

Scoping Document of Current National Service Provision of Exercise Rehabilitation in Multiple Morbidities

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Glossary

AACVPR	American Association of Cardiovascular and Pulmonary Rehabilitation
ACPICR	Association of Chartered Physiotherapists In Cardiac Rehabilitation
BACPR	British Association of Cardiac Prevention and Rehabilitation
BTS	British Thoracic Society
CABG	coronary artery bypass graft
COPD	chronic obstructive pulmonary disease
DGH	district general hospital
IHD	ischaemic heart disease
MRC	Medical Research Council
NACR	National Audit of Cardiac Rehabilitation
NHS	National Health Service
NRES	National Research Ethics Service
OA	osteoarthritis
PA	physical activity
PCI	percutaneous coronary intervention
REC	Research Ethics Committee
rehab	rehabilitation
TH NORTH	teaching hospital north
TH SOUTH	teaching hospital south
UK	United Kingdom

Executive Summary

Multi-morbidity is common with increasing age. It reduces quality of life and has significant health economic implications [1, 2]. Being physically active reduces morbidity and all-cause mortality in a large number of chronic diseases [3]. NHS care is traditionally delivered in a single disease framework which is becoming inappropriate in the context of increasing multi-morbidity[2].

The aims of this scoping project were to begin to understand the current provision of physical activity interventions for long-term conditions and multi-morbidity and secondly, to provide information to inform potential more comprehensive scoping exercises in terms of data collection methods and questionnaire format and content.

Scoping was performed in three regions of the UK to represent differing social demography, geography and rurality and to represent both district general hospitals (DGH) and teaching hospital (TH) settings. Detailed information on routine physical activity advice and structured exercise rehabilitation services was collected through a semi-structured interview process. A detailed assessment of NHS exercise rehabilitation services in eleven chronic disease areas was performed. All eleven identified chronic diseases include physical activity in national guidelines for routine management.

An estimated 50% of patients passing through exercise rehabilitation services have multi-morbidity although accurate collection of this data is lacking.

Physical Activity advice is offered routinely in secondary care chronic disease management in 54% (TH north), 64% (TH south) and 91% (DGH) of disease areas despite national guidelines that include physical activity advice for all eleven of the chronic diseases included.

Structured exercise rehabilitation for chronic disease management exists in 36% (TH north and DGH) and 54% (TH south) of services. There is inadequate capacity to accommodate all eligible patients in a number of exercise rehabilitation programmes . This leads to prioritization of patients in some programmes and exclusions based on both morbidity and logistical concerns. For example, one falls prevention programme provided home or class-based exercise to 13% of all referred patients with falls in 2012-13.

Only 36% of the rehabilitation services are currently using recognised behavioural change techniques and those that are, offer this sporadically and inconsistently.

42% of programmes offer home exercise alternatives .

Data collection of long-term physical activity level is currently only collected routinely for cardiac rehabilitation. There is a lack of long-term physical activity and behavioural change outcome data which, therefore, hinders meaningful research into effectiveness of physical activity interventions.

The scoping project suggests that despite compelling evidence as to the potential efficacy of increasing physical activity, there is a lack of NHS provision for most patients with long term conditions and multi-morbidity. It also suggests that, despite pockets of good practice, there is a significant inequality of provision across the NHS and a failure to adopt recognized behavioural change frameworks in delivery. To achieve a full picture of national service provision of exercise rehabilitation a more extensive national service evaluation would be required.

This pilot scoping exercise also shows that, logistically, data collection in this area is difficult partly because of a lack of comparable, available data and partly due to lack of time and motivation of individual service providers to engage with this process.

Background and Rationale

The rationale of this project is to understand current provision of physical activity intervention in treatment pathways for long term conditions in England.

Multi-morbidity is not a recent phenomenon, but one that has become increasingly common with increased incidence of chronic diseases (NIDDM, COPD, IHD) and with an ageing population. In the 2011 Census [4], the population of the United Kingdom (UK) was estimated to be 63.2 million with an estimated 10.1 million people over 65.

The report states:

Over the last century the UK population structure has changed significantly. Although the proportion of the population aged 15-64 has remained broadly similar, the proportion of the population aged 0-14 has nearly halved (31 per cent in 1911 compared to 18 in 2011) and the proportion of older people aged 65 and over has more than trebled (from 5 to 16 per cent)...This ageing population has considerable implications for a range of policy issues within the UK, such as pensions and provision of health-care.

Data from the Kings fund corroborates this with average life expectancy for males and females steadily rising with an average life expectancy for men being 71 and 77 years in 1981 and 2014 respectively. Similar rises are seen in women.

Estimates of multi-morbidity vary considerably with prevalence ranging from 12.9% to 95.1% in a recent systematic review [5]. Even taking the conservative estimate of 12.9% this equates to over 1million people in the UK currently living with multi-morbidity. A US epidemiological study of 15 prevalent chronic conditions in 31 million Medicare patients, found the prevalence of multi-morbidity (defined as 2 or more chronic diseases) in the over 65 age group to be 62%[6]. This would equate to 6.3 million people over the age of 65 with multi-morbidity in the UK.

The 2013 National Audit for Cardiac Rehabilitation (NACR) found that patients with multi-morbidity were less likely to be taking moderate exercise for 30 minutes five or more times a week [7] The odds of not achieving this recommended level was 1.7 times higher for people with five or more co-morbidities than those with none. There remains a dearth of evidence relating to the management of people with multi-morbidity and in particular, how to achieve improved long-term physical activity levels. This evidence void is compounded by the fact that both NHS provision and research agenda are organised in single disease silos.

Being physically active reduces morbidity and all-cause mortality in a large number of chronic diseases [3] – many more than were realised even a decade ago. The efficacy of exercise in the primary, secondary and tertiary prevention of disease is now well documented. Morbidity reduces quality of life for individuals and has a significant health economic implication. Becoming more physically active requires initial behavioural change and ultimately long term lifestyle modification. There are now national guidelines for physical activity advice in most chronic disease areas and all of the eleven chronic disease areas focused on in this scoping project (see Appendix 1).

Despite this, there is a physical inactivity endemic. Older people with multi-morbidity are particularly inactive [8]. Evidence from both randomized controlled trials and audit data shows that changing physical activity behaviours in the long term is particularly challenging [9]. There is increasing evidence that leads us to believe that the use of recognised behavioural change techniques in the delivery of physical activity interventions will improve outcomes [10-13].

There is no existing documentation of the current position with regards to the provision of physical activity interventions for those with multi-morbidity in the UK. Although there is now audit data in cardiac rehabilitation [7, 14], this is not helpful when considering multi-morbidity. There is no existing published audit data in any other chronic disease area. There is limited data, even in published audits, surrounding use of behavioural change theories in delivery.

This was an exploratory exercise to understand how the physical activity guidelines for 11 chronic disease areas are being delivered across England within care pathways, and specifically gather information around delivery in the context of multimorbidity, in order to fulfill the following aims.

Aims

The aims of this scoping project are twofold:

1. To begin to understand the current provision of physical activity interventions for long-term conditions and multi-morbidity in terms of:
 - Level of provision across 11 chronic diseases (CD) in 3 geographical areas
 - Scope of current services and how this compares to current best evidence
 - Provision for those with multi-morbidity
 - Evidence of adherence to accepted behavioural change frameworks
2. To provide information to inform potential more comprehensive scoping exercises in terms of data collection methods and questionnaire format and content.

Methods

Eleven common chronic disease areas were identified as important based on current evidence for the role of exercise in primary or secondary prevention of morbidity (Figure 1). Evidence supporting the use of physical activity interventions and current best practice guidelines were collated and are presented in appendix 5.

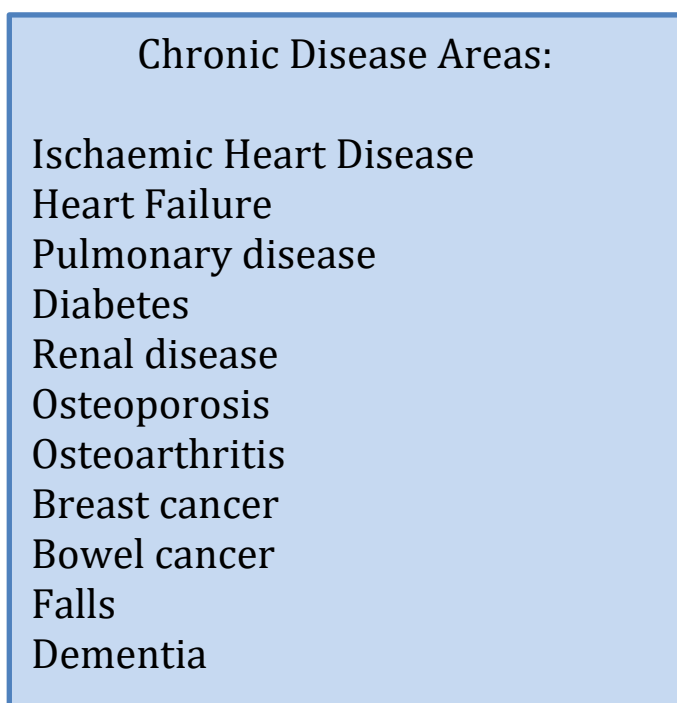


Figure 1 - Chronic disease areas

Three regions were chosen to reflect practice in a variety of English NHS settings: city, rural, DGH, teaching hospital, north and south regions. Within this document they are referred to as Teaching Hospital north (TH north), Teaching Hospital south (TH south) and District General Hospital (DGH).

A questionnaire (Appendix 1) was designed to collate detailed information regarding physical activity advice and structured exercise rehabilitation. The information collected was as follows:

1. Information/education

- (a) Is formal physical activity information or education routinely provided to patients at any point in their care?
- (b) Is this information or education in the form of verbal, written or video communication.

2. Structured exercise rehab programme

Is there a structured exercise rehab programme for each chronic disease area?

3. Post-programme exercise pathway

Is there a pathway for ongoing exercise rehabilitation following the structured programme?

5. Recruitment/inclusion/exclusion

- (a) How are patients recruited into your programme?
- (b) What are the inclusion criteria?
- (c) What are the exclusion criteria?

6. Patient engagement:

- (a) What percentage of eligible patients take part?
- (b) What are the reasons that people give for not taking part?

7. Behavioural change

- (a) Are psychological interventions designed to change behaviour offered?
- (b) If so, what?

8. Multi-morbidity:

- (a) What percentage of patients have another chronic disease ie. Multi-morbidity?
- (b) What percentage of patients have 2 or more other chronic diseases?

9. Patient demographics:

- (a) What percentage of patients on the rehab programme are men/women and how does this compare to the local population?
- (b) What percentage of patients on the rehab programme are from BME communities and how does this compare to the local population?

10. Data collection

What data is collected regarding long-term PA level after structured intervention?

11. Staffing

- (a) How many staff (full-time equivalent) does it take to deliver the exercise component of the rehabilitation programme?
- (b) What are the core competencies/minimal qualifications of staff used to deliver your structured exercise intervention?

12. Funding

- (a) Who funds your programme?
- (b) What is the annual budget?

The project was led by a sport and exercise medicine physician. There was an active decision to use a clinician rather than a non-clinical researcher. This decision was taken after several failed attempts by a non clinical researcher to collect this information. The rationale was that a clinician is familiar with the different chronic disease areas and familiar with established NHS exercise rehabilitation programmes. The team believed it would be easier for a physician to facilitate clinical conversations with medical staff when going through the questionnaire.

Contacts in the eleven disease areas were obtained via known clinical contacts in the hospital region of interest and/or via information pages on the hospital websites. The majority of contacts were Lead Physiotherapists in the chronic disease area. Initial contact was made by email wherever possible (occasionally by initial phone call if no email was identifiable). The initial email introduced the national scoping project. It explained its aim to obtain a picture of

current exercise rehabilitation provision in eleven chronic disease areas in a number of regions of the UK. It made clear that all information collated would be anonymised. Permission was sought to have a more detailed conversation by telephone (or in person if preferred) in order to go through the questionnaire where this was required. If the chronic disease area had no formal exercise rehabilitation then only 3 questions needed to be answered. This could often be established from the initial email and obviate the need for telephone contact. If telephone contact was made the conversation was short (5 minutes). In disease areas where an exercise rehabilitation programme exists the whole questionnaire needed to be answered either by telephone or in person. These interviews took between 30minutes and one hour.

The project was registered in each region according to their local guidelines. The research and development teams in each region were contacted and a protocol of the project was forwarded in order to aid this process. As per NRES Research Ethics Committee Guidelines this project did not require REC review. Two regions registered the project with the audit department. One region did not require registration of the project as it was considered service evaluation rather than research or audit.

Results

The results below are presented within the broad categories of interest explored by the questionnaire.

1. Information/Education

Questions:

(a) Is formal physical activity information or education routinely provided to patients at any point in their care?

(b) Is this information or education in the form of verbal communication, written communication or a video?

In all three regions, over half of chronic disease areas routinely provide some type of PA education or information to their patients (Table 1). The range varies from 54% of chronic disease areas routinely being offered PA advice in TH north to 91% in the DGH.

Verbal and written advice is used most commonly (Table 1). Video (DVD or online) advice was least likely to be used in all three regions. DVD or online videos are provided in three chronic disease areas (cardiac rehab in the DGH; pulmonary rehab and falls service in TH south). The DVD or online video provided by the cardiac rehab and falls service gives a home exercise programme for patients to follow. The online video provided by the pulmonary rehabilitation gives education about the benefits of pulmonary rehabilitation. There is a lack of uniformity of provision of verbal, written and video information.

The chronic disease areas where PA advice was least likely to be routinely offered were dementia, breast cancer, bowel cancer and renal disease (Table 2).

