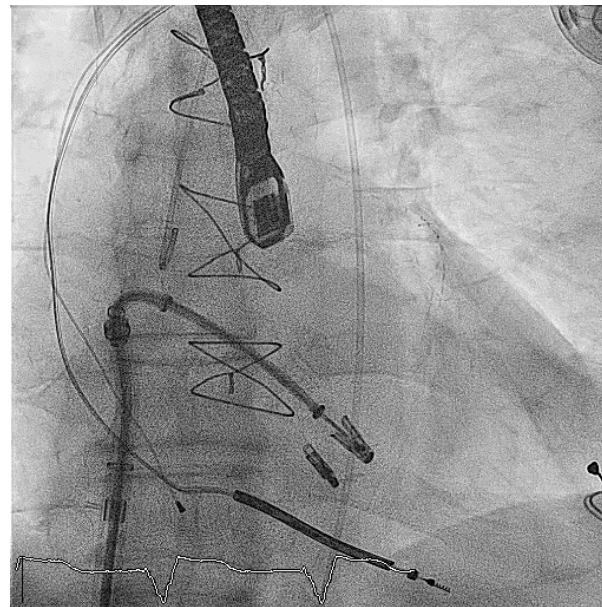
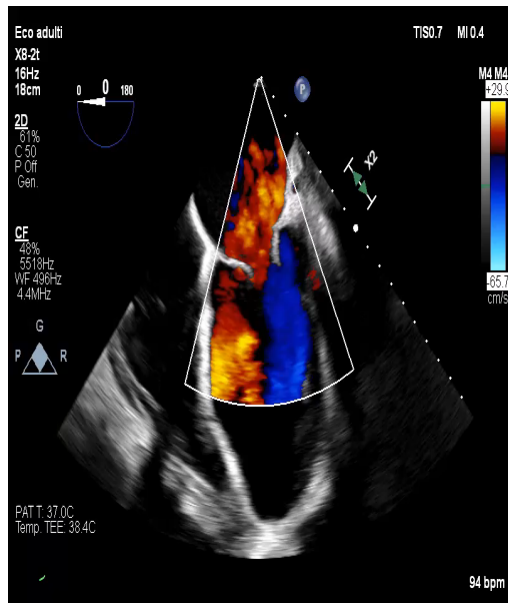
Long-term MCS as DT



<https://doi.org/10.1093/eurheartj/ehab368>

- **2 years later**

- After an initial improvement to functional class II, the clinical conditions worsen again with dyspnea that sometimes appears at rest
- Decision is taken to propose a MitraClip intervention



Clinical case #2: retired school teacher

CLINICAL HISTORY

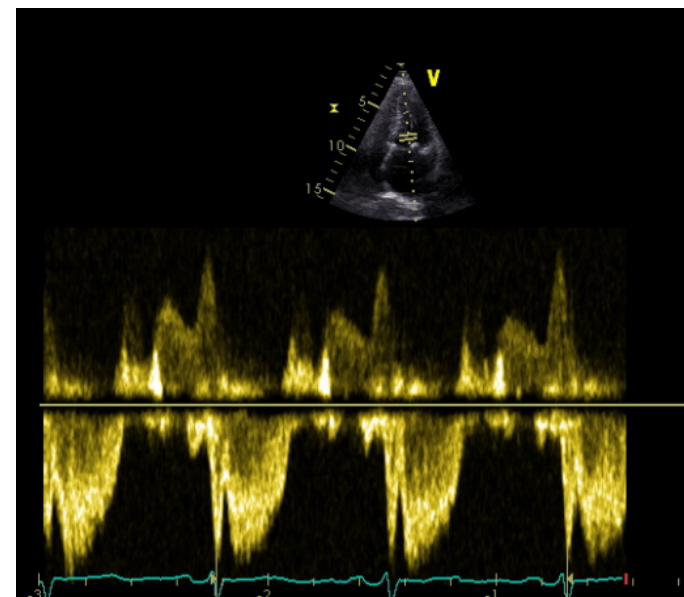
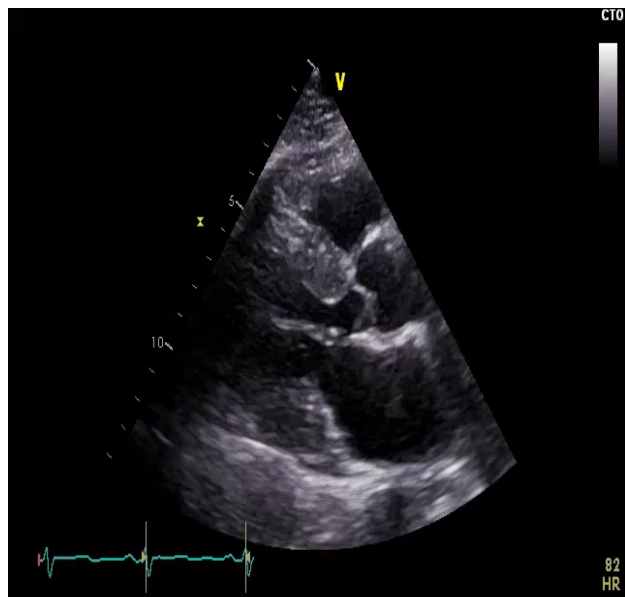
- 67 years old lady, previous primary school teacher, married with 3 children (1 still living with her because of disability), since the age of 35
- At the age of 56 PCI of the LAD because of angina
- For about 2 years she has complained on Dyspnoea Functional Class II (she still maintains all her activities however she needs more time)
- CVRF: Family history of CVD, arterial hypertension
- Her current treatment:
 - Aspirin 100mg 1-0-0
 - Metoprolol 2x25mg
 - Amlodipin 10 mg 1-0-0



