Why do so few patients with heart failure participate in cardiac rehabilitation? A cross-sectional survey from England, Wales and Northern Ireland

Hasnain M Dalal,1 Jennifer Wingham,2 Joanne Palmer,2 Rod Taylor,3 Corinna Petre,4 Robert Lewin4 on behalf of the REACH-HF investigators

ABSTRACT

Objectives: To determine why so few patients with chronic heart failure in England, Wales and Northern Ireland take part in cardiac rehabilitation.

Design: Two-stage, postal questionnaire-based national survey.

Participants and setting: Stage 1: 277 cardiac rehabilitation centres that provided phase 3 cardiac rehabilitation in England, Wales and Northern Ireland registered on the National Audit of Cardiac Rehabilitation register. Stage 2: 35 centres that indicated in stage 1 that they provide a separate cardiac rehabilitation programme for patients with heart failure.

Results: Full data were available for 224/277 (81%) cardiac rehabilitation centres. Only 90/224 (40%) routinely offered phase 3 cardiac rehabilitation to patients with heart failure. Of these 90 centres that offered rehabilitation, 43% did so only when heart failure was secondary to myocardial infarction or revascularisation. Less than half (39%) had a specific rehabilitation programme for heart failure. Of those 134 centres not providing for patients with heart failure, 84% considered a lack of resources and 55% exclusion from commissioning contracts as the reason for not recruiting patients with heart failure. Overall, only 35/224 (16%) centres provided a separate rehabilitation programme for people with heart failure.

Conclusions: Patients with heart failure as a primary diagnosis are excluded from most cardiac rehabilitation programmes in England, Wales and Northern Ireland. A lack of resources and direct exclusion from local commissioning agreements are the main barriers for not offering rehabilitation to patients with heart failure.

INTRODUCTION

Heart failure is becoming more prevalent worldwide,1 mainly due to ageing of the population and improved survival after acute cardiac events. In the UK, about 900 000 people are living with heart failure but only a small minority participate in cardiac rehabilitation.2 Numerous national and international evidence-based guidelines have been...
developed to improve diagnosis and treatment for patients with heart failure and have covered aetiology, prevention, diagnosis and therapeutic interventions. Exercise training has been evaluated intensively with respect to the benefit that it may provide in the treatment of those with heart failure. Evidence from meta-analyses shows that cardiac rehabilitation improves quality of life, reduces symptom burden, reduces readmissions to hospital and may improve survival in patients with systolic heart failure. In the UK, cardiac rehabilitation has been defined as a ‘multidisciplinary intervention for people with heart disease. Its main aims are to help the patient to recover as quickly and completely as possible and then to reduce to a minimum the chance of recurrence of the cardiac illness.

Current guidelines from the National Institute for Health and Clinical Excellence (NICE), American College of Cardiology/American Heart Association and European Society of Cardiology recommend cardiac rehabilitation as an effective and safe intervention for heart failure. These guidelines all recommend that cardiac rehabilitation programmes should not be restricted to exercise alone but should include education, psychological input and drug therapy; in other words, comprehensive cardiac rehabilitation to enhance self-management and help patients achieve better long-term management of their chronic illness.

Despite the clear recommendations in the various guidelines, only a small minority of people affected by heart failure in the UK, and elsewhere, have participated in cardiac rehabilitation. In the UK between April 2007 and March 2008, only 1% of patients who participated in cardiac rehabilitation were referred because of heart failure, and a recent European survey showed that <20% of patients with heart failure are involved in cardiac rehabilitation. Two main reasons may explain the suboptimal provision and uptake of this intervention in people with cardiac rehabilitation: previous guidelines provided no specific details for healthcare planners about how and where these cardiac rehabilitation services would best be delivered, and healthcare staff involved in frontline cardiac rehabilitation services are unsure about the safety and benefits of cardiac rehabilitation in people with heart failure. Recent guidelines from Europe and North America give more detailed information on the content and provision of rehabilitation programmes in heart failure.

Most trials of cardiac rehabilitation have excluded patients with heart failure and preserved ejection fraction (diastolic heart failure), who make up 54% of the population with heart failure, and it is not clear to what extent they are specifically excluded from cardiac rehabilitation in routine practice. In the UK, an emphasis has been placed on providing choice between hospital-based rehabilitation and home-based individual programmes such as the Heart Manual after myocardial infarction, as such a choice has been shown to increase uptake.

We conducted a two-stage national survey in 2009–2010. This study aimed first to ascertain why such a small percentage of people with heart failure are receiving cardiac rehabilitation given that it is so widely acknowledged as beneficial and second to find out more about those centres that are providing a service specifically for heart failure. We therefore assessed current provision of cardiac rehabilitation for patients with heart failure in England, Wales and Northern Ireland (stage 1) and obtained data on the features of cardiac rehabilitation centres that did offer cardiac rehabilitation for patients with heart failure (stage 2).

METHODS

Stage 1

Stage 1 of the national survey included all centres that provided phase 3 rehabilitation (graduated exercise training supplemented by education on importance of medication, risk factors, diet, stress management and relaxation training) in England, Wales and Northern Ireland registered on the National Audit of Cardiac Rehabilitation (NACR) register funded by the British Heart Foundation. Each centre was sent a 17-item one-page postal questionnaire that asked respondents to indicate whether they routinely provided a cardiac rehabilitation service for patients with heart failure and to identify and give brief details about barriers to provision of such a service. The stage 1 questionnaire was mailed out by the NACR office in York (see online appendix for the stage 1 questionnaire). To validate the data, responses from stage 1 in terms of the demographic and activity features of the centres were compared with information from the NACR (the methods and measures used by the NACR are described in and available for download from http://www.cardiacrehabilitation.org.uk/nacr).

