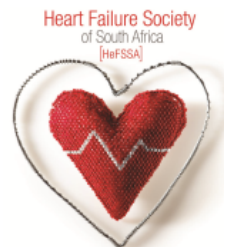


HeFSSA Practitioners Program 2016

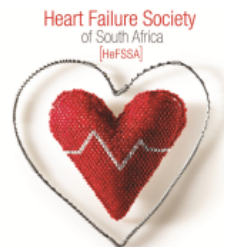
Theme – “What is NEW in Heart Failure treatment?”

08:00	Registration
08:25	Welcome and Thank You to Sponsors
08:30	The new kid on the block – “ ARNI”
09:15 new?	How do I effectively diurese my patient? Anything
10:00	Tea Break
10:30	Drugs, devices and procedures to offer the atrial fibrillation patient- new and exciting
11:15	The NEW Heart Failure guidelines from ESC (Europe)
11:45	Questionnaire
12:00	Departure



CASE STUDY:

The NEW Heart Failure Guidelines from ESC 2016



New Classification and Diagnosis

The principal changes from the 2012 guidelines relate to:

- New term for patients with HF and a LVEF that ranges from 40 to 49% — 'HF with midrange EF (**HFmrEF**)'; this may stimulate research into the underlying Characteristics, pathophysiology and treatment of this population
- Clear recommendations on the diagnostic criteria for HF with reduced EF (**HFrEF**), **HFmrEF** and HF with preserved EF (**HFpEF**)
- New algorithm for the diagnosis of HF in the non-acute setting based on the evaluation of HF **probability**
- New algorithm for a combined diagnosis and treatment of **acute HF** based on the presence/absence of congestion/hypoperfusion

www.escardio.org/guidelines



New Classification and Diagnosis

The principal changes from the 2012 guidelines (continue):

- Recommendations aimed at **prevention** or delay of the development of overt HF or the prevention of death before the onset of symptoms;
- Indications for the use of the **new compound sacubitril/valsartan**, the first in the class of angiotensin receptor neprilysin inhibitors (ARNIs);
- Modified indications for cardiac resynchronization therapy (**CRT**);
- The concept of an early initiation of appropriate therapy going along with relevant investigations in acute HF that follows the '**time to therapy**' approach already well established in ACS;

www.escardio.org/guidelines



Case study

67 year old woman known with:

- Hypertension
- Diabetes

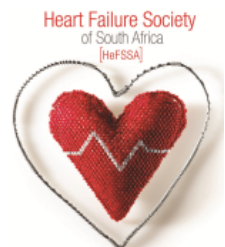
3 week history of dyspnoea, now unable to walk more than 50m on the flat, 3 pillow orthopnoea and intermittent PND with a nocturnal cough

She also recently noted that her legs were swelling.

She is currently experiencing no chest pain nor palpitations

Current meds: SHE HAS NO MEDICATION ALLERGIES

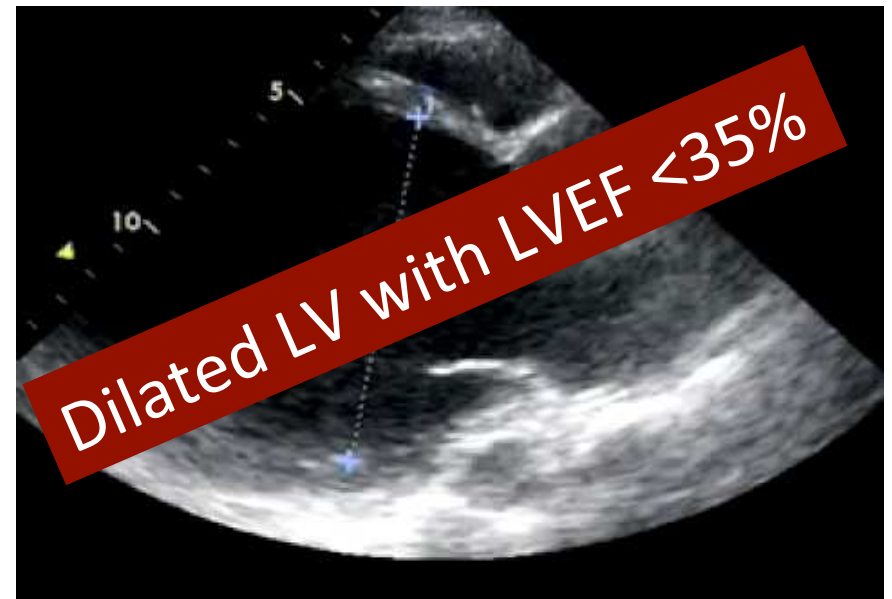
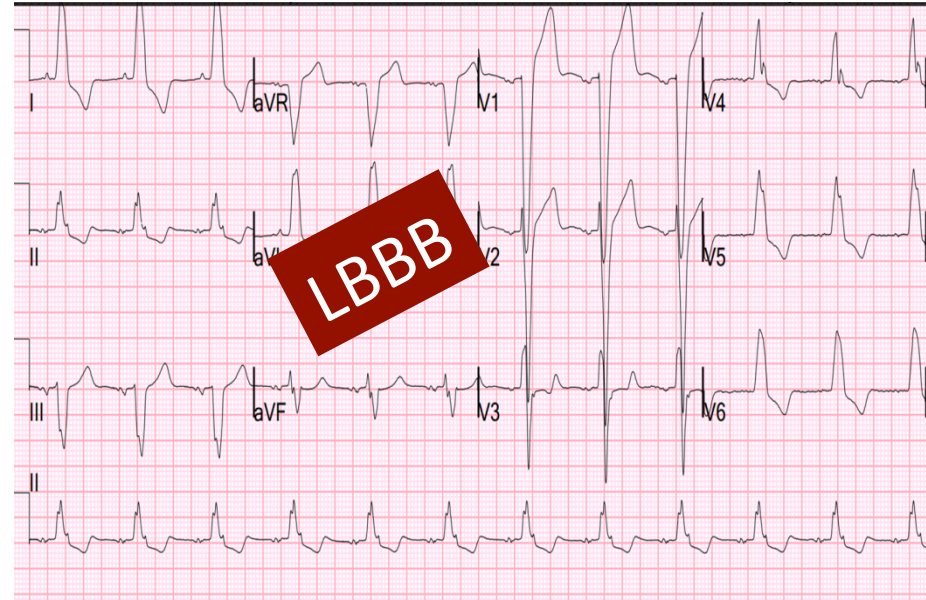
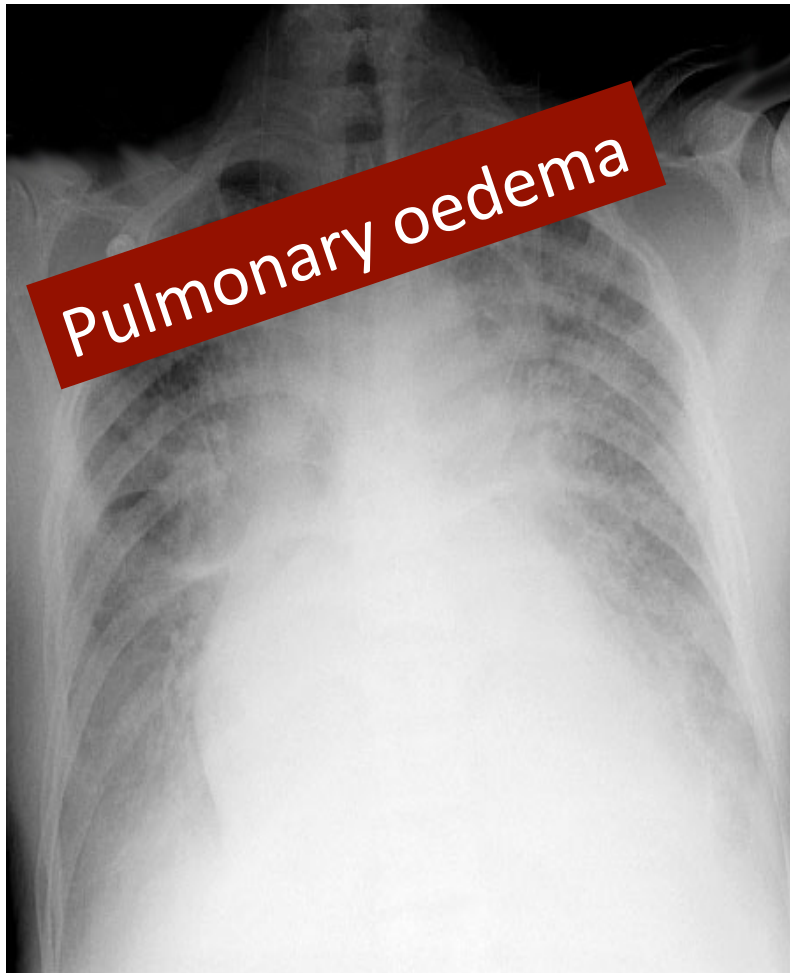
- Hydrochlorothiazide 12.5mg po daily
- Enalapril 5mg po daily
- Metformin 1g po bd