Table 1 - ROUTINE PA ADVICE

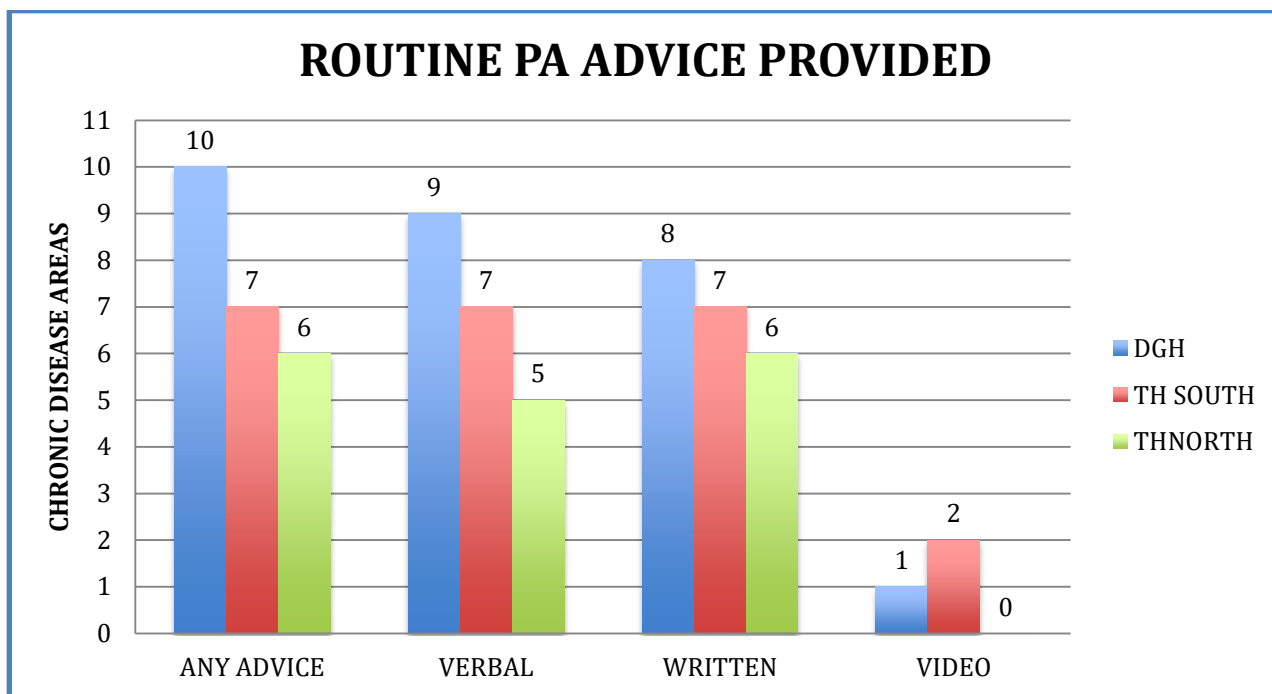
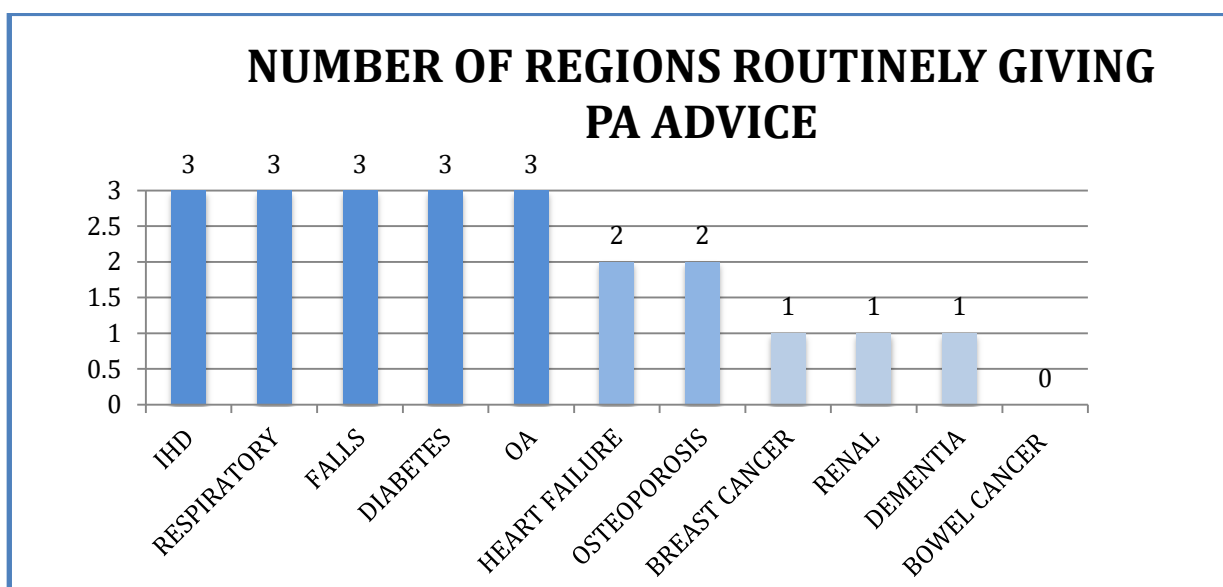


Table 2 - PA ADVICE PER CHRONIC DISEASE



Breast Cancer

Breast cancer patients in the DGH are routinely given verbal advice and written advice using Breast Cancer Care leaflets. These leaflets are primarily aimed at breast cancer diagnosis or treatment and contain some general information about PA, particularly with respect to its benefit in fatigue [15].

The patients in the two teaching hospitals were not routinely given PA advice. However in the northern teaching hospital region there is currently a working group looking at the local provision of PA advice and support in breast cancer.

Bowel Cancer

No routine PA advice or education is provided in the three regions

Renal Disease

Written PA advice is routinely provided to peritoneal dialysis patients in the DGH, but not in the THs.

Ischaemic Heart Disease

All three regions provide routine PA advice as part of cardiac rehabilitation. Two regions use verbal and written information. The DGH also uses an exercise DVD.

Heart Failure

All three regions provided routine PA advice to heart failure patients. TH south and north routinely provided verbal and written physical activity advice. The DGH routinely provided written advice with ad hoc verbal advice if patients expressed an interest.

Respiratory Disease

All three regions provide routine verbal and written physical activity advice to patients with chronic respiratory disease. In addition, the TH south directs patients to an online video which discusses the benefits of pulmonary rehabilitation.

Diabetes

All three regions provide routine verbal and written PA advice to patients with diabetes (IDDM or NIDDM) via structured education programmes.

TH south offers NIDDM patients (with a friend or partner if they wish) a free 3hr structured education programme in a range of venues in the region covering topics including PA. It is run on an interactive basis, enhancing the learning experience and addressing the individual needs expressed by the patients.

The DGH and TH north offer Type 2 diabetic patients the DESMOND education programme [16, 17].

TH north offer Type 1 diabetic patients the DAFNE education programme [18].

There is a large volume of national guidance on Type 1 and Type 2 diabetes and all include exercise recommendations. The Department of Health National Framework for Diabetes sets out quality standards for diabetes care. Standard 1 gives guidance on diabetes prevention and includes the importance of PA, discusses the need for local strategies to increase PA and recommends continuing education for NHS staff regarding the role of PA in diabetes [19].

Falls Service

All three regions provide routine verbal and written PA advice to patients who attend the falls prevention service. TH south also signposts patients to an online home exercise video (also available free as a DVD).

Osteoporosis

Two regions (DGH and TH south) routinely provide verbal and written PA advice to patients with osteoporosis. The leaflet used by the DGH is the National Osteoporosis Society leaflet 'Healthy Living for Strong Bones'. [20]

TH north has osteoporosis leaflets available in the waiting room and posters for a local charity-run exercise class.

OA

All three regions provide routine written PA advice to patients in the form of Arthritis Research UK leaflets. The DGH and TH south routinely offer verbal PA advice as well.

Dementia

One region (DGH) provides routine verbal PA advice to dementia patients.

2. Structured Exercise Rehabilitation Programmes

Questions: Is there a structured exercise rehab programme in the chronic disease area? What does the programme look like?

Six chronic disease areas offered a structured exercise rehabilitation programme in the TH south and these were: cardiac, pulmonary, falls service, OA, heart failure and osteoporosis. TH north offers four structured rehab programmes in cardiac rehabilitation, pulmonary rehabilitation, falls service and heart failure. The DGH also offered four structured rehabilitation programmes and these were: cardiac, pulmonary, falls service and OA.

All of the structured exercise rehabilitation programmes were free to eligible patients.

STRUCTURED EXERCISE REHAB PROGRAMMES?

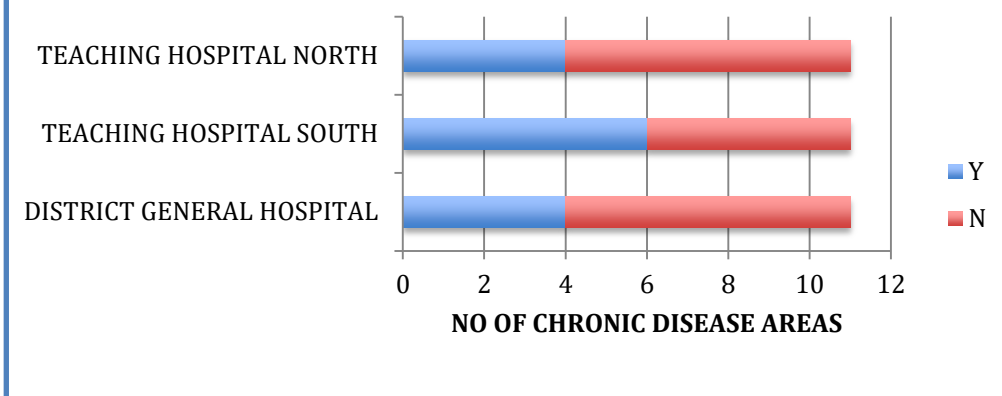


Figure 2 - current number of structured exercise programmes per region

TH NORTH	TH SOUTH	DGH
CARDIAC	CARDIAC	CARDIAC
PULMONARY	PULMONARY	PULMONARY
FALLS SERVICE	FALLS SERVICE	FALLS SERVICE
HEART FAILURE	OSTEOARTHRITIS	OSTEOARTHRITIS
	HEART FAILURE	
	OSTEOPOROSIS	

Table 3 - Details of structured exercise rehab by region

Cardiac rehabilitation (IHD)

There are several sources of guidance regarding cardiac rehabilitation (rehab) for patients with cardiovascular disease. The National Service Framework for Coronary Heart Disease provides guidance from the Department of Health[21]. The British Association for Cardiovascular Prevention and Rehabilitation (BACPR) produce standards for cardiac rehabilitation in the UK [22] and the National Audit of Cardiac Rehabilitation produces an annual statistical report[7].

Cardiac rehabilitation is offered in all three hospital regions and is well-structured and audited. Phase 3 cardiac rehabilitation includes structured exercise rehabilitation in a hospital or community setting.

REHAB DETAILS	BEST EVIDENCE (Taylor R)	TH south	DGH	TH north
Frequency		1 x week	1 x week	2 x week
Number of sessions		10	6	8
Duration of session		60mins	45mins	30mins

Intensity	Moderate (Borg 3-5/10)	Moderate (mod Borg 12)	Moderate (mod Borg 12-14)
Type	Aerobic, balance & strength	Aerobic, balance & strength	Aerobic & strength
Guideline used	BACPR & ACIPR	BACPR & AACVPR	ACPIR

Table 4 - comparative overview of cardiac rehab by region

TH North

The exercise component of the cardiac rehab programme in TH north is based on ACPICR (Association of Chartered Physiotherapists In Cardiac Rehabilitation) guidelines. It uses mostly community gyms within leisure centres. The exercise part of cardiac rehabilitation is 30mins twice a week for 8 weeks. There is choice of activities to include both aerobic and strength. Participants are encouraged to aim for moderate intensity (Borg 12-14). Prior to starting Phase 3 the participants complete a health screen as part of Phase 2 cardiac rehabilitation. PA levels are assessed in a narrative manner e.g. "What exercise do you currently do?" The participant completes an objective assessment of function using the 6min walk test or shuttle test. A home exercise programme is offered to patients unable to attend classes and this consists of one-to-one assessment and guidance by physiotherapists in the individual' home.

TH South

The exercise component of the cardiac rehab programme in TH south is based on BACPR (British Association of Cardiac Prevention and Rehabilitation) guidelines [23]and ACPICR guidelines. It uses mostly community gyms with one hospital physiotherapy gym. The exercise part of the rehab is 60mins once a week for 10 weeks (or twice a week for 5wks). There is a choice of activities to include both aerobic and strength. Participants are encouraged to aim for moderate intensity (Modified Borg 3-5). Prior to starting Phase 3 the participants are screened for acute illness or unstable cardiac symptoms. PA levels are assessed in a narrative manner e.g. "What exercise do you currently do?" The participant completes an objective assessment of function such as the 6min walk test, submax bike test or Chester step test. A home exercise programme is offered to patients unable to attend classes and this consists of the British Heart Foundation exercise DVD and telephone support).

DGH

The exercise component of the cardiac rehab programme in the DGH is based on BACPR and AACVPR (American Association of Cardiovascular and Pulmonary Rehabilitation) guidelines. It uses mostly community gyms, community centres and village halls. The exercise part of the rehab is 45mins once a week for 6 weeks. There is choice of sitting or standing exercises to include both aerobic and strength. Participants are encouraged to aim for moderate intensity (modified Borg 4). Prior to starting Phase 3 the participants complete a health screen about current physical status and cardiac status. PA levels are assessed against national exercise

guidelines. A home exercise programme is offered to patients unable or unwilling to attend classes and this consists of a home exercise DVD and the Heart Manual[24].

Pulmonary rehabilitation

NICE guidance ‘Chronic Obstructive Pulmonary Disease: Management of chronic obstructive pulmonary disease in adults in primary and secondary care (CG101)’ recommends pulmonary rehabilitation (rehab) is provided to COPD patients[25]. The British Thoracic Society has recently published a detailed quality standard for pulmonary rehabilitation [26] and guidelines for pulmonary rehabilitation[27].

Pulmonary rehabilitation is offered in all three regions.

REHAB DETAILS	BEST EVIDENCE	TH south	DGH	TH north
Frequency		2 x week	2 x week	2 x week
Total number of sessions		12	14	12
Duration of session		60mins	60mins	30mins
Intensity		Moderate (Borg 3-4/10)	Moderate (Borg 4/10)	Moderate (Borg 4/10)
Type		Aerobic, anaerobic & strength	Aerobic, anaerobic, balance & strength	Aerobic & strength
Guideline used		BTS	unknown	unknown

Table 5 - comparative overview of pulmonary rehab by region

TH north

Pulmonary rehab is run in community gyms, community centres and health centres. The exercise part of the rehab is 30mins twice a week for 6 weeks. There is no participant choice to the programme but it is structured to include aerobic and strength work. Participants are encouraged to aim for moderate intensity (modified Borg 4). Participants complete a pre-participation health screen which includes assessment of current physical status and current respiratory symptoms. Functional status is assessed using incremental shuttle walk test or the endurance shuttle walk test.

TH south

Pulmonary rehab in TH south is based on British Thoracic Society (BTS) guidelines. It is run in community gyms. The exercise part of the rehab is 60mins twice a week for 6 weeks. There is no participant choice to the programme but it is structured to include aerobic and strength work. Participants are encouraged to aim for moderate intensity (modified Borg 4). Participants complete a pre-participation health screen which includes a physiotherapy assessment, St

George's respiratory questionnaire, CAT score and HAD score prior to the course. Functional status is assessed using the 6min shuttle test.

DGH

Pulmonary rehab in the DGH is run in community halls, hospices and a physiotherapy gym in a GP medical centre. The exercise part of the rehab is 60mins twice a week for 7 weeks. The programme is seated or standing and structured to include aerobic, anaerobic, balance and strength work. Participants are encouraged to aim for moderate intensity (modified Borg 4). Participants complete a pre-participation health screen with a nurse or physiotherapist (no details).

Falls Service

NICE guidance on prevention of falls emphasizes the importance of strength and balance training in prevention of falls [28]:

'Strength and balance training is recommended. Those most likely to benefit are older people living in the community with a history of recurrent falls and/or balance and gait deficit. A muscle-strengthening and balance programme should be offered. This should be individually prescribed and monitored by an appropriately trained professional'.

A structured Falls Prevention rehabilitation service is offered in all three regions. All the regions base their rehabilitation on the Otago Exercise Programme [29]. One region also uses the Falls Management Exercise (FaME) programme for guidance[30].

