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Home-based versus centre-based cardiac rehabilitation (Review)

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[Intervention Review]

Home-based versus centre-based cardiac rehabilitation

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ABSTRACT

Background

Cardiovascular disease is the most common cause of death globally. Traditionally, centre-based cardiac rehabilitation programmes are offered to individuals after cardiac events to aid recovery and prevent further cardiac illness. Home-based and technology-supported cardiac rehabilitation programmes have been introduced in an attempt to widen access and participation, especially during the SARS-CoV-2 pandemic. This is an update of a review previously published in 2009, 2015, and 2017.

Objectives

To compare the effect of home-based (which may include digital/telehealth interventions) and supervised centre-based cardiac rehabilitation on mortality and morbidity, exercise-capacity, health-related quality of life, and modifiable cardiac risk factors in patients with heart disease

Search methods

We updated searches from the previous Cochrane Review by searching the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (Ovid), Embase (Ovid), PsycINFO (Ovid) and CINAHL (EBSCO) on 16 September 2022. We also searched two clinical trials registers as well as previous systematic reviews and reference lists of included studies. No language restrictions were applied.

Selection criteria

We included randomised controlled trials that compared centre-based cardiac rehabilitation (e.g. hospital, sports/community centre) with home-based programmes (± digital/telehealth platforms) in adults with myocardial infarction, angina, heart failure, or who had undergone revascularisation.

Data collection and analysis

Two review authors independently screened all identified references for inclusion based on predefined inclusion criteria. Disagreements were resolved through discussion or by involving a third review author. Two authors independently extracted outcome data and study characteristics and assessed risk of bias. Certainty of evidence was assessed using GRADE.

Main results

We included three new trials in this update, bringing a total of 24 trials that have randomised a total of 3046 participants undergoing cardiac rehabilitation. A further nine studies were identified and are awaiting classification. Manual searching of trial registers until 16 September 2022 revealed a further 14 clinical trial registrations - these are ongoing. Participants had a history of acute myocardial infarction, revascularisation, or heart failure. Although there was little evidence of high risk of bias, a number of studies provided insufficient detail to enable assessment of potential risk of bias; in particular, details of generation and concealment of random allocation sequencing and blinding of outcome assessment were poorly reported.

No evidence of a difference was seen between home- and centre-based cardiac rehabilitation in our primary outcomes up to 12 months of follow-up: total mortality (risk ratio [RR] = 1.19, 95% confidence interval [CI] 0.65 to 2.16; participants = 1647; studies = 12/comparisons = 14; low-certainty evidence) or exercise capacity (standardised mean difference (SMD) = -0.10, 95% CI -0.24 to 0.04; participants = 2343; studies = 24/comparisons = 28; low-certainty evidence). The majority of evidence (N=71 / 77 comparisons of either total or domain scores) showed no significant difference in health-related quality of life up to 24 months follow-up between home- and centre-based cardiac rehabilitation. Trials were generally of short duration, with only three studies reporting outcomes beyond 12 months (exercise capacity: SMD 0.11, 95% CI -0.01 to 0.23; participants = 1074; studies = 3; moderate-certainty evidence). There was a similar level of trial completion (RR 1.03, 95% CI 0.99 to 1.08; participants = 2638; studies = 22/comparisons = 26; low-certainty evidence) between home-based and centre-based participants. The cost per patient of centre- and home-based programmes was similar.

Authors' conclusions

This update supports previous conclusions that home- (± digital/telehealth platforms) and centre-based forms of cardiac rehabilitation formally supported by healthcare staff seem to be similarly effective in improving clinical and health-related quality of life outcomes in patients after myocardial infarction, or revascularisation, or with heart failure. This finding supports the continued expansion of healthcare professional supervised home-based cardiac rehabilitation programmes (± digital/telehealth platforms), especially important in the context of the ongoing global SARS-CoV-2 pandemic that has much limited patients in face-to-face access of hospital and community health services.

Where settings are able to provide both supervised centre- and home-based programmes, consideration of the preference of the individual patient would seem appropriate. Although not included in the scope of this review, there is an increasing evidence base supporting the use of hybrid models that combine elements of both centre-based and home-based cardiac rehabilitation delivery.

Further data are needed to determine: (1) whether the short-term effects of home/digital-telehealth and centre-based cardiac rehabilitation models of delivery can be confirmed in the longer term; (2) the relative clinical effectiveness and safety of home-based programmes for other heart patients, e.g. post-valve surgery and atrial fibrillation.

PLAIN LANGUAGE SUMMARY

Home-based versus supervised centre-based cardiac rehabilitation

Review question

We compared home-based cardiac rehabilitation programmes (including those that involve use of digital technology, such as websites and apps) with supervised centre-based cardiac rehabilitation for adults with myocardial infarction (blood flow to the heart has stopped), angina (chest pain), heart failure (heart is unable to pump blood around the body properly) or who had undergone revascularisation (surgery to restore blood flow).

Background

Cardiac rehabilitation aims to restore people with heart disease to health, through a combination of exercise, education, and psychological support. Traditionally, centre-based cardiac rehabilitation programmes (e.g. based at a hospital, gymnasium or in community/sport centre) are offered to people after cardiac events. Home-based cardiac rehabilitation programmes, which can include digital platforms, have been introduced to increase access and participation.

Search date

We searched up to September 2022.

Study characteristics

We searched for randomised controlled trials (trials that randomly allocate participants to one of two or more treatment groups) looking at the effectiveness of home-based (which may include digital/telehealth technology) versus supervised centre-based cardiac rehabilitation programmes, in adults with heart disease.

We included 24 trials (3046 participants). We also found nine more studies and 14 trial registrations but they are ongoing or yet to be included in analyses. Most trials were relatively small (median 104 participants, range: 20 to 525). The average age of trial participants

ranged from 51.6 to 69 years. Women accounted for only 19% of recruited participants; four trials did not include women. All trials included centre- and home-based models of delivery that required supervision (either in person or remote) by healthcare professionals. Four trials used digital/telehealth technology to support their home-based delivery.

Diagnoses recruited for the trials varied: nine studies included a mixed population with coronary heart disease, six studies in those who had experienced a heart attack/myocardial infarction, four studies following revascularisation, and five in those with heart failure.

Key results

We found that home- and centre-based cardiac rehabilitation programmes are similar in benefits, measured in terms of numbers of deaths, exercise capacity and health-related quality of life. Further data are needed to confirm if these short-term effects of home/digital & telehealth- and centre-based cardiac rehabilitation can be sustained over time.

Quality of the evidence

Evidence quality ranged from low (total mortality), to moderate (exercise capacity over 12 months and health-related quality of life). The main reasons for the low assessment of quality was poor study reporting.

Summary of findings 1. Home-based versus centre-based cardiac rehabilitation for heart disease

Home-based versus supervised centre-based cardiac rehabilitation for heart disease

Patient or population: Patients with heart disease
Settings: Home and rehabilitation centres
Intervention: Home-based cardiac rehabilitation
Comparison: Centre-based cardiac rehabilitation

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with centre-based	Risk with home-base				
Total mortality Number of deaths Follow-up: up to 12 months	Study population 20 per 1000	24 per 1000 (13 to 43)	RR 1.19 (0.65 to 2.16)	1647 (12 studies)	⊕⊕⊖⊖ LOW [1,2]	
Exercise capacity ≤ 12 months* Follow-up: 2 to 12 months **Exercise capacity > 12 months*** Follow-up: 12 to 24 months *Validated outcome measure (e.g. VO_2 peak, 6-minute walk test)		SMD 0.10 lower (0.24 lower to 0.04 higher) SMD 0.11 higher (-0.01 lower to 0.23 higher)	-	2343 (24 studies) 1074 (3 studies)	⊕⊕⊖⊖ LOW [1,3] ⊕⊕⊕⊖ MODERATE [1]	Higher score indicates improved activity. A rule of thumb for interpreting SMD is that 0.2 represents a small effect, 0.5 a moderate effect and 0.8 a large effect (Cohen 1988).
Withdrawal from the exercise programme Number of completers (participants with data at follow-up) Follow-up: 2 to 72 months	Study population 886 per 1000	921 per 1000 (877 to 957)	RR 1.04 (0.99 to 1.08)	2638 (23 studies)	⊕⊕⊖⊖ LOW [1,3]	
HRQoL Validated measures of HRQoL (e.g. Short Form Health Survey (SF-36),	See comment		Not estimable	2207 (18 studies)	⊕⊕⊕⊖ MODERATE[1]	The majority of evidence (71/77 comparisons of either total or domain scores) showed no significant difference in health-

	Sickness Impact Profile, Nottingham Health Profile) Follow-up: 2 to 24 months			related quality of life up to 24 months follow-up between home- and centre-based cardiac rehabilitation.

*__The risk in the intervention group__ (and its 95% confidence interval) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio; **OR:** Odds ratio;

GRADE Working Group grades of evidence
High certainty: We are very confident that the true effect lies close to that of the estimate of the effect
Moderate certainty: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different
Low certainty: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect
Very low certainty: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

[1] Random sequence generation, allocation concealment or blinding of outcome assessors were poorly described in over 50% of included studies; bias likely, therefore, certainty of evidence downgraded by one level.
[2] The 95% CIs includes both no effect, appreciable benefit and appreciable harm (i.e. CI < 0.75 and > 1.25), therefore, certainty of evidence downgraded by one level.
[3]Substantial heterogeneity (I^2 > 50%) therefore certainty of evidence downgraded by one level.

BACKGROUND

Description of the condition

Cardiovascular diseases (CVDs), mainly coronary heart disease (CHD) and stroke, are the leading worldwide cause of mortality and are a major contributor to disability (Roth 2020). In 2019, an estimated 17.9 million people died from CVD, representing 32% of all global deaths (WHO 2021). Of these deaths, 85% were due to myocardial infarction (MI) and stroke (WHO 2021). Over three-quarters of CVD deaths occurred in low- and middle-income countries (WHO 2021).

CHD is caused by the build-up of plaque inside the coronary arteries (atherosclerosis), causing arterial narrowing and reduced flow of oxygen-rich blood to the heart. The main manifestations of CHD are angina pectoris (chest pain), myocardial infarction (MI), and heart failure. MI occurs when blood flow to the heart muscle is abruptly cut off as the result of a blockage in one or more of the coronary arteries, causing tissue damage. Over time, CHD can weaken the heart muscle and lead to arrhythmias or heart failure. CHD causes significant morbidity and mortality and, as a long-term condition, it contributes greatly to disability in developed countries, accounting for 19% of total disability-adjusted-life-years (DALYs) lost in European countries (European Cardiovascular Disease Statistics 2017). CHD can result in difficulties in functionality and performing everyday activities, and impairs sexual function (Racca 2010), all contributing to a reduction in health-related quality of life (HRQoL) (Gravely-Witte 2007).

In the United Kingdom (UK), an estimated 2.3 million people live with CHD – around 1.5 million men and 830,000 women (BHF 2021). Before the SARS-CoV-2 pandemic, ~100,000 people were admitted to hospital with MIs, and ~200,000 were diagnosed with heart failure annually in the UK (BHF 2021). With an ageing population, an increasing number of people are now living with CHD, including heart failure, and many individuals need support to manage their symptoms and improve their prognosis.(Dalal 2021).

People living with CVD are at significantly increased risk of severe outcomes (3.9 times higher) and death (2.7 times higher) from SARS-CoV-2 infection and COVID-19 (BHF 2021).

Description of the intervention

Cardiac rehabilitation is a complex intervention that includes exercise training, physical activity promotion, health education, cardiovascular risk management and psychological support, personalised to the individual needs of patients with diagnosed heart disease (Richardson 2019). Historically, cardiac rehabilitation programmes were limited to exercise training (Taylor 2021). However, it is now routinely recommended that programmes also provide lifestyle education on CHD risk factor management plus counselling and psychological support, resulting in a more 'comprehensive cardiac rehabilitation' programme being offered to patients (Taylor 2021). A 2020 European position paper, in keeping with other national and international guidelines (Ambrosetti 2020), stated that "comprehensive cardiac rehabilitation has been recognised as the most cost-effective intervention to ensure favourable outcomes across a wide spectrum of cardiovascular disease" (BACPR 2017; Pieopoli 2016).

Cardiac rehabilitation should be considered an essential part of the contemporary treatment of heart disease and is considered a priority in countries with a high prevalence of CHD (Taylor 2021). Cardiac rehabilitation has been shown to improve HRQoL and reduce future morbidity (Anderson 2016; Davies 2014; Taylor 2014). Based on evidence from previous meta-analyses and systematic reviews, international guidelines give cardiac rehabilitation their highest recommendation (class I: evidence and/or general agreement that a given treatment or procedure is beneficial, useful and effective and should be recommended) based on an evidence rating of level A [data derived from multiple randomised controlled trials (RCTs) or meta-analyses] or level B (data derived from a single RCT or large non-randomised studies). More specifically, the evidence for cardiac rehabilitation is rated as follows for post-acute coronary syndrome (ACS), post-primary coronary angioplasty, and coronary artery surgery [patients with ACS (class 1, level A)] including ST-segment elevation myocardial infarction, non-ST-segment elevation myocardial infarction, and unstable angina (class 1, level B). In addition, evidence for cardiac rehabilitation for patients undergoing reperfusion (e.g. coronary artery bypass graft, primary percutaneous coronary intervention, and percutaneous coronary intervention) is rated as class 1, level A by the American College of Cardiology/American Heart Association (Balady 2011; Kulik 2015; Smith 2011; Yancy 2013) and the European Society of Cardiology, (McMurray 2012; Roffi 2015; Steg 2012) and is recommended by the National Institute for Health and Care Excellence (NICE 2010; NICE 2013). Similar national and international recommendations based on a high level evidence are made for patients with newly diagnosed chronic heart failure and chronic heart failure with a step change in clinical presentation (class 1, level A) (McDonagh 2021).

Despite the evidence for clinical and cost-effectiveness, participation in cardiac rehabilitation, traditionally delivered in hospital outpatient departments or community centres, has remained suboptimal, with overall participation rates < 20% in the US (Beatty 2018) and similar rates after a diagnosis of heart failure in Europe (Bjarnason-Wehrens 2010). Poor participation has predominated in certain groups: women, older people, ethnic minorities, and those living in rural communities or who are socioeconomically deprived (Ritchey 2020). Consequently, calls were made for alternatives to centre-based cardiac rehabilitation (Ambrosetti 2020; Arena 2012). Suggested interventions included rehabilitation at home facilitated by healthcare professionals and supported by telehealth technologies, to improve uptake (Clark 2015). The 2019 scientific statement by the American Heart Association and the American College of Cardiology in 2019 advocated for home-based cardiac rehabilitation (Thomas 2019). Guidance from NICE on chronic heart failure in the UK in 2018 stated that "delivery of home-based rehabilitation may increase access and uptake (NICE 2018). Telerehabilitation ("rehabilitation from a distance by using one or several devices monitoring and communicating patient specific information to the caregivers" (Frederix 2019)) which often involves telephones, videoconferencing, and mobile apps (telehealth) are increasingly being used as an adjunct to home-based rehabilitation (Thomas 2019; Thomas 2020).

How the intervention might work

There are a number of mechanisms by which rehabilitation benefits patients, dependent on the cause of their heart disease. For people with CHD, approximately half of the 28% reduction in cardiac mortality achieved with exercise-based cardiac rehabilitation

has been attributed to reductions in major risk factors (e.g. reduction in lipids, blood pressure, and smoking) (Taylor 2006). For patients with ischaemic causes of heart failure, exercise training appears to improve myocardial perfusion by alleviating endothelial dysfunction, thereby dilating coronary vessels, and by stimulating new vessel formation by way of intermittent ischaemia (Piepoli 2004). Indeed, Haykowsky 2007 demonstrated that aerobic training in people with heart failure patients improves myocardial contractility and diastolic filling. In their meta-analysis, Haykowsky 2007 demonstrated the benefits of exercise training in people with heart failure in terms of cardiac remodelling as measured by ejection fraction, end-diastolic volume, and end-systolic volume. Skeletal muscle dysfunction and wasting may also respond to exercise training (Haykowsky 2007). Regular physical activity by people with heart failure also stimulates vasodilation in the skeletal muscle vasculature and improves oxidative capacity (Hambrecht 1998). The inclusion of psycho-educational interventions may improve patients' knowledge and risk factor behaviour (Brown 2013; Dickens 2013) and psychological well-being, including levels of depression and anxiety.

Why it is important to do this review

Although the beneficial effects of cardiac rehabilitation have previously been demonstrated, participation remains suboptimal (Dalal 2012; Dalal 2021; Taylor 2021), particularly so in patients with heart failure (Dalal 2012; Dalal 2021; Taylor 2021). The number of patients with heart failure in the UK participating in rehabilitation decreased from 4969 (< 10% of eligible patients) before the pandemic (May 2019-January 2020) to 1474 (< 5% of eligible patients) during the first wave of SARS-CoV-2 (February-August 2020) (Ruano-Ravina 2016). Analysis by the British Heart Foundation (BHF) published in 2020 mirrored other cardiac audits, showing a 30-40% decrease in use of cardiology and rehabilitation services during the pandemic compared with a similar period in 2019 (Doherty 2020). SARS-CoV-2 has therefore led to further calls for alternatives to traditional centre-based cardiac rehabilitation.

The suboptimal uptake of cardiac rehabilitation can be attributed to several factors, including barriers at the level of the clinician, patient, and health service (Dalal 2021; Taylor 2021). The absence of education on cardiac rehabilitation in the general medical and cardiology training of clinicians may contribute to the low rate of referral by physicians. For patients, several factors could influence their participation in a cardiac rehabilitation programme, such as the inconvenience (and costs of transport) of travelling to a centre-based programme held during the '9–5' working day, especially for those in employment. At the health service level, barriers can include the capacity and funding of cardiac rehabilitation programmes and the availability of trained staff. For example, the 2019 UK National Audit of Cardiac Rehabilitation (NACR) showed that the majority (75.4%) of patients received group-based, supervised cardiac rehabilitation compared with only 8.8% taking up home-based cardiac rehabilitation (Doherty 2020). Barriers at these three levels are probably interactive. For example, travelling to centres and a dislike of group-based rehabilitation sessions can be relevant for certain groups of patients, including women, ethnic minorities and people from areas of high deprivation who are elderly, living with multiple long-term health conditions, or living in rural areas (Ruano-Ravina 2016)

Over the last decades there has been an increasing amount of published evidence for home-based models of cardiac rehabilitation, including those supporting by technology, hence the need to update this review. In the previous version of this Cochrane Review (Anderson 2017), the authors identified 23 head-to-head randomised controlled trials of home-versus centre-based cardiac rehabilitation. The authors reported the two methods of delivery to be equally effective for improving the clinical and health-related quality of life outcomes in low risk patients after MI or revascularisation, or with heart failure. This, together with the absence of evidence of important differences in healthcare costs between the two approaches, led to the authors advocating for the expansion of home-based cardiac rehabilitation programmes and suggesting that the choice of participating in a more traditional and supervised centre-based programme or a home-based programme should reflect the preference of the individual patient.

OBJECTIVES

To compare the effect of home-based and supervised centre-based cardiac rehabilitation on mortality and morbidity, exercise-capacity, health-related quality of life, and modifiable cardiac risk factors in patients with heart disease

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials (RCTs; individual or cluster level), including parallel-group or cross-over designs, were eligible for inclusion. We included studies reported as full text, those published as abstracts only, and unpublished data.

Types of participants

The study population included adults (≥ 18 years) who were post-myocardial infarction (MI), had angina, or had undergone revascularisation (coronary artery bypass grafting (CABG), percutaneous transluminal coronary angioplasty or coronary artery stent) or who had heart failure, who had taken part, or been invited to take part, in cardiac rehabilitation. In trials with a mixed indication population, > 50% of the trial participants should have had a relevant diagnosis.

Studies were excluded if they included participants with heart transplants, those implanted with either cardiac resynchronisation therapy or implantable defibrillators, or those who had previously received cardiac rehabilitation.

Types of interventions

Home-based cardiac rehabilitation is defined as a structured programme (that includes exercise training) with clear objectives for the participants, including monitoring, follow-up visits, letters, telephone calls from staff or at least self-monitoring diaries (Jolly 2006) and/or digital/telehealth interventions used (e.g. mobile/smartphone, mobile application [app], portable computer, Internet, biosensors [Rawstorn 2016]). The comparison group was centre-based cardiac rehabilitation based in a variety of settings (e.g. hospital physiotherapy department, university gymnasium, community/sports centre). We included cardiac rehabilitation programmes whether they were based solely on exercise or included other intervention elements (comprehensive cardiac rehabilitation). We excluded trials that included 'hybrid'

programmes, i.e. patients received a mix of centre-based ± home-based sessions.

Types of outcome measures

We sought to report the following primary and secondary outcomes, but they did not form the basis of our inclusion/exclusion criteria.

Primary outcomes

- Total mortality.
- Cardiac events:
  - Re-infarction;
  - Total revascularisations (including CABG and percutaneous coronary intervention (PCI)); and
  - Cardiac associated hospitalisation.
- Exercise capacity assessed by validated outcome measure (e.g. peak oxygen [VO_2] uptake, 6-minute walk test).
- Validated measures of HRQoL (e.g. Short Form Health Survey (SF-36), Sickness Impact Profile, Nottingham Health Profile).
- Withdrawal from the intervention programme (measured as number of completers).

Secondary outcomes

- Modifiable coronary risk factors
  - blood lipid levels i.e. total, high density lipoprotein [HDL], and low density lipoprotein [LDL] cholesterol, and triglycerides,
  - systolic and diastolic blood pressure,
  - self-reported smoking behaviour.
- Adherence to cardiac rehabilitation (however reported).
- Costs and health service use (e.g. staffing for cardiac rehabilitation delivery, use of medication, primary care contacts).

For event outcomes, we sought data on the number of trial participants who experienced the event at least once. Reporting one or more of the outcomes listed here in the trial was not an inclusion criterion for the review. Where a published report did not appear to report one of these outcomes, we accessed the trial protocol and contacted the trial authors to ascertain whether the outcomes were measured but not reported. Relevant trials which measured these outcomes but did not report the data at all, or not in a usable format, were included in the review as part of the narrative.

Search methods for identification of studies

Electronic searches

The search from the previously published Cochrane review (Taylor 2015) was updated by searching the following bibliographic databases on 16 September 2022:

- CENTRAL Issue 8, 2022 in the Cochrane Library.
- MEDLINE (Ovid, 1946 to 15 September 2022).
- Embase (Ovid, 1980 to 2022 Week 36).
- PsycINFO (Ovid, 1806 to September Week 1 2022).
- CINAHL Plus (EBSCO, 1937 to 16 September 2022).

The search strategies were designed with reference to those of the previous version of this review (Taylor 2015). We searched the databases using a strategy combining selected MeSH terms and free-text terms relating to patient education and coronary heart disease (CHD) and terms added for digital/telehealth, with filters applied to limit to RCTs. We used the Cochrane sensitivity-maximising RCT filter for MEDLINE, and for Embase, and terms recommended in the *Cochrane Handbook for Systematic Reviews of Interventions* were applied (Lefebvre 2011). Adaptations of this filter were applied to CINAHL and PsycINFO. We translated the MEDLINE search strategy into the other databases using the appropriate controlled vocabulary, as applicable. We imposed no language or other limitations and gave consideration to variations in terms used and spellings of terms in different countries so that studies would not be missed by the search strategy because of such variations. See Appendix 1 for details of the search strategies used.

The reporting of search results was conducted in accordance with PRISMA (Moher 2009). Information about the number of studies identified, included and excluded, and the reasons for exclusion are summarised using a flow diagram (Figure 1).