Clinical examination

- Respiratory distress – RR 32 breaths/min, Sats (room air) 92%
- Pulse 108 beats/min and regular
- Bilateral ankle oedema
- JVP elevated to angle of jaw
- A volume loaded apex in 6th ICS, AAL
- 2/6 PSM at apex with radiation to axilla
- Bilateral crackles at lung bases

CXR, ECG, Echo



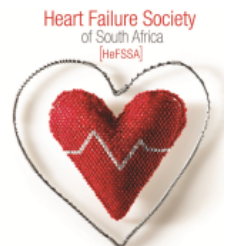
Making a diagnosis

Clinical syndrome with some

- Typical symptoms: breathlessness, ankle swelling, fatigue
- Typical signs: elevated JVP, pulmonary crackles, peripheral oedema

Caused by a structural and/or functional cardiac abnormality

- resulting in reduced cardiac output and/or elevated intracardiac pressures at rest or during stress



Signs and symptoms typical of heart failure

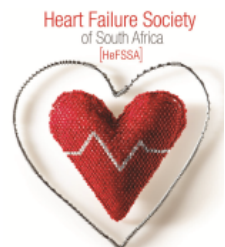
Symptoms	Signs
Typical	More specific
Breathlessness Orthopnoea Paroxysmal nocturnal dyspnoea Reduced exercise tolerance Fatigue, tiredness, increased time to recover after exercise Ankle swelling	Elevated jugular venous pressure Hepatojugular reflux Third heart sound (gallop rhythm) Laterally displaced apical impulse
Less typical	Less specific
Nocturnal cough Wheezing Bloating feeling Loss of appetite Confusion (especially in the elderly) Depression Palpitations Dizziness Syncope Bendopnea ⁵³	Weight gain (>2 kg/week) Weight loss (in advanced HF) Tissue wasting (cachexia) Cardiac murmur Peripheral oedema (ankle, sacral, scrotal) Pulmonary crepitations Reduced air entry and dullness to percussion at lung bases (pleural effusion) Tachycardia Irregular pulse Tachypnoea Cheyne Stokes respiration Hepatomegaly Ascites Cold extremities Oliguria Narrow pulse pressure

Signs and symptoms

Sensitivity and specificity of clinical symptoms and signs in HF

Clinical Features	Sensitivity (%)	Specificity (%)
Breathlessness	66	52
Orthopnoea	21	81
PND	33	76
History of oedema	23	80
Tachycardia	7	99
Pulmonary crackles	13	91
Oedema on examination	10	93
3 rd heart sound	31	95 ←
Raised JVP	10	97 ←

Sosin M et al, Manson Publishing 2006



Diagnostic algorithm

PATIENT WITH SUSPECTED HF^a (non-acute onset)



ASSESSMENT OF HF PROBABILITY

1. Clinical history:

History of CAD (MI, revascularization)
History of arterial hypertension
Exposition to cardiotoxic drug/radiation
Use of diuretics
Orthopnoea / paroxysmal nocturnal dyspnoea

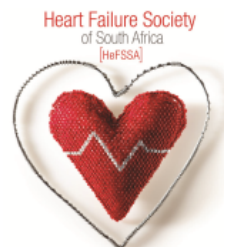
2. Physical examination:

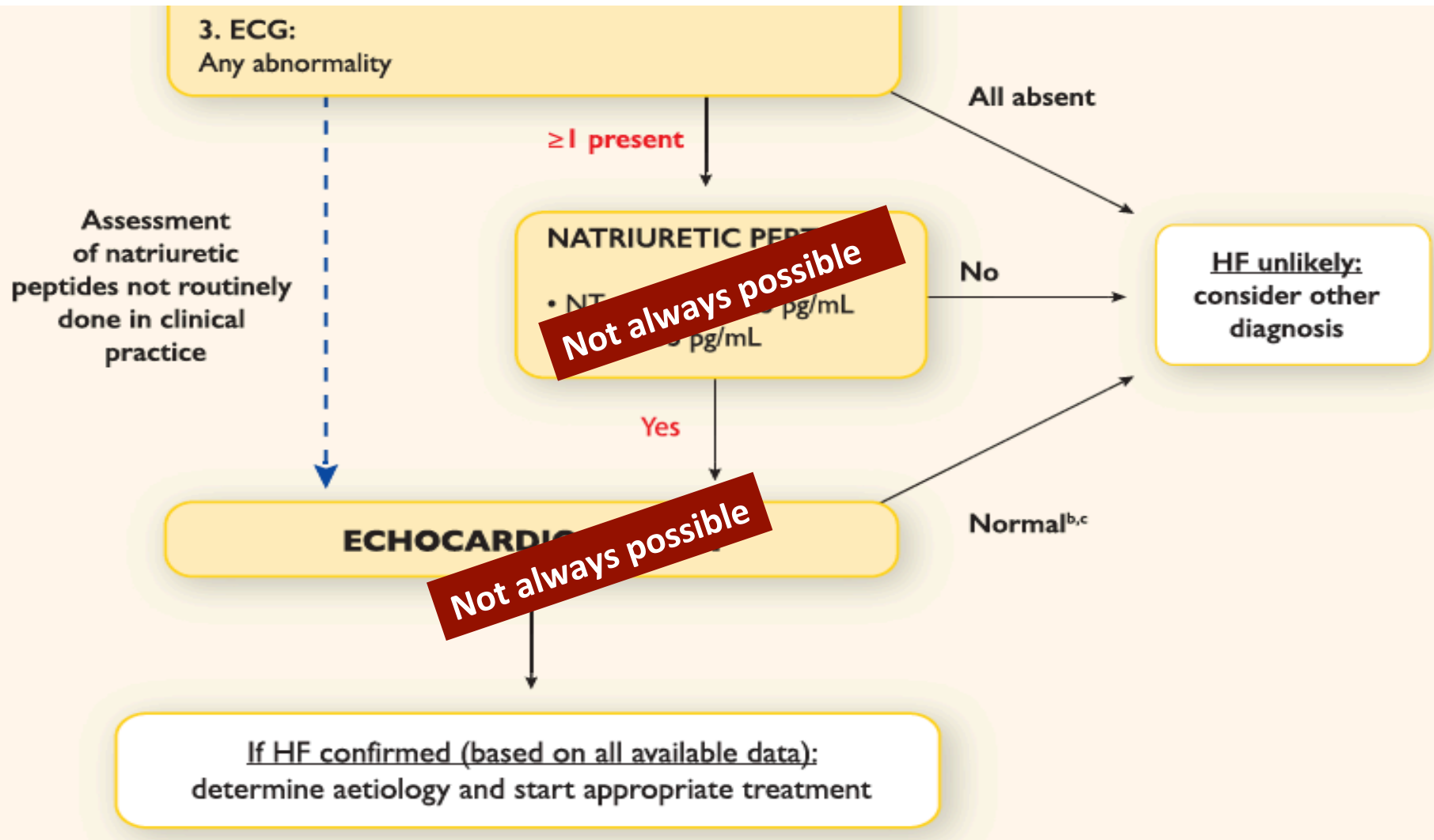
Rales
Bilateral ankle oedema
Heart murmur
Jugular venous dilatation
Laterally displaced/broadened apical beat

3. ECG:

Any abnormality

If these are all normal, heart failure is unlikely





EF classification of heart failure

Table 3.1 Definition of heart failure with preserved (HFpEF), mid-range (HFmrEF) and reduced ejection fraction (HFrEF)

Type of HF		HFrEF	HFmrEF	HFpEF
CRITERIA	1	Symptoms ± Signs ^a	Symptoms ± Signs ^a	Symptoms ± Signs ^a
	2	LVEF <40%	LVEF 40–49%	LVEF ≥50%
	3	–	1. Elevated levels of natriuretic peptides ^b ; 2. At least one additional criterion: a. relevant structural heart disease (LVH and/or LAE), b. diastolic dysfunction (for details see Section 4.3.2)	1. Elevated levels of natriuretic peptides ^b ; 2. At least one additional criterion: a. relevant structural heart disease (LVH and/or LAE), b. diastolic dysfunction (for details see Section 4.3.2).



Our patient

- Clinical symptoms and sign suggestive of heart failure
- CXR showed pulmonary oedema
- ECG showed sinus rhythm and a LBBB
- Echo: Dilated LV with EF 30% and moderate MR

HOW WOULD YOU TREAT?



Patient with symptomatic^a HFrEF^b

Class I
Class IIa

Therapy with ACE-I^c and beta-blocker
(Up-titrate to maximum tolerated evidence-based doses)

Still symptomatic
and LVEF $\leq 35\%$

No

Yes

Add MR antagonist^{d,e}
(up-titrate to maximum tolerated evidence-based dose)

Yes

No

Still symptomatic
and LVEF $\leq 35\%$

Yes

Able to tolerate
ACEI (or ARB)^{f,g}

Sinus rhythm,
QRS duration ≥ 130 msec

Sinus rhythm,^h
HR ≥ 70 bpm

ARNI to replace
ACE-I

Evaluate need for
CRT^{i,j}

Ivabradine

These above treatments may be combined if indicated

Resistant symptoms

Yes

No

Consider digoxin or H-ISDN
or LVAD, or heart transplantation

No further action required
Consider reducing diuretic dose

Diuretics to relieve symptoms and signs of congestion

If LVEF $\leq 35\%$ despite OMT
or a history of symptomatic VT/VF, implant ICD

Therapy with ACE-I^c and beta-blocker
(Up-titrate to maximum tolerated evidence-based doses)

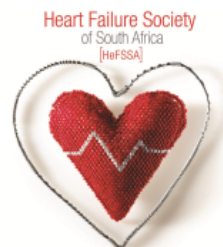
**Still symptomatic
and LVEF $\leq 35\%$**

No

Yes

Add MR antagonist^{d,e}
(up-titrate to maximum tolerated evidence-based dose)

**ALL patients unless CI or not tolerated should get
and ACE-I, betablocker or MR antagonist for survival
benefit**

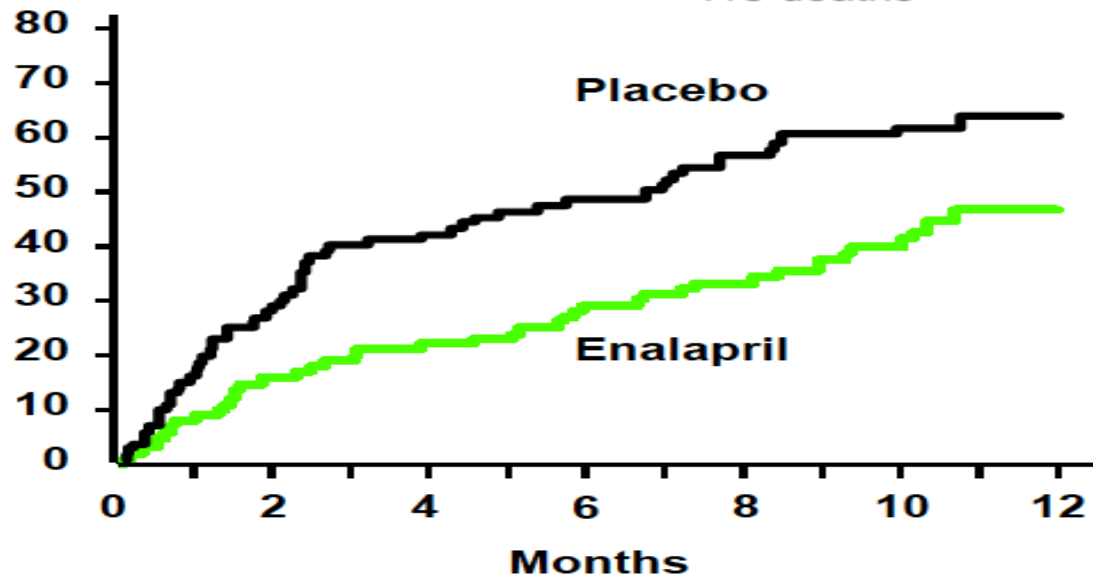


ACE-Inhibitors reduce mortality

CONSENSUS Enalapril in severe HF

253 patients in NYHA class IV
Randomized to placebo/enalapril
From first patient to end of study 20 month
118 deaths