REHAB DETAILS	BEST EVIDENCE	TH south	DGH	TH north
Frequency		1 x week	2 x week	1 x week
Total number of sessions		unknown	10	8
Duration of session		60mins	90mins	120
Intensity		Low then increases	Moderate	Low-moderate
Type		Aerobic, anaerobic, balance & strength	Aerobic, anaerobic, balance & strength	Balance & strength
Guideline used		Otago	Otago + PSI	Otago

Table 6 - comparative overview of Falls Prevention service by region

TH north

Falls service in TH north is based on the Otago programme. Participants are offered either a home-exercise programme or a group exercise programme called Big (balance and independence groups) which are held in a variety of settings including nursing homes and supported living complexes. There is no participant choice to the programme but it is structured to include aerobic, balance and strength work. The exercise component is 60 mins of a 120min session once a week from 8 weeks. Participants are encouraged to aim for low to moderate intensity. Participants complete a pre-participation balance and mobility screen. They have no formal assessment of their current PA levels.

TH south

Falls service in TH south is based on the Otago programme and is run in community hospital gyms. There is no participant choice to the programme but it is structured to include aerobic and strength work. The sessions last 90 minutes and occur twice a week for 5 weeks. Participants are encouraged to aim for moderate intensity. Participants complete a pre-participation health screen as part of their falls assessment. They have no formal assessment of their current PA levels.

DGH

Falls service in TH south is based on the Otago and FaME programmes. It is run in acute hospital gyms and community hospital gyms. There is no participant choice to the programme but it is structured to include aerobic, anaerobic, balance and strength work. Participants are encouraged to aim for moderate intensity (modified Borg 4). Participants have objective functional assessments in the form of Get Up + Go test, Berg Balance test and Falls Efficacy Scale (FES1).

Again, can you put this in a chart and compare to systematic reviews of trials. There was one recently in the BMJ which was good-I have the ref)

Osteoarthritis

NICE has recently updated its osteoarthritis guidance and highlights the importance of exercise as a core non-pharmaceutical approach to osteoarthritis management. It has not been specified whether exercise should be provided by the NHS or whether the healthcare professional should provide advice and encouragement to the person to obtain and carry out the intervention themselves[31].

Two regions (DGH and TH south) offer structured exercise rehabilitation to osteoarthritis patients. One region bases their rehabilitation programme on the ESCAPE programme for knee osteoarthritis.[32]

REHAB	BEST	TH south	DGH	TH north
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DETAILS	EVIDENCE	(pilot)	
Frequency	2 x week	1 x week	n/a
Total number of sessions	16	6	n/a
Duration of session	60mins	45mins	n/a
Intensity	Moderate	Low	n/a
Type	Aerobic, balance & strength	Aerobic, balance & strength	n/a
Guideline used	unknown	ESCAPE programme	n/a

Table 7 - comparative overview of OA rehab by region

DGH

The DGH has a pilot structured rehab programme for OA based on the ESCAPE programme. It is based in community gym settings, offers choice of gym equipment to participants and includes aerobic, balance and strength work. The sessions lasts 45minutes and are weekly for 6 weeks. Participants complete a pre-participation health screen in the form of a medical health screen, WOMAC patient reported outcome score and a Quality of Life tool. Current physical activity level is assessed using the Stanford Exercise Behaviour Tool (see Appendix 2)[33].

TH south

There is not an OA specific rehabilitation programme in the TH south, but instead the OA patients can be referred to joint-specific rehabilitation programmes e.g. Patients with different diagnoses but all have knee pain. These sessions last 60 minutes and are offered on a twice weekly basis for 8 weeks. There is no choice of activity, but it is structured to include aerobic, balance and strength work. Participants are encouraged to aim for a moderate intensity. The participants are assessed using a Quality of Life (QoL) tool (detail unknown).

Osteoporosis

National Osteoporosis Guideline Group (NOGG) does not currently give guidance on osteoporosis rehabilitation programmes and recommend further research.

A recent Cochrane review[34] found that the most effective type of exercise intervention on bone mineral density (BMD) for the neck of femur appears to be progressive resistance strength training and the most effective intervention for BMD at the spine was a combination exercise types. However they state:

‘These exercise types should be considered as preferred interventions in clinical practice, however, it remains unclear as to what constitutes an optimal exercise programme’.

REHAB DETAILS	BEST EVIDENCE	TH south	DGH (pilot)	TH north
Frequency		1 x week	n/a	n/a
Total number of sessions		6	n/a	n/a
Duration of session		60mins land-based + 30 mins pool	n/a	n/a
Intensity		Moderate	n/a	n/a
Type		Aerobic, anaerobic, balance & strength	n/a	n/a
Guideline used		Glasgow Osteoporosis programme	n/a	n/a

Table 8 - comparative overview of osteoporosis rehab by region

One region (TH south) offers structured exercise rehabilitation for patients with osteoporosis. The sessions are based in the physiotherapy gym and pool at the hospital. The patients can be seated or standing and the sessions are structured to include aerobic, anaerobic, balance and strength exercise. Each session lasts 45-60 minutes in the gym and 30 minutes in the pool. They are weekly and last 6 weeks. Participants are encouraged to aim for a moderate intensity. Individuals have a pre-participation screen with a physiotherapist including a cardiac screen and hydrotherapy safety screen. There is a narrative discussion about PA levels but not objective. Objective functional testing is performed and includes the 6min walk test and timed sit to stand test.

Heart failure

Two regions (TH north and south) offer structured exercise rehabilitation in heart failure. The DGH expressed a wish to be able to offer this service to heart failure patients but have no funding to do so.

TH north incorporate heart failure patients into their cardiac rehabilitation programme (described above).

TH south

The rehab programme uses hospital gyms or community gyms. The exercise part of the rehab is 60mins once a week for 10 weeks (or twice a week for 5wks). There is a choice of sitting or standing activities to include aerobic, anaerobic, balance and strength. The sessions last 60minutes on a weekly basis for 8 weeks. Participants are given an intensity of low or moderate depending on the severity of heart failure symptoms. A pre-exercise health screen is performed looking at medical history and current symptom history. Objective functional assessment is

performed using the 6min walk test. Patients who are not able to access the gym-based rehabilitation are offered a home exercise programme with telephone advice.

3. Recruitment/inclusion/exclusion

Cardiac rehabilitation (IHD)

Recruitment and inclusion/exclusion criteria for cardiac rehabilitation programmes for each region are displayed in Table 4. The regions all stated that they based their programme on guidelines. TH north using ACPICR. DGH using BACPR and AACVPR and TH south using BACPR and ACPICR guidelines.

Table 9 - Recruitment/inclusion/exclusion for cardiac rehab

REGION	DISEASE SPECIFIC AREA	HOW ARE THE PATIENTS RECRUITED?	INCLUSION CRITERIA?	EXCLUSION CRITERIA
TEACHING HOSPITAL NORTH (ACPICR as guidance)	CARDIAC	1. FROM PHASE II REHAB	4/52 POST-MI, 6/52 POST VALVE, 1/52 POST PCI, STABLE ANGINA	UNSTABLE ANGINA, UNCONTROLLED ARRHYTHMIAS, AS >50MMHG, POSITIVE ETT >2MM, UNCOMPENSATED CCF, BP DROP OF >20MMHG ON EXERCISE, BP >200/100, ASCENDING AA >40CM, AAA>45MMHG, ACUTE FEVER.
DGH (BACPR and AACVPR as guidance)	CARDIAC	1. HOSPITAL VIA PHASE II. 2. GP'S 3. NURSES 4. SELF-REFERRALS (WITHIN 6 WEEKS OF EVENT)	MI'S PCI'S CABG	NIL SPECIFIC, TRY TO MODIFY TO INDIVIDUAL. IF UNABLE TO PARTICIPATE IN GROUP EXERCISE WILL BE OFFERED HOME EXERCISE PROGRAMME USING HEART MANUAL.
TEACHING HOSPITAL SOUTH (BACPR and ACPCIR guidance)	CARDIAC	1. POST-EVENT/SURGERY VIA PHASE II 2. TROP RISE >1 VIA A+E OR GP, 3. SELF-REFERRAL 4. GP REFERRAL 5. CONSULTANT REFERRAL	BYPASS CABG, PRIMARY PCI, TROPONIN RAISE >1, NON-STEMIs, STEMIs, VALVE REPLACEMENT (NEED TO REFER)	DECOMPENSATED HEART FAILURE, UNCONTROLLED BLOOD SUGARS. IF VERY FRAIL/POOR MOBILITY/COGNITIVE ISSUES WILL TEND TO USE HEART FAILURE SERVICE AS SMALLER NUMBERS.

BACPR

The BACPR 2012 Standards and Core Components for Cardiovascular Disease Prevention and Rehabilitation in Standard 3 states that *programmes should aim to offer cardiac rehabilitation to the following patient groups (see table 5) irrespective of age, sex, ethnic group and clinical condition*[23].

Table 10 - BACPR guidelines for recruitment

- acute coronary syndrome
- following revascularisation
- stable heart failure
- stable angina
- following implantation of cardiac defibrillators and resynchronisation devices
- heart valve repair/replacement
- heart transplantation and ventricular assist devices
- grown-up congenital heart disease (GUCH)
- other atherosclerotic diseases e.g. peripheral arterial disease, transient ischaemic attack.

The BACPR acknowledges that regions may have to prioritise services in the first instance, but state that the aim should be to provide services to all the conditions above. In addition, the BACPR suggests that patients with multi-morbidity such as asymptomatic diabetes may well benefit from cardiac rehab programmes as a preventative measure.

Exclusion criteria are not specific in the BACPR guideline, but state *prior to participating in the exercise/activity component of cardiac rehabilitation all patients should undergo assessment, including baseline assessment of fitness/functional capacity and risk stratification*[23].

ACPICR

The ACPICR 2009 Standards for Physical Activity and Exercise In the Cardiac Population[35] identify and list in Standard 2 (initial assessment) absolute contraindications for cardiac rehabilitation patients and these are listed in Table 6.

The following are absolute contraindications which preclude a patient from joining or continuing the exercise component of an inpatient and outpatient cardiac rehabilitation programme (22):

- Unstable angina
- Resting systolic blood pressure (SBP) of >200mmHg, or diastolic BP >110mmHg (should be assessed on a case-by-case basis)
- Orthostatic blood pressure (BP) drop of >20 mmHg with symptoms
- Critical aortic stenosis
- Acute systemic illness or fever
- Uncontrolled atrial or ventricular arrhythmias
- Acute pericarditis or myocarditis
- Uncompensated congestive heart failure (CCF)
- 3rd degree AV block (without pacemaker)
- Active pericarditis or myocarditis
- Recent embolism
- Thrombophlebitis
- Resting ST segment displacement (>2 mm)
- Uncontrolled diabetes (should be assessed in accordance with local protocol and on a case-by-case basis)
- Severe orthopaedic conditions that would prohibit exercise
- Other metabolic conditions, such as acute thyroiditis, hypokalaemia or hyperkalaemia, hypovolaemia etc
- Severe rejection (cardiac transplantation recipients)

Table 11 – ACPICR list of absolute CI's to cardiac rehab

AACVPR

The AACVPR (American Association of Cardiovascular and Pulmonary Rehabilitation) publishes guidelines online for members of their Association. Full guidelines are unavailable online to non-members. A Frequently Asked Questions sheet is available [36]. This states who would benefit from cardiac rehabilitation (see table). The conditions listed are included in the guidelines for recruitment from the BACPR above. The FAQ sheet gives no details of exclusion criteria.

Table 12 - AACVPR diseases that benefit from cardiac rehab

- Myocardial infarction (heart attack)
- Coronary artery bypass graft surgery (CABG)
- Current stable angina pectoris
- Heart valve repair or replacement
- Percutaneous transluminal coronary angioplasty (PTCA)/ or coronary stenting
- Heart or heart-lung transplant
- Heart Failure and those with ventricular assist devices
- Coronary artery disease equivalents such as diabetes or peripheral artery disease
- Patients with diabetes

All the hospitals recruit patients from Phase II cardiac rehabilitation following an acute cardiac event or cardiac intervention/surgery. The information gathered suggests the recruitment from cardiac intervention/surgery is prioritised to patients who have had PCIs and CABG. TH south and north also accept valve replacements onto cardiac rehab. There is no mention of heart transplant patients or patients who have had implantable cardiac defibrillators.

DGH and TH south also have a recruitment avenue via general practice that allow patients with stable angina access to cardiac rehab. TH north did not list GP as a recruitment pathway, but this may have been an omission because stable angina patients are on the inclusion criteria.

Heart failure patients were offered cardiac rehab in TH south and north, but not in the DGH due to lack of funding.

Diabetic patients are currently not offered cardiac rehabilitation in any region. It is not clear whether patients with peripheral artery disease or transient ischaemic attacks accessed the system via GP referrals as we did not collect this data.

Exclusion criteria in TH south and north were detailed and reflect their use of ACPICR guidance (see Table 3 above). The DGH stated they did not have specific exclusion criteria, but modified the cardiac rehab to the patient, including the use of home-based programmes using the Heart Manual [24].

Pulmonary rehabilitation

The British Thoracic Society's pulmonary rehabilitation guideline makes the following recommendations [27]:

- Patients with COPD can be referred for pulmonary rehabilitation regardless of whether or not they have chronic respiratory failure.
- Patients with COPD should be referred for pulmonary rehabilitation regardless of their smoking status.
- People with chronic respiratory disease should be referred to pulmonary rehabilitation irrespective of coexistent stable cardiovascular disease
- Patients with non-CF bronchiectasis who have breathlessness affecting their ADL should have access to and be considered for pulmonary rehabilitation.
- The routine referral of patients with asthma to pulmonary rehabilitation is not recommended.
- A coexistent AAA <5.5 cm should not preclude referral to pulmonary rehabilitation and being included in moderate intensity aerobic exercise training, provided blood pressure is controlled.
- Coexistent symptoms of anxiety and/or depression in patients with COPD should not preclude referral to pulmonary rehabilitation.
- Patients with a MRC dyspnoea score of 3–5 who are functionally limited by breathlessness should be referred for outpatient pulmonary rehabilitation.
- Patients with a MRC dyspnoea score of 2 who are functionally limited by breathlessness should be referred for pulmonary rehabilitation.
- Patients with a MRC dyspnoea score of 5 who are housebound should not routinely be offered supervised pulmonary rehabilitation within their home.

Recruitment and inclusion/exclusion criteria for pulmonary rehabilitation programmes for each region are displayed in Table 6. TH south base their rehabilitation programme on British Thoracic Society guidelines [27]. It is unknown if TH north or the DGH based their programmes on national guidelines.

Table 13 - inclusion/exclusion criteria for pulmonary rehab

REGION	DISEASE SPECIFIC AREA	HOW ARE THE PATIENTS RECRUITED?	INCLUSION CRITERIA?	EXCLUSION CRITERIA
TEACHING HOSPITAL NORTH	RESPIRATORY	1. CONSULTANTS, 2. COPD NURSES, 3. COMMUNITY RESP NURSES	ANY CHRONIC LUNG DISEASE	UNSTABLE ANGINA., CHEST PAIN, UNCONTROLLED ARYTHMIAS, AS, AAA>5.5CM, CARACT SURGERY IN LAST 2 WKS, BP >200/100, MOD-SEVERE HEART FAILURE, PE, RESTING SATS <92%
DGH	RESPIRATORY	1. CONSULTANT, 2. GP, 3. PRACTICE NURSE, 4. SELF REFERRALS (NEED CHECKING WITH GP TO AVOID MIS-DIAGNOSIS)	1. MOD-SEVERE COPD WITH 50% PRIORITISED TO MRC 4-5 AND/OR RECURRENT HOSPITAL ADMISSIONS AND 50% FROM REST OF WAITING LIST ORDER, 2. MRC ≥3	1. HIGH FALLS RISK, 2. UNSTABLE ANGINA, 3. MENTAL HEALTH PRECLUDES ENGAGEMENT WITH GROUP EXERCISE.
TEACHING	RESPIRATORY	1.GP,	1. MRC > 3	1. UNCONTROLLED ANGINA.

