Current Management Strategies for Heart Failure

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More malignant than cancer?

Survival vs. Month of follow-up for different conditions among men. The graph shows survival rates for MI, Bladder, Prostate, Bowel, and Heart Failure, with Heart Failure having the lowest survival rate.
Current Management Strategies for Heart Failure

CURRENT BEST PRACTICE
ACEI - CONSENSUS

Placebo N = 126
Enalapril N = 127

Why research matters

**N Engl J Med 2001;344:1651**

- Survival over months for placebo and carvedilol groups. P=0.00013
- Survival over months for placebo and carvedilol groups. P=0.0014 (adjusted)

**Eur Heart J 1999;20:136**

- Mortality over years for placebo and enalapril groups. Average life increment 260 days (up 50% from 521 to 781 days)

**N Engl J Med 1999;341:709**

- Survival over months for placebo and spironolactone groups.


- Survival over months for CRT and no CRT groups. P<0.002
Pharmacology

Effect of triple therapy (ACEi, βB, aldo antag)

Lives Saved per 1000 over 2 years

NYHA

I

II

153

III/IV

452

OMT

OMT

Dead

Effect of OMT

Alive

J Am Coll Cardiol 2003;42:1234-7
Drug difficulties

• 72 year old ♂
• LVEF 20% (IHD)
• NYHA II (6 MWT – 410 m)

• Enalapril 5mg  bd; BP 106/72
• Enalapril 10mg bd; BP 98/64
Drug difficulties

<table>
<thead>
<tr>
<th>Drug</th>
<th>Diastolic</th>
<th>Systolic</th>
<th>Creatinine (mg/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enalapril (mg/bd)</td>
<td>5</td>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td>Carvedilol (mg/bd)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Eplerenone (mg/d)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
Drug difficulties

• Symptomatic hypotension
  – Maximise ACEi, then add β blocker?
  – Maximise β blocker, then add ACEi?

• A little bit of everything is better than a lot of something.

• Don’t worry about BP
Current Management Strategies for Heart Failure

BEST PRACTICE INCLUDES ...
LBBB

- Prevalence
- Incidence
- BiV pacing?

- Perhaps 1/3 of patients have LBBB (564/1612 - 35% - in Hull)
- Incidence is 11% PA
- Of 835 survivors at one year in Hull
  - 36.3% had QRS>119mSec at baseline
  - 39.5% had QRS>119mSec at 1 year

Eur J Heart Fail 2008;10:696-702
LBBB
Effect of cumulative therapy

Data from IMPROVE-HF registry

Nested case-control study
1376 cases and 2752 propensity-matched controls
Age 72; 72% ♂
LVEF 25%

J Am Heart Assoc 2012;1:16
Angiotensinogen → Renin → Ang I → Ang II → AT₁, AT₂ → Aldosterone

NEP → (breakdown products) → ANP, BNP

ACE → (breakdown products) → kinins

ACE → Ang I → kinins

ACE → Ang II → AT₁, AT₂ → Aldosterone

LCZ696 → sacubitril → valsartan
PARADIGM-HF

A Primary End Point

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

P < 0.001

B Death from Cardiovascular Causes

Hazard ratio, 0.80 (95% CI, 0.71–0.89)

P < 0.001

C Hospitalization for Heart Failure

Hazard ratio, 0.79 (95% CI, 0.71–0.89)

P < 0.001

D Death from Any Cause

Hazard ratio, 0.84 (95% CI, 0.76–0.93)

P < 0.001

No. at Risk

<table>
<thead>
<tr>
<th>Group</th>
<th>Days since Randomization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
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<tr>
<td>LCZ696</td>
<td>4187</td>
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<tr>
<td>Enalapril</td>
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</table>

Current Management Strategies for Heart Failure

REHABILITATION
Reduced physical activity is critical in the care of patients with heart failure throughout their entire course

E Braunwald. Heart Disease, 3rd Edition 1988
Rest in CHF

- 10 patients with ischaemic heart failure
- Bed rest for 46-552 days (ave 328)
- 4 decreased heart size
- 3 dead in hospital
- 3 dead within 4 months of leaving hospital

Chest 1971;60:423
Training in CHF

Exercise time

Heart rate variability

Coats. *Circulation* 1992;85:2119
Well-being
Exercise capacity
Anaerobic threshold
Cardiac output
Leg muscle bulk
Muscle metabolism
Leg AV $O_2$
Ventilatory response $\downarrow$
Sympathovagal $\downarrow$
HF-ACTION

• N=2331
• NYHA II-IV
• LVEF≤35%
• Randomised to:
  – exercise program focused on increasing workout intensity and duration
    • 36 supervised 30 minute sessions three times per week.
      Then home exercise five times per week at moderate intensity for 40 minutes
  – usual care - exercise was simply encouraged

*JAMA* 2009;**301**:1439-1450
HF-ACTION

All-Cause Mortality or All-Cause Hospitalization

HR, 0.93 (95% CI, 0.84-1.02); P = .13
Adjusted HR, 0.89 (95% CI, 0.81-0.99); P = .03

No. at risk
Usual care 1172 651 337 146
Exercise training 1159 656 352 167

JAMA 2009;301:1439-1450
HF-ACTION

Ischemic Heart Failure Etiology

Nonischemic Heart Failure Etiology

No. of participants
Exercise training
Usual care

Baseline 3 6 9 12 24 36

Exercise training
598 547 511 472 470
277
131
Usual care
599 514 481 471 431
265
151

Baseline 3 6 9 12 24 36

Exercise training
561 505 480 440 436
292
163
Usual care
572 472 436 430 419
267
129

\( P = .001 \) for treatment effect for both ischemic and nonischemic heart failure. Error bars indicate standard errors at each time point.
Exercise & sport

• No reason to forbid it
• Every reason to encourage it
Training
Training
The magic trousers ...
The magic trousers ...