Stage 2

Stage 2 of the survey was sent from the Royal Cornwall Hospitals Trust and included all centres that confirmed in stage 1 that they provided a separate cardiac rehabilitation service for patients with heart failure. These centres were sent a 44-item five-page questionnaire designed to find out more about the nature (patient demographics and staffing) and content of their cardiac rehabilitation service (see online appendix for the stage 2 questionnaire). In the first instance, the stage 2 questionnaire was sent by email, with a letter explaining why more detailed information was being requested from the centres. To optimise response rates, non-responders were sent personalised letters with stamped addressed envelopes, and these were followed by reminder emails and telephone calls.

Data analysis

We entered participating centres’ responses into an Excel spreadsheet. We undertook frequency analyses for stages 1 and 2. We compared the results of the stage 1
questionnaire between centres that did provide separate cardiac rehabilitation programmes for heart failure and those that did not. We made comparisons using the \(\chi^2\) test for binary data and Mann–Whitney U tests for ordinal data. We analysed data with SPSS software (V.19).

RESULTS
Stage 1
Of the 277 questionnaires sent out to cardiac rehabilitation centres in England, Wales and Northern Ireland, 232 (84%) were completed and returned (figure 1). Eight (3.4%) of these 232 centres did not respond to the first question: ‘Do you routinely offer phase 3 cardiac rehabilitation to people with heart failure?’ which meant that 224 (81%) responses were eligible for full analysis. Table 1 summarises the response to the key questions in stage 1.

Of the 224 centres with complete responses, 134 (60%) reported that they did not routinely accept people with heart failure and 90 (40%) that they did routinely offer phase 3 cardiac rehabilitation in heart failure. Of the 90 centres that did offer cardiac rehabilitation in heart failure, 39 (43%) did so only when heart failure was secondary to referral after myocardial infarction or revascularisation. Overall, only 35/224 (16%) responding centres specifically recruited patients with heart failure. Only 33/90 (37%) centres responded to a question asking about their provision of cardiac rehabilitation for patients with heart failure with preserved ejection fraction (diastolic heart failure), with only one-third (11/33) taking patients from this group.

Patients with heart failure and preserved ejection fraction were included in cardiac rehabilitation programmes by 11/90 (12%) centres, with 79 centres accepting only patients with systolic heart failure. Patients with New York Heart Association class IV disease were excluded by 53/90 (59%) centres.

Of the 90 centres that did offer cardiac rehabilitation for heart failure, 35 (39%) had a specific cardiac rehabilitation programme for this patient group. Of these, 27 (30%) offered a home-based cardiac rehabilitation programme such as the Heart Manual or the British Heart Foundation’s Heart Failure Plan (see footnote). Hospital-based rehabilitation for groups was offered in 72 (80%) centres, with only 30 (33%) offering a choice between home-based and centre-based programmes (table 1).

From the 134 centres that did not routinely offer rehabilitation in heart failure, 113 (84%) indicated that a lack of resources was a factor and 73 (54%) indicated that the exclusion of such a service from commissioning contracts had influenced decisions on its provision. More than half (54%) of the centres expressed confidence in the skill mix and knowledge of their staff to provide cardiac rehabilitation in heart failure. Table 2 summarises the perceived barriers given by the 90 cardiac rehabilitation centres that offer cardiac rehabilitation for heart failure. Importantly, overall 146/224 (65%) centres considered that evidence on safety was adequate and 159/224 (71%) did not believe that lack of evidence on clinical benefit was an influencing factor.

Comparison between centres that did and did not provide CR in HF (some data obtained directly from the NACR Database)
A higher percentage of patients diagnosed with heart failure were referred to centres that offered cardiac rehabilitation in heart failure (1301/28 231 (4.6%)) than to those that did not (185/32 246 (0.6%)) \((p<0.05)\). A statistically significant difference was also seen in the median number of patients referred per annum between the centres that routinely offered cardiac rehabilitation in heart failure and those that did not (287 vs 202, respectively, \(p=0.03\)). Nearly three of four patients seen were men: 57/78 (73%) in centres offering and 85/115 (74%) in those not offering cardiac rehabilitation in heart failure. Patients who survived myocardial infarction (8448/28 231 (32%)) and coronary artery bypass surgery (5047/28 231 (18%)) formed the largest proportion of patients with heart failure receiving cardiac rehabilitation. The skill mix did not differ significantly between programmes that did \((n=90)\) or did not \((n=134)\) offer cardiac rehabilitation except for the number of nurses. Centres not offering rehabilitation in heart failure had a mean of 2.67 (SD 1.79) whole-time nurses compared with a mean of 2.24 (SD 1.85) in centres offering a dedicated rehabilitation programme in heart failure—a difference that was statistically significant \((p=0.039)\) (table 3).
Stage 2

Only 35 (16%) of the 224 respondents in stage 1 had indicated that they provided a separate cardiac rehabilitation programme for people with heart failure. Of these 35 centres, 24 (69%) agreed to provide more information about their heart failure service and were willing to participate in stage 2 of the survey. Complete stage 2 questionnaires were received from 17 (71%) of these 24 centres.

The geographical area of responding centres was mainly urban (10/17; 59%) or mixed rural and urban (7/17; 41%). The number of patients with heart failure seen annually varied widely, with 5/17 (29%) centres seeing 10–50 referred patients, 4/17 (24%) centres seeing 51–100 patients and 3/17 (18%) seeing more than 100 patients.

Centres with dedicated cardiac rehabilitation services for heart failure were based mainly in district general hospitals (6/17; 35%) or the community (5/17; 29%) or had clinics in both settings (4/17; 24%). A combination of hospital-based and home-based programmes was offered by 7/17 (41%) of centres, with 8/17 (47%) offering only hospital-based programmes. Seven centres offered both centre-based and home-based cardiac rehabilitation, and nearly half (8/17) offered only a centre-based cardiac rehabilitation programme. The duration of the cardiac rehabilitation programmes offered was <6 weeks for 2/17 (12%) of centres, 6–12 weeks for 10/17 (59%) centres and >12 weeks for 4/17 (24%) centres. A home exercise programme was offered in 10 centres.

