The National Heart Failure Audit 2010/2011

Project Steering Group;
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General Progress-April 2010-March 2011

85% NHS Trusts submitting data (133/156)

36,504 admissions

70% increase from last year

54% of HES discharges with HF in first position
  58% England
  8% Wales

Now >80,000 admissions recorded since 2006/7

36 mandatory fields
  Missing data<5% of diagnostic tests and treatments
**Demographics 2010-11**

Men admitted 5 years earlier than women, mean age for all 77.3, 74.9 (M) and 80.2 (F), p<0.001

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Number of Patients (M)</th>
<th>Number of Patients (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-44</td>
<td>443</td>
<td>208</td>
</tr>
<tr>
<td>45-54</td>
<td>848</td>
<td>333</td>
</tr>
<tr>
<td>55-64</td>
<td>1,999</td>
<td>788</td>
</tr>
<tr>
<td>65-74</td>
<td>3,834</td>
<td>2,026</td>
</tr>
<tr>
<td>75-84</td>
<td>5,850</td>
<td>4,777</td>
</tr>
<tr>
<td>85+</td>
<td>5,318</td>
<td>3,837</td>
</tr>
</tbody>
</table>

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**KING'S HEALTH PARTNERS**
Social Deprivation and HF Admission

<table>
<thead>
<tr>
<th>Deprivation group</th>
<th>Mean age at first admission (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = most affluent</td>
<td>78.9</td>
</tr>
<tr>
<td>2</td>
<td>78.8</td>
</tr>
<tr>
<td>3</td>
<td>77.8</td>
</tr>
<tr>
<td>4</td>
<td>76.4</td>
</tr>
<tr>
<td>5 = most deprived</td>
<td>74.0</td>
</tr>
</tbody>
</table>
Diagnosis

82% of patients (n=24,753) had access gold standard diagnostic e.g echo
Cardiology -50%
General medical- 41%
Other wards -9%

56% (n= 16,872) had LVSD

More men (64%) than women (37%) had LVSD
More women had LV hypertrophy (54%), Valve disease (60%) and “diastolic dysfunction” (56%).
**Symptoms**

Breathlessness at rest - 29% of patients
Severely limited exercise capacity - 39%
Moderate or severe oedema - 43%

almost identical to the previous year’s data.

**On readmission**

Breathlessness - 33%
Severely limited exercise capacity - 41%
Moderate or severe oedema - 49%
### Aetiology and Comorbidity

**TABLE 2: PREVIOUS MEDICAL HISTORY AND LEFT VENTRICULAR SYSTOLIC DYSFUNCTION**

<table>
<thead>
<tr>
<th>Condition</th>
<th>LVSD (%)</th>
<th>no LVSD (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischaemic heart disease</td>
<td>52</td>
<td>38</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>36</td>
<td>40</td>
<td>p=0.001</td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>37</td>
<td>21</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Valvular heart disease</td>
<td>18</td>
<td>11</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Hypertension</td>
<td>51</td>
<td>56</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Renal impairment</td>
<td>4</td>
<td>15</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Diabetes</td>
<td>28</td>
<td>30</td>
<td>not significant</td>
</tr>
</tbody>
</table>
Place of Care

Cardiology wards (n= 13,454; 45%)
General medical wards (n=13,669; 45%)

Cardiology were more often men (62%), younger age groups (74 and under)

Consistent findings over the last three years.
### Treatment

<table>
<thead>
<tr>
<th>Drug</th>
<th>Total %</th>
<th>Cardiology</th>
<th>Gen Med</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop</td>
<td>86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACEI</td>
<td>68</td>
<td>59</td>
<td>34</td>
</tr>
<tr>
<td>ARB</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE/ARB</td>
<td>81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BB</td>
<td>65</td>
<td>62</td>
<td>31</td>
</tr>
<tr>
<td>ARA</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiazide</td>
<td>4.3</td>
<td>62</td>
<td>30</td>
</tr>
</tbody>
</table>

ACEI/BB/ARA more likely to be prescribed to men, and younger age (p<0.001)
Treatment

% of patients key heart failure drugs

Age Group

18-44 45-54 55-64 65-74 75-84 85+

ACEi
BB
Loop Diuretic
ARA
Monitoring

47% - referred to HF specialist services (n=11670).
   62% (n=7,243) men.

Cardiology wards - 58%
General Medicine - 37%

64% <45 - HF liaison services.
37% > 85 age group

Pattern is similar to last year, access rates for older age groups have improved slightly.
Readmissions

6802 (20%) readmitted during the year.
Median number = 1, up to 13
Length of Stay

Mean LOS- 11 days
Median LOS- 9 days
Both comparable with HES.

The mean LOS was similar in cardiology and other wards and for both men and women.

Difference between age groups.

