

Evidence Brief: Cardiac Rehabilitation

Contents

Key publications – the big picture.....	3
Guidelines	3
Case Studies.....	3
HEE Star	4
Statistics.....	4
HEE National Data Programme	4
Published Peer Reviewed Research.....	4
Workforce	4
Nurses	6
Pharmacists.....	9
Allied Health Professionals.....	11
Technology.....	15
Multidisciplinary teams.....	17
Career pathways and progression.....	17
Expanded cardiac rehabilitation services.....	19
Barriers and facilitators.....	20
New models of care.....	21
Advanced Practice.....	22
Systematic Reviews.....	23
Competency Frameworks	26
*Help accessing articles of papers	26

Produced by the HEE Knowledge Management team Evidence Briefs offer a quick overview of the published reports, research, and evidence on a workforce-related topic.

Date of publication: October 2022

Evidence Brief: Cardiac Rehabilitation

Please acknowledge this work in any resulting paper or presentation as:

Evidence Brief: Cardiac rehabilitation. Katie Nicholas. (October 2022). UK: Health Education England Knowledge Management Team

There may have been an update to this Evidence Brief - to check you are reading the most current version please see the links below:

- [Complete Evidence Brief list – link for HEE staff](#)
- [Complete Evidence Brief list – link for External staff](#)

Key publications – the big picture

[Cardiology GIRFT Programme National Specialty Report](#) Free NHS Futures log in required*

Author(s): Getting It Right First Time (GIRFT) NHS
Publication date: February 2021

An estimated 6.1 million people in England¹ are currently living with cardiovascular disease (CVD). Although mortality rates from CVD fell by 52% between 1990 and 2013,² CVD remains one of the biggest killers in the UK.³ Healthcare costs relating to heart and circulatory disease are estimated at £7.4bn each year, while the wider cost to the economy in England is estimated at £15.8bn annually.⁴ Therefore, prevention, diagnosis and management of CVD forms a key part of the NHS England and NHS Improvement (NHSE/I) Long Term Plan.⁵ The falling CVD mortality rate has been the biggest contributor to increased life expectancy for men and women within the UK. However, demographic shifts within our society mean that CVD-related mortality is increasing. To address this, we need to review the ways cardiac services are delivered and who is delivering them, to ensure both that patients are getting the care they need during the ongoing COVID-19 pandemic, and that services are fit for the future.

[The National Audit of Cardiac Rehabilitation: Quality and Outcomes Report 2019](#)

Source: British Heart Foundation
Publication date: 2019

The National Audit of Cardiac Rehabilitation (NACR) is a BHF strategic project that aims to support cardiovascular prevention and rehabilitation services to achieve the best possible outcomes for patients with cardiovascular disease, irrespective of where they live.

The NACR Quality and Outcomes Report 2019 combines data from cardiac rehabilitation programmes in England, Wales and

Northern Ireland, and presents recommendations for how to improve programmes.

See p. 34 “Is CR delivered by a multidisciplinary team (MDT) as recommended by national guidance?”

BACPR standards recommend that CR, which is increasingly offered to a multi-morbid patient population, is best delivered by an MDT of skilled and experienced healthcare professionals (BACPR 2017). In the UK, nurses represent the largest professional group involved in delivering CR (almost 97%) followed by physiotherapists at 64%, and an increasingly good spread across other health professionals (Table 12). Some variation in the make-up of MDTs exists between different countries (Table 12).

Guidelines

[Chronic heart failure in adults: diagnosis and management NICE Guidelines NG106](#)

Source: NICE

Publication date: 12th September 2018

See 1.9 Cardiac rehabilitation

Case Studies

[Cardiology GIRFT Programme National Specialty Report](#) Free NHS Futures log in required*

Author(s): Getting It Right First Time (GIRFT) NHS
Publication date: February 2021

See p. 39 Delivering cardiac rehab services through a social enterprise model

Atrium Health Ltd is a social enterprise offering cardiac and pulmonary rehabilitation services, physical activity programmes and health promotion interventions. Set up in 2012 in response

to rising demand, the service aims to offer seamless care for patients transitioning from acute care to long-term rehabilitation. Atrium employs five staff and operates with a number of service level agreements with the NHS and one direct contract with Coventry and Rugby CCG.

HEE Star

More resources and tools are available by searching “heart” in the [HEE Star](#)

Statistics

You can find relevant statistics on the [Health and Care Statistics Landscape](#)

HEE National Data Programme

HEE staff can look at the [National Data Warehouse \(NDL\)](#) SharePoint site to find out more about datasets and Tableau products.

Published Peer Reviewed Research

Workforce

[Rehabilitation workforce challenges to implement person-centred care](#)

Author(s): Fernandes et al.

Source: IJERPH 19(6)

Publication date: 2022

There is an increasing emphasis on developing person-centered care in rehabilitation settings. However, this care practice has not been fully implemented due to several factors. This study explores rehabilitation workforce perspectives on the barriers and facilitators to implementing person-centered care (PCC). This was a quantitative descriptive study, which was developed based on interviews with 12 healthcare professionals from a private institution in the region of Lisbon and Tagus Valley in Portugal. The recruitment was made in October 2020. Braun, Clarke, Hayfield, and Terry’s content analysis was applied to the transcripts, and these were transcribed verbatim. The consolidated criteria for reporting qualitative research (COREQ) checklist were applied to this study. Participants described barriers such as an unsupportive organization and leadership, staff constraints, heavy workload, and resistance to change. Unique to this study, a patient’s clinical characteristics were identified as barriers to person-centered care. As facilitators, they described leadership, staff satisfaction, a positive physical environment, training and education, and shared decision-making. It is essential to understand the perceptions of the rehabilitation workforce, as they play an integral role in providing PCC. This study serves as a guide to facilitate person-centered care, as it provides an understanding of key barriers and facilitators for its implementation in rehabilitation settings.

[Is there a staffing problem in cardiac rehab?](#) Scroll down to Abstract ID:S123

Item Type: Conference Proceeding

Authors: Martens, D.W. and Harris, J.E.

Publication Date: 2021

Publication Details: Journal of Cardiopulmonary Rehabilitation and Prevention. Conference: 36th American Association of Cardiovascular and Pulmonary Rehabilitation Annual Meeting, AACVPR 2021. Virtual. 41(5) (pp E22-E23); Lippincott Williams and Wilkins, pp. E22

Abstract: Introduction: As a seasoned cardiac rehabilitation professional, I have observed complaints about lack of cardiac rehabilitation staffing, which adversely affects managers and staff performance. Medicare's somewhat vague staff requirement is to assure adequate patient care. Purpose(s): The Plan-Do-Study-Act (PDSA) methodology is used to improve patient care systems and process quality. I conducted a survey to assess my staffing concerns and observations. I have also worked on a staffing method, which can compare the actual full-time employee FTE used versus the formula's staff FTE calculation need. Design(s): Questions about staff enthusiasm, staffing sufficiency, and ability to perform quality ITPs, educate patients, and progress exercise were asked. Questions assessed staffing concerns pre and post-Covid. To promote honest answers identifying information was omitted from the survey. Method(s): During the summer of 2020 a staffing survey was sent to the TriState Society of Cardiovascular and Pulmonary Rehab (TSSCVPR). TSSCVPR consists of PA, NJ and DE and is an affiliate chapter of AACVPR. There were 20 managers and 21 staff that responded to this survey. Result(s): Decline in staff enthusiasm in Cardiac Rehab to the level of somewhat to strongly agree. Pre-Covid: 40% of Managers and 33.3% of Staff. During Covid 65% of Managers and 61.9% of Staff. Ability to perform quality ITPs to the level of strongly agree. Pre-Covid: 30% of Managers and

28.6% of Staff. Covid: 25% of Managers and 14.3% of Staff. Insufficient staffing to educate patients that somewhat to strongly agree. Pre-Covid: 55% of Managers and 42.9% of Staff. Covid: 55% of Managers and 52.3% of Staff. Insufficient staffing to progress the exercise prescription to the level of somewhat to strongly agree. Pre-Covid: Managers 10% and Staff 28.6%. Covid: Managers 25% and Staff 38.1% Understaffed by 2-3 FTEs: Pre-Covid: Managers 0% and Staff 0%, Covid: Managers: 15% and Staff 35% Understaffed by 1-1.5 FTEs: Pre-Covid: Managers 40% and Staff 61.9%, Covid: Managers: 45% and Staff 35% Summary of Understaffed by 1-3 FTEs: Pre-Covid: Managers 40% and Staff 61.9%, Covid: Managers: 60% and Staff 70% Conclusion(s): Survey indicates significant quality concerns in many cardiac rehabilitation programs. Covid had a negative impact on staffing in all categories. The survey indicates that managers are not getting the support they need to properly staff their programs and Covid created a higher level of concern. There is a need to continue with the PDSA methodology to improve cardiac rehab staffing and share findings with AACVPR members.

[Cardiac rehabilitation and stroke teams attitudes to people with stroke taking part in cardiac rehabilitation: focus group study](#)

Abstract only*

Item Type: Journal Article

Authors: Clague-Baker, N.;Robinson, T.;Drewry, S.;Hagenberg, A. and Singh, S.

