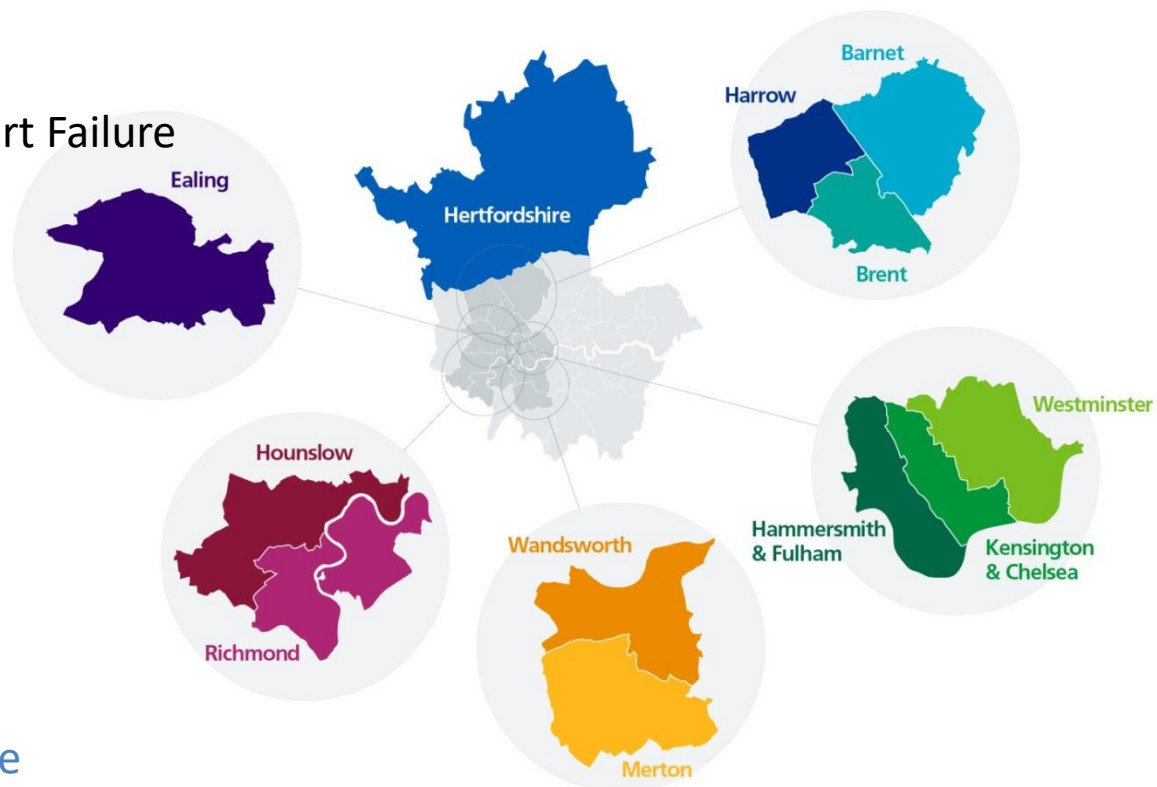


# Understanding Heart Failure management

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RN, ACP, PGDip, MSc

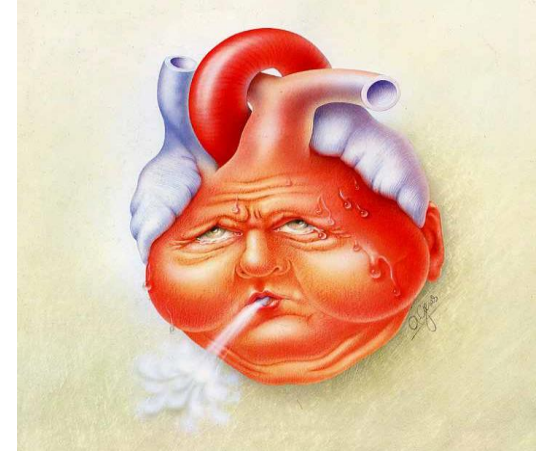
Clinical Lead Specialist for Heart Failure  
and Cardiac Rehabilitation



Your healthcare closer to home

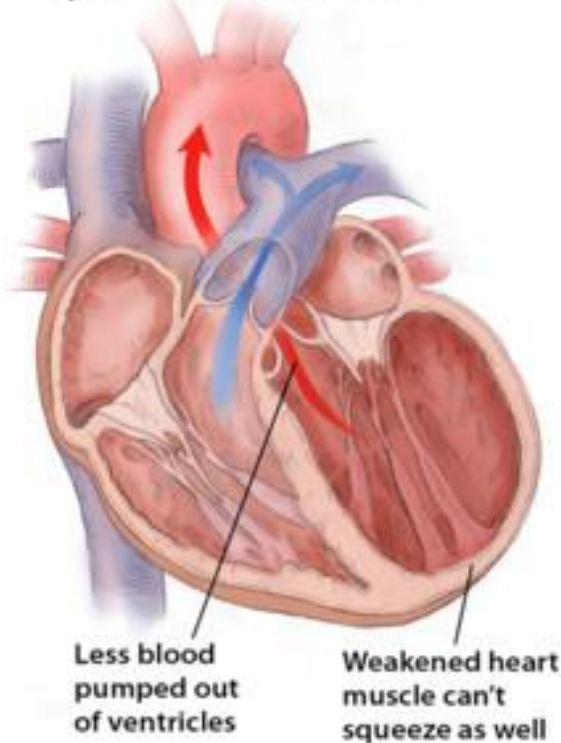
# What is heart failure ?

