



Patients with heart failure are not receiving cardiac rehabilitation: a cross-sectional study of common barriers

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Patients with heart failure are not receiving cardiac rehabilitation: a cross-sectional study of common barriers

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Summary

Article focus

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

To find out the features of cardiac rehabilitation centres that offer a service to patients with heart failure

Key messages

Most cardiac rehabilitation centres in England, Wales, and Northern Ireland do not routinely offer cardiac rehabilitation to people with chronic heart failure

- Only one in six cardiac rehabilitation centres offers a dedicated cardiac rehabilitation programme for patients with heart failure. Those with heart failure (New York Heart Association (NYHA) stages I to III) after myocardial infarction or coronary revascularisation have the best chance of getting on a cardiac

rehabilitation programme

- Lack of resources and exclusion from local commissioning agreements are seen as the main reasons for not offering cardiac rehabilitation to people with heart failure

Strengths and limitations

1
2
3 The first comprehensive national survey of cardiac rehabilitation services for patients
4 with heart failure with a response rate of 84% conducted with the National Audit of
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7 Cardiac Rehabilitation (NACR).
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11 The conclusions that can be drawn from stage 2 of the survey are limited because of
12
13 the low response rate.
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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 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.

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.

Conclusion 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.

What is already known on this topic

- In the UK nearly a million people are living with chronic heart failure but only a very small minority have participated in cardiac rehabilitation
- Recent systematic reviews of exercise based cardiac rehabilitation have found significant improvements in health related quality of life and reductions in hospitalisation in patients with systolic heart failure following cardiac rehabilitation compared with usual care
- Several international guidelines, including the current guidance from the National Institute for Health and Clinical Excellence (NICE), recommend cardiac rehabilitation in chronic heart failure

What this study adds

- Most cardiac rehabilitation centres in England, Wales, and Northern Ireland do not routinely offer cardiac rehabilitation to people with chronic heart failure
- Only one in six cardiac rehabilitation centres offers a dedicated cardiac rehabilitation programme for patients with heart failure. Those with heart failure (New York Heart Association (NYHA) stages I to III) after myocardial infarction or coronary revascularisation have the best chance of getting on a cardiac rehabilitation programme
- Lack of resources and exclusion from local commissioning agreements are seen as the main reasons for not offering cardiac rehabilitation to people 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.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.³⁻⁵ Exercise training has been evaluated intensively with respect to the benefit that it may provide in the treatment of those with heart failure.⁶ 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.⁷

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.^{8-10,20} 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.^{11,12} In the UK between April 2007 and March 2008, only 1% of patients who participated in cardiac rehabilitation were referred because of heart

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3 failure,¹¹ and a recent European survey showed that <20% of patients with heart
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5 failure are involved in cardiac rehabilitation.¹² Two main reasons may explain the
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7 suboptimal provision and uptake of this intervention in people with cardiac
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9 rehabilitation: the guidelines provide no specific details for healthcare planners about
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11 how and where these cardiac rehabilitation services would best be delivered, and
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13 healthcare staff involved in frontline cardiac rehabilitation services are unsure about
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15 the safety and benefits of cardiac rehabilitation in people with heart failure.¹³
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21 Most trials of cardiac rehabilitation have excluded patients with heart failure and
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23 preserved ejection fraction (diastolic heart failure), who make up 54% of the
24
25 population with heart failure, and it is not clear to what extent they are specifically
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27 excluded from cardiac rehabilitation in routine practice.¹⁴ In the UK, an emphasis has
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29 been placed on providing choice between hospital based rehabilitation and home
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31 based individual programmes such as the Heart Manual¹⁵ after myocardial infarction,
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33 as such a choice has been shown to increase uptake.¹⁶
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39 We conducted a two-stage national survey in 2009-10. This study aimed firstly to
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41 ascertain why such a small percentage of people with heart failure are receiving
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43 cardiac rehabilitation given that it is so widely acknowledged as beneficial and
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45 secondly to find out more about those centres that are providing a service
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47 specifically for heart failure. We therefore assessed current provision of cardiac
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49 rehabilitation for patients with heart failure in England, Wales, and Northern Ireland
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51 (stage 1) and obtained data on the features of cardiac rehabilitation centres that did
52
53 offer cardiac rehabilitation for patients with heart failure (stage 2).
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Methods

Stage 1

Stage 1 of the national survey included all centres that provided phase III rehabilitation in England, Wales, and Northern Ireland registered on the National Audit of Cardiac Rehabilitation (NACR) database 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 eBMJ 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 on and available for download from 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 eBMJ 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

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3 reminder emails and telephone calls.
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7 **Data analysis**

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9 We entered participating centres' responses into an Excel spreadsheet. We
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11 undertook frequency analyses for stages 1 and 2. We compared the results of the
12
13 stage 1 questionnaire between centres that did provide separate cardiac
14
15 rehabilitation programmes for HF and those that did not. We made comparisons
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17 using the χ^2 test for binary data and Mann-Whitney U tests for ordinal data. We
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19 analysed data with SPSS software (version 19).
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25 **Results**

26 **Stage 1**

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28 Of the 277 questionnaires sent out to cardiac rehabilitation centres in England,
29
30 Wales, and Northern Ireland, 232 (84%) were completed and returned (figure 1).
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32 Eight (3.4%) of these 232 centres did not respond to the first question: 'Do you
33
34 routinely offer phase III cardiac rehabilitation to people with heart failure?', which
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36 meant that 224 (81%) responses were eligible for full analysis. Table 1 summarises
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38 the response to the key questions in stage 1.
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45 <<Figure 1 near here>>

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47 <<Table 1 near here>>
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52 Of the 224 centres with complete responses, 134 (60%) reported that they did not
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54 routinely accept people with heart failure and 90 (40%) that they did routinely offer
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56 phase 3 cardiac rehabilitation in heart failure. Of the 90 centres that did offer cardiac
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3 rehabilitation in heart failure, 39 (43%) did so only when heart failure was secondary
4 to referral after myocardial infarction or revascularisation. Overall, only 35/224 (16%)
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6
7 responding centres specifically recruited patients with heart failure. Only 33/90 (37%)
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9
10 centres responded to a question asking about their provision of cardiac rehabilitation
11 for patients with heart failure with preserved ejection fraction (diastolic heart failure),
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14 with only one third (11/33) taking patients from this group. Patients with heart failure
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17 and preserved ejection fraction were included in cardiac rehabilitation programmes
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20 by 11/90 (12%) centres, with 79 centres accepting only patients with systolic heart
21 failure. Patients with New York Heart Association (NYHA) class IV disease were
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24 excluded by 53/90 (59%) centres.

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

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43 From the 134 centres that did not routinely offer rehabilitation in heart failure 113
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46 (84%) indicated that a lack of resources was a factor and 73 (54%) indicated that the
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49 exclusion of such a service from commissioning contracts had influenced decisions
50 on its provision. More than half (54%) of the centres expressed confidence in the skill
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52
53 mix and knowledge of their staff to provide cardiac rehabilitation in heart failure.
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55
56 Table 2 summarises the reasons given by the 90 cardiac rehabilitation centres that
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58
59 stated they did not offer cardiac rehabilitation for heart failure. Importantly, overall
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3 146/224 (65%) centres considered that evidence on safety was adequate and
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5 159/224 (71%) did not believe lack of evidence on clinical benefit was an influencing
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7 factor.
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12 <<Table 2 near here>>
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14 15 16 *Comparison between centres that did and did not provide CR in HF*

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18 A higher percentage of patients diagnosed with heart failure were referred to centres
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20 that offered cardiac rehabilitation in heart failure (4.6%) than to those that did not
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22 (0.6%) ($P<0.05$). A statistically significant difference was also seen in the median
23
24 number of patients referred per annum between the centres that routinely offered
25
26 cardiac rehabilitation in heart failure and those that did not (287 versus 202,
27
28 respectively; $P=0.03$). Nearly three out of four patients seen were men: 73% in
29
30 centres offering and 74% in those not offering cardiac rehabilitation in heart failure.
31
32 Patients who survived myocardial infarction (32%) and coronary artery bypass
33
34 surgery (19%) formed the largest proportion of patients with heart failure receiving
35
36 cardiac rehabilitation. The skill mix did not differ significantly between programmes
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38 that did ($n=90$) or did not ($n=134$) offer cardiac rehabilitation (Table 3).
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49 **Stage 2**