HOSPITAL SOUTH		2. PRACTICE NURSES, 3. PHYSIO, 4. SECONDARY CARE RESPIRATORY NURSES, 5. SELF-REFERRAL		2. BP 140/80 REFERRED BACK TO GP 3. AORTIC STENOSIS 4. EYE SURGERY OR ABDOMINAL SURGERY WITHIN LAST 3 MONTHS.
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All the hospitals recruit pulmonary rehabilitation patients via primary and secondary care using doctors and nurses. The TH south and the DGH also recruits via self-referral (the DGH requests a check an individual's own GP occurs first to avoid misdiagnosis).

TH north had the widest inclusion criteria of 'any chronic lung disease'. The TH south and DGH included COPD with an MRC of 3 or more.

Falls Service

Recruitment and inclusion/exclusion criteria for falls prevention programmes for each region are displayed in Table 7. All the regions based their rehabilitation on the Otago Exercise Programme [29]

NICE guidance is vague about recruitment/inclusion/exclusion criteria:

'Those most likely to benefit are older people living in the community with a history of recurrent falls and/or balance and gait deficit'. [28]

The recruitment of patients is widest in the DGH.

Table 14 - inclusion/exclusion criteria for falls service

REGION	DISEASE SPECIFIC AREA	HOW ARE THE PATIENTS RECRUITED?	INCLUSION CRITERIA?	EXCLUSION CRITERIA
TEACHING HOSPITAL NORTH	FALLS	ANY REFERRALS EXCEPT SELF-REFERRALS	AT RISK OF FALL. NEED TO BE INDEPENDENT FOR BIG CLASSES	TEACHING HOSPITAL NORTH
DGH	FALLS	1. GP 2. PHYSIO 3. SELF-REFERRAL 4. RAPID RESPONSE TEAM. 5. A+E	≥65YRS. DO NOT NEED TO HAVE FALLEN. IF BERG BALANCE SCALE < 25 HAVE 1:1 PHYSIO, IF 25-45 HAVE HOSPITAL PROGRAMME (SMALLER GROUPS), IF >45 HAVE COMMUNITY BASED PROGRAMME (LARGER GROUPS)	INABILITY TO ENGAGE WITH EXERCISE PROGRAMME EG. ADVANCED DEMENTIA. (DEMENTIA WITH CARER TO HELP OK)
TEACHING HOSPITAL SOUTH (BACPR as guidance)	FALLS PREVENTION	FOLLOWING A FALLS ASSESSMENT	1. GOOD COGNITION OR CARER ABLE TO ATTEND 2. BERG BALANCE SCORE >32	1. DEMENTIA WITH MARKED COGNITIVE DECLINE 2. NO CARER ABLE TO ACCOMPANY 3. PATIENT CHOICE TO DECLINE 4. UNSTABLE CHRONIC DISEASE

Osteoarthritis

Recruitment and inclusion/exclusion criteria for OA rehabilitation programmes in two regions are displayed in Table 8.

There are no national guidelines for recruitment, exclusion and inclusion of patients onto osteoarthritis rehabilitation programmes.

Table 15 - Inclusion/exclusion criteria for OA exercise rehabilitation

REGION	DISEASE SPECIFIC AREA	HOW ARE THE PATIENTS RECRUITED?	INCLUSION CRITERIA?	EXCLUSION CRITERIA
DGH	OA	1. PHYSIO 2. ORTHOPAEDIC PRACTITIONER SERVICE 3. SELF-REFERRAL	MILD-MODERATE OA OF HIP OR KNEE	SEVERE CHANGES ON XRAY, JOINT REPLACEMENTS, DECREASED MOBILITY
TEACHING HOSPITAL SOUTH	OA	ASSESSED ON NEED BY PHYSIO	OA BUT NOT CLEARLY STIPULATED	NOT CLEARLY STIPULATED

Osteoporosis

Recruitment and inclusion/exclusion criteria for the osteoporosis rehabilitation programme in TH South are displayed in Table 9.

There are no current guidelines for osteoporosis rehabilitation programmes.

Table 16 - Inclusion/exclusion for osteoporosis exercise rehabilitation

REGION	DISEASE SPECIFIC AREA	HOW ARE THE PATIENTS RECRUITED?	INCLUSION CRITERIA?	EXCLUSION CRITERIA
TEACHING HOSPITAL SOUTH	OSTEOPOROSIS	FROM OSTEOPOROSIS HOSPITAL TEAM. OCC X-DEPT REFERRAL. NOT GP OR SELF-REFERRAL.	OSTEOPOROSIS + PAIN	NIL SPECIFIC FOR SEATED EXERCISE. IF HAVE SEVERE MENTAL HEALTH ISSUES E.G.ADVANCED DEMENTIA MAY NOT BE SUITABLE. MAY NOT BE SUITABLE FOR POOL WORK E.G CVA

Heart failure

Recruitment and inclusion/exclusion criteria for heart failure rehabilitation programmes for two regions are displayed in Table 10.

NICE guidance for chronic heart failure recommends an exercise rehabilitation programme that assesses patients to ensure the patient is stable and does not have a condition or device that would preclude an exercise-based rehabilitation programme.[37]

Table 17 - Inclusion/exclusion criteria for heart failure exercise rehabilitation

REGION	DISEASE SPECIFIC AREA	HOW ARE THE PATIENTS RECRUITED?	INCLUSION CRITERIA?	EXCLUSION CRITERIA
TEACHING	HEART	1. GP'S 2.	STABLE	UNSTABLE ANGINA, UNCONTROLLED

HOSPITAL NORTH	FAILURE	CARDIOLOGISTS 3. COMMUNITY HEART FAILURE NURSES	NYHA 1-3 HEART FAILURE	ARRHYTHMIAS, AS >50MMHG, POSITIVE ETT >2MM, UNCOMPENSATED CCF, BP DROP OF >20MMHG ON EXERCISE, BP >200/100, ASCENDING AA >40CM, AAA>45MMHG, ACUTE FEVER.
TEACHING HOSPITAL SOUTH	HEART FAILURE	1. HOSPITAL ADMISSION (OFFERED APPT) 2. COMMUNITY HEART FAILURE NURSES 3. GP REFERRAL	HEART FAILURE (ANY AETIOLOGY)	NIL SPECIFICALLY

4. Behaviour Change and Structured Exercise Rehabilitation

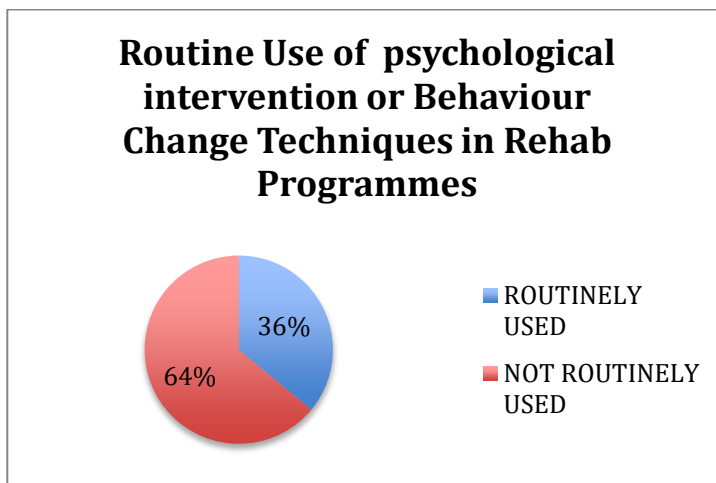
Behaviour change questions:

- a. Do you offer any psychological interventions designed to change behaviour?
- b. If so, what? (using standardized descriptions – Appendix 1)

Behaviour change techniques are an important component of exercise rehabilitation in chronic disease [10-12]. Within the three regions 36% (5 out of 14) exercise rehabilitation programmes routinely use health behaviour change techniques (Figure 3).

Six exercise rehabilitation programmes refer to a psychologist on an ad hoc basis. The decision to refer was based on arbitrary criteria more often related to the co-existence of depression or anxiety than on the need to influence long term behavioural change. Three exercise rehabilitation programmes do not currently use any psychological intervention. The DGH pulmonary rehabilitation stated they had tried to use behaviour change techniques in the past, but not currently. They described the trial as unsuccessful, but the reason for this was not given.

Figure 3 - Routine Use of Behaviour Change Techniques



The BACPR are explicit that health behaviour change forms a core component of cardiac rehabilitation [23]:

3.1.1 Health behaviour change

To facilitate effective behaviour change, cardiac rehabilitation services should ensure:

- *The use of health behaviour change interventions underpinned by an up-to-date psychological evidence-base*
- *The provision of or access to training in communication skills for all staff, which may include motivational interviewing techniques and relapse-prevention strategies.*
- *The provision of information and education to support fully informed choice from a menu of evidence-based locally available programme components. Offering choice may improve uptake and adherence to cardiac rehabilitation*
- *They address any cardiac or other misconceptions (including any about cardiac rehabilitation) and illness perceptions that lead to increased disability and distress*
- *Support for patients (and significant supporting others), including goal-setting and pacing skills, and exploring problem solving skills, in order to improve long term self-management.*
- *Regular follow up to assess progress and advise on further goal setting*
- *Where possible, the patient identifies someone best placed to support him/her (e.g. a partner, relative, close friend). The accompanying person should be encouraged to actively participate in cardiac rehabilitation activities whenever possible, to maximise patient recovery and health behaviour change, whilst also addressing their own health behaviours*

One out of three cardiac rehabilitation schemes routinely uses behaviour change techniques.

In rehabilitation programmes where behaviour change techniques were used they were asked to consider Appendix 3 (Standardised Behaviour Change Techniques) and state which ones were used. The commonest types of behaviour change technique being used were:

- goal setting for behaviour,
- goal setting for outcome,
- informing patients of general consequences of their behaviour
- informing patients of individual consequences of their behaviour
- motivational interviewing

Standardised behaviour change techniques used

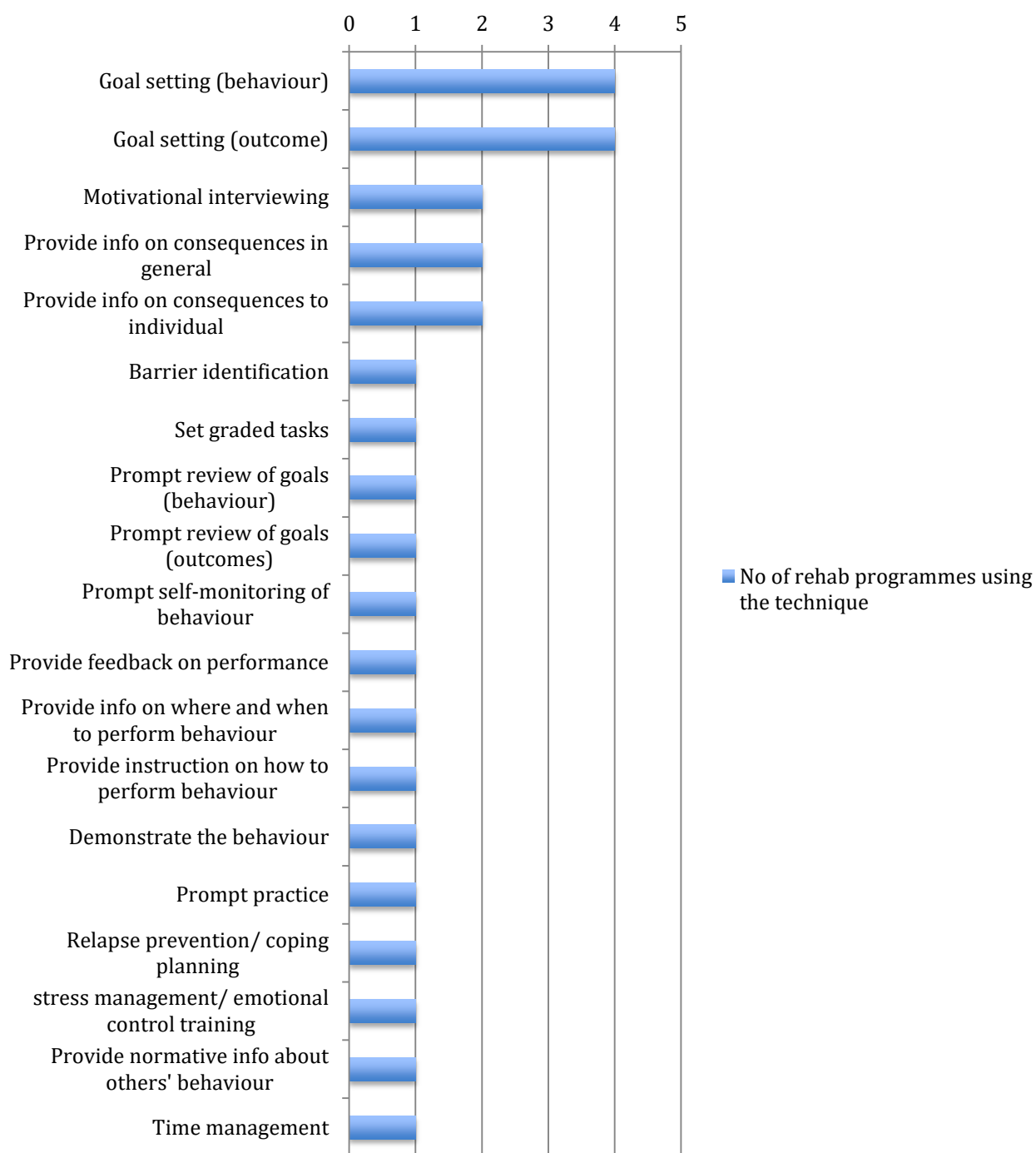


Figure 4 - Standardised behaviour change techniques used

5. Multi-morbidity and Structured Exercise Rehabilitation

Multi-morbidity questions:

- a. What % of patients have another chronic disease?
- b. What % of patients have more than 2 chronic diseases?

Multi-morbidity is common with increasing age, reduces quality of life and has significant health economic implications [1, 2]

The results show that the majority of patients in all three regions passing through exercise rehabilitation had multi-morbidity defined as 2 or more chronic diseases. The percentages provided by all three regions were estimates – this data was not collected by any of the rehabilitation programmes. In TH north, three of the rehabilitation programmes did not feel able to provide estimates for patients having more than 2 chronic diseases and this is reflected as zero in Figure 7.