- Impairment of the heart ability to function as a pump to support circulation.
- Caused by a structural or functional cardiac disorder  
“The FINAL common pathway for the many cardiac conditions that affect the heart pump function”



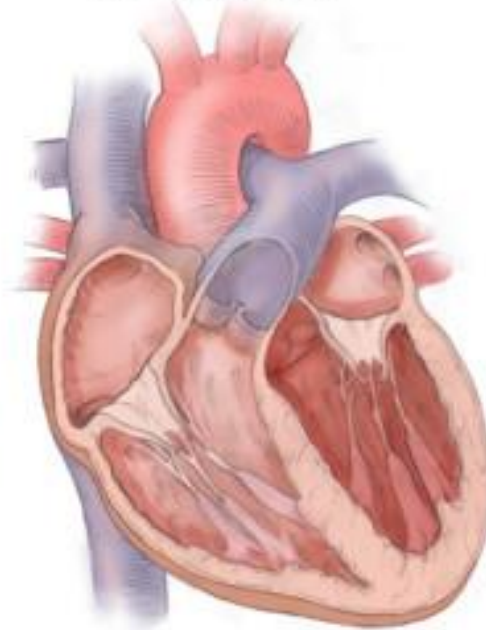
# Types of Heart Failure

Systolic Heart Failure

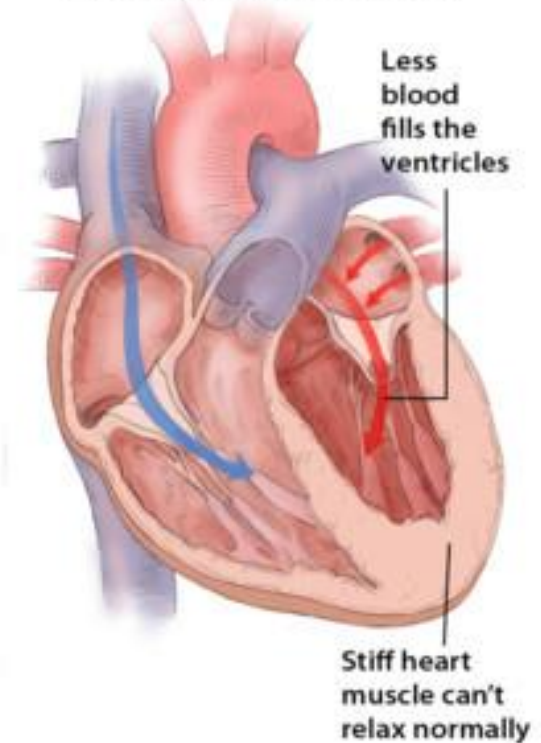


Heart Failure with reduced ejection fraction (HFrEF)

Normal Heart

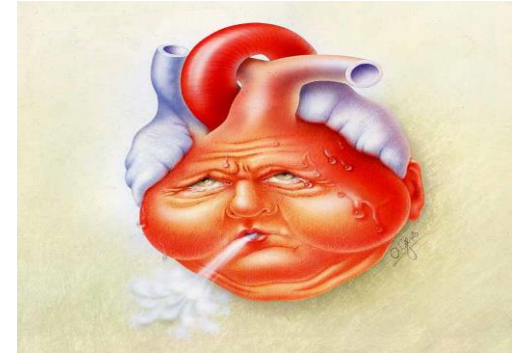


Diastolic Heart Failure



Heart Failure with preserved ejection fraction (HFpEF)

# The Burden of heart failure



- Patients are often older and can have multiple comorbidities
- Only cardiovascular condition that is *increasing* in the UK- approx. 920,000
- Multiple admissions 100,000 per year
- **Higher** mortality rate than most common cancers excluding lung cancer
- HIGH COST !!!!!



# Signs to help #BEATHF

B – Breathless



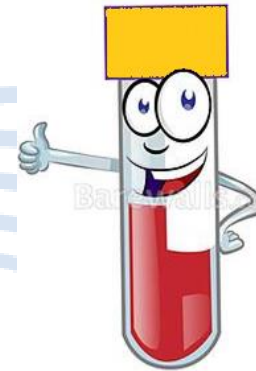
E – Exhaustion



A – Ankle swelling



T – Time for a simple  
blood test



BEAT-HF acronym (Pumping Marvellous Foundation social media campaign)