CLINICAL EXAMINATION

- BP 155/100mmhg
- Puls 80/min
- Normal Heart-Lung auscultation
- No peripheral oedema, no jugular distension





EF 65%, LEFT VENTRICULAR HYPERTROPHY
SIGNS OF SEVERE DIASTOLIC DYSFUNCTION

Nt-ProBNP 756 pg/ml (N< 180pg/ml)



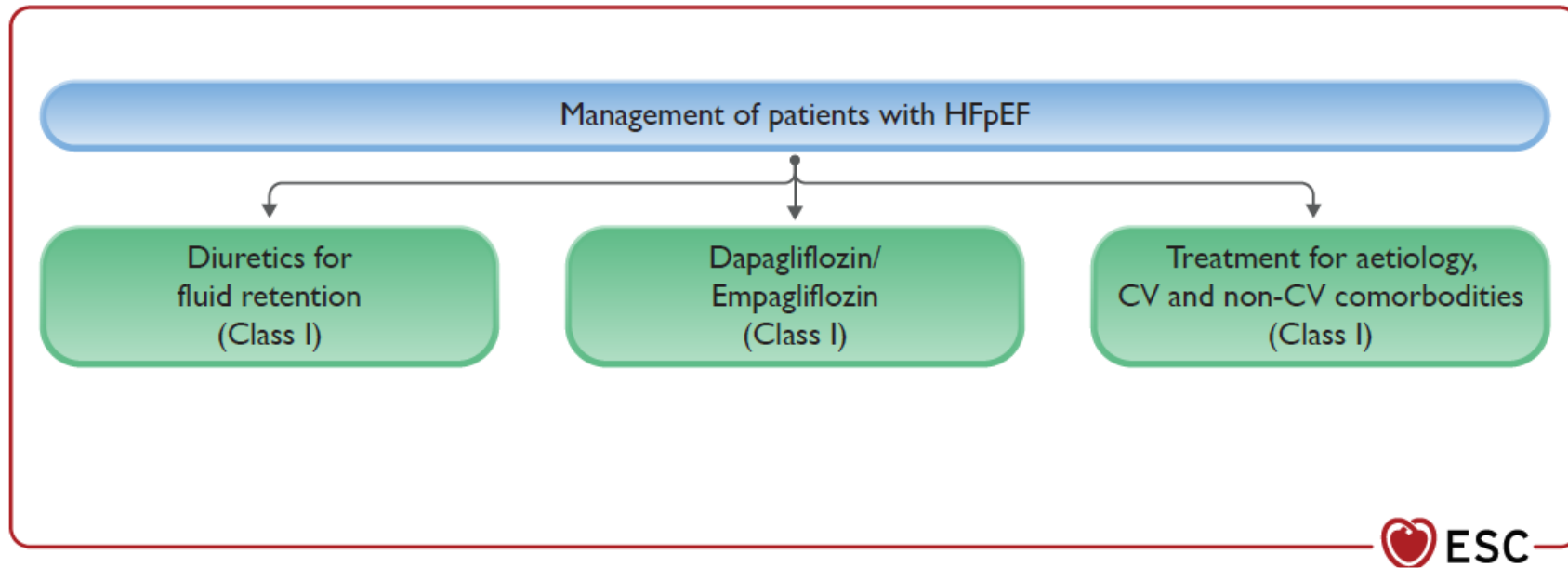
HFrEF, HFmrEF or HFpEF?

