



An Update in Heart Failure

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Disclosures

No financial, industry, pharma disclosures  
I am not an endocrinologist

References

Heart, Lung and Circulation 2018; 21, 1123-1208  
1445-9006/04/0356-00  
<https://doi.org/10.1016/j.hlc.2018.06.1002>

**GUIDELINES**

**National Heart Foundation of Australia and Cardiac Society of Australia and New Zealand: Guidelines for the Prevention, Detection, and Management of Heart Failure in Australia 2018**

Key Points

- Heart disease in women
- The standard of care for heart failure has recently changed
- Cardiologist are more interested in diabetes than they used to be
- There is a state heart failure service

Terminology

- HFpEF** • Heart failure with preserved ejection fraction (Diastolic Heart Failure)
- HFmrEF** • Heart failure with reduced ejection fraction (Systolic Heart Failure)
- HFmrEF** • Newer category (EF 40-50%)

Heart Disease in Women

- Ischaemia may present differently
- After myocardial infarction women have a worse heart failure syndrome
- Women are more likely to develop HFpEF
- Women are more likely to have SCAD
- Women with diabetes are at greater risk of MI than men with diabetes

**Symptoms and signs of heart failure**

**More typical symptoms**

Dyspnoea (usually with exertion)  
Orthopnoea  
Paroxysmal nocturnal dyspnoea  
Fatigue

**Less typical symptoms**

Nocturnal cough  
Wheezing  
Abdominal bloating  
Anorexia  
Confusion (elderly)  
Depression  
Palpitations  
Diastases  
Syncope  
Bradypnoea (shortness of breath when leaning forward)

**More specific signs**

Elevated jugular venous pressure  
Hepatopulmonary reflux  
Third heart sound  
Laterally displaced apex beat

**Less specific signs**

Weight gain (>2 kg/week)  
Weight loss (in advanced heart failure)  
Peripheral oedema (ankle, sacrum)  
Pulmonary crackles  
Pleural effusions  
Cardiac murmur  
Tachycardia  
Tachypnoea  
Crackles/stridor respiration  
Ascites

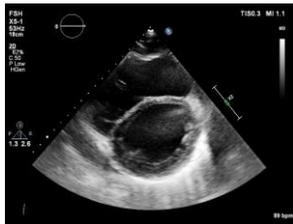
## What is Heart Failure?

A clinical syndrome with signs and symptoms that typically occur on exertion

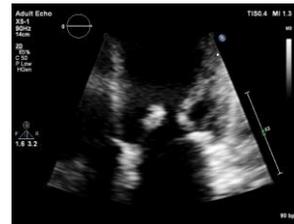
## Pathophysiology

- Heart can't pump
  - Systolic heart failure
- Heart can't fill under normal pressure
  - Diastolic heart failure
- Blood can't get through
  - Valve stenoses
- Blood goes back the wrong way
  - Valve regurgitation
- Heart is too slow

## HFrEF



## Mitral Stenosis



## Which Investigations?

**History**

- FHx (detailed)
- Substance abuse
- Timeline with NYHA class
- Multisystem questioning: RHD, chemo/radiotherapy

**Bloods**

- FBC / Ue / LFT / BNP / troponin
- TFT / Fe / B12 / Folate / (resp viruses) / (Fabry's) / ANA / ENA
- Vitamin D

**Imaging**

- ECG
- CXR
- Echocardiogram
- (CT / invasive angiogram)
- Segmental / risk factors / significant systolic dysfunction with no clear cause
- (Cardiac MRI)
- More than mild LV systolic dysfunction with no cause found and clear coronary arteries

## How to Treat Heart Failure

**Treat any underlying causes**

- Significant arrhythmias
- Significant coronary disease
- Significant valve disease
- Thyroid dysfunction
- Cease substance abuse

**Evidence base**

- HFrEF= strong
- HFpEF / HFmrEF = weak

**For All - Conservative Treatment**

- Fluid Restriction**
- Salt Restriction**
  - Dietician input
- Daily Exercise**
  - 30 minutes moderate pace walking twice a day
- Weight reduction**
  - If overweight

**HFpEF**

- BP control
- Exercise
- Healthy weight
- Avoid tachycardia
- Exclude underlying causes
  - Stress testing / angiography
  - Is there hypertrophy?
- Gentle diuresis

**HFREF - Why do we use the meds we use?**

**Renin-angiotensin-aldosterone system**

The diagram illustrates the RAAS pathway: Renin converts Angiotensinogen to Angiotensin I, which is then converted to Angiotensin II. Angiotensin II causes vasoconstriction, stimulates the release of Aldosterone, and leads to sodium retention. Aldosterone also causes sodium retention. These effects result in increased blood volume, hypertension, and cardiac hypertrophy/fibrosis.

**HFREF Management Algorithm**

**Additional treatment options for persistent HFREF:**  
 Consider device therapy if LVEF <35%. Consider beta-blocker if in sinus rhythm, LVEF <35%. Consider titration or combination of ACEi/ARB/ARNI if tolerated. Consider titration or combination of ACEi/ARB/ARNI if tolerated. Consider titration or combination of ACEi/ARB/ARNI if tolerated.