Publication Date: 2018

Journal: Clinical Rehabilitation 32(10), pp. 1416

Abstract: Background: The Cardiovascular Disease Outcomes Strategy (department of health (DoH), 2013) recommends the use of existing cardiac rehabilitation (CR) programmes for people after transient ischaemic attack (TIA) and mild disability stroke. However, there is no research exploring the attitudes of CR or stroke staff who might feasibly be delivering this service.

Method: Using a qualitative interpretive approach with five researchers, seven focus groups with CR and stroke teams were conducted prior to stroke patients taking part in CR and four focus groups after CR. Group discussions were audiotaped and transcribed verbatim. Themes were identified to explain attitudes. Results/Findings: Main themes were as follows: Confidence - CR team lack of confidence to deliver the service and the stroke team having lack of confidence in the CR team, change in confidence in CR team post CR. Lack of Knowledge - CR team -stroke knowledge, Stroke team - CR knowledge, cardiovascular (CV) training, and healthy lifestyles, Stroke and Exercise - barriers - stroke team more aware of personal barriers, both teams aware of environmental barriers, social barriers, and cultural barriers, both teams - identified most patients motivated early after stroke. CR adaptations needed - education programme to include stroke information and class structure. Discussion: Importance of communication, education, and support between stroke and CR teams to provide effective CR for people with stroke. Conclusion: Stroke and CR teams feel that small numbers of people with mild stroke can be included in existing CR programmes where CR staff have increased stroke knowledge and confidence and the programme is adapted and supported by specialist stroke staff.

[The current and potential capacity for cardiac rehabilitation utilization in the United States](#) Abstract only*

Item Type: Journal Article

Authors: Pack, Quinn R.;Squires, Ray W.;Lopez-Jimenez, Francisco;Lichtman, Steven W.;Rodriguez-Escudero, Juan P.;Zysek, Victoria N. and Thomas, Randal J.

Publication Date: 2014

Journal: Journal of Cardiopulmonary Rehabilitation & Prevention 34(5), pp. 318-326

Abstract: PURPOSE: Prior studies suggest that program capacity restraints may be an important reason for outpatient

cardiac rehabilitation (CR) underutilization. We sought to measure current CR capacity and growth potential. METHODS: We surveyed all CR program directors listed in the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) database in November 2012. Respondents reported current enrollment levels, program capacity, expansion potential, and obstacles to growth. RESULTS: Of the 812 program directors in the AACVPR database, 290 (36%) completed the full survey. Respondents represented somewhat larger programs than nonrespondents but were otherwise representative of all registered AACVPR programs. Current enrollment, estimated capacity, and estimated expansion capacity were reported at a median (interquartile range) of 140 (75, 232), 192 (100, 300), and 240 (141, 380) patients annually, respectively. Using these data, we estimated that, in the year 2012, national CR utilization was 28% (min, max: 20, 38) of eligible patients. Even with modest expansion of all existing programs operating at capacity, a maximum of 47% (min, max: 32, 67) of qualifying patients in the United States could be serviced by existing CR programs. Obstacles to increasing patient participation were primarily controllable system-related problems such as facility restraints and staffing needs. CONCLUSIONS: Even with substantial expansion of all existing CR programs, there is currently insufficient capacity to meet national service needs. This limit probably contributes to CR underutilization and has important policy implications. Solutions to this problem will likely include the creation of new CR programs, improved CR reimbursement strategies, and new models of CR delivery.

Nurses

[The nurse-coordinated cardiac care bridge transitional care programme: a randomised clinical trial.](#)

Item Type: Journal Article

Authors: Jepma, Patricia;Verweij, Lotte;Buurman, Bianca M.;Terbraak, Michel S.;Daliri, Sara;Latour, Corine H. M.;Ter Riet, Gerben;Karapinar-Carkit, Fatma;Dekker, Jill;Klunder, Jose L.;Liem, Su-San;Moons, Arno H. M.;Peters, Ron J. G. and Scholte Op Reimer, Wilma J M.

Publication Date: 11 10 ,2021

Journal: Age & Ageing 50(6), pp. 2105-2115

Abstract: BACKGROUND: after hospitalisation for cardiac disease, older patients are at high risk of readmission and death. OBJECTIVE: the cardiac care bridge (CCB) transitional care programme evaluated the impact of combining case management, disease management and home-based cardiac rehabilitation (CR) on hospital readmission and mortality. DESIGN: single-blind, randomised clinical trial. SETTING: the trial was conducted in six hospitals in the Netherlands between June 2017 and March 2020. Community-based nurses and physical therapists continued care post-discharge. SUBJECTS: cardiac patients ≥ 70 years were eligible if they were at high risk of functional loss or if they had had an unplanned hospital admission in the previous 6 months. METHODS: the intervention group received a comprehensive geriatric assessment-based integrated care plan, a face-to-face handover with the community nurse before discharge and follow-up home visits. The community nurse collaborated with a pharmacist and participants received home-based CR from a physical therapist. The primary composite outcome was first all-cause unplanned readmission or mortality at 6 months. RESULTS: in total, 306 participants were included. Mean age was 82.4 (standard deviation 6.3), 58% had heart failure and 92% were acutely hospitalised. 67% of the intervention key-elements were delivered. The composite outcome incidence was 54.2% (83/153) in the intervention group and 47.7% (73/153) in the control group (risk differences 6.5% [95% confidence intervals, CI -4.7 to 18%], risk ratios 1.14 [95% CI 0.91-1.42], $P = 0.253$). The study was discontinued prematurely

due to implementation activities in usual care. CONCLUSION: in high-risk older cardiac patients, the CCB programme did not reduce hospital readmission or mortality within 6 months. TRIAL REGISTRATION: Netherlands Trial Register 6,316, <https://www.trialregister.nl/trial/6169>. Copyright © The Author(s) 2021. Published by Oxford University Press on behalf of the British Geriatrics Society. All rights reserved. For permissions, please email: journals.permissions@oup.com.

[Effects of a nurse-led eHealth cardiac rehabilitation programme on health outcomes of patients with coronary heart disease: A randomised controlled trial.](#) Abstract only*

Item Type: Journal Article

Authors: Su, Jing Jing and Yu, Doris Sau-Fung

Publication Date: Oct ,2021

Journal: International Journal of Nursing Studies 122, pp. 104040

Abstract: BACKGROUND: The uptake of and adherence to cardiac rehabilitation remain suboptimal despite its apparent health benefits in modifying risk factors and slowing disease progression. eHealth refers to the use of information and communication technologies for health-related purposes. It is a promising approach for improving participation in cardiac rehabilitation by enabling instant contact, hypermedia information delivery, technology-monitored functionalities and individualised progress monitoring. AIMS: To evaluate the effects of a nurse-led eHealth cardiac rehabilitation (NeCR) system on health behaviours, cardiac self-efficacy, anxiety and depression, health-related quality of life, risk parameters and unplanned use of care services for people with coronary heart disease. DESIGN: A single-blinded randomised controlled trial design was used. METHODS: The study randomly assigned 146 patients hospitalised for coronary heart disease to receive either the NeCR intervention or the usual care. Underpinned by social cognitive theory, the intervention commenced before

hospital discharge with an in-person session by the nurse to identify individualised self-care needs, set goals and develop an action plan to enhance behavioural risk factor modification and orientate the patient to the use of the information and communication technology platform for cardiac rehabilitation. After discharge, the e-platform helped patients gain knowledge of disease management and monitor goal attainment for health behavioural changes. The nurse provided feedback on the patients' goal attainment and lifestyle modifications on a weekly basis in a small group format through the WeChat platform, thus also mobilising peer influence. Data for lifestyle behaviours, physiological risk parameters and clinical outcomes were collected at baseline and at 6 and 12 weeks post-intervention. RESULTS: At 6 weeks post-intervention, participants in the intervention group showed significant improvement in the number of steps/day (beta = 2628.48, p = .022), the number of minutes/week sitting (beta = -640.30, p = .006) and their health-promoting lifestyle profile (beta = 25.17, p < .001). Copyright © 2021. Published by Elsevier Ltd.

[A snapshot of cardiac rehabilitation nursing resource in New Zealand in 2018](#) Abstract only*

Item Type: Conference Proceeding

Authors: Marshall, W., Gasparini, C., Reed, S., Johansen, Y. and Benatar, J.

Publication Date: 2018

Publication Details: Heart Lung and Circulation. Conference: Cardiac Society of Australia and New Zealand Annual Scientific Meeting 2018. Christchurch New Zealand. 27(Supplement 1) (pp S38-S39); Elsevier Ltd, pp. S38

Abstract: Aim: To describe the current state of cardiac rehabilitation (CR) nurse staffing resource at DHBs across New Zealand. Method(s): A questionnaire was developed and sent to all CR providers at DHBs within New Zealand. The

questionnaire assesses the number of patients eligible for CR, programs offered and staffing resource. Result(s): 18 (95%) of DHBs responded to the survey, 1 non responder from a small DHB where a CR nurse provider could not be found. The mean number of patients eligible for CR is 725+/-426 patients per year at each DHB. One nurse manages an average of 569+/-263 patients per year (range 227 to 1250 patients/nurse). 4 DHBs only have cardiac specialty nurses and there are no CR nurse practitioners in New Zealand. 70% of responders felt that more nurse FTE was needed for CR at their DHB. Only 1 DHB does not offer Phase 1 CR education. All other DHBs offer phase 1 CR with 55% undertaken by CR nurses alone, 28% a mixture of ward staff and CR nurses and 12% by ward staff only. 72% offered community based phase 2 programs and 55% offered home visits. Conclusion(s): There is a large disparity in CR nurse resource across DHBs and most nurses feel under resourced. This disparity in resource impacts the service offered to patients dependent on geography.