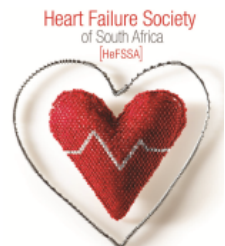
All Cause Mortality (%)



Relative risk
reduction = 27%

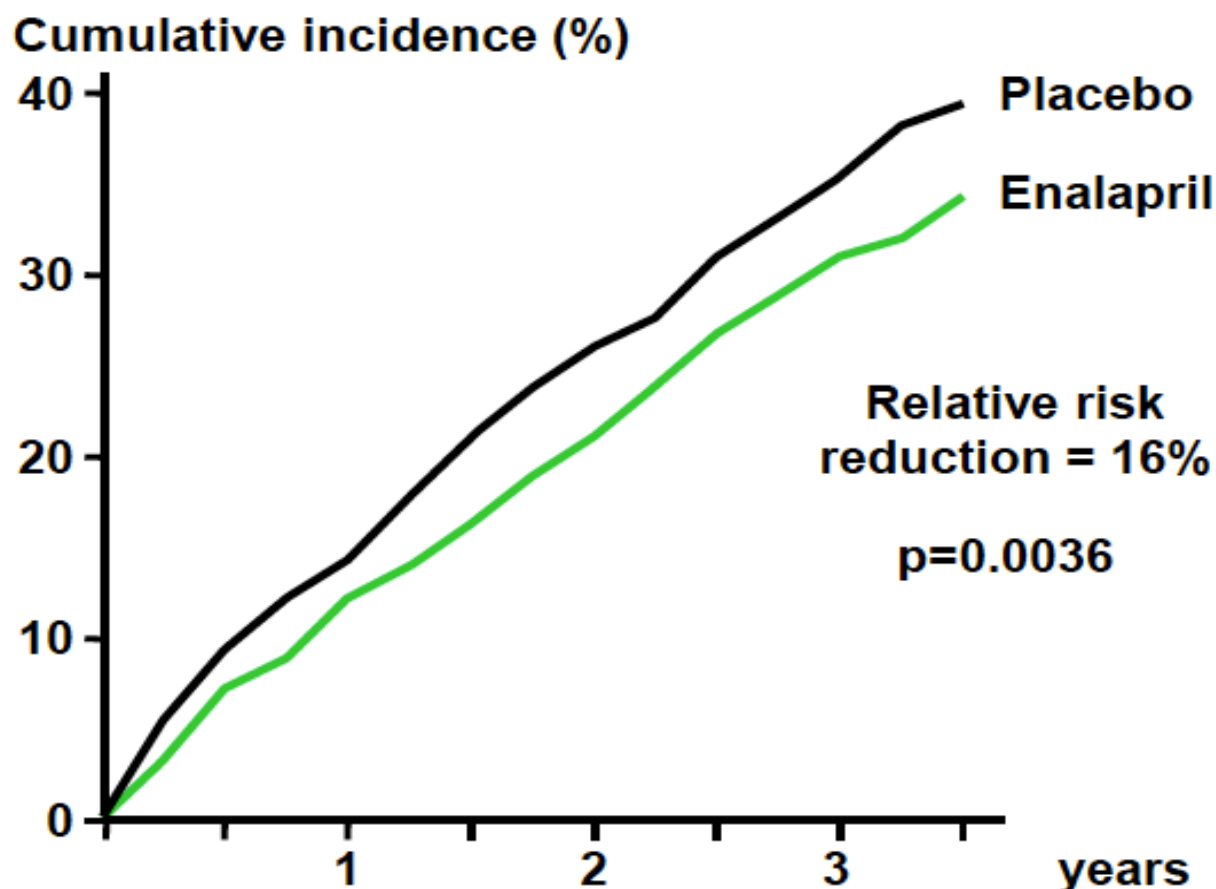
$p=0.003$

Swedberg et al NEJM 1987



SOLVD Treatment Trial

All Cause Death



Number at risk

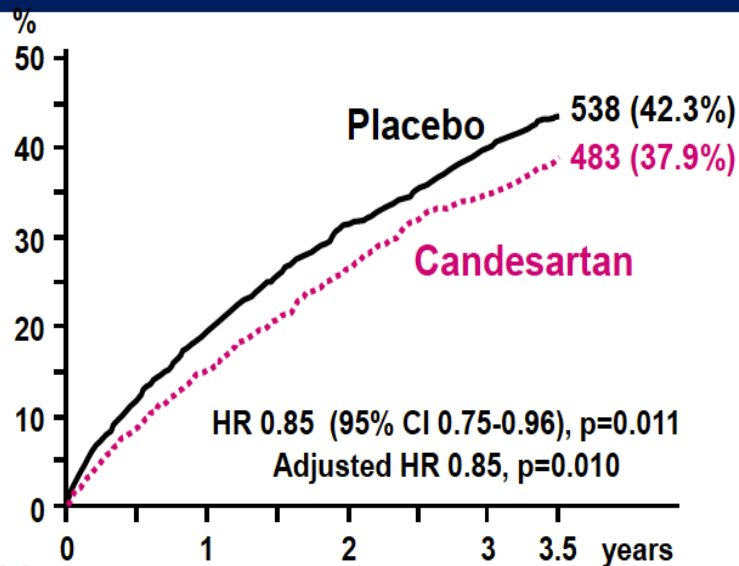
Enalapril	1285	1127	1010	697	526
Placebo	1284	1085	939	669	487