Figure 1. PRISMA flow diagram ***Two RCTs removed as follow-up communication with trial lead investigators: neither trial was available/published to allow full assessment of their methods/risk of bias **Attempts to seek further information were unsuccessful***

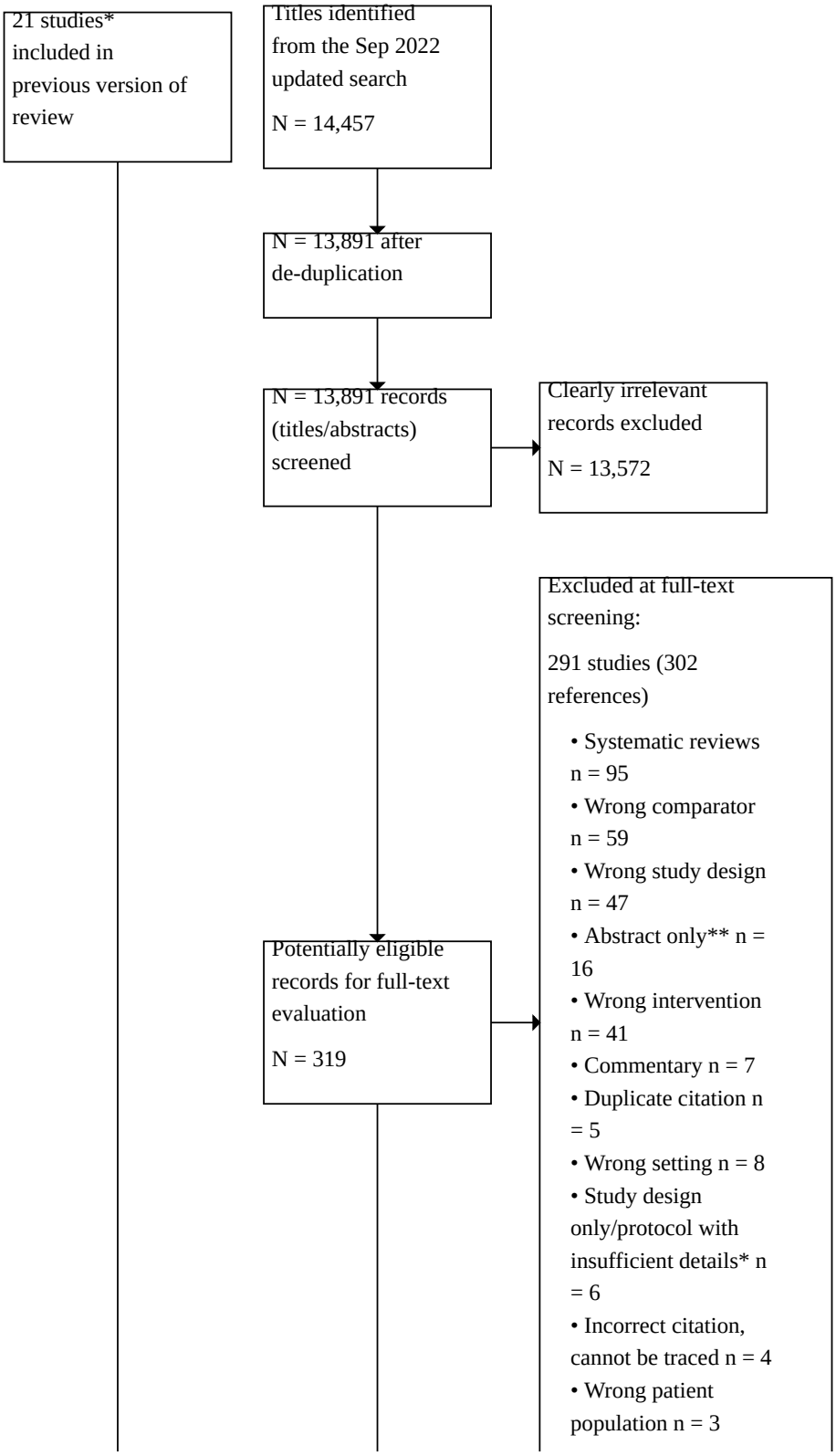
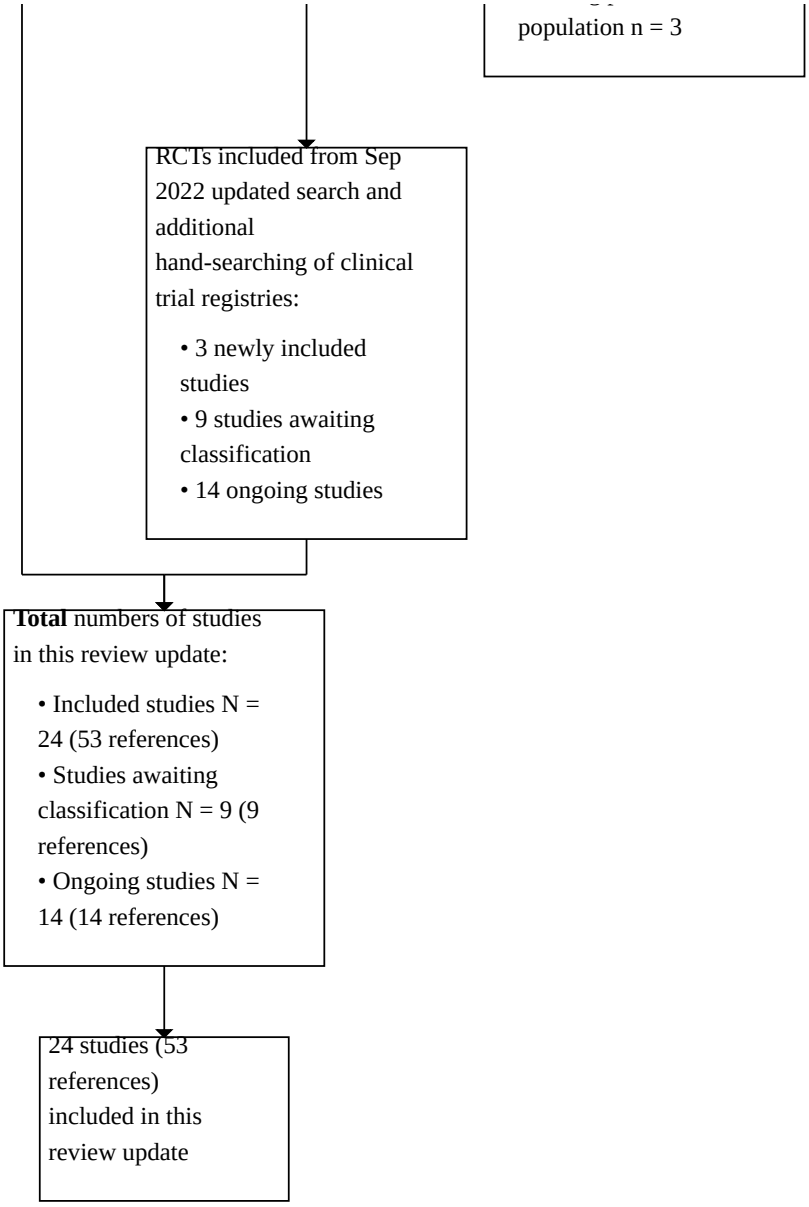


Figure 1. (Continued)



Searching other resources

We handsearched reference lists of retrieved articles and systematic reviews for any studies not identified by the electronic searches. We also searched clinical trial registers on 16 September 2022; World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (http://www.who.int/ictrp/en) and ClinicalTrials.gov (https://clinicaltrials.gov) for ongoing clinical trials and sought expert advice. Attempts were made to contact all study authors where relevant information was not available in the published manuscript.

Data collection and analysis

Selection of studies

Two review authors (STJMc, SM, HD, or CC) independently screened titles and abstracts for inclusion of all the potentially relevant studies we identified as a result of the search and coded them as 'retrieve' or 'do not retrieve.' If there were any disagreements, a third author was asked to arbitrate (STJMc, SM, HD, CC, or RST). We identified and excluded duplicates and collated multiple reports of the same study so that each study rather than each report was the unit of interest in the review. We recorded the selection process in sufficient detail to complete a PRISMA flow diagram and Characteristics of excluded studies table (Liberati 2009). Where

necessary, authors of included studies were contacted for missing information.

Data extraction and management

Two independent review authors (STJMc, SM, CC and HD) extracted study characteristics of included RCTs using a standardised data collection form which had been piloted on two RCTs included in the review. The following categories of data were extracted:

- Methods: including study design, total duration of study, number of centres, setting, date of study conduct
- Participants: including N randomised, N lost to follow-up, N analysed, age, sex, CHD diagnosis, and inclusion and exclusion criteria
- Intervention & control: including mode of exercise, duration, frequency and intensity, any co-intervention and description of comparator
- Outcome: primary and secondary outcomes
- Funding, notable conflicts of interest of authors

Two independent review authors (RST, JA) extracted outcome data. If data were presented numerically (in tables or text) and graphically (in figures), the numeric data were used because of possible measurement error when estimating from graphs. Any discrepancies were resolved by arbitration. One review author (RST) transferred extracted data into Review Manager 5.3 (RevMan 2014), and checked data for accuracy against the data collection forms.

If there were multiple reports of the same study, we assessed the duplicate publications for additional data. We extracted outcome results at all follow-up points post-randomisation. We contacted study authors where necessary to provide additional information.

Assessment of risk of bias in included studies

The risk of bias in new trials was assessed by two reviewers independently (RST and JA) using the criteria outlined in Higgins 2011. We resolved any disagreements by discussion. We assessed the risk of bias according to the following domains:

- random sequence generation
- allocation concealment
- blinding of participants and personnel
- blinding of outcome assessment
- incomplete outcome data
- selective outcome reporting

In addition, evidence was sought that the groups were balanced at baseline and whether co-interventions were delivered equally across the groups. We graded each potential source of bias as high, low or unclear and provided a quote from the study report together with a justification for our judgement in the Risk of bias tables that are appended to the Characteristics of included studies tables.

Measures of treatment effect

We extracted outcome results at follow-up and the focus of this review was the between-group difference in home-based versus centre-based groups. Primary outcomes relating to clinical event data were extracted as dichotomous outcomes for each study. Event data were expressed as risk ratios (RRs) with associated 95% confidence intervals (CI), and study sample sizes were based on the number randomised to treatment conditions. For continuous variables, mean differences (MDs) and 95% CIs were calculated for each outcome, with sample sizes based on the number completing assessments at each time point. When the results at follow-up and differences between groups of the individual trials were not reported in the original publication, we calculated P values for the differences using the reported mean and standard deviation with the t-test command in STATA (StataCorp 2021).

Given the variety of exercise capacity measures reported, results for this outcome were expressed as a standardised mean difference (SMD). We interpreted SMD as 0.2, 0.5,and 0.8 representing a 'small', 'medium', and 'large' effect size, respectively (Faraone 2008). Where a trial reported more than one exercise capacity endpoint, we used the first one reported in the publication. Other continuous outcomes were pooled as mean differences (MDs).

Unit of analysis issues

In accordance with the *Cochrane Handbook for Systematic Reviews of Intervention* (Higgins 2022), we ensured that the analysis was appropriate to the level at which randomisation occurred. All studies included in this review were simple parallel-group RCTs with no cross-over trials, and so there were no issues relating to unit of analysis. If we identify any cross-over trials for future updates of this review, we will only include the first period of the study.

Three trials contained three arms: (1) Gordon 2002 compared two home-based exercise groups (‘community’ & physician ‘supervised’) with a single home-based programme; (2) Aamot 2014 compared two centre-group (‘group’ & ‘treadmill’) programmes with a single home-based programme; (3) Grace 2016 compared two centre-based programmes (‘mixed’-sex vs ‘women’ only) with a single home-based programme. In all three cases, we divided the number randomised to the comparison group in half to obtain the denominator for data analysis; the mean and standard deviation for the comparator groups remained unchanged for both comparisons. One trial (Miller 1984) contained four arms with two home vs centre comparisons based on two different durations of intervention (11 & 26 weeks). Both trial subgroups ('brief' and 'expanded') are reported separately.

Dealing with missing data

We contacted study investigators to verify key study characteristics and obtain missing numerical outcome data where possible (e.g. when a study was available as abstract only or where only study designs/protocols were reported).

Where necessary, we used the RevMan calculator to calculate missing standard deviations using other data from the trial, such as confidence intervals, based on methods outlined in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2022).

Assessment of heterogeneity

Heterogeneity amongst included studies was explored qualitatively (by comparing the characteristics of included studies) and quantitatively (using the Chi^2 test of homogeneity and I^2 statistic). Where appropriate, the results from included studies were combined for each outcome to give an overall estimate of treatment effect. An I^2 statistic of ≥ 50% was taken to indicate substantive statistical heterogeneity. We undertook extensive meta-regression

to examine heterogeneity (see Subgroup analysis and investigation of heterogeneity).

Assessment of reporting biases

The funnel plot and the Egger test (Egger 1997) were used to examine small study bias for outcomes where there were 10 or more studies contributing data to the analysis (Higgins 2022).

Data synthesis

We performed meta-analyses with 95% confidence intervals where appropriate (i.e. when treatments, participants, and the underlying clinical question were similar enough for pooling to make sense). Similar to our approach in previous review versions (Anderson 2017; Taylor 2015), a fixed-effect meta-analysis was used except where substantive statistical heterogeneity was indicated by an I^2 of ≥ 50%, in which case a random-effects model was used. If a statistically significant difference was present using the random-effects model, we also reported the fixed-effect pooled estimate and 95% CI because of the tendency of smaller trials, which are more susceptible to publication bias, to be over-weighted with a random-effects analysis. Meta-analyses were undertaken at two time points: (1) up to and including 12-months and (2) > 12 months follow-up. In both cases, we took the latest follow-up, e.g. if a trial assessed outcomes at 3, 6, 12, 24, and 36 months, we used the outcome at 12 months for (1) and at 36 months for (2).

Subgroup analysis and investigation of heterogeneity

We undertook subgroup analysis using meta-regression to examine potential treatment effect modifiers. We tested the following a priori hypotheses that there may be differences in the effect of home- and centre-based cardiac rehabilitation programmes on total mortality, exercise capacity ≤ 12 months, withdrawal from the intervention programme (measured as no. completers), total cholesterol, and blood pressure, across the following subgroups:

- case mix (CHD vs PCI vs HF);
- type of cardiac rehabilitation (exercise-only cardiac rehabilitation versus comprehensive cardiac rehabilitation);
- 'dose' of exercise intervention (dose = number of weeks of exercise training x average number of sessions/week x average duration of session in minutes) (dose ≥ 1000 units versus dose < 1000 units);
- follow-up period;
- year of publication;
- sample size;
- risk of bias (low risk in ≥ 4 items versus < 4 items); and
- study location (Europe vs North America vs other).

For this update review and due to the increasing number of published trials using telerehabilitation, we included the subgroup of home + telerehabilitation vs home alone.

Given the relatively small ratio of trials to covariates, multivariable meta-regression was not appropriate, and instead, limited to a univariate analysis; we only undertook meta-regression when there were 10 or more trials contributing to the analysis (Higgins 2022).

Sensitivity analysis

If a statistically significant difference was present using the random-effects model, we also reported the fixed-effect pooled estimate and 95% CI because of the tendency of smaller trials, which are more susceptible to publication bias, to be over-weighted with a random effects analysis.

Summary of findings and assessment of the certainty of the evidence

Two independent review authors (RST, JA) employed the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach to interpret result findings and used GRADEpro GDT 2015 to import data from Review Manager to create a Summary of findings table. We created a Summary of findings table using the following outcomes:

- total mortality;
- exercise capacity;
- withdrawal from the intervention programme (measured as no. of completers);
- HRQoL.

We used the five GRADE considerations (study limitations, consistency of effect, imprecision, indirectness, and publication bias) to assess the certainty of a body of evidence as it related to the studies that contributed data to the meta-analyses for the prespecified outcomes. We used methods and recommendations described in the *Cochrane Handbook for Systematic Reviews of Interventions* using GRADEpro software (Higgins 2022). We have justified all decisions to downgrade the certainty of evidence using footnotes, and have made comments to aid readers' understanding of the review, where necessary.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies; Characteristics of studies awaiting classification; Characteristics of ongoing studies

Results of the search

The previous 2017 version of this Cochrane Review contributed 21 trials to this latest update (Aamot 2014; Arthur 2002; Bell 1998; Carlson 2000; Cowie 2012; Dalal 2007; Daskapan 2005; Gordon 2002; Grace 2016; Jolly 2007; Karapolat 2009; Kassaian 2000; Kraal 2014; Marchionni 2003; Miller 1984; Moholdt 2012; Oerkild 2011; Piotrowicz 2010; Sparks 1993; Varnfield 2014; Wu 2006). Two RCTs that were included in the previous version have been excluded from this update as contact with the trialists indicated that these trials had not been published in full and therefore prevented RoB assessment (Hadadzadeh 2015; Haddadzadeh 2013).

For the updated search run in September 2022, a total of 14,457 records were identified through database searches and 13,891 records were screened following de-duplication. We assessed a total of 319 full-text records. From these, we included an additional three trials (Hwang 2017; Maddison 2019; Sagar 2012), resulting in a total of 24 included RCTs. A further nine publications were identified and are categorised as studies awaiting classification (see Characteristics of studies awaiting classification). Manual searching of trial registers also identified a further 14 ongoing studies. See Characteristics of ongoing studies.

Of the 24 studies included in this update, three studies had three arms and either compared a single home-based programme with two supervised centre-based exercise programmes (Aamot 2014 - a supervised group or a treadmill exercise programme that were both centre-based; Grace 2016 - a supervised mixed-sex or a supervised women-only (single sex) supervised centre-based programme) compared to a home-based programme), or a centre-based programme compared to two home based programmes (Gordon 2002 - a physician-supervised/nurse-case-managed home or a community-based home programme compared to a centre-based programme). One four-arm trial compared two centre-based and two home-based programmes (Miller 1984 - centre-vs home programmes of either 11 or 26 weeks). This updated review therefore includes 28 home-based versus centre-based cardiac rehabilitation comparisons. We used the method for splitting sample size of shared comparator studies in accordance with the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2022). Marchionni 2003 reported outcomes for home-based versus centre-based care according to three patient age subgroups (i.e. 45 to 65, 66 to 75, > 75 years). Given the data reporting, we pooled these data to obtain single overall outcome results for home- and centre-based groups.

The study selection process is summarised in the PRISMA flow diagram (Figure 1).

Included studies

Design

Two trials were formally designed using a non-inferiority design (Hwang 2017; Maddison 2019).

Population

The 24 included trials recruited a total of 3046 participants. Most trials were relatively small in sample size (median 74 participants, range: 20 to 525). The average age of patients in the trials ranged from 51.6 to 69.0 years. Except for four trials (Kassaian 2000; Miller 1984; Sparks 1993; Wu 2006), all included women. However, women accounted for only ~20% of all participants who were recruited in the included studies. The mix of participants recruited to included trials varied, with nine studies including a mixed population of people with coronary heart disease (CHD) (Aamot 2014; Carlson 2000; Gordon 2002; Grace 2016; Jolly 2007; Kassaian 2000; Kraal 2014; Oerkild 2011; Piotrowicz 2010), six studies included patients post-myocardial infarction (MI) (Bell 1998; Dalal 2007; Maddison 2019; Marchionni 2003; Miller 1984; Varnfield 2014), four recruited patients following revascularisation (Arthur 2002; Moholdt 2012; Sagar 2012; Wu 2006), and five studies included participants with heart failure (Cowie 2012; Daskapan 2005; Hwang 2017; Karapolat 2009; Piotrowicz 2010). A number of trials noted that patients were of low-to-moderate risk (i.e. they formally excluded high-risk patients).

Settings & follow-up

All trials used an individual patient level method for randomisation. Four studies were UK-based (Bell 1998; Cowie 2012; Dalal 2007; Jolly 2007); four were based in the USA (Carlson 2000; Gordon 2002; Miller 1984; Sparks 1993); two studies each were from Australia (Hwang 2017; Varnfield 2014), Canada (Arthur 2002; Grace 2016); Norway (Aamot 2014; Moholdt 2012) and Turkey (Daskapan 2005; Karapolat 2009), and one each from China (Wu 2006), Denmark (Oerkild 2011), India (Sagar 2012), Iran (Kassaian 2000), Italy (Marchionni 2003), Netherlands (Kraal 2014), New Zealand (Maddison 2019), and Poland (Piotrowicz 2010). Most studies reported outcomes up to six months post-randomisation. Only three studies reported longer-term (> 12 months) follow-up: 14 months (Marchionni 2003), 18 months (Arthur 2002) and 24 months (Jolly 2007).

Interventions

Fifteen studies compared comprehensive programmes (i.e. exercise plus education and/or psychological management) and the remainder reported only an exercise intervention (Aamot 2014; Daskapan 2005; Grace 2016; Karapolat 2009; Kassaian 2000; Kraal 2014; Miller 1984; Sagar 2012; Wu 2006). The cardiac rehabilitation programmes differed considerably in duration (range: 1 to 6 months), frequency (1 to 5 sessions per week) and session length (20 minutes to 60 minutes per session). Most programmes used individually tailored exercise prescription which makes it difficult to precisely quantify the amount of exercise undertaken. Centre-based programmes typically provided supervised cycle and treadmill exercise, while virtually all home programmes were based on walking, with some level of intermittent nurse or exercise specialist telephone support.

Four trials formally used digital technology to provide a telerehabiliation home-based delivery of cardiac rehabilitation. In the FIT@Home study (Kraal 2014) patients received individual coaching by telephone once a week, based on measured heart rate data that were shared through the Internet. In Varnfield 2014, a smartphone was used to deliver rehabilitation in patient's homes, and included health and exercise monitoring, motivational and educational material delivery, and weekly mentoring consultations. In Hwang 2017, a real-time exercise and education intervention was delivered into the patients' home twice-weekly, using online videoconferencing software. Similarly, the REMOTE-CR study (Maddison 2019) provided individualised exercise prescription, real-time exercise monitoring/coaching and theory-based behavioural strategies via a bespoke telerehabilitation platform.

Details of included studies are listed in Characteristics of included studies.

Excluded studies

We excluded 291 studies from a full-text review. The majority of these exclusions were systematic reviews (n = 95) or ineligible study designs (n = 47), or trials that did not meet the inclusion/exclusion criteria based on types of participants, interventions and comparators, or settings (N = 111). A number of studies were excluded on the grounds that they employed a hybrid model of rehabilitation i.e. a mixture of centre and home-based delivery. Details of excluded studies are listed in the Characteristics of excluded studies.

Risk of bias in included studies

A summary of the risk of bias for each individual trial is shown in Figure 2 and an overall summary is provided in Figure 3.