[21st century nurse's role in decreasing the rising burden of cardiovascular disease](#) Abstract only*

Item Type: Journal Article

Authors: Victor, G.; Sommer, J. and Khan, F. H.

Publication Date: 2016

Journal: Anaesthesia, Pain and Intensive Care 20(4), pp. 503-510

Abstract: Background: Cardiovascular diseases are the major cause of morbidity and premature mortality in man worldwide. Developing countries contribute a greater share to the global burden of cardiovascular disease. About one third of all deaths in Pakistan are caused by cardiovascular diseases. Purpose(s): The purpose of this review article is to identify and highlight the roles of nurse in decreasing the burden of cardiovascular mortality and morbidity. The critical barriers to nurse roles are also discussed. Methodology: The literature search was done

using key words and statements; cardiovascular diseases, prevalence of cardiovascular diseases in Pakistan and worldwide, roles of nurse, current roles of nurse in cardiovascular diseases prevention and management, from HF.C digital library, Google Scholar and PubMed. Result(s): Nurses represent the largest body of health care professional. A socially responsible nurse having civic sense is a key for applying public health interventions in the community. Being round the clock at patient bedside, nurse is in best position to initiate the resuscitation process whether witnessed or/and unwitnessed cardiac arrest. Nurse role in cardiac rehabilitation is identified as having a 'spider- in-the-web' like character. A trained nurse could effectively deal with CVS emergencies including rhythm recognition, early defibrillation and emergency medication administration. The nurse role as educator could meet the needs of patients through education, support, supervision and reinforcement. Need for specialized knowledge, shortage of nurses, work overload and role confusion are barriers to nurse roles. Implications: Critical health care problems from CVD cannot be alleviated without the involvement of nursing workforce. The emerging roles of nurse can significantly contribute to counteract the growing cardiovascular problems.

Pharmacists

[Management of pharmacotherapy-related problems in acute coronary syndrome: Role of clinical pharmacist in cardiac rehabilitation unit.](#)

Item Type: Journal Article

Authors: Casper, Eman Ahmed; El Wakeel, Lamiaa Mohamed; Saleh, Mohamed Ayman and El-Hamamsy, Manal Hamed

Publication Date: Jul ,2019

Journal: Basic & Clinical Pharmacology & Toxicology 125(1),

pp. 44-53

Abstract: Acute coronary syndrome (ACS) is one of the leading causes of mortality worldwide and negatively impacts healthcare costs, productivity and quality of life. Polymorbidity and polypharmacy predispose ACS patients to medication discrepancies between cardiologist-prescribed medication and drug use by the patient, drug-related problems (DRPs) and inadequate drug adherence. This study aimed to evaluate the impact of clinical pharmacist-provided services on the outcome of ACS patients. This was a prospective, randomized, controlled study on ACS patients participating in a cardiac rehabilitation programme. Forty ACS patients were randomly assigned to either control group, who received standard medical care, or intervention group, who received standard medical care plus clinical pharmacist-provided services. Services included DRP management, clinical assessment and enforcing the patient education and adherence. For both groups, the following were assessed at baseline and after 3 months: DRPs, adherence (assessed by 8-item Morisky Adherence Questionnaire), patient's knowledge (assessed by Coronary Artery Disease Questionnaire), 36-Short Form Health Survey (SF-36), heart rate, systolic and diastolic blood pressure, low-density lipoprotein (LDL), total cholesterol (TC) and fasting blood glucose (FBG). After 3 months, there was a significant difference between the intervention and control groups in the per cent change of DRPs (median: -100 vs 5.882, $P = 0.0001$), patient's adherence score (median: 39.13 vs -14.58, $P = 0.0001$), knowledge score (median: 30.28 vs -5.196, $P = 0.0001$), SF-36 scores, heart rate (mean: -10.04 vs 6.791, $P = 0.0001$), diastolic blood pressure (mean: -17.87 vs 10.45, $P = 0.0001$), systolic blood pressure (mean: -16.22 vs 4.751, $P = 0.0001$), LDL (median: -25.73 vs -0.2538, $P = 0.0071$), TC (median: -14.62 vs 4.123, $P = 0.0005$) and FBG (median: -11.42 vs 5.422, $P = 0.0098$). Clinical pharmacists can play an important role as part of a cardiac rehabilitation team through

patient education and interventions to minimize DRPs.
Copyright © 2019 Nordic Association for the Publication of BCPT (former Nordic Pharmacological Society).

[Pharmacist Intervention in Cardiac Rehabilitation: A RANDOMIZED CONTROLLED TRIAL](#) Abstract only*

Item Type: Journal Article

Authors: Alsabbagh, M. W.;Lemstra, M.;Eurich, D.;Wilson, T. W.;Robertson, P. and Blackburn, D. F.

Publication Date: 2012

Journal: Journal of Cardiopulmonary Rehabilitation & Prevention 32(6), pp. 394-399

Abstract: PURPOSE: : We aimed to determine to what extent a telephone-based pharmacist intervention would (a) be utilized by individuals not attending a traditional cardiac rehabilitation (CR) program and (b) facilitate adherence to cardiovascular medications. METHODS: : We conducted a randomized, controlled open-label trial among patients eligible for CR in Saskatoon, Canada. Patients were invited to participate in telephone-based CR, regardless of participation in the formal program. Subjects in the intervention group were assessed by the CR pharmacist and received education and counseling on medication adherence. The primary endpoint was adherence to cardiovascular medication assessed by electronic filling records over a minimum of 6 months. Mean adherence was expected to reach 70% during the followup period. RESULTS: : Patient recruitment was halted early because of low enrollment. Of the 95 patients randomized, 90% had also registered in the traditional CR program. During the followup period, 129 telephone interactions were performed (median, 2 calls), with every subject taking part in at least 1 interaction. Over the study period, the mean adherence to all recently initiated cardiovascular medications combined was 88.8% in the intervention group and 89.9% in the usual care group (P = .73). CONCLUSIONS: : Participation in traditional CR programs does

not appear to be influenced by the availability of telephone-based education and support. Furthermore, the high rate of adherence among the control group may suggest that CR programs are attracting 'healthy adherers' who volunteer for such programs, while missing those with the greatest need for health care system resources.

[Pharmacist's role in an interdisciplinary cardiac rehabilitation team](#). Abstract only*

Item Type: Journal Article

Authors: Packard, K.;Herink, M. and Kuhlman, P.

Publication Date: 2012

Journal: Journal of Allied Health 41(3), pp. 113-117

Abstract: The purpose of this study was to determine the impact of pharmacist and pharmacy student involvement with an interdisciplinary cardiac rehabilitation program in the outpatient setting. The study included 192 patients who were seen following discharge from an acute care hospital between June 2008 and September 2010. The pharmacy team educated patients on their medications, conducted medication reconciliation, and made patient and provider interventions when appropriate. The pharmacist met with the cardiac rehabilitation team before these sessions to identify areas of focus and concern. The team met again after the sessions to reconcile medication lists and identify areas for follow-up. Of the 192 patients seen, an intervention was initiated in 157 (81.8%), for a total of 467 interventions (mean 2.43 interventions/patient). Medication reconciliation interventions not requiring a physician response comprised 79.9% of total interventions, most commonly involving an over-the-counter medication not initially reported (18%). Seventy-six patient interventions and 18 provider interventions were also made; of these, 92% of the patient interventions were accepted, and 72% of the provider interventions were accepted. The most common patient intervention was changing the administration time of a

medication (36.8%), and the most common provider intervention was avoidance of a significant drug interaction (33.3%). Pharmacists can play a vital role as part of an interdisciplinary cardiac rehabilitation team to ensure proper adherence to cardiac medications and patient safety through patient education and interventions. © 2012 Association of Schools of Allied Health Professions, Wash., DC.

Allied Health Professionals

[Clinical exercise provision in the UK: Comparison of staff job titles, roles and qualifications across five specialised exercise services.](#)

Item Type: Journal Article

Authors: Crozier, A.;Watson, P. M.;Graves, L. E. F.;George, K.;Naylor, L.;Green, D. J.;Rosenberg, M. and Jones, H.

Publication Date: 2022

Journal: BMJ Open Sport and Exercise Medicine 8(1) (pagination), pp. Arte Number: e001152. ate of Pubaton: 24 Jan 2022

Abstract: Objectives In the UK, the National Health Service long-term plan advocates exercise as a key component of clinical services, but there is no clearly defined workforce to deliver the plan. We aimed to provide an overview of current UK clinical exercise services, focusing on exercise staff job titles, roles and qualifications across cardiovascular, respiratory, stroke, falls and cancer services. Methods Clinical exercise services were identified electronically between May 2020 and September 2020 using publicly available information from clinical commissioning groups, national health boards and published audit data. Data relating to staff job titles, roles, qualifications and exercise delivery were collected via electronic records and telephone/email contact with service providers. Results Data were obtained for 731 of 890 eligible clinical services (216 cardiac, 162 respiratory, 129 stroke, 117 falls,

107 cancer). Cardiac rehabilitation services provided both clinical (phase III) and community (phase IV) exercise interventions delivered by physiotherapists, exercise physiologists (exercise specific BSc/MSc) and exercise instructors (vocationally qualified with or without BSc/MSc). Respiratory, stroke and falls services provided a clinical exercise intervention only, mostly delivered by physiotherapists and occupational therapists. Cancer services provided a community exercise service only, delivered by vocationally qualified exercise instructors. Job titles of a exercise physiologists' (n=115) bore little alignment to their qualifications, with a large heterogeneity across services. Conclusion In the UK, clinical exercise services job titles, roles and qualifications were inconsistent. Regulation of exercise job titles and roles is required to remove the current disparities in this area. Copyright © 2022 SAE International. All rights reserved.