HFREF	ACEi	ARB	MRA	ARNI	LVEF	ICD	CRT
Heart failure with reduced ejection fraction	Angiotensin-converting enzyme inhibitor	Angiotensin receptor blocker	Mineralocorticoid receptor antagonist	Angiotensin receptor neprilysin inhibitor	Left ventricular ejection fraction	Implantable cardioverter defibrillator	Cardiac resynchronization therapy

Abbott Sanofi/Amgen, AstraZeneca, Boehringer Ingelheim, Bristol-Myers Squibb, Daiichi Sankyo, Gilead, Janssen, Merck, Novartis, Pfizer, Sanofi, Takeda, Teva, Vertex, Zentiva, Zovon

**Entresto (ARNI)**

**Entresto (ARNI) Mechanism:**

- RAAS Inhibition (Valsartan, RAAS<sup>2,3</sup>):**
  - Sodium and water retention
  - Vasoconstriction
  - Hypertrophy
  - Fibrosis
- Natriuretic Peptide System (NPS) Activation (Entresto):**
  - Natriuresis/diuresis
  - Aldosterone suppression
  - Vasodilation
  - Inhibition of fibrosis

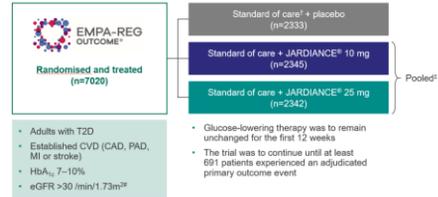
**Practical Points with Entresto**

- Not within 36 hours of ACEi
- May need to reduce diuretics when initiated
- Expect a BP drop
- Expect a GFR drop
- Start at low / mid dose and aim to double every 4 weeks

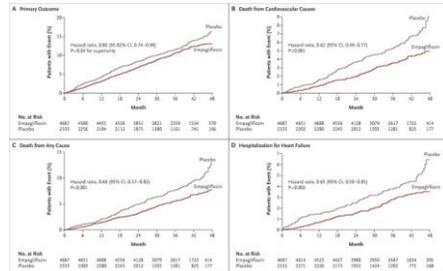
Cardiologists  
are getting  
more  
interested in  
Diabetes

- Hypoglycaemic management
  - "to reduce microvascular complications"
- No impact on CV events / survival in the landmark trials for the glucose lowering interventions
- Cardiologist more concerned with HTN and lipids

EMPA-REG OUTCOME: PATIENTS RECEIVED JARDIANCE® OR PLACEBO ON TOP OF STANDARD OF CARE FOR CV AND T2D MANAGEMENT<sup>1</sup>



JARDIANCE® IS THE ONLY ORAL T2D AGENT APPROVED TO REDUCE THE RISK OF CV DEATH<sup>1,2</sup>



**Recommendation: Sodium-glucose cotransporter 2 (SGLT2) inhibitors are recommended in patients with type 2 diabetes mellitus associated with cardiovascular disease and insufficient glycaemic control despite metformin, to decrease the risk of cardiovascular events and decrease the risk of hospitalisation for heart failure.**

(Strong recommendation FOR; high quality of evidence.)

**Recommendation: ACE inhibitors are recommended in**

Practical  
Points for  
Jardiance

- If our patient has CVD and T2DM we need to strongly consider Jardiance
- Expect a 0.7% drop in HbA1c
- BP drop
- Weight loss
- Expect a drop in eGFR (will recover to some degree after a few weeks)
- Reasons not to
  - eGFR < 45
  - HbA1c < 7%

## Prescribing Jardiance

- Must already be on at least one of metformin, SU or insulin
- Can be part of triple therapy
- Start at 10mg
- Main issue is increased risk of UTI

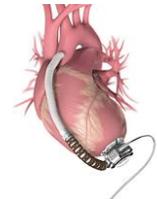
## The Future with SGLT2 inhibitors

- Is it a class effect?
- What about patients with DM without established CV disease?
- What about patients with DM and CV disease with eGFR <45
- What about patients without DM who might benefit from the physiological effects of Jardiance? Hypertensive patients? Heart failure patients

## • The State Heart Failure Unit (AHFCTS)

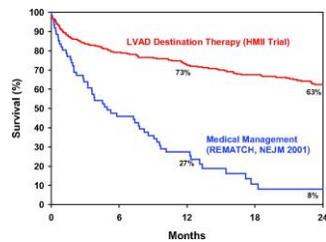
I Need Help	
Inotropes	Previous or ongoing requirement for Dobutamine, Milrinone, Dopamine or Levosimendan
NYHA Class / Natriuretic Peptides	Persisting NYHA III or IV and/or persistently high or NT-ProBNP
End-Organ Dysfunction	Worsening renal or liver dysfunction in the setting of heart failure
Ejection Fraction	Very low ejection fraction < 20%
Defibrillator Shocks	Recurrent appropriate defibrillator shocks
Hospitalizations	>1 Hospitalizations with heart failure in last 12 months
Edema / Escalating Diuretics	Persisting Fluid Overload and/or increasing diuretic requirement
Low Blood Pressure	Consistently low BP with systolic < 90-100 mm Hg
Prognostic Medication	Inability to up-titrate (or need to decrease/cease) $\beta$ -blockers, ARBs or MRAs

Fig 1. 'I Need Help' – Markers of Advanced Heart Failure

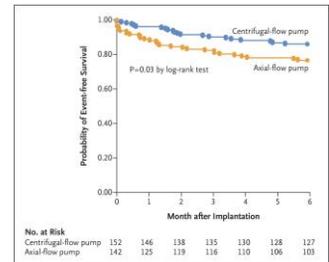


LVAD

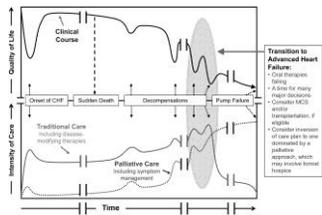
## LVAD Survival



## LVAD Survival – Momentum III trial



# Plan Ahead



Heart disease in women is common Have a high index of suspicion

The standard of care for heart failure has recently changed Consider ENTRESTO if ongoing symptoms and EF <40%

Cardiologists are more interested in diabetes than they used to be Jardiance saves lives in CVD/DM patients and may turn out to be a heart failure drug

There is a state heart failure service Feel free to refer in / discuss cases

## Key Points