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52 Only 35 (16%) of the 224 respondents in stage 1 had indicated that they provided a
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54 separate cardiac rehabilitation programme for people with heart failure. Of these 35
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56 centres, 24 (69%) agreed to provide more information about their heart failure
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3 service and were willing to participate in stage 2 of the survey. Complete stage 2
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5 questionnaires were received from 17 (71%) of these 24 centres.
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10 The geographical area of responding centres was mainly urban (10/17; 59%) or
11
12 mixed rural and urban (7/17; 41%). The number of patients with heart failure seen
13
14 annually varied widely, with 5/17 (29%) centres seeing 10–50 referred patients, 4/17
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16 (24%) centres seeing 51–100 patients, and 3/17 (18%) seeing more than 100
17
18 patients.
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23 Centres with dedicated cardiac rehabilitation services for heart failure were based
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25 mainly in district general hospitals (6/17; 35%) or the community (5/17; 29%) or had
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27 clinics in both settings (4/17; 24%). A combination of hospital based and home
28
29 based programmes was offered by 41% of centres, with 47% offering only hospital
30
31 based programmes. Seven centres offered both centre based and home based
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33 cardiac rehabilitation, and nearly half (8/17) offered only a centre based cardiac
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35 rehabilitation programme. The duration of the cardiac rehabilitation programmes
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37 offered was <6 weeks for 12% of centres, 6–12 weeks for 59%, and >12 weeks for
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39 24%. A home exercise programme was offered in 10 centres.
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46 Supervised exercise training was a key component of almost all (95%) of the
47
48 dedicated cardiac rehabilitation for heart failure programmes, with 11/17 (65%)
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50 centres including sessions lasting up to one hour and 5/17 (29%) including sessions
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52 of up to two hours. All centres provided education on heart failure, self management,
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54 medication, and diet.
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3 Anxiety and depression were assessed by more than 80% (14/17) of centres, with
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5 71% using the hospital anxiety and depression scale (HADS) questionnaire. More
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7 than half of centres referred patients with high levels of anxiety and depression to
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9 their general practitioner or counsellor.
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14 Centres that offered a dedicated rehabilitation programme in heart failure employed
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16 3–4 whole time equivalent members of staff (7/17), with most employing cardiac
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18 rehabilitation nurses, physiotherapists, heart failure specialist nurses, and a
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20 coordinator. Few centres reported employing a psychologist (2/17) or dietician (3/17)
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22 as a member of their cardiac rehabilitation teams.
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27 **Discussion**

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29 Our survey shows that 60% of the cardiac rehabilitation centres in England, Wales,
30
31 and Northern Ireland did not accept patients with heart failure, although most of
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33 those completing the survey accepted that there was good scientific evidence of
34
35 benefit. This is not a new concern. The Healthcare Commission reported in 2007 that
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37 only 5.7% of 6 998 patients with heart failure surveyed were referred for cardiac
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39 rehabilitation.¹³ A 2008 national audit of cardiac rehabilitation in the UK reported that
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41 the cardiac rehabilitation service for heart failure was patchy or non-existent in many
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43 areas,¹¹ and the 2010 NACR report states that 60 477 patients participated in
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45 cardiac rehabilitation although one in four cardiac rehabilitation centres excluded
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47 patients with heart failure and only 1% of participants were referred because of heart
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49 failure.¹⁷ The Healthcare Commission also reviewed progress on the implementation
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51 of the national service framework for coronary heart disease and highlighted the
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53 need to improve access and provision of cardiac rehabilitation services for people
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3 with heart failure.^{13,18} This implementation gap has also been reiterated by the NHS
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5 Institute for Innovation and Improvement.¹⁹ Most cardiac rehabilitation centres are
6
7 not implementing the latest guidance from NICE.²⁰
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12 Our survey aimed to discover why there is a problem with delivery. Most programme
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14 coordinators regarded the major barriers to providing a service for heart failure as
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16 local commissioning arrangements, local patient pathways, other people (for
17
18 example, heart failure specialist nurses) providing a similar service, or lack of
19
20 resources. Only a very small number expressed doubt about safety, their
21
22 competency, or the skill mix. A significant difference was identified in the annual
23
24 number of patients seen in those centres that did and did not have a dedicated heart
25
26 failure programme, with larger programmes more likely to have such a programme.
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28 However, taken as a whole, no difference was seen in the staff mix of programmes
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30 that did or did not specifically recruit patients with heart failure. This suggests that
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32 most existing cardiac rehabilitation centres could provide such a service if
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34 commissioners were to include heart failure in the contract and only a few would
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36 require some further education or expertise.
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44 In the 134/224 (60%) centres that did not routinely offer cardiac rehabilitation in heart
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46 failure in the UK, the main barriers were lack of resources and lack of
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48 commissioning. Nearly one third (29/90) of centres that provided cardiac
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50 rehabilitation in heart failure did not consider a lack of resources—time, staff,
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52 accommodation, transport, or equipment—as an issue. Most (67/90) centres that
53
54 provided cardiac rehabilitation indicated that they had the correct skill mix and
55
56 knowledge to manage patients with heart failure. In contrast to the findings of the
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3 Healthcare Commission, which reported that frontline cardiac rehabilitation services
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5 are unsure about the safety and benefits of rehabilitation in heart failure,¹³ our survey
6
7 found that a lack of evidence on safety or clinical benefit was not a factor that
8
9 influenced most centres' ability to offer cardiac rehabilitation.
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14 Overall, a dedicated cardiac rehabilitation service for heart failure was reported by
15
16 only 35/224 (16%) centres, with 90/224 (40%) offering cardiac rehabilitation to some
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18 patients with heart failure. Of these, a mere 11/90 (12%) provided any support for the
19
20 54% of the heart failure population with heart failure and preserved ejection
21
22 fraction.²¹ The latter presents a similar burden to systolic heart failure in terms of
23
24 healthcare costs, rehospitalisation rates, mortality, exercise intolerance, and quality
25
26 of life.²²⁻²⁴ Good evidence supports the benefits of cardiac rehabilitation in systolic
27
28 heart failure in terms of quality of life, exercise capacity, and reduced rates of
29
30 hospital readmission related to heart failure.⁷ The same cannot be said for heart
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32 failure with preserved ejection fraction, however, for which evidence is limited;
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34 research is therefore needed to assess definitively the effectiveness and cost
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36 effectiveness of exercise based cardiac rehabilitation interventions.
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43 Patients with less severe forms of systolic heart failure (NYHA class I-III) after a
44
45 heart attack or coronary revascularisation have the best chance of being offered
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47 cardiac rehabilitation. One third (27/90) of cardiac rehabilitation centres offering
48
49 services to patients with heart failure offered a home-based programme, and a
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51 similar proportion (30/90) offered a choice of home or centre based cardiac
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53 rehabilitation. The lack of an alternative evidence based intervention to centre based
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55 cardiac rehabilitation and the lack of referral by healthcare professionals may explain
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3 why uptake of cardiac rehabilitation remains suboptimal in patients with heart failure.
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7 The main reasons people give for not accepting an invitation to attend centre based
8 cardiac rehabilitation classes are problems with accessibility and parking at their
9 local hospital, a dislike of groups, and work or domestic commitments.²⁵⁻²⁹ These
10 problems might be overcome by home based programmes, which have been
11 introduced in an attempt to widen access and participation. Evidence on the
12 effectiveness of home based models of cardiac rehabilitation in people with heart
13 failure is needed so that policymakers and commissioners can decide what to
14 provide as part of a comprehensive cardiac rehabilitation service for people with
15 heart disease. A trial based in the United Kingdom of home exercise compared with
16 care by a specialist heart failure nurse, without other educational elements, in
17 patients with stable heart failure on optimised therapy failed to find a benefit in heart
18 failure specific quality of life.³⁰ However, adherence to the programme was relatively
19 low, with participants having a large number of comorbid conditions that may have
20 required more specialist exercise input rather than a nurse led service.
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40 Choice in healthcare is a government priority.³¹ One recent randomised controlled
41 trial of cardiac rehabilitation in a rural setting used a comprehensive cohort design
42 that allowed participants a choice of centre based or home based cardiac
43 rehabilitation.^{32,33} The Cornwall Heart Attack Rehabilitation Management Study
44 (CHARMS) investigators showed that most recruited patients (55%) wanted to
45 choose their method of cardiac rehabilitation and that outcomes did not differ
46 between the randomised and preference arms.³³
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3 In October 2011, NICE published updated guidance on commissioning cardiac
4 rehabilitation services to accompany the recommendations within the NICE clinical
5 guideline on chronic heart failure.²⁰ The advice will be linked to the outcomes and
6 indicators specified in the NHS outcomes framework and should help
7
8 'commissioners in designing services to improve outcomes for patients and to help
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10 the NHS make better use of its resources'.³⁴
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18 ***Limitations of the study***

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

33 Commissioning groups should follow the recently developed NHS Commission's
34 guide to coronary heart disease and the need for cardiac rehabilitation³⁵ and the
35 recently published NICE guidance on commissioning on cardiac rehabilitation³⁴ for
36 all newly diagnosed patients with chronic heart failure. Part of this guidance
37 recommends offering all patients a choice of venue (home or hospital) for cardiac
38 rehabilitation, although there is little evidence on the effectiveness of home based
39 models of cardiac rehabilitation in people with heart failure, including programmes
40 that may be suitable for patients with heart failure and preserved ejection fraction—
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robust evidence for these is needed.

