Case Study 3
DECOMPENSATED CHRONIC HEART FAILURE (HFrEF)
• Mr AB, 54 year old male – blue collar worker
• Metabolic syndrome – hypertensive, dyslipidaemia and type 2 diabetic (central obesity)
• Life style & dietary management
• Presents with a 6 week history of worsening shortness of breath on exertion
• Finds great difficulty walking up 2 flights of stairs
• Body mass index – 34kg/m²
• Blood pressure – 167/98 mmHg at rest
• Pulse rate 88 beats/min
• Respiratory rate of 22 breaths/min at rest
• Bilateral Grade 3 peripheral oedema
• Raised jugular venous pressure
• Congested tender hepatomegaly
<table>
<thead>
<tr>
<th>Type of HF</th>
<th>HFrEF</th>
<th>HFmrEF</th>
<th>HFrEF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Symptoms ± Signs&lt;sup&gt;a&lt;/sup&gt;</td>
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</tr>
<tr>
<td>2</td>
<td>LVEF &lt;40%</td>
<td>LVEF 40–49%</td>
<td>LVEF ≥50%</td>
</tr>
<tr>
<td>3</td>
<td>–</td>
<td>1. Elevated levels of natriuretic peptides&lt;sup&gt;b&lt;/sup&gt;; 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).</td>
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</table>

TYPICAL SIGNS AND SYMPTOMS

Main symptoms
- Breathlessness
- Orthopnea
- Paroxysmal Nocturnal Dyspnea
- Reduced exercise tolerance
- Fatigue
- Ankle swelling

Main signs
- Elevated jugular venous pressure
- Hepato-jugular reflux
- Third heart sound
- Laterally displaced apical impulse
- Cardiac murmur
EPIDEMIOLOGY OF HEART FAILURE

ACC/AHA Staging

- **NYHA Classification**
  - IV
  - III
  - II
  - I

- **Refractory End-Stage HF**
  - 0.2 million
  - Marked symptoms at rest despite maximal medical therapy

- **Symptomatic HF**
  - 5 million
  - Known structural heart disease
  - Shortness of breath and fatigue
  - Reduced exercise tolerance

- **Asymptomatic HF**
  - 8-10 million
  - Previous MI
  - LV systolic dysfunction
  - Asymptomatic valvular disease

- **High Risk for Developing HF**
  - 50-60 million
  - Hypertension
  - CAD
  - Diabetes mellitus
  - Family history of cardiomyopathy

- **Olmsted (45+ yr)**
  - Established HF Diagnosis
  - 0.2%

- **Normals**
  - 32%
WHAT IS THE COMMONEST CAUSE OF HFReF in AFRICA?
HFrEF AETIOLOGY

MEDICAL THERAPY

Patient with symptomatica HFrEFb

Therapy with ACE-I* and beta-blocker
(Up-titratre to maximum tolerated evidence-based doses)

Still symptomatic and LVEF ≤35%

No

Yes

Add MR antagonist* (up-titrate to maximum tolerated evidence-based dose)

Still symptomatic and LVEF ≤35%

No

Yes

Able to tolerate ACEI (or ARB)†
Sinus rhythm, QRS duration ≥130 msec
Sinus rhythm, HR ≥70 bpm

ARNI to replace ACE-I
Evaluate need for CRT‡
Ivabradine

These above treatments may be combined if indicated

Resistant symptoms

No further action required
Consider reducing diuretic dose

Diuretics to relieve symptoms and signs of congestion

If LVEF ≤35% despite OMT or a history of symptomatic VT/VEF, implant ICD

Consider digoxin or H-ISDN or LVAD, or heart transplantation
6 weeks later the patient presents to your rooms for follow-up

He is in NYHA II

He has grade 1 peripheral oedema

He reports “feeling much better”

**Medication:** Metformin 850mg BD, Furosemide 40mg BD, Slow K 600mg dly, Enalapril 5mg BD, Carvedilol 6.25mg BD, Aldactone 12.5mg dly.
WHAT TO DO NEXT?
# TARGET DOSES