Figure 2. Methodological quality summary: review authors' judgements about each methodological quality item for each included study

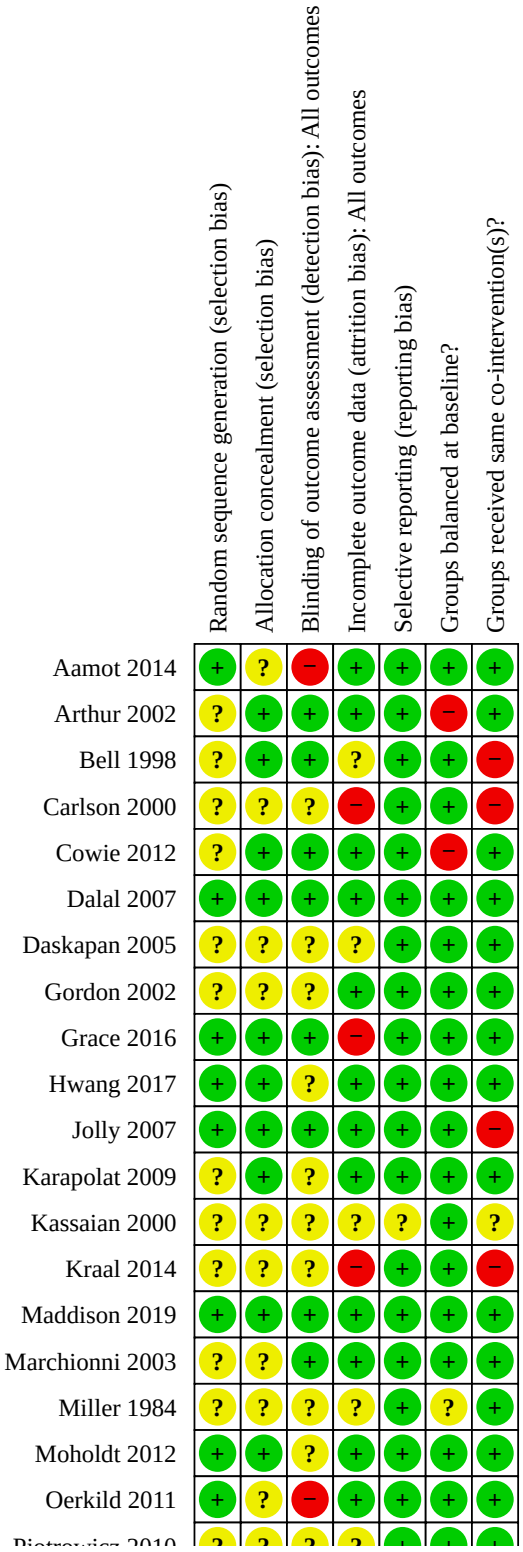


Figure 2. (Continued)

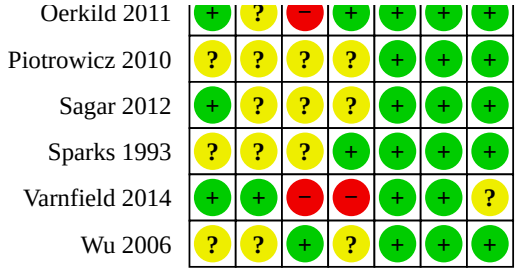
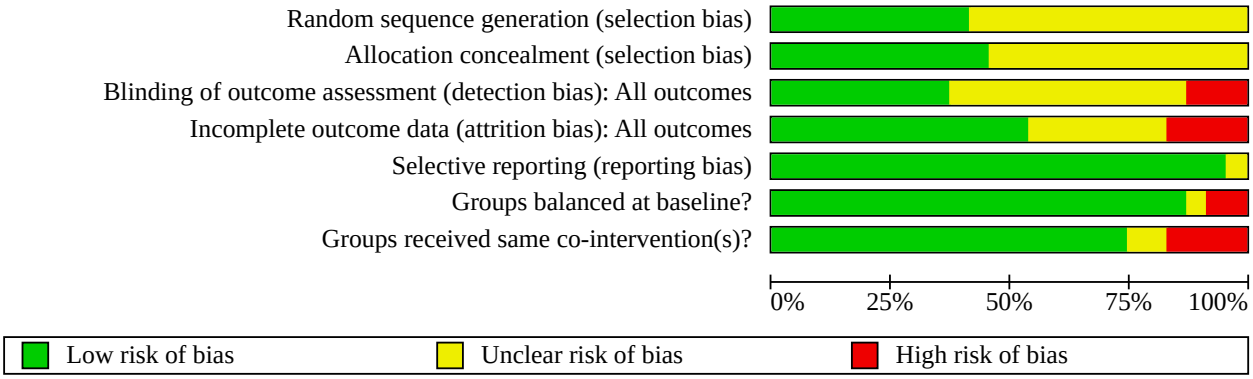


Figure 3. Methodological quality graph: review authors' judgements about each methodological quality item presented as percentages across all included studies



Allocation

Although details of generation and concealment of random allocation sequence were often poorly reported, no studies were judged to be at high risk of bias.

Blinding

Given the nature of interventions being tested, it was not possible to blind participants or carers to group allocation. Thus, we did not formally assess the risk of performance bias from the non-blinding of participants and/or personnel.

In such situations, blinding outcome assessors to knowledge of allocation is probably of greater importance (Moustgaard 2020). Three studies were judged to be at high risk of bias i.e. reported they did not undertake outcome blinding (Aamot 2014; Oerkild 2011; Varnfield 2014).

Incomplete outcome data

Loss to follow-up varied considerably amongst studies and was often asymmetric across home- and centre-based cardiac rehabilitation groups. Only a few trials examined the impact of losses to follow-up or dropouts on outcome results. Four studies were judged as having a high risk of attrition bias with overall loss to follow-up > 20% or marked asymmetrical loss to follow-up across groups (Carlson 2000; Grace 2016; Kraal 2014; Varnfield 2014).

Selective reporting

We compared the reported outcomes in the results sections to the outcomes described in the published protocol or trial registration (where available) or as reported in the methods of the published papers. Most of the included studies fully reported on all the specified outcomes listed in their methods sections. No studies were judged to be at high risk of bias.

Groups balanced at baseline?

Given the relatively small size of included trials, there is a high risk of (chance) imbalance in baseline patient demographics, medical history and/or outcomes. However, we found generally good evidence of balance in baseline characteristics between groups and, in only two cases, there was objective evidence of imbalances in baseline characteristics (Arthur 2002; Cowie 2012).

Groups received the same co-interventions?

When comparing two active modes of intervention delivery (i.e. home- vs centre-based rehabilitation in this case), it is important to be able to judge whether the interventions were delivered similarly. However, because the rehabilitation intervention was usually tailored to the individual participant, it was difficult to quantify the precise level of intervention. Most trials were judged to be at low risk of bias, i.e. the home- and centre-based programme groups appeared to be receiving comparable interventions (and co-interventions). Four trials were considered to be at high risk of bias. Bell 1998, Carlson 2000 and Jolly 2007 included hospital

cardiac rehabilitation programmes which were fixed in terms of frequency and content over the period of the study. In contrast, the home-based intervention in these studies consisted of use of the Heart Manual 2016 where the participants could self-regulate the frequency and nature of rehabilitation sessions they undertook. Kraal 2014 was also judged as having high risk of bias in this domain as, while telephone coaching was offered to the home-based cohort in this study, no coaching was offered to patients receiving centre-based cardiac rehabilitation.

Other potential sources of bias

Where reported, the source of funding was usually public (e.g. governmental or health research funder) and only one trial reported receiving commercial funding (Varnfield 2014) from a smartphone company.

Effects of interventions

See: **Summary of findings 1** Home-based versus centre-based cardiac rehabilitation for heart disease

Primary outcomes

Total mortality

Twelve trials (14 comparisons) reported total mortality up to one year following the intervention (Aamot 2014; Bell 1998; Dalal 2007; Daskapan 2005; Haddadzadeh 2013; Jolly 2007; Kraal 2014; Miller 1984; Miller 1984 expanded; Moholdt 2012; Oerkild 2011; Piotrowicz 2010). A pooled analysis found no evidence of a significant difference in mortality at three to 12 months of follow-up between home- and centre-based cardiac rehabilitation (RR 1.19, 95% CI 0.65 to 2.16; participants = 1647; 12 studies ; I^2 = 0%; fixed-effect; low-certainty evidence; Analysis 1.1).

Jolly 2007 reported that there was no between-group difference in mortality at 24 months follow-up (home group: 6/263; centre group: 3/262, P = 0.32).

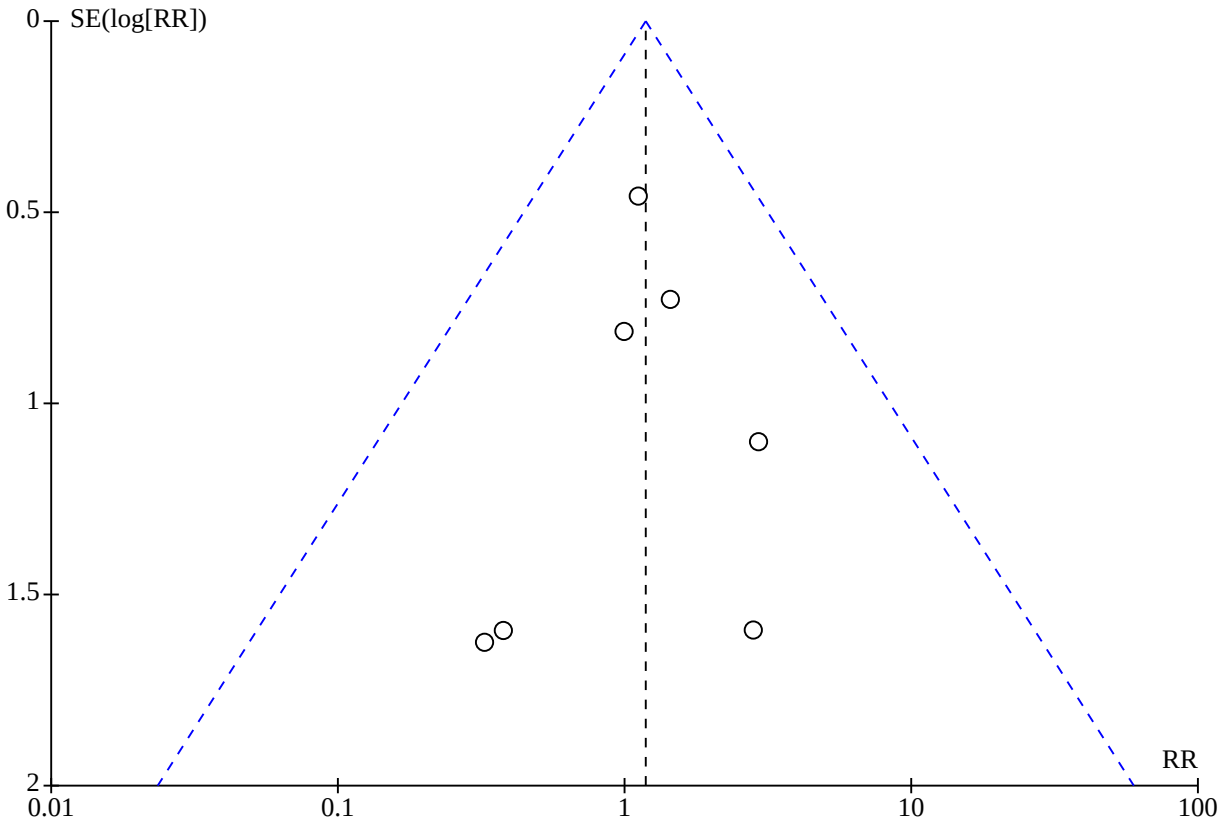
Subgroup analyses

Predictors of treatment effect on total mortality were examined across the longest follow-up period of each individual study, using univariate meta-regression. We found no evidence that mortality risk was associated with case mix, type of cardiac rehabilitation, duration of follow-up, year of publication, study location, study location (continent) or sample size (Table 1).

Small study bias

There was no evidence of funnel plot asymmetry for total mortality (Egger test P = 0.170; Figure 4).

Figure 4. Funnel plot of comparison: 1 home-base vs centre-based, outcome: 1.1 Total mortality.



Cardiac events

Only six studies (Arthur 2002; Dalal 2007; Jolly 2007; Maddison 2019; Oerkild 2011; Piotrowicz 2010) reported cardiac events, including re-infarction, revascularisation (coronary artery bypass grafting (CABG) and percutaneous coronary intervention (PCI)) or cardiac-associated hospitalisation. Given the differing nature of the events reported, it was not possible to pool the data.

Dalal 2007 and Jolly 2007 reported no difference in revascularisation or recurrent myocardial infarction (MI) events between home- and centre-based cardiac rehabilitation. Piotrowicz 2010 reported no heart failure-related admissions in either group. Oerkild 2011 stated that "the number and length of acute and non-acute admissions and adverse events (admission for MI, progressive angina, decompensated congestive heart failure, severe bleeding, new malignant disease and performance of (percutaneous coronary intervention)) to be equally distributed (across groups at 12 months follow-up)" but did not report numbers of events. The six-year follow-up report of the Arthur 2002 study described that a total of 46/79 (62%) centre-based cardiac rehabilitation patients experienced a hospitalisation compared to 35/70 (50%) in the home-based group (P = 0.31). However, the total number of hospitalisations in centre-based patients was greater than that in home-based participants (79 versus 42, P < 0.0001). Maddison 2019 reported that four (of 86) patients in the home-based arm experienced a hospitalisation at 24 weeks compared to one patient (of 80) in the centre-based group.

Subgroup analyses

Due to the small number of studies reporting cardiac events, it was not possible to examine the effects of potential treatment effect modifiers on these outcomes.

Small study bias

Due to the small number of studies reporting cardiac events, it was not possible to examine small study bias.

Exercise capacity

All included studies reported on exercise or functional capacity in the short-term (8 weeks to 12 months follow-up); three (Arthur 2002; Jolly 2007; Marchionni 2003) presented longer-term data (> 12 months follow-up) and one reported outcomes at six-year follow-up (Arthur 2002). All studies reported absolute exercise capacity at follow-up, except two trials (3 comparisons; Gordon 2002 supervised; Gordon 2002 not supervised; Oerkild 2011) which reported change in exercise capacity at follow-up compared to baseline. Studies reported exercise capacity using a variety of metrics that included direct measures of oxygen uptake, walking distance, and workload on a static cycle.

The pooled analysis showed no evidence of a difference in short-term exercise capacity between home-based and centre-based cardiac rehabilitation (SMD -0.10, 95% CI -0.24 to 0.04; participants = 2343; studies = 24 (28 comparisons); I^2 = 60%; random-effects; low-certainty evidence; Analysis 1.2).

In a pooled analysis of three studies reporting longer-term data (> 12 months; Arthur 2002; Jolly 2007; Marchionni 2003), there was no evidence of a difference in exercise capacity following home-based cardiac rehabilitation compared with centre-based cardiac rehabilitation (SMD 0.11, 95% CI -0.01 to 0.23; participants = 1074; studies = 3; I^2 = 0%; fixed-effect; moderate-certainty evidence; Analysis 1.3).

Arthur 2002 reported that mean peak oxygen consumption (VO_2) at six-year follow-up was higher in the 96 participants who had undergone home-based cardiac rehabilitation (1543 mL/min (SD 444)) compared to the 74 participants who had received centre-based cardiac rehabilitation (1412 mL/min (SD 356); P = 0.01).

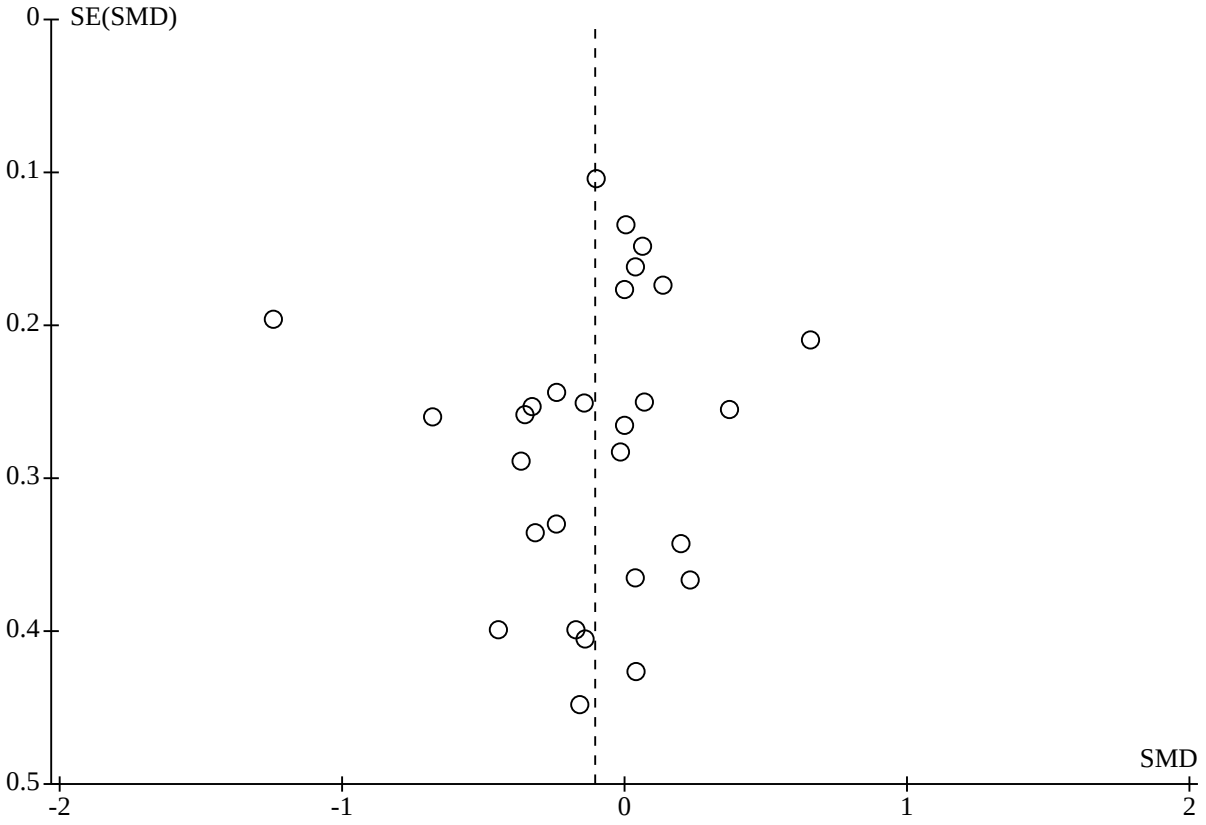
Subgroup analyses

We found no evidence that exercise capacity is associated with case mix, dose of exercise, type of cardiac rehabilitation, duration of follow-up, year of publication, study location, study location (continent) or sample size (Table 2).

Small study bias

There was no evidence of funnel plot asymmetry for exercise capacity (Egger test P = 0.255; Figure 5).

Figure 5. Funnel plot of comparison: 1 home-base vs centre-based, outcome: 1.2 Exercise capacity ≤ 12 months.



Health-related quality of life (HRQoL)

Eighteen trials reported validated measures of HRQoL (Table 3). These included generic HRQoL instruments (e.g. EQ-5D (EuroQoL 1990), Nottingham Health Profile (Hunt 1980), Short-Form 36 (SF-36; McHorney 1993), Sickness Impact Profile (Bergner 1976) as well as disease-specific instruments (e.g. MacNew; Höfer 2004; Minnesota Living With Heart Failure Questionnaire, MLWHF; Rector 1993). Given the variation in HRQoL outcomes reported (including total and domain scores of both generic and disease-specific tools), as per our approach in the previous review versions (Anderson 2017; Taylor 2015), pooling across studies was deemed inappropriate.

We adopted a vote-counting approach to summarise the data and direction of effect. Whilst this synthesis without meta-analysis (SWiM) method has significant limitations, we believe it to be the only method that allows us to communicate the results in a transparent and concise format (Campbell 2020). Whilst individual studies reported consistent improvements in HRQoL at follow-up with both home- and centre-based cardiac rehabilitation compared to baseline, most of the evidence (N = 71 / 77 comparisons of either total or domain scores) showed no significant difference in HRQoL at follow-up between centre and home.

Withdrawals from the intervention programme

Using the number of 'completers', i.e. the number of participants with outcome data at follow-up, we found no difference in the level of study completion with home-based compared with centre-based trials (RR 1.03, 95% CI 0.99 to 1.08; participants = 2638; studies = 23 (26 comparisons); I^2 = 55%; random-effects; low-certainty evidence; Analysis 1.4).

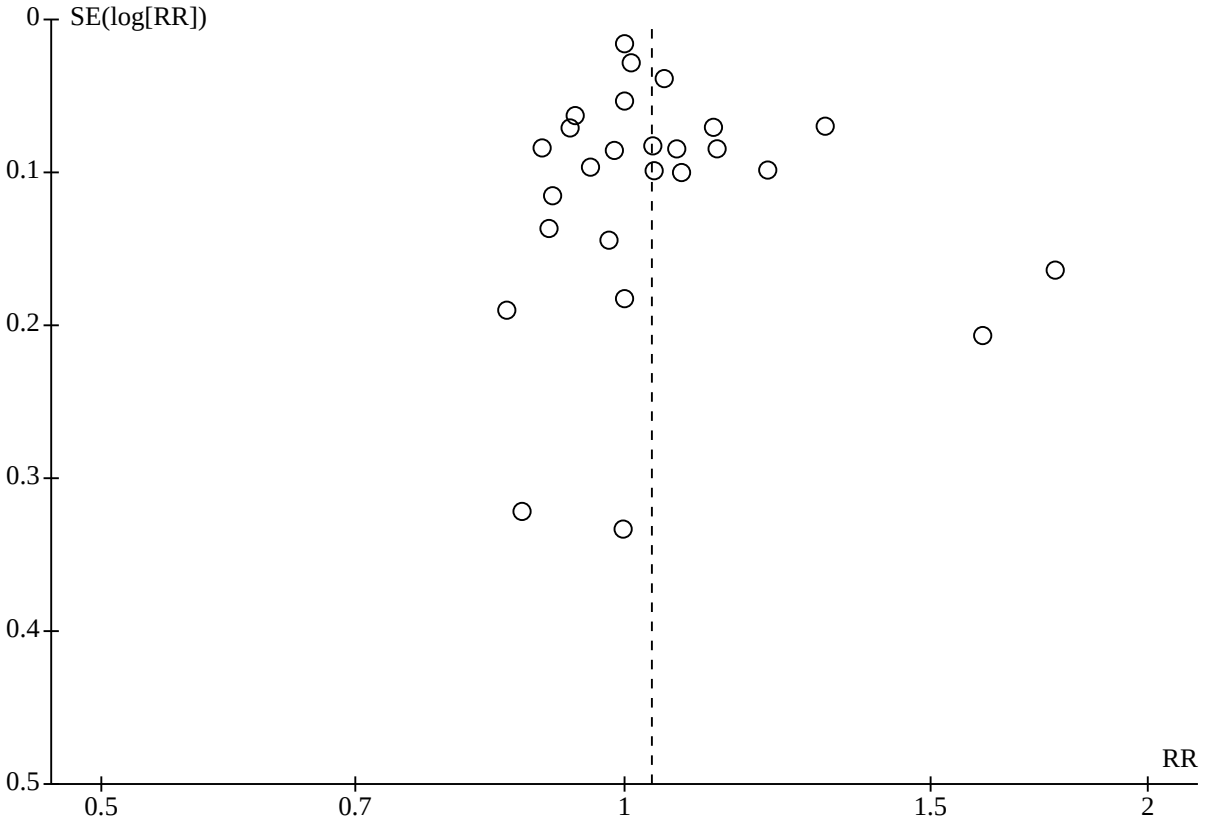
Subgroup analyses

We found no evidence that withdrawal from the intervention programme (measured as no. completers) risk was associated with case mix, dose of exercise, type of cardiac rehabilitation, duration of follow-up, year of publication, study location, study location (continent), or sample size (Table 4).

Small study bias

There was evidence of funnel plot asymmetry for withdrawal from the intervention programme (measured as no. of completers; Egger test P < 0.0001; Figure 6).

Figure 6. Funnel plot of comparison: 1 home-base vs centre-based, outcome: 1.4 Completers.



Secondary outcomes

Modifiable coronary risk factors

Blood lipids

Nine of the included trials (10 comparisons) reported data on blood lipids (Bell 1998; Carlson 2000; Dalal 2007; Gordon 2002; Jolly 2007; Kassaian 2000; Maddison 2019; Moholdt 2012; Oerkild 2011; Varnfield 2014). Study results were expressed as millimols per litre (mmol/L; Bell 1998; Dalal 2007; Jolly 2007; Maddison 2019) or milligrams per decilitre (mg/dL; Carlson 2000; Gordon 2002; Kassaian 2000); in the latter case we converted values into mmol/L before pooling for meta-analysis.

Total cholesterol

Pooled analysis revealed no evidence of a difference in the total cholesterol between home- and centre-based groups (MD 0.06 mmol/L, 95% CI -0.09 to 0.21; participants = 1290; studies = 10, comparisons = 11; I^2 = 52%; random-effects; Analysis 1.5).