# Goals of HF management



**Prevent hospital admissions**



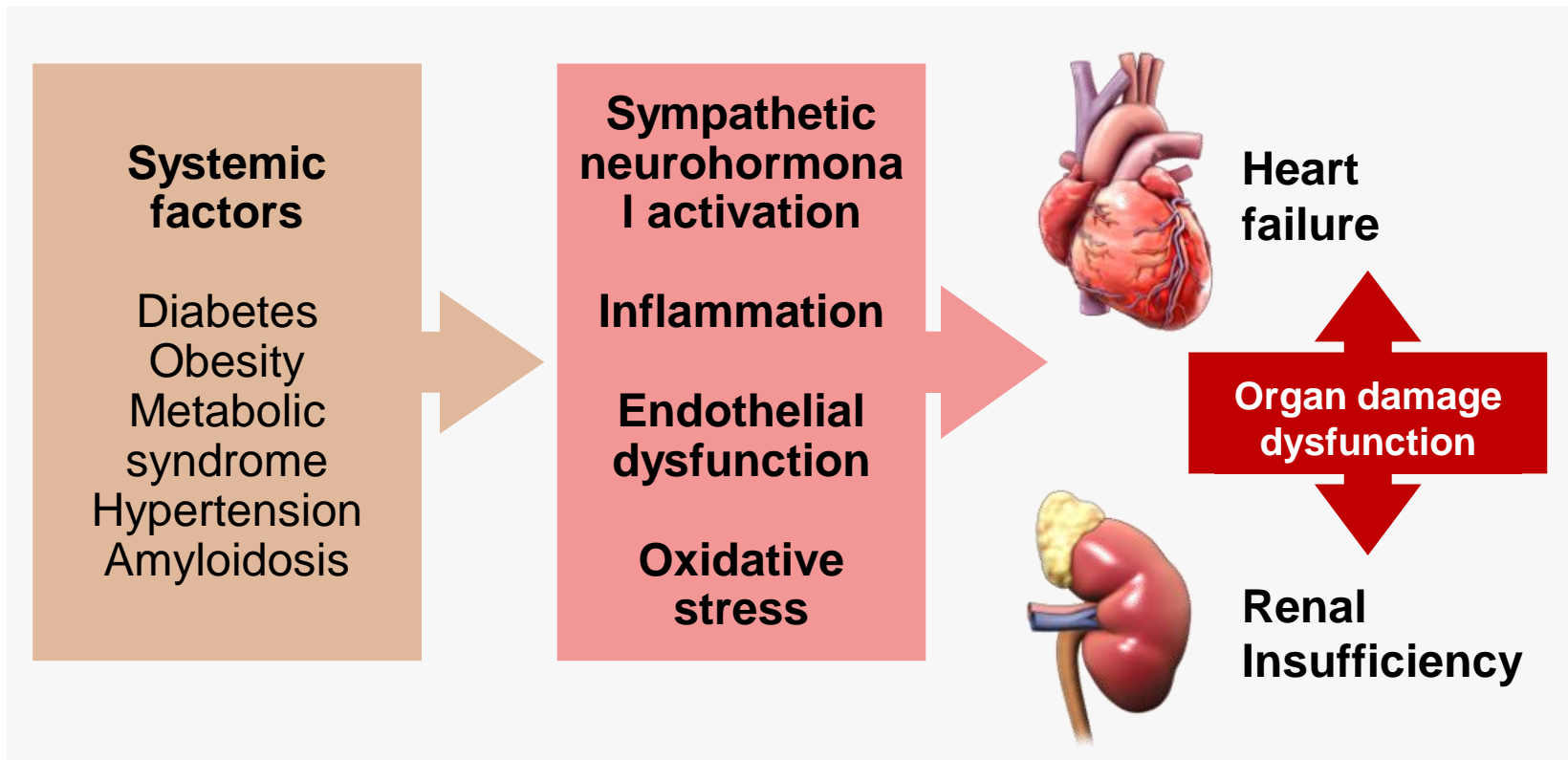
**Improve diagnosis and treatment**



**Increase the length and quality of life**

**Patient centred shared  
decision making**

# What is Cardiorenal syndrome?



# Heart failure diagnostic workup should be based on a clear patient history, physical exam and diagnostic tests

## Medical history

- Uncover symptoms of HF
- Identify history of risk factors
- Medications used

## Physical exam

- Signs of volume overload
- Evidence of secondary causes

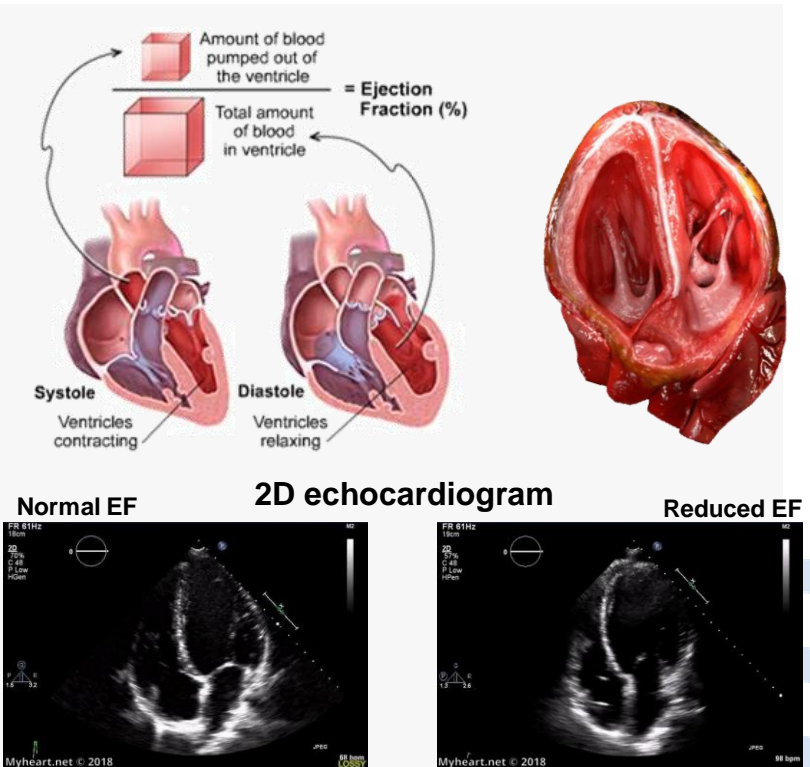
## Diagnostic tests may include

- BNP, NT-proBNP (plus full blood tests)
- ECG
- ECG or imaging stress test
- Chest x-ray
- 2-D echocardiogram with Doppler
- Angiogram/CT coronary angiogram
- MRI