<table>
<thead>
<tr>
<th></th>
<th>Starting dose (mg)</th>
<th>Target dose (mg)</th>
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</thead>
<tbody>
<tr>
<td><strong>ACE-I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Captopril&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.25 t.i.d.</td>
<td>50 t.i.d.</td>
</tr>
<tr>
<td>Enalapril</td>
<td>2.5 b.i.d.</td>
<td>10–20 b.i.d.</td>
</tr>
<tr>
<td>Lisinopril&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.5–5.0 o.d.</td>
<td>20–35 o.d.</td>
</tr>
<tr>
<td>Ramipril</td>
<td>2.5 o.d.</td>
<td>10 o.d.</td>
</tr>
<tr>
<td>Trandolapril&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.5 o.d.</td>
<td>4 o.d.</td>
</tr>
<tr>
<td><strong>Beta-blockers</strong></td>
<td></td>
<td></td>
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<tr>
<td>Bisoprolol</td>
<td>1.25 o.d.</td>
<td>10 o.d.</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>3.125 b.i.d.</td>
<td>25 b.i.d.&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Metoprolol succinate (CR/XL)</td>
<td>12.5–25 o.d.</td>
<td>200 o.d.</td>
</tr>
<tr>
<td>Nebivolol&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.25 o.d.</td>
<td>10 o.d.</td>
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<tr>
<td><strong>ARBs</strong></td>
<td></td>
<td></td>
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<tr>
<td>Candesartan</td>
<td>4–8 o.d.</td>
<td>32 o.d.</td>
</tr>
<tr>
<td>Valsartan</td>
<td>40 b.i.d.</td>
<td>160 b.i.d.</td>
</tr>
<tr>
<td>Losartan(^{b,c})</td>
<td>50 o.d.</td>
<td>150 o.d.</td>
</tr>
<tr>
<td><strong>MRAAs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eplerenone</td>
<td>25 o.d.</td>
<td>50 o.d.</td>
</tr>
<tr>
<td>Spironolactone</td>
<td>25 o.d.</td>
<td>50 o.d.</td>
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<tr>
<td><strong>ARNI</strong></td>
<td></td>
<td></td>
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<tr>
<td>Sacubitril/valsartan</td>
<td>49/51 b.i.d.</td>
<td>97/103 b.i.d.</td>
</tr>
<tr>
<td><strong>If-channel blocker</strong></td>
<td></td>
<td></td>
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<tr>
<td>Ivabradine</td>
<td>5 b.i.d.</td>
<td>7.5 b.i.d.</td>
</tr>
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9 MONTHS FUP

- Mr AB admitted to hospital for worsening signs and symptoms
- On Enalapril 10mg po bd, Carvedilol 25mg po bd, Aldactone 25mg po dly, Lasix 40mg po dly, Slow K 600mg po dly and Metformin 850mg po bd.
- He reports no viral prodromal illness,
- He reports excellent compliance
- His Echocardiogram shows an EF of 38%
HFrEF NATURAL HISTORY

- Increasing frequency of acute events with disease progression leads to high rates of hospitalization and increased risk of mortality
- With each acute event, myocardial injury may contribute to progressive LV dysfunction

LV: left ventricular
ROLE FOR THE ARNI?
Figure 3. Kaplan–Meier curves for primary end point (A) and expanded composite (B), according to treatment group. (HR and corresponding P value are from the Cox model adjusted for region). CI indicates confidence interval; and HR, hazard ratio.

TAKE HOME MESSAGES

• HF is a life threatening disease!
• Prognosis is guarded with therapy!
• Adherence to guideline therapy recommendations improves outcomes – includes up-titrating to target dosage of therapy
QUESTIONS ON MANAGEMENT STRATEGIES

• How soon should you follow-up patients once a diagnosis of HF is made?
• How rapidly should you up titrate to target doses?
• When should you refer your patients for specialist care?
• What information do you tell your patients about HF?
• Which therapies are symptom relieving?
• Which therapies are life prolonging?
THANK YOU