Jolly 2007 reported no significant difference between home- and centre-based cardiac rehabilitation groups in total cholesterol concentration at 24 months follow-up (MD = -0.11 mmol/L, 95% CI 0.06 to -0.28).

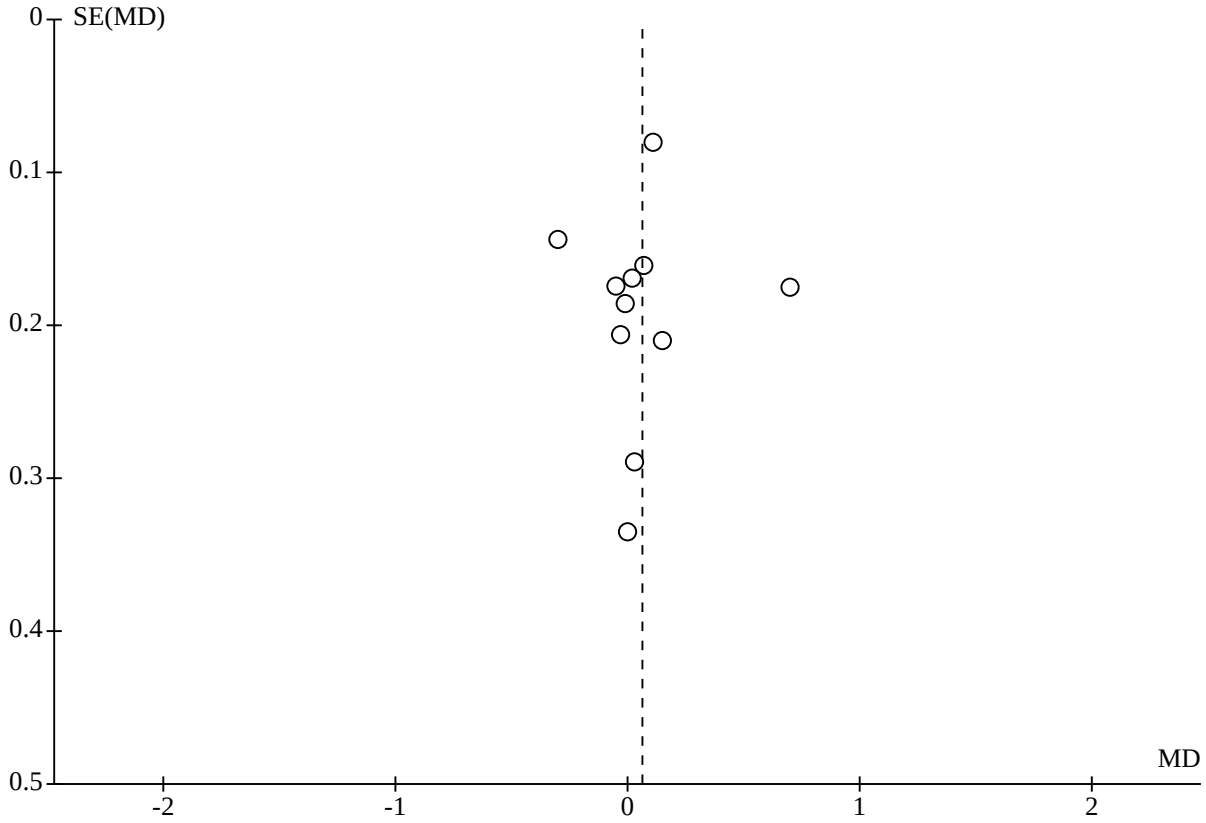
Subgroup analyses

There was weak evidence (P < 0.05) that the impact of cardiac rehabilitation was associated with both type of programme (larger effect with exercise only vs comprehensive rehab trials) and study location (larger effects in trials from North America and other countries than from Europe). There was no association with other trial covariates i.e. case mix, dose of exercise, duration of follow-up, year of publication, study location, or sample size (Table 5).

Small study bias

There was no evidence of funnel plot asymmetry for total cholesterol (Egger test P = 0.657; Figure 7).

Figure 7. Funnel plot of comparison: 1 home-base vs centre-based, outcome: 1.5 Total cholesterol 3 to 12 months.



High-density lipoprotein (HDL) cholesterol

There was some evidence of a lower high-density lipoprotein concentration following centre- compared to home-based cardiac rehabilitation (MD -0.06 mmol/L, 95% CI -0.10 to -0.03; participants = 961; studies = 7; comparisons = 8; I^2 = 35%; fixed-effects; Analysis 1.6). A similar result was seen in a random-effects analysis (-0.06 mmol/L, 95% CI -0.10 to -0.01).

Jolly 2007 reported no significant difference between home- and centre-based cardiac rehabilitation groups in high-density lipoprotein levels at 24 months follow-up (MD 0.03 mmol/L, 95% CI -0.10 to 0.04).

Subgroup analyses

Due to the small number of studies reporting HDL cholesterol, it was not possible to examine the effects of potential treatment effect modifiers on these outcomes.

Small study bias

Due to the small number of studies reporting HDL cholesterol, it was not possible to examine small study bias in these outcomes.

Low-density lipoprotein (LDL) cholesterol

There was no evidence of a difference in LDL-cholesterol concentration between groups (MD 0.04 mmol/L, 95% CI -0.14 to 0.22; participants = 429 ; studies = 5, comparisons = 6; I^2 = 54%; random-effects; Analysis 1.7).

Subgroup analyses

Due to the small number of studies reporting LDL cholesterol, it was not possible to examine the effects of potential treatment effect modifiers on these outcomes.

Small study bias

Due to the small number of studies reporting LDL cholesterol, it was not possible to examine small study bias in these outcomes.

Triglycerides

There was no evidence of a difference in triglyceride levels (MD 0.02 mmol/L, 95% CI -0.17 to 0.13; participants =535; studies = 6, comparisons = 7; I^2 = 0%; fixed-effect; Analysis 1.8).

Subgroup analyses

Due to the small number of studies reporting triglycerides, it was not possible to examine the effects of potential treatment effect modifiers on these outcomes.

Small study bias

Due to the small number of studies reporting triglycerides, it was not possible to examine small study bias in these outcomes.

Blood pressure

Eleven included trials (13 comparisons) reported on systolic and diastolic blood pressure respectively (Aamot 2014; Carlson 2000;

Dalal 2007; Daskapan 2005; Gordon 2002; Gordon 2002 Supervised; Jolly 2007; Kassaian 2000; Maddison 2019, Oerkild 2011, Varnfield 2014) or systolic blood pressure alone (Bell 1998).

No evidence of a difference was found at follow-up between groups in either pooled systolic blood pressure (MD 1.17 mmHg, 95% CI -0.44 to 2.77; participants = 1455; studies = 12, comparisons = 14; I^2 = 48%; fixed-effects; Analysis 1.9) or diastolic blood pressure (MD 0.80 mmHg, 95% CI -0.76 to 2.35; participants = 1309; studies = 11, comparisons = 13; I^2 = 52%; random-effects; Analysis 1.10) following home- or centre-based cardiac rehabilitation.

At 24 months follow-up, Jolly 2007 reported no significant difference between home- and centre-based cardiac rehabilitation groups in systolic blood pressure (MD = -0.85 mmHg; 95% CI 2.48 to -4.18) or diastolic blood pressure (MD -0.76 mmHg, 95% CI 1.12 to -2.64).

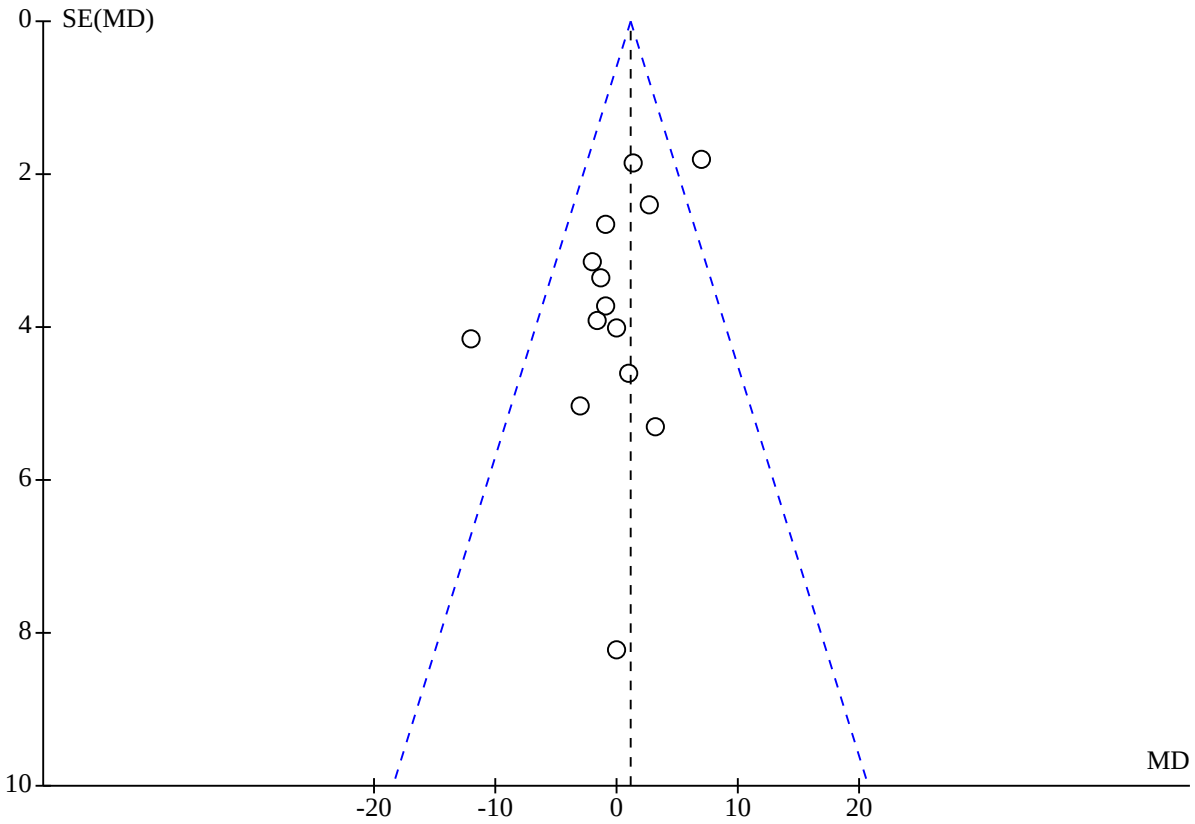
Subgroup analyses

No statistically significant associations were seen in any of the analyses for systolic or diastolic blood pressure with case mix, dose of exercise, type of cardiac rehabilitation, duration of follow-up, year of publication, study location, study location (continent), or sample size (Table 6, Table 7).

Small study bias

There was some evidence of funnel plot asymmetry for systolic blood pressure (Egger test P = 0.025; Figure 1) but not for diastolic blood pressure (Egger test P = 0.102; Figure 8).

Figure 8. Funnel plot of comparison: 1 home-base vs centre-based, outcome: 1.9 Systolic blood pressure 3 to 12 months.



Smoking behaviour

Five studies (6 comparisons) reported on participants' self-reported smoking behaviour at three to 12 months of follow-up (Bell 1998; Dalal 2007; Gordon 2002; Gordon 2002 Supervised; Jolly 2007; Oerkild 2011). There was no evidence indicating a difference in the proportion of smokers at follow-up between home- and centre-based cardiac rehabilitation (RR: 1.02, 95% CI 0.83 to 1.27; participants = 986; studies = 5, comparisons = 6; I^2 = 0%; fixed-effect; Analysis 1.11).

Jolly 2007 reported no difference in smoking between home- and centre-based arms at 24 months (RR: 1.16, 95% CI 0.58 to 33.3).

There was evidence of a consistent reduction in self-reported smoking behaviour following both home- and centre-based cardiac rehabilitation. This finding was confirmed in the one study that used cotinine-validated assessments of smoking (Jolly 2007).

Subgroup analyses

Due to the small number of studies reporting smoking, it was not possible to examine the effects of potential treatment effect modifiers on these outcomes.

Small study bias

Due to the small number of studies reporting smoking behaviour, it was not possible to examine small study bias.

Adherence

Eighteen studies reported data on adherence to cardiac rehabilitation over the duration of the study (Table 8) with most (13) only reporting session attendance or completion which can only be considered a proxy measure of exercise adherence. Some studies reported more than one measure of adherence. Pooling across studies was therefore deemed to be inappropriate. Nine studies (Carlson 2000; Cowie 2012; Dalal 2007; Gordon 2002; Grace 2016; Jolly 2007; Karapolat 2009; Maddison 2019; Miller 1984) found no evidence of a significant difference in the level of adherence between groups. Superior adherence to home-based cardiac rehabilitation was reported in six studies (Arthur 2002; Hwang 2017; Kraal 2014; Marchionni 2003; Piotrowicz 2010; Varnfield 2014) and evidence of superior adherence in centre-based cardiac rehabilitation in one study (Aamot 2014). Three other studies reported adherence (Daskapan 2005; Moholdt 2012; Sparks 1993) but it was not possible to assess if there was a statistically significant difference between home- and centre-based cardiac rehabilitation.

Costs and health service use

Eight studies reported costs (Table 9). Differences in currencies and timing of studies meant that it was not possible to compare the costs directly across studies. In six of these studies, healthcare costs associated with cardiac rehabilitation were lower for the home-based than centre-based programmes (Carlson 2000; Dalal 2007; Hwang 2017; Maddison 2019Marchionni 2003; Varnfield 2014), although cost was significantly lower in only one study (Dalal 2007). Jolly 2007 found that home-based cardiac rehabilitation was more expensive than centre-based cardiac rehabilitation, although the costs of the two would have been the same if participant costs were included. One study (Cowie 2012) included the costs of a no-cardiac rehabilitation control and showed that cardiac rehabilitation costs were offset by a reduction in hospital admissions over five years, resulting in a substantive cost-saving when compared with control, i.e. GBP -3304 per participant for home-based cardiac rehabilitation and GBP -3784 per participant for hospital-based cardiac rehabilitation.

Eight studies reported different aspects of consumption of healthcare resources, including re-admissions to hospital, primary care consultations and use of secondary care medication (Table 10; Table 11). No significant between-group differences were seen.

DISCUSSION

Summary of main results

The traditional mainstay approach to cardiac rehabilitation delivery in many countries is a face-to-face inpatient and outpatient provision, which takes place in a hospital or community facility setting. In spite of the evidence of benefits of cardiac rehabilitation in CHD, PCI, and heart failure populations (Anderson 2016; Long 2019) and associated strong clinical guideline recommendations (Ponikowski 2016; Smith 2011), the utilisation of cardiac rehabilitation remains stubbornly poor across the globe. Whilst the barriers to cardiac rehabilitation access are complex (Dalal 2021; Taylor 2021), the availability of home-based programmes, including digital/telehealth technology, provides an opportunity to increase uptake and participation in cardiac rehabilitation. The SARS-CoV-2 pandemic has had a dramatic negative impact on cardiac rehabilitation access (Scherrenberg 2020). This can be illustrated by the UK National Audit, which has observed more than a two-third decrease in cardiac rehabilitation attendance in patients with heart failure from the pre-SARS-CoV-2 period (4969 patients, May 2019 to Jan 2020) to post-SARS-CoV-2 (1474 patients, Feb 2020 to Aug 2020) (Doherty 2020). However, this drop in uptake was associated with a substantial increase in the proportion of patients enroling in home-based CR programmes, increasing from 22.2% to 72.4% in the same respective time frames.

This updated review included 24 trials which randomised 3046 participants following an MI or PCI or with heart failure, to either home-based or centre-based cardiac rehabilitation. Although models of home-based rehabilitation varied widely, all studies included formal supervision by a qualified healthcare or exercise professional. Three of the included trials were based on the Heart Manual model (Bell 1998; Dalal 2007; Heart Manual 2016; Jolly 2007), a programme that consists of a self-help manual supported by a nurse facilitator (Lewin 1992). Four trials used digital technology to support home-based delivery of cardiac rehabilitation (Hwang 2017; Kraal 2014; Maddison 2019; Varnfield 2014), including real-time exercise monitoring/coaching and theory-based behavioural strategies via a bespoke digital/telehealth platform.

Across this evidence base, we found no evidence supporting important differences in outcomes for patients receiving home-based or centre-based cardiac rehabilitation either in the short-term (3 to 12 months) or longer-term (up to 24 months) for mortality, cardiac events, exercise capacity, modifiable risk factors (total cholesterol; LDL cholesterol; systolic blood pressure; diastolic blood pressure; proportion of smokers at follow-up) or HRQoL or trial completion. There was a small outcome difference in favour of centre-based participants for HDL cholesterol. In contrast, in home-based participants, there was some evidence of higher levels of programme adherence attributed to attendance. We found no consistent evidence to support an important difference in the average cost per patient of providing home-based versus centre-based programmes.

Overall completeness and applicability of evidence

The inclusion criteria for this review are broad, in order to reflect current practice where an increasingly diverse patient population is accessing cardiac rehabilitation services (BACPR 2017). While the original version of this review was limited to trials in participants with stable CHD either following an acute MI or PCI (Taylor 2010), updates of this review have included an increasing number of trials in people with heart failure (Taylor 2015). However, because of the inclusion of home-based programmes, the majority of trials have traditionally focused on low-risk patients. Moreover, only ~20% of all participants included in this review were women and the majority of trials took place in high-income settings.

Interventions, especially home-based programmes, varied substantially in their content, dose, and level of healthcare staff support/supervision. Few studies reported fidelity (whether the intervention was delivered as intended) and details of the actual level of intervention implemented, both key aspects in understanding of the impact and replication of a complex

intervention, such as cardiac rehabilitation (Hoffmann 2014). As details of interventions were often poorly reported, it was difficult to assess whether the cardiac rehabilitation programmes would meet current recommendations of good practice (Ambrosetti 2020; BACPR 2017).

Quality of the evidence

Methods of randomisation (sequence generation and concealment) and outcome blinding were generally poorly reported across the included trials, although there was some evidence of an improvement in the certainty of reporting in more recent trials. Due to this poor reporting, the certainty of the evidence for outcomes was assessed as 'moderate' at best. Other reasons for downgrading the certainty of evidence included inconsistency (exercise capacity ≤ 12 months and withdrawal from the intervention programme (measured as number of completers)) and imprecision (mortality).

Potential biases in the review process

This study sought to bring together a comprehensive and contemporary synthesis of the RCT evidence directly comparing home- (with or without a digital/telehealth platform) versus centre-based cardiac rehabilitation. However, we recognise that our review has some potential biases.

Firstly, given the inconsistent reporting of outcomes, we were unable to judge the degree of publication bias for all outcomes, although there was no evidence of funnel plot asymmetry or statistically significant Egger tests for the majority of outcomes where this was tested (total mortality, exercise capacity, total cholesterol or diastolic blood pressure).

Second, the variation and complexity in HRQoL reporting (including total and domain scores of both generic and disease-specific tools) meant that, as seen in previous review versions (Anderson 2017; Taylor 2015), we were not able to quantitatively pool outcomes using standardised meta-analytic approaches and, instead, we used a synthesis without meta-analysis (SWiM) approach (Campbell 2000).

Third, there was evidence of considerable statistical heterogeneity across a number of outcomes. This is likely to reflect the substantial clinical heterogeneity across trials both in terms of their patient populations and the range of home- and centre-based cardiac rehabilitation interventions. Most studies were of relatively short duration, with only three trials reporting outcomes beyond 12 months of follow-up (Arthur 2002; Jolly 2007; Marchionni 2003). The number of deaths and cardiac events reported by most trials was therefore correspondingly small.

Finally, it has been hypothesised that patient preference may have an impact on uptake and adherence to home-based cardiac rehabilitation (Grace 2005). However, such a hypothesis is difficult to test in a traditional parallel two-group RCT design and, therefore, our finding of similar adherence between home- and centre-based cardiac rehabilitation needs to be interpreted with caution, especially as measuring adherence accurately remains problematic and is variable across studies (Bollen 2014; Newman-Beinart 2017). One included trial (Dalal 2007) employed a comprehensive cohort design in addition to the randomised element of home- and centre-based allocation in which there was also a patient preference element (participants could choose between home- and hospital-based cardiac rehabilitation). The study authors reported that outcome differences between the home and hospital arms in the preference (non-randomised) sample were very similar to those in the randomised comparison. Adherence to home-based cardiac rehabilitation was also comparable between the randomised (75%) and preference arms (73%). This finding does not support the hypothesis that patients who can choose a programme to suit their lifestyle and preferences will have a higher adherence rate and improved outcomes. However, as with the randomised comparison, the number of participants in the preference arms was small (N = 126).

Agreements and disagreements with other studies or reviews

Whilst the findings of this update that the outcomes and costs of home- versus centre-based cardiac rehabilitation are similar is consistent with the previous versions of this Cochrane Review (Taylor 2010; Taylor 2015; Buckingham 2016), this update does provide additional evidence that includes: heart failure patients, collection/reporting of additional HRQoL data, and trials of home-based programmes that include a digital/telehealth technology framework. We did not include trials of centre-based programmes including digital/telehealth technology.

A number of recent systematic reviews assessed the impact of home and digital/telehealth-rehabilitation programmes against usual care or centre-based rehabilitation. One meta-analysis concluded that the gains in exercise capacity and HRQoL with digital/telehealth rehabilitation in CHD patients appeared to be comparable with those seen with centre-based delivery (Ramachandran 2021). Another review reported that home-based cardiac rehabilitation programmes are as effective as centre-based programmes in terms of mortality, morbidity, short-term exercise capacity, blood pressure, smoking cessation, and HRQoL (Crawford-Faucher 2010). A recent systematic review assessed the safety of home-based cardiac rehabilitation programmes and concluded that the risk of adverse events occurring is low and therefore cardiac patients should be encouraged to undertake physical exercise regularly in their own environment if not attending centre-based sessions and be reassured that it is safe to do so.

Several cardiac rehabilitation programmes are now using this hybrid approach to deliver cardiac rehabilitation (Imran 2019) which typically involves patients initially undergoing centre-based cardiac rehabilitation and then evolution to longer-term maintenance through technology-supported, home-based sessions. Given that such hybrid programmes do not meet the inclusion criteria of this review, we have not included the evidence here for such a model of delivery.

AUTHORS' CONCLUSIONS

Implications for practice

Supervised home/digital-telehealth and centre-based models of cardiac rehabilitation appear to be of similar effectiveness in improving clinical outcomes and HRQoL in post-MI, PCI, and heart failure patients and they present a low risk of adverse events. This finding, together with a similar average cost per patient between the approaches, supports both the wider implementation of alternative models to centre-based programmes in order to improve access and uptake of cardiac rehabilitation, especially in

the midst of the SARS-CoV-2 pandemic. Where healthcare settings have sufficient resources, the offer of centre- or home/digital-based programmes should consider the preference of the individual patient. Hybrid models combining both centre-and home-based cardiac rehabilitation delivery modalities are gaining popularity and a developing evidence base but not reviewed here (Wu 2018).

Implications for research

Further data are needed to confirm whether the short-term benefits of home/digital-telehealth- and centre-based modes of delivery of cardiac rehabilitation continue into the longer term. Evidence is also needed of the use of supervised centre- and home/digital-telehealth rehabilitation models in other cardiac populations, such as stable angina pectoris, atrial fibrillation, congenital heart disease, and post-valve surgery. Where future trials directly compare different models of cardiac rehabilitation, they need to consider adequately powered non-inferiority/equivalence study designs. To inform practice and policy, future studies also need to include consideration of costs, better report intervention fidelity and adherence, and more consistently report validated patient-relevant outcomes.

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Editorial and peer-reviewer contributions

Cochrane Heart supported the authors in the development of this review update and managed the editorial process. The following people conducted the editorial process.