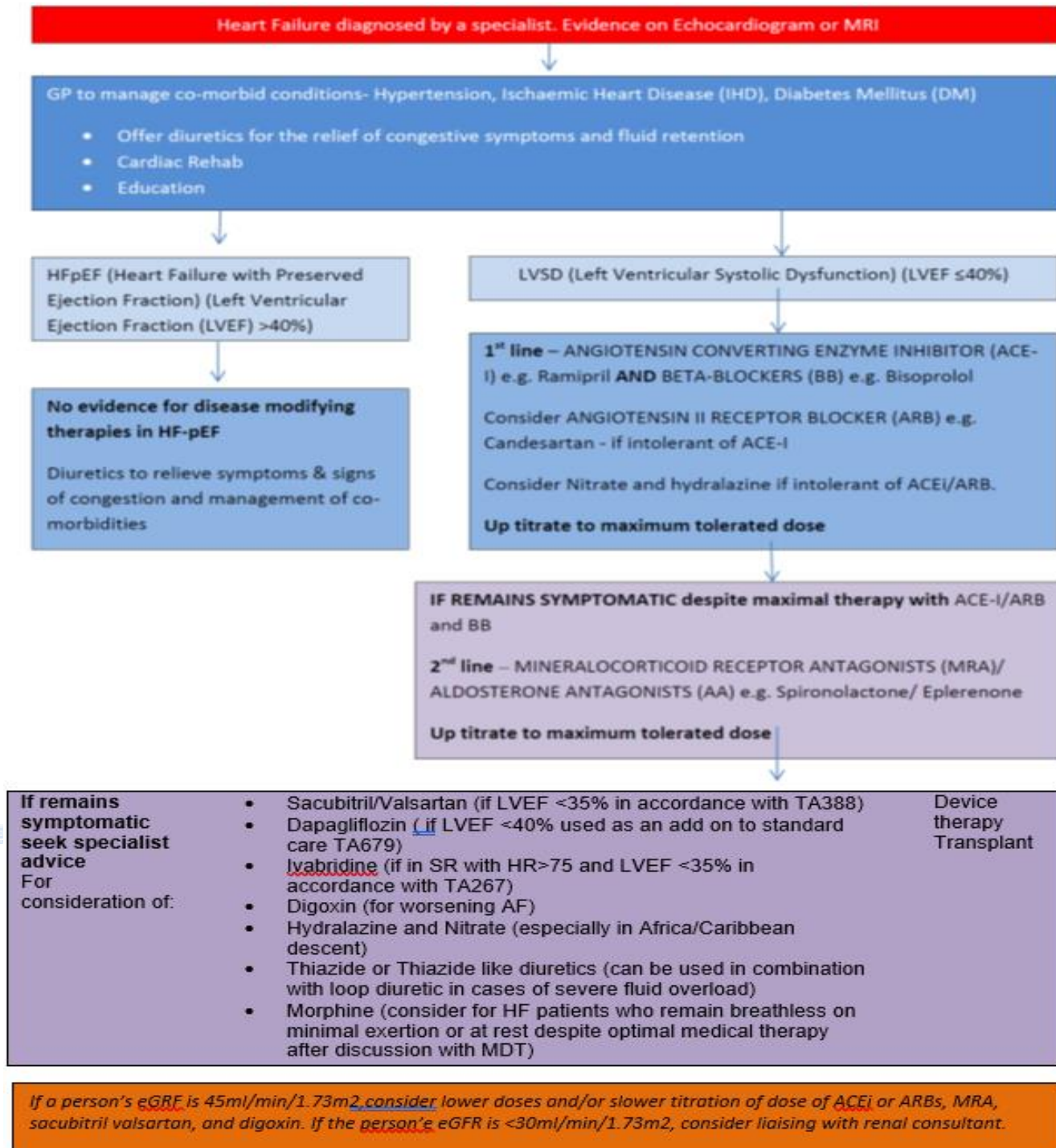


# Ejection fraction is a key criteria in heart failure management

- **Ejection Fraction (EF)** is the percentage of blood that is pumped out of the heart during each beat
- A normal EF is  $\geq 50\%$
- Heart failure with an EF  $\leq 40\%$  is known as **heart failure with reduced ejection fraction (HFrEF)**
- Heart failure in the setting of a normal EF is known as **heart failure with preserved ejection fraction (HFpEF)**
- Debate exists about how to describe those with HF and an EF between 40-50%