Footnotes

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Contributors: RL and RST conceived the original idea of conducting the survey. HD, RST, RL, and JP wrote the paper. The survey questionnaires were designed by the REACH-HF Study Group and administered by CP via the National Audit of Cardiac Rehabilitation office in York and by JW and HD in Truro. CP and JP were involved in collating the data and data input. JP and RT analysed the data. HD and RL are joint guarantors for this study. The REACH-HF investigators include the authors HD, RL, RST, and JW, as well as Patrick Doherty, Kate Jolly, Russell Davis, Sally Singh, Jackie Austin, Robert Williams, Colin Green, Colin Greaves, Robin van Lingen, Lorna Geach and John Packard.

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1
2
3 partners, or children have no financial relationships that may be relevant to the
4
5 submitted work; and (4) none have non-financial interests that may be relevant to the
6
7 submitted work.
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12 Ethical approval: Not required
13

14 15 16 17 **References**

- 18 1. Adams KF. Translating heart failure guidelines into clinical practice: clinical science and
19 the art of medicine. *Curr Cardiol Rep* 2001;**3**(2):130–5.
20
- 21 2. Bethell HJ, Evans JA, Turner SC, et al. The rise and fall of cardiac rehabilitation in the
22 United Kingdom since 1998. *J Public Health (Oxf)* 2007;**29**(1):57–61.
23
- 24 3. Hunt SA, Baker DW, Chin MH, et al. ACC/AHA guidelines for the evaluation and
25 management of chronic heart failure in the adult: executive summary a report of the
26 American College of Cardiology/American Heart Association Task Force on Practice
27 Guidelines (Committee to Revise the 1995 Guidelines for the Evaluation and
28 Management of Heart Failure): developed in collaboration with the International Society
29 for Heart and Lung Transplantation; endorsed by the Heart Failure Society of America.
30 *Circulation* 2001;**104**(24):2996–3007.
31
- 32 4. Remme WJ, Swedberg K. Guidelines for the diagnosis and treatment of chronic heart
33 failure. *Eur Heart J* 2001;**22**(17):1527–60.
34
- 35 5. Task Force on Heart Failure of the European Society of Cardiology. Guidelines for the
36 diagnosis of heart failure. *Eur Heart J* 1995;**16**(6):741–51.
37
- 38 6. European Heart Failure Training Group. Experience from controlled trials of physical
39 training in chronic heart failure. Protocol and patient factors in effectiveness in the
40 improvement in exercise tolerance. *Eur Heart J* 1998;**19**:466–75.
41
- 42 7. Davies EJ, Rees K, Moxham T, et al. Exercise based rehabilitation for heart failure. *Eur*
43 *J Heart Fail* 12.7 (2010): 706-15
44
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60

- 1
2
3 8. NICE. *Chronic heart failure. National clinical guidelines for diagnosis and management*
4 *in primary and secondary care. National guideline No 5.* London: Royal College of
5 Physicians, 2003.
6
7
- 8
9 9. Hunt SA, Abraham WT, Chin MH, et al. 2009 focused update incorporated into the
10 ACC/AHA 2005 guidelines for the diagnosis and management of heart failure in adults:
11 a report of the American College of Cardiology Foundation/American Heart Association
12 Task Force on Practice Guidelines developed in collaboration with the International
13 Society for Heart and Lung Transplantation. *Circulation* 2009;**119**(14):e391–479.
14
15
- 16 10. Dickstein K, Cohen-Solal A, Filippatos G, et al. ESC guidelines for the diagnosis and
17 treatment of acute and chronic heart failure 2008: the Task Force for the Diagnosis and
18 Treatment of Acute and Chronic Heart Failure 2008 of the European Society of
19 Cardiology. Developed in collaboration with the Heart Failure Association of the ESC
20 (HFA) and endorsed by the European Society of Intensive Care Medicine (ESICM). *Eur*
21 *Heart J* 2008;**29**:2388–442.
22
23
- 24 11. British Heart Foundation Cardiac Care and Education Research Group. *The National*
25 *Audit of Cardiac Rehabilitation. Annual statistical report 2009.* BHF: London, 2009.
26 Available at: www.cardiacrehabilitation.org.uk/nacr/docs/2009.pdf (last accessed 12
27 November 2009).
28
29
- 30 12. Bjarnason-Wehrens B, McGee H, Zwisler AD, et al. Cardiac rehabilitation in Europe:
31 results from the European Cardiac Rehabilitation Inventory Survey. *Eur J Cardiovasc*
32 *Prev Rehabil* 2010;**17**(4):410–8.
33
34
- 35 13. Healthcare Commission. *Pushing the boundaries.* London: Healthcare Commission,
36 2007.
37
38
- 39 14. Lam CS, Donal E, Kraigher-Krainer E, et al. Epidemiology and clinical course of heart
40 failure with preserved ejection fraction. *Eur J Heart Fail* 2011;**13**:18–28.
41
42
- 43 15. Lewin B. Effects of self-help post-myocardial-infarction rehabilitation on psychological
44 adjustment and use of health services. *Lancet* 1992;**339**:1036–40.
45
46
47
48
49
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58
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60

16. Dalal HM, Evans PH. Achieving national service framework standards for cardiac rehabilitation and secondary prevention. *BMJ* 2003;326:481-4.
17. British Heart Foundation Cardiac Care and Education Research Group. *National audit of cardiac rehabilitation. Annual statistical report 2010*. London: BHF, 2010.
18. Department of Health. *Coronary heart disease: national service framework for coronary heart disease*. London: DH, 2000.
19. NHS Institute for Innovation and Improvement. *Delivering quality and value. Focus on: heart failure*. Coventry: NHS Institute for Innovation and Improvement, 2009. Available at: www.institute.nhs.uk (last accessed 11 November 2009).
20. NICE. *Chronic Heart Failure. Management of chronic heart failure in adults in primary and secondary care*. NICE clinical guideline CG108. London: NICE, 2010. Available at: <http://guidance.nice.org.uk/nicemedia/live/13099/50514/50514.pdf> (last accessed 2 September 2011).
21. Owan TE, Redfield MM. Epidemiology of diastolic heart failure. *Prog Cardiovasc Dis* 2005;47: 320-32.
22. Liao L, Anstrom KJ, Gottdiener JS, et al. Long-term costs and resource use in elderly participants with congestive heart failure in the Cardiovascular Health Study. *Am Heart J* 2007;153:245-52.
23. Kitzman DW, Little WC, Brubaker PH, et al. Pathophysiological characterization of isolated diastolic heart failure in comparison to systolic heart failure. *JAMA* 2002;288:2144-50.
24. Gottdiener JS, McClelland RL, Marshall R, et al. Outcome of congestive heart failure in elderly persons: influence of left ventricular systolic function. The Cardiovascular Health Study. *Ann Intern Med* 2002;137:631-9.
25. Jones M, Jolly K, Raftery J, et al. 'DNA' may not mean 'did not participate': a qualitative study of reasons for non-adherence at home and centre-based cardiac rehabilitation. *Fam Pract* 2007;24(4):343-57.