Supervised exercise training was a key component of almost all (16/17 (94%)) of the dedicated cardiac rehabilitation programmes, with 11/17 (65%) centres including sessions lasting up to 1 h and 5/17 (29%) including sessions of up to 2 h. The content of

<table>
<thead>
<tr>
<th>Reason cited</th>
<th>Number of centres (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of resources</td>
<td>29 (32)</td>
</tr>
<tr>
<td>No contract for heart failure</td>
<td>16 (18)</td>
</tr>
<tr>
<td>Heart failure specialist nurse already meets cardiac rehabilitation need</td>
<td>14 (16)</td>
</tr>
<tr>
<td>Lack of referrals from heart failure service clinicians</td>
<td>11 (12)</td>
</tr>
<tr>
<td>Patients go to another cardiac rehabilitation programme in area</td>
<td>9 (10)</td>
</tr>
<tr>
<td>Not confident in having the correct skill mix</td>
<td>8 (9)</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Table 1 Summary of responses to the key questions in stage 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
</tr>
<tr>
<td>Do you routinely offer phase III cardiac rehabilitation to people with heart failure? (n=224)</td>
</tr>
<tr>
<td>Which of these best describes the heart failure pathway into cardiac rehabilitation in your area?</td>
</tr>
<tr>
<td>Usually only if they have been referred for acute myocardial infarction or revascularisation (n=90)</td>
</tr>
<tr>
<td>We offer cardiac rehabilitation to all people with heart failure regardless of the cause (n=90)</td>
</tr>
<tr>
<td>Do you provide a separate programme for heart failure patients? (n=90)</td>
</tr>
<tr>
<td>If yes, are spouses/partners invited to participate in cardiac rehabilitation? (n=90)</td>
</tr>
<tr>
<td>Do you provide a home-based cardiac rehabilitation programme for heart failure? (n=90)</td>
</tr>
<tr>
<td>Do you provide a hospital- /centre-based programme for patients with heart failure? (n=90)</td>
</tr>
<tr>
<td>Do you offer heart failure patients a choice of home- or centre-based cardiac rehabilitation? (n=90)</td>
</tr>
<tr>
<td>Do you offer cardiac rehabilitation to New York Heart Association class IV patients? (n=90)</td>
</tr>
<tr>
<td>Do any of the following factors influence you in offering/not offering cardiac rehabilitation to people with heart failure?</td>
</tr>
<tr>
<td>Not enough resources (n=90)</td>
</tr>
<tr>
<td>HF patients are not included in our contract with the commissioners (n=90)</td>
</tr>
<tr>
<td>We are not confident that we have the right skill mix/knowledge to manage these patients (n=90)</td>
</tr>
<tr>
<td>Lack of evidence/guidance on safety (n=90)</td>
</tr>
</tbody>
</table>

NA, not applicable.
the exercise training variably included warm-up sessions followed by aerobic exercises and resistance training with varying levels of intensity—generally three levels depending on the patient’s exercise capacity assessed using rating of perceived exertion. Most centres reported moderate levels of exercise intensity which varied from 40% to 60% of peak heart rate (equivalent to level 3 to 5 on the Borg scale). The equipment used included exercise bikes, rowing machines, treadmills, arm bikes, cross trainers and step-up equipment. Normal physical activity (ie, walking) was used in 13/17 (76%) of centres to promote fitness. All centres provided education on heart failure, self-management, medication and diet.

Anxiety and depression were assessed by more than 80% (14/17) of centres, with 71% using the Hospital Anxiety and Depression Scale questionnaire. More than half of centres referred patients with high levels of anxiety and depression to their general practitioner or counsellor. Centres that offered a dedicated rehabilitation programme in heart failure employed three to four whole time equivalent members of staff (7/17), with most employing cardiac rehabilitation nurses, physiotherapists, heart failure specialist nurses and a coordinator. Few centres reported employing a psychologist (2/17) or dietician (3/17) as a member of their cardiac rehabilitation teams.

**DISCUSSION**

Our survey shows that 60% of the cardiac rehabilitation centres in England, Wales and Northern Ireland did not accept patients with heart failure, although most of those completing the survey accepted that there was good scientific evidence of benefit. This is not a new concern. The Healthcare Commission reported in 2007 that only 5.7% of 6998 patients surveyed were referred for cardiac rehabilitation. A recent audit from England, Northern Ireland and Wales reported that the cardiac rehabilitation service for heart failure was patchy or non-existent in many areas, and the 2010 national audit of cardiac rehabilitation (NACR) report states that 60 477 patients participated in cardiac rehabilitation, although one in four cardiac rehabilitation centres excluded patients with heart failure and only 1% of participants were referred because of heart failure. The Healthcare Commission also reviewed progress on the implementation of the national service framework for coronary heart disease and highlighted the need to improve access and provision of cardiac rehabilitation services for people with heart failure. This implementation gap has also been reiterated by the NHS Institute for Innovation and Improvement. Most cardiac rehabilitation centres are not implementing the latest guidance from NICE.

Our survey aimed to discover why there is a problem with delivery. Most programme coordinators regarded the major barriers to providing a service for heart failure as local commissioning arrangements, local patient pathways, other people (eg, heart failure specialist nurses) providing a similar service or lack of resources. Only a very small number expressed doubt about safety, their competency or the skill mix. A significant difference was identified in the annual number of patients seen in those centres that did and did not have a dedicated heart failure programme, with larger programmes more likely to have such a programme. However, taken as a whole, no difference was seen in the staff mix of programmes that did or did not specifically recruit patients with heart failure save for the number of nurses who featured prominently and interestingly were represented in higher numbers in centres that did not offer a dedicated rehabilitation programme in heart failure. This suggests that most existing cardiac rehabilitation centres could provide such a service if commissioners were to include heart failure in the contract and only a few would require some further education or expertise. It is also noteworthy that while 60%–62% of cardiac rehabilitation centres have administrative and secretarial support, <8% have direct involvement from a physician. Madden et al have suggested that ‘Rehabilitation might be perceived differently if presented as part of a treatment programme prescribed by cardiologists rather than as an optional lifestyle improver suggested by nurses, as is current UK practice’.