![Graph showing VO2/kg and HR with annotations for Walk time and Peak VO2 with P<0.01 for both categories.]
The magic trousers ...

**Peak VO$_2$ (ml.kg$^{-1}$.min$^{-1}$)**

![Graph showing Peak VO$_2$ over time for two groups: Group A and Group B.](image)

- **Baseline**: 18 weeks
- **8 weeks**: Training and De-training
- **18 weeks**: Training and De-training

**P<0.01**

*J Card Fail 2009;15:319-26*
Current Management Strategies for Heart Failure

ORGANISATION OF CARE
Chronic heart failure quality standard

Issued: June 2011

NICE quality standard 9
guidance.nice.org.uk/qs9

Acute heart failure: diagnosis and management in adults

Quality standard
Published: 3 December 2015

QS 103
Quality statement 6
Adults with stable chronic heart failure are offered an exercise-based programme of cardiac rehabilitation. [2011, updated 2016]

Quality statement 7
Adults with chronic heart failure referred to a programme of cardiac rehabilitation are offered sessions during and outside working hours, and the choice of undertaking the programme at home, in the community or in a hospital setting. [new 2016]
• **Statement 3.** Adults admitted to hospital with acute heart failure have input within 24 hours from a dedicated specialist heart failure team.

• **Statement 6.** Adults with acute heart failure have a follow-up clinical assessment ... within 2 weeks of hospital discharge.

• **Statement 3.** People referred ... either because of suspected heart failure and previous MI or high serum natriuretic peptide levels, are seen by a specialist within 2 weeks of referral.

• **Statement 9.** People with stable chronic heart failure receive a clinical assessment at least every 6 months.
Median age: 80 years
• 67% >75 years
• Women 5 years older than men
• Most deprived 5 y lower than least

In-hospital mortality 9.5%
• 7% cardiology wards
• 11% general medical
• 14% other

6% died in 30 days after discharge
Survival by referral to rehab

% Survived post-discharge

Days

No

Yes
Best practice tariff

Focus on Heart Failure:

10 recommendations to improve care and transform lives
BACPR / BSH Position Statement on:

The access of patients with "heart failure" to exercise-based cardiovascular rehabilitation services.

According to the most recent National Audit of Cardiac rehabilitation (NACR) report 2015, of the total number of patients accessing CR services in England & Wales, less than 5% have a primary diagnosis of "heart failure". In Northern Ireland, the figure is less than 1% (no data available for Scotland at present). There will be a variety of reasons that underpin this, yet the evidence for CR in this patient group is robust and is supported by explicit quality standards published by NICE:

"Adults with stable, chronic heart failure are offered an exercise-based programme of cardiac rehabilitation. Offering an exercise-based programme of cardiac rehabilitation to ALL adults with chronic heart failure when their condition is stable will help to prevent the person's heart failure from worsening, reduce their risk of future heart problems and improve their quality of life."  Chronic Heart Failure in Adults. Quality Standard (February 2016; nice.org.uk/guidance/qs65 (Quality Statement 6)

For many patients who have been hospitalised with heart failure, there may be a reluctance to offer early access to CR due to uncertainty about "stability" of the condition and/or lack of clarity concerning aetiology and additional investigations or procedures (such as invasive angiography, complex device implantation). It is the view of both BACPR and BSH, that if patients are deemed sufficiently "stable" to be discharged from an acute care setting, then onward referral to a CR programme should take place just as it would for patients post MI or revascularisation. The benefits of many of the CR core components can be realised by this patient group (including self-management) even if plans for additional tests / procedures have been initiated. During "initial assessment", if there are concerns regarding a patient's "risk stratification" (because additional tests have been planned) then it is reasonable to delay a formalised assessment of exercise capacity and begin an exercise programme at the lowest intensity level. Once an appropriate risk tool can be completed, this component should be reviewed. Attempts should be made to improve local awareness of the importance of early access to CR for patients with heart failure, develop electronic referral processes and, where practical, involve specialist heart failure nurses (community & hospital-based).

SHAPE 1st MERGEFORMAT

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Chair, BSH

British Association for Cardiovascular Prevention and Rehabilitation
Affiliated group of the British Cardiovascular Society
Company limited by guarantee. Registered in England 3290345 Registered Charity No. 1129845
Registered Office 3 Fitzroy Square London W1T 5HQ
Heart failure v cardiology

- 214 patients assessed for transplantation
- comprehensive management programme

- therapy
- education
- weekly follow up

Before

After

Peak VO2

Number of hospitalisations

J Am Coll Cardiol 1997;30:725