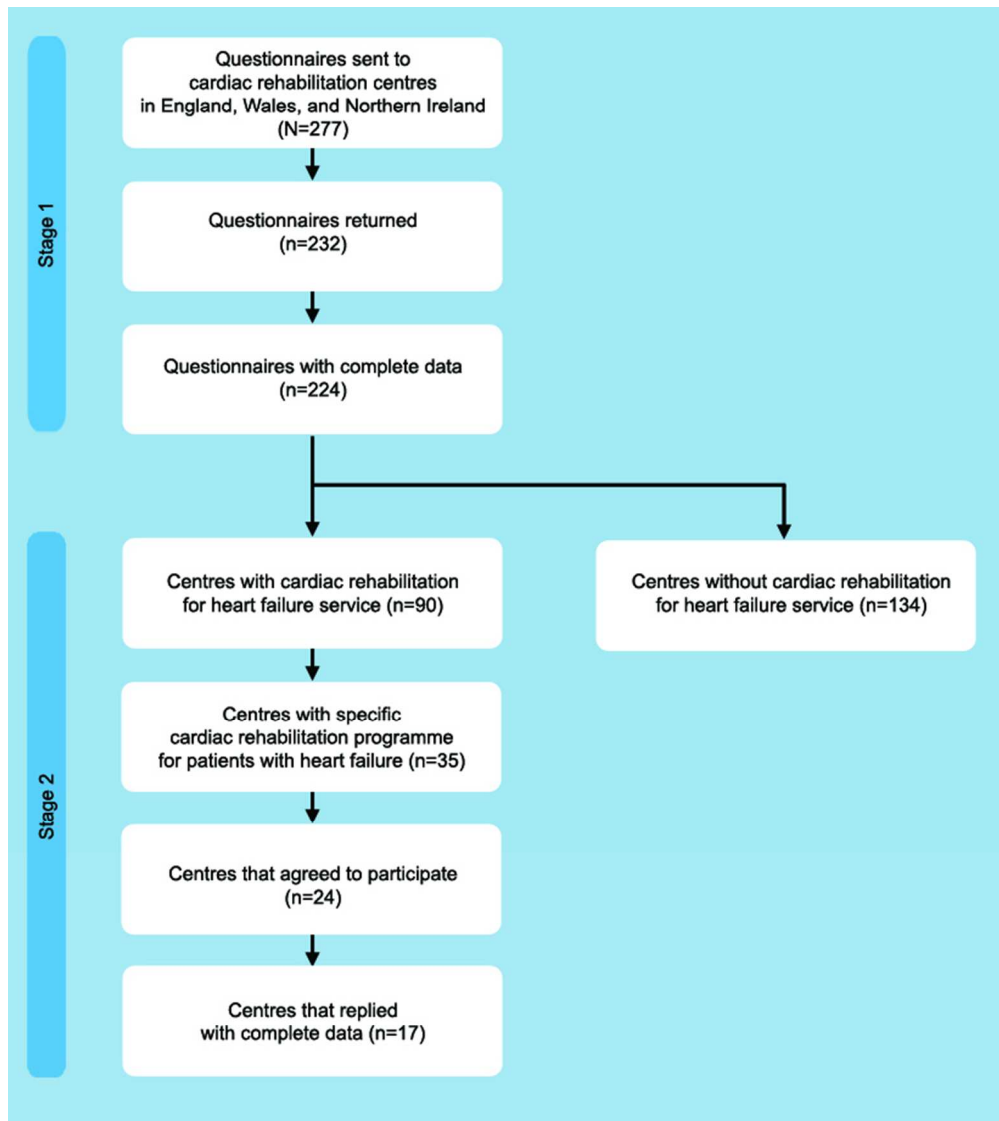
- 1
2
3 26. Ades PA, Waldmann ML, McCann WJ, et al. Predictors of cardiac rehabilitation
4 participation in older coronary patients. *Arch Intern Med* 1992;**152**(5):1033–5.
5
6
7 27. Ferguson EE. Cardiac rehabilitation – an effective and comprehensive but underutilized
8 program to reduce cardiovascular risk in patients with CVD. *US Cardiovasc Dis*
9 2006;**II**:14–6.
10
11
12
13 28. Campbell N, Grimshaw J, Rawles J, et al. Cardiac rehabilitation: the agenda set by post-
14 myocardial infarction patients. *Health Educ J* 1994;**53**:409–20.
15
16
17 29. Pell J, Pell A, Morrison C, et al. Retrospective study of influence of deprivation on
18 uptake of cardiac rehabilitation. *BMJ* 1996;**313**:267–8.
19
20
21 30. Jolly K, Taylor RS, Lip GY, et al. A randomized trial of the addition of home-based
22 exercise to specialist heart failure nurse care: the Birmingham Rehabilitation Uptake
23 Maximisation study for patients with Congestive Heart Failure (BRUM-CHF) study. *Eur J*
24 *Heart Fail* 2009;**11**(2):205–13.
25
26
27
28
29 31. Lewis RQ. A new direction for NHS community services. *BMJ* 2006;**332**(7537):315.
30
31 32. Wingham J, Dalal HM, Sweeney KG, et al. Listening to patients: choice in cardiac
32 rehabilitation. *Eur J Cardiovasc Nurs* 2006;**5**:289-94.
33
34
35 33. Dalal HM, Evans PH, Campbell JL, et al. Home-based versus hospital-based
36 rehabilitation after myocardial infarction: a randomized trial with preference arms –
37 Cornwall Heart Attack Rehabilitation Management Study (CHARMS). *Int J Cardiol*
38 2007;**119**(2):202–11.
39
40
41 34. National Institute for Health and Clinical Excellence. *Advice from NICE aims to improve*
42 *commissioning of services for people with chronic heart failure and for people who need*
43 *cardiac rehabilitation*. London: NICE, 2011. Available at:
44 www.nice.org.uk/newsroom/pressreleases/chronicheartfailurecardiacrehabilitationcommi
45 [ssioningguides.jsp](http://www.nice.org.uk/newsroom/pressreleases/chronicheartfailurecardiacrehabilitationcommi) (last accessed 23 November 2011).
46
47
48
49
50
51
52
53 35. Department of Health. *Commissioning a cardiac rehabilitation service: reabling people*
54 *with coronary heart disease*. London: DH, 2010. Available at:
55
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www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/Browsable/DH_117504 (last accessed 23 November 2011).

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Study flow chart
290x324mm (72 x 72 DPI)

Table 1 Summary of responses to the key questions in stage 1.

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

NA=not applicable.

Table 2 Reasons cardiac rehabilitation programmes give for not offering cardiac rehabilitation for patients with heart failure.

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

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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.

| Discipline | Number (%) of centres | | P value |
|-------------------------------------|--|---|---------|
| | Offering cardiac rehabilitation for heart failure (n=90) | Not offering cardiac rehabilitation for heart failure (n=134) | |
| Consultant/doctor | 7 (7.8) | 10 (7.5) | 0.186 |
| Physiotherapist/exercise specialist | 39 (43.3) | 49 (36.6) | 0.210 |
| Physiotherapy assistant | 15 (16.7) | 25 (18.7) | 0.736 |
| Dietician | 46 (51.1) | 70 (52.2) | 0.538 |
| Psychologist | 9 (10) | 13 (9.7) | 0.122 |
| Secretary/administrator | 56 (62.2) | 81 (60.4) | 0.700 |
| Healthcare assistant | 5 (5.6) | 13 (9.7) | 0.587 |

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
Other (please specify) _____

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.

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*

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*

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.*

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*

Q3 Please define the geographical area served your department serves?

- Mainly urban*
- Mainly rural*
- Mixed*

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?

| | Yes | No |
|------------------------|--------------------------|--------------------------|
| NYHA Class | <input type="checkbox"/> | <input type="checkbox"/> |
| Ejection Fraction | <input type="checkbox"/> | <input type="checkbox"/> |
| HF patients with ICD's | <input type="checkbox"/> | <input type="checkbox"/> |

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

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

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 Go to Q16

Between 6-12 weeks Go to Q16

More than 12 weeks . Go to Q15

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

Q19 Please describe the exercises used , the intensity of the exercises and comment on patient to staff ratio during the exercise sessions.

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?

| | Yes | No |
|-----------------------|--------------------------|--------------------------|
| 6 min Walk Test | <input type="checkbox"/> | <input type="checkbox"/> |
| Shuttle Walk Test | <input type="checkbox"/> | <input type="checkbox"/> |
| Other, please specify | | |
| | | |

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.....

| | Yes | No |
|--|--------------------------|--------------------------|
| Heart Failure | <input type="checkbox"/> | <input type="checkbox"/> |
| Self-Management Strategies (monitoring for fluid, breathing changes, pain) | <input type="checkbox"/> | <input type="checkbox"/> |
| Medication | <input type="checkbox"/> | <input type="checkbox"/> |
| Diet | <input type="checkbox"/> | <input type="checkbox"/> |
| Benefits | <input type="checkbox"/> | <input type="checkbox"/> |
| Household Adaptations | <input type="checkbox"/> | <input type="checkbox"/> |

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?

Referred to their GP

Referred to a counsellor

Referred to CPN

Other, please specify

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

Q31 Do you include any training or support for carers?

Yes Go to Q32

No Go to Q33

Q30 Please describe what method you use

Q32 Please describe what support you provide.