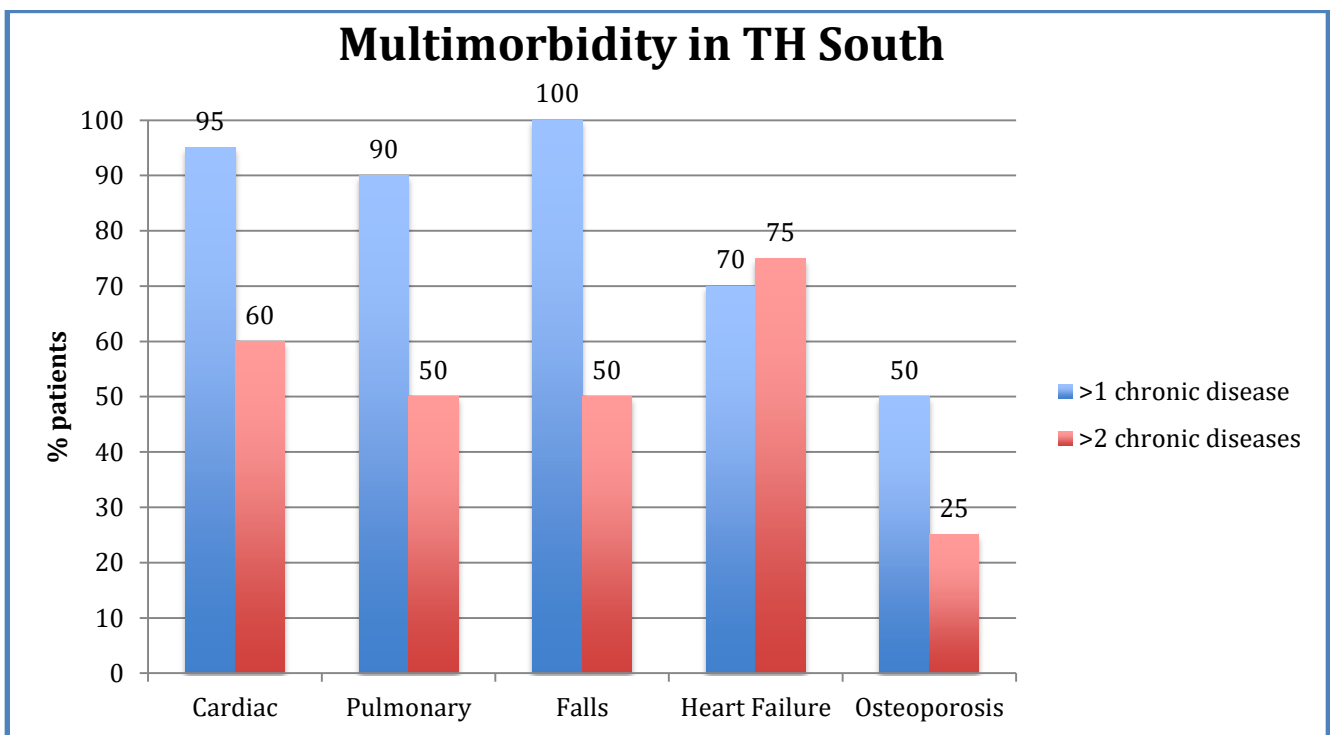


Figure 5 - multimorbidity in TH south

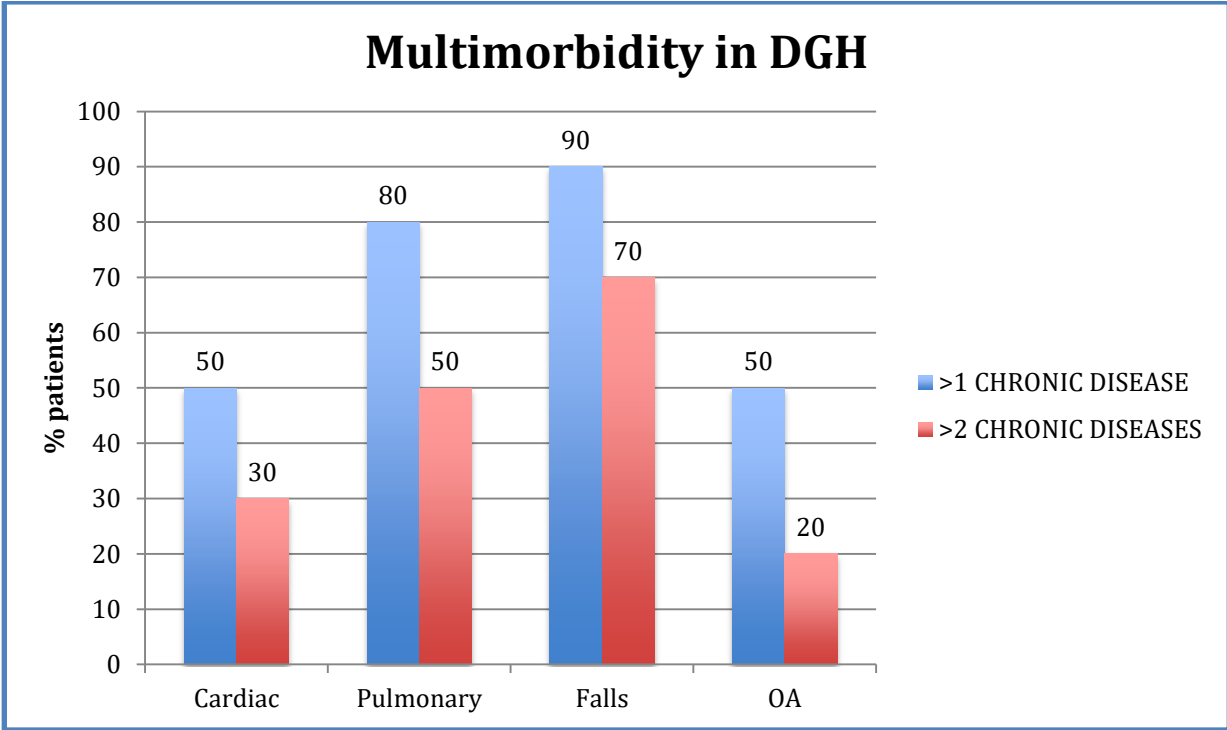


Figure 6 - multimorbidity in DGH

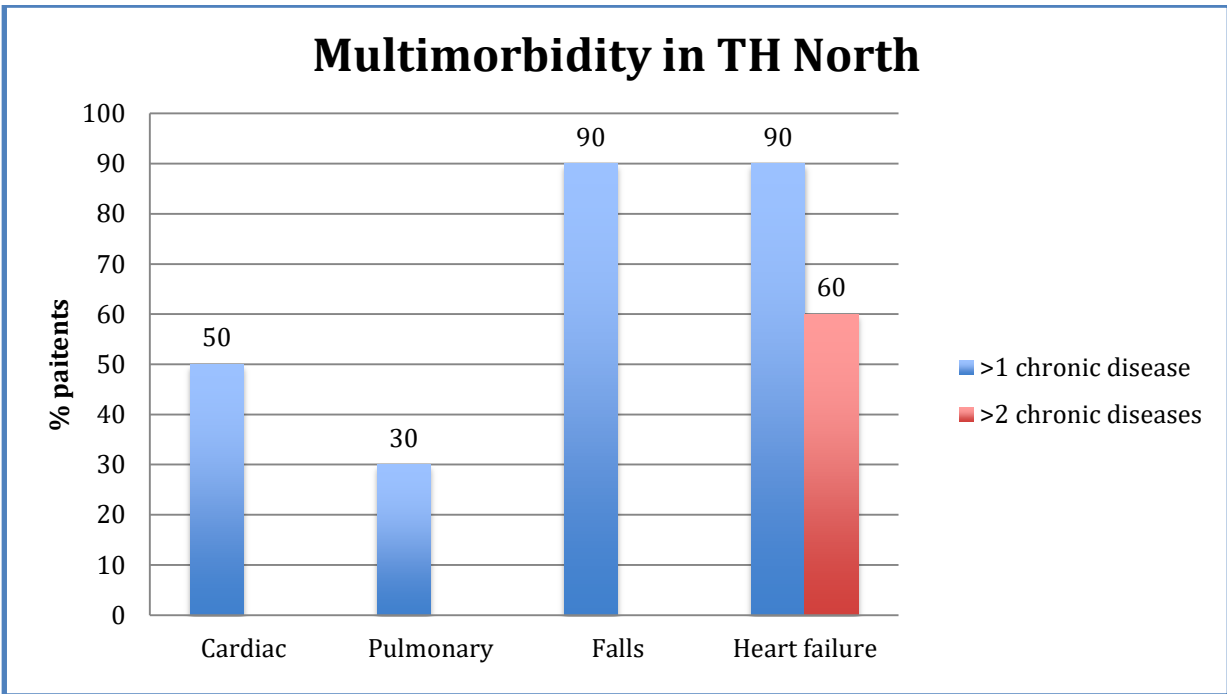


Figure 7 - multimorbidity in TH North

6. Post-rehabilitation exercise pathway

Question: is there a post-rehabilitation exercise pathway?

The majority of the structured exercise rehabilitation programmes refer patients on to a post-rehabilitation exercise pathway (see figure 9). All of these pathways have a cost to the patient. These pathways are all home or community based. There is a lack of data on utilization of these pathways.

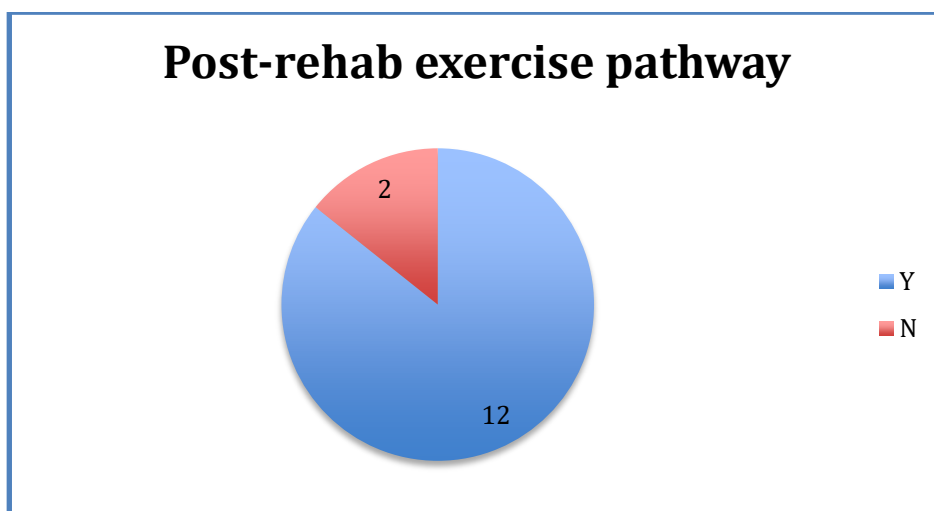


Figure 8- is there a post-rehab exercise pathway?

A comparative table of post-rehab exercise pathways is shown in Table 18. TH north has pathways in place for all the rehab programmes. These are gym and circuit training programmes based in leisure centres. The exact cost to the patient was not given but described as 'reduced'. The provision is via county councils and described as 'patchy' across their region.

The DGH has post-rehabilitation exercise pathways in place for 3 of the 4 programmes (not the OA pilot scheme). The cardiac patients are offered Phase 4 rehabilitation in a gym or community hall (£3/session). The pulmonary patients are offered a home or gym-based respiratory exercise group run by a BLF course instructor (£2.50-£2.75/session). The falls service offers a weekly seated or standing class at village halls for £2-4/session). Again, the point was made that the provision was patchy across the county.

TH south has post-rehabilitation exercise pathways in place for 5 of the 6 programmes. The cardiac patients and heart failure patients are offered Phase IV cardiac rehabilitation (£2.60-£3.50/session) but only 2 venues across the region are currently running due to staffing issues in other venues. The alternative is for patients to seek Exercise on Referral from their GP to their local gym. Pulmonary rehab patients can be referred to Exercise on Referral which consists of a 3 week programme with a community gym instructor (£3/session). Patients over 50yrs with osteoporosis or who've accessed the falls service are signposted to an online exercise prescription and activity signposting pathway. The website allows patients to sign in, complete a health screen, complete a PA assessment and enter preferences for activity type, location, cost

and so on. It then provides an online exercise prescription with a list of local activities reflecting the individuals preferences.

Table 18 - comparison table of post-rehab exercise pathway

DISEASE AREA	DETAILS	TH SOUTH	DGH	TH NORTH
IHD	VENUE	GYM	GYM OR COMMUNITY HALL	GYM OR CIRCUITS
	COST/SESSION	£3.50	£3	VARIABLES WITH VENUE
	CHOICE OF ACTIVITY	Y		Y
HEART FAILURE	VENUE	GYM	N/A	GYM OR CIRCUITS
	COST/SESSION	£2.60	N/A	VARIABLES WITH VENUE
	CHOICE OF ACTIVITY	Y	N/A	Y
PULMONARY	VENUE	GYM OR HOME	HOME OR GYM	GYM OR CIRCUITS
	COST/SESSION	£3 OR FREE	£2.50 - £2.75	REDUCED COST
	CHOICE OF ACTIVITY	Y	N	Y
FALLS PREVENTION	VENUE	HOME	COMMUNITY HALL	GYM
	COST/SESSION	FREE	£2	REDUCED COST
	CHOICE OF ACTIVITY	Y	N	Y
OSTEOPOROSIS	VENUE	HOME	N/A	N/A
	COST/SESSION	FREE	N/A	N/A
	CHOICE OF ACTIVITY	Y	N/A	N/A
OA	VENUE	N/A	N/A	N/A
	COST/SESSION	N/A	N/A	N/A
	CHOICE OF ACTIVITY	N/A	N/A	N/A

7. Patient engagement

Patient engagement:

- a. What percentage of referred patients takes part?
- b. What are the reasons that people give for not taking part?

The answers to part (a) were all estimates. Only TH south and DGH were able to provide estimates of patient engagement. The estimates were varied between 40-95% of eligible patients participating in rehabilitation programmes.

The NACR 2013 audit found that of those referred nationally to cardiac rehabilitation, 87% over those referred for Phase I cardiac rehabilitation go on to reach Phase IV. They note that the greatest loss of patients in the rehabilitation pathway is at entry to Phase III [7] The health professionals that were questioned for this scoping project were all involved in Phase III cardiac rehabilitation which involves patients coming through from Phase II CR but also referrals from primary care.

The estimates of engagement in the three regions scoped were between 40 and 65% of patients referred. Transport issues and lack of patient interest were the commonest reasons given for these levels.

Table 19 - % ELIGIBLE PATIENTS TAKING PART IN REHAB

TEACHING HOSPITAL SOUTH	CARDIAC	40-50%
TEACHING HOSPITAL SOUTH	PULMONARY	50%
DGH	CARDIAC	65%
DGH	PULMONARY	75%
DGH	FALLS	95%

The NACR 2013 and 2014 national audits lists the commonest reasons for not engaging in cardiac rehabilitation programme for Phase III patients as being (in order of frequency):

- Not interested/refused
- Physical incapacity
- Too far to travel
- Rehabilitation not appropriate

It is interesting to note that only 2% of patients not engaging were not interested or refused, but a further 48% were deemed not to be suitable by the service provider.

In this scoping project, there were similar reasons provided for patients not taking part in different regions and across different chronic disease areas. They were as follows (in order of frequency):

- Transport issues
- Patient choice
- Lack of understanding/awareness
- Dislike of group environments
- Lack of capacity

It is also recognized that % of referred patients taking part is not comparable to % of eligible patients taking part. Eligibility is difficult to estimate due to lack of a denominator.

