Congestive Heart Failure
or
Heart Failure

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Ascot Cardiology Group

Heart Failure Workshop
April, 2014
Question One

What is the difference between “congestive heart failure” and “heart failure”?

1. There is no difference.
2. “Congestion” is a lay term and has no place in medical terminology.
3. I know what is congestion, and I know what is heart failure, not all persons with heart failure have congestion.
4. Cardiologists just like to confuse GPs to create the delusion of superior knowledge!
Question Two

To make the diagnosis of heart failure, the patients must have the following symptoms or signs:

1. Ankle oedema ± ascites
2. Dyspnoea with exertion
3. Orthopnoea and PND
4. Any one or more of the above
5. None of above are necessary
Question Three

In heart failure there is failure to:

1. Maintain low filling pressures
2. Maintain a normal stroke volume at rest
3. Maintain a normal ejection fraction at rest
4. Increase cardiac output satisfactorily with exercise
5. All of the above do not fail in every patient
6. Only 4 and 5
Case One
Female, aged 52 years
Could she have heart failure and if so, what could be the aetiology?

**Problems:**

- Brother was resuscitated from a community arrest, has a diagnosis of the long QT syndrome and has ICD.
- Patient does not have history of dizziness and has not had any syncope. There is no other family history of sudden cardiac death. ECG revealed sinus rhythm with automated corrected QT interval of 0.46s.
- Adult onset asthma treated with Seretide.
- Recent onset “anxiety attacks”.
- Likely to have ectopic beats, noted intermittently to have an erratic rhythm including when examined today but when had ECG was in normal sinus rhythm.
Case One
Female, aged 52 years
Could she have heart failure and if so, what could be the aetiology?

Echo:
• Rhythm- sinus. HR: 80-90 BPM.
• The left ventricle is severely dilated and spherically remodelled. LVEDD is 6.9 cm. Indexed to BSA 3.75 mm/m^2. Left ventricular function is globally severely reduced. Estimated EF is ~ 20 %. There is no thrombus. Moderate diastolic dysfunction with pseudonormal filling pattern. Moderately dilated LA.
• MV leaflets are tethered during systole secondary to LV remodelling. Moderate central MR.
• The right ventricle is normal size. The right ventricular systolic function is moderately reduced.
Case One
Female, aged 52 years
Could she have heart failure and if so, what could be the aetiology?

CT coronary angiography
Smooth coronary arteries
No plaque
Note- heart rate 45/min on high dose beta-blocker therapy at time of CTCA (tolerated beta-blocker despite diagnosis of adult onset asthma).

Aetiology of heart failure:
- Rhythm
  - Sinus
- LV
  - Reduced EF
  - Dilated, global impairment
  - Non-ischaemic
- Valves
  - Functional mitral regurgitation
Case One
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Could she have heart failure and if so, what could be the aetiology?

Holter monitor test found sinus rhythm with rate of 38 – 86bpm, mild first degree block present. Frequent multimorphic ventricular ectopy with ectopic burden of 30% Ectopics were stated to be multimorphic but on review 80% were of one morphology.

Aetiology of heart failure:
- Rhythm
  - Sinus
  - Narrow QRS
  - High ectopic burden
- LV
  - Reduced EF
- Dilated, global impairment
- Non-ischaemic
- Valves
  - Functional mitral regurgitation
Case One
Female, aged 52 years
Could she have heart failure and if so, what could be the aetiology?

Echo after drug titration
- Moderate to severe LV dilatation with LVEDD 5.8cm and with EF 20 – 25%.
- Mitral regurgitation decreased - mild.
- Pulmonary artery systolic pressure was estimated at 20mmHg plus mean right atrial pressure.

Aetiology of heart failure:
- Rhythm
  - Sinus
  - Narrow QRS
  - High ectopic burden
- LV
  - Reduced EF
    - improved
  - Dilated, global impairment
    - Non-ischaemic
- Valves
  - Functional mitral regurgitation
    - Decreased to mild.
Case One
Female, aged 52 years
Could she have heart failure and if so, what could be the aetiology?