Q33 Do you collect the following data on patients who receive cardiac rehabilitation for HF?

| | Yes | No |
|--|--------------------------|--------------------------|
| First Assessment data using the NACR computer database | <input type="checkbox"/> | <input type="checkbox"/> |
| Minnesota Living with Heart Failure | <input type="checkbox"/> | <input type="checkbox"/> |

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.

| | 0-24% | 25-49% | 50-74% | >75% |
|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Hospital Clinician | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| GP/Practice Nurse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Heart Failure Specialist Nurse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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

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%..... | <input type="checkbox"/> |
| 25-49%..... | <input type="checkbox"/> |
| 50-74%..... | <input type="checkbox"/> |
| >74%..... | <input type="checkbox"/> |

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

| | Yes | No |
|---|--------------------------|--------------------------|
| Financial Pressures | <input type="checkbox"/> | <input type="checkbox"/> |
| Lack of clinical guidelines/evidence about suitability | <input type="checkbox"/> | <input type="checkbox"/> |
| Risk of exercise in these patients | <input type="checkbox"/> | <input type="checkbox"/> |
| 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

2011-000787

STROBE Statement—Checklist of items for *cross-sectional studies*

| | Item No | |
|---------------------------|---------|--|
| Title and abstract | 1 | <p>Patients with heart failure are not receiving cardiac rehabilitation: a national survey of the common barriers</p> <hr/> <p>Objective. To determine why so few patients with chronic heart failure in England, Wales, and Northern Ireland take part in cardiac rehabilitation</p> <p>Design. Two stage, postal questionnaire-based, national survey.</p> <p>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.</p> <p>Main outcome measures. N/A.</p> <p>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.</p> <hr/> <p>Introduction</p> <p>Background/rationale</p> |
| | 2 | <p>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</p> |

| | | |
|------------------------------|-----|--|
| | | failure |
| Objectives | 3 | 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 |
| 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 | Not applicable |
| Discussion | | |
| Key results | 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 | | |
| Funding | 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 |



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

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

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Supplementary files: 2 survey questionnaires

Summary

Article focus

- To determine why so few patients with chronic heart failure in England, Wales, and Northern Ireland take part in cardiac rehabilitation
- To find out the features of cardiac rehabilitation centres that offer a service to patients with heart failure

Key messages

- Most cardiac rehabilitation centres in England, Wales, and Northern Ireland do not routinely offer cardiac rehabilitation to people with chronic heart failure
- Only one in six cardiac rehabilitation centres offers a dedicated cardiac rehabilitation programme for patients with heart failure
- Those with heart failure (New York Heart Association (NYHA) stages I to III) after myocardial infarction or coronary revascularisation have the best chance of getting on a cardiac rehabilitation programme
- Lack of resources and exclusion from local commissioning agreements are seen as the main reasons for not offering cardiac rehabilitation to people with heart failure

Strengths and limitations

- The first comprehensive national survey of cardiac rehabilitation services for patients with heart failure, with a response rate of 84% conducted with the National Audit of Cardiac Rehabilitation (NACR)
- The conclusions that can be drawn from stage 2 of the survey are limited because of the low response rate

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.

Conclusion 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.^{3,4} Exercise training has been evaluated intensively with respect to the benefit that it may provide in the treatment of those with heart failure.⁵ 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.^{6,7} 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.'⁸

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.^{3,4,9,10} 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.

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5 Despite the clear recommendations in the various guidelines, only a small minority of
6
7 people affected by heart failure in the UK, and elsewhere, have participated in
8
9 cardiac rehabilitation.^{11,12} In the UK between April 2007 and March 2008, only 1% of
10
11 patients who participated in cardiac rehabilitation were referred because of heart
12
13 failure,¹¹ and a recent European survey showed that <20% of patients with heart
14
15 failure are involved in cardiac rehabilitation.¹² Two main reasons may explain the
16
17 suboptimal provision and uptake of this intervention in people with cardiac
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19 rehabilitation: previous guidelines¹³⁻¹⁵ provided no specific details for healthcare
20
21 planners about how and where these cardiac rehabilitation services would best be
22
23 delivered, and healthcare staff involved in frontline cardiac rehabilitation services are
24
25 unsure about the safety and benefits of cardiac rehabilitation in people with heart
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27 failure.¹⁶ Recent guidelines from Europe and North America give more
28
29 detailed information on the content and provision of rehabilitation programmes
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31 in heart failure.^{17,18}

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38 Most trials of cardiac rehabilitation have excluded patients with heart failure and
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40 preserved ejection fraction (diastolic heart failure), who make up 54% of the
41
42 population with heart failure, and it is not clear to what extent they are specifically
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44 excluded from cardiac rehabilitation in routine practice.¹⁹ In the UK, an emphasis has
45
46 been placed on providing choice between hospital based rehabilitation and home
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48 based individual programmes such as the Heart Manual²⁰ after myocardial infarction,
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50 as such a choice has been shown to increase uptake.²¹

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56 We conducted a two stage national survey in 2009-10. This study aimed firstly to
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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. 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 training⁸) in England, Wales, and Northern Ireland registered on the National Audit of Cardiac Rehabilitation (NACR) database 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 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 on and available for download from 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 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 HF and those that did not. We made comparisons using the χ^2 test for binary data and Mann-Whitney U tests for ordinal data. We analysed data with SPSS software (version 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

1
2
3 routinely offer phase 3 cardiac rehabilitation to people with heart failure?', which
4
5 meant that 224 (81%) responses were eligible for full analysis. Table 1 summarises
6
7 the response to the key questions in stage 1.
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10
11 <<Figure 1 near here>>
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14 <<Table 1 near here>>
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18 Of the 224 centres with complete responses, 134 (60%) reported that they did not
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20 routinely accept people with heart failure and 90 (40%) that they did routinely offer
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22 phase 3 cardiac rehabilitation in heart failure. Of the 90 centres that did offer cardiac
23
24 rehabilitation in heart failure, 39 (43%) did so only when heart failure was secondary
25
26 to referral after myocardial infarction or revascularisation. Overall, only 35/224 (16%)
27
28 responding centres specifically recruited patients with heart failure. Only 33/90 (37%)
29
30 centres responded to a question asking about their provision of cardiac rehabilitation
31
32 for patients with heart failure with preserved ejection fraction (diastolic heart failure),
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34 with only one third (11/33) taking patients from this group. Patients with heart failure
35
36 and preserved ejection fraction were included in cardiac rehabilitation programmes
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38 by 11/90 (12%) centres, with 79 centres accepting only patients with systolic heart
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40 failure. Patients with New York Heart Association (NYHA) class IV disease were
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42 excluded by 53/90 (59%) centres.
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50 Of the 90 centres that did offer cardiac rehabilitation for heart failure, 35 (39%) had a
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52 specific cardiac rehabilitation programme for this patient group. Of these, 27 (30%)
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54 offered a home based cardiac rehabilitation programme such as the Heart Manual or
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56 the British Heart Foundation's Heart Failure Plan (see footnote). Hospital-based
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3 rehabilitation for groups was offered in 72 (80%) centres, with only 30 (33%) offering
4 a choice between home based and centre based programmes (Table 1).
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10 From the 134 centres that did not routinely offer rehabilitation in heart failure, 113
11 (84%) indicated that a lack of resources was a factor and 73 (54%) indicated that the
12 exclusion of such a service from commissioning contracts had influenced decisions
13 on its provision. More than half (54%) of the centres expressed confidence in the skill
14 mix and knowledge of their staff to provide cardiac rehabilitation in heart failure.
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20 Table 2 summarises the results of the perceived barriers given by the 90 cardiac
21 rehabilitation centres that offer cardiac rehabilitation for heart failure. Importantly,
22 overall 146/224 (65%) centres considered that evidence on safety was adequate and
23 159/224 (71%) did not believe lack of evidence on clinical benefit was an influencing
24 factor.
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34 <<Table 2 near here>>
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38 *Comparison between centres that did and did not provide CR in HF (some data*
39 *obtained directly from the NACR database)*
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42 A higher percentage of patients diagnosed with heart failure were referred to centres
43 that offered cardiac rehabilitation in heart failure (13 01/28 231 (4.6%)) than to those
44 that did not (185/32 246 (0.6%)) ($P<0.05$). A statistically significant difference was
45 also seen in the median number of patients referred per annum between the centres
46 that routinely offered cardiac rehabilitation in heart failure and those that did not (287
47 versus 202, respectively; $P=0.03$). Nearly three out of four patients seen were men:
48 57/78 (73%) in centres offering and 85/115 (74%) in those not offering cardiac
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3 rehabilitation in heart failure. Patients who survived myocardial infarction
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5 (8 448/28 231 (32%)) and coronary artery bypass surgery (5 047/28 231 (18%))
6
7 formed the largest proportion of patients with heart failure receiving cardiac
8
9 rehabilitation. The skill mix did not differ significantly between programmes that did
10
11 (n=90) or did not (n=134) offer cardiac rehabilitation except for the number of nurses.
12
13
14 Centres not offering rehabilitation in heart failure had a mean of 2.67 (sd 1.79)
15
16 whole time nurses compared to a mean of 2.24 (sd 1.85) in centres offering a
17
18 dedicated rehabilitation programme in heart failure-a difference which was
19
20 statistically significant (p=0.039) (Table 3).
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25 <<Table 3 near here>>
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29 **Stage 2**