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**Table 3** Staffing mix in centres that did (n=90) and did not (n=134) offer cardiac rehabilitation for heart failure

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Offering cardiac rehabilitation for heart failure (n=90)</th>
<th>Not offering cardiac rehabilitation for heart failure (n=134)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant/doctor</td>
<td>7 (7.8)</td>
<td>10 (7.5)</td>
<td>0.186</td>
</tr>
<tr>
<td>Nurse</td>
<td>78 (86.7)</td>
<td>119 (88.9)</td>
<td>0.039*</td>
</tr>
<tr>
<td>Exercise specialist</td>
<td>39 (43.3)</td>
<td>49 (36.6)</td>
<td>0.210</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td>48 (53.3)</td>
<td>75 (56.0)</td>
<td>0.071</td>
</tr>
<tr>
<td>Physiotherapy assistant</td>
<td>15 (16.7)</td>
<td>25 (18.7)</td>
<td>0.736</td>
</tr>
<tr>
<td>Dietician</td>
<td>46 (51.1)</td>
<td>70 (52.2)</td>
<td>0.538</td>
</tr>
<tr>
<td>Psychologist</td>
<td>9 (10)</td>
<td>13 (9.7)</td>
<td>0.122</td>
</tr>
<tr>
<td>Secretary/administrator</td>
<td>56 (62.2)</td>
<td>81 (60.4)</td>
<td>0.700</td>
</tr>
<tr>
<td>Healthcare assistant</td>
<td>5 (5.6)</td>
<td>13 (9.7)</td>
<td>0.587</td>
</tr>
<tr>
<td>Occupational therapist</td>
<td>20 (22.2)</td>
<td>44 (32.8)</td>
<td>0.760</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>44 (48.9)</td>
<td>62 (46.3)</td>
<td>0.225</td>
</tr>
</tbody>
</table>

*statistically significant.
In contrast to the findings of the Healthcare Commission, which reported that frontline cardiac rehabilitation services are unsure about the safety and benefits of rehabilitation in heart failure, our survey found that a lack of evidence on safety or clinical benefit was not a factor that influenced most centres’ ability to offer cardiac rehabilitation.

In this survey, only 11/90 (12%) of centres provided any support for the 54% of the heart failure population with heart failure and preserved ejection fraction. The latter presents a similar burden to systolic heart failure in terms of healthcare costs, rehospitalisation rates, mortality, exercise intolerance and quality of life. Good evidence supports the benefits of cardiac rehabilitation in systolic heart failure in terms of quality of life, exercise capacity, reduced rates of hospital readmission related to heart failure and potential improvements in overall survival. However, the same cannot be said for heart failure with preserved ejection fraction, for which evidence is limited; research is therefore needed to assess definitively the effectiveness and cost effectiveness of exercise-based cardiac rehabilitation interventions.

Patients with less severe forms of systolic heart failure (New York Heart Association class I–III) after a heart attack or coronary revascularisation have the best chance of being offered cardiac rehabilitation. The lack of an alternative to centre-based cardiac rehabilitation, because of a lack of evidence, and the lack of referral by healthcare professionals may explain why uptake of cardiac rehabilitation remains suboptimal in patients with heart failure. Offering ‘real and unconstrained’ choice of home-based and centre-based rehabilitation may help to improve the uptake of rehabilitation in heart failure, as it has in patients after myocardial infarction.

The main reasons people give for not accepting an invitation to attend centre-based cardiac rehabilitation classes are problems with accessibility and parking at their local hospital, a dislike of groups and work or domestic commitments. These problems might be overcome by home-based programmes, which have been introduced in an attempt to widen access and participation. Evidence on the effectiveness of home-based models of cardiac rehabilitation in people with heart failure is needed so that policymakers and commissioners can decide what to provide as part of a comprehensive cardiac rehabilitation service for people with heart disease. A trial based in the UK of home exercise compared with care by a specialist heart failure nurse, without other educational elements, in patients with stable heart failure on optimised therapy failed to find a benefit in heart failure-specific quality of life. However, adherence to the programme was relatively low, with participants having a large number of comorbid conditions that may have required more specialist exercise input rather than a nurse-led service.

Choice in healthcare is a government priority. One recent randomised controlled trial of cardiac rehabili-
Why do so few patients with heart failure participate in rehabilitation?

Competition of interests None.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement The Excel spreadsheets with responses from the stage 1 and stage 2 surveys and the data supplied by the National Audit of Cardiac Rehabilitation for this study will be placed in the Dryad repository and readers can access this via the DOI:10.5061/dryad.n6661sh1. The demographic data from the centres are anonymous and the risk of identification of individual centres is low.

REFERENCES

Rehabilitation Enablement in Chronic Heart Failure: Reach HF Study

Follow Up Survey

We are conducting some research funded by the National Institute of Health Research in order to develop specific cardiac rehabilitation programmes for people with chronic heart failure (HF). In 2009, you kindly completed an additional questionnaire to the NACR annual survey of cardiac rehabilitation provision and indicated you were willing to provide some more information about your service. We would be grateful if you could complete this survey and return it before the end of October 2010. Please tick the most appropriate answer that describes your service.

Cardiac Rehabilitation Centre ID number: □

Name, Address, Email and Telephone Number of the Unit

Demographics of the Rehabilitation Unit

Q1 Where is your unit based? Tick more than one if you provide a service from the hospital and a community setting.

In a community setting .......................................................... □
In a district general hospital .................................................. □
In a tertiary centre ................................................................. □

Q2 In which of these venues do you provide cardiac rehabilitation for people with HF? Tick all that apply.

In an acute hospital ............................................................. □
In a community hospital ...................................................... □
In a community hall/centre ............................................... □
In a GP Surgery ................................................................. □
In the home ................................................................. □
Other area, please describe e.g. a combination of home and centre-based.

Q3 Please define the geographical area served your department serves?

Mainly urban ................................................................. □
Mainly rural ................................................................. □
Mixed ........................................................................ □

Q4a How many people with a primary diagnosis of HF were referred to the unit in the last 12 months covered by the 2009 NACR survey?