Options
• LVEF still less than 30%
  – ICD
• Review holter monitor
  – 80% of VEs monomorphic
  – Option of focal ablation of ectopic focus
  – If LVEF improves will not require ICD

Aetiology of heart failure:
  Rhythm
  Sinus
  Narrow QRS
  High ectopic burden
  LV
  Reduced EF
  - improved
  Dilated, global impairment
  Non-ischaemic
  Valves
  Functional mitral regurgitation
  Decreased to mild.
Case Two
Male, aged 67 years
Nurse-Led Heart Failure Clinic Patient

- Non Ischaemic Cardiomyopathy with severe functional mitral regurgitation and with pulmonary hypertension.
- After drug titration only trivial MR and now normal PASP.
- LVEF improved from 20-25% to 30-35%. LV decreased in size to be within normal limits.
- Mild disease on coronary angiogram
- Previous binge drinker

Aetiology of heart failure:
Rhythm
- Sinus, narrow QRS

LV
- Reduced EF
  - Dilated, global impairment
  - Non-ischaemic

Valves
- Functional mitral regurgitation
  - Decreased from severe to trivial.
Question Four

With reference to heart failure medication:

1. It is too complex and GPs are not in a position to make any adjustments.
2. I know what is required and am confident in making changes.
3. Not only am I confident in making changes, I actually do see heart failure patients regularly for drug dose up-titration.
With reference to systolic heart failure medication:

1. All patients should be on an ACE-I (or ARB). Other drugs should only be introduced if patient is symptomatic.
2. All patients should be on an ACE-I (or ARB) and beta-blocker. Most should also be treated with spironolactone.
3. If the starting SBP is only 100mmHg, there is no hope of attaining maximum heart failure medication.
Case Two

Male, aged 67 years

Nurse-Led Heart Failure Clinic Patient
Case Two
Male, aged 67 years
Nurse-Led Heart Failure Clinic Patient

Heart Failure Clinic 15/10/13

Current Status
attended clinic again today, and seems generally well. His Frusemide was decreased to 20mg od last week, and he has no current signs or symptoms of fluid retention. He is walking 20 to 30 minutes per day without shortness of breath or chest discomfort. He continues to get some atypical chest discomfort and remains somewhat anxious about this, despite reassurance that it does not sound like angina. ECG shows lateral T inversion as previously. Awaiting coronary angiogram.

Recommendations
Carvedilol dose increased to 6.25mg bd on 15th October. Phoned Wayne on the 18th and he says he has tolerated this well.

Probable Future Recommendations for Further Investigation
Awaiting coronary angiogram.

Likely Principle Cause(s) of Heart Failure
Probable Non Ischaemic Cardiomyopathy, but ischaemia has not been ruled out – awaiting coronary angiogram. Previous binge drinker
## Case Two

**Male, aged 67 years**

**Nurse-Led Heart Failure Clinic Patient**

### Assessment for “Common Conditions” that Can Cause Heart Failure

<table>
<thead>
<tr>
<th>Condition</th>
<th>Y/N/unlikely</th>
<th>Brief description of relevant history and findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischaemic heart disease</td>
<td>U</td>
<td>Not ruled out. Awaiting angio</td>
</tr>
<tr>
<td>Valvular heart disease</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Dilated cardiomyopathy</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Other cardiomyopathy</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Hypertensive heart disease or isolated diastolic dysfunction</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Haemochromotosis</td>
<td>N</td>
<td>8/10/13: ferritin 196ug/L</td>
</tr>
</tbody>
</table>