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31 Only 35 (16%) of the 224 respondents in stage 1 had indicated that they provided a
32
33 separate cardiac rehabilitation programme for people with heart failure. Of these 35
34
35 centres, 24 (69%) agreed to provide more information about their heart failure
36
37 service and were willing to participate in stage 2 of the survey. Complete stage 2
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39 questionnaires were received from 17 (71%) of these 24 centres.
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45 The geographical area of responding centres was mainly urban (10/17; 59%) or
46
47 mixed rural and urban (7/17; 41%). The number of patients with heart failure seen
48
49 annually varied widely, with 5/17 (29%) centres seeing 10–50 referred patients, 4/17
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51 (24%) centres seeing 51–100 patients, and 3/17 (18%) seeing more than 100
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53 patients.
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3 Centres with dedicated cardiac rehabilitation services for heart failure were based
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5 mainly in district general hospitals (6/17; 35%) or the community (5/17; 29%) or had
6
7 clinics in both settings (4/17; 24%). A combination of hospital based and home
8
9 based programmes was offered by 7/17 (41%) of centres, with 8/17 (47%) offering
10
11 only hospital based programmes. Seven centres offered both centre based and
12
13 home based cardiac rehabilitation, and nearly half (8/17) offered only a centre based
14
15 cardiac rehabilitation programme. The duration of the cardiac rehabilitation
16
17 programmes offered was <6 weeks for 2/17 (12%) of centres, 6–12 weeks for 10/17
18
19 59%, and >12 weeks for 4/17 (24%). A home exercise programme was offered in 10
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21 centres.
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27 Supervised exercise training was a key component of almost all (16/17 (94%)) of the
28
29 dedicated cardiac rehabilitation for heart failure programmes, with 11/17 (65%)
30
31 centres including sessions lasting up to one hour and 5/17 (29%) including sessions
32
33 of up to two hours. The content of the exercise training variably included warm-up
34
35 sessions followed by aerobic exercises and resistance training with varying levels of
36
37 intensity – generally three levels depending on the patient's exercise capacity
38
39 assessed using rating of perceived exertion. The equipment used included exercise
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41 bikes, rowing machines, treadmills, arm bikes, cross trainers, and step up
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43 equipment. Normal physical activity (that is, walking) was used in 13/17 (76%) of
44
45 centres to promote fitness. All centres provided education on heart failure, self
46
47 management, medication, and diet.
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54 Anxiety and depression were assessed by more than 80% (14/17) of centres, with
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56 71% using the hospital anxiety and depression scale (HADS) questionnaire. More
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3 than half of centres referred patients with high levels of anxiety and depression to
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5 their general practitioner or counsellor.
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10 Centres that offered a dedicated rehabilitation programme in heart failure employed
11
12 3–4 whole time equivalent members of staff (7/17), with most employing cardiac
13
14 rehabilitation nurses, physiotherapists, heart failure specialist nurses, and a
15
16 coordinator. Few centres reported employing a psychologist (2/17) or dietician (3/17)
17
18 as a member of their cardiac rehabilitation teams.
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20 21 22 23 **Discussion**

24
25 Our survey shows that 60% of the cardiac rehabilitation centres in England, Wales,
26
27 and Northern Ireland did not accept patients with heart failure, although most of
28
29 those completing the survey accepted that there was good scientific evidence of
30
31 benefit. This is not a new concern. The Healthcare Commission reported in 2007 that
32
33 only 5.7% of 6 998 patients with heart failure surveyed were referred for cardiac
34
35 rehabilitation.¹⁶ A recent national audit of cardiac rehabilitation in the UK reported
36
37 that the cardiac rehabilitation service for heart failure was patchy or non-existent in
38
39 many areas,¹¹ and the 2010 NACR report states that 60 477 patients participated in
40
41 cardiac rehabilitation although one in four cardiac rehabilitation centres excluded
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43 patients with heart failure and only 1% of participants were referred because of heart
44
45 failure.²² The Healthcare Commission also reviewed progress on the implementation
46
47 of the national service framework for coronary heart disease and highlighted the
48
49 need to improve access and provision of cardiac rehabilitation services for people
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51 with heart failure.^{16,23} This implementation gap has also been reiterated by the NHS
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53 Institute for Innovation and Improvement.²⁴ Most cardiac rehabilitation centres are
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3 not implementing the latest guidance from NICE.¹⁰
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8 Our survey aimed to discover why there is a problem with delivery. Most programme
9 coordinators regarded the major barriers to providing a service for heart failure as
10 local commissioning arrangements, local patient pathways, other people (for
11 example, heart failure specialist nurses) providing a similar service, or lack of
12 resources. Only a very small number expressed doubt about safety, their
13 competency, or the skill mix. A significant difference was identified in the annual
14 number of patients seen in those centres that did and did not have a dedicated heart
15 failure programme, with larger programmes more likely to have such a programme.
16 However, taken as a whole, no difference was seen in the staff mix of programmes
17 that did or did not specifically recruit patients with heart failure save for the number of
18 nurses who featured prominently and interestingly were represented in higher
19 numbers in centres that did not offer a dedicated rehabilitation programme in heart
20 failure. This suggests that most existing cardiac rehabilitation centres could provide
21 such a service if commissioners were to include heart failure in the contract and only
22 a few would require some further education or expertise. It is also noteworthy that
23 while 60-62% of cardiac rehabilitation centres have administrative and secretarial
24 support, less than 8% have direct involvement from a physician. Madden et al have
25 suggested that: 'Rehabilitation might be perceived differently if presented as part of
26 a treatment programme prescribed by cardiologists rather than as an optional
27 lifestyle improver suggested by nurses, as is current UK practice'.²⁵
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54 In contrast to the findings of the Healthcare Commission, which reported that
55 frontline cardiac rehabilitation services are unsure about the safety and benefits of
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3 rehabilitation in heart failure,¹⁶ our survey found that a lack of evidence on safety or
4
5 clinical benefit was not a factor that influenced most centres' ability to offer cardiac
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7 rehabilitation.
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11 In this survey, only 11/90 (12%) of centres provided any support for the 54% of the
12
13 heart failure population with heart failure and preserved ejection fraction.²⁶ The latter
14
15 presents a similar burden to systolic heart failure in terms of healthcare costs,
16
17 rehospitalisation rates, mortality, exercise intolerance, and quality of life.²⁷⁻²⁹ Good
18
19 evidence supports the benefits of cardiac rehabilitation in systolic heart failure in
20
21 terms of quality of life, exercise capacity, reduced rates of hospital readmission
22
23 related to heart failure, and potential improvements in overall survival.^{6,7} However,
24
25 the same cannot be said for heart failure with preserved ejection fraction, for which
26
27 evidence is limited; research is therefore needed to assess definitively the
28
29 effectiveness and cost effectiveness of exercise based cardiac rehabilitation
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31 interventions.
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39 Patients with less severe forms of systolic heart failure (NYHA class I-III) after a
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41 heart attack or coronary revascularisation have the best chance of being offered
42
43 cardiac rehabilitation. The lack of an alternative to centre based cardiac
44
45 rehabilitation, because of a lack of evidence, and the lack of referral by healthcare
46
47 professionals may explain why uptake of cardiac rehabilitation remains suboptimal in
48
49 patients with heart failure. Offering 'real and unconstrained'²⁵ choice of home based
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51 and centre based rehabilitation may help to improve the uptake of rehabilitation in
52
53 heart failure, as it has in patients after myocardial infarction.^{21,30}
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3 The main reasons people give for not accepting an invitation to attend centre based
4 cardiac rehabilitation classes are problems with accessibility and parking at their
5 local hospital, a dislike of groups, and work or domestic commitments.³¹⁻³⁵ These
6 problems might be overcome by home based programmes, which have been
7 introduced in an attempt to widen access and participation. Evidence on the
8 effectiveness of home based models of cardiac rehabilitation in people with heart
9 failure is needed so that policymakers and commissioners can decide what to
10 provide as part of a comprehensive cardiac rehabilitation service for people with
11 heart disease. A trial based in the UK of home exercise compared with care by a
12 specialist heart failure nurse, without other educational elements, in patients with
13 stable heart failure on optimised therapy failed to find a benefit in heart failure
14 specific quality of life.³⁶ However, adherence to the programme was relatively low,
15 with participants having a large number of comorbid conditions that may have
16 required more specialist exercise input rather than a nurse led service.
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36 Choice in healthcare is a government priority.³⁷ One recent randomised controlled
37 trial of cardiac rehabilitation in a rural setting used a comprehensive cohort design
38 that allowed participants a choice of centre based or home based cardiac
39 rehabilitation.^{30,38} The Cornwall Heart Attack Rehabilitation Management Study
40 (CHARMS) investigators showed that most recruited patients (55%) wanted to
41 choose their method of cardiac rehabilitation and that outcomes did not differ
42 between the randomised and preference arms.³⁸
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54 In October 2011, NICE published updated guidance on commissioning cardiac
55 rehabilitation services to accompany the recommendations within the NICE clinical
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3 guideline on chronic heart failure.¹⁰ The advice will be linked to the outcomes and
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5 indicators specified in the NHS outcomes framework and should help
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7 'commissioners in designing services to improve outcomes for patients and to help
8
9 the NHS make better use of its resources'.³⁹
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12 13 14 **Limitations of the study**