SOLVD Investigators NEJM 1991

ARB Trials

CHARM - Candesartan

CHARM-Added: Primary outcome
CV death or CHF hospitalisation

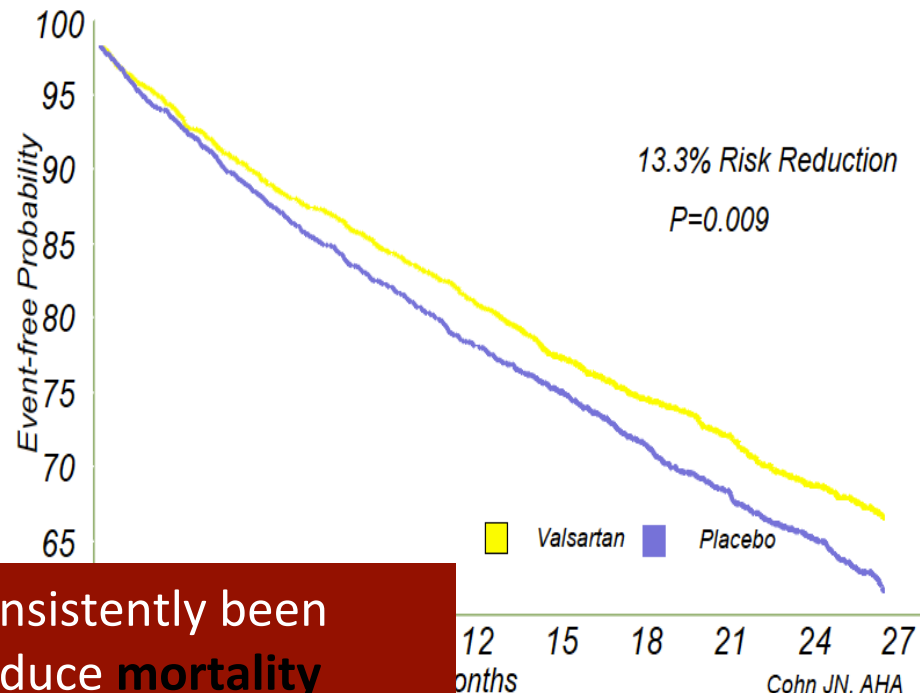


Number at risk

Candesartan	1276	1176	1063
Placebo	1272	1136	1013

VALHeFT - Valsartan

Val-Heft: Combined All-Cause Mortality and
Morbidity

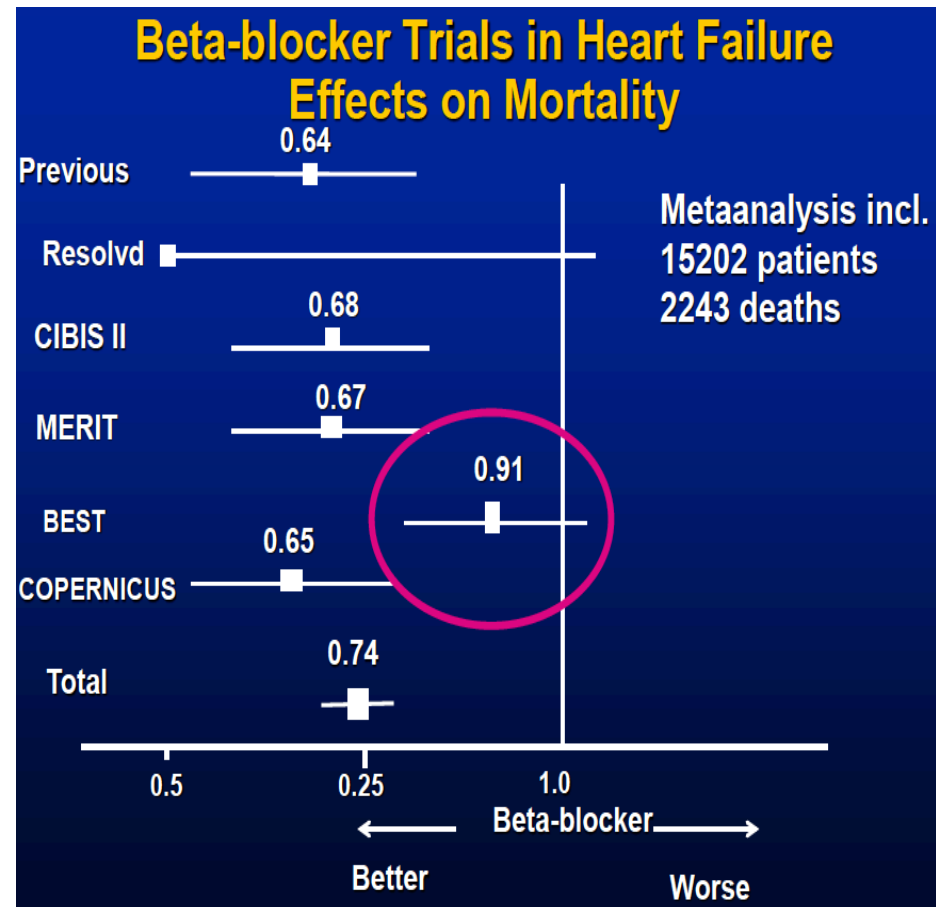


- Have not consistently been shown to reduce **mortality**
- Reserved for those who are ACE intolerant or those who can take an ACE but not an MRA



Beta-blockers

- Reduce morbidity and mortality in stable patients with heart failure despite being on an ACE-I
- Used in addition to an ACE-I
- Start at low dose and uptitrate to maximum tolerated dose
- In those with acute decompensated heart failure, initiate only once patient is stable

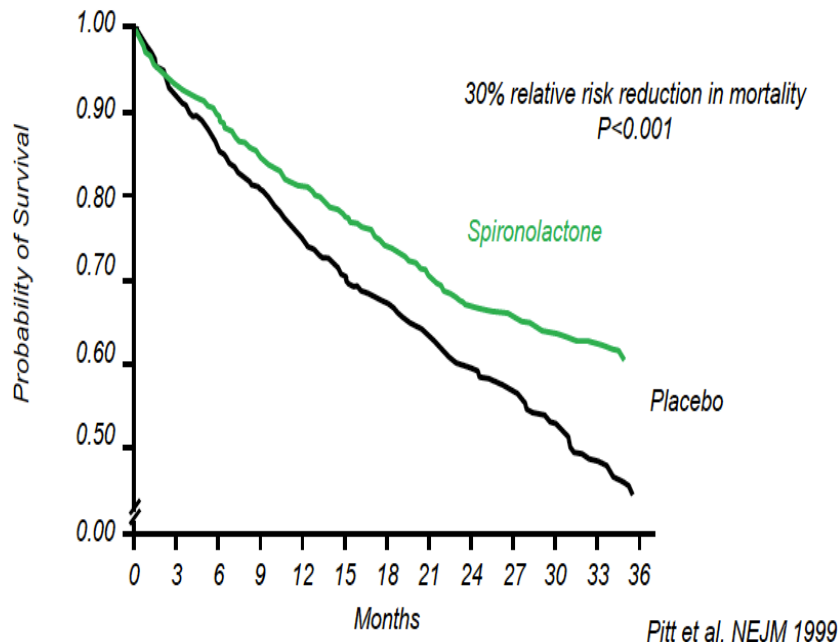


Aldosterone inhibition

RALES

Randomized ALdactone Evaluation Study

1663 patients, NYHA class III-IV, LVEF ≤ 0.35 . ACE-i 95%, digoxin 73% and beta blockers 10.5%. Mean follow-up 24 months.