- Co-ordinating Editor/Sign-off Editor (final editorial decision): Rui Providencia, Cochrane Heart, University College London.
- Managing Editors (selected peer reviewers, collated peer reviewer comments, provided editorial guidance to authors, edited the review): Ghazaleh Aali and Nicole Martin, Cochrane Heart, University College London.
- Copy Editor (copy-editing and production): Anne Lethaby, c/o Cochrane Central Production Service.
- Information Specialist: Farhad Shokraneh, Cochrane Heart, University College London.
- Peer-reviewers (provided comments and recommended editorial decisions): William E. Cayley, Jr. (Contact Editor) Augusta Family Medicine Rural Training Site, WI, USA; Amine Ghram (Clinical Reviewer), Department of Exercise Physiology, Faculty of Physical Education and Sport Sciences, University of Tehran, Iran, and Healthy Living for Pandemic Event Protection (HL - PIVOT) Network, Chicago, Illinois, USA; Jenna L. Taylor (Clinical reviewer), Department of Cardiovascular Medicine, Mayo Clinic, USA.

Cochrane Central Editorial Service completed pre-publication methods/editorial checks; Cochrane Central Production Service managed the production/copy-edit process prior to publication (Methods Editor: Liz Bickerdike; Managing Editor: Joey Kwong; Copy Editor: Anne Lethaby).

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IRCT20210509051235N1 *{published and unpublished data}*

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ISRCTN18022985 *{published data only}*

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KCT0006385 *{published data only}*

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NCT04938661 *{published and unpublished data}*

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NCT05019157 *{published and unpublished data}*

TELE-WEAR: a multi-centre, blinded, randomized controlled trial investigating the efficacy, efficiency and cost - effectiveness of a cardiac telerehabilitation program using wearable sensors. https://clinicaltrials.gov/ct2/show/NCT05019157?term=home&cond=cardiac+rehabilitation&age=12&sfpd_s=01%2F12%2F2020&sfpd_e=04%2F09%2F2

NCT05201976 *{published and unpublished data}*

A Clinical Trial Investigating the Effects of a Virtually Implemented Home Based Cardiac Rehab Program With Real-time, Video-based Exercise Supervision and Vitals Monitoring. https://trialsearch.who.int/Trial2.aspx?TrialID=NCT05201976.

NCT05264701 *{published data only}*

Investigation of the Effects of Artificial Intelligence-supported and Technology-based Cardiac Rehabilitation Programs on Participation and Exercise Capacity in Coronary Artery Patients. https://clinicaltrials.gov/ct2/show/NCT05264701.

NCT05270993 *{published and unpublished data}*

An Integrative Cardiac Rehabilitation Employing Smartphone Technology (iCREST) for Patients With Post-myocardial Infarction: A Randomized Controlled Trial. https://clinicaltrials.gov/ct2/show/NCT05270993.

NCT05326529 *{published and unpublished data}*

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Aamot 2014

Study characteristics	
Methods	**Study design:** Multi-centre RCT with 3 parallel groups: centre-based group exercise, centre-based treadmill exercise, or home-based exercise **Number of centres:** 2 **Country:** Norway **Dates patients recruited:** October 2009 to April 2011 **When randomised:** After the baseline tests **Maximum follow-up:** 12 weeks
Participants	**Inclusion criteria:** Aged over 18 years, diagnosed MI, CABG surgery, or acute coronary syndrome (ACS), and able to perform a maximal treadmill test **Exclusion criteria:** Heart failure, severe arrhythmias, drug abuse, or a medical condition contraindicative to high-intensity training **N randomised:** total: 90; home-based cardiac rehabilitation: 28; centre-based cardiac rehabilitation (treadmill exercise): 34; centre-based cardiac rehabilitation (group exercise): 28 **Method of assessment:** NR **Diagnosis (% of pts):** **Previous AMI:** home-based cardiac rehabilitation: 71.4%; treadmill exercise: 67.6%; group exercise: 64.3% **Previous CABG**: home-based cardiac rehabilitation: 21.4%; treadmill exercise: 26.5%; group exercise: 25.0% **ACS:** home-based cardiac rehabilitation: 7.2%; treadmill exercise: 5.9%; group exercise: 10.7% **Age (mean ± SD):** total: NR; home-based cardiac rehabilitation: 58 ± 8 years; treadmill exercise: 56 ± 9 years; group exercise: 58 ± 8 years **Percentage male:** total: 88.9%; home-based cardiac rehabilitation: 96.4%; treadmill exercise: 82.4%; group exercise: 89.3%

Aamot 2014 *(Continued)*

	Ethnicity: NR
Interventions	All participants in all groups performed HIT twice a week for 12 weeks. Every session started with a 10-minute warm-up at low-to-moderate intensity (50% to 70% of peak heart rate, HR) and continued with four intervals lasting 4 minutes each, at an exercise intensity of 85% to 95% of peak HR. Each interval was separated by 4 minutes of active breaks at an intensity of 70% of peak HR. After the last interval, a cool-down period of 3 to 5 minutes was performed at 50% of peak HR. All participants were individually instructed in use of the HR monitor, and how to reach target HR. As aerobic capacity increased, the participants increased work load to maintain relative exercise intensity. Completion of 70% of the exercise sessions was considered to be training per-protocol. **Home-based:** The home-based exercise started with two initial sessions with personal instruction of a physiotherapist where they learned how to perform HIT and to use the HR monitors. These sessions were performed as up-hill walking or jogging. After the introduction, HIT was performed in preferred exercise mode in their home environment; up-hill walking, cross-country skiing, bicycling, running, or using indoor equipment such as treadmills or cross-trainers. All participants varied their exercise mode, but they kept to the exercise design and relative exercise intensity. A Holter electrocardiogram was recorded during the first exercise session to ensure that no arrhythmia occurred during or immediately after exercise. **Time of start after event:** NR **Components:** Exercise only **Aerobic exercise:** **Modality:** HIT was performed in preferred exercise mode e.g. up-hill walking, cross country skiing, bicycling, running, or using indoor equipment such as treadmills or cross trainers **Dose:** **Length of session:** 45 mins **Frequency/no of sessions:** twice a week **Intensity:** 50% to 95% of peak HR **Resistance training included?** No **Total duration:** 12 weeks **Intermittent nurse or exercise specialist telephone support?** NR **Co-interventions:** None described **Centre-based treadmill :** Treadmill exercise: The treadmills were used at the hospitals, in smaller groups consisting of 3–7 patients. Work load was adjusted individually, either by fast walking with inclination or running with less inclination. A physiotherapist was present to provide monitors and to assist if necessary. **Time of start after event:** NR **Components:** Exercise only **Aerobic exercise:** **Modality:** Treadmills **Dose:** **Length of session:** 45 mins

Aamot 2014 *(Continued)*

Frequency/no of sessions: twice a week

Intensity: 50% to 95% of peak HR

Resistance training included? No

Total duration: 12 weeks

Intermittent nurse or exercise specialist telephone support? NR

Co-interventions: None described

Centre-based group:

The group exercise sessions were held at the hospitals in groups of 10 to 15 people, instructed by a physiotherapist. After a warm-up consisting of aerobics, the HIT was organised as circuit training and the intervals performed with a variety of exercises, from running to cycling, squats, and steps. Active breaks could consist of strength exercises (push-ups, sit-ups) or walking.

Time of start after event: NR

Components: Exercise only

Aerobic exercise:

Modality: Circuit training

Dose:

Length of session: 45 mins

Frequency/no of sessions: twice a week

Intensity: 50% to 95% of peak HR

Resistance training included? No

Total duration: 12 weeks

Intermittent nurse or exercise specialist telephone support? NR

Co-interventions: None described

Outcomes	Peak VO_2, HRQoL
Follow-up	12 weeks
Source of funding	This work was supported by the Liaison Committee between the Central Norway Regional Health Authority and the Norwegian University of Science and Technology (NTNU).
Conflicts of interest	The authors declared that there was no conflict of interest.
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomization was performed after the baseline tests, by a web-based randomization system."
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described

Aamot 2014 *(Continued)*

Blinding of outcome assessment (detection bias) All outcomes	High risk	"The test personnel were not blinded for allocation."
Incomplete outcome data (attrition bias) All outcomes	Low risk	Home-based cardiac rehabilitation: 2/28 (7.1 %) lost to follow-up Treadmill: 2/34 (5.9 %) lost to follow-up Group exercise: 3/28 (10.7 %) lost to follow-up
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods were reported in the results section.
Groups balanced at baseline?	Low risk	"Group differences were not significant".
Groups received same co-intervention(s)?	Low risk	No co-interventions were received by any group.

Arthur 2002

Study characteristics	
Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** Canada **Dates patients recruited:** July 1997 to October 1998 **When randomised:** 35 to 49 day post-CABG surgery, after baseline assessment **Maximum follow-up:** 6 years
Participants	**Inclusion criteria:** 35 to 49 days post-CABG, able to achieve 40 to 80% of age/sex-predicted METs on cycle ergometry, read/write English **Exclusion criteria:** Recurrent angina, positive graded exercise test, unable to attend rehabilitation 3 times weekly, physical limitations, previously participant of outpatient cardiac rehabilitation **N randomised:** total: 242; home-based cardiac rehabilitation: 120; centre-based cardiac rehabilitation: 122 **Method of assessment:** NR **Diagnosis (% of pts):** **Previous CABG**: 100% **Age (mean ± SD):** total: 63.3 ± 13 years **Percentage male:** total: 81% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** Patients also attended 1 hour exercise consultation with exercise specialist at baseline and after 3 months training, completed exercises log reviewed every 2 months, and with telephone support call every 2 weeks. **Time of start after event:** 35 to 49 day post-CABG surgery

Arthur 2002 *(Continued)*

Components: Exercise, education. psychosocial

Aerobic exercise:

Modality: walking

Dose:

Length of session: 40 min/session

Frequency/no of sessions: 5 sessions weekly

Intensity: 60% to 70% VO_2max

Total duration: 6 months

Intermittent nurse or exercise specialist telephone support? Home patients were telephoned every 2 weeks by the exercise specialist to monitor progress, assess and document adherence, revise the exercise prescription if necessary, and provide support and education. Exercise logs were reviewed monthly.

Co-interventions: Dietary advice and psychological support

Description of centre-based cardiac rehabilitation**:**

Supervised by exercise specialist and completed exercises log reviewed every month

Time of start after event: 35 to 49 day post-CABG surgery

Components: Exercise, education, psychosocial

Aerobic exercise:

Modality: cycle ergometer, treadmill, track walking, and stair-climbing

Dose:

Length of session: 40 min/session

Frequency/no of sessions: 3 sessions weekly

Intensity: 60% to 70% VO_2max

Total duration: 6 months

Co-interventions: Dietary advice and psychological support

Outcomes	Primary: exercise capacity (METs) Secondary: HRQoL (SF-36); cardiac morbidity, mortality
Follow-up	6 and 18 months and 6 years post-randomisation
Source of funding	Heart and Stroke Foundation of Ontario (grant no. T 4004)
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement

Arthur 2002 *(Continued)*

Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Low risk	"...the data analyst, who had no role in this project, prepared the randomization schedule using a blocked format"; "...the resulting group assignments were than sealed in opaque envelopes that were opened in sequence after consent".
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"...the physicians who evaluated the primary variables were blind to the patients assignment".
Incomplete outcome data (attrition bias) All outcomes	Low risk	CONSORT flow diagram shows loss to follow-up 20/242 (8%) at 6 months follow-up and 24/242 (10%) at 18 months follow-up. No imputation of missing data undertaken
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	High risk	“There were statistically significant differences at baseline between the two groups in weight, resting heart rate, and social support.”
Groups received same cointervention(s)?	Low risk	“Similar numbers of patients in the [hospital and home] groups chose to consult with either clinic dietician or psychologist.”

Bell 1998

Study characteristics	
Methods	**Study design:** Multi-centre RCT **No of centres:** 5 district hospitals **Country:** UK **Dates patients recruited:** NR **When randomised:** NR **Maximum follow-up:** 52 weeks
Participants	**Inclusion criteria:** Acute MI (2 of: elevated serum creatinine kinase or oxaloacetic transaminase, prolonged chest pain consistent with AMI, new Q waves or evolutionary ST changes in ECG) **Exclusion criteria:** Physical infirmity, unable to speak or read English, dementia or psychosis, aged > 75 years, living > 20 miles from CCU, serious persisting medical complications, any other excluding conditions (consultants opinion), for some hospitals - participation in the previous rehabilitation programme **N randomised:** total: 252; home-based cardiac rehabilitation: 152; centre-based cardiac rehabilitation: 100 **Method of assessment:** NR **Diagnosis (% of pts):** **AMI:** 100% **Age (mean ± SD): total:** 59 ± 8.9 years **Percentage male: total:** 77%

Bell 1998 *(Continued)*

	Ethnicity: NR
Interventions	**Description of home-based** cardiac rehabilitation**:** Heart Manual **Time of start after event:** NR **Components:** Exercise, education and psychological **Aerobic exercise:** **Modality:** Walking **Dose:** **Length of session:** NR **Frequency/no of sessions:** NR **Intensity:** NR **Total duration:** 6 weeks **Intermittent nurse or exercise specialist telephone support?** 4 phone calls by facilitator, health education, stress management **Co-interventions:** NR **Description of centre-based** cardiac rehabilitation**:** **Time of start after event:** NR **Components:** Exercise, education and psychological **Aerobic exercise:** **Modality:** Walking **Dose:** **Length of session:** ≥ 20 min **Frequency/no of sessions:** 1 session/week or 4 weeks of 2 sessions/week **Intensity:** 3 to 4 on Borg RPE scale **Total duration:** 12 weeks **Co-interventions:** Education sessions - CHD causes, medication, risk factor modification, stress management, and exercise
Outcomes	Primary: exercise capacity (METs) Secondary: total cholesterol; systolic blood pressure; HRQoL (Nottingham Health Profile); smoking; mortality; readmission rate; use of primary care services
Follow-up	16 and 48 weeks post-randomisation (20 and 52 weeks post-MI)
Source of funding	NR
Conflicts of interest	NR
Notes	Published as PhD thesis only
Risk of bias	

Bell 1998 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Low risk	"Series of sealed envelopes containing cards evenly distributed between conditions …envelopes were taken sequentially …opened envelopes were retained and returned to trial coordinator".
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"All measurements were performed 'blind' by members of the medical staff and technicians".
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Follow-up data on all randomised patients were not reported, no CONSORT flow diagram was reported and it was difficult to determine from the report those who were lost to follow-up or who dropped out.
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	There were no statistically significant differences in population demographics between the two groups.
Groups received same co-intervention(s)?	High risk	Although the intervention for both groups consisted of exercise, education, and stress management, the nature and amount of the intervention were quite different.

Carlson 2000

Study characteristics	
Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** USA, single hospital centre **Dates patients recruited:** NR **When randomised:** within 2 weeks of entering cardiac rehabilitation **Maximum follow-up:** 6 months
Participants	**Inclusion criteria:** Men and women aged 35 to 75 years referred for the first time to outpatient cardiac rehabilitation, living ≤ 30 miles from the rehabilitation facility, of low-to-moderate cardiac risk **Exclusion criteria:** NR **N Randomised:** total: 80; home-based cardiac rehabilitation: 38; centre-based cardiac rehabilitation: 42 **Method of assessment:** NR **Diagnosis (% of pts):** **MI:** home-based cardiac rehabilitation: 47%; centre-based cardiac rehabilitation: 26% **Angioplasty:** home-based cardiac rehabilitation: 55%; centre-based cardiac rehabilitation: 40% **CABG**: home-based cardiac rehabilitation: 32%; centre-based cardiac rehabilitation: 40%

Carlson 2000 *(Continued)*

	Age (mean ± SD): total: NR; home-based cardiac rehabilitation: 59 ± 10 years; centre-based: 59 ± 9 years **Percentage male:** total: NR; home-based cardiac rehabilitation: 82%; centre-based cardiac rehabilitation: 83% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** first 4 weeks - 3 hospital-based exercise sessions/week with ECG monitoring, progressively reducing frequency of centre-based sessions **Time of start after event:** NR **Components:** Exercise, education, psychosocial **Aerobic exercise:** **Modality:** NR **Dose:** **Length of session:** 30 to 40 min/session **Frequency/no of sessions:** 2 to 5 sessions/week **Intensity:** 60 to 85% aerobic capacity **Total duration:** 25 weeks **Co-interventions:** Weekly educational and counselling meetings that included sessions on exercise, diet, risk factors, drugs, and overcoming barriers to behaviour change. Based on Bandura's self-efficacy theory **Description of centre-based** cardiac rehabilitation**:** **Centre-based** cardiac rehabilitation**(control):** **Exercise:** modality: aerobic exercise **Time of start after event:** NR **Components:** e.g. exercise only, exercise and education, exercise and psychosocial **Aerobic exercise:** **Modality:** NR **Dose:** **Length of session:** 30 to 45 min/session **Frequency/no of sessions:** 2 to 3 sessions/week **Intensity:** 60 to 85% aerobic capacity **Resistance training included?** **Total duration:** 25 weeks **Co-interventions:** Three sessions of education and counselling that included sessions on exercise, diet, risk factors, and drugs
Outcomes	Primary: peak functional capacity (METs), LDL cholesterol Secondary: total cholesterol, HDL cholesterol, triglycerides, blood pressure, cardiovascular medications, costs, adherence (exercise sessions attended)

Carlson 2000 *(Continued)*

Follow-up	6 months post-randomisation
Source of funding	NR
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	"...it was not possible to blind the clinicians to the protocol patients were assigned". Outcome blinding not reported
Incomplete outcome data (attrition bias) All outcomes	High risk	"...significantly more [centre-based CR] participants dropped out", "Because more [centre-based CR] participants dropped out and failed to return for their 6-month [exercise test] evaluation, this evaluation is a representation of more compliant patients".
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	"…only significant difference between groups was a higher resting systolic blood pressure in [centre-based CR] …selected demographic and psychological measures including socioeconomic status and social support were comparable between the 2 groups at baseline".
Groups received same co-intervention(s)?	High risk	"The primary differences in the [home-based CR] compared with the [centre-based CR] included: …(2) an ongoing weekly education/support group, and (3) education and counselling that emphasized overcoming barriers associated with developing independent exercise and nutrition behaviours". Although both groups received exercise training, education, and counselling, the amount and nature of this intervention were different between groups.

Cowie 2012

Study characteristics

Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** UK **Dates patients recruited:** May 2007 and August 2008 **When randomised:** After baseline tests **Maximum follow-up:** 8 weeks

Cowie 2012 *(Continued)*

Participants	**Inclusion criteria:** (1) left ventricular systolic dysfunction on echocardiography, (2) clinically stable for at least one month, and (3) on optimised medication dosages **Exclusion criteria:** (1) significant ischaemic symptoms at low workloads, (2) uncontrollable diabetes, (3) acute systematic illness or fever, (4) recent embolism, (5) acute pericarditis, (6) moderate-to-severe aortic stenosis, (7) regurgitant valvular heart disease requiring surgery, (8) myocardial infarction within the past three weeks, (9) new onset of atrial fibrillation, (10) signs and symptoms of decompensation, (11) other comorbidities (life-threatening, uncontrolled, infectious, or exacerbated by exercise). **N randomised:** total: 60; home-based cardiac rehabilitation: 20; centre-based cardiac rehabilitation: 20; control: 20 (usual care – no cardiac rehabilitation - not considered in this review) **Method of assessment:** Echocardiography **Diagnosis (% of pts):** **NYHA class II/III post-H:** F100% **Age (range):** total: 66 (35-85) years; home-based cardiac rehabilitation: 65.5 (35 to 82) years; centre-based cardiac rehabilitation: 71.2 (59 to 85) years; control: 61.4 (39 to 79) years **Percentage male:** total: 85%; home-based cardiac rehabilitation: 90%; centre-based cardiac rehabilitation: 80%; control: 85% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** Exercise: 1-hour aerobic-based exercise session (DVD and booklet), started with a 15-minute warm-up, and ended with a 15-minute cool-down. Aerobic overload: 2 x 15-minute circuits (10 simple, functional aerobic exercises e.g. knee lifts, side steps); interspersed with low-paced 'active recovery' (toe tapping or slow walking; 90 seconds for each exercise). Gradually increasing the proportion of time spent on aerobic overload in relation to active recovery provided interval training, which was individually tailored and progressed. **Time of start after event:** NR **Components:** Exercise and education **Aerobic exercise:** **Modality:** Functional aerobic exercises e.g. knee lifts, side steps interspersed with low-paced 'active recovery' (toe tapping or slow walking) **Dose:** **Length of session:** 1 hour **Frequency/no of sessions:** twice a week **Intensity:** NR **Total duration:** eight weeks **Intermittent nurse or exercise specialist telephone support?** Physiotherapist telephoned every two weeks to modify exercise prescriptions where appropriate. **Co-interventions:** Educated on symptoms of unstable heart failure. Use of heart rate monitors to guide training intensity. Encouraged to work at 12 to 13 on the Borg RPE. Advised to adhere to usual heart failure nursing care and daily routines **Description of centre-based** cardiac rehabilitation**:** As above i.e. 1-hour aerobic-based exercise session (physiotherapist-led) started with a 15-minute warm-up, and ended with 15-minute cool-down. Aerobic overload: 2 x 15-minute circuits (10 simple, functional aerobic exercises e.g. knee lifts, side steps); interspersed with low-paced 'active recovery' (toe tapping or slow walking; 90 seconds for each

Cowie 2012 *(Continued)*

	exercise). Gradually increasing the proportion of time spent on aerobic overload in relation to active recovery provided interval training, which was individually tailored and progressed. **Components:** Exercise and education **Aerobic exercise:** **Modality:** Functional aerobic exercises e.g. knee lifts, side steps interspersed with low-paced 'active recovery' (toe tapping or slow walking) **Dose:** **Length of session:** 1 hour **Frequency/no of sessions:** twice a week **Intensity:** NR **Total duration:** eight weeks **Co-interventions:** Educated on symptoms of unstable heart failure. Use of heart rate monitors to guide training intensity. Encouraged to work at 12 to 13 on the Borg RPE. Advised to adhere to usual heart failure nursing care and daily routines
Outcomes	Exercise capacity (shuttle walk test), health-related quality of life (SF-36 and Minnesota Living With Heart Failure)
Follow-up	8 weeks
Source of funding	This work was supported by NHS Ayrshire and Arran's coronary heart disease Managed Clinical Network
Conflicts of interest	Professor Malcolm Granat is a co-inventor of the activPALTM and a director of PAL Technologies Ltd., Glasgow, UK. Professor Granat had no involvement in data collection, or analysis of results. No other conflicts of interest declared
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Low risk	"...participants were randomised (using concealed envelopes) to one of three groups".
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"...measurements obtained by researcher blind to participants"
Incomplete outcome data (attrition bias) All outcomes	Low risk	5/20 (25%) centre-based and 5/20 (25%) dropped out.
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.

Cowie 2012 *(Continued)*

Groups balanced at baseline?	High risk	"...the mean age of the hospital group was 10 years older than the control group (P = 0.001)".
Groups received same co-intervention(s)?	Low risk	"[both groups were] ...advised to adhere to usual heart failure nursing care and daily routines".

