Acute Heart Failure 2017
Acute Heart Failure 2017

- Heart Failure Definitions
  - HFrEF, HFmrEF, EFpEF

- Acute Decompensated Heart Failure
  - De Novo presentation
  - Decompensation of Chronic Heart Failure

- Longer Term Mortality Reduction
How frequently do you see a Heart Failure Presentation on your medical intake in 2017?

- 1:2 patients
- 1:5 patients
- 1:10 patients
- 1:20 patients
- 1:30 patients
Of Those Heart Failure Presentation on your medical intake, what proportion are first presentations?

- 10%
- 20%
- 30% patients
- 50% patients
- >50% patients
From those of you who are not cardiologists, would you be responsible for the management of these patients beyond the first 24 hours?

- YES
- NO
Epidemiology

- Most frequent cause of acute hospitalisation in over 60’s
- 5% of all medical admissions
- Mean stay 10-12 days
- 50% readmitted within 6 months
- Prognosis worse than for all common cancers except lung cancer
<table>
<thead>
<tr>
<th>Classification of AHF %</th>
<th>All</th>
<th>De novo AHF</th>
<th>ADCHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decompensated HF</td>
<td>65.4</td>
<td>52.4</td>
<td>73.0***</td>
</tr>
<tr>
<td>Pulmonary oedema</td>
<td>16.2</td>
<td>26.0</td>
<td>10.4***</td>
</tr>
<tr>
<td>Cardiogenic shock</td>
<td>3.9</td>
<td>6.8</td>
<td>2.2***</td>
</tr>
<tr>
<td>Hypertensive HF</td>
<td>11.4</td>
<td>11.4</td>
<td>11.3</td>
</tr>
<tr>
<td>Right HF</td>
<td>3.2</td>
<td>3.4</td>
<td>3.0</td>
</tr>
</tbody>
</table>
Five-Year Survival Post Hospitalisation

**Women**

- Breast
- MI
- Bowel
- Ovarian
- Heart Failure
- Lung

**Men**

- MI
- Bladder
- Prostate
- Bowel
- Heart Failure
- Lung

Month of follow-up

Survival (%)
Prognosis

The physician who cannot inform his patient what would be the probable issue of his complaint [...] is not qualified to prescribe any rational treatment for its cure.

### Definition of the Type of HF

<table>
<thead>
<tr>
<th>Type</th>
<th>Criteria</th>
</tr>
</thead>
</table>
| **HFrEF**     | 1) Symptoms ± signs  
                2) LVEF < 40%                                                              |
| **HFmrEF**    | 1) Symptoms ± signs  
                2) LVEF 40% to 49%  
                3) Elevated levels of natriuretic peptides  
                                    - At least one additional criterion:  
                                      - Relevant structural heart disease (LVH and/or LAE)  
                                      - Diastolic dysfunction |
| **HFpEF**     | 1) Symptoms ± signs  
                2) LVEF ≥ 50%  
                3) Elevated levels of natriuretic peptides  
                                    - At least one additional criterion:  
                                      - Relevant structural heart disease (LVH and/or LAE)  
                                      - Diastolic dysfunction |

## Treatment of HFpEF/HFmrEF

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
<th>Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is recommended to screen patients with HFpEF or HFmrEF for both cardiovascular and non-cardiovascular comorbidities, which, if present, should be treated provided safe and effective interventions exist to improve symptoms, well-being and/or prognosis.</td>
<td>I</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Diuretics are recommended in congested patients with HFpEF or HFmrEF in order to alleviate symptoms and signs.</td>
<td>I</td>
<td>B</td>
<td>178, 179</td>
</tr>
</tbody>
</table>
Helsinki-Zurich AHF Study (n=312)

All-cause mortality

- In-hospital: 8%
- 30-days: 11%
- 12-weeks: 18%
- 12 months: 29%

- 14% ICU vs 8.4% no ICU
- 21% TnT >0.1 vs 7% TnT <0.1
Helsinki-Zurich AHF Study

Survival in patients with AHF

Rudiger A. at al Eur J Heart Fail 2005 Jun;7(4):662-70
AHFS: Prognostic Value of Tn T

Perna ER et al. AM Heart J. 2002;143:814
EuroHeart Failure Survey II

Alertness and Mortality

DIED
SURVIVOR

Somnolent Confused

Unpublished data ESC 2005 Stockholm
EuroHeart Failure Survey II

Classification of AHF and Mortality

- PulmEdema
- CardioShock
- HypertensiveHF
- RightHF

DIED
SURVIVOR

Unpublished data ESC 2005 Stockholm
«Perhaps it is more important to know what kind of patient has the disease, than what kind of disease has the patient»