Less than 10 ................................................................. □
Between 10 and 50 ...................................................... □
Between 51 and 100 ...................................................... □
More than 100 .............................................................. □

Q4b If known, please specify an exact number of patients who started cardiac rehab.

Q4c How many completed the cardiac rehab programme?

Q5a How many patients with HF were referred because of acute MI?

Less than 10 ................................................................. □
Between 10 and 25 ...................................................... □
Between 26 and 50 ...................................................... □
Between 51 and 100 ...................................................... □
More than 100 .............................................................. □

Q5b If known please specify exact number of patients who were referred because of acute MI.
Q6 Do you include patients with HF and preserved ejection fraction in your CR programme?
Yes ........................................... 
No ...........................................

Q7 Do you have entry criteria for your programme?
Yes ........................................... Go to Q8
No ........................................... Go to Q9

Q8 What is the entry criteria for your programme?

- NYHA Class
- Ejection Fraction
- HF patients with ICD's
- Any comments

Q9 What are your exclusion criteria? Please specify.

Q10 Do you offer only a centre-based CR programme for people with HF?
Yes ........................................... 
No ...........................................

Q11 Do you offer only a home-based CR programme for people with Heart Failure?
Yes ........................................... Go to Q12
No ........................................... Go to Q13

Q12 Which one do you offer?
- Heart Manual ...........................................
- BHF Heart Failure Plan..............................
- Other, please specify.

Q13 Do you offer both a home and centre-based programme?
Yes ........................................... 
No ...........................................

Q14 What is the duration of your programme?
- Less than 6 weeks ...........................................
- Between 6-12 weeks ......................................
- More than 12 weeks ..................................

Q15 If more than 12 weeks please specify how long the duration of your programme is.

Q16 How often are patients invited to attend?
- Once a week .............................................
- Twice a week ...........................................
- Three times a week ..................................
- Other, please specify

Exercise

Q17 Do you provide supervised exercise in your programme for patients with HF?
Yes ........................................... Go to Q18
No ........................................... Go to Q20

Q18 How long are the exercise sessions?
- Up to one hour .............................................
- Between one and two hours ..........................
- Other ..........................................................
Q20 Do you use walking and/or other forms of normal physical activity as a method for increasing fitness - e.g. daily walking programme.

Yes ...........................  Go to Q21
No .............................  Go to Q22

Q21 Please describe your method below

Q22 How do you assess the exercise capacity?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 min Walk Test</td>
<td></td>
</tr>
<tr>
<td>Shuttle Walk Test</td>
<td></td>
</tr>
<tr>
<td>Other, please specify</td>
<td></td>
</tr>
</tbody>
</table>

Q23 Do you offer a home exercise programme?

Yes ...........................  Go to Q24
No .............................  Go to Q25

Q24 Please describe and indicate if you use a specific programme such as the Heart Manual, BHF Heart Failure Plan or your own programme.

Education

Q25 Do you provide information about.......

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Failure</td>
<td></td>
</tr>
<tr>
<td>Self-Management Strategies (monitoring for fluid, breathing changes, pain)</td>
<td></td>
</tr>
<tr>
<td>Medication</td>
<td></td>
</tr>
<tr>
<td>Diet</td>
<td></td>
</tr>
<tr>
<td>Benefits</td>
<td></td>
</tr>
<tr>
<td>Household Adaptations</td>
<td></td>
</tr>
</tbody>
</table>

Psychological Intervention

Q26 Do you assess anxiety and depression?

Yes ...........................  Go to Q27
No .............................  Go to Q28

Q27 What tool do you use?

HADS ........................................ |
Other, please specify

Q28 What support is offered to people with HF who have high levels of anxiety and depression?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referred to their GP ...........................................</td>
<td></td>
</tr>
<tr>
<td>Referred to a counsellor .................................</td>
<td></td>
</tr>
<tr>
<td>Referred to CPN ............................................</td>
<td></td>
</tr>
<tr>
<td>Other, please specify</td>
<td></td>
</tr>
</tbody>
</table>
Q29  Do you use a specific psychological model of intervention, e.g. motivational interviewing and 'goal' setting with regular review and resetting of new goals?
Yes ............................................ Go to Q30
No ............................................. Go to Q31

Q30  Please describe what method you use

Q31  Do you include any training or support for carers?
Yes ............................................ Go to Q32
No ............................................. Go to Q33

Q32  Please describe what support you provide.

Q33  Do you collect the following data on patients who receive cardiac rehabilitation for HF?
First Assessment data using the NACR computer database
Minnesota Living with Heart Failure
Other, please specify

Staffing

Q34  How many staff work in the cardiac rehabilitation department? (Full-time equivalents)
1-2.................................................................
3-4.................................................................
5-6.................................................................
7-8.................................................................
9 or more...........................................................

Q35  What is the composition of the staff working in the cardiac rehabilitation department? Please specify how many full-time equivalents.
Cardiac Rehabilitation Co-ordinator
Cardiac Rehabilitation Nurse
Heart Failure Specialist Nurse
Physiotherapist
Exercise Physiologist/Therapist
Occupational Therapist
Psychologist
Doctor
Other (please specify)
Liaison with Other Services

Q36 Where do your HF patient referrals come from? Please provide an estimated proportion.

- [ ] Hospital Clinician
- [ ] GP/Practice Nurse
- [ ] Heart Failure Specialist Nurse
- [ ] Other, please specify

Q37 Are HF specialist nurses involved in your cardiac rehab programme?
- [ ] Yes ........................... Go to Q38
- [ ] No ............................. Go to Q39

Q38 What is their role?

Q39 Do you refer patients with HF for long term exercise classes/Phase IV rehab?
- [ ] Yes .................................................. Go to Q40
- [ ] No ..................................................

Q40 Do you refer HF patients to primary care teams for long term follow up?
- [ ] Yes ........................... Go to Q41
- [ ] No ................................. Go to Q42

Q41 Please indicate the estimated proportion of referrals to primary care teams

- [ ] 0-24%................................................................
- [ ] 25-49%............................................................
- [ ] 50-74%.............................................................
- [ ] >74%................................................................