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16 The conclusions that can be drawn from stage 2 of the survey are limited because of
17
18 the low response rate (n=17). Although we obtained detailed information about
19
20 centres that provided a separate cardiac rehabilitation programme for patients with
21
22 heart failure, inferences from this part of the study should be treated with caution.
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25 26 27 **Recommendations from this study**

28
29 Commissioning groups should follow the recently developed NHS Commission's
30
31 guide to coronary heart disease and the need for cardiac rehabilitation⁴⁰ and the
32
33 recently published NICE guidance on commissioning on cardiac rehabilitation³⁹ for
34
35 all newly diagnosed patients with chronic heart failure. Part of this guidance
36
37 recommends offering all patients a choice of venue (home or hospital/centre based)
38
39 for cardiac rehabilitation, although there is little evidence on the effectiveness of
40
41 home based models of cardiac rehabilitation in people with heart failure, including
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43 programmes that may be suitable for patients with heart failure and preserved
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45 ejection fraction—robust evidence for these is needed.
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50 51 **Footnotes**

52
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2
3 for help with the literature search. The BHF Heart Failure Plan has now been
4
5 replaced with An Everyday Guide to Living with Heart Failure
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9
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11 RST, RL, and JP wrote the paper. The survey questionnaires were designed by the
12 BHF Care and Education Research Group at York and the REACH-HF Study Group
13 and administered by CP via the National Audit of Cardiac Rehabilitation office in
14 York and by JW and HD in Truro. CP and JP were involved in collating the data and
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3 submitted work; and (4) none have non-financial interests that may be relevant to the
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5 submitted work.
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10 Data sharing: The Excel spreadsheets with responses from the Stage 1 and Stage 2
11
12 surveys and the data supplied by the NACR for this study will be placed in the Dryad
13
14 repository and readers can access this via the DOI:xxx.
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16 The demographic data from the centres are anonymous and the risk of identification
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18 of individual centres is low
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24 Ethical approval: Not required.
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28 **References**

- 29
30 1. Adams KF. Translating heart failure guidelines into clinical practice: clinical science and
31
32 the art of medicine. *Curr Cardiol Rep* 2001;**3**(2):130–5.
33
- 34 2. Bethell HJ, Evans JA, Turner SC, et al. The rise and fall of cardiac rehabilitation in the
35
36 United Kingdom since 1998. *J Public Health (Oxf)* 2007;**29**(1):57–61.
37
- 38 3. Hunt SA, Abraham WT, Chin MH, et al. 2009 focused update incorporated into the
39
40 ACC/AHA 2005 guidelines for the diagnosis and management of heart failure in adults:
41
42 a report of the American College of Cardiology Foundation/American Heart Association
43
44 Task Force on Practice Guidelines developed in collaboration with the International
45
46 Society for Heart and Lung Transplantation. *Circulation* 2009;**119**(14):e391–479.
47
- 48 4. Dickstein K, Cohen-Solal A, Filippatos G, et al. ESC guidelines for the diagnosis and
49
50 treatment of acute and chronic heart failure 2008: the Task Force for the Diagnosis and
51
52 Treatment of Acute and Chronic Heart Failure 2008 of the European Society of
53
54 Cardiology. Developed in collaboration with the Heart Failure Association of the ESC
55
56
57
58
59
60

- 1
2
3 (HFA) and endorsed by the European Society of Intensive Care Medicine (ESICM). *Eur*
4 *Heart J* 2008;**29**:2388–442.
5
6
7 5. European Heart Failure Training Group. Experience from controlled trials of physical
8 training in chronic heart failure. Protocol and patient factors in effectiveness in the
9 improvement in exercise tolerance. *Eur Heart J* 1998;**19**:466–75.
10
11
12 6. Davies EJ, Rees K, Moxham T, et al. Exercise based rehabilitation for heart failure. *Eur*
13 *J Heart Fail* 2010;**12**:706-15.
14
15
16 7. Piepoli MF, Davos C, Francis DP, et al. Exercise training meta-analysis of trials in
17 patients with chronic heart failure (ExTraMATCH). *BMJ* 2004;**328**:189.
18
19
20 8. Bethell H, Lewin R, Dalal H. Cardiac rehabilitation in the United Kingdom. *Heart*
21 2009;**95**:271-5.
22
23
24 9. NICE. *Chronic heart failure. National clinical guidelines for diagnosis and management*
25 *in primary and secondary care. National guideline No 5.* London: Royal College of
26 Physicians, 2003.
27
28
29 10. NICE. *Chronic heart failure. Management of chronic heart failure in adults in primary*
30 *and secondary care.* NICE clinical guideline CG108. London: NICE, 2010. Available at:
31 <http://guidance.nice.org.uk/nicemedia/live/13099/50514/50514.pdf> (last accessed 2
32 September 2011).
33
34
35 11. British Heart Foundation Cardiac Care and Education Research Group. *The National*
36 *Audit of Cardiac Rehabilitation. Annual statistical report 2009.* BHF: London, 2009.
37 Available at: www.cardiacrehabilitation.org.uk/nacr/docs/2009.pdf (last accessed 12
38 November 2009).
39
40
41 12. Bjarnason-Wehrens B, McGee H, Zwisler AD, et al. Cardiac rehabilitation in Europe:
42 results from the European Cardiac Rehabilitation Inventory Survey. *Eur J Cardiovasc*
43 *Prev Rehabil* 2010;**17**(4):410–8.
44
45
46 13. Hunt SA, Baker DW, Chin MH, et al. ACC/AHA guidelines for the evaluation and
47 management of chronic heart failure in the adult: executive summary a report of the
48 American College of Cardiology/American Heart Association Task Force on Practice
49
50
51
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2
3 Guidelines (Committee to Revise the 1995 Guidelines for the Evaluation and
4 Management of Heart Failure): developed in collaboration with the International Society
5 for Heart and Lung Transplantation; endorsed by the Heart Failure Society of America.
6
7
8
9 *Circulation* 2001;**104**(24):2996–3007.
- 10
11 14. Remme WJ, Swedberg K. Guidelines for the diagnosis and treatment of chronic heart
12 failure. *Eur Heart J* 2001;**22**(17):1527–60.
- 13
14
15 15. Task Force on Heart Failure of the European Society of Cardiology. Guidelines for the
16 diagnosis of heart failure. *Eur Heart J* 1995;**16**(6):741–51.
- 17
18
19 16. Healthcare Commission. *Pushing the boundaries*. London: Healthcare Commission,
20 2007.
- 21
22
23 17. Thomas RJ, King M, Luik K, et al. AACVPR/ACC/AHA 2007 performance measures on
24 cardiac rehabilitation for referral to and delivery of cardiac rehabilitation/secondary
25 prevention services. *Circulation* 2007;**116**:1611–42.
- 26
27
28
29 18. Piepoli MF, Corrà U, Benzer W, et al. Secondary prevention through cardiac
30 rehabilitation: from knowledge to implementation. A position paper from the Cardiac
31 Rehabilitation Section of the European Association of Cardiovascular Prevention and
32 Rehabilitation. *Eur J Cardiovasc Prev Rehabil* 2010;**17**:1-17.
- 33
34
35
36
37 19. Lam CS, Donal E, Kraigher-Krainer E, et al. Epidemiology and clinical course of heart
38 failure with preserved ejection fraction. *Eur J Heart Fail* 2011;**13**:18-28.
- 39
40
41
42 20. Lewin B. Effects of self-help post-myocardial-infarction rehabilitation on psychological
43 adjustment and use of health services. *Lancet* 1992;**339**:1036-40.
- 44
45
46 21. Dalal HM, Evans PH. Achieving national service framework standards for cardiac
47 rehabilitation and secondary prevention. *BMJ* 2003;**326**:481-4.
- 48
49
50 22. British Heart Foundation Cardiac Care and Education Research Group. *National audit of
51 cardiac rehabilitation. Annual statistical report 2010*. London: BHF, 2010.
- 52
53
54 23. Department of Health. *Coronary heart disease: national service framework for coronary
55 heart disease*. London: DH, 2000.
- 56
57
58
59
60