- Spironolactone or eplerenone are recommended in all patient with HFrEF (EF<35%) who remain symptomatic despite ACE-I or beta blocker
- Reduced mortality and hospitalization
- Renal function and Potassium should be checked regularly, especially on initiation

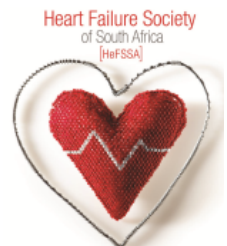
Our patient

She was given:

- Lasix 40mg po bd for her congestion
- Enalapril 2,5mg po bd up-titrated to 5mg po bd
- Carvedilol 6.25 mg po bd
- Spironolactone 25mg po daily was added to provide symptom relief after a week
 - K and renal function was monitored

She remains symptomatic

NOW WHAT WOULD YOU DO?

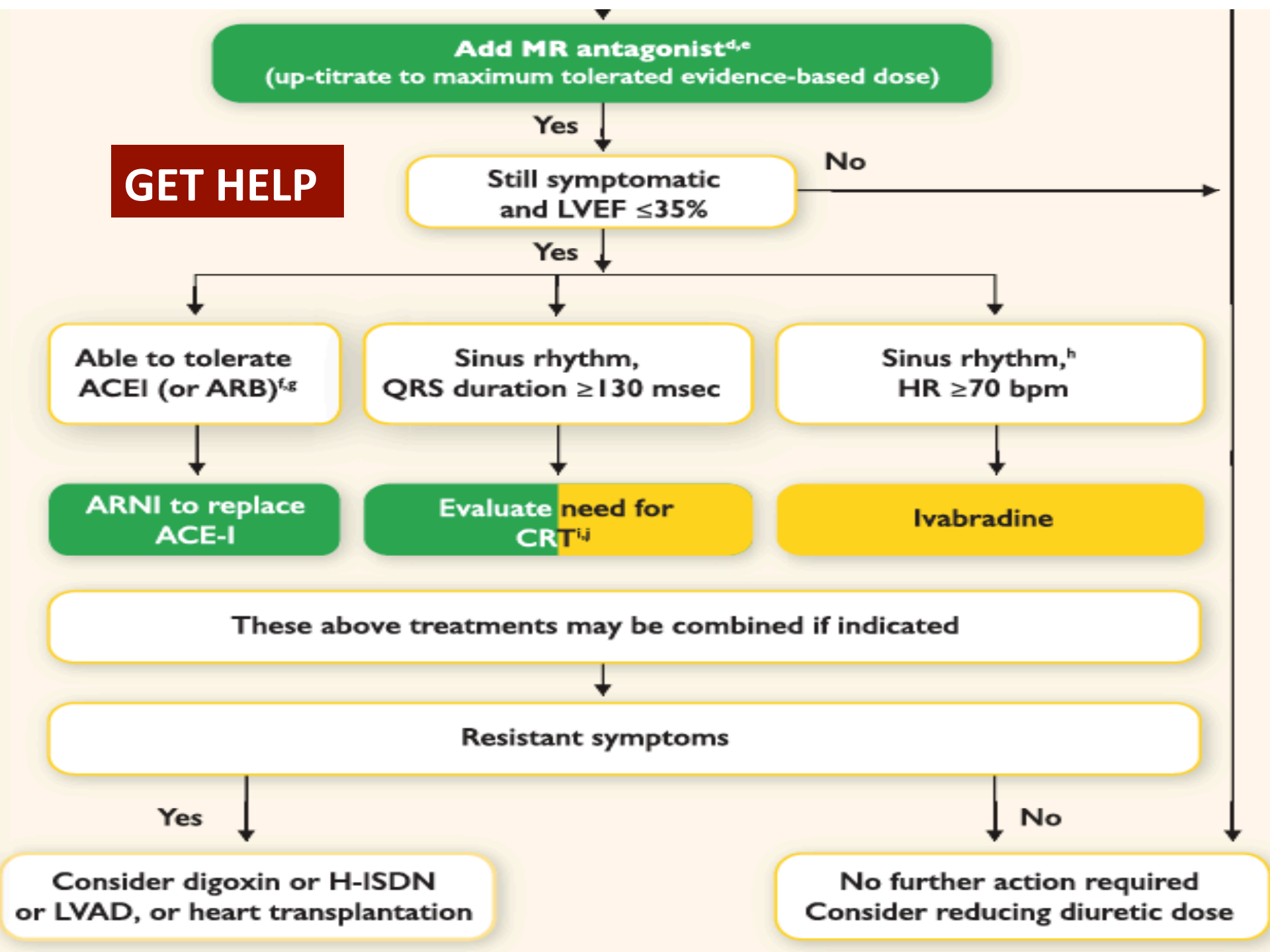


Dose recommendations

	Starting dose (mg)	Target dose (mg)
ACE-I		
Captopril ^a	6.25 <i>t.i.d.</i>	50 <i>t.i.d.</i>
Enalapril	2.5 <i>b.i.d.</i>	20 <i>b.i.d.</i>
Lisinopril ^b	2.5–5.0 <i>o.d.</i>	20–35 <i>o.d.</i>
Ramipril	2.5 <i>o.d.</i>	10 <i>o.d.</i>
Trandolapril ^a	0.5 <i>o.d.</i>	4 <i>o.d.</i>
Beta-blockers		
Bisoprolol	1.25 <i>o.d.</i>	10 <i>o.d.</i>
Carvedilol	3.125 <i>b.i.d.</i>	25 <i>b.i.d.</i> ^d
Metoprolol succinate (CR/XL)	12.5–25 <i>o.d.</i>	200 <i>o.d.</i>
Nebivolol ^e	1.25 <i>o.d.</i>	10 <i>o.d.</i>
ARBs		
Candesartan	4–8 <i>o.d.</i>	32 <i>o.d.</i>
Valsartan	40 <i>b.i.d.</i>	160 <i>b.i.d.</i>
Losartan ^{b,c}	50 <i>o.d.</i>	150 <i>o.d.</i>
MRAs		
Eplerenone	25 <i>o.d.</i>	50 <i>o.d.</i>
Spirolactone	25 <i>o.d.</i>	50 <i>o.d.</i>
ARNI		
Sacubitril/valsartan	49/51 <i>b.i.d.</i>	97/103 <i>b.i.d.</i>
If-channel blocker		
Ivabradine	5 <i>b.i.d.</i>	7.5 <i>b.i.d.</i>