Q42 What do you consider as the main constraints to providing cardiac rehabilitation to all people with HF in your area?

- [ ] Financial Pressures ..............................
- [ ] Lack of clinical guidelines/evidence about suitability
- [ ] Risk of exercise in these patients
- [ ] Other e.g. referred to palliative or end of life pathway/Specialist Heart Failure Nursing Team. Please comment

Q43 Do you have spare capacity within your current service?

- [ ] Yes ........................... Go to Q44
- [ ] No ................................. Go to End

Q44 Please indicate how many additional patients (per week) with HF that you could take on to your cardiac rehab programme.

Thank you for completing this survey

Please return questionnaires to:
Dr H Dalal, Chief Investigator REACH-HF Study Group, R&D Directorate, The Knowledge Spa, Royal Cornwall Hospitals Trust, Truro, TR1 3HD

For any queries please contact me <Hayes.Dalal@3spires.cornwall.nhs.uk> or Jenny Wingham Jenny.Wingham@rcht.cornwall.nhs.uk
Cardiac Rehabilitation for People with Heart Failure

1 Do you routinely offer Phase III cardiac rehabilitation to people with heart failure?  
Yes ☐ Go to Q2  
No ☐ Go to Q14

2 Please tick which Phases you provide for HF  
I ☐ II ☐ III ☐ IV ☑

3 Which of these best describes the HF pathway into CR in your area?  
Yes ☐ No ☐

Usually only if they have been referred for Acute MI or revascularisation  
Offered to people with other conditions e.g. cardiomyopathy and/or valve disease  
We offer CR to all people with HF regardless of the cause  
We don’t usually take people with diastolic HF

4 Do you provide a separate programme for the HF patients?  
Yes ☐ Go to Q4  
No ☐ Go to Q5

5 If yes, are spouses/partners invited to participate in CR?  
Yes ☐ No ☐

6 Do you provide a home based CR programme for HF?  
Yes ☐ Go to Q6  
No ☐ Go to Q7

7 If yes, which programme do you offer?  
The Heart Manual ☐  
The BHF Heart Failure Plan ☑

8 Do you provide a hospital/centre (group) based programme for HF patients?  
Yes ☐ No ☐

9 Do you offer HF patients a choice of home or centre based CR?  
Yes ☐ No ☐

10 Do you have inclusion or exclusion criteria for HF?  
Yes ☐ Go to Q10  
No ☐ Go to Q14

11 If yes to Q9, are these based on the NYHA Classification?  
Yes ☐ Go to Q11  
No ☐ Go to Q12

12 Please answer the following questions on inclusion/exclusion criteria (tick all that apply)  
I ☐ II ☐ III ☐ IV ☑

Which NYHA Class do you include?  
Which NYHA Class do you exclude?

13 Is inclusion based on LV ejection fraction?  
Yes ☐ No ☐

If yes, please give %:

14 Do you have any other exclusion criteria?  
Yes ☐ No ☐

If yes, please describe:

15 Do any of the following factors influence you in offering / not offering CR to people with HF?  
Yes ☐ No ☐

HF patients go to another CR programme in our area  
Not enough resources (e.g. time, number of staff, accommodation, transport, equipment) to open programme to this group  
HF patients are not included in our contract with the commissioners  
We are not confident we have right skill mix / knowledge to manage these patients  
CR was not included in the locally agreed clinical guideline/pathway for people with HF  
Lack of interest / referrals from local HF service clinician(s)  
The Specialist Heart Failure Nurse services already meets the patients rehab needs  
Lack of evidence / guidance on safety  
Lack of evidence of clinical benefit  
other reasons (continue on reverse if needed)

16 If you would like to provide more information or comments about CR for HF, either in your area or in general, please add below and continue on reverse if needed.

17 We may wish to contact you again for more information. If you are willing to help with a further short survey please give us your contact email and/or telephone numbers.

Thank you. Your information will be anonymised and combined in a UK wide report and BHF campaign to help gain improved CR services for people with Heart Failure.
Table 3  Staffing mix in centres that did (n=90) and did not (n=134) offer cardiac rehabilitation for heart failure.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Number (%) of centres</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Offering cardiac rehabilitation for heart failure (n=90)</td>
<td>Not offering cardiac rehabilitation for heart failure (n=134)</td>
</tr>
<tr>
<td>Consultant/doctor</td>
<td>7 (7.8)</td>
<td>10 (7.5)</td>
</tr>
<tr>
<td>Nurse</td>
<td>78 (86.7)</td>
<td>119 (88.9)</td>
</tr>
<tr>
<td>Exercise specialist</td>
<td>39 (43.3)</td>
<td>49 (36.6)</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td>48 (53.3)</td>
<td>75 (56.0)</td>
</tr>
<tr>
<td>Physiotherapy assistant</td>
<td>15 (16.7)</td>
<td>25 (18.7)</td>
</tr>
<tr>
<td>Dietician</td>
<td>46 (51.1)</td>
<td>70 (52.2)</td>
</tr>
<tr>
<td>Psychologist</td>
<td>9 (10)</td>
<td>13 (9.7)</td>
</tr>
<tr>
<td>Secretary/administrator</td>
<td>56 (62.2)</td>
<td>81 (60.4)</td>
</tr>
<tr>
<td>Healthcare assistant</td>
<td>5 (5.6)</td>
<td>13 (9.7)</td>
</tr>
<tr>
<td>Occupational therapist</td>
<td>20 (22.2)</td>
<td>44 (32.8)</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>44 (48.9)</td>
<td>62 (46.3)</td>
</tr>
</tbody>
</table>

* [JL1]
Need to add what the * stands for.
Table 2 Results of the perceived barriers to offering rehabilitation from centres that indicated they routinely offer cardiac rehabilitation in heart failure (n=90).