- 1
2
3 24. NHS Institute for Innovation and Improvement. *Delivering quality and value. Focus on:*
4 *heart failure*. Coventry: NHS Institute for Innovation and Improvement, 2009. Available
5 at: www.institute.nhs.uk (last accessed 11 November 2009).
6
7
- 8
9 25. Madden M, Furze G, Lewin RJ. Complexities of patient choice in cardiac rehabilitation:
10 qualitative findings. *J Adv Nurs* 2011;67:540-9.
11
- 12
13 26. Owan TE, Redfield MM. Epidemiology of diastolic heart failure. *Prog Cardiovasc Dis*
14 2005;47: 320-32.
15
- 16
17 27. Liao L, Anstrom KJ, Gottdiener JS, et al. Long-term costs and resource use in elderly
18 participants with congestive heart failure in the Cardiovascular Health Study. *Am Heart J*
19 2007;153:245-52.
20
- 21
22 28. Kitzman DW, Little WC, Brubaker PH, et al. Pathophysiological characterization of
23 isolated diastolic heart failure in comparison to systolic heart failure. *JAMA*
24 2002;288:2144-50.
25
- 26
27 29. Gottdiener JS, McClelland RL, Marshall R, et al. Outcome of congestive heart failure in
28 elderly persons: influence of left ventricular systolic function. The Cardiovascular Health
29 Study. *Ann Intern Med* 2002;137:631-9.
30
- 31
32 30. Wingham J, Dalal HM, Sweeney KG, et al. Listening to patients: choice in cardiac
33 rehabilitation. *Eur J Cardiovasc Nurs* 2006;5:289-94.
34
- 35
36 31. Jones M, Jolly K, Raftery J, et al. 'DNA' may not mean 'did not participate': a qualitative
37 study of reasons for non-adherence at home and centre-based cardiac rehabilitation.
38 *Fam Pract* 2007;24(4):343-57.
39
- 40
41 32. Ades PA, Waldmann ML, McCann WJ, et al. Predictors of cardiac rehabilitation
42 participation in older coronary patients. *Arch Intern Med* 1992;152(5):1033-5.
43
- 44
45 33. Ferguson EE. Cardiac rehabilitation – an effective and comprehensive but underutilized
46 program to reduce cardiovascular risk in patients with CVD. *US Cardiovasc Dis*
47 2006;11:14-6.
48
- 49
50 34. Campbell N, Grimshaw J, Rawles J, et al. Cardiac rehabilitation: the agenda set by post-
51 myocardial infarction patients. *Health Educ J* 1994;53:409-20.
52
53
54
55
56
57
58
59
60

- 1
2
3 35. Pell J, Pell A, Morrison C, et al. Retrospective study of influence of deprivation on
4 uptake of cardiac rehabilitation. *BMJ* 1996;**313**:267–8.
5
6
7 36. Jolly K, Taylor RS, Lip GY, et al. A randomized trial of the addition of home-based
8 exercise to specialist heart failure nurse care: the Birmingham Rehabilitation Uptake
9 Maximisation study for patients with Congestive Heart Failure (BRUM-CHF) study. *Eur J*
10 *Heart Fail* 2009;**11**(2):205–13.
11
12
13 37. Lewis RQ. A new direction for NHS community services. *BMJ* 2006;**332**(7537):315.
14
15
16 38. Dalal HM, Evans PH, Campbell JL, et al. Home-based versus hospital-based
17 rehabilitation after myocardial infarction: a randomized trial with preference arms –
18 Cornwall Heart Attack Rehabilitation Management Study (CHARMS). *Int J Cardiol*
19 2007;**119**(2):202–11.
20
21
22 39. National Institute for Health and Clinical Excellence. *Advice from NICE aims to improve*
23 *commissioning of services for people with chronic heart failure and for people who need*
24 *cardiac rehabilitation*. London: NICE, 2011. Available at:
25 www.nice.org.uk/newsroom/pressreleases/chronicheartfailurecardiacrehabilitationcommi
26 [ssioningguides.jsp](http://www.nice.org.uk/newsroom/pressreleases/chronicheartfailurecardiacrehabilitationcommi) (last accessed 23 November 2011).
27
28
29 40. Department of Health. *Commissioning a cardiac rehabilitation service: reabling people*
30 *with coronary heart disease*. London: DH, 2010. Available at:
31 www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidanc
32 [e/Browsable/DH_117504](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidanc) (last accessed 23 November 2011).
33
34
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Table 1 Summary of responses to the key questions in stage 1.

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

NA=not applicable.

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Table 2 Results of the pPerceived barriers to offering rehabilitation from centres that indicated they routinely offer cardiac rehabilitation in heart failure (n=90). Reasons cardiac rehabilitation programmes give for not offering cardiac rehabilitation for patients with heart failure.

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

For peer review only

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

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

†

Comment [JL1]: Need to add what the * stands for.

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
Other (please specify) _____

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.

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*

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*

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.*

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*

Q3 Please define the geographical area served your department serves?

- Mainly urban*
- Mainly rural*
- Mixed*

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?

| | Yes | No |
|------------------------|--------------------------|--------------------------|
| NYHA Class | <input type="checkbox"/> | <input type="checkbox"/> |
| Ejection Fraction | <input type="checkbox"/> | <input type="checkbox"/> |
| HF patients with ICD's | <input type="checkbox"/> | <input type="checkbox"/> |
| 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

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

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 Go to Q16

Between 6-12 weeks Go to Q16

More than 12 weeks . Go to Q15

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

Q19 Please describe the exercises used , the intensity of the exercises and comment on patient to staff ratio during the exercise sessions.

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?

| | Yes | No |
|-----------------------|--------------------------|--------------------------|
| 6 min Walk Test | <input type="checkbox"/> | <input type="checkbox"/> |
| Shuttle Walk Test | <input type="checkbox"/> | <input type="checkbox"/> |
| Other, please specify | | |
| | | |

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.....

| | Yes | No |
|--|--------------------------|--------------------------|
| Heart Failure | <input type="checkbox"/> | <input type="checkbox"/> |
| Self-Management Strategies (monitoring for fluid, breathing changes, pain) | <input type="checkbox"/> | <input type="checkbox"/> |
| Medication | <input type="checkbox"/> | <input type="checkbox"/> |
| Diet | <input type="checkbox"/> | <input type="checkbox"/> |
| Benefits | <input type="checkbox"/> | <input type="checkbox"/> |
| Household Adaptations | <input type="checkbox"/> | <input type="checkbox"/> |

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?

Referred to their GP

Referred to a counsellor

Referred to CPN

Other, please specify

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

Q31 Do you include any training or support for carers?

Yes Go to Q32

No Go to Q33

Q30 Please describe what method you use

Q32 Please describe what support you provide.

Q33 Do you collect the following data on patients who receive cardiac rehabilitation for HF?

| | Yes | No |
|--|--------------------------|--------------------------|
| First Assessment data using the NACR computer database | <input type="checkbox"/> | <input type="checkbox"/> |
| Minnesota Living with Heart Failure | <input type="checkbox"/> | <input type="checkbox"/> |

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.

| | 0-24% | 25-49% | 50-74% | >75% |
|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Hospital Clinician | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| GP/Practice Nurse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Heart Failure Specialist Nurse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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
 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?

| | Yes | No |
|---|--------------------------|--------------------------|
| Financial Pressures | <input type="checkbox"/> | <input type="checkbox"/> |
| Lack of clinical guidelines/evidence about suitability | <input type="checkbox"/> | <input type="checkbox"/> |
| Risk of exercise in these patients | <input type="checkbox"/> | <input type="checkbox"/> |
| 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

2011-000787

STROBE Statement—Checklist of items for *cross-sectional studies*

| | Item No | |
|---------------------------|---------|--|
| Title and abstract | 1 | <p>Patients with heart failure are not receiving cardiac rehabilitation: a national survey of the common barriers</p> <hr/> <p>Objective. To determine why so few patients with chronic heart failure in England, Wales, and Northern Ireland take part in cardiac rehabilitation</p> <p>Design. Two stage, postal questionnaire-based, national survey.</p> <p>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.</p> <p>Main outcome measures. N/A.</p> <p>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.</p> <hr/> <p>Introduction</p> <p>Background/rationale</p> |
| | 2 | <p>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</p> |

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| Objectives | 3 | 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 |
| 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.

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| Other analyses | 17 | Not applicable |
| Discussion | | |
| Key results | 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 | | |
| Funding | 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 |