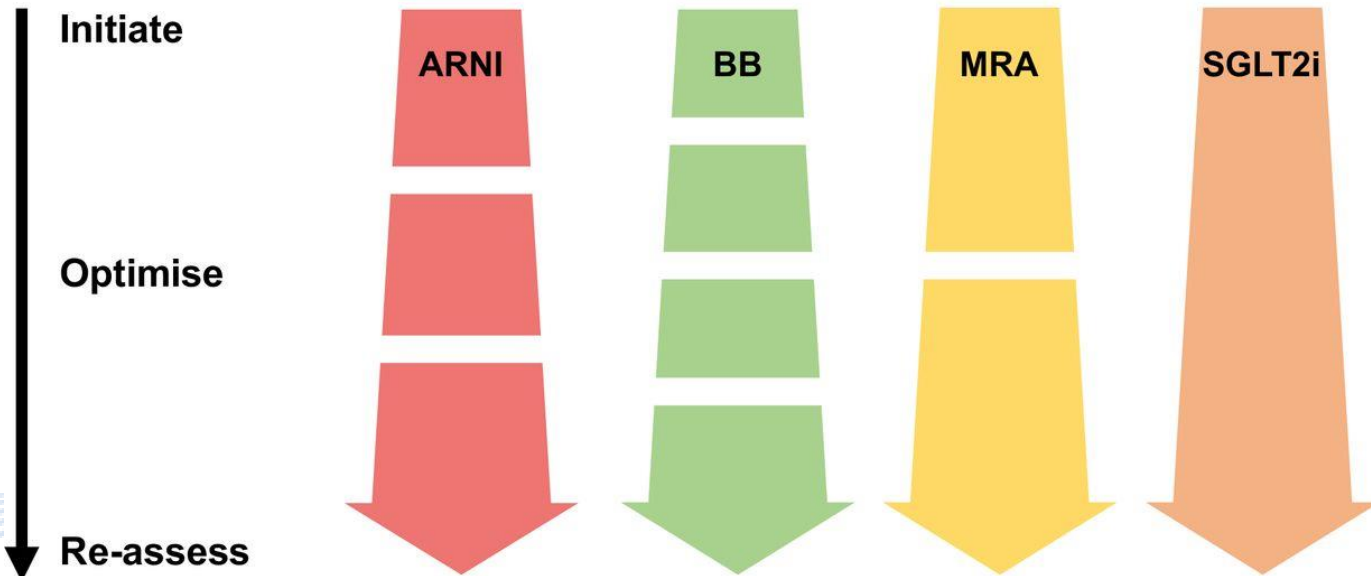


# Medicine management pathway NICE guidance



# ESC guidance

## The Four Pillars of Heart Failure



Consider additional therapies



cardiac output  $\searrow$   $\longrightarrow$  adrenergic activity  $\nearrow$

$\beta$ -blockers

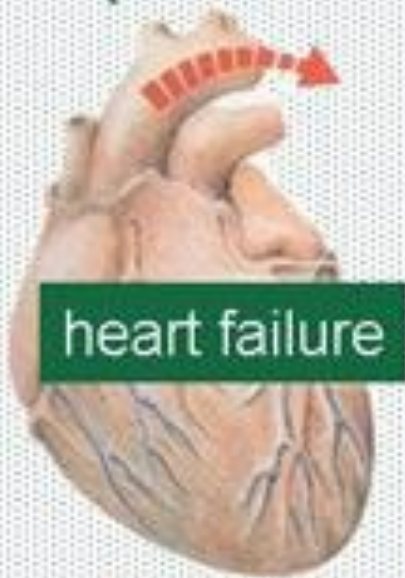
inhibition

activation of  
cardiac  
 $\beta_1$ -adrenergic  
receptors

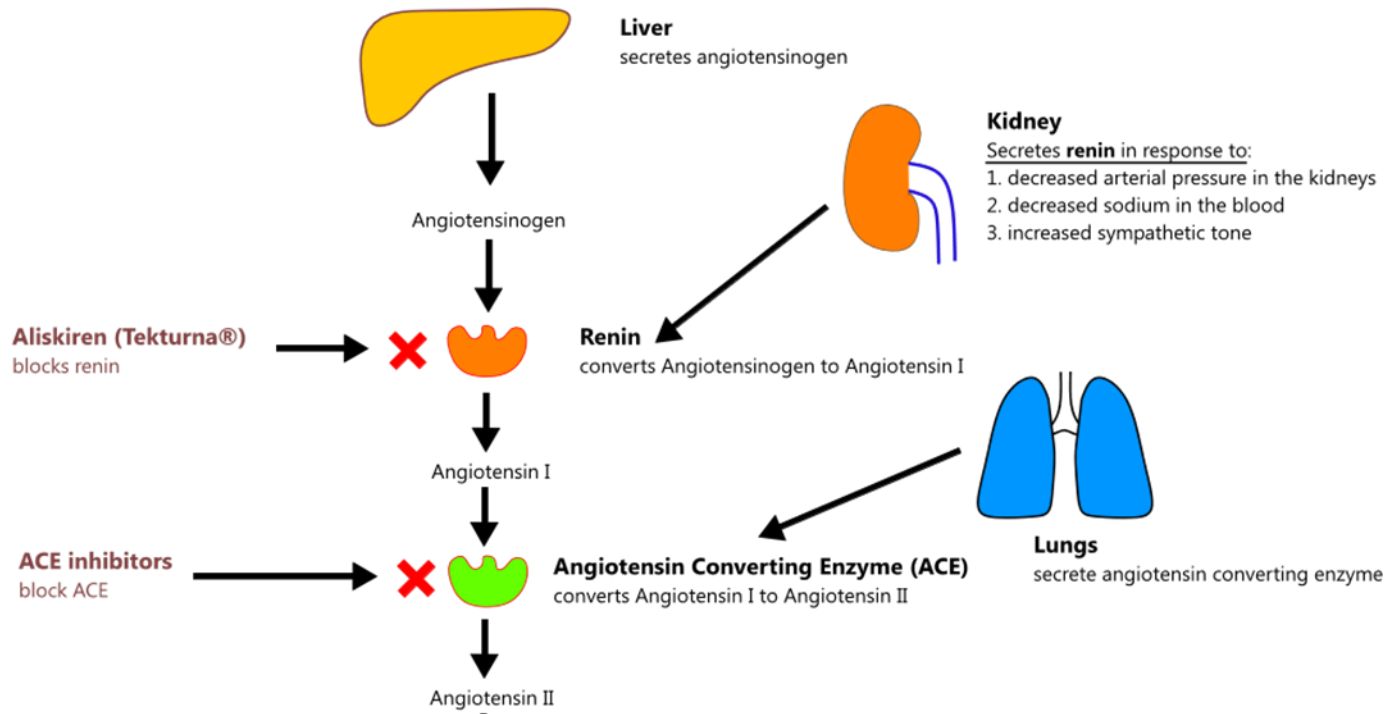
- aggravation of the disease
- sudden arrhythmic death

- heart rate  $\nearrow$
- contractility  $\nearrow$

cardiac output  $\nearrow$



# The Renin-Angiotensin-Aldosterone System (RAAS)

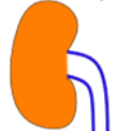


**Angiotensin II Receptor Blockers (ARBs)**  
block angiotensin II receptors


**Angiotensin II Receptors**  
located in adrenal glands, vascular smooth muscle, the heart, and the brain




Angiotensin stimulates aldosterone secretion in the adrenal glands. Aldosterone promotes sodium and fluid retention.