Readmission:
Mean LOS- 13 days
- Cardiology (14 days) and general medicine wards (12 days) and other wards (13 days).
- No difference between men and women but longer LOS for older age groups.
Mean Length of Stay

Hospitals (n=176)

length of stay (mean) in days
Mortality

Validated life status - 27,850 (2010/11 audit time period)

33.1% (9,223) patients died during or after a hospitalisation
32.0 % for men and 34.4% for women)

The median follow up time was 237 days for all, and 306 for survivors

Mortality or readmission=51%
In Hospital Mortality

11.6 % (10.6 % for men and 12.8 % for women: p<0.001)

Significantly lower for those admitted:

- Cardiology ward (8%)
- General medical (14%)
- Other ward (17%)

p<0.001
## Post Discharge Survival
### Cox Proportional Hazards Model

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Hazard Ratio (HR)</th>
<th>Range of HR</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous MI</td>
<td>1.3</td>
<td>1.2-1.3</td>
<td>p&lt;0.0001</td>
</tr>
<tr>
<td>Age at admission</td>
<td></td>
<td></td>
<td>p&lt;0.0001</td>
</tr>
<tr>
<td>Male sex</td>
<td>1.2</td>
<td>1.1-1.3</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>NYHA class III or IV</td>
<td>1.4</td>
<td>1.1-1.6</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>No ACEI therapy</td>
<td>1.4</td>
<td>1.3-1.6</td>
<td>p&lt;0.0001</td>
</tr>
<tr>
<td>No beta blocker therapy</td>
<td>1.5</td>
<td>1.3-1.6</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Loop diuretic therapy</td>
<td>1.2</td>
<td>1.0-1.3</td>
<td>p&lt;0.04</td>
</tr>
<tr>
<td>No cardiology follow-up</td>
<td>1.5</td>
<td>1.4-1.6</td>
<td>p&lt;0.001</td>
</tr>
</tbody>
</table>
In Hospital Death
Multiple Logistic Regression Model

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Hazard Ratio (HR)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous MI</td>
<td>1.3</td>
<td>p=0.006</td>
</tr>
<tr>
<td>Age at admission</td>
<td></td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Moderate oedema</td>
<td>2.1</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>NYHA class III or IV</td>
<td>1.6</td>
<td>p=0.03</td>
</tr>
<tr>
<td>No ACEI therapy</td>
<td>1.6</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>No beta blocker therapy</td>
<td>2.8</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>LV Systolic Dysfunction</td>
<td>1.3</td>
<td>p=0.02</td>
</tr>
<tr>
<td>Not admitted to a Cardiology ward</td>
<td>1.3</td>
<td>p=0.006</td>
</tr>
</tbody>
</table>
Mortality post discharge-Kaplan Meier by Age and Sex

Kaplan Meier Survival for All Discharges by Age Cut Point of 70 Years

- <70 years
- ≥70 years

Kaplan Meier Survival for all Discharges with Heart Failure by Sex

- Female
- Male
LVSD or not..
Drugs, Drugs, Drugs……

Post Discharge Survival by ACE inhibitor use in those with LVSD

[Graph showing survival rates with and without ACE inhibitors]

Post Discharge Survival by Beta-Blocker Use for those with LVSD

[Graph showing survival rates with and without beta-blockers]
Dose Matters…

Kaplan Meier Survival for Discharges by Ramipril Dose at Discharge

- Ramipril > 5mg
- Ramipril <= 5mg

N=10,272
P<0.001
For Beta Blockers as well...

Kaplan Meier Survival from Discharge by Bisoprolol Dose

Bisoprolol ≥ 5mg

Bisoprolol < 5mg

11,682
P < 0.001
Log rank 33
More is less..

Post Discharge Survival by Number of Disease Modifying Drugs for Those with LVSD

ACEI/ARB +BB+ MRA
ACEI/ARB +BB
ACEI/ARB
No DRUGS

Log Rank 500!
P<0.00000…
Less Loop....
Post Discharge Mortality

Kaplan Meier Survival by Admission Ward

Cum Survival

Time in Days

Cardiology

GIM

KING'S HEALTH PARTNERS
Survival and Follow Up

Kaplan Meier Survival for All Discharges With Heart Failure According to Cardiology Follow Up Status

Kaplan Meier Survival for all Discharges With Heart Failure According to Heart Failure Nurse Follow Up
In Hospital Mortality (%)
National HF Audit

No change in mortality

Very robust data

Larger than earlier comparators
  HCC (9398), EHFSII (3580), OPTIMISE-HF (48, 612)

Access to specialist cardiology care improves outcomes
  The rest follows, drugs, specialist FU etc

BCS progress
  Cardiac Care units

Use the time in hospital well
  ACEI, BB, MRAs.....
The future for the audit..

- aim for >90% participation by 2012.
- aim to acquire data on >70% of all patients with a primary discharge diagnosis of HF.
- modest expansion of the minimal dataset so that use of key interventions (e.g. CRT devices) and attainment of key targets (e.g. heart rate) can be assessed.
- better risk stratification, so that outcomes across institutions can be more easily compared. Also, this would allow NICE quality standards to be more readily assessed.
HF Audit and Research

Academic group

Encourage Applications for use of data

Developing an interactive guidelines tool to improve outcomes
Thank You.....

All participants

Implementation Group
   J Austin, J Grange, H Pryse-Hawkins and G Baldock-Apps

NHS IC-Tracy Whittaker, Nadeem Fazal, Marion Standing, Lynne Walker

HQIP, Helen Laing
The national heart failure audit for England and Wales 2008–2009

John G F Coland,1 Theresa McDonagh,2 Alan S Rigby,3 Ashraf Yassir,1 Tracy Whittaker,1 Henry J Dargie,1 on behalf of the National Heart Failure Audit Team for England and Wales