William Osler, MD
Risk Factors

- De Novo AHF
- ACS as a cause of HF
- Renal Failure
- Age
- Weight
- Confined to bed, Cold Periphery, Not Alert,
- Positive Troponin, CK-MB
## Risk of in Hospital Mortality

<table>
<thead>
<tr>
<th>Age</th>
<th>Alertness</th>
<th>ACS</th>
<th>Cold periphery</th>
<th>Risk of in Hospital Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>2%</td>
</tr>
<tr>
<td>70</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>6.3%</td>
</tr>
<tr>
<td>&gt;75</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>37%</td>
</tr>
</tbody>
</table>

Statistical Analysis by M. Hochadel
Acute Management
# Short- and long-term outcomes in the SURVIVE trial

<table>
<thead>
<tr>
<th>End point</th>
<th>Levosimendan, n=664</th>
<th>Dobutamine, n=663</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyspnea at 24 h, &gt;mild improvement (%)</td>
<td>82</td>
<td>83</td>
<td>0.96</td>
</tr>
<tr>
<td>All-cause mortality at 31 days (%)</td>
<td>12</td>
<td>14</td>
<td>0.29</td>
</tr>
<tr>
<td>All-cause mortality at 180 days (%)*</td>
<td>26</td>
<td>28</td>
<td>0.40</td>
</tr>
<tr>
<td>Cardiovascular mortality at 180 days (%)</td>
<td>24</td>
<td>26</td>
<td>0.33</td>
</tr>
<tr>
<td>Mean out-of-hospital days alive at 180 days</td>
<td>120.2</td>
<td>116.6</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Acute Heart Failure

- Serelaxin
- Bioengineered relaxin 2
- RELAX-AHF-2
- n=6600
- 48hr IV Serelaxin vs. placebo
- No difference in mortality/worsening HF

- Ultratide
- Analogue of Urodilatin
- TRUE-HF
- n=2157
- 48hr IV Ultratide vs placebo
- Less HF events first 48hr but no other no net benefit at 120hr, 30d and Fup (median 27/12)
Jugular Venous Pressure

Top of Jugular Vein

Vertical distance above angle of Louis

Right Atrium

JVP = 2 + 5
= 7 cm of water

angle of Louis

5 cm
CONGESTION

- A
  dry-warm
  \(N=123\)

+ B
  wet-warm
  \(N=222\)

ADEQUATE PERFUSION

\[\begin{array}{c|c}
\text{dry-cold} & \text{L} \\
(N=16) & \text{C} \\
& \text{wet-cold} \\
(N=91) & \\
\end{array}\]

LW Stevenson et al JACC 2003
CONGESTION

<table>
<thead>
<tr>
<th>A</th>
<th>--</th>
<th>dry-warm (N=123)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>+</td>
<td>wet-warm (N=222)</td>
</tr>
</tbody>
</table>

Diuretics

iv Nitrates
ACE/ARB
B-blockers

LW Stevenson et al JACC 2003
Figure 1. Kaplan-Meier survival estimates for loop diuretic dose quartiles in patients with advanced systolic HF over 2-year follow-up.
• CAD is the main background illness in 60%
• Diabetes is frequent in 32% and
• COPD prevalent in 19%,
• Renal disease in 17%,
• Anemia in 10%
Stabilised Acute Phase

CONSENSUS 10-year follow-up
All randomised patients, original and follow-up

Mortality

Year

p=0.008

Placebo
Enalapril

Swedberg et al, EHJ 1999
Mortality by treatment

Probability of Event

- Captopril
- Valsartan
- Valsartan + Captopril

Valsartan vs Captopril: HR = 1.00; P = 0.982
Valsartan + Captopril vs Captopril: HR = 0.98; P = 0.726

Months 0 6 12 18 24 30 36
Captopril 4909 4428 4241 4018 2636 1432 364
Valsartan 4909 4464 4272 4007 2648 1437 357
Valsartan + Cap 4885 4414 4266 3994 2648 1435 382

Total mortality
6642 pts with AMI, LVEF <40%, Rales, Standard Therapy

Cumulative incidence (%)