Dalal 2007

Study characteristics	
Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** UK **Dates patients recruited:** December 2000 to September 2003 **When randomised:** Following consent **Maximum follow-up:** 9 months
Participants	**Inclusion criteria:** Confirmed acute myocardial infarction (WHO criteria), ability to read English, registered with family doctor in one of two primary care trusts **Exclusion criteria:** Severe heart failure, unstable angina, uncontrolled arrhythmia, history of major psychiatric illness, other significant comorbidity precluding the ability to exercise on the treadmill, patients re-admitted with acute myocardial infarction who had already received an intervention earlier in the study **N randomised:** total: 104; home-based cardiac rehabilitation: 60; centre-based cardiac rehabilitation: 44 **Method of assessment:** Confirmed acute myocardial infarction (WHO criteria) **Diagnosis (% of pts):** **Post-MI:** 100% **Age (mean ± SD):** total: 62 ± 15 years; home-based cardiac rehabilitation: 60.6 ± 10.1 years; centre-based cardiac rehabilitation: 64.3 ± 11.2 years **Percentage male:** total: 81%; home-based cardiac rehabilitation: 82%; centre-based cardiac rehabilitation: 80% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** Heart Manual **Time of start after event:** **Components:** Exercise, education and psychosocial **Aerobic exercise:** **Modality:** walking **Dose:** **Length of session:** NR **Frequency/no of sessions:** NR

Dalal 2007 *(Continued)*

	Intensity: NR **Total duration:** 6 weeks **Intermittent nurse or exercise specialist telephone support?** Home visit in first week after discharge by cardiac rehabilitation nurse followed up by up to 4 telephone calls at 2, 3, 4, and 6 weeks **Co-interventions:** NR **Description of centre-based** cardiac rehabilitation**:** **Components:** Exercise, education and psychosocial **Aerobic exercise:** **Modality:** NR **Dose:** **Length of session:** NR **Frequency/no of sessions:** 1 to 5 sessions/week **Intensity:** NR **Total duration:** 8 to 10 weeks **Co-interventions:** Input from dietician, psychologist, occupational therapist, and pharmacist
Outcomes	Primary: quality of life (MacNew questionnaire), total cholesterol Secondary: exercise capacity (METs), self-reported smoking, cardiovascular morbidity, mortality, secondary prevention medication use
Follow-up	9 months post-randomisation
Source of funding	NHS Executive South West (Research and Development) Project Grant D/02/10.99
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"...computerised random number trial allocation sequence was determined before the study".
Allocation concealment (selection bias)	Low risk	"...allocation was transferred to sequentially numbered, opaque, sealed envelopes and concealed from the research nurse, who carried out baseline assessment".
Blinding of outcome assessment (detection bias) All outcomes	Low risk	“...the person assessing the primary outcome questionnaires was blinded to allocation".
Incomplete outcome data (attrition bias) All outcomes	Low risk	“...the last known observation carried forward to replace missing values at 9 months for the primary outcome measures”

Dalal 2007 *(Continued)*

Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	"The randomized groups were well balanced, apart from a higher proportion of patients in employment in the home based group (51% versus 26%, P = 0.013)".
Groups received same co-intervention(s)?	Low risk	Both groups received similar advice regarding exercise, stress management, and education.

Daskapan 2005

Study characteristics	
Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** Turkey **Dates patients recruited:** 2000 to 2001 **When randomised:** NR **Maximum follow-up:** 12 weeks
Participants	**Inclusion criteria:** Heart failure > 3 month duration **Exclusion criteria:** Valvular heart disease, exercise-induced cardiac arrhythmias, symptomatic myocardial ischaemia within 3 months, taking beta-blockers **N randomised:** total: 29; home-based cardiac rehabilitation: 15; centre-based cardiac rehabilitation: 14 **Method of assessment:** Patients fulfilled criteria of the New York Heart Association; class II or III CHF **Diagnosis (% of pts):** **Class II or III NYHA with ischaemic or idiopathic dilated cardiomyopathy:** 100% **Age (mean ± SD):** total: NR; home-based cardiac rehabilitation: 49 ± 11 years; centre-based cardiac rehabilitation: 52 ± 8 years **Percentage male:** total: 73%; home-based cardiac rehabilitation: 73%; centre-based cardiac rehabilitation: 73% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** The home-based exercise training group (HETG) performed 12 weeks of physical training by themselves. Follow-up logs completed daily/returned bi-weekly **Components:** Exercise only **Aerobic exercise:** **Modality:** Walking **Dose:** **Length of session:** 45 min/session (including warm-up, cool-down, recovery) **Frequency/no of sessions:** 3 sessions/week

Daskapan 2005 *(Continued)*

	Intensity: up to 60% peak heart rate (RPE 12 to 16) **Total duration:** 12 weeks **Intermittent nurse or exercise specialist telephone support?** Weekly phone calls from staff monitoring adherence and progress, monthly phone calls from patients for control purposes **Co-interventions:** NR **Description of centre-based** cardiac rehabilitation**:** The supervised exercise training group (SETG) performed 12 weeks of physical training on treadmill at the laboratory **Components:** Exercise only **Aerobic exercise:** **Modality:** Walking on a treadmill **Dose:** **Length of session:** 45 min/session (including warm-up, cool-down, recovery) **Frequency/no of sessions:** 3 sessions/week **Intensity:** up to 60% peak heart rate (RPE 12 to 16) **Total duration:** 12 weeks **Co-interventions:** NR
Outcomes	(Primary and secondary outcomes not distinguished) exercise capacity (mL/kg/min), resting BP, systolic and diastolic BP, adherence, dropouts, mortality
Follow-up	12 weeks post-randomisation
Source of funding	NR
Conflicts of interest	NR
Notes	Data on mortality obtained by personal contact

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of assessors not described
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	3/11 (27%) centre-based patients and 4/11 (36%) home-based patients dropped out.

Daskapan 2005 *(Continued)*

Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	"Among patients who completed the study, no differences in demographic characteristics were seen between the 2 study groups after randomization (P > 0.05)."
Groups received same cointervention(s)?	Low risk	"We chose lower intensity …training prescriptions in the HETG to avoid any adverse occurrences and also in the SETG to provide comparable training intensity levels between 2 groups."

Gordon 2002

Study characteristics	
Methods	**Study design:** Single-centre RCT - 3-arm physician-supervised home-based cardiac rehabilitation vs. community home-based cardiac rehabilitation vs centre-based cardiac rehabilitation **No of centres:** 1 **Country:** USA **Dates patients recruited:** NR **When randomised:** Following baseline testing **Maximum follow-up:** 12 weeks
Participants	**Inclusion criteria:** Diagnosed CAD; low-to-moderate risk of cardiac events (1. no cardiac arrest within 1 year, 2. no complex ventricular dysrhythmia, 3. ejection fraction < 40%, 4. no complicated MI or cardiac surgery, 5. no increasing systolic BP response to exercise testing, 6. no angina pectoris < 5.0 METs); ≥ 4 weeks post-hospitalisation; aged 21 to 75 years; no life-threatening illness and/or psychological abnormality; speak/write English; ability to complete exercise treadmill test; ability to attend 36 cardiac rehabilitation sessions **Exclusion criteria:** NR **N randomised:** total: 155; physician-supervised home-based cardiac rehabilitation: 54; community home-based cardiac rehabilitation: 49; centre-based cardiac rehabilitation: 52 **Method of assessment:** NR **Diagnosis (% of pts):** **History of prior MI**: physician-supervised home-based cardiac rehabilitation: 29%; community home-based cardiac rehabilitation: 16%; centre-based cardiac rehabilitation: 6% **History of prior CABG:** physician-supervised home-based cardiac rehabilitation: 37%; community home-based cardiac rehabilitation: 40%; centre-based cardiac rehabilitation: 38% **History of prior PTCA:** physician-supervised home-based cardiac rehabilitation: 42%; community home-based cardiac rehabilitation: 47%; centre-based cardiac rehabilitation: 53% **Age (mean ± SD):** total: NR; physician-supervised home-based cardiac rehabilitation: 61 ± 10 years; community home-based cardiac rehabilitation: 60 ± 9 years; centre-based cardiac rehabilitation: 60 ± 9 years **Percentage male:** total: NR; physician-supervised home-based cardiac rehabilitation: 73%; community home-based cardiac rehabilitation: 78%; centre-based cardiac rehabilitation: 76% **Ethnicity:** NR
Interventions	**Physician-supervised home-based:**

Gordon 2002 *(Continued)*

Components: Exercise and education

Aerobic exercise:

Modality: NR

Dose:

Length of session: individually prescribed (30 to 60 min of aerobic exercise)

Frequency/no of sessions: individually prescribed

Intensity: 60% to 85% peak HR

Total duration: 12 weeks

Intermittent nurse or exercise specialist telephone support? appointments: 2 office visits, 4 phone calls

Co-interventions: Written materials, audiotapes, nutrition, weight and stress management, smoking cessation programme, individual CAD risk factors management

Community home-based:

Components: Exercise and education

Aerobic exercise:

Modality: NR

Dose:

Length of session: individually prescribed (30 to 60 min of aerobic exercise)

Frequency/no of sessions: individually prescribed

Intensity: 60 to 85% peak HR

Total duration: 12 weeks

Intermittent nurse or exercise specialist telephone support? 12 on site visits or telephone calls (patient choice)

Co-interventions: Written materials, audiotapes, nutrition, weight and stress management, smoking cessation programme, individual CAD risk factors management

Centre-based cardiac rehabilitation:

Components: e.g. exercise only, exercise and education, exercise and psychosocial

Aerobic exercise:

Modality: e.g. running, cycling, skipping

Dose:

Length of session: Individually prescribed (30 to 60 min of aerobic exercise)

Frequency/no of sessions: 3 sessions/week (total of 36 sessions = appointments)

Intensity: 60 to 85% peak HR

Total duration: 12 weeks

Co-interventions: Written materials, audiotapes, education on CAD risk factors and lifestyle modification

Gordon 2002 *(Continued)*

Outcomes	(Primary and secondary risk factors not distinguished) maximal oxygen uptake, blood pressure, fasting serum lipids, self-reported smoking status, rehospitalisation, adherence (completion of appointments)
Follow-up	12 weeks post-randomisation
Source of funding	NR
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of assessors not described
Incomplete outcome data (attrition bias) All outcomes	Low risk	Data for 142 pts who completed exercise testing at baseline and at follow-up (not all 155 pts randomised) reported only; numbers of dropouts reported and reasons described.
Selective reporting (reporting bias)	Low risk	All outcomes mentioned in the methods were reported in the results.
Groups balanced at baseline?	Low risk	"Randomization did not result in statistical significant differences among patients assigned to the 3 interventions".
Groups received same co-intervention(s)?	Low risk	All groups received similar written materials and advice.

Grace 2016

Study characteristics

Methods	**Study design:** Single-blind, 3 parallel-arm multi-centre RCT **No of centres:** 6 **Country:** Canada **Dates patients recruited:** 1 November 2009 to 31 July 2013 **When randomised:** After intake assessment **Maximum follow-up:** Six months
Participants	**Inclusion criteria:** Residency in the city where the cardiac rehabilitation programmes were offered, proficiency in English, approval to participate in cardiac rehabilitation programme by cardiac specialist or general practitioner, and eligibility for home-based cardiac rehabilitation (i.e. low-to-moderate risk of an adverse event during exercise as demonstrated by lack of complex ventricular dysrhythmia, New

Grace 2016 *(Continued)*

	York Heart Association class 1-2 classification, and left ventricular ejection fraction of > 40%, or Canadian Cardiovascular Society class 1-2 classification) **Exclusion criteria:** Musculoskeletal, neuromuscular, visual, cognitive, or serious mental illness, or any serious illness that would preclude cardiac rehabilitation eligibility; deemed not suitable for cardiac rehabilitation by physician; plans to leave area; discharged to a long-term care facility; and participation in another RCT with behavioural interventions **N randomised:** total: 169; home-based cardiac rehabilitation: 55; comparator 1 (mixed sex): 59, comparator 2 (women only): 55 **Method of assessment:** Clinical charts were reviewed for inclusion/exclusion criteria. **Diagnosis (% of pts):** **PCI:** total: 49.1%; home-based cardiac rehabilitation: 50.0%; mixed sex: 50.0%; women only: 47.3% **Angina/ACS/CAD:** total: 36.2%; home-based cardiac rehabilitation: 35.8%; mixed sex: 36.4%; women only: 36.4% **MI:** total: 35.8%; home-based cardiac rehabilitation: 34.0%; mixed sex: 38.6%; women only: 34.5% **CABG:** total: 25.5%; home-based cardiac rehabilitation: 25.9%; mixed sex: 21.4%; women only: 29.1% **Valve:** total: 19.4%; home-based cardiac rehabilitation: 20.4%; mixed sex: 19.3%; women only: 18.5% **Age (mean ± SD):** total: 63.64 ± 10.42 years; home-based cardiac rehabilitation: 63.13 ± 10.94 years; mixed sex: 61.56 ± 9.73 years; women only: 66.22 ± 10.21 years **Percentage male: total:** NR **Ethnicity (% white):** total: 62.5%; home-based cardiac rehabilitation: 65.3%; mixed sex: 62.7%; women only: 59.1%
Interventions	Female patients were randomised to 1 of 3 models: (1) supervised mixed-sex, (2) supervised women only, or (3) home-based cardiac rehabilitation There were 3 cardiac rehabilitation sites involved in the trial, each offering all 3 models of cardiac rehabilitation. The programmes lasted 4 to 6 months. At each site, a graded exercise stress test was performed pre-programme and post-programme. Results were used to develop individualised exercise prescriptions and participants were encouraged to accumulate at least 150 minutes of exercise per week at their target heart rate, preferably exercising most days of the week via stationary bicycle/treadmill/walking. **Home-based:** Home-based cardiac rehabilitation participants had at least 3 onsite visits and then exercised at home. **Time of start after event:** NR **Components:** Exercise only **Aerobic exercise:** **Modality:** stationary bicycle/treadmill/walking **Dose:** Participants were encouraged to accumulate at least 150 minutes of exercise per week **Length of session:** NR **Frequency/no of sessions:** NR **Intensity:** Participants exercised according to an individualised exercise prescription which included a target heart rate. **Resistance training included?** No

Grace 2016 *(Continued)*

	Total duration: 4 to 6 months **Intermittent nurse or exercise specialist telephone support?** Patients were phoned weekly or bi-weekly, depending on programme protocols and based on patient need. **Co-interventions:** Patients were provided the same education materials as patients attending the supervised models at their initial visit, which was reviewed on the phone with programme staff. **Centre-based supervised mixed-sex:** **Comparator 1:** supervised mixed-sex **Comparator 2**: supervised women only **Time of start after event:** NR **Components:** Exercise only **Aerobic exercise:** **Modality:** stationary bicycle/treadmill/walking **Dose:** **Length of session:** up to 1 hour **Frequency/no of sessions:** 1 to 2 times/week **Intensity:** Individualised target heart rate **Resistance training included?** Yes **Total duration:** 4 to 6 months **Co-interventions:** Education materials provided **Centre-based supervised single-sex:** **Time of start after event:** NR **Components:** Exercise only **Aerobic exercise:** **Modality:** stationary bicycle/treadmill/walking **Dose:** **Length of session:** up to 1 hour **Frequency/no of sessions:** 1 to 2 times/week **Intensity:** Individualised target heart rate **Resistance training included?** Yes **Total duration:** 4 to 6 months **Co-interventions:** Education materials provided
Outcomes	Adherence to cardiac rehabilitation, exercise capacity
Follow-up	6 months
Source of funding	Heart and Stroke Foundation of Ontario (Grant in Aid no. NA 6682)

Grace 2016 *(Continued)*

Conflicts of interest	None declared
Notes	SD values for adherence data were provided by the author on request.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"The randomization sequence was computer generated, in blocks of 6, and stratified by condition…through randomize.net."
Allocation concealment (selection bias)	Low risk	"Recruiters went online to ascertain random allocation and informed patients and CR sites."
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"The CR program staff members were not aware of study objectives or which participants were involved in the trial. As a manipulation check, a masked research assistant checked CR charts to confirm the program model attended at the expected CR discharge date. Post-test CR data extraction, including stress test results, and program adherence were also undertaken by the masked research assistant."
Incomplete outcome data (attrition bias) All outcomes	High risk	Home-based cardiac rehabilitation: 35/55 (64%) lost to follow-up Mixed sex centre-based cardiac rehabilitation: 38/59 (64%) lost to follow-up Women only centre-based cardiac rehabilitation: 34/55 (62%) lost to follow-up
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods were reported in the results section.
Groups balanced at baseline?	Low risk	There were no significant differences between patients randomised to each of the 3 models (all $P > 0.05$).
Groups received same co-intervention(s)?	Low risk	"Patients were provided the same education materials as patients attending the supervised models at their initial visit, which was reviewed on the phone with program staff."

Hwang 2017

Study characteristics

Methods	Randomised, parallel, non-inferiority trial
Participants	**N Randomised:** 53 (29 centre-based CR & 24 home-based CR) **Diagnosis (% of pts):** LVEF: 35 atrial arrhythmia: 21 diabetes mellitus: 23 chronic respiratory conditions: 18 depression: 8 stroke: 7

Hwang 2017 *(Continued)*

	arthritis: 17 **Case mix:** ischaemic cardiomyopathy: 29 valvular: 2 idiopathic dilated cardiomyopathy: 10 heart failure with preserved ejection fraction: 5 **Age, mean (SD):** 67 (12) **Percentage male:** 40/53 (75%) **Percentage white:** 49/53 (92%) **Inclusion/exclusion criteria:** *Inclusion:* "diagnosis of chronic heart failure confirmed by an echocardiogram (heart failure with reduced or preserved ejection fraction) presented with clinical heart failure symptoms and were aged over 18 years." *Exclusion:* "did not meet safety screening criteria as outlined by the Australian Exercise Guidelines for patients with chronic heart failure, such as symptomatic severe aortic stenosis and significant ischaemia at low exercise intensity; lived in an institution such as a nursing home; lived more than an hour driving distance from the treating hospital or had no support person at home, which was important for those recruited to the home-based telerehabilitation program for safety reasons"
Interventions	Hospital-based CR (supervised) **Exercise:***Total duration:* 12 weeks; *frequency:* 2 (3 additional) sessions/wk; *duration:* 60 mins /session (10-min warm-up, 40 mins aerobic and strength exercises, 10-min cool-down) ; *intensity:* 9 (very light) to 13 (somewhat hard) on the perceived exertion scale: modality: not stated **Other:** "education sessions at the hospital on the same day as the exercise sessions. These sessions were delivered by a multidisciplinary team including the nurse, dietitian, physiotherapist, occupational therapist, social worker and pharmacist. The topics that were covered included self-management, nutritional counselling, physical activity counselling, psychological interventions, medications and risk factor management, where appropriate." Home-based CR - telerehabilitation (control) **Exercise:***Total duration:* 12 weeks; *frequency:* 2 (3 additional) sessions/wk; *duration:* 60 mins /session (10-min warm-up, 40 mins aerobic and strength exercises, 10-min cool-down) ; *intensity:* 9 to 13 on the perceived exertion scale: modality: not stated **Other:** Delivered as a telerehabilitation programme via a synchronous videoconferencing platform across the internet to groups of up to four participants within the home. Telerehabilitation equipment was loaned to participants as required, including a laptop computer, a mobile broadband device connected to 3G wireless broadband internet, an automatic sphygmomanometer, a finger pulse oximeter, free weights and resistance bands. "A 15-minute interaction period was held at the start of each telerehabilitation session to facilitate these discussions. A range of resources were accessed through the videoconferencing platform to facilitate these discussions, such as screen and document sharing, collaborative drawing and chat functions."
Outcomes	**Primary outcome:** Exercise capacity: 6-minute walk distance (6MWD)

Hwang 2017 *(Continued)*

Secondary outcomes:

- balance tests were measured using the Balance Outcome Measure for Elder Rehabilitation (BOOMER)
- exercise capacity: a 10-m walk test*
- exercise capacity: grip strength was measured using a hand-held dynamometer*
- exercise capacity: quadriceps strength was measured using a hand-held dynamometer*
- HRQoL: Minnesota Living with Heart Failure Questionnaire (MLWHFQ)*
- HRQoL: EuroQol five-dimensional (EQ-5D)*
- patient satisfaction was measured using the Client Satisfaction Questionnaire (CSQ-8)
- Adherence: number of sessions attended by each participant*
- serious adverse events (defined as death, cardiac arrest and syncope, and minor adverse events included angina, diaphoresis, palpitations and falls)*

*Outcomes relevant to this SR.

Follow-up	12 and 24 weeks post-randomisation
Source of funding	Princess Alexandra Hospital Research Support Scheme Small Grant 2013; The Prince Charles Hospital Foundation Novice Researcher Grant 2012; and the Queensland Health, Health Practitioner Research Scheme 2012-13
Conflicts of interest	The authors reported no competing interests.
Notes	No subgroup analyses reported

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Consenting participants were allocated 1:1 using a non-blocked random allocation sequence."
Allocation concealment (selection bias)	Low risk	"Allocation was concealed through the use of opaque, sealed and numbered envelopes, and administered by an experienced, independent researcher at a central location."
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	"While the treating healthcare professionals could not be blinded to group allocation, participants were asked not to disclose their group allocation to the blinded assessors."
Incomplete outcome data (attrition bias) All outcomes	Low risk	12 weeks 3/53 (6%) lost to follow-up (all centre-based group) and 24 weeks 4/53 (8%) lost to follow-up (1 home-based & 3 centre-based)
Selective reporting (reporting bias)	Low risk	All outcomes listed in the methods section and registration were reported in the results.
Groups balanced at baseline?	Low risk	"Table 1 summarises participant characteristics and shows that the groups were well matched."
Groups received same co-intervention(s)?	Low risk	Both groups appeared to receive the same intervention. "home-based telerehabilitation program delivered twice weekly; or a control group, who were provided with a traditional centre-based program of the same duration and frequency."

Jolly 2007

Study characteristics	
Methods	**Study design:** Multi-centre RCT **No of centres:** 4 **Country:** UK **Dates patients recruited:** February 2002 to January 2004 **When randomised:** Following baseline assessment **Maximum follow-up:** 24 months
Participants	**Inclusion criteria:** Acute MI, coronary angioplasty (± stenting) or CABG **Exclusion criteria:** Inability to speak either English or Punjabi, dementia, severe hearing impairment, sight defects of sufficient severity to prevent reading the Heart Manual, and serious persisting complications **N randomised:** total: 525; home-based cardiac rehabilitation: 263; centre-based cardiac rehabilitation: 262 **Method of assessment:** Killip Class **Diagnosis (% of pts):** **MI:** home-based cardiac rehabilitation: 49.0%; centre-based cardiac rehabilitation: 49.2% **PTCA:** home-based cardiac rehabilitation: 38.4%; centre-based cardiac rehabilitation: 42.0% **CABG:** home-based CR: 12.5%; centre-based cardiac rehabilitation: 8.8% **Age (mean ± SD):** home-based cardiac rehabilitation: 60.3 ± 10.5 years; centre-based cardiac rehabilitation: 61.8 ± 11.0 years **Percentage male:** home-based cardiac rehabilitation: 77.2%; centre-based cardiac rehabilitation: 76.0% **Ethnicity:** home-based cardiac rehabilitation: 80.2%; centre-based cardiac rehabilitation: 79.3%
Interventions	**Description of home-based** cardiac rehabilitation**:** The home-based programme consisted of a manual, three home visits (at 10 days, 6 weeks and 12 weeks) and telephone contact at 3 weeks. Patients who had had an MI were discharged home with the Heart Manual. Additional visits were made as deemed necessary by the rehabilitation nurse. The manual encourages patients to build up their exercise gradually to achieve a minimum of 15 minutes of moderately intense activity daily. **Components:** Exercise, education and psychosocial **Aerobic exercise:** **Modality:** walking **Dose:** **Length of session:** minimum of 15 mins **Frequency/no of sessions:** up to daily **Intensity:** NR **Total duration:** 6 weeks Heart Manual programme and 12 weeks nurse support **Intermittent nurse or exercise specialist telephone support?** Three home visits (at 10 days, 6 weeks and 12 weeks) and telephone contact at 3 weeks **Co-interventions:** Education on risk factors, lifestyle changes, medications and stress management (relaxation tapes)

Jolly 2007 *(Continued)*

	Description of centre-based cardiac rehabilitation**:** The four centre-based programmes varied in length, including nine sessions at weekly intervals, 12 sessions over 8 weeks and 24 individualised sessions over 12 weeks. Programmes commenced between 4 weeks and 8 weeks following the cardiac event. Patients exercised to 65% to 75% of their predicted maximal heart rate and the exercise element of the sessions lasted from 25 minutes to 40 minutes plus warm-up and cool-down elements. **Components:** Exercise, education and psychosocial **Aerobic exercise:** **Modality:** circuit training, cycle ergometer **Dose:** **Length of session:** 25 to 30 min/session **Frequency/no of sessions:** 1 or 2 sessions/week **Intensity:** 65% to 75% HRmax **Resistance training included?** **Total duration:** 6 to 12 weeks **Co-interventions:** Education and stress management (relaxation)
Outcomes	Primary: serum cholesterol, total cholesterol, HDL cholesterol, blood pressure, exercise capacity (ISWT), smoking (cotinine-validated) Secondary: quality of life (EQ-5D), health service utilisation (hospital readmissions, primary care visits, medication), mortality, cardiovascular events, costs
Follow-up	6, 12, 24 months
Source of funding	Funded by the UK Department of Health through its Health Technology Assessment Programme. National Heart Research funded the development of the Heart Manual for patients following a revascularisation procedure
Conflicts of interest	"None"
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Patients who consented to randomisation were randomised on an individual basis with minimisation by (1) original diagnosis (MI/revascularisation), (2) age (< 50/50-74/75+ years), (3) sex, (4) ethnicity (Caucasian/Asian/other) and (5) hospital of recruitment."
Allocation concealment (selection bias)	Low risk	"Allocation was undertaken by the Birmingham Cancer Clinical Trials Unit, a group that was independent from the trial team …When a patient agreed to be randomised…the research nurse telephoned the Clinical Trials Unit…and was given an allocation group."
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Assessments were blinded, with follow-up undertaken by a research nurse who had neither recruited the patient nor provided home cardiac rehabilitation support."