[The Benefits Of Utilizing Occupational And Physical Therapists In Cardiopulmonary Rehab](#) Abstract only

Item Type: Conference Proceeding

Authors: Palle, S.R.

Publication Date: 2022

Publication Details: Journal of Cardiopulmonary Rehabilitation and Prevention. Conference: 37th American Association of Cardiovascular and Pulmonary Rehabilitation Annual Meeting, AACVPR. West Palm Beach, FL United States. 42(5) (pp E73); Lippincott Williams and Wilkins,

Abstract: Introduction: In 2021 the COVID pandemic put a strain on the healthcare system resulting in burnout and staff shortages. As a result a lot of employers looked for strategies to maximize their resources without sacrificing the quality of patient care. The pandemic was particularly hard on cardiopulmonary rehabilitation programs, some of which were forced to temporarily shut down. With cardiovascular disease continuing to be the leading cause of death, according to the

Evidence Brief: Cardiac Rehabilitation

Centers of Disease Control and Prevention (CDC), it is crucial that we come up with solutions to confront the impacts of the pandemic. Purpose(s): This study aims to demonstrate how the integration of both the Physical Medicine & Rehabilitation (PM&R) and Cardiac Rehabilitation (CR) departments helps meet the demands of patients and assists in the optimization of resources. Design(s): This retrospective study looked to examine the benefits of utilizing both Physical Therapists (PT) and Occupational Therapists (OT) in all 3 phases of the CR program: Phase 1 is the inpatient visit, Phase 2 is the monitored program and Phase 3 is the wellness/secondary prevention program. Method(s): In a retrospective review from Jan 2021 to Dec 2021 data was collected about patient diagnosis, staffing & patient feedback and patient census/wait list. Result(s): Involvement of both PTs and OTs revealed the following: 1.) Improved phase 1 visits and referrals in the treatment of myocardial infarction, with a total of 391 visits. Our program was able to retain the platinum performance achievement award from the American College of Cardiology even during the pandemic. 2.) Reduced wait times for phase 2 which was reduced from several months to 2 weeks. This was achieved by freeing up nurses to interview and assess new patients while the therapists helped work with those already enrolled in the program. 3.) A sustained phase 3 program achieved by therapists helping triage the surge in patients due to other programs in the system being forced to shut down. Our program accommodated 165 patients in the wellness program in 2021. 4.) With the integration of PM&R and CR, nurses were able to cross refer patients back to PM&R if they had a history of falls or if the patient was post COVID and did not qualify for pulmonary rehab. 5.) Improved team engagement scores which were in the 90th percentile and patient experience scores which were in the 99th percentile. Conclusion(s): This study demonstrates what an important role both PTs & OTs can have in CR when both departments are integrated especially during

challenging times. Involving PTs/OTs in CR helps promote a teamwork approach by allowing clinicians to utilize their skills to address patient impairments from a unique perspective to help patients meet their goals.

[Utilising digital health services to enable clinical placement expansion in a cardiac rehabilitation service...Physiotherapy UK Virtual Conference, November 5-6, 2021](#)

Author(s): Phoenix ; Scordis, C.; Leslie, R. Source: Physiotherapy; vol. 114

Publication date: February 2022

Purpose: The trust was awarded funding from HEE to increase physiotherapy placement capacity throughout this academic year. Aims of our project included: • Improve student experience and provide them with vital skills for future delivery of healthcare. • Improve educator experience. • Enable students to experience rehabilitation during/post pandemic (patients with long term conditions and those that had suffered an acute event). • Improve patient experience.

[Cardiorespiratory physiotherapy as a career choice— perspective of students and physiotherapists in Portugal](#)

Abstract only*

Item Type: Journal article

Authors: Marques, A., Oliveira, A., Machado, A., Jácome, C., Cruz, J., Pinho, T., Hall, A., Alvelos, H. and Brooks, D.

Publication Date: 2019

Publication Details: Philadelphia, Pennsylvania: Taylor & Francis Ltd

Abstract: We investigated Portuguese physiotherapy students' and physiotherapists' (1) perceptions of cardiorespiratory physiotherapy (CRP); (2) factors that influenced their decision to pursue a career in CRP; and (3) suggestions to develop CRP. Online surveys were disseminated to final year students and physiotherapists. A number of 189 students (mean age 23

SD 6] years; 78% ♀) and 375 physiotherapists (mean age 31 SD 8] years; 78% ♀) participated. Students' opinions about CRP were positively influenced by lecturers (n = 112, 69%), clinical experiences (n = 110, 68%), and scientific evidence (n = 93, 57%). Only 13% of students were "extremely interested" in specializing in CRP. Interest in the area and clinical exposure were the main factors influencing students to pursue a career in CRP. A percentage of 15 of responding physiotherapists were working in CRP. Their decision to pursue a CRP career was most influenced by their interest in the area (n = 37, 67%) and opportunity to work in acute settings (n = 31; 56%). Main suggestions to develop CRP were (1) include placements in CRP; (2) emphasize health promotion within the curriculum; and (3) develop CRP skills in broader contexts and training. Strategies focusing on changing the curriculum, increasing exposure to CRP, providing good mentorship, developing health promotion activities, and creating postgraduate courses may increase the attractiveness for CRP.

[Influence of cardiorespiratory clinical placements on the specialty interest of physiotherapy students](#)

Author(s): Sanchez et al.

Source: Healthcare

Publication date: 2019

Clinical placements are an important part of health students' training. Whilst much value is placed on the clinical environment as a place to learn, there is a paucity of direct evidence about its effectiveness. The aim of this study was to compare the competence, importance, and interest in cardiorespiratory physiotherapy of students before and after one month of clinical practice. A pre- and post-placement questionnaire about students' interest in different physiotherapy subspecialties was used. The students with a cardiorespiratory clinical placement showed a significant change in their perception about the importance of the cardiorespiratory specialty (0.348 ± 1.01 ; $p <$

0.001), while no significant change was observed in the students without cardiorespiratory placement (-0.014 ± 0.825 ; $p = 0.883$). The presence or absence of clinical placements seems to have a definitive impact on students' choice of a specialty. This implies the need for developing a set of clinical placements in all the subareas of physiotherapy in order to give undergraduate students the opportunity to make a better decision.

[Advances in cardiorespiratory physiotherapy and their clinical impact](#) Abstract only*

Item Type: Journal Article

Authors: Denehy, Linda;Granger, Catherine L.;El-Ansary, Doa and Parry, Selina M.

Publication Date: 2018

Journal: Expert Review of Respiratory Medicine 12(3), pp. 203-215

Abstract: INTRODUCTION: Cardiorespiratory physiotherapy is an evidence-based practice that has evolved alongside changes in medical and surgical management, analgesia, the ageing society and increasing comorbidities of our patient populations. Continued research provides the profession with the ability to adapt to meet the changing patient and community needs. Areas covered: This review focuses on surgical, respiratory and critical care settings discussing the most significant changes over the past decade with an increased focus on rehabilitation across the care continuum and a shift away from providing predominately airway clearance in established disease populations but also providing this in emerging groups. Further important changes are identification and emphases on patient self-management including changing their behaviour to more positively embrace wellness, particularly increasing physical activity levels. This paper outlines these changes and offers speculation on factors that may impact the profession in the future. Expert commentary:

The increasing focus on new technologies, physical activity levels, changes to the health systems in different countries and an increasingly comorbid and ageing society will shape the next steps in the evolution of cardiorespiratory physiotherapy. Continued research is vital to keep pace with these changes so that physiotherapists can provide the most effective treatments to improve patient outcomes.

[Physiotherapists in Cardiac and Pulmonary Rehabilitation -- Sharing the Rehabilitation Space with Clinical Exercise Physiologists?](#)

Item Type: Journal Article

Authors: Mooney, Sarah and Rhodes, Sarah

Publication Date: 2018

Journal: New Zealand Journal of Physiotherapy 46(2), pp. 49-50

Exercise has been central to physiotherapy, providing one of the most effective therapeutic interventions used by physiotherapists to improve the health and function of people with conditions ranging from acute musculoskeletal injury to chronic illness (e.g. cardiopulmonary diseases). As physiotherapists, we aim to maximise the potential of movement, function and quality of life of individuals across the age continuum, regardless of their health condition and complexity, and environment (World Confederation for Physical Therapy, 2015); exercise is therefore core business. More recently in New Zealand (NZ), there has been a growth in the number and services provided by clinical exercise physiologists whose business is also exercise. Described as individuals who provide 'specialised' exercise and lifestyle education to people across the health continuum including people diagnosed with cardiovascular and respiratory disease (Clinical Exercise Physiology New Zealand, a, n.d.), clinical exercise physiologists have begun to share the rehabilitation space in areas such as cardiac and pulmonary rehabilitation.