Type of HF		HFrEF	HFmrEF	HFpEF
Criteria	1	Symptoms ± signs ^a	Symptoms ± signs ^a	Symptoms ± signs ^a
	2	LVEF ≤40%	LVEF 41–49% ^b	LVEF ≥50%
	3	–	–	Objective evidence of cardiac structural and/or functional abnormalities consistent with the presence of LV diastolic dysfunction/raised LV filling pressures, including raised natriuretic peptides ^c



FINAL DIAGNOSIS

- HYPERTENSIVE CARDIOMYOPATHY
- HFPEF, NYHA II



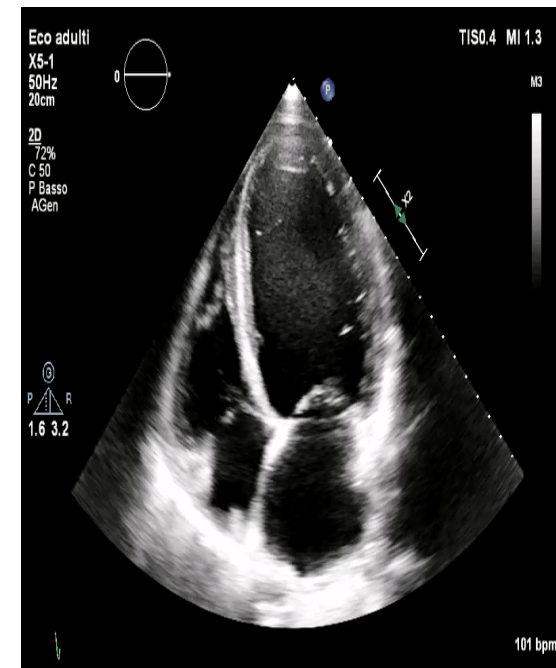




WHAT ABOUT THE CAUSES OF HF?

- MYOCARDIAL INFARCTION & ISCHEMIA
- HYPERTENSION
- VALVE DISEASES
- DILATED CARDIOMYOPATHY
- TOXIC/DRUG DAMAGE
- MYOCARDITIS (INFLAMMATION)
- METABOLIC /NUTRITIONAL DISORDERS
- **20-30% NOT KNOWN**

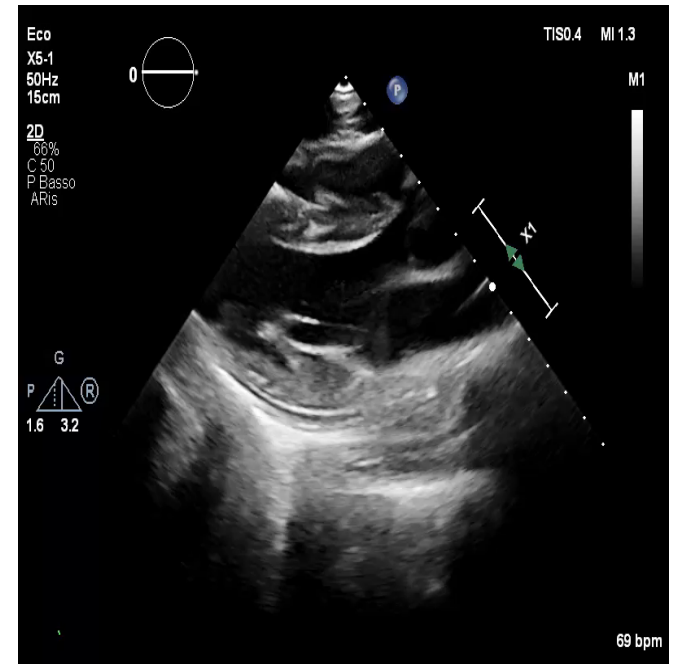
HFrEF



NYHA III

WHAT ABOUT THE CAUSES OF HF?

- HYPERTENSION
- AGING
- AORTIC STENOSIS
- INFILTRATIVE DISORDERS (AMYLOIDOSIS)
- HYPERTROPHIC CARDIOMYOPATHY
- OBESITY, METABOLIC SYNDROME, DIABETES
- ATRIAL FIBRILLATION
- CHRONIC KIDNEY DISEASE
- OBSTRUCTIVE SLEEP APNEA



HFpEF

NYHA III