### Assessment of severity

<table>
<thead>
<tr>
<th>NYHA Class</th>
<th>II- Mild symptoms and slight limitation during ordinary activity. Comfortable at rest.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCS Grade (angina)</td>
<td>Nil typical angina; getting atypical discomfort after meals associated with belching</td>
</tr>
</tbody>
</table>
### Assessment for Aggravating or Precipitating factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Y/N/unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial fibrillation</td>
<td>N</td>
</tr>
<tr>
<td>Anaemia</td>
<td>N</td>
</tr>
<tr>
<td>Thyrotoxicosis</td>
<td>N</td>
</tr>
<tr>
<td>Excessive salt intake</td>
<td>N</td>
</tr>
<tr>
<td>Non-compliance with medication</td>
<td>N</td>
</tr>
<tr>
<td>Any other factor which increases cardiac demand e.g. severe infection.</td>
<td>N</td>
</tr>
</tbody>
</table>

### Associated medical conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Y/N</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma/COAD</td>
<td>Y</td>
<td>COAD</td>
</tr>
<tr>
<td>Hypertension</td>
<td>?</td>
<td>Patient reports that BP previously high</td>
</tr>
<tr>
<td>Diabetes</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Dyslipidaemia</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Overweight and obesity</td>
<td>Y</td>
<td>BMI 31</td>
</tr>
<tr>
<td>OSA</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Renal Impairment</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>
### Patient knowledge

<table>
<thead>
<tr>
<th>Daily weigh</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid and intake (no more than 2g of salt per day)</td>
<td>Y</td>
</tr>
<tr>
<td>Action plan for increasing weight due to fluid retention</td>
<td>N</td>
</tr>
<tr>
<td>Understanding medication</td>
<td>Y</td>
</tr>
<tr>
<td>NZ Guidelines 2001 suggest no more than one alcoholic drink per day</td>
<td>Y</td>
</tr>
</tbody>
</table>
Case Two
Male, aged 67 years
Nurse-Led Heart Failure Clinic Patient

Summary of Investigations

CXR:
18/7/13: There is a wedge of consolidation within the right lower lobe, seen behind the heart and on the lateral film. There is also thickening of the pleural fissures bilaterally, and small pleural effusions, larger on the right side than the left. The heart size is normal, CTR equals 0.48.
11/9/13: There remains collapse/consolidation within the right middle lobe and a further focal patch of consolidation has developed at the left lung base. There are small bilateral pleural effusions. These have mildly increased in volume. Appearances are relatively non-specific and may reflect atypical pulmonary infection, or less likely congestive cardiac failure.
19/9/13: Compared to the prior x-ray on 11/09/13, the right middle and the left basal consolidation appear to have resolved with no underlying abnormality. There is a minimal trace of pleural thickening in the inferior costophrenic recesses.

17/9/13: Echo
Rhythm: Sinus. HR: 90-100 BPM. The study was technically difficult. The study was technically limited. Limited views were obtained. Moderate-severe LV dilatation. LVEDD is 6.9cm. No LVH. Regional wall motion abnormalities cannot be excluded due to limited visualization. Left ventricular function is globally severely reduced. EF is visually estimated at ~20-25%. The left ventricular apex is not well visualized. Mild-moderate RV dilatation. Moderate-severe RV systolic dysfunction. Moderate-severe PHT. Severe LA dilatation. Mild RA dilatation. Moderate-severe functional MR. Mild-moderate TR. Mild aortic root dilatation. The aortic sinus(es) of Valsalva are borderline dilated. Trivial pericardial effusion. Small left pleural effusion.

8/10/13: Six Minute Walk Test
Distance: 362m
HR: Pre 75, Post 87
Level of Fatigue: Pre 1-2, Post 1
Level of Dyspnoea: Pre 0, Post 3
**Case Two**
Male, aged 67 years
Nurse-Led Heart Failure Clinic Patient