<table>
<thead>
<tr>
<th>Reason cited</th>
<th>No (%) of centres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of resources</td>
<td>29 (32)</td>
</tr>
<tr>
<td>No contract for heart failure</td>
<td>16 (18)</td>
</tr>
<tr>
<td>Heart failure specialist nurse already meets cardiac rehabilitation need</td>
<td>14 (16)</td>
</tr>
<tr>
<td>Lack of referrals from heart failure service clinicians</td>
<td>11 (12)</td>
</tr>
<tr>
<td>Patients go to another cardiac rehabilitation programme in area</td>
<td>9 (10)</td>
</tr>
<tr>
<td>Not confident in having the correct skill mix</td>
<td>8 (9)</td>
</tr>
</tbody>
</table>
**Table 1** Summary of responses to the key questions in stage 1.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No (%)</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you routinely offer phase III cardiac rehabilitation to people with heart failure? (n=224)</td>
<td>90</td>
<td>134</td>
<td>NA</td>
</tr>
<tr>
<td>(40.1)</td>
<td></td>
<td>(59.9)</td>
<td></td>
</tr>
<tr>
<td>Which of these best describes the heart failure pathway into cardiac rehabilitation in your area?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usually only if they have been referred for acute myocardial infarction or revascularisation (n=90)</td>
<td>39</td>
<td>12</td>
<td>39 (43.4)</td>
</tr>
<tr>
<td>(43.3)</td>
<td></td>
<td>(13.3)</td>
<td></td>
</tr>
<tr>
<td>We offer cardiac rehabilitation to all people with heart failure regardless of the cause (n=90)</td>
<td>56</td>
<td>17</td>
<td>17 (18.9)</td>
</tr>
<tr>
<td>(62.2)</td>
<td></td>
<td>(18.9)</td>
<td></td>
</tr>
<tr>
<td>We don’t usually take people with diastolic heart failure (n=90)</td>
<td>11</td>
<td>22</td>
<td>57 (63.3)</td>
</tr>
<tr>
<td>(12.2)</td>
<td></td>
<td>(24.4)</td>
<td></td>
</tr>
<tr>
<td>Do you provide a separate programme for heart failure patients? (n=90)</td>
<td>35</td>
<td>52</td>
<td>3 (3.3)</td>
</tr>
<tr>
<td>(38.9)</td>
<td></td>
<td>(57.8)</td>
<td></td>
</tr>
<tr>
<td>If yes, are spouses/partners invited to participate in cardiac rehabilitation? (n=90)</td>
<td>37</td>
<td>29</td>
<td>24 (26.7)</td>
</tr>
<tr>
<td>(41.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you provide a home based cardiac rehabilitation programme for heart failure? (n=90)</td>
<td>27</td>
<td>56</td>
<td>7 (7.8)</td>
</tr>
<tr>
<td>(30.0)</td>
<td></td>
<td>(62.2)</td>
<td></td>
</tr>
<tr>
<td>Do you provide a hospital/centre based programme for patients with heart failure? (n=90)</td>
<td>72</td>
<td>15</td>
<td>3 (3.3)</td>
</tr>
<tr>
<td>(80.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you offer heart failure patients a choice of home or centre based cardiac rehabilitation? (n=90)</td>
<td>30</td>
<td>56</td>
<td>4 (4.4)</td>
</tr>
<tr>
<td>(33.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you offer cardiac rehabilitation to New York Heart Association class IV patients? (n=90)</td>
<td>16</td>
<td>56</td>
<td>18 (20.0)</td>
</tr>
<tr>
<td>(17.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do any of the following factors influence you in offering/not offering cardiac rehabilitation to people with heart failure?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not enough resources (n=90)</td>
<td>29</td>
<td>50</td>
<td>11 (12.2)</td>
</tr>
<tr>
<td>(32.2)</td>
<td></td>
<td>(55.6)</td>
<td></td>
</tr>
<tr>
<td>HF patients are not included in our contract with the commissioners (n=90)</td>
<td>16</td>
<td>54</td>
<td>20 (22.2)</td>
</tr>
<tr>
<td>(17.8)</td>
<td></td>
<td>(60.0)</td>
<td></td>
</tr>
<tr>
<td>We are not confident that we have the right skill mix/knowledge to manage these patients (n=90)</td>
<td>8</td>
<td>67</td>
<td>15 (16.7)</td>
</tr>
<tr>
<td>(8.9)</td>
<td></td>
<td>(74.4)</td>
<td></td>
</tr>
<tr>
<td>Lack of evidence/guidance on safety (n=90)</td>
<td>6</td>
<td>71</td>
<td>13 (14.4)</td>
</tr>
<tr>
<td>(6.7)</td>
<td></td>
<td>(78.9)</td>
<td></td>
</tr>
<tr>
<td>Lack of evidence on clinical benefit (n=90)</td>
<td>2</td>
<td>74</td>
<td>14 (15.6)</td>
</tr>
<tr>
<td>(2.6)</td>
<td></td>
<td>(82.2)</td>
<td></td>
</tr>
</tbody>
</table>

NA=not applicable.
### Title and abstract

**Objective.** To determine why so few patients with chronic heart failure in England, Wales, and Northern Ireland take part in cardiac rehabilitation.  
**Design.** Two stage, postal questionnaire-based, national survey.  
**Population & Setting.** Stage 1: 277 cardiac rehabilitation centres that provided phase III cardiac rehabilitation in England, Wales, and Northern Ireland registered on the National Audit of Cardiac Rehabilitation register. Stage 2: 35 centres that indicated in stage 1 that they provide a separate cardiac rehabilitation programme for patients with heart failure.  
**Main outcome measures.** N/A.  
**Results.** Full data were available for 224/277 (81%) cardiac rehabilitation centres. Only 90/224 (40%) routinely offered phase 3 cardiac rehabilitation to patients with heart failure. Of these 90 centres that offered rehabilitation, 43% did so only when heart failure was secondary to myocardial infarction or revascularisation. Less than half (39%) had a specific rehabilitation programme for heart failure. Of those 134 centres not providing for patients with heart failure, 84% considered a lack of resources and 55% exclusion from commissioning contracts as the reason for not recruiting patients with heart failure. No difference was seen in the skill mix between programmes that did or did not provide rehabilitation for patients with heart failure. Overall, only 35/224 (16%) centres provided a separate rehabilitation programme for people with heart failure.