Angiotensin stimulates sodium and fluid retention in the kidneys



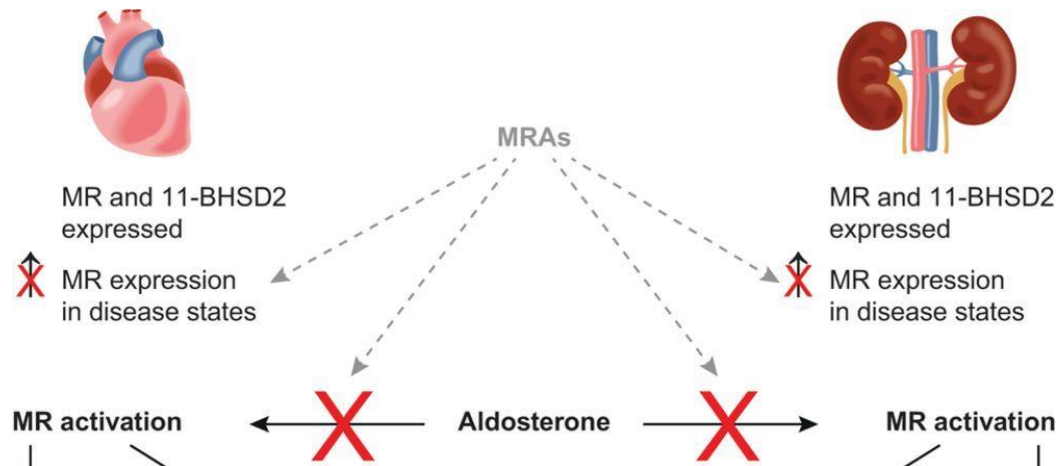
Angiotensin stimulates muscle hypertrophy and fibrosis in the heart



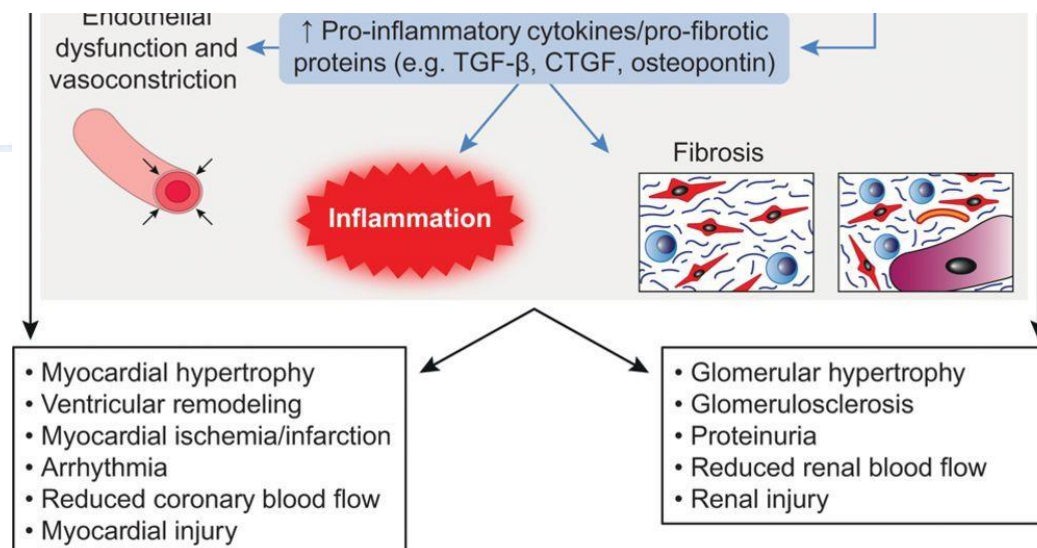
Angiotensin stimulates sympathetic outflow in the brain