- Placebo
- Eplerenone

RR = 0.85 (95% CI, 0.75-0.96)
p=0.008

Months since randomisation

<table>
<thead>
<tr>
<th></th>
<th>Placebo</th>
<th>3313</th>
<th>3064</th>
<th>2983</th>
<th>2830</th>
<th>2418</th>
<th>1801</th>
<th>1213</th>
<th>709</th>
<th>323</th>
<th>99</th>
<th>2</th>
<th>0</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eplerenone</td>
<td>3319</td>
<td>3125</td>
<td>3044</td>
<td>2896</td>
<td>2463</td>
<td>1857</td>
<td>1260</td>
<td>728</td>
<td>336</td>
<td>110</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Pitt et al, NEJM 2003
Current Treatments Dramatically Reduced Mortality


Percentage death @ 1 year

Placebo group
Active treatment group

McMurray Heart 1999; 82(suppl 4): IV14-22
CIBIS III Trial

Primary endpoint

Per-protocol (PP)

Mean follow-up 1.25 years

B/E vs E/B
HR 0.97 (95% CI 0.78-1.21)
non-inferiority P=0.046

Intention-to-treat (ITT)

B/E vs E/B
HR 0.94 (95% CI 0.77-1.16)
non-inferiority P=0.019

DOI: 10.1161/CIRCULATIONAHA.105.582320
Primary composite endpoint

Ivabradine n=793 (14.5%PY) Placebo n=937 (17.7%PY)

HR = 0.82  p<0.0001

Cumulative frequency (%)


www.shift-study.com
Hospitalization for heart failure

Ivabradine n=514 (9.4%PY) Placebo n=672 (12.7%PY)

Cumulative frequency (%)

HR = 0.74  \( p<0.0001 \)

- 26%


www.shift-study.com
Entresto or Sacubitril/ Valsartan combination
Entresto or Sacubitril/Valsartan combination

A Primary End Point

Hazard ratio, 0.80 (95% CI, 0.73–0.87)
P<0.001

Cumulative Probability

Days since Randomization

No. at Risk
LCZ696  4187  3922  3663  3018  2257  1544  896  249
Enalapril  4212  3883  3579  2922  2123  1488  853  236
NICOR National Heart Failure Audit 2011-12

![Graph showing survival rates over days after discharge and a table summarizing patient outcomes by place of care.]

<table>
<thead>
<tr>
<th>Place of care</th>
<th>Total number of patients</th>
<th>Total number deceased</th>
<th>Percentage deceased</th>
<th>Median follow-up period (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiology</td>
<td>13463</td>
<td>2944</td>
<td>22%</td>
<td>242</td>
</tr>
<tr>
<td>General Medicine</td>
<td>11100</td>
<td>3308</td>
<td>30%</td>
<td>225</td>
</tr>
<tr>
<td>Other</td>
<td>2734</td>
<td>914</td>
<td>33%</td>
<td>215</td>
</tr>
</tbody>
</table>
Non-drug Strategies
Left bundle branch block
Implantable cardioverter defibrillators and cardiac resynchronisation therapy for arrhythmias and heart failure (review of TA95 and TA120)

Issued: June 2014

NICE technology appraisal guidance 314
guidance.nice.org.uk/ta314
<table>
<thead>
<tr>
<th>QRS interval</th>
<th>NYHA class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>&lt;120 milliseconds</td>
<td>ICD if there is a high risk of sudden cardiac death</td>
</tr>
<tr>
<td>120–149 milliseconds without LBBB</td>
<td>ICD</td>
</tr>
<tr>
<td>120–149 milliseconds with LBBB</td>
<td>ICD</td>
</tr>
<tr>
<td>≥150 milliseconds with or without LBBB</td>
<td>CRT-D</td>
</tr>
</tbody>
</table>

LBBB, left bundle branch block; NYHA, New York Heart Association
Cardiac Venous Anatomy
Δ = + 23 %

p = 0.0001
Δ = -32%  
\( p = 0.0001 \)
HR 0.64 (95% CI 0.48 to 0.85)

P = .0019

Also 52% reduction in the rate of hospitalisation for worsening heart failure

Number-Needed-to-Treat (NNT) to Save One Life


MADIT II (3 year)
 Incremental Cost per Life-Year Saved

MADIT (2.4 year)
 AVID (3 year)
 SCDHeFT (5 year)
 SAVE (3.5 year)
 Merit-HF (1 year)
 4S (6 year)

4 11 9 14 20 26 28
Heart Failure 2017

From: Survival following a diagnosis of heart failure in primary care
Heart Failure 2017

European Journal of Heart Failure
Volume 17, Issue 3, pages 242-247, 9 MAR 2015 DOI: 10.1002/ejhf.250
Conclusions

• De Novo presenting heart failure patients have a much higher early mortality than chronic heart failure admissions
• Risk stratification once again guides therapy
• Over use of loop diuretics will prevent the utilisation of prognostically important therapies
Questions?