### Introduction

**Background/rationale**  
Heart failure is becoming more prevalent worldwide, mainly due to ageing of the population and improved survival after acute cardiac events. In the UK, about 900,000 people are living with heart failure. Strong evidence from meta-analyses shows that cardiac rehabilitation improves quality of life, reduces symptom burden, and reduces readmissions to hospital in patients with systolic heart failure. Current guidelines from the National Institute for Health and Clinical Excellence (NICE), American College of Cardiology (ACC)/American Heart Association (AHA), and European Society of Cardiology (ESC) recommend cardiac rehabilitation as an effective and safe intervention for heart failure. Despite the clear recommendations in the various guidelines, only a small minority of people affected by heart failure in the UK, and elsewhere, have participated in cardiac rehabilitation. Two main reasons may explain the suboptimal provision and uptake of this intervention in people with cardiac rehabilitation: the guidelines provide no specific details for healthcare planners about how and where these cardiac rehabilitation services would best be delivered, and healthcare staff involved in frontline cardiac rehabilitation services are unsure about the safety and benefits of cardiac rehabilitation in people with heart failure.
We aimed firstly to ascertain why such a small percentage of people with heart failure are receiving cardiac rehabilitation given that it is so widely acknowledged as beneficial and secondly to find out more about those centres that are providing a service specifically for heart failure. Our objective was to find out about the current provision of cardiac rehabilitation for patients with heart failure in England, Wales, and Northern Ireland.

**Methods**

| Study design | 4 | Two stage, postal questionnaire-based, national survey. |
| Setting | 5 | England, Wales, and Northern Ireland, UK |
| Participants | 6 | Cardiac rehabilitation centres in England, Wales, and Northern Ireland registered on the National Audit of Cardiac Rehabilitation register |
| Variables | 7 | Not applicable |
| Data sources/measurement | 8* | Responses to two postal surveys: stage 1 and stage 2 |
| Bias | 9 | Not applicable |
| Study size | 10 | 277 cardiac rehabilitation centres that provided phase III cardiac rehabilitation in England, Wales, and Northern Ireland registered on the National Audit of Cardiac Rehabilitation register |
| Quantitative variables | 11 | See item 12 |
| Statistical methods | 12 | We undertook frequency analyses for stages 1 and 2. We compared the results of the stage 1 questionnaire between centres that did provide separate cardiac rehabilitation programmes for HF and those that did not. We made comparisons using the test for binary data and Mann-Whitney U tests for ordinal data. We analysed data with SPSS software (version 19). |

**Results**

| Participants | 13* | Responses to all questions from the stage 1 (17 items) and stage 2 (44 items) national questionnaire received between October 2010 to March 2011 were analysed. This covers 81% of cardiac rehabilitation centres in England, Wales and Northern Ireland on the NACR register. The 2010 NACR report states that 60,477 patients participated in cardiac rehabilitation across the UK. |
| Descriptive data | 14* | This data was collected only as part of the two questionnaires included as appendices to the main paper |
| Outcome data | 15* | Not applicable |
Full data were available for 224/277 (81%) cardiac rehabilitation centres. Only 90/224 (40%) routinely offered phase 3 cardiac rehabilitation to patients with heart failure. Of these 90 centres that offered rehabilitation, 43% did so only when heart failure was secondary to myocardial infarction or revascularisation. Less than half (39%) had a specific rehabilitation programme for heart failure. Of those 134 centres not providing for patients with heart failure, 84% considered a lack of resources and 55% exclusion from commissioning contracts as the reason for not recruiting patients with heart failure. No difference was seen in the skill mix between programmes that did or did not provide rehabilitation for patients with heart failure. Overall, only 35/224 (16%) centres provided a separate rehabilitation programme for people with heart failure.

Main results 16

| Main results | 16 | Full data were available for 224/277 (81%) cardiac rehabilitation centres. Only 90/224 (40%) routinely offered phase 3 cardiac rehabilitation to patients with heart failure. Of these 90 centres that offered rehabilitation, 43% did so only when heart failure was secondary to myocardial infarction or revascularisation. Less than half (39%) had a specific rehabilitation programme for heart failure. Of those 134 centres not providing for patients with heart failure, 84% considered a lack of resources and 55% exclusion from commissioning contracts as the reason for not recruiting patients with heart failure. No difference was seen in the skill mix between programmes that did or did not provide rehabilitation for patients with heart failure. Overall, only 35/224 (16%) centres provided a separate rehabilitation programme for people with heart failure. |

Other analyses 17

| Other analyses | 17 | Not applicable |

Discussion

| Discussion | 18 | Our survey shows that 60% of the cardiac rehabilitation centres in England, Wales, and Northern Ireland did not accept patients with heart failure, although most of those completing the survey accepted that there was good scientific evidence of benefit. Most cardiac rehabilitation centres are not implementing the latest guidance from NICE. |

| Limitations | 19 | The conclusions that can be drawn from stage 2 of the survey are limited because of the low response rate (n=17). Although we obtained detailed information about centres that provided a separate cardiac rehabilitation programme for patients with heart failure, inferences from this part of the study should be treated with caution. |

| Interpretation | 20 | Commissioning groups should follow the recently developed NHS Commission’s guide to coronary heart disease and the need for cardiac rehabilitation and the recently published NICE guidance on commissioning on cardiac rehabilitation for all newly diagnosed patients with chronic heart failure. |

| Generalisability | 21 | The response rate of 81% for stage 1 of our survey demonstrates the current provision of cardiac rehabilitation for patients with heart failure in England, Wales and Northern Ireland. Given the high response rate we can be confident that our findings can be extrapolated to reflect provision throughout the UK. |

Other information

| Other information | 22 | This study was supported by a Programme Development Grant (RP-DG-0709-10111) from the National Institute for Health Research (NIHR), Department of Health, England |