[Important aspects in relation to patients' attendance at exercise-based cardiac rehabilitation - facilitators, barriers and physiotherapist's role: A qualitative study.](#)

Item Type: Journal Article

Authors: Back, M.; Oberg, B. and Krevers, B.

Publication Date: 2017

Journal: BMC Cardiovascular Disorders 17(1), pp. no pagination

Abstract: Background: In order to improve attendance at exercise-based cardiac rehabilitation (CR), a greater insight into patients' perspectives is necessary. The aim of the study was to explore aspects that influence patients' attendance at exercise-based CR after acute coronary artery disease (CAD) and the role of the physiotherapist in patients' attendance at exercise-based CR. Method(s): A total of 16 informants, (5 women; median age 64.5, range 47-79 years), diagnosed with CAD, were included in the study at the Cardiology Department, Linköping University Hospital, Sweden. Qualitative interviews were conducted and analysed according to inductive content analysis. Result(s): Four main categories were identified: (i) previous experience of exercise, (ii) needs in the acute phase, (iii) important prerequisites for attending exercise-based CR and (iv) future ambitions. The categories demonstrate that there are connections between the past, the present and the future, in terms of attitudes to facilitators, barriers and the use of strategies for managing exercise. An overall theme, defined as existential thoughts, had a major impact on the patients' attitudes to attending exercise-based CR. The interaction and meetings with the physiotherapists in the acute phase were described as important factors for attending exercise-based CR. Moreover, informants could feel that the physiotherapists supported them in learning the right level of effort during exercise and reducing the fear of exercise. Conclusion(s): This study adds to previous knowledge of barriers and facilitators for

exercise-based CR that patients with CAD get existential thoughts both related to exercise during the rehabilitation process and for future attitudes to exercise. This knowledge might necessitate greater attention to the physiotherapist-patient interaction. To be able to tailor exercise-based CR for patients, physiotherapists need to be aware of patients' past experiences of exercise and previous phases of the rehabilitation process as these are important for how patients perceive their need and ability of exercise. Copyright © 2017 The Author(s).

[Ambulatory surveillance of patients referred for cardiac rehabilitation following cardiac hospitalization: a feasibility study.](#) Abstract only*

Item Type: Journal Article

Authors: Alter, David A.;Habit, Juda;Grace, Sherry L.;Fair, Terry;Kiernan, David;Clark, Wendy and Fell, David

Publication Date: 2012

Journal: Canadian Journal of Cardiology 28(4), pp. 497-501

Abstract: **BACKGROUND:** Our purpose was to examine the feasibility of implementing an ambulatory surveillance system for monitoring patients referred to cardiac rehabilitation following cardiac hospitalizations. **METHODS:** This study consists of 1208 consecutive referrals to cardiac rehabilitation between October 2007 and April 2008. Patient attendance at cardiac rehabilitation, waiting times for cardiac rehabilitation, and adverse events while waiting for cardiac rehabilitation were tracked by telephone surveillance by a nurse. **RESULTS:** Among the 1208 consecutive patients referred, only 44.7% attended cardiac rehabilitation; 36.4% of referred patients were known not to have attended any cardiac rehabilitation, while an additional 18.9% of referred patients were lost to follow-up. Among the 456 referred patients who attended the cardiac rehabilitation program, 19 (4.2%) experienced an adverse event while in the queue (13 of which were for cardiovascular

hospitalizations with no deaths), with mean waiting times of 20 days and 24 days among those without and with adverse events, respectively. Among the 440 referred patients who were known not to have attended any cardiac rehabilitation program, 114 (25.9%) had adverse clinical events while in the queue; 46 of these events required cardiac hospitalization and 8 patients died. **CONCLUSIONS:** Ambulatory surveillance for cardiac rehabilitation referrals is feasible. The high adverse event rates in the queue, particularly among patients who are referred but who do not attend cardiac rehabilitation programs, underscores the importance of ambulatory referral surveillance systems for cardiac rehabilitation following cardiac hospitalizations. Copyright © 2012 Canadian Cardiovascular Society. Published by Elsevier Inc. All rights reserved.

Technology

[Virtual and in-person cardiac rehabilitation](#)

Author(s): Dalal et al.

Source: BMJ 373:n1270

Publication date: June 2021

What you need to know

- Most eligible patients with coronary heart disease and heart failure do not participate in cardiac rehabilitation. Covid-19 has exacerbated this, with a substantial drop in the number of patients participating
- Home and telehealth based interventions are increasingly being used as alternatives to traditional centre based rehabilitation programmes
- Outcomes for patients participating in home based rehabilitation compare favourably with centre based programmes in terms of hospitalisations, quality of life, and cost

- Telehealth based interventions are promising, but some patients may find these interventions challenging
- Novel ways of delivering rehabilitation have been employed during the covid-19 pandemic, including hybrid models that are likely to be offered as alternatives to centre based rehabilitation in future, enabling greater patient choice and greater uptake of cardiac rehabilitation

[Delivering healthcare at a distance to cardiac patients during the Covid-19 pandemic: experience from clinical practice](#)

Author(s): Klompstra and Jaarsam

Source: European Journal of Cardiovascular Nursing 19(6)

Publication date: June 2020

The COVID-19 pandemic has accelerated how healthcare providers are working to deliver healthcare at distance. Many cardiac patients are now relying on phone and videoconference to receive medical care from home. The situation is pushing healthcare towards the future, leading to a leap forward for cardiac telemedicine. In this HeartBeat we highlight initiatives to deliver care at distance.

The first program is the TeleCheck-AF (an initiative from Maastricht University Medical Centre+, The Netherlands), an on-demand and on-prescription mHealth program that includes a smartphone app (FibriCheck) for patients with atrial fibrillation (AF) (see [Figure 1](#)). Using the index finger and the phone's camera, this app can detect the pulse, then use an algorithm to identify if the patient has AF and whether the heart rate is fast or slow. These vital data can be used by the physician to guide the teleconsultation and to monitor treatment at distance.

[Mobile Technologies to Promote Physical Activity during Cardiac Rehabilitation: A Scoping Review](#)

Item Type: Journal Article

Authors: Meinhart, Florian;Stutz, Thomas;Sareban,

Mahdi;Kulnik, Stefan Tino and Niebauer, Josef

Publication Date: Dec 24 ,2020

Journal: Sensors 21(1)

Abstract: Promoting regular physical activity (PA) and improving exercise capacity are the primary goals of cardiac rehabilitation (CR). Mobile technologies (mTechs) like smartphones, smartwatches, and fitness trackers might help patients in reaching these goals. This review aimed to scope current scientific literature on mTechs in CR to assess the impact on patients' exercise capacity and to identify gaps and future directions for research. PubMed, CENTRAL, and CDSR were systematically searched for randomized controlled trials (RCTs). These RCTs had to utilize mTechs to objectively monitor and promote PA of patients during or following CR, aim at improvements in exercise capacity, and be published between December 2014 and December 2019. A total of 964 publications were identified, and 13 studies met all inclusion criteria. Home-based CR with mTechs vs. outpatient CR without mTechs and outpatient CR with mTechs vs. outpatient CR without mTechs did not lead to statistically significant differences in exercise capacity. In contrast, outpatient CR followed by home-based CR with mTechs led to significant improvement in exercise capacity as compared to outpatient CR without further formal CR. Supplying patients with mTechs may improve exercise capacity. To ensure that usage of and compliance with mTechs is optimal, a concentrated effort of CR staff has to be achieved. The COVID-19 pandemic has led to an unprecedented lack of patient support while away from institutional CR. Even though mTechs lend themselves as suitable assistants, evidence is lacking that they can fill this gap.

[Introduction of a novel service model to improve uptake and adherence with cardiac rehabilitation within Buckinghamshire Healthcare NHS Trust](#)

Author(s): McCartan et al.

Source: BMC Cardiovascular Disorders 17(184)

Publication date: 2017

Background: Buckinghamshire Healthcare NHS Trust (BHT) carried out a cardiac rehabilitation (CR) service redesign aimed at optimising patient recruitment and retention and decreasing readmissions. Methods: A single centre observational study and local service evaluation were carried out to describe the impact of the novel technology-enabled CR model. Data were collected for adult patients referred for CR at BHT, retrospectively for patients referred during the 12-month pre-implementation period (Cohort 1) and prospectively for patients referred during the 12-month post-implementation period (Cohort 2). The observational study included 350 patients in each cohort, seasonally matched; the service evaluation included all eligible patients. No data imputation was performed. Results: In the observational study, a higher proportion of referred patients entered CR in Cohort 2 (84.3%) than Cohort 1 (76.0%, $P = 0.006$). Fewer patients in Cohort 2 had ≥ 1 cardiac-related emergency readmission within 6 months of discharge (4.3%) than Cohort 1 (8.9%, $P = 0.015$); readmissions within 30 days and 12 months were not significantly different. Median time to CR entry from discharge was significantly shorter in Cohort 2 (35.0 days) than Cohort 1 (46.0 days, $P < 0.001$). The CR completion rate was significantly higher in Cohort 2 (75.6%) than Cohort 1 (47.4%, $P < 0.001$); median CR duration for completing patients was significantly longer in Cohort 2 (80.0 days) than Cohort 1 (49.0 days, $P < 0.001$). Overall, similar results were observed in the service evaluation. Conclusions: Introduction of the novel technology-enabled CR model was associated with short-term improvements in emergency readmissions and sustained increases in CR entry, duration and completion.