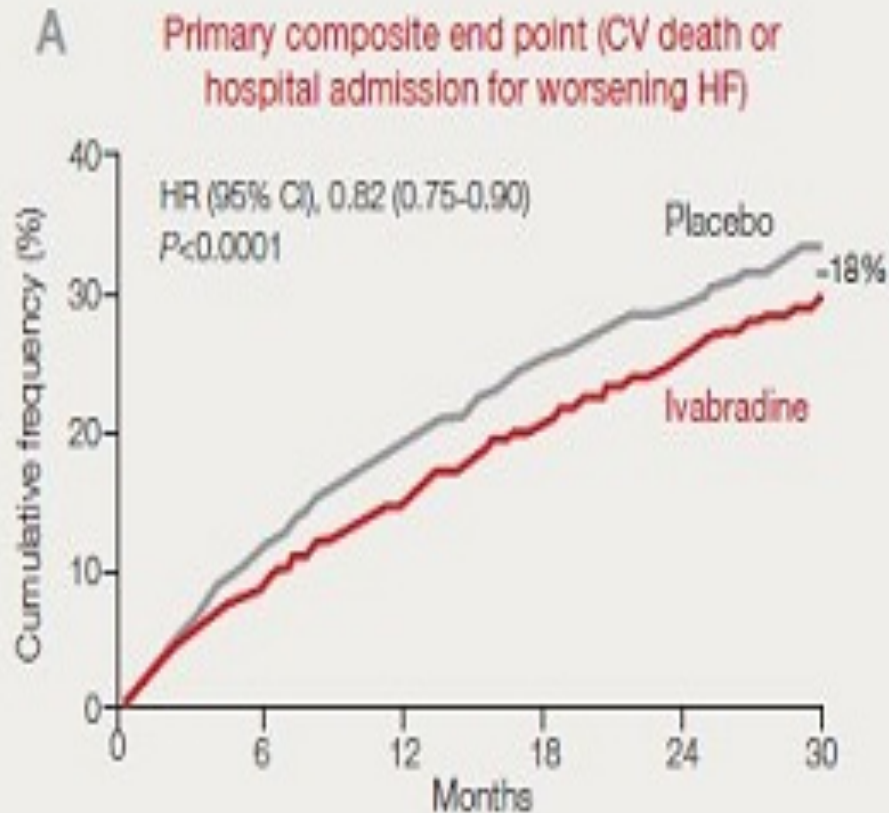
Slowly up-titrate to the maximum dose that is tolerated by the patient





Ivabradine

SHIFT Trial



- Slows heart rate by inhibiting the I_f channel in sinus node
- Reduced endpoint of mortality and hospitalization in those with LVEF $< 35\%$, in SR, on OMT including a betablocker with a HR still > 70

Cardiac Resynchronisation Therapy Indications

Recommendations for cardiac resynchronization therapy implantation in patients with heart failure

Recommendations	Class ^a	Level ^b
CRT is recommended for symptomatic patients with HF in sinus rhythm with a QRS duration ≥ 150 msec and LBBB QRS morphology and with LVEF $\leq 35\%$ despite OMT in order to improve symptoms and reduce morbidity and mortality.	I	A
CRT should be considered for symptomatic patients with HF in sinus rhythm with a QRS duration ≥ 150 msec and non-LBBB QRS morphology and with LVEF $\leq 35\%$ despite OMT in order to improve symptoms and reduce morbidity and mortality.	IIa	B
CRT is recommended for symptomatic patients with HF in sinus rhythm with a QRS duration of 130–149 msec and LBBB QRS morphology and with LVEF $\leq 35\%$ despite OMT in order to improve symptoms and reduce morbidity and mortality.	I	B
CRT may be considered for symptomatic patients with HF in sinus rhythm with a QRS duration of 130–149 msec and non-LBBB QRS morphology and with LVEF $\leq 35\%$ despite OMT in order to improve symptoms and reduce morbidity and mortality.	IIb	B
CRT rather than RV pacing is recommended for patients with HFrEF regardless of NYHA class who have an indication for ventricular pacing and high degree AV block in order to reduce morbidity. This includes patients with AF (see Section 10.1).	I	A
CRT should be considered for patients with LVEF $\leq 35\%$ in NYHA Class III–IV ^d despite OMT in order to improve symptoms and reduce morbidity and mortality, if they are in AF and have a QRS duration ≥ 130 msec provided a strategy to ensure bi-ventricular capture is in place or the patient is expected to return to sinus rhythm.	IIa	B
Patients with HFrEF who have received a conventional pacemaker or an ICD and subsequently develop worsening HF despite OMT and who have a high proportion of RV pacing may be considered for upgrade to CRT. This does not apply to patients with stable HF.	IIb	B
CRT is contra-indicated in patients with a QRS duration < 130 msec.	III	A



A word on Iron deficiency and anemia

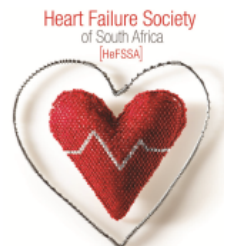
Recommendations	Class ^a	Level ^b
Iron deficiency		
Intravenous FCM should be considered in symptomatic patients with HFrEF and iron deficiency (serum ferritin <100 µg/L, or ferritin between 100–299 µg/L and transferrin saturation <20%) in order to alleviate HF symptoms, and improve exercise capacity and quality of life.	Ia	A

- Iron deficiency is common in heart failure
- Associated with worse prognosis
- 2 RCT's IV iron (FAIR-HF / CONFIRM-HF)
 - Improvement in exercise capacity
 - Reduced heart failure hospitalizations



Take home messages

- The diagnosis of heart failure remains a clinical diagnosis
 - Natriuretic biomarker testing is a useful rule-out test if unsure of diagnosis
- ACE-inhibitors, beta-blockers and mineralocorticoid antagonists remain the mainstay of treatment
- Remember to up-titrate to maximum doses
- Do refer if no improvement on these for evaluation for more specialized therapies including newer drugs and device therapy