8. Patient demographics

Patient demographics:

- a) What percentage of patients on the rehabilitation programme are men/women and how does this compare to the local population?
- b) What percentage of patients on the rehabilitation programme are from BME communities and how does this compare to the local population?

The ratio of female to male adults aged 18 and over in the three regions scoped is very close to 1:1. (TH south women 330,827, men - 322,971; DGH women 304,398, men - 292,586; TH north-women 681,829, men - 661,772)[4]. Due to a longer life expectancy in women, this ratio increases in later decades with a greater number of women than men. However, to make full sense of this question, an understanding of the prevalence of the chronic disease in different genders and different ethnicities is necessary.

Cardiac rehabilitation

IHD is more common in men than pre-menopausal women, although the gap closes after the menopause. These differences seemed to be reflected in the male:female ratio estimates for all three regions.

Pulmonary rehabilitation

A recent study from the American Lung Association has found a higher rate of COPD in women, particularly below the age of 65years[38]. This is a shift from previous epidemiology suggesting a roughly equal incidence in the genders. All three regions showed a higher estimated rate of attendance by men. One region thought the lower rate of attendance by women on pulmonary rehabilitation was in part due to their role as carers making it harder for them to take the time to come to rehabilitation.

Falls Prevention Service

The World Health Organisation has estimated that 30% of older people aged over 65 and 50% of those over 80 will fall each year. More women have non-fatal falls and this gender difference is related to the fact more women report their falls to the healthcare services [39]. Many falls in both genders go unreported. Falls lead to 70,000 hip fractures annually in the UK and are the leading cause of accident-related death in older people [40]. Two of the three regions felt unable to estimate the gender difference. The DGH estimated a majority (80%) of women attending the falls service. They stated they would expect more men but feel the format may not appeal and have considered holding classes in rugby clubs or bowling clubs.

Table 20 - PATIENT DEMOGRAPHICS

REGION	DISEASE SPECIFIC AREA	% MEN	% WOMEN	HOW DOES THIS COMPARE TO LOCAL COMMUNITY?	% BME	HOW DOES THIS COMPARE TO LOCAL COMMUNITY?
TH SOUTH	CARDIAC	70	30	Unknown	Unknown	Unknown
DGH	CARDIAC	80	20	As expected	<5% AND MAINLY ASIAN	LESS THAN COMMUNITY
TH NORTH	CARDIAC	75	25	Unknown	Unknown but thought to be lower than local population	Larger proportion of DNA's
TH SOUTH	PULMONARY	60	40	Unknown	<10%	Unknown
DGH	PULMONARY	60	40	Less women than expected. ? Because they are often care providers	<5% AND MAINLY ASIAN	Less than local community
TH NORTH	PULMONARY	50	50	Unknown	LOW	Unknown
TH SOUTH	FALLS PREVENTION	Unknown	Unknown	Unknown	Unknown	Unknown
DGH	FALLS PREVENTION	20	80	Expect more men - unclear why, but may not appeal. Have considered holding classes in rugby clubs or bowling clubs.	Well represented with a BME class at Day Centre and Asian Elders women only class.	Unknown
TH NORTH	FALLS PREVENTION	Unknown	Unknown	Unknown	Unknown	Unknown
TH SOUTH	HEART FAILURE	60	40	Unknown	LOW	Unknown
TH NORTH	HEART FAILURE	75	25	Unknown	Unknown but thought to be lower than local population	Larger proportion of DNA's
TH SOUTH	OSTEOPOROSIS	15	85	MORE MEN IN COMMUNITY	No BME patients	Does not reflect community but ?why
DGH	OA	40	60	Unknown	Unknown	Unknown

9. Data Collection following exercise rehabilitation

Data collection:

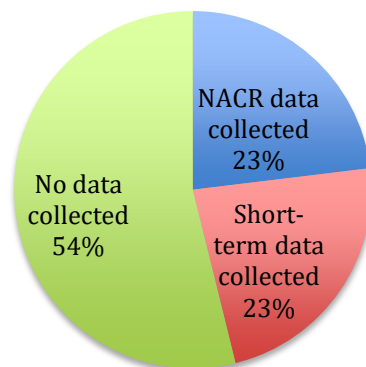
What data is collected regarding long-term PA level after structured rehabilitation programme?

Limited or no physical activity data collection is collected in the majority of regions. The cardiac rehabilitation programmes (3 of the 14) collect data at one year through the national audit programme (NACR). Three other rehabilitation programmes collect short-term (3 month) data regarding function e.g. 6 minute walk test, but not PA level data.

The data that is available from the NACR audit of cardiac rehabilitation 2013 showed a 14% point increase in the number of people self reporting exercising five or more times a week for 30 minutes and a 23% point reduction in those who rarely/never took exercise[7].

Table 21 - PA data collection post-rehabilitation

Physical Activity Data Collection Post-rehabilitation



10. Staffing

Staffing:

- How many staff (full-time equivalent) does it take to deliver the exercise component of the rehab programme?
- What are the core competencies/minimal qualifications of staff used to deliver your structured exercise intervention?

The staffing of exercise rehabilitation vary between region and chronic disease area. On average 2 staff are required to run the programmes. 93% of rehabilitation programmes use a minimum of at least one qualified (Band 5+) physiotherapist or nurse.

Table 22 - staffing of exercise rehabilitation programmes

REGION	CHRONIC DISEASE AREA	HOW MANY STAFF (FTE) NEEDED TO DELIVER THE EXERCISE COMPONENT OF REHAB PROGRAMME?	CORE COMPETENCIES/MINIMAL QUALS OF STAFF DELIVERING EXERCISE COMPONENT? (FREE TEXT)
TH SOUTH	CARDIAC	3 STAFF FOR EACH SESSION	2 X EXERCISE PHYSIOLOGISTS, 1 X BAND 6 NURSE.
TH SOUTH	HEART FAILURE	3 STAFF FOR EACH SESSION. 1:2 RATIO FOR HEART FAILURE (C/F 1:5 FOR IHD).	1 X EXERCISE PHYSIOLOGIST, 2 X NURSES.
TH SOUTH	PULMONARY	2 STAFF FOR EACH SESSION.	1 X QUALIFIED PHYSIO + 1 X NON-QUALIFIED STAFF
TH SOUTH	FALLS PREVENTION	2 STAFF FOR EACH SESSION.	BALANCE + EDUCATION = PHYSIO + HCA, OTAGO PROGRAMME = PHYSIO + EXERCISE TUTOR
TH SOUTH	OSTEOPOROSIS	2 STAFF FOR EACH SESSION.	PHYSIOTHERAPIST. ASSISTANT NORMALLY HCA AND DUTIES RELATED TO SAFETY IN POOL.
TH SOUTH	OA	1 PHYSIOTHERAPIST PER SESSION	BAND 6 PHYSIO
GLOS	CARDIAC	3 STAFF PER SESSION	BAND 5/6 PHYSIO + BAND 3 PHYSIO + EXERCISE INSTRUCTOR
GLOS	PULMONARY	2 STAFF FOR EACH SESSION	INITIALLY 2 X BAND 5/6/7 PHYSIO. AT END OF COURSE BAND 5/6/7 PHYSIO + BAND 3 PHYSIO ASSISTANT.
GLOS	FALLS	1 STAFF FOR EACH SESSION	BAND 3 PHYSIO ASSISTANT
GLOS	OA	2 STAFF FOR EACH SESSION	BAND 6 PHYSIO + GYM INSTRUCTOR

SHEFFIELD	CARDIAC	3 STAFF PER SESSION	BAND 6 PHYSIO + RGN + 1 BAND 3 PHYSIO ASSISTANT
SHEFFIELD	HEART FAILURE	3 STAFF PER SESSION	BAND 6 PHYSIO + RGN + 1 BAND 3 PHYSIO ASSISTANT
SHEFFIELD	PULMONARY	3 STAFF PER SESSION	2 X BAND 6 PHYSIOS + 1 X BAND 4 PHYSIO
SHEFFIELD	FALLS	2 STAFF PER SESSION	BAND 4 PSI-TRAINED PHYSIO + BAND 3 PHYSIO ASSISTANT

11. Funding

Funding:

- a. Who funds your programme?
- b. What is the annual budget?

The funding of the rehabilitation projects was mainly by the local Clinical Commissioning Group (CCG). One pilot scheme was being funded by a charity.

The figures provided in Table 16 of annual budgets are estimates. The overall funding of the rehabilitation schemes covers the cost of the educational components as well as the exercise components. Many programmes felt unable to estimate the exact cost of the exercise component of the rehabilitation schemes. Many rehabilitation schemes did not disclose their annual budget.

If a more extensive scoping project occurred nationally, it might be worth considering using the Freedom of Information act to obtain the exact costs from the CCGs. It is not clear how much detail would be provided by going down this route and the figures obtained would still need to be put in the context of staffing levels, venue costs, recruitment numbers and so on, in order to be comparable with other regions.

Table 23 - funding of exercise rehabilitation

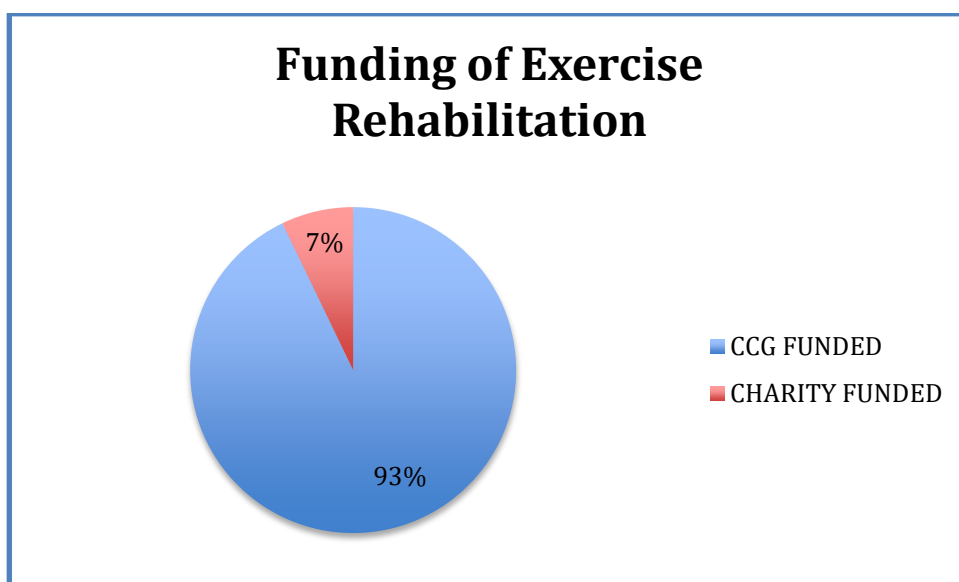


Table 24 - details of funding in exercise rehabilitation

TEACHING HOSPITAL SOUTH	HEART FAILURE	£48,000/YR (£240/PATIENT/PROGRAMME)
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TEACHING HOSPITAL SOUTH	PULMONARY	£300,000/YR
DGH	PULMONARY	£120,000 (EST). £738/PATIENT/COURSE BUT ONLY ~60% EXERCISE COMPONENT

12 Discussion

The aim of this scoping project was twofold: to begin to understand current provision of physical activity interventions for long-term conditions and multi-morbidity and secondly, to provide information to inform potential more comprehensive scoping exercises.

- **Understanding the current provision of physical activity interventions for long-term conditions and multi-morbidity**

This was explored in terms of:

- Level of provision across 11 chronic diseases (CD) in 3 geographical areas
- Scope of current services and how this compares to current best evidence
- Provision for those with multi-morbidity
- Evidence of adherence to accepted behavioural change frameworks

PA advice is offered routinely in secondary care chronic disease management in 54% (TH north), 64% (TH south) and 91% (DGH) of services. Physical activity advice was most commonly delivered by verbal advice or with a leaflet. Where advice is offered, it is offered in the context of a single chronic disease area. There is a lack of uniformity of information across the country. In the context of overwhelming evidence and national disease specific guidelines, these results are disappointing. It is arguable as to whether provision of a leaflet is destined to change long term physical activity behavior but even this minimum requirement is not being met consistently. Routine PA advice in multi-morbid states is likely to be varied in other regions of the UK, but is currently unknown.

Structured exercise rehabilitation for chronic disease management exists in 36% (TH north and DGH) and 54% (TH south) of chronic disease areas. While this observation reflects funding streams and national policy, this demonstrates significant inequality in provision across chronic disease.

The capacity and capability of exercise rehabilitation services to accommodate all eligible patients is not clear. The reasons for this are complex. The total number of patients with a chronic disease will include undiagnosed cases in the community, diagnosed cases managed in the community and diagnosed cases that are referred to secondary care. The secondary care patients are only part of the eligible denominator as there is a referral pathway into exercise rehabilitation schemes from primary care. It is therefore impossible to provide an accurate denominator. The number of patients who actually pass through an exercise rehabilitation service (the numerator) is influenced by a number of factors including patient choice, provider choice and available funding. It was also not possible, through this scoping project, to accurately estimate proportion of referred patients seen. There were clear indicators, however, that services were not able to accommodate all referred patients. A number of the services were explicit about the fact they prioritise the incoming referrals for rehabilitation services, which is evidence of a lack of capacity and lack of expertise to deliver exercise interventions in the face of multiple morbidity. This phenomenon is also demonstrated in the 2014 National Audit of cardiac

rehabilitation which observes that nearly 50% of eligible patients not taking up rehabilitation were excluded by the service provider[14].

As the survey only collected limited data from staff on capacity, we looked at public domain reports for TH south. As an example, for the falls service in a 2 year period, there were 4247 fallers referred directly from the community and from secondary care. Of these, 89 people accessed home-based Otago exercise programmes and 461 attended exercise groups. This equates to 13% of fallers accessing exercise rehabilitation. This is likely to be an overestimation of actual fallers as it does not take unreported falls into account. Taking national statistics for prevalence of falling, an estimated one in three adults over 65 fall each year. In this population of approximately 30,000 people over the age of 80 [41], current prevalence figures would estimate that 15,000 of them fall each year [42]. The actual figure for eligible people entering falls rehabilitation is therefore likely to be nearer 2%. This phenomenon is further illustrated in the National Audit of Cardiac Rehabilitation which states that on average 48% of eligible people (MI, CABG or PCI) enter cardiac rehabilitation while only 50% of those enter phase 3 [7]. This does not include other eligible patients (heart failure, pacemaker, angina, PVD etc).

There was a significant heterogeneity of delivery of exercise dose across the disease areas and across the regions studied. There was also significant variance from national guidelines in a number of instances. The reasons for this heterogeneity and variance are not clear from this scoping exercise but are likely to reflect capacity and funding issues.

Multi-morbidity was estimated as 50% of patients passing through exercise rehabilitation services. A number of exercise rehab staff were unable to make an estimate at all suggesting a lack of awareness of the importance of multi-morbidity as an issue in their patient population. Accurate data regarding levels of multi-morbidity are lacking even in existing national audits. Multi-morbidity is not explicitly catered for in the majority of the exercise rehabilitation programmes. The common scenario is that patients access a particular rehabilitation programme because they have a particular chronic disease diagnosis. Having other chronic morbidities may or may not exclude them from participation, but when they do not, are not specifically addressed in the education or exercise programme. For example, a patient accessing cardiac rehabilitation with osteoporosis would not be given an exercise prescription that also addresses bone density or sarcopaenia. However, there was evidence of more streamlined practice occurring in some areas where rehabilitation services are combined.