Multidisciplinary teams

[The multidisciplinary team approach in cardiovascular care](#)

Author(s): Hendriks and Jaarsma

Source: European Journal of Cardiovascular Nursing 20(2) pp. 91-92

Publication date: 2021

The general population is aging and the prevalence of multimorbid cardiovascular conditions is rising. This has resulted in complex treatment approaches, not only focusing on the management of a particular condition but requiring a comprehensive approach, including treatment of the primary condition, underlying (cardiovascular) comorbidity and risk factors, and lifestyle modification.

Novel models of care delivery have emerged in which multidisciplinary teams including nurses, allied professionals, medical professionals as well as patients work closely together in collaborative practice models, aiming to improve patient outcomes. Since the majority of care for chronic illnesses is performed by patients (and families) themselves, they should be engaged as member of the multidisciplinary team.

Career pathways and progression

[Cardiac Rehabilitation Knowledge and Attitudes of Cardiology Fellows](#). Abstract only*

Item Type: Journal Article

Authors: Kellar, Garrett;Hickey, Gavin W.;Goss, Fredric;Fertman, Carl and Forman, Daniel E.

Publication Date: 01 01 ,2021

Journal: Journal of Cardiopulmonary Rehabilitation & Prevention 41(1), pp. 30-34

Abstract: PURPOSE: Cardiac rehabilitation (CR) is underutilized with only 8-31% of eligible patients participating.

Lack of referral and lack of physician endorsement are well-known barriers to participation. Physicians who lack insights regarding CR are less likely to refer patients and recommend it. Cardiology fellows are early career physicians who spend a significant amount of time treating patients eligible for CR. At one institution's cardiology fellowship program, we sought to assess fellow attitudes and knowledge base regarding CR and to determine their facilitators and barriers to CR endorsement and referral. **METHODS:** University of Pittsburgh Department of Medicine Cardiology fellows were surveyed and interviewed to assess CR knowledge, attitudes, and perceived facilitators and barriers to CR endorsement and referral. **RESULTS:** The cardiology fellows at this institution had strong belief in the benefits and cost-effectiveness of CR. Despite their support of CR, they had low CR knowledge scores. Perceived impediments to CR included complicated logistics of CR operations, limited communication between CR staff and fellows, limited time with patients, presumed patient barriers, perceived self-barriers, and poor understanding of referral processes (particularly as they varied in each hospital in which they rotated). Perceived supports to CR included greater awareness of evidence-based outcomes, awareness of patient-centered outcomes, pre-arranged order sets, and reminders for referral. **CONCLUSION:** This study revealed perceptions of cardiology fellows at one institution regarding CR that have not been considered previously. Key barriers to endorsement and referral to CR were exposed as well as opportunities to overcome them. Fellowship training affords an important opportunity to improve CR education, and to potentially improve participation of eligible patients for this important aspect of care. Copyright © 2020 Wolters Kluwer Health, Inc. All rights reserved.

[Educational Preparation, Roles, and Competencies to Guide Career Development for Cardiac Rehabilitation Nurses.](#)

Abstract only*

Item Type: Journal Article

Authors: Lin, S. H.; Neubeck, L. and Gallagher, R.

Publication Date: 2017

Journal: The Journal of Cardiovascular Nursing 32(3), pp. 244-259

Abstract: **BACKGROUND:** Cardiac rehabilitation is one of the most widely recommended strategies to reduce the burden of cardiovascular disease. The multicomponent nature of cardiac rehabilitation programs requires a multidisciplinary team of healthcare professionals including nurses who are equipped with extensive knowledge and skills. However, there is a lack of a comprehensive, explicit career pathway that contains academic and clinical development to prepare nurses to become cardiac rehabilitation specialists. **OBJECTIVE:** The aim of this study is to identify the 3 essential components for cardiac rehabilitation professionals: (1) educational preparation, (2) role/responsibility, and (3) competency to inform the framework of career development for cardiac rehabilitation nurses. **METHODS:** Through scoping review, 4 stages from the methodological framework of scoping review by Arksey and O'Malley (Int J Soc Methodol. 2005;8:19-32) were used. **RESULTS:** Some attempts have been made in developing frameworks of career development for cardiac rehabilitation professionals with these 3 components through guidelines/standards and core curriculum development worldwide, among which the United States is the only country with a well-established system including guidelines for cardiac rehabilitation/secondary prevention programs, a position statement in terms of competencies, and certification examination for cardiac rehabilitation professionals. Nevertheless, further development and integration of these efforts, specifically for cardiac rehabilitation nurses, are required. **CONCLUSIONS:** It is vital to raise the awareness of the significant contribution that appropriately educated and

trained nurses make in reducing the global burden of cardiovascular disease through cardiac rehabilitation. Therefore, action on establishing a system of comprehensive, clearly defined career development pathway for cardiac rehabilitation nurses worldwide is of immediate priority.

Expanded cardiac rehabilitation services

[Inclusion of stroke patients in expanded cardiac rehabilitation services: a cross-national qualitative study with cardiac and stroke rehabilitation professionals.](#) Abstract only*

Item Type: Journal Article

Authors: Jeffares, Isabelle;Merriman, Niamh A.;Doyle, Frank;Horgan, Frances and Hickey, Anne

Publication Date: 2022

Journal: Disability & Rehabilitation 44(14), pp. 3610-3622

Abstract: PURPOSE: This qualitative study explored healthcare professionals' views in relation to the potential expansion of cardiac rehabilitation services to include stroke patients, thereby becoming a cardiovascular rehabilitation model.

DESIGN AND METHODS: 23 semi-structured interviews were completed with hospital and community-based stroke and cardiac rehabilitation professionals in Switzerland (n = 7) and Ireland (n = 19). The sample comprised physiotherapists, occupational therapists, speech and language therapists, stroke physicians, cardiologists, psychologists, dieticians and nurses. Interviews were audio-recorded and the transcripts were analysed in NVivo using inductive Thematic Analysis.

RESULTS: Barriers and facilitators to cardiovascular rehabilitation were captured under four broad themes; (i) Cardiac rehabilitation as "low-hanging fruit," (ii) Cognitive impairment ("the elephant in the room"), (iii) Adapted cardiac rehabilitation for mild stroke, and (iv) Resistance to change.

CONCLUSIONS: Hybrid cardiac rehabilitation programmes could be tailored to deliver stroke-specific education, exercises

and multidisciplinary expertise. Post-stroke cognitive impairment was identified as a key barrier to participation in cardiac rehabilitation. A cognitive rehabilitation intervention could potentially be delivered as part of cardiac rehabilitation, to address the cognitive needs of stroke and cardiac patients. Implications for rehabilitation The cardiac rehabilitation model has the potential to be expanded to include mild stroke patients given the commonality of secondary prevention needs. Up to half of stroke survivors are affected by post-stroke cognitive impairment, consequently mild stroke patients may not be such an "easy fit" for cardiac rehabilitation. A cardiovascular programme which includes common rehabilitation modules, in addition to stroke- and cardiac-specific content is recommended. A cognitive rehabilitation module could potentially be added as part of the cardiac rehabilitation programme to address the cognitive needs of stroke and cardiac patients.

[Feasibility of integrating survivors of stroke into cardiac rehabilitation: A mixed methods pilot study.](#)

Item Type: Journal Article

Authors: Regan, Elizabeth W.;Handlery, Reed;Stewart, Jill C.;Pearson, Joseph L.;Wilcox, Sara and Fritz, Stacy

Publication Date: 2021

Journal: PLoS ONE [Electronic Resource] 16(3), pp. e0247178

Abstract: BACKGROUND: Survivors of stroke are often deconditioned and have limited opportunities for exercise post-rehabilitation. Cardiac Rehabilitation (CR), a structured exercise program offered post-cardiac event in the United States (U.S.), may provide an opportunity for continued exercise. The purpose of this study was to examine the feasibility of integrating survivors of stroke into an existing, hospital-based CR program through an assessment of (1) recruitment, uptake and retention, (2) adherence and fidelity, (3) acceptability and (4) safety.

METHODS: A mixed methods design combined a single group,

pre-post design, pilot feasibility study with an imbedded qualitative inquiry. Survivors of stroke were recruited into a standard 12-week, 36 visit CR program. RESULTS: Fifty-three survivors were referred, 29 started and 24 completed the program. Program uptake rate was 55% and completion rate was 83%. Eleven completers and one non-completer participated in the qualitative interviews. Program completers attended an average of 25.25 (SD 5.82) sessions with an average of 38.93 (SD 5.64) exercise minutes per session while reaching targeted rate of perceived exertion levels. Qualitative themes included perceived benefits of an individualized program in a group setting, positive interactions with qualified staff, opportunities for socialization, and regular monitoring and staff attentiveness promoting feelings of safety. CONCLUSIONS: Survivors of stroke were able to meet Medicare standard dosage (frequency and session duration) and rate of perceived intensity goals, and perceived the program as needed regardless of their mobility limitations or previous exercise experience. Primary challenges included managing referrals and uptake. Results support feasibility and benefit for survivors to integrate into U.S. CR programs.