Angiotensin stimulates vasoconstriction in blood vessels

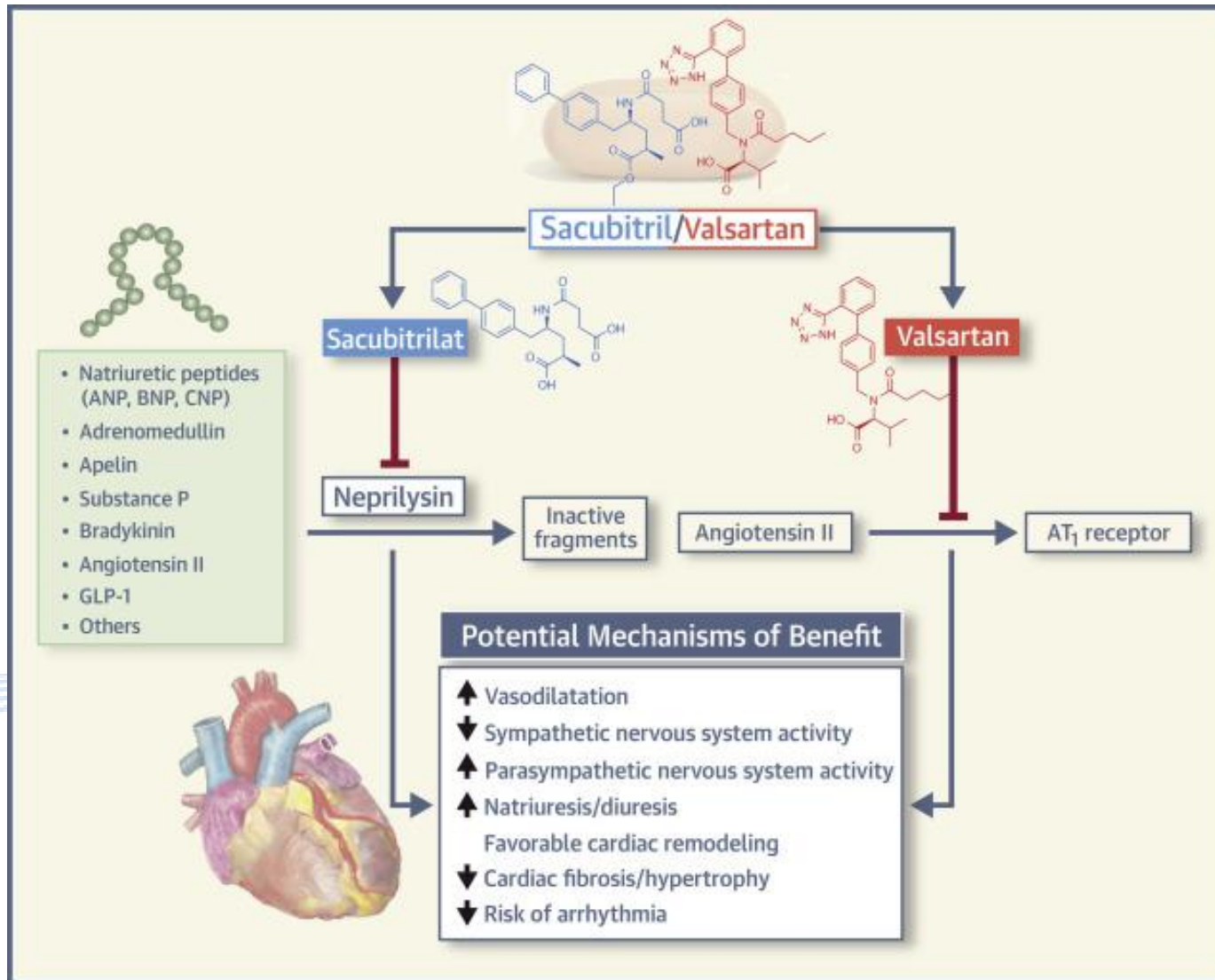


- An ARA/MRA is recommended for all patients with persisting symptoms (NYHA class II–IV) and an EF  $\leq 40\%$ , despite maximum tolerated treatment with an ACE inhibitor (or an A2RA if an ACE inhibitor is not tolerated) and a beta-blocker.
- Prior to initiating or titrating ARA/MRAs consider reducing or stopping other hypotensive causing drugs of no value in heart failure.





# Sacubitril/ Valsartan (Entresto) TA388



# When to start?

- Current NICE guidance
- Remains symptomatic despite stable first line medications
- LVEF<35%
- ACEi must be stopped 36 hours to commencing
- No wash out period is required for ARB
- Contra-indicated with hepatic impairment/ Hx angioedema, use with ACE and ARB, symptomatic hypotension, end stage renal failure  $K^+ > 5.3$
- Start 49mg/51mg twice daily
- Increase to 103mg/97mg twice daily
- Start reduced 24mg/26mg twice daily in moderate renal impairment( $eGFR < 60$ )/ SBP>100mmHg.





# When to start

- SGLT2i should be considered for all patients with heart failure who do not have any contraindications.

## Contraindications

- Type 1 diabetes
- Previous incidence of diabetic Ketoacidosis
- Restrictive cardiomyopathy, active myocarditis, pericarditis, HCM or primary valve disease
- Caution if concomitant PVD, peripheral neuropathy, lower extremity diabetic ulcers, soft tissue infection or active sepsis
- Pregnancy and breastfeeding

## Start Dapa 10mg

[https://hertsvalleysccg.nhs.uk/download\\_file/6445/389](https://hertsvalleysccg.nhs.uk/download_file/6445/389)

# Monitoring



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## Blood Pressure, Blood Chemistry and Symptoms

- Review 7- 10 days of initiation or dose titration.
- In absence of any adverse effects, continue up titration at 2-4 weekly intervals [according to BNF recommendations] until maximum or target dose reached.
- We allow for potassium up to 5.5 and creatinine 30% increase from baseline- we would always look to reduce doses not stop altogether.
- We are accepting of a BP >90 systolic if asymptomatic
- Aim for a HR of 50-60 in SR and 70-80 in AF



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# How to put this into practice?

# Case study 1. Offloading an 82 YO man following admission to hospital with decompensated HF

## **ECHO**

Left ventricular systolic dysfunction (LVSD) EF 35% (2020)

## **PmHx**

TIA, AF, MVR (2003) PPM (2011)

## **Symptoms/Assessment**

No CP, Palpitations, Dizziness, breathlessness on mild exertion, No PND or orthopnea

mobilises around the house and manage the stairs with a break half way (NYHA III)

Lower limbs: pitting oedema of both legs up to scrotum.

Chest ausc: reduced air sounds in both lower lobes.

Vital signs: HR 56BPM, BP 100/50, Sats 96%, WT 82kg (dry weight 70kg)

## Bloods

UREA, CREAT ELECTROLYTES

Sodium 138 mmol/L 133 - 146

Potassium 3.8 mmol/L 3.5 - 5.3

Urea \* 12.6 mmol/L 2.5 - 7.8

Creatinine \* 137  $\mu$ mol/L 59 - 104

eGFR result/1.73m<sup>2</sup> 43 mL/min Normal eGFR > 90 ml/min/1.73m<sup>2</sup>

.

## Meds

Warfarin, Bisoprolol 7.5mg, Simvastatin, Pantoprazole 40mg,  
Tamsulosin 400mcg, Bumetanide 2mg am and 1mg pm

Candesartan 4mg and Eplerenone 25mg (stopped in hospital due to mild AKI)

# Management plan



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- Increase Bumetanide 2mg BD
- Restart Eplerenone 25mg
- Decrease Bisoprolol to 5mg
- When would you restart Candesartan?

# Non-pharmacological advice?

- Daily weights
- Fluid restriction 1.5-2l
- Reduced salt diet
- Mobilise
- Keep feet elevated when sitting.