Jolly 2007 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	Low risk	"A sensitivity analysis was undertaken on the 12-month data to assess the potential impact of the missing values for the ISWT, [systolic] BP, [diastolic] BP, [total cholesterol] and the Hospital Anxiety and Depression Scale scores."
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	"Demographic characteristics, diagnosis, past medical history and cardiac risk factors were well matched between the two arms at baseline."
Groups received same co-intervention(s)?	High risk	Although both groups received exercise, education and stress management, the nature and amount of intervention between groups were different.

Karapolat 2009

Study characteristics	
Methods	RCT parallel groups **Study design:** Single-centre RCT **No of centres:** 1 **Country:** Turkey **Dates patients recruited:** 2007 to 2008 **When randomised:** NR **Maximum follow-up:** 8 weeks
Participants	**Inclusion criteria:** HF as a result of ischaemic and dilated cardiomyopathy, clinical stability for at least 3 months, left ventricular ejection fraction ≤ 40%, NYHA functional class II-III, optimal and standard pharmacological treatment, the ability to speak and understand Turkish, absence of psychiatric disease, the ability to remain stable during exercise tests, and willingness to volunteer to participate in this study **Exclusion criteria:** Neurological orthopaedic, peripheral vascularisation, or severe pulmonary disease; NYHA class IV patients; unstable angina pectoris; poorly controlled or exercise-induced cardiac arrhythmias; recent acute coronary syndrome or revascularisation (≤ 3 months); significant valvular disease; atrial fibrillation; uncontrolled arterial hypertension; and performing exercise training at regular intervals during the previous 6 weeks **Method of assessment:** Standard echocardiography and Tissue Doppler Imaging echocardiography (TDI) **N randomised:** total: 74; home-based cardiac rehabilitation: 37; centre-based cardiac rehabilitation: 37 **Diagnosis (% of pts):** **Heart failure:** 100% **Age (mean ± SD):** home-based cardiac rehabilitation: 44.05 ± 11.49 years; centre-based cardiac rehabilitation: 45.16 ± 13.58 years **Percentage male:** home-based cardiac rehabilitation: 62%; centre-based cardiac rehabilitation: 66% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** All sessions were performed at home, supervised by a physician. A specific programme was designed for each patient based on individual muscle

Karapolat 2009 *(Continued)*

	strength, joint flexibility, and aerobic endurance. Exercise sessions included flexibility exercises, aerobic exercises, and breathing exercises. The flexibility exercises focused on range of motion and included exercises designed to stretch the cervical and lumbar spine and the upper and lower extremities. Training HR measured by monitor. **Components:** Exercise only **Aerobic exercise:** **Modality:** walking **Dose:** **Length of session:** NR **Frequency/no of sessions:** NR **Intensity:** NR **Total duration:** 8 weeks **Intermittent nurse or exercise specialist telephone support?** NR **Co-interventions:** NR **Description of centre-based** cardiac rehabilitation**:** **Centre-based** cardiac rehabilitation**(control):** **Exercise**: All rehabilitation sessions were supervised by a physician. A specific programme was designed for each patient based on individual muscle strength, joint flexibility, and aerobic endurance. Exercise sessions included flexibility exercises, aerobic exercises, and breathing exercises. The flexibility exercises focused on range of motion and included exercises designed to stretch the cervical and lumbar spine and the upper and lower extremities. Training HR measured by monitor. **Components:** e.g. exercise only, exercise and education, exercise and psychosocial **Aerobic exercise:** **Modality:** Treadmill **Dose:** **Length of session:** 45 to 60 min (including 5-min warm-up, 30-min aerobic exercise and 5-min cool-down) **Frequency/no of sessions:** 3 sessions/week **Intensity:** 60% to 70% heart rate reserve, level 13 to 15 on the Borg scale **Total duration:** 8 weeks **Co-interventions:** NR
Outcomes	Exercise capacity, quality of life (SF-36)
Follow-up	8 weeks
Source of funding	"We have no support for this study".
Conflicts of interest	NR
Notes	

Karapolat 2009 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Low risk	"...randomized (using concealed envelopes)"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of assessors was not reported.
Incomplete outcome data (attrition bias) All outcomes	Low risk	Flow diagram shows loss to follow-up 5/37 (14%) hospital-based, 1/37 (3%) home-based group; no imputation of missing data undertaken
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	Good balance in patient demographics
Groups received same co-intervention(s)?	Low risk	Only difference between groups is whether exercise training performed in hospital or home

Kassaian 2000

Study characteristics

Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** Iran **Dates patients recruited:** NR **When randomised:** Immediately after baseline tests (one to two months after acute Q wave MI or CABG) **Maximum follow-up:** 12 weeks
Participants	**Inclusion criteria:** AMI or CABG in last 1 to 2 months, NYHA class < IV, ejection fraction ≥ 30%, able to exercise on a treadmill and participate in exercise programme **Exclusion criteria:** High-risk stress test, decompensated CHF (NYHA IV), unstable angina, uncontrolled atrial fibrillation, high-grade atrioventricular block (grade 2 or 3), active pericarditis or myocarditis, recent pulmonary thromboembolism, exercise-induced asthma, claudication, fixed-rate permanent pacemaker, severe medical problem **N randomised:** total: 125; home-based cardiac rehabilitation: 60; centre-based cardiac rehabilitation: 65 **Diagnosis (% of pts):** **MI:** total: 23.2%; home-based cardiac rehabilitation: 13.3%; centre-based cardiac rehabilitation: 32.3%

Kassaian 2000 *(Continued)*	**CABG:** total:76.8%; home-based cardiac rehabilitation: 86.7%; centre-based cardiac rehabilitation: 67.7% **Age (mean ± SD):** 55 ± 9.5 years **Percentage male: total:** 100% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** Patients were taught to count their pulse rate. **TIme of start after even:** One to two months after acute Q wave MI or CABG **Components:** Exercise only **Aerobic exercise:** **Modality:** NR **Dose:** **Length of session:** NR **Frequency/no of sessions:** NR **Intensity:** "based on exercise test results" **Total duration:** 12 weeks **Intermittent nurse or exercise specialist telephone support?** NR **Co-interventions:** NR **Description of centre-based** cardiac rehabilitation**:** **Components:** Exercise only **Aerobic exercise:** **Modality:** treadmill **Dose:** **Length of session:** 20 to 30 min + 10-min warm-up + 10-min cool-down/session **Frequency/no of sessions:** 3 sessions week **Intensity:** 60% to 85% (not reported if relative to HRmax) **Total duration:** 12 weeks **Co-interventions:** NR
Outcomes	(Primary and secondary outcomes not distinguished) systolic BP, diastolic BP, heart rate (all resting and sub-maximal), functional capacity (METs), BMI, cholesterol: total, LDL, HDL, triglyceride
Follow-up	12 weeks post-randomisation
Source of funding	NR
Conflicts of interest	NR
Notes	

Kassaian 2000 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of assessors was not reported.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No information on loss to follow-up or missing data management
Selective reporting (reporting bias)	Unclear risk	Not all outcomes reported mentioned in methods section
Groups balanced at baseline?	Low risk	"Among patients who completed the study no differences in demographic characteristics were seen between the two study groups after randomisation."
Groups received same co-intervention(s)?	Unclear risk	Details of home-based intervention not reported

Kraal 2014

Study characteristics

Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** Netherlands **Dates patients recruited:** March 2013 to March 2014 **When randomised:** After written consent, one week after cardiac rehabilitation intake **Maximum follow-up:** 12 weeks
Participants	**Inclusion criteria:** Patients entering cardiac rehabilitation after hospitalisation for MI, unstable angina, or a revascularisation procedure (PCI or CABG). Only patients with a low-to-moderate risk of future cardiac events according to the Dutch cardiac rehabilitation guidelines were included. Patients were required to have Internet access and a computer at home. **Exclusion criteria:** None described **N randomised: total:** 55;**intervention:** 26**; comparator:** 26 **Method of assessment:** NR **Diagnosis (% of pts):** **ACS with PCI:** home-based cardiac rehabilitation: 56%; centre-based cardiac rehabilitation: 40% **ACS without PCI:** home-based cardiac rehabilitation: 16%; centre-based cardiac rehabilitation: 20%

Kraal 2014 *(Continued)*

	Angina pectoriswith PCI: home-based cardiac rehabilitation: 8%; centre-based cardiac rehabilitation: 16% **Angina pectoriswithout PCI:** home-based cardiac rehabilitation: 8%; centre-based cardiac rehabilitation: 0% **CABG:** home-based cardiac rehabilitation: 12%; centre-based cardiac rehabilitation: 24% **Age (mean ± SD) (N = 25):** total: NR; home-based cardiac rehabilitation: 60.6 ± 7.5 years; centre-based cardiac rehabilitation: 56.1 ± 8.7 years **Percentage male (N = 25):** total: NR; home-based cardiac rehabilitation: 88%; centre-based cardiac rehabilitation: 84% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** Patients in the HT group received three initial supervised training sessions. During these sessions, patients received instructions on how to use a wearable heart rate monitor (Garmin Forerunner 70) and how to upload the recorded exercise data to a web application (Garmin Connect) through the Internet. The web application was used to review the training data by the patient, the physical therapist and the exercise specialist. During the first sessions, the patients were also familiarised with the training programme (duration, intensity) and their preferred training modality in the home environment was discussed. After three supervised training sessions, patients in the HT group started training in their home environment. **Time of start after event:** NR **Components:** Exercise plus behavioural change **Aerobic exercise:** **Modality:** Patient's preferred training modality **Dose:** **Length of session:** 45 to 60 min **Frequency/no of sessions:** at least two training sessions per week **Intensity:** 70% to 85% of maximal heart rate **Resistance training included?** No **Total duration:** 12 weeks **Intermittent nurse or exercise specialist telephone support?** Patients received feedback on training frequency, duration and intensity from the physical therapist once a week via telephone. After 12 weeks, the telephonic feedback was terminated and the patients were advised to continue their training with the heart rate monitor. **Co-interventions:** Patients in the home-based training group received coaching from their therapist through weekly telephone calls. During this phone call the therapist gave feedback on training parameters that were measured during the preceding week, and discussed progress with respect to the personal training goals. In addition, based on the principles of motivational interviewing, they discussed barriers and facilitative factors in adhering to the exercise training protocol. **Description of centre-based** cardiac rehabilitation**:** **Time of start after event:** NR **Components:** Exercise only **Aerobic exercise:**

Kraal 2014 *(Continued)*

	Modality: Group-based training sessions on a treadmill or cycle ergometer, supervised by physical therapists and exercise specialists **Dose:** **Length of session:** 45 to 60 min **Frequency/no of sessions:** at least two training sessions per week **Intensity:** 70% to 85% of their maximal heart rate **Resistance training included?** No **Total duration:** 12 weeks **Co-interventions:** None described
Outcomes	Exercise capacity; HRQoL; adherence to cardiac rehabilitation
Follow-up	12 weeks
Source of funding	ZonMw, the Dutch Organisation for Health Research and Development (project number 837001003)
Conflicts of interest	The FIT@Home study is executed in collaboration with Philips Research; the heart rate monitors used during home-based training were provided by Philips Research.
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"...patients were randomly allocated to homebased training (HT) or centre-based training (CT)". Method of randomisation not described
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of assessors was not reported.
Incomplete outcome data (attrition bias) All outcomes	High risk	Home-based cardiac rehabilitation: 4/29 (13.8%) lost to follow-up Centre-based cardiac rehabilitation: 1/26 (3.8%) lost to follow-up Loss to follow-up was disproportionately higher in the intervention group. "Data were analysed per protocol".
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results section.
Groups balanced at baseline?	Low risk	No P values were given, but baseline characteristics appeared to be similar in both groups.
Groups received same co-intervention(s)?	High risk	"…patients in the HT group started training at home and received coaching from their therapist through weekly telephone calls..." No coaching was given to the centre-based cardiac rehabilitation group.

Maddison 2019

Study characteristics	
Methods	Randomised controlled non-inferiority trial
Participants	**N Randomised:** 162 **Diagnosis (% of pts):** Hypertension: 63% Diabetes: 18% Hypercholesterolaemia: 82% **Case mix:** Angina pectoris: 42% Myocardial infarction: 75% Angioplasty: 65% CABG: 24% **Age, mean (SD):** centre-based: 61.5 (12.2)/61.0 (13.2) **Percentage male:** 139/162 (86%) **Percentage white:** 122/162 (75%) **Inclusion/exclusion criteria:** *Inclusion:* clinically stable English-speaking adults (≥ 18years) documented diagnosis of CHD within 6 months (atherosclerosis, angina pectoris, myocardial infarction, coronary revascularisation) *Exclusion:* admitted to hospital with heart disease within 6 weeks had terminal cancer a pacemaker implantable cardioverter-defibrillator significant non-CHD exercise limitations were contraindicated for maximal exercise testing completed ≥ 150 min/week moderate-to-vigorous physical activity currently participating in supervised exCR
Interventions	**Hospital-based CR (supervised)**

Maddison 2019 *(Continued)*

	Exercise:*Total duration:* 12 weeks; *frequency:* 3 sessions/wk; *duration:* 30-45 mins/session (15 warm-up & 5-min cool-down); *intensity:* moderate-vigorous; modality: various e.g. treadmill, cycle ergometer, rowing machine **Other:** supervised **Home-based CR (control) REMOTE intervention** **Exercise:***Total duration:* 12 weeks; *frequency:* 3 sessions/wk; *duration:* 30-60 mins/session (including warm-up & cool-down); *intensity:* 40%-65% heart rate reserve/RPE 11-13 (intensity levels were adjusted to optimise physiological adaptation without inducing abnormal clinical signs or symptoms): modality: walking but others (e.g. cycling, rowing) if preferred **Other:** "The REMOTE-CR platform comprised a smartphone and chest-worn wearable sensor (BioHarness 3, Zephyr Technology, USA). App features enabled real-time remote exercise monitoring and coaching, retrospective exercise performance review, goal-setting, behaviour change education and social support. Behavioural intervention content was grounded in self-efficacy and self-determination theories, and the Taxonomy of Behaviour Change Techniques. During exercise training, participants' physiological (heart and respiratory rate, single lead ECG) and geopositional data were displayed in the smartphone app for self-monitoring, streamed to a web server via 3G/4G/Wi-Fi, and visualised in the web app for exCR specialist review. ExCR specialists provided real-time individualised audio coaching, feedback and social support throughout (but not prior to) real-time exercise monitoring. Participants received audio communications via earphones to optimise usability and preserve the real-time context of message content. Finally, participants received behaviour change education via direct messaging.
Outcomes	**Primary:** Exercise capacity: treadmill maximal exercise test - maximal oxygen uptake ($\dot{V}O_2$ max)* **Secondary:** Risk factors: SBP and DBP, lipids* Exercise adherence: numbers of sessions attended compared to number of sessions prescribed* HRQoL: EQ-5D* Economic evaluation: healthcare costs and QALYs* Motivation Physical activity: self-report (Godin Leisure Time Physical Activity Questionnaire (GLTPAQ) and objective (Actrigraph uniaxial accelerometer) Exercise-related motivation (self-efficacy, intention, confidence, locus of causality) Adverse events (any self-reported change in health state) **relevant outcomes to this SR*
Follow-up	12 and 24 weeks post-randomisation
Source of funding	Auckland Medical Research Foundation (1113020)
Conflicts of interest	"RM was supported by the New Zealand Health Research Council (Sir Charles Hercus Health Research fellowship). MM is supported by the Australian National Health and Medical Research Council (Centre for Research Excellence, 1041020). We declare no further competing interests."

Maddison 2019 *(Continued)*

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Participants were randomised (1:1) to receive REMOTE-CR (intervention) or CBexCR (control) using a computer-generated sequence—created by a blinded statistician—that included variable blocking (n = 2/4) and stratification (sex/study site)."
Allocation concealment (selection bias)	Low risk	"Treatment allocation was concealed using sequentially numbered, sealed, opaque envelopes".
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"staff performing V̇O2 max testing at 12 weeks were blinded to treatment allocation."
Incomplete outcome data (attrition bias) All outcomes	Low risk	CONSORT flow diagram reported Home-based group: 12 weeks: 14/82 (17%); 24 weeks: 17/82 (21%) Centre-based group: 12 weeks: 9/80 (11%); 24 weeks: 11/80 (14%) "Multiple imputations were applied to missing primary (but not secondary) outcome data using the Markov chain Monte Carlo method assuming the data were multivariate normal".
Selective reporting (reporting bias)	Low risk	All outcomes listed in protocol and registration reported
Groups balanced at baseline?	Low risk	"Baseline demographic and clinical characteristics were balanced between groups."
Groups received same co-intervention(s)?	Low risk	Centre-based CR…"Exercise prescription was comparable to REMOTE-CR" home-based CR".

Marchionni 2003

Study characteristics

Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** Italy **Dates patients recruited:** NR **When randomised:** NR **Maximum follow-up:** 14 months
Participants	**Inclusion criteria:** Aged > 45 years, MI

Marchionni 2003 *(Continued)*

	Exclusion criteria: Severe cognitive impairment; physical disability; left ventricular ejection fraction < 35%; contraindications to vigorous exercise; eligibility for myocardial revascularisation, living too far from cardiac rehabilitation unit **N randomised:** total: 180; home-based cardiac rehabilitation: 90; centre-based cardiac rehabilitation: 90 **Method of assessment:** NR **Diagnosis (% of pts):** **MI:** 100% **Age (mean ± SD):** total: 69 ± 1.6 years; home-based cardiac rehabilitation: NR; centre-based cardiac rehabilitation: NR **Percentage male:** total: 71%; home-based cardiac rehabilitation: NR; centre-based cardiac rehabilitation: NR **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** **Components:** Exercise only **Aerobic exercise:** **Modality:** cycle ergometer **Dose:** **Length of session:** NR **Frequency/no of sessions:** 3 days/week **Intensity:** 70% to 85% peak HR **Total duration:** 8 weeks **Intermittent nurse or exercise specialist telephone support?** Physical therapist home visits every other week **Co-interventions:** Monthly family-oriented support groups **Description of centre-based** cardiac rehabilitation**:** **Components:** Exercise only **Aerobic exercise:** cycle ergometer **Modality:** e.g. running, cycling, skipping **Dose:** **Length of session:** NR **Frequency/no of sessions:** 3 days/week **Intensity:** 70% to 85% peak HR **Total duration:** 12 weeks **Co-interventions:** Risk factor management counselling; support group meetings
Outcomes	Primary: total work capacity

Marchionni 2003 *(Continued)*

	Secondary: HRQoL (Sickness Impact Profile), mortality, morbidity (cardiovascular events), healthcare utilisation (medical visits, rehospitalisation), costs, and adherence (number of completed training sessions)
Follow-up	2, 8, 14 months post-randomisation
Source of funding	National Research Council (CNR), the University of Florence, and the Regional Government of Tuscany, Italy
Conflicts of interest	NR
Notes	Subgroup analysis in age groups (middle-aged: 45 to 65 years, old: 65 to 75 years, very old: > 75 years). Data presented separately for 3 age groups. Follow-up data on charts only; authors contacted for numerical data at follow-up and these have been supplied for total work capacity and Sickness Impact Profile separately for 3 groups; we pooled data across age groups.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Testing personnel were blinded to patient assignment."
Incomplete outcome data (attrition bias) All outcomes	Low risk	"...we performed a sensitivity analysis comparing results obtained with and without replacement of missing data with data obtained with the expectation-maximization imputation method. Because the 2 analyses provided similar results, which were also similar with missing data substituted with data estimated in a worst-case scenario, only the data from patients who completed the study are presented".
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	“...baseline sociodemographic and clinical characteristics were similar across the 3 arms of the trial”. Baseline characteristics by home and hospital group allocation not reported in tabular format
Groups received same co-intervention(s)?	Low risk	"Patients received an exercise prescription similar to that of the Hosp-CR group.... A physical therapist made home visits every other week to adjust if necessary the exercise prescription, to enhance adherence with intervention".

Miller 1984

Study characteristics

Methods	**Study design:** Single-centre RCT: 4 groups 2 home-based arms (8 weeks (brief) or 23 weeks (extended)) and 2 centre-based arms (8 weeks (brief) or 23 weeks (extended))

Miller 1984 *(Continued)*

	No of centres: 1 **Country:** USA **Dates patients recruited:** NR **When randomised:** NR **Maximum follow-up:** 23 weeks
Participants	**Inclusion criteria:** Uncomplicated AMI (elevated serum creatinine kinase or oxaloacetic transaminase, prolonged chest pain consistent with AMI, new Q waves or evolutionary ST changes in ECG) **Exclusion criteria:** Unable to undertake exercise test, congestive heart failure, unstable angina pectoris, valvular heart disease, atrial fibrillation, bundle branch block, history of bypass, stroke, orthopaedic abnormalities, peripheral vascular disease, chronic pulmonary obstructive disease, obesity **N randomised:** total: 127; home-based cardiac rehabilitation: 66 (33 in brief exercise programme subgroup and 33 in extended subgroup); centre-based cardiac rehabilitation: 61 (31 in brief subgroup and 30 in extended subgroup) **Method of assessment:** MI was documented by the combination of characteristic elevation of serum creatine kinase or oxaloacetic transaminase, a history of prolonged chest pain consistent with MI, and the appearance of new Q waves or evolutionary ST segment changes. **Diagnosis (% of pts):** **Uncomplicated acute MI:** 100% **Age (mean ± SD):** total: 52 ± 9 years; home-based cardiac rehabilitation: NR; centre-based cardiac rehabilitation: NR **Percentage male: total:** 100% **Ethnicity:** NR
Interventions	**Home-based 2 groups:** **Aerobic exercise:** **Modality:** stationary cycling. Portable heart rate monitors and teletransmissions of ECG **Dose:** **Length of session:** 30 min/session **Frequency/no of sessions:** 5 sessions/week **Intensity:** 70% to 85% HRmax **Resistance training included?** NR **Total duration:** 8 weeks (brief) or 23 weeks (extended) **Intermittent nurse or exercise specialist telephone support?** 2 phone calls/week by staff to verify training intensity, clinical status and medication **Co-interventions:** NR **Centre-based 2 groups:** **Time of start after event:** 3 weeks after infarction **Components:** Exercise only **Aerobic exercise:** **Modality:** walking/jogging; group-based and supervised

Miller 1984 *(Continued)*

	Dose: **Length of session:** 60 mins/session **Frequency/no of sessions:** 5 sessions/week **Intensity:** 70% to 85% HRmax **Resistance training included?** NR **Total duration:** 8 weeks (brief) or 23 weeks (extended) **Co-interventions:** NR
Outcomes	Exercise capacity; mortality and cardiovascular morbidity
Follow-up	23 weeks post-randomisation
Source of funding	Grant HL18907 from the NHLBI, Bethesda, and by a grant from the PepsiCo Foundation, Purchase, NY
Conflicts of interest	NR
Notes	Results reported according to the two subgroups, i.e. brief versus extended exercise training and included into analysis separately

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of assessors was not reported.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Dropouts reported; no imputation of missing data discussed
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Unclear risk	Baseline characteristics not reported
Groups received same co-intervention(s)?	Low risk	Both home and centre groups were very closely balanced in terms of the exercise training received.