Barriers and facilitators

[A survey of the perceptions of barriers to and facilitators of cardiac rehabilitation in healthcare providers and policy stakeholders](#)

Item Type: Journal Article

Authors: Kim, C.;Kwak, H. B.;Sung, J.;Han, J. Y.;Lee, J. W.;Lee, J. H.;Kim, W. S.;Bang, H. J.;Baek, S.;Joa, K. L.;Kim, A. R.;Lee, S. Y.;Kim, J.;Kim, C. R.;Kwon, O. P.;Sohn, M. K.;Moon, C. W.;Lee, J. I. and Jee, S.

Publication Date: 2022

Journal: BMC Health Services Research 22(1), pp. no pagination

Abstract: Background: Cardiac rehabilitation (CR) is a prognostic management strategy to help patients with CVD achieve a good quality of life and lower the rates of recurrence, readmission, and premature death from disease. Globally, cardiac rehabilitation is poorly established in hospitals and communities. Hence, this study aimed to investigate the discrepancies in the perceptions of the need for CR programs and relevant health policies between directors of hospitals and health policy personnel in South Korea to shed light on the status and to establish practically superior and effective strategies to promote CR in South Korea. Method(s): We sent a questionnaire to 592 public health policy managers and directors of selected hospitals, 132 of whom returned a completed questionnaire (response rate: 22.3%). The participants were categorized into five types of organizations depending on their practice of PCI (Percutaneous Coronary Intervention), establishment of cardiac rehabilitation, director of hospital, and government's policy makers. Differences in the opinions between directors of hospitals that perform/do not perform PCI, directors of hospitals with/without cardiac rehabilitation, and between hospital directors and health policy makers were analyzed. Result(s): Responses about targeting diseases for cardiac rehabilitation, patients' roles in cardiac rehabilitation, hospitals' roles in cardiac rehabilitation, and governmental health policies' roles in cardiac rehabilitation were more positive among hospitals that perform PCI than those that do not. Responses to questions about the effectiveness of cardiac rehabilitation and hospitals' roles in cardiac rehabilitation tended to be more positive in hospitals with cardiac rehabilitation than in those without. Hospital directors responded more positively to questions about targeting diseases for cardiac rehabilitation and governmental health policies' roles in cardiac rehabilitation than policy makers, and both hospitals and public organizations provided negative responses to the question about patients' roles in cardiac

rehabilitation. Responses to questions about targeting diseases for cardiac rehabilitation, patients' roles in cardiac rehabilitation, and governmental health policies' roles in cardiac rehabilitation were more positive in hospitals that perform PCI than those that do not and public organizations. Conclusion(s): Hospitals must ensure timely referral, provide education, and promote the need for cardiac rehabilitation. In addition, governmental socioeconomic support is needed in a variety of aspects. Copyright © 2022, The Author(s).

New models of care

[Million Hearts Cardiac Rehabilitation Think Tank: Accelerating New Care Models.](#)

Item Type: Journal Article

Authors: Beatty, Alexis L.;Brown, Todd M.;Corbett, Mollie;Diersing, Dean;Keteyian, Steven J.;Mola, Ana;Stolp, Haley;Wall, Hilary K. and Sperling, Laurence S.

Publication Date: 2021

Journal: Circulation.Cardiovascular Quality & Outcomes 14(10), pp. e008215

Abstract: This article describes the October 2020 proceedings of the Million Hearts Cardiac Rehabilitation Think Tank: Accelerating New Care Models, convened with representatives from professional organizations, cardiac rehabilitation (CR) programs, academic institutions, federal agencies, payers, and patient representative groups. As CR delivery evolves, terminology is evolving to reflect not where activities occur (eg, center, home) but how CR is delivered: in-person synchronous, synchronous with real-time audiovisual communication (virtual), or asynchronous (remote). Patients and CR staff may interact through ≥ 1 delivery modes. Though new models may change how CR is delivered and who can access CR, new models should not change what is delivered—a multidisciplinary program addressing CR core components. During the coronavirus

disease 2019 (COVID-19) public health emergency, Medicare issued waivers to allow virtual CR; it is unclear whether these waivers will become permanent policy post-public health emergency. Given CR underuse and disparities in delivery, new models must equitably address patient and health system contributors to disparities. Strategies for implementing new CR care models address safety, exercise prescription, monitoring, and education. The available evidence supports the efficacy and safety of new CR care models. Still, additional research should study diverse populations, impact on patient-centered outcomes, effect on long-term outcomes and health care utilization, and implementation in diverse settings. CR is evolving to include in-person synchronous, virtual, and remote modes of delivery; there is significant enthusiasm for implementing new care models and learning how new care models can broaden access to CR, improve patient outcomes, and address health inequities.

[From cardiac rehabilitation to ambulatory preventive care: The Swiss way](#)

Item Type: Journal Article

Authors: Saner, H.

Publication Date: 2016

Journal: Swiss Sports & Exercise Medicine 64(2), pp. 26-30

Abstract: Over the last years, cardiac rehabilitation services have expanded their indication to include not just patients after myocardial infarction or surgery, but also a variety of non-acute cardiovascular disease (CVD) states like stable coronary artery disease, peripheral artery disease, neurovascular disease as well as asymptomatic patients with no history of CVD but with a constellation of cardiovascular risk factors, especially metabolic syndrome and diabetes mellitus. In 2015, 110 ambulatory cardiovascular prevention and rehabilitation programs existed in Switzerland: 57 for cardiac, 17 for peripheral artery disease and 36 for diabetes rehabilitation. Rehabilitative and preventive care

is provided by a team of professionals including preventive cardiologists, exercise experts (physiotherapists and sports scientists), nurses, dieticians, psychologists, occupational therapists and social services experts. It seems reasonable to combine professional efforts by integrating prevention and rehabilitation for all high risk patients. The creation of cardiovascular prevention centers, which bring together professionals and patients in dedicated hospital or community settings is a promising first step. In 2015, 7 centers have been recognized as specialized cardiovascular prevention centers in Switzerland. Furthermore, community-based and patient-centered activities and programs have a great potential to contribute to improved preventive care and to support long-term adherence. A closer cooperation between professional preventive teams in prevention centers and the primary care physicians has a great potential to contribute to close this gap and to provide seamless primary and secondary preventive care for patients in need and the society.

Advanced Practice

[Advanced practitioner cardiology follow-up clinic - A cardiac rehabilitation led service](#)

Item Type: Conference Proceeding

Authors: Jones, C.

Publication Date: 2021

Publication Details: Physiotherapy (United Kingdom).

Conference: Virtual Physiotherapy UK 2020 Conference.

Virtual, Online. 113(Supplement 1) (pp e113); Elsevier Ltd,

Abstract: Purpose: For the last 10 years, patients in North East Wales who had suffered a cardiac event and/or intervention such as PCI or CABG were followed up in cardiology clinics by Chest Pain Assessment nurses rather than Cardiologists.

Cardiac Rehabilitation (CR) is provided as a separate service. Following the introduction of ACPs (3 nurses, 1 Physiotherapist)

in CR, it has been observed that patient assessment and treatment is being duplicated between the 2 services. With the aim of streamlining services and avoiding this duplication, we took the decision to merge the services and absorb post intervention clinic into the CR service. It is hoped that the integration of the 2 services will lead to a more cost and time efficient journey for cardiac patients through the utilisation of advanced practice knowledge and skills. Method(s): We compared the 2 services. Follow-up after a cardiac event requires: 1. Clinical history taking and review of current cardiac symptoms. 2. Clinical assessment (blood pressure, heart rate and rhythm and chest auscultation). 3. Diagnostics to include blood tests (lipids, kidney function, liver function and glucose levels), ECG, echocardiogram, and cardiac stress tests. 4. Cardioprotective medicine management (commencement and titration of medicines such as ACE-Inhibitors, Beta-blockers and anti-anginal medication). Result(s): Following the addition of ACPs to the CR team, these requirements are increasingly met throughout the duration of a patient's Cardiac Rehabilitation journey, before the patient reaches the follow-up cardiology clinic. We identified the need to formalise the ACP's assessment during CR to safely eradicate the requirement for standalone cardiology follow up clinic. It would be necessary for all patients to be seen at some point during their Cardiac Rehabilitation. Conclusion(s): North East Wales Cardiac Rehabilitation service follows BACPR's guidance for best practice (British Association for Cardiac Prevention and Rehabilitation Standards and Core Components, 2017) when structuring their programme's. With the addition of advanced skills, all of the follow-up clinic requirements could be met whilst also adhering to the BACPR's Standards and Core Components. Impact: All patients will be seen by an ACP during their rehab - an ACP will run a regular follow up CR clinic. A letter will be dictated at this clinic and the admin will order case notes and transcribe the letters. For patients who have

undergone cardiac interventions or suffered an MI and do not attend CR (very few), they will be invited to a standalone clinic which will run only once every 6-8 weeks depending on need. The potential impact is a cost-saving of approximately 6800 per year (5 h per week of ACP (band 7 or 8a) time absorbed into existing CR service). There is also a time saving for patients and reduced impact on the CR service, as staff will be available for general CR input where they would previously have covered time taken for standalone follow-up clinic. It will strengthen the case for an increase in ACPs within CR in other areas in the UK - potential cost saving if existing services have a follow-up with consultants - 105,000.00 per year. Funding acknowledgements: Not funded. Copyright © 2021

Systematic Reviews

[Effectiveness of virtual reality in cardiac rehabilitation: A systematic review and meta-analysis of randomized controlled trials.](#) Abstract only*

Item Type: Journal Article

Authors: Chen, Y.;Cao, L.;Xu, Y.;Zhu, M.;Guan, B. and Ming, W. K.