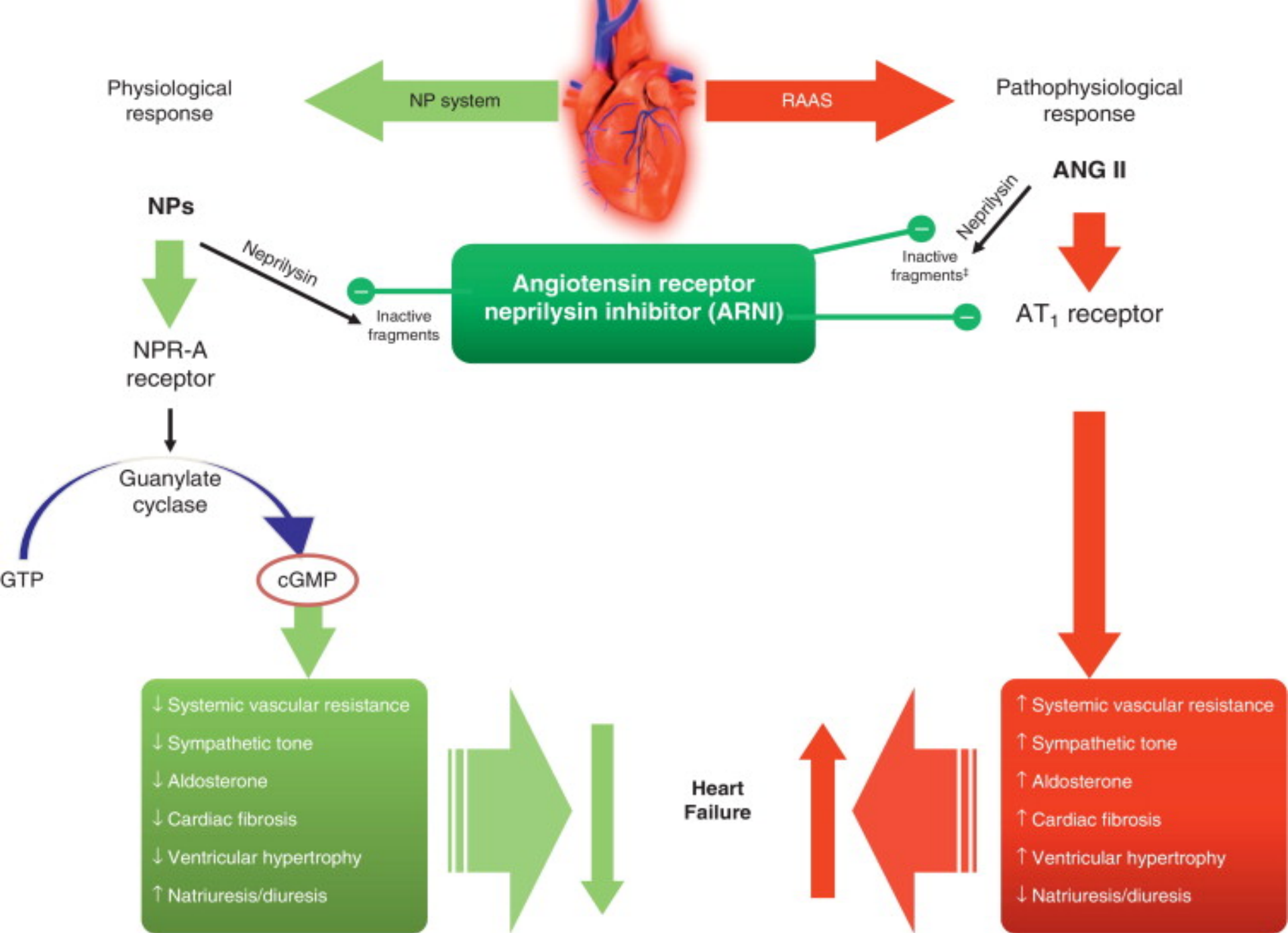


The End

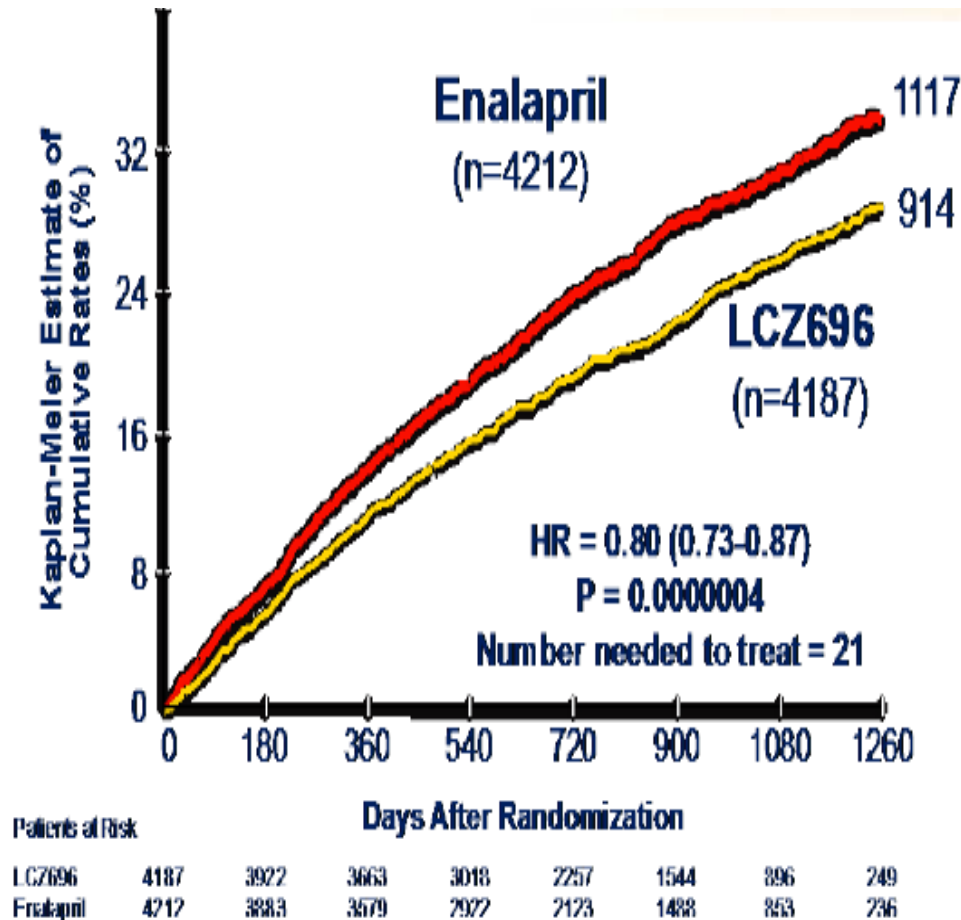


Slides to see as optional

- Speakers may want to put in their own slide of hydralazine and nitrate
- A slide on digoxin



Angiotensin Receptor Neprilysin Inhibitor



- Sacubitril/Valsartan is superior to Enalapril in reducing death and hospitalization for heart failure
- Indicated to replace ACE-I in ambulatory HFrEF patients who remain symptomatic despite OMT

Patient with suspected AHF

**Urgent phase
after first medical
contact**

1. Cardiogenic shock ?

Yes

Circulatory support
• pharmacological
• mechanical

No

2. Respiratory failure ?

Yes

Ventilatory support
• oxygen
• non-invasive positive
pressure ventilation
(CPAP, BiPAP)
• mechanical ventilation

No

**Immediate stabilization
and transfer to ICU/CCU**

**Immediate phase
(initial 60–120 minutes)**

Identification of acute aetiology:

C acute **C**oronary syndrome
H **H**ypertension emergency
A **A**rrhythmia
M acute **M**echanical cause^a
P **P**ulmonary embolism

No

Yes

Immediate initiation
of specific treatment

Follow detailed recommendations
in the specific ESC Guidelines

**Diagnostic work-up to confirm AHF
Clinical evaluation to select optimal management**