# Monitor 7-10 days later

## Vital Signs

HR 56, BP 110/ 50, WT 76kg, Sats 98%

## Bloods

UREA, CREAT ELECTROLYTES

Sodium 138 mmol/L 133 - 146

Potassium 4.7 mmol/L 3.5 - 5.3

Urea \* 14.4 mmol/L 2.5 - 7.8

Creatinine \* 122  $\mu$ mol/L 59 - 104

eGFR result/1.73m<sup>2</sup> 49 mL/min Normal eGFR > 90  
mL/min/1.73m<sup>2</sup>

## Case Study 2. Optimising pharmacotherapy in a 82 YO man following off loading.

12 weeks on:

- **Symptoms/Assessment**
- No CP, Palpitations, Dizziness, breathlessness on mild exertion, No PND or orthopnea
- mobilises around the house and garden finds he has more energy (NYHA II)
- Lower limbs: mild pitting oedema to ankles.
- Chest ausc: clear, good air entry through out.
- Vital signs: HR 55BPM, BP 105/55, Sats 98%, WT 72kg (dry weight 70kg)

## **Bloods**

UREA, CREAT ELECTROLYTES

Sodium 138 mmol/L 133 - 146

Potassium 4.7 mmol/L 3.5 - 5.3

Urea \* 14.4 mmol/L 2.5 - 7.8

Creatinine \* 122  $\mu\text{mol/L}$  59 - 104

eGFR result/ $1.73\text{m}^2$  49 mL/min Normal eGFR > 90 mL/min/ $1.73\text{m}^2$

LIVER FUNCTION TEST- stable

## **Meds**

Warfarin, Bisoprolol 7.5mg, Simvastatin, Pantoprazole 40mg, Tamsulosin 400mcg, Bumetanide 2mg OD, Candesartan 4mg and Eplerenone 50mg

# Management plan

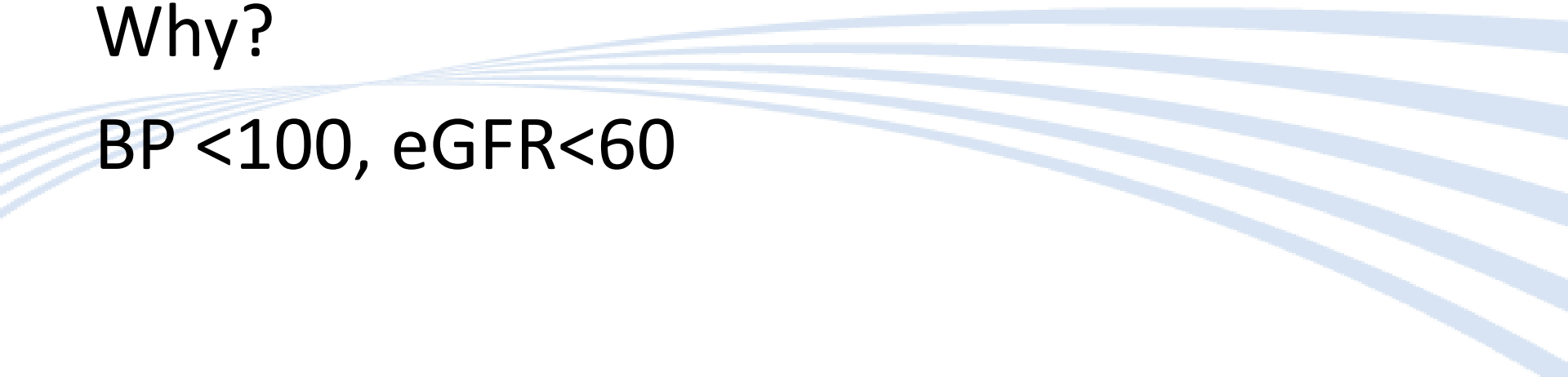
Start Entresto.

What dose?

24mg/26mg twice daily

Why?

BP <100, eGFR<60



# Monitor 7-10 days later

## Bloods

UREA, CREAT ELECTROLYTES

Sodium 138 mmol/L 133 - 146

Potassium 4.7 mmol/L 3.5 - 5.3

Urea \* 14.4 mmol/L 2.5 - 7.8

Creatinine \* 124  $\mu$ mol/L 59 - 104

eGFR result/1.73m<sup>2</sup> 48 mL/min Normal eGFR > 90  
mL/min/1.73m<sup>2</sup>

**Vital signs:** HR 58BPM, BP 105/55, Sats 98%, WT 72kg (dry weight 70kg)

- Other considerations?

## **Case study 3. Optimising pharmacotherapy in a 82 YO man following stabilisation of all 3 prognostic meds to complete the '4 pillars of HF'**

4 weeks on.

### **Symptoms/Assessment**

- No CP, Palpitations, Dizziness, breathlessness on mild exertion, No PND or orthopnea
- mobilises around the house and garden continues to have more energy (NYHA II)
- Lower limbs: mild pitting oedema to ankles.
- Chest ausc: clear, good air entry through out.
- Vital signs: HR 55BPM, BP 105/55, Sats 98%, WT 72kg (dry weight 70kg)

## Bloods

UREA, CREAT ELECTROLYTES

Sodium 134 mmol/L 133 - 146

Potassium 5.2 mmol/L 3.5 - 5.3

Urea \* 8.6 mmol/L 2.5 - 7.8


Creatinine \* 124  $\mu$ mol/L 59 - 104

eGFR result/1.73m<sup>2</sup> 47 mL/min Normal eGFR > 90  
mL/min/1.73m<sup>2</sup>

## Meds

Warfarin, Bisoprolol 7.5mg, Simvastatin 20mg, Pantoprazole 40mg, Tamsulosin 400mcg, Bumetanide 2mg, Entreso 24/26mg twice daily, Eplerenone 50mg

# Management plan

- Start Dapa
  - Dapagliflozin for it shown 32 % reduction all-cause mortality, 35% reduction in HF hospitalisation as well as affording renal protection.
  - What dose?
  - 10mg once daily
- 



# Other considerations?

- Repeat bloods- 7-10 days
- ? Reduce diuretic

## Sick day rules

- If unwell with diarrhoea/vomiting, fever/sweats/shaking.

## STOP

- Diuretics
- SGLT2i
- ACE/ARB/ARNI



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# Questions?