Publication Date: 2022

Journal: International Journal of Nursing Studies
133(pagination), pp. no pagination

Abstract: Background: Cardiovascular disease has risen sharply and causes more premature deaths than cancer, while it represents a major economic burden for healthcare systems and impacts patients' quality of life negatively. Virtual reality has captured the attention of researchers in the field of cardiac rehabilitation. However, the efficacy of virtual reality among individuals undergoing cardiac rehabilitation remains inconclusive. Objective(s): To appraise research evidence on the effects of virtual reality for individuals undergoing cardiac rehabilitation. Design(s): Systematic review and meta-analysis.

Method(s): A systematic search of publications was conducted using Pubmed, Embase, Web of science, Cumulative Index to Nursing and Allied Health Literature database (CINAHL), Cochrane Central Register of Controlled trials and Physiotherapy Evidence Database (PEDro) from inception to 15 May 2022, without language restriction. The Cochrane Risk of Bias Tool was used to examine the methodological quality of the included randomized controlled studies. When feasible, a meta-analysis was performed to calculate the pooled effects using Review Manager (Version 5.4). Otherwise, narrative summaries were performed. The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) methodology was used to assess the certainty of the evidence. Result(s): A total of ten studies were included. Virtual reality probably increases exercise capacity for individuals undergoing cardiac rehabilitation (the pooled mean difference 49.55, 95% confidence interval 30.59 ~ 68.52, P Result(s): A total of ten studies were included. Virtual reality probably increases exercise capacity for individuals undergoing cardiac rehabilitation (the pooled mean difference 49.55, 95% confidence interval 30.59 ~ 68.52, P Conclusion(s): Individuals undergoing cardiac rehabilitation may benefit from virtual reality since it can improve exercise capacity and psychological outcomes. More large, and well-designed studies with tailored virtual reality intervention are warranted to confirm the effects of virtual reality on individuals undergoing cardiac rehabilitation. Tweetable abstract: Virtual reality may benefit individuals undergoing cardiac rehabilitation since it can improve exercise capacity and psychological outcomes. Copyright © 2022 Elsevier Ltd

[A systematic review of provider-and system-level factors influencing the delivery of cardiac rehabilitation for heart failure](#)

Author(s): Daw et al.

Source: BMC Health Services Research 21(1267)

Publication date: 2021

Background: There is a longstanding research-to-practice gap in the delivery of cardiac rehabilitation for patients with heart failure. Despite adequate evidence confirming that comprehensive cardiac rehabilitation can improve quality of life and decrease morbidity and mortality in heart failure patients, only a fraction of eligible patients receives it. Many studies and reviews have identified patient-level barriers that might contribute to this disparity, yet little is known about provider- and system-level influences. Methods: A systematic review using narrative synthesis. The aims of the systematic review were to a) determine provider- and system-level barriers and enablers that affect the delivery of cardiac rehabilitation for heart failure and b) juxtapose identified barriers with possible solutions reported in the literature. A comprehensive search strategy was applied to the MEDLINE, Embase, PsycINFO, CINAHL Plus, EThoS and ProQuest databases. Articles were included if they were empirical, peer-reviewed, conducted in any setting, using any study design and describing factors influencing the delivery of cardiac rehabilitation for heart failure patients. Data were synthesised using inductive thematic analysis and a triangulation protocol to identify convergence/contradiction between different data sources. Results: Seven eligible studies were identified. Thematic analysis identified nine overarching categories of barriers and enablers which were classified into 24 and 26 themes respectively. The most prevalent categories were 'the organisation of healthcare system', 'the organisation of cardiac rehabilitation programmes', 'healthcare professional' factors and 'guidelines'. The most frequent themes included 'lack of resources: time, staff, facilities and equipment' and

'professional's knowledge, awareness and attitude'.

Conclusions: Our systematic review identified a wide range of provider- and system-level barriers impacting the delivery of cardiac rehabilitation for heart failure, along with a range of potential solutions. This information may be useful for healthcare professionals to deliver, plan or commission cardiac rehabilitation services, as well as future research.

[Effectiveness of nurse-led cardiac rehabilitation programs following coronary artery bypass graft surgery: A systematic review.](#) Abstract only*

Item Type: Journal Article

Authors: Mares, M. A.; McNally, S. and Fernandez, R. S.

Publication Date: 2018

Journal: JBI Database of Systematic Reviews and Implementation Reports 16(12), pp. 2304-2329

Abstract: Review objective: The objective of this review was to investigate the effectiveness of nurse-led cardiac rehabilitation programs following coronary artery bypass graft surgery on patients' health-related quality of life and hospital readmission. Introduction: Coronary heart disease is a major cause of death and disability worldwide, putting a great strain on healthcare resources. For the past two decades, population-wide primary prevention and individual healthcare approaches have resulted in a dramatic decline in overall cardiac mortality. Over the intervening years, surgical techniques in cardiology have also improved substantially. As a result, long-term outcomes in patients treated with coronary artery bypass graft surgery have established the treatment's effectiveness and survival benefit. Furthermore, participating in cardiac rehabilitation following coronary artery bypass graft surgery has also demonstrated a significant decrease in all-cause cardiac mortality in these patients. Inclusion criteria: This review included studies with participants aged 18 years and over, post coronary artery bypass graft surgery that evaluated nurse-led cardiac

rehabilitation (CR) programs compared with usual care or other forms of CR. The outcomes of interest were the health-related quality of life and hospital readmissions following coronary artery bypass graft surgery and measured using validated scales. Randomized controlled trials reported in English between 2000 to June 2017 were considered for inclusion. Method(s): The search strategy aimed to find both published and unpublished studies using a three-step search strategy. An initial search of MEDLINE, CINAHL and Scopus was undertaken, followed by a search for unpublished studies including Dissertation Abstracts International, ProQuest Dissertations and Theses, Google Scholar, MedNar and ClinicalTrials.gov. Papers selected for retrieval were assessed by two independent reviewers for methodological validity prior to inclusion in the review using the standardized critical appraisal tools from the Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information (JBI SUMARI). Quantitative data was extracted from papers included in the review using the standardized data extraction tool from JBI-SUMARI. No meta-analysis was undertaken due to heterogeneity of the outcome measures. All results were subject to double data entry. Effect sizes expressed as risk ratio (for categorical data) and weighted mean differences (for continuous data) and their 95% confidence intervals were calculated for analysis. Result(s): Three trials involving 329 patients were included in the final review. The trials that investigated the effect of home based cardiac rehabilitation programs compared to usual care at six weeks, three months and six months follow-up demonstrated no statistically significant difference in health-related quality of life at any of the follow-up periods. However, one study demonstrated significantly higher scores related to health-related quality of life among those who received nurse-led home based cardiac rehabilitation (154.93+/-4.6) compared to those who received usual care (134.20+/-8.2) at two months follow-up. No trials

were identified that compared the effectiveness of nurse-led cardiac rehabilitation programs following coronary artery bypass graft surgery on readmissions to hospital. Conclusion(s): There is not enough evidence to support or discourage nurse-led cardiac rehabilitation programs on health-related quality of life in patients following coronary artery bypass graft surgery. However, the sparse data available suggests improvements in health-related quality of life at two months follow-up among those who received a nurse-led program. Further large-scale multicenter trials with standardized methodology are needed to determine the effect of nurse-led cardiac rehabilitation programs on health-related quality of life and rates of readmission to hospital following coronary artery bypass graft surgery. Copyright © 2018 THE JOANNA BRIGGS INSTITUTE.

Competency Frameworks

[Core competencies for the Physical Activity and Exercise component for Cardiovascular Disease Prevention and Rehabilitation](#)

Source: British Association for Cardiovascular Prevention and Rehabilitation

Thirteen Core Competences are outlined, identifying specific knowledge and skills for each competency, with a framework to assess the health professional's ability to demonstrate their competence in physical activity and exercise prescription.

The working party that developed these competences included:

- Association of Chartered Physiotherapists with a special interest in Cardiac Rehabilitation (ACPICR)
- BACPR Exercise Instructor Network (EIN)
- British Association of Exercise Sciences (BASES)

[Core competencies for the Health behaviour Change and Education Component of Cardiovascular Rehabilitation Services](#)

Source: British Association for Cardiovascular Prevention and Rehabilitation

This document provides guidance on the key competences required to ensure the use of best practice standards and guidelines for healthy eating and body composition. In total, 7 core competences are outlined, identifying specific knowledge and skills for each core competency and a framework to assess the health professional's ability to demonstrate their competence. This document also serves as a tool to monitor the need for continuing professional development for the exercise professional and supporting staff to achieve specific competences.

*Help accessing articles of papers

Where a report/ journal article or resource is freely available the link has been provided. If an NHS OpenAthens account is required this has been indicated. It has also been highlighted if only the abstract is available. If you do not have an OpenAthens account you can self-register here.

If you need help accessing an article, or have any other questions, contact the Knowledge Management team for support KnowledgeManagement@hee.nhs.uk