Only 36% of these rehabilitation services are routinely using recognised behavioural change techniques. It is worth noting that studies successfully employing recognized behavioural change frameworks in the adoption of physical activity have based the entire intervention around the psychological aspects of behavioural change [13, 43]. This was not the case in the programmes scoped in this project. The National audit for cardiac rehabilitation has shown that only 10% have access to a psychologist.

Home-based exercise is only offered as an alternative to group-based exercise in 42% of the services. This may be relevant as the main reason cited for lack of patient engagement is difficulty getting to the venues. Dislike of group environments is also cited as a reason for non-attendance and this could also be accommodated if more home-based rehabilitation was available.

Data collection of long-term PA level is currently only collected routinely in 23% of exercise rehabilitation services (cardiac rehabilitation). Even in cardiac rehabilitation, however, this data is only sporadically collected and relies on self-report. In order for exercise rehabilitation schemes to be evidence-based and deserving of CCG commissioning there is a very real need to collect this data, analyse it and use it to continue to improve service design with the aim of changing long-term behaviour effectively.

- **To provide information to inform potential more comprehensive scoping exercises in terms of data collection methods and questionnaire format and content.**

The study method of using telephone and face-to-face surveys worked reasonably well. The process of identifying the most appropriate contacts in each chronic disease area, sending initial emails, following up unanswered emails, finding alternative contacts, sending out further emails and awaiting responses were the major rate-limiting steps in the process and could take many weeks. Once contact had been made with an appropriate practitioner in the disease area who was willing to go through the questionnaire, the process was relatively straightforward. It was noticeable that questionnaires conducted by telephone were often shorter. Face-to-face meetings were longer and more informative. There were a number of drawbacks of the method used that could be overcome with minor study method changes. Firstly, more sensitive data about staffing levels and funding were often not disclosed. A potential solution to this is to use the Freedom of Information Act. A second point is that the reference document for types of behaviour change technique is long and cumbersome and the investigator's impression was that the level of detail precluded adequate consideration by the interviewee. A simplification of the standardised behaviour technique document could be designed without compromising the quality of data collected. This would encourage greater engagement with this question. These factors need to be considered if a more extensive service evaluation is planned.

Conclusions

This scoping project suggests that there is a lack of NHS provision of physical activity advice in some geographical areas despite evidence and guidelines for physical activity advice in all of these chronic disease areas scoped. Multi-morbidity data is not collected but perceived to be high by the staff delivering exercise rehabilitation programmes. Multi-morbidity does not appear to systematically exclude patients from the existing exercise rehabilitation programmes, but it is also not actively addressed. It also suggests that despite pockets of good practice, there is an inequality across the NHS and a failure to adopt recognized behavioural change frameworks in delivery.

To achieve a full picture of national service provision of exercise rehabilitation a more extensive national service evaluation is required. The methods used for this scoping project could be reproduced (with modifications) for a more extensive service evaluation. It may also be necessary to use Freedom of Information Act to collect more sensitive data about staffing and costs.

There is an urgent need for a national strategy to address service provision for long-term conditions and multi-morbidity within an agreed audit framework and evaluation process. In addition, future services should be designed around recognised behavioural change frameworks in order to ensure a higher degree of long-term compliance.

Appendix 1 - Guidelines for the use of physical activity interventions in 11 chronic disease areas.

Breast Cancer

The **World Cancer Research Fund** gives clear evidence-based advice regarding the benefits of PA in breast cancer based on their Second Expert Report[44]. **Cancer Research UK** also provides a summary of the evidence for the impact of PA on breast cancer risk and provide PA guidelines for breast cancer[45].

The **Breast Cancer Care** website has more information about PA than is available in leaflet form. It has a link to an excellent free online video “Eat Well, Keep Active After Breast Cancer” which discusses diet, PA and well-being over 30 minutes using both testimonials and sound practical PA advice [46]

Bowel Cancer

The **World Cancer Research Fund** gives clear evidence-based advice regarding the benefits of PA in bowel cancer based on their Second Expert Report [47]. **Cancer Research UK** provides a summary of the evidence for the impact of PA on bowel cancer risk and provide PA guidelines for bowel cancer[45].

Renal Disease

The **Renal Association** produce NICE-accredited guidelines for chronic renal failure and other renal disease. Their guideline on Detection, Monitoring and Care of Patients with CKD recommends that patients with CKD should receive advice to perform regular moderate exercise [48]

Heart Failure

The **Scottish Intercollegiate Guidelines Network (SIGN)** guidelines for heart failure recommends that motivational techniques should be used to promote regular low intensity physical activity amongst patients with stable heart failure [49].

NICE guidance for management of chronic heart failure recommends that adults are offered a supervised group exercise-based rehabilitation programme [37]. It provides the following guidance:

- *Ensure the patient is stable and does not have a condition or device that would preclude an exercise-based rehabilitation programme.*
- *Include a psychological and educational component in the programme.*
- *The programme may be incorporated within an existing cardiac rehabilitation programme.*

Respiratory Disease

NICE guidance 'Chronic Obstructive Pulmonary Disease: Management of chronic obstructive pulmonary disease in adults in primary and secondary care (CG101)' recommends exercise advice is routinely offered [25].

Diabetes

There is a large volume of national guidance on Type 1 and Type 2 diabetes and all include exercise recommendations. The **Department of Health National Framework** for Diabetes sets out quality standards for diabetes care. Standard 1 gives guidance on diabetes prevention and includes the importance of PA, discusses the need for local strategies to increase PA and recommends continuing education for NHS staff regarding the role of PA in diabetes [19].

NICE public health guidance 'Preventing Type 2 diabetes: population and community-led interventions (PH35)' addresses the importance of both national and local efforts. It provides detailed guidance to commissioners and providers of national public health services about how to promote PA at a national and local level[50]. 'Preventing type 2 diabetes: risk identification and interventions for individuals at high risk (PH38)' contains recommendations for NHS staff, local authorities and diabetes organisations on raising awareness of the importance of PA and providing tailored advice on PA [51]. 'Type 1 diabetes: diagnosis and management of diabetes in children, young people and adults (CG15)' also recommends that exercise is encouraged in children and young people and provides practical advice regarding management of blood glucose when exercising[52].

Falls Service

Physical activity advice from the **NICE guidance** 'Prevention of Falls' emphasizes the importance of strength and balance training in prevention of falls[28].

Osteoporosis

The **National Osteoporosis Society** cites a number of guidelines for osteoporosis including the **NICE guidance** on prevention of falls [28] if the patient is deemed at risk with appropriate advice regarding strength and balance training. Another guideline 'Management of Osteoporosis' from the **Scottish Intercollegiate Guidelines Society** (SIGN) recommends strength and balance exercise for prevention of falls and low impact weight-bearing exercise and high-intensity strength training to maintain bone density in men and post-menopausal women. [53]

OA

NICE highlights the importance of exercise as a core non-pharmaceutical approach to osteoarthritis management [31]. It recommends both muscle strengthening and aerobic exercise. It has not been specified whether exercise should be provided by the NHS or whether the healthcare professional should provide advice and encouragement to the person to obtain and carry out the intervention themselves.

Dementia

A recent **Cochrane Review** found promising evidence that exercise programs can significantly improve cognitive functioning of people with dementia and their ability to perform daily activities, but no significant effect of exercise on mood, including challenging behaviours and

depression.[54] They conclude that further research would support development of best practice guidelines, and help to understand what level and intensity of exercise is beneficial for which types of dementia.

Current **NICE guidance** does not mention exercise as a non-pharmacological intervention for cognitive symptoms. However, it highlights the benefit of exercise in dementia to promote and maintain independence of people with dementia.

'Health and social care staff should aim to promote and maintain the independence, including mobility, of people with dementia...Care plans should always include:

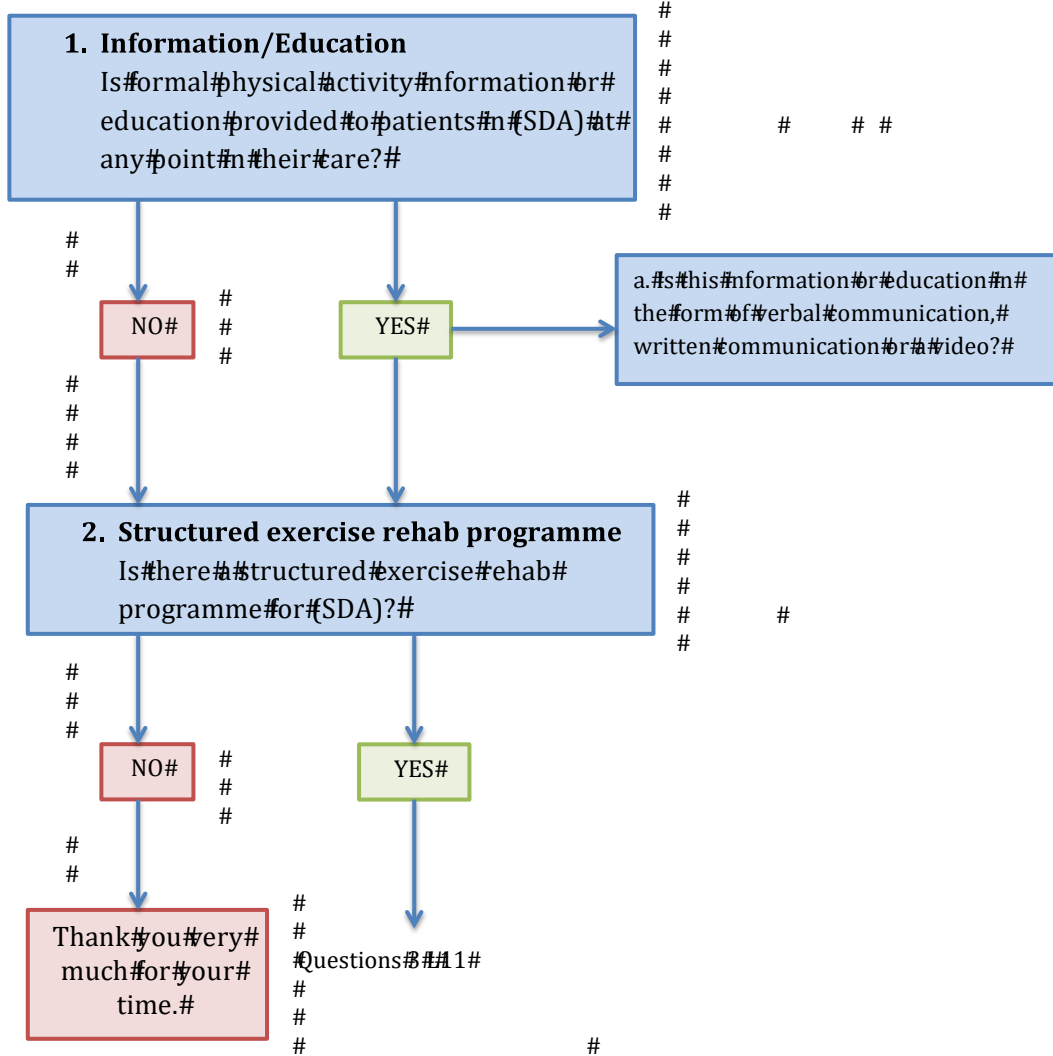
- *physical exercise, with assessment and advice from a physiotherapist when needed.'*

It also states that secondary prevention of dementia is important through prevention of vascular disease [55].

SIGN guideline 86 'Management of Patients with Dementia: a National Clinical Guideline' states: *'For people with dementia, a combination of structured exercise and conversation may help maintain mobility'*[56].

Phase 0 'Scoping' Questionnaire v4!!

PA# physical activity, SDA# specific disease area e.g. oncology, BME# black minority ethnic





3. Rehab Programme Structure

a. What venue do you use?

#

b. Which of the following exercise types included: aerobic (Y/N), anaerobic (Y/N), balance (Y/N), strength (Y/N)

#

c. Is there a choice of activity? (Y/N)

#

d. What is the duration? (# mins)

#

e. What is the frequency (#/month)

#

f. What is the intensity (low, moderate, high)

#

g. Do you perform a health screen pre exercise? (Y/N)

What is it?

#

h. Do you assess current PA level? (Y/N)

What do you use? E.g. GPPAQ

#

g. Do you follow a particular exercise programme (e.g. Otago)

Y/N

What is it?

#

h. What is the cost to the individual of each session? (£)

#

i. Is there a home exercise programme? (Y/N)

#

#

#



KJ5/3/14 Phase 0 Scoping Questionnaire Flowchart

#

10. Data collection

- a. What data do you collect regarding long term PA level after structured intervention?
#
- b. At what time point is the data collected following the programme?
#
- c. If data is collected, what are the results for last year?
#

#



11. Staffing

- a. How many staff (full time equivalent) does it take to deliver the exercise component of your intervention?
#
- b. What are the core competencies/minimal qualifications of staff used to deliver your structured exercise intervention?
#

#



12. Funding

- a. Who funds your programme?
#
- b. what is the annual budget?
#



Thank you very much for your time

Appendix 3 – Stanford Exercise Behaviour Scale

Name



D.O.B

Pre-Class

Post-Class

3 Months Post Class

Stanford Exercise Behaviours

During the past week (even if it was not a typical week for you), how much total time (for the entire week) did you spend on each of the following? (Please circle one number for each question).

How much time during the past week...	None	Less than 30 minutes/	30-60 minutes/ week	1-3 hours/ week	More than 3 hours/week
1. Stretching or strengthening exercises (range of motion, weights, etc.)	0	1	2	3	4
2. Walk for exercise	0	1	2	3	4
3. Swimming or aquatic exercise	0	1	2	3	4
4. Bicycling (including stationary exercise bikes)	0	1	2	3	4
5. Other aerobic exercise equipment (Stairmaster, rowing, skiing machine,	0	1	2	3	4
6. Other aerobic exercise (specify:.....)	0	1	2	3	4

Total:



Appendix 4 – Standardised Behaviour Change Technique Definitions

Standardised Behaviour change technique definitions.