### Current status

<table>
<thead>
<tr>
<th>Symptomatic status</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ankle swelling</td>
<td>None</td>
</tr>
<tr>
<td>SOBOE</td>
<td>None</td>
</tr>
<tr>
<td>PND</td>
<td>None</td>
</tr>
<tr>
<td>Orthopnoea</td>
<td>Sleeps with 2 pillows</td>
</tr>
<tr>
<td>Weight</td>
<td>Weight: 99kg</td>
</tr>
<tr>
<td>Angina</td>
<td>Some atypical chest discomfort</td>
</tr>
<tr>
<td><strong>Drug Allergies</strong></td>
<td>Nil known</td>
</tr>
</tbody>
</table>

### Objective assessment

<table>
<thead>
<tr>
<th>Test</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate and rhythm</td>
<td>84 regular</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>Lying: 105/60</td>
</tr>
<tr>
<td></td>
<td>Standing: 100/60</td>
</tr>
<tr>
<td>JVP</td>
<td>Does not appear elevated</td>
</tr>
<tr>
<td>Chest</td>
<td>Chest clear</td>
</tr>
<tr>
<td>Date of last CXR</td>
<td>19/9/13</td>
</tr>
<tr>
<td>Peripheral oedema</td>
<td>None</td>
</tr>
<tr>
<td>Heart sounds/murmurs</td>
<td>No murmurs heard</td>
</tr>
<tr>
<td>ECG</td>
<td>SR 75bpm</td>
</tr>
<tr>
<td>Blood tests (electrolytes, creatinine, FBC)</td>
<td>8/10/13: Na+ 138mmol/L, K+ 4.1mmol/L, creatinine 80umol/L; 17/9/13: Hb132g/L</td>
</tr>
</tbody>
</table>
**Current heart failure drug therapy and potential for optimization**

<table>
<thead>
<tr>
<th>Drug</th>
<th>8/10/13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carvedilol</td>
<td>3.125mg mane</td>
</tr>
<tr>
<td>Cilazapril</td>
<td>0.5mg bd</td>
</tr>
<tr>
<td>Frusemide</td>
<td>↓ to 20mg od</td>
</tr>
</tbody>
</table>

Vaccination against influenza in winter in high risk groups

**Non-heart failure drug therapy**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atorvastatin</td>
<td>20mg od</td>
<td></td>
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<tr>
<td>Omeprazole</td>
<td>40mg bd</td>
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</tr>
</tbody>
</table>
Case Two
Male, aged 67 years
Nurse-Led Heart Failure Clinic Patient

<table>
<thead>
<tr>
<th>Drug</th>
<th>8/10/13</th>
<th>15/10/13</th>
<th>22/10/13</th>
<th>12/11/13</th>
<th>26/11/13</th>
<th>17/12/13</th>
<th>21/1/14</th>
<th>18/2/14</th>
<th>18/3/14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carvedilol</td>
<td>3.125mg</td>
<td>↑to 6.25mg</td>
<td>6.25mg</td>
<td>↑to 12.5mg</td>
<td>12.5mg</td>
<td>12.5mg</td>
<td>12.5mg</td>
<td>18.75mg</td>
<td>18.75mg</td>
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<td>bd</td>
<td>bd</td>
<td>bd</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Cilazapril</td>
<td>0.5mg</td>
<td>0.5mg</td>
<td>↑to 1.0mg</td>
<td>1mg</td>
<td>1.5mg</td>
<td>2.5mg</td>
<td>2.5mg</td>
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<td>1.5mg</td>
<td>2mg</td>
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<tr>
<td>Frusemide</td>
<td>↓to 20mg</td>
<td>20mg</td>
<td>20mg</td>
<td>20mg</td>
<td>20mg</td>
<td>20mg</td>
<td>20mg</td>
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<td>Stop</td>
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<tr>
<td>Spironolactone</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>25 mg</td>
<td>25mg</td>
<td>25mg od</td>
</tr>
<tr>
<td>Vaccination</td>
<td></td>
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</tbody>
</table>
Heart Failure Drug Titration - ACE inhibitor

Creatinine is no more than 25% above baseline (or seek specialist opinion)

Note - during initiation of treatment an increase in creatinine up to 30% above baseline is acceptable (provided creatinine is no greater than 250 micromol/L) and should stabilise within the first two months. Consider other medications that may affect renal function.