1. Provide information on consequences of behaviour in general
Information about the relationship between the behaviour and its possible or likely consequences in the general case, usually based on epidemiological data, and not personalised for the individual (contrast with technique 2).
2. Provide information on consequences of behaviour to the individual
Information about the benefits and costs of action or inaction to the individual or tailored to a relevant group based on that individual's characteristics (i.e. demographics, clinical, behavioural or psychological information). This can include any costs/benefits and not necessarily those related to health, e.g. feelings.
3. Provide information about others' approval
Involves information about what other people think about the target person's behaviour. It clarifies whether others will like, approve or disapprove of what the person is doing or will do.
NB: Check that any instance does not also involve techniques 1 (Provide information on consequences of behaviour in general) or 2 (Provide information on consequences of behaviour to the individual) or 4 (Provide normative information about others' behaviour).
4. Provide normative information about others' behaviour
Involves providing information about what other people are doing i.e. indicates that a particular behaviour or sequence of behaviours is common or uncommon amongst the population or amongst a specified group – presentation of case studies of a few others is not normative information.
NB: this concerns other people's actions and is distinct from the provision of information about others' approval (technique 3 (Provide information about others' approval)).
5. Goal setting (behaviour)
The person is encouraged to make a behavioural resolution (e.g. take more exercise next week). This is directed towards encouraging people to decide to change or maintain change.
NB: This is distinguished from technique 6 (goal setting – outcome) and 7 (action planning) as it does not involve planning exactly how the behaviour will be done and either when or where the behaviour or action sequence will be performed. Where the text only states that goal setting was used without specifying the detail of action planning involved then this would be an example of this technique (not technique 7 (action planning)). If the text states that 'goal setting' was used if it is not clear from the report, if the goal setting was related to behaviour or to other outcomes, technique 6 should be coded. This includes sub-goals or preparatory behaviours and/or specific contexts in which the behaviour will be performed. The behaviour in this technique will be directly related to or be a necessary condition for the target behaviour (e.g. shopping for healthy eating; buying equipment for physical activity).
NB: check if techniques applied to preparatory behaviours should also be coded as instances of technique 9 (Set graded tasks).
6. Goal setting (outcome)
The person is encouraged to set a general goal that can be achieved by behavioural means but is not defined in terms of behaviour (e.g. to reduce blood pressure or lose/maintain weight), as opposed to a goal based on changing behaviour as such. The goal may be an expected consequence of one or more behaviours, but is not a behaviour per se (see also techniques 5

(Goal setting – behaviour) and 7 (Action planning)). This technique may co-occur with technique 5 if goals for both behaviour and other outcomes are set.

7. Action planning

Involves detailed planning of what the person will do including, as a minimum, when, in which situation and/or where to act. 'When' may describe frequency (such as how many times a day/week or duration (e.g. for how long). The exact content of action plans may or may not be described, in this case code as this technique if it is stated that the behaviour is planned contingent to a specific situation or set of situations even if exact details are not present.

NB: The terms 'goal setting' or 'action plan' are not enough to ensure inclusion of this technique unless it is clear that plans involve linking behavioural responses to specific situational cues, when only described as 'goal setting' or 'action plan' without the above detail it should be regarded as applications of techniques 5 and 6.

8. Barrier identification/problem solving

This presumes having formed an initial plan to change behaviour. The person is prompted to think about potential barriers and identify the ways of overcoming them. Barriers may include competing goals in specified situations. This may be described as 'problem solving'. If it is problem solving in relation to the performance of a behaviour, then it counts as an instance of this technique. Examples of barriers may include behavioural, cognitive, emotional, environmental, social and/or physical barriers.

NB: Closely related to techniques 7 (action planning) and 9 (set graded task), but involves a focus on specific obstacles to performance. It contrasts with technique 35 (relapse prevention/coping planning), which is about maintaining behaviour that has already been changed.

9. Set graded tasks

Breaking down the target behaviour into smaller easier to achieve tasks and enabling the person to build on small successes to achieve target behaviour. This may include increments towards target behaviour or incremental increases from baseline behaviour.

NB: The key difference to technique 7 (Action planning) lies in planning to perform a sequence of preparatory actions (e.g. remembering to take gym kit to work), task components or target behaviours which are in a logical sequence or increase in difficulty over time – as opposed to planning 'if-then' contingencies when/where to perform behaviours. General references to increasing physical activity as intervention goal are not instances of this technique.

10. Prompt review of behavioural goals

Involves a review or analysis of the extent to which previously set behavioural goals (e.g. take more exercise next week) were achieved. In most cases, this will follow previous goal setting (see technique 5, 'goal setting-behaviour') and an attempt to act on those goals, followed by a revision or readjustment of goals, and/or means to attain them.

NB: Check if any instance also involves techniques 6 (goal setting – behaviour), 8 (barrier identification/problem solving), 9 (set graded tasks) or 11 (prompt review of outcome goals).

11. Prompt review of outcome goals

Involves a review or analysis of the extent to which previously set outcome goals (e.g. to reduce blood pressure or lose/maintain weight) were achieved. In most cases, this will follow previous goal setting (see technique 6, goal setting-outcome') and an attempt to act on those goals, followed by a revision of goals, and/or means to attain them.

NB: Check that any instance does not also involve techniques 5 (goal setting – outcome), 8 (barrier identification/problem solving), 9 (set graded tasks) or 10 (prompt review of behavioural goals).

12. Prompt rewards contingent on effort or progress towards behaviour

Involves the person using praise or rewards for attempts at achieving a behavioural goal. This might include efforts made towards achieving the behaviour or progress made in

preparatory steps towards the behaviour, but not merely participation in intervention. This can include self-reward.

NB: This technique is not reinforcement for performing the target behaviour itself, which is an instance of technique 13 (provide rewards contingent on successful behaviour).

13. Provide rewards contingent on successful behaviour

Reinforcing successful performance of the specific target behaviour. This can include praise and encouragement as well as material rewards but the reward/incentive must be explicitly linked to the achievement of the specific target behaviour i.e. the person receives the reward if they perform the specified behaviour but not if they do not perform the behaviour. This can include self-reward. Provisions of rewards for completing intervention components or materials are not instances of this technique. References to provision of incentives for being more physically active are not instances of this technique unless information about contingency to the performance of the target behaviour is provided.

NB: Check the distinction between this and techniques 7 (action planning) and 17 (prompt self-monitoring of behavioural outcome) and 19 (provide feedback on performance).

14. Shaping

Contingent rewards are first provided for any approximation to the target behaviour e.g. for any increase in physical activity. Then, later, only a more demanding performance, e.g. brisk walking for 10 min on 3 days a week would be rewarded. Thus, this is graded use of contingent rewards over time.

15. Prompting generalisation of a target behaviour

Once behaviour is performed in a particular situation, the person is encouraged or helped to try it in another situation. The idea is to ensure that the behaviour is not tied to one situation but becomes a more integrated part of the person's life that can be performed at a variety of different times and in a variety of contexts.

16. Prompt self-monitoring of behaviour

The person is asked to keep a record of specified behaviour(s) as a method for changing behaviour. This should be an explicitly stated intervention component, as opposed to occurring as part of completing measures for research purposes. This could e.g. take the form of a diary or completing a questionnaire about their behaviour, in terms of type, frequency, duration and/or intensity. Check the distinction between this and techniques 17 (prompt self-monitoring of behavioural outcome).

17. Prompt self-monitoring of behavioural outcome

The person is asked to keep a record of specified measures expected to be influenced by the behaviour change, e.g. blood pressure, blood glucose, weight loss, physical fitness.

NB: It must be reported as part of the intervention, rather than only as an outcome measure. Check the distinction between this and techniques 16 (Prompt self-monitoring of behaviour).

18. Prompting focus on past success

Involves instructing the person to think about or list previous successes in performing the behaviour (or parts of it).

NB: This is not just encouragement but a clear focus on the person's past behaviour. It is also not feedback because it refers to behaviour preceded the intervention.

19. Provide feedback on performance

This involves providing the participant with data about their own recorded behaviour (e.g. following technique 16 (prompt self-monitoring of behaviour)) or commenting on a person's behavioural performance (e.g. identifying a discrepancy with between behavioural performance and a set goal – see techniques 5 (Goal setting – behaviour) and 7 (action planning)

– or a discrepancy between one's own performance in relation to others' – note this could also involve technique 28 (Facilitate social comparison).

20. Provide information on where and when to perform the behaviour

Involves telling the person about when and where they might be able to perform the behaviour this e.g. tips on places and times participants can access local exercise classes. This can be in either verbal or written form.

NB: Check whether there are also instances of technique 21 (Provide instruction on how to perform the behaviour).

21. Provide instruction on how to perform the behaviour

Involves telling the person how to perform behaviour or preparatory behaviours, either verbally or in written form. Examples of instructions include; how to use gym equipment (without getting on and showing the participant), instruction on suitable clothing, and tips on how to take action. Showing a person how to perform a behaviour without verbal instruction would be an instance of technique 22 only.

NB: Check whether there are also instances of techniques 5, 7, 8, 9 and 22. Instructions to follow a specific diet or programme of exercise without instructions how to perform the behaviours are not included in this definition. Cooking and exercise classes as well as personal trainers and recipes should always be coded as this technique, but may also be coded as 22 (model/demonstrate the behaviour).

22. Model/Demonstrate the behaviour

Involves showing the person how to perform a behaviour e.g. through physical or visual demonstrations of behavioural performance, in person or remotely.

NB: This is distinct from just providing instruction (technique 21) because in 'demonstration' the person is able to observe the behaviour being enacted. This technique and techniques 21 (Provide instruction on how to perform the behaviour) and may be used separately or together. Instructing parents or peers to perform the target behaviour is not an instance of this technique as fidelity would be uncertain.

23. Teach to use prompts/cues

The person is taught to identify environmental prompts which can be used to remind them to perform the behaviour (or to perform an alternative, incompatible behaviour in the case of behaviours to be reduced). Cues could include times of day, particular contexts or technologies such as mobile phone alerts which prompt them to perform the target behaviour.

NB: This technique could be used independently or in conjunction with techniques 5 (goal setting-behaviour) and 7 (action planning; see also 24 (environmental restructuring)).

24. Environmental restructuring

The person is prompted to alter the environment in ways so that it is more supportive of the target behaviour e.g. altering cues or reinforcers. For example, they might be asked to lock up or throw away or their high calorie snacks or take their running shoes to work. Interventions in which the interveners directly modify environmental variables (e.g. the way food is displayed in shops, provision of sports facilities) are not covered by this taxonomy and should be coded independently.

25. Agree behavioural contract

Must involve written agreement on the performance of an explicitly specified behaviour so that there is a written record of the person's resolution witnessed by another.

26. Prompt practice

Prompt the person to rehearse and repeat the behaviour or preparatory behaviours numerous times. Note this will also include parts of the behaviour e.g. refusal skills in relation to unhealthy snacks. This could be described as 'building habits or routines' but is still practice so

long as the person is prompted to try the behaviour (or parts of it) during the intervention or practice between intervention sessions, e.g. as 'homework'.

27. Use of follow-up prompts

Intervention components are gradually reduced in intensity, duration and frequency over time, e.g. letters or telephone calls instead of face to face and/or provided at longer time intervals.

28. Facilitate social comparison

Involves explicitly drawing attention to others' performance to elicit comparisons.

NB: The fact the intervention takes place in a group setting, or have been placed in groups on the basis of shared characteristics, does not necessarily mean social comparison is actually taking place. Social support may also be encouraged in such settings and this would then involve technique 29 (plan social support/social change). Group classes may also involve instruction (technique 21 (provide instruction on how to perform the behaviour)) demonstration (technique 22 (model/demonstrate the behaviour)) and practice (technique 26 (prompt practice)).

29. Plan social support/social change

Involves prompting the person to plan how to elicit social support from other people to help him/her achieve their target behaviour/outcome. This will include support during interventions e.g. setting up a 'buddy' system or other forms of support and following the intervention including support provided by the individuals delivering the intervention, partner, friends and family.

30. Prompt identification as role model/position advocate

Involves focusing on how the person may be an example to others and affect their behaviour, e.g. being a good example to children. Also includes providing opportunities for participants to persuade others of the importance of adopting/changing the behaviour, for example, giving a talk or running a peer-led session.

31. Prompt anticipated regret

Involves inducing expectations of future regret about the performance or non-performance of a behaviour. This includes focusing on how the person will feel in the future and specifically whether they will feel regret or feel sorry that they did or did not take a different course of action. Do not also code instances of this technique as the more generic providing information on consequences (techniques 1 (provide information on consequences of behaviour in general and 2 (provide information on consequences of behaviour to the individual))).

32. Fear arousal

Involves presentation of risk and/or mortality information relevant to the behaviour as emotive images designed to evoke a fearful response (e.g. 'smoking kills!' or images of the grim reaper). Do not also code instances of this technique as the more generic providing information on consequences (techniques 1 (provide information on consequences of behaviour in general) and 2 (provide information on consequences of behaviour to the individual))).

33. Prompt self talk

Encourage the person to use talk to themselves (aloud or silently) before and during planned behaviours to encourage, support and maintain action.

34. Prompt use of imagery

Teach the person to imagine successfully performing the behaviour or to imagine finding it easy to perform the behaviour, including component or easy versions of the behaviour. Distinct from recalling instances of previous success without imagery (technique 18 (prompting focus on past success)).

35. Relapse prevention/coping planning

This relates to planning how to maintain behaviour that has been changed. The person is prompted to identify in advance situations in which the changed behaviour may not be

maintained and develop strategies to avoid or manage those situations. Contrast with techniques 7 (action planning) and 8 (barrier identification/problem solving) which are about initiating behaviour change.

36. Stress management/emotional control training

This is a set of specific techniques (e.g. progressive relaxation) which do not target the behaviour directly but seek to reduce anxiety and stress to facilitate the performance of the behaviour. It might also include techniques designed to reduce negative emotions or control mood or feelings that may interfere with performance of the behaviour, and/or to increase positive emotions that might help with the performance of the behaviour.

NB: Check whether there are any instances of technique 8 (barrier identification/problem solving), which includes identifying emotional barriers to performance, in contrast to the current technique, which addresses stress and emotions, whether they have been identified as barriers or not.

37. Motivational interviewing

This is a clinical method including a specific set of techniques involving prompting the person to engage in change talk in order to minimise resistance and resolve ambivalence to change (includes motivational counselling).

NB: Only rate this technique if explicitly referred to by name, not if one identifies specific elements of it, this may happen if you have prior experience with this technique.

38. Time management

This includes any technique designed to teach a person how to manage their time in order to make time for the behaviour. These techniques are not directed towards performance of target behaviour but rather seek to facilitate it by freeing up times when it could be performed.

NB: Only rate this technique if explicitly referred to by name, not if one identifies specific elements of it, this may happen if you have prior experience with this technique.

39. General communication skills training

This includes any technique directed at general communication skills but not directed towards a particular behaviour change. Often this may include role play and group work focusing on listening skills or assertive skills.

NB: Practicing a particular behaviour-specific interpersonal negotiation e.g. refusal skills in relation to cigarettes or alcohol would not be an instance of this technique.

40. Stimulate anticipation of future rewards

Create anticipation of future rewards without necessarily reinforcing behaviour throughout the active period of the intervention. Code this technique when participants are told at the onset that they will be rewarded based on behavioural achievement.

Appendix 5 - BACPR 3.1.1 Health Behaviour Change Guidelines

3.1.1 Health behaviour change. To facilitate effective behaviour change, cardiac rehabilitation services should ensure:

- The use of health behaviour change interventions underpinned by an up-to-date psychological evidence-base.
- The provision of or access to training in communication skills for all staff, which may include motivational interviewing techniques and relapse-prevention strategies.
- The provision of information and education to support fully informed choice from a menu of evidence-based locally available programme components. Offering choice may improve uptake and adherence to cardiac rehabilitation.
- They address any cardiac or other misconceptions (including any about cardiac rehabilitation) and illness perceptions that lead to increased disability and distress.
- Support for patients (and significant supporting others), including goal-setting and pacing skills, and exploring problem solving skills, in order to improve long term self-management.
- Regular follow up to assess progress and advise on further goal setting.
- Where possible, the patient identifies someone best placed to support him/her (e.g. a partner, relative, close friend). The accompanying person should be encouraged to actively participate in cardiac rehabilitation activities whenever possible, to maximise patient recovery and health behaviour change, whilst also addressing their own health behaviours.

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