**Increase dose:**

<table>
<thead>
<tr>
<th></th>
<th>Cilazapril</th>
<th>Lisinopril</th>
<th>Enalapril</th>
<th>Captopril</th>
<th>Quinapril</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start dose</td>
<td>0.5mg daily</td>
<td>5mg daily</td>
<td>2.5mg BD</td>
<td>6.25mg TDS</td>
<td>2.5mg BD</td>
</tr>
<tr>
<td>1(^{st}) titration</td>
<td>1mg</td>
<td>10mg</td>
<td>5mg BD</td>
<td>12.5mg TDS</td>
<td>5mg BD</td>
</tr>
<tr>
<td>2(^{nd}) titration</td>
<td>2.5mg</td>
<td>20mg</td>
<td>10mg BD</td>
<td>25mg TDS</td>
<td>7.5mg BD</td>
</tr>
<tr>
<td>3(^{rd}) titration</td>
<td>5mg</td>
<td></td>
<td></td>
<td>50mg TDS</td>
<td>10mg BD</td>
</tr>
</tbody>
</table>

Higher doses may be indicated for some patients (e.g. those with coexisting hypertension)
Heart Failure Drug Titration - Beta-blocker

**Up-titrate only if:**
- No symptomatic bradycardia
- No signs of overt congestion
- No symptomatic hypotension
  - **Note:** Patients will often have systolic blood pressure below 100 mmHg and not be symptomatic
- Euvolaemic i.e. no recent severe diuresis
- Repeat ECG every visit if first degree heart block at initiation of beta-blocker

**Increase dose:**

<table>
<thead>
<tr>
<th></th>
<th>Metoprolol</th>
<th>Carvedilol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start dose</strong></td>
<td>23.75mg daily</td>
<td>3.125mg BD</td>
</tr>
<tr>
<td><strong>1(^{st}) titration</strong></td>
<td>47.5mg daily</td>
<td>6.25mg BD</td>
</tr>
<tr>
<td><strong>2(^{nd}) titration</strong></td>
<td>95mg daily</td>
<td>12.5mg BD</td>
</tr>
<tr>
<td><strong>Target dose</strong></td>
<td>190mg daily</td>
<td>25mg BD*</td>
</tr>
</tbody>
</table>

*May increase up to 50mg BD for those over 85kg
Case Three
Male, aged 61 years

- 2006 CMR EF of 15%, focal ischaemic scar involving the anterior septum & apex
- 2007 No obstructive disease at coronary angiography

Aetiology of heart failure:
- Rhythm
- LV
  - Reduced EF
    - Dilated, global impairment
  - Non-ischaemic
- Valves
Case Three
Male, aged 61 years

Aetiology of heart failure:
- SR, wide QRS LBBB
- LV Reduced EF
- Dilated, global impairment
- Non-ischaemic

Valves
- 2006 CMR EF of 15%, focal ischaemic scar involving the anterior septum & apex
- 2007 No obstructive disease at coronary angiography
Case Three
Male, aged 61 years

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- 2007 No obstructive disease at coronary angiography

Aetiology of heart failure:
- Rhythm
  - SR, wide QRS LBBB
- LV
  - Reduced EF
  - Dilated, global impairment
- Non-ischaemic

Valves
Case Three
Male, aged 61 years
Case Three
Male, aged 61 years

- 2006 CMR EF of 15%, focal ischaemic scar involving the anterior septum & apex
- 2007 No obstructive disease angiography
- 2009 CRT-D
- 2010 Echo EF 30-35% and reduction in size of LV
- 2011 Echo EF 40-45%

Aetiology of heart failure:
Rhythm
SR, wide QRS LBBB
Status: post-CRT-D implant

LV
Reduced EF
Dilated, global impairment
Non-ischaemic

Valves
Aetiology of Heart Failure

Aetiology of heart failure:

- Rhythm
  - SR, wide QRS LBBB
  - High ectopic burden- monomorphic vs multimorphic

- LV
  - Reduced EF
    - Dilated, global impairment; non-ischaemic
  - Reduced EF
    - Ischaemic cardiomyopathy

- Valvular heart disease
Case Four
Male, 61 years

Lone AF, but moderate dilation of LA.
Successful cardioversion in May 2010, SR only maintained for short period.
Has symptoms of fatigue and exhaustion. Previous chest discomfort when walking briskly uphill.
Current smoker
Treated with simvastatin

Aetiology of heart failure:
Rhythm
AF, narrow QRS
LV
Normal LVEF
Valvular heart disease
Case Four
Male, 61 years
Case Four
Male, 61 years
Case Four
Male, 61 years

Aetiology of heart failure:
Rhythm
AF, narrow QRS
Poor rate control with exercise

LV
Normal LVEF (old study)
Not yet excluded IHD

Valvular heart disease
Aetiology of Heart Failure

Aetiology of heart failure:
  Rhythm
    AF - poor rate control
    SR, wide QRS LBBB
    High ectopic burden - monomorphic vs multimorphic
  LV
    Reduced EF
      Dilated, global impairment
      Non-ischaemic
    Reduced EF
      Ischaemic cardiomyopathy
  Valvular heart disease
Case Five
Female, aged 75 years

- History of hypertension
- June 2005 - heart failure admission

Aetiology of heart failure:

Rhythm
- AF - poor rate control
- SR, wide QRS LBBB
- High ectopic burden - monomorphic vs multimorphic

LV
- Reduced EF, dilated, global impairment, non-ischaemic
- Reduced EF, ischaemic cardiomyopathy

Valvular heart disease
Case Five
Female, aged 75 years

Question Six
Which of the following is most correct?

1. At her age, with a long history of hypertension, ischaemic heart disease is the most likely cause of heart failure.
2. Even if the echocardiogram finds normal LV systolic function, advanced coronary artery disease is the most likely cause if the ECG shows inferolateral ST sag.
3. This is likely to be a case of “flash” pulmonary oedema in a person with renal artery stenosis.
4. Even if the patient is in atrial fibrillation, this is unlikely to be the underlying cause of heart failure.
5. The diagnosis is clearly an acute interstitial lung process.
Case Five
Female, aged 75 years
Case Five
Female, aged 75 years

Diastolic function assessment
- Transmitral Doppler
- Tissue Doppler
- Pulmonary venous Doppler
Case Five
Female, aged 75 years

- History of hypertension
- June 2005- heart failure admission
- Therapy
  - Decongestive therapy
  - Treat hypertension
  - Identify precipitating and aggravating factors

Aetiology of heart failure:

- Rhythm
  - SR, no ECG LVH change but with severe LVH on echo

- LV
  - Normal LVEF
  - Severe LV diastolic dysfunction

- Valves
  - Nil significant valvular disease
Aetiology of Heart Failure

Aetiology of heart failure:

Rhythm
- AF - poor rate control
- SR, wide QRS LBBB
- High ectopic burden - monomorphic vs multimorphic

LV
- Reduced EF, dilated, global impairment, non-ischaemic
- Reduced EF, ischaemic cardiomyopathy
- Normal EF, significant diastolic dysfunction

Valvular heart disease

Aggravating Factors
- NSAID and steroid use; non-compliance with drugs or fluid restriction; AF; anaemia
## Case Two
Nurse-Led Heart Failure Clinic + GP assistance

<table>
<thead>
<tr>
<th>Current heart failure drug therapy and potential for optimization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drug</strong></td>
</tr>
<tr>
<td>Carvedilol</td>
</tr>
<tr>
<td>Cilazapril</td>
</tr>
<tr>
<td>Frusemide</td>
</tr>
<tr>
<td>Spironolactone</td>
</tr>
<tr>
<td>Vaccination against influenza in</td>
</tr>
</tbody>
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