Moholdt 2012

Study characteristics

Methods	**Study design:** Single-centre RCT

Moholdt 2012 *(Continued)*

	No of centres: 1 **Country:** Norway **Dates patients recruited:** NR **When randomised:** 4 to 8 weeks after CABG surgery **Maximum follow-up:** 6 months
Participants	**Inclusion criteria:** Had coronary artery bypass surgery 4 to 8 weeks before enrolment and clinically stable (defined as the absence of unstable angina pectoris, symptoms of heart failure, pleural liquid limiting respiration, lung disease limiting respiration, ongoing infections, and atrial fibrillation limiting circulation) **Exclusion criteria:** Left ventricular ejection fraction < 30%, contraindications to vigorous physical activity (unstable angina, uncontrolled abnormal heart rhythms, severe aortic stenosis, suspected or known dissecting aneurysm, infection in the heart or any other systemic infection), pulmonary disease clearly limiting exercise capacity, pregnancy, or drug abuse **N randomised:** total: 30; home-based cardiac rehabilitation: 14; centre-based cardiac rehabilitation: 16 **Diagnosis (% of pts):** **CABG**: 100% **Age (mean ± SD):** total: 63 ± 77 years; home-based cardiac rehabilitation: 61.7 ± 8.0 years; centre-based cardiac rehabilitation: 63.6 ± 7.3 years **Percentage male:** total: 80%; home-based cardiac rehabilitation: 78.6%; centre-based cardiac rehabilitation: 81.3% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** **Time of start after event:** 4 to 8 weeks after CABG surgery **Components:** Exercise and education **Aerobic exercise:** **Modality:** walking, jogging, swimming or cycling (patient choice) **Dose:** **Length of session:** 38 min (10-min warm-up, 4 x 4-min intervals of high intensity exercise, 4 x 3-min intervals of moderate intensity **Frequency/no of sessions:** 3 sessions/week **Intensity:** 70% HRmax (moderate intensity) to 85% to 95% HRmax (high intensity) **Resistance training included?** **Total duration:** 6 months **Intermittent nurse or exercise specialist telephone support?** **Co-interventions:** Diet counselling, a smoking cessation programme, lectures about healthy lifestyle in general. After discharge from the rehabilitation centre, the patients were advised to keep on exercising at home, and were invited back for follow-up testing after 6 months. **Description of centre-based** cardiac rehabilitation**(residential rehabilitation):** **Time of start after event:** 4 to 8 weeks after CABG surgery **Components:** Exercise and education

Moholdt 2012 *(Continued)*

	Aerobic exercise: **Modality:** Outdoor walking, cross-country skiing in winter time, indoor cycling, hall games **Dose:** **Length of session:** NR **Frequency/no of sessions:** 30 exercise sessions with low intensity, 16 with moderate intensity, and 10 with high intensity **Intensity:** Up to 11 on the Borg scale (light intensity); 12 to 14 on the Borg scale (moderate intensity); and 15 to 17 on the Borg scale (high intensity) **Resistance training included?** strength training **Total duration:** 4 weeks **Co-interventions:** Diet counselling, a smoking cessation programme, lectures about healthy lifestyle in general. After discharge from the rehabilitation centre, the patients were advised to keep on exercising at home, and were invited back for follow-up testing after 6 months. They did not receive a training diary or concrete advice about how to exercise on discharge.
Outcomes	Primary: peak oxygen consumption Secondary: HRQoL total, HDL cholesterol and triglycerides
Follow-up	6 months post-randomisation
Source of funding	EXTRA funds from the Norwegian Foundation for Health and Rehabilitation. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.
Conflicts of interest	The authors declared that no competing interests existed.
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Allocation was done by a computer using block randomisation. The first, the smallest and the largest block, were defined by the technicians at the unit of Applied Clinical Research at the university".
Allocation concealment (selection bias)	Low risk	"The person including the patients got the allocation results on screen and by e-mail by logging on to a website."
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of assessors was not reported.
Incomplete outcome data (attrition bias) All outcomes	Low risk	CONSORT flow diagram shows loss to follow-up of 4/30 (13%) at 6 months.
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	Although no statement of similarity of baseline characteristics, the provided characteristic of both groups appeared similar.

Moholdt 2012 *(Continued)*

Groups received same co-intervention(s)?	Low risk	Co-interventions received by both groups

Oerkild 2011

Study characteristics	
Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** Denmark **Dates patients recruited:** January 2007 to July 2008 **When randomised:** NR **Maximum follow-up:** 12 months
Participants	N = 36 pts home-based intervention; N = 39 pts centre-based intervention, 100% coronary heart disease, mean age home 74.4 (5.8), mean age centre 74.7 (5.9), 19 males: 17 females home, 26 males: 13 females centre **Inclusion criteria:** ≥ 65 years old with a 'new' event of coronary heart disease defined as AMI, percutaneous transluminal coronary intervention or CABG **Exclusion criteria:** mental disorders (dementia), social disorders (severe alcoholism and drug abuse), living at nursing home, language barriers and the use of wheelchair **N randomised:** total: 75; home-based cardiac rehabilitation: 36; centre-based cardiac rehabilitation: 39 **Method of assessment:** NR **Medical history (% of pts):** **Previous MI:** home-based cardiac rehabilitation: 27.8%; centre-based cardiac rehabilitation: 30.8% **Previous PCI:** home-based cardiac rehabilitation: 19.4%; centre-based cardiac rehabilitation: 18.0% **Previous CABG:** home-based cardiac rehabilitation: 16.7%; centre-based cardiac rehabilitation: 5.4% **Heart failure LVEF ≤ 45%:** home-based cardiac rehabilitation: 38.9%; centre-based cardiac rehabilitation: 30.8% **Age (mean ± SD):** total: NR; home-based cardiac rehabilitation: 74.4 ± 5.8 years; centre-based cardiac rehabilitation: 74.7 ± 5.9 years **Percentage male:** total: 60.0%; home-based cardiac rehabilitation: 52.8%; centre-based cardiac rehabilitation: 66.7% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** The exercise programmes were individualised but followed international recommendations. A physiotherapist individually tailored the exercise programmes. At 3 months when the intervention ceased, participants were encouraged to continue to exercise 30 min 6 days/week at 11 to 13 on the Borg scale. **Time of start after event:** NR ("new event") **Components:** Exercise and education **Aerobic exercise:** **Modality:** Self-paced brisk walking and stationary cycling **Dose:**

Oerkild 2011 *(Continued)*

Length of session: 30 min

Frequency/no of sessions: 6 days/week

Intensity: 11 to 13 on a Borg scale

Resistance training included? NR

Total duration: 6 weeks

Intermittent nurse or exercise specialist telephone support? A cardiologist counselled the patients at baseline and after 3, 6 and 12 months. At 4 and 5 months, a telephone call was made to answer any questions, regarding risk factor intervention and medical adjustment.

Co-interventions: Patients were offered six education lectures, two dietary counselling sessions, three practical cooking and (if needed) smoking cessation counselling sessions.

Description of centre-based cardiac rehabilitation**:**

This consisted of a six-week intensive programme where patients were offered group-based supervised exercise training 60 min twice a week and were encouraged to exercise at home to comply with the international recommendations. As for the home programme, a physiotherapist individually tailored the exercise programmes. At 3 months when the intervention ceased, participants were encouraged to continue to exercise for 30 min 6 days/week at 11 to 13 on the Borg scale

Other:

Time of start after event: NR

Components: Individually tailored

Aerobic exercise:

Modality: e.g. running, cycling, skipping.

Dose:

Length of session: 60 min

Frequency/no of sessions: 2 sessions/week

Intensity: NR

Resistance training included? NR

Total duration: 6 weeks

Co-interventions: Patients were offered dietary counselling and (if needed) smoking cessation. A cardiologist counselled the patients at baseline and after 3, 6 and 12 months. At 4 and 5 months, a telephone call was made to answer any questions.

Outcomes	Primary: exercise capacity (VO_2 and 6MWT) Secondary: systolic and diastolic blood pressure; cholesterol (total, HDL, LDL), smoking, HRQoL (SF-12)
Follow-up	3 and 12 months
Source of funding	The Velux Foundation
Conflicts of interest	There were no conflicts of interest to declare.
Notes	
Risk of bias	

Oerkild 2011 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	“Patients were randomised in alternate block sizes of four to six using computer-generated randomly permuted blocks”.
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	High risk	"Because of the nature of CR, the result of the randomisation could not be blinded and was therefore open to the investigator, involved health personnel and patients”.
Incomplete outcome data (attrition bias) All outcomes	Low risk	4/75 (5%) dropouts
Selective reporting (reporting bias)	Low risk	All outcomes outlined in the methods were reported in the results.
Groups balanced at baseline?	Low risk	"Baseline characteristics according to intervention...show no significant difference between the two groups. In addition, no significant differences were found in the use of medication and in socio-demographic data”.
Groups received same co-intervention(s)?	Low risk	“The pharmacological treatment followed international guidelines and [was] thus identical in the two groups”. “Regarding risk factor intervention and medical adjustment, a cardiologist counselled the patients both at home and in the centre intervention at baseline and after 3, 6 and 12 months.”

Piotrowicz 2010

Study characteristics	
Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** Poland **Dates patients recruited:** NR **When randomised:** Following baseline measurements **Maximum follow-up:** 8 weeks
Participants	**Inclusion criteria:** (i) patients of either sex with any aetiology of left ventricular systolic HF (as defined in the European Society of Cardiology (ESC) guidelines) diagnosed for > 3 months; (ii) with a left ventricular ejection fraction ≤ 40% on echocardiography; (iii) in NYHA class II or III; (iv) who were clinically stable and receiving an optimal and stable medication regimen for at least 4 weeks before enrolment; and (v) who were able to exercise using the new model of home-based exercise **Exclusion criteria:** (i) NYHA class I or IV; (ii) unstable angina; (iii) a history of an acute coronary syndrome within the last month, coronary artery bypass grafting within the last 2 months, or initiation of cardiac resynchronisation therapy (CRT) within the last year; (iv) symptomatic and/or exercise-induced cardiac arrhythmia or conduction disturbances; (v) valvular or congenital heart disease requiring surgical treatment; (vi) hypertrophic cardiomyopathy; (vii) severe pulmonary hypertension or other severe pulmonary disease; (viii) uncontrolled hypertension; (ix) anaemia (haemoglobin, 10.0 g/dL); (x) acute and/or decompensated non-cardiac disease; (xi) physical disability related to severe or neurological problems; (xii) acute or chronic inflammatory disease; (xiii) cancer; (xiv) severe psychiatric disorder; and (xv) patient refusal to participate

Piotrowicz 2010 *(Continued)*

N randomised: total: 152; home-based cardiac rehabilitation (telemonitored cardiac rehabilitation): 77; centre-based cardiac rehabilitation (outpatient-based standard cardiac rehabilitation): 75

Method of assessment: Two-dimensional echocardiography

Diagnosis (% of pts):

Heart failure: 100%

Ischaemic: home-based cardiac rehabilitation: 73.3%; centre-based cardiac rehabilitation: 85.7%
Non-ischaemic: home-based cardiac rehabilitation: 26.7%; centre-based cardiac rehabilitation: 14.3%
MI: home-based cardiac rehabilitation: 64.0%; centre-based cardiac rehabilitation: 78.6%

Age (mean ± SD): total: 58.1 ± 10.2 years; home-based cardiac rehabilitation: 56.4 ± 10.9 years; centre-based cardiac rehabilitation: 60.5 ± 8.8 years

Percentage male: total: NR; home-based cardiac rehabilitation: 85%; centre-based cardiac rehabilitation: 95%

Ethnicity: NR

Interventions

Description of home-based cardiac rehabilitation**:** To make the ET safe for HF patients, the following recommendations were taken into account: (i) special attention was paid to appropriate patient risk stratification before cardiac rehabilitation; (ii) contraindications to ET were never overlooked; (iii) in patients with an implantable cardioverter defibrillator (ICD), maximal training HR was set at 20 bpm lower than the defibrillator discharge threshold; and (iv) in patients with a pacemaker, the rate-response function was switched on, enabling HR adjustment to the physical effort which facilitates reaching the desired training HR. Exercise training was planned individually for each patient during hospitalisation. The chosen workload reflected individual effort tolerance with regard to: (i) perceived exertion according to the Borg scale and (ii) the training HR range established individually for each patient. In line with the standards, the assumption was that patients should not exceed perceived moderate exertion during the ET (i.e. a score of 11 on the Borg scale).

Components: Exercise, education and psychological

Aerobic exercise:

Modality: Continuous walking training on level ground

Length of session: 20 to 45 min (i) warm-up: 5 to 10 mins (breathing and light exercises, callisthenics), (ii) basic aerobic endurance training for 10 to 30 mins (walking), and (iii) a 5-min cooling down (a period when patients could calm down and relax)

Frequency/no of sessions: 3 sessions/week

Intensity: Individually tailored

Resistance training included? NR

Total duration: 8 weeks

Intermittent nurse or exercise specialist telephone support? NR

Co-interventions: All patients and partners participated in an education programme: how to measure HR, BP, and body weight; evaluate signs and symptoms; level perceived exertion and how to perform exercise training. Each patient received psychological support.

Description of centre-based cardiac rehabilitation**:**

Components: Exercise, education and psychological

Aerobic exercise:

Modality: Cycle ergometer

Piotrowicz 2010 *(Continued)*

	Dose: **Length of session:** 20 to 45 min (i) warm-up: 5 to 10 min (breathing and light exercises, callisthenics), (ii) basic aerobic endurance training for 10 to 30 min (walking), and (iii) a 5-min cooling down (a period when patients could calm down and relax) **Frequency/no of sessions:** 3 sessions/week **Intensity:** Individually tailored **Resistance training included?** NR **Total duration:** 8 weeks **Co-interventions:** All patients and partners participated in an education programme: how to measure HR, BP, and body weight; evaluate signs and symptoms; level perceived exertion and how to perform exercise training. Each patient received psychological support.
Outcomes	Exercise capacity (6MWT), quality of life (SF-36), mortality, hospitalisation
Follow-up	8 weeks
Source of funding	National Institute of Cardiology, Warsaw, Poland (study number 2.9/I/06)
Conflicts of interest	"none declared"
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of assessors was not reported.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	CONSORT flow diagram shows 19/75 (25%) of centre-based group and 2/77 (3%) of home-based group failed to provide 8-week data; no imputation of missing data undertaken
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	“At baseline there were no significant intergroup differences in terms of demographic and clinical parameters, NYHA functional class, echocardiographic parameters, 6-MWT distance, functional capacity in [cardiopulmonary exercise testing], medical therapy, or the SF-36 questionnaire score”.
Groups received same co-intervention(s)?	Low risk	Both groups received some education and psychological support co-intervention.

Sagar 2012

Study characteristics	
Methods	Randomised controlled trial
Participants	**N Randomised:** 30 **Diagnosis (% of pts):** post-CABG **Case mix:** not stated **Age, mean (SD):** Hospital-based: 59 (7.29) Home-based: 58.8 (6.73) **Percentage male:** Not stated **Percentage white:** Not stated **Inclusion/exclusion criteria:** *Inclusion:* Patients had undergone CABG Age group: 45-76 years Patients with ejection fraction > 45% *Exclusion:* Uncontrolled diabetes and metabolic disturbances Uncontrolled hypertension Neurological or muscular disorders Uncontrolled arrhythmias Haemodynamically unstable
Interventions	**Hospital-based CR (supervised)** **Exercise:***Total duration:* 4 weeks; *frequency:* 3 sessions/wk; *duration:* 40 mins/session; (10 minutes warm-up phase, 20 minutes of endurance training and 10 minutes of relaxation phase) *intensity:* 70% of the maximum heart rate (treadmill): modality: Resistance exercises using light weights (1/2 kg. weight cuffs), treadmill **Other:** The warm-up phase included the following exercise patterns with 10 repetitions per day: Simple neck movements, deep breathing exercises, upper limb free exercises, trunk mobility exercises, knee marching while standing with hands supported. The patients were also asked to follow the regular walking at their own pace for 30 minutes daily. **Home-based CR (control)** **Exercise:***Total duration:* 4 weeks; *frequency:* 2 session/day; *duration:* not clear ; *intensity:* : modality: not clear 10 repetitions twice per day of simple neck movements, deep breathing exercises, upper limb free exercises, trunk mobility exercises, knee marching while standing with hands supported. **Other:** none
Outcomes	Haemodynamic parameters: heart rate, blood pressure* ; exercise-capacity: 6MWD*; HRQoL: SF-36*.

Sagar 2012 *(Continued)*

	*outcomes relevant to this SR
Follow-up	4 weeks post-randomisation
Source of funding	Study supported by the Princess Alexandra Hospital Research Support Scheme Small Grant 2013; The Prince Charles Hospital Foundation Novice Researcher Grant 2012; and the Queensland Health, Health Practitioner Research Scheme 2012-13
Conflicts of interest	"Authors have no conflict of interest to declare".
Notes	Authors contacted (no reply) to clarify exercise element of home-based intervention

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Details not stated
Allocation concealment (selection bias)	Unclear risk	Details not stated
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Due to the open nature of the trial, patients and clinicians could not be blinded and it was not reported if outcome assessors were blinded.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Details not stated
Selective reporting (reporting bias)	Low risk	All outcomes listed in the methods were reported (no protocol publication or trial registration).
Groups balanced at baseline?	Low risk	"The comparison between both the groups shows that statistically there are no major differences at baseline".
Groups received same co-intervention(s)?	Low risk	Both groups appeared to receive same intervention.

Sparks 1993

Study characteristics

Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** USA **Dates patients recruited:** NR **When randomised:** NR **Maximum follow-up:** 12 weeks
Participants	**Inclusion criteria:** Male cardiac patients **Exclusion criteria:** Not capable of exercising on a bicycle ergometer, serious arrhythmias, symptoms of frequent chest pain, shortness of breath, hypertension

Sparks 1993 *(Continued)*

	N randomised: total: NR; home-based cardiac rehabilitation 10; centre-based cardiac rehabilitation: 10 **Method of assessment:** NR **Diagnosis (% of pts):** MI, CABG, PTCA **Age (mean ± SD): total:** 51.6 ± 12 years **Percentage male: total:** 100% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** **Components:** Exercise and education **Aerobic exercise:** **Modality:** cycle ergometer with transtelephonic ECG monitoring **Dose:** **Length of session:** 1 hour **Frequency/no of sessions:** 3 days/week **Intensity:** 60% to 75% peak HR **Resistance training included?** NR **Total duration:** 12 weeks **Intermittent nurse or exercise specialist telephone support?** Transtelephonic ECG monitoring **Co-interventions:** Education materials on diet, medications, risks and benefits of the exercise **Description of centre-based** cardiac rehabilitation**:** **Modality:** cycle ergometer **Dose:** **Length of session:** 1 hour **Frequency/no of sessions:** 3 days/week **Intensity:** 60% to 75% peak HR **Resistance training included?** NR **Total duration:** 12 weeks **Co-interventions:** Education materials on diet, medications, risks and benefits of the exercise
Outcomes	Exercise capacity (peak VO_2max); adherence (compliance with exercise); safety (dropout)
Follow-up	12 weeks post-randomisation
Source of funding	NR
Conflicts of interest	NR
Notes	Data read from graphs
Risk of bias	

Sparks 1993 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of assessors was not reported.
Incomplete outcome data (attrition bias) All outcomes	Low risk	1/20 (5%) dropouts reported
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	Although no statement of similarity of baseline characteristics, the characteristics presented appeared similar between groups.
Groups received same cointervention(s)?	Low risk	Education materials on diet, medications, risks and benefits of the exercise given to both groups

Varnfield 2014

Study characteristics	
Methods	**Study design:** Multi-centre RCT **No of centres:** 4 (Health Service District community centres, Brisbane) **Country:** Australia **Dates patients recruited:** 2009 to 2011 **When randomised:** mean of 68 days for centre-based CR & 54 for home-based CR **Maximum follow-up:** 6 months
Participants	**Inclusion criteria:** Post-MI patients referred to cardiac rehabilitation **Exclusion criteria:** Unable to participate in self-management programmes due to medical care needs, unable to operate smartphone for purposes of trial (e.g. vision, hearing, cognitive or dexterity impairment) or attend TCR, or involved in another trial or had no experience with mobile/smartphones. **N randomised:** total: 120; centre-based: 60; home-based: 60 **Method of assessment:** NR **Diagnosis (% of pts):** **STEMI:** home-based cardiac rehabilitation: 49%; centre-based cardiac rehabilitation: 56% **NSTEMI**: home-based cardiac rehabilitation: 49%; centre-based cardiac rehabilitation: 44% **Angina:** home-based cardiac rehabilitation: 6%; centre-based cardiac rehabilitation: 5% **Heart failure**: home-based cardiac rehabilitation: 4%; centre-based cardiac rehabilitation: 2% **Bypass surgery:** home-based cardiac rehabilitation: 11%; centre-based cardiac rehabilitation: 5%

Varnfield 2014 *(Continued)*

	Angioplasty/stent: home-based cardiac rehabilitation: 66%; centre-based cardiac rehabilitation: 80% **Age (mean ± SD):** total: NR; home-based cardiac rehabilitation: 54.9 ± 9.6 years; centre-based cardiac rehabilitation: 56.2 ± 10.1 years **Percentage male:** 82/94 (87%); home-based cardiac rehabilitation: 91%; centre-based cardiac rehabilitation: 83% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** The Care Assessment Platform of Cardiac Rehabilitation (CAP-CR) platform used a smartphone for health and exercise monitoring, and delivery of motivational and educational materials to participants via text messages and pre-installed audio and video files (including understanding cardiovascular disease symptoms and management). The platform included a web portal with participant data for mentors to provide weekly consultations. Each participant was equipped with a smartphone pre-installed with health diary and activity monitoring applications; blood pressure monitor; and weight scale. Activity monitoring (step number, duration and intensity) was automatic through the phone's in-built accelerometer. Participants were advised to make daily health diary entries: weight, BP, sleep duration and quality, exercise other than automatically monitored steps, stress, meals and, if relevant, alcohol consumption and smoking. Mentors reviewed updated data prior to weekly consultations. **Time of start after event:** Average = 54 days **Components:** Exercise and education **Aerobic exercise:** **Modality:** walking **Dose:** **Length of session:** Target = at least 30 min **Frequency/no of sessions:** Target = most days of the week **Intensity:** Borg scale 11 to 13 **Resistance training included?** No **Total duration:** 6 weeks **Intermittent nurse or exercise specialist telephone support?** Weekly consultations via the web portal to provide informed, personalised feedback according to goals set **Co-interventions:** Educational materials **Description of centre-based** cardiac rehabilitation**:** The traditional, centre-based programme (TCR) programme comprised of two supervised exercise and 1-h educational sessions on a weekly basis for 6 weeks at one of four Health Service District community centres. Participants started education sessions once enrolled in cardiac rehabilitation and twice-weekly exercise sessions commenced once centre appointments became available. **Time of start after event:** Average = 68 days **Components:** Exercise and education **Aerobic exercise:** **Modality:** Circuit-based exercise e.g. treadmill, rower, squats and modified push-ups **Dose:** **Length of session:** NR

Varnfield 2014 *(Continued)*

	Frequency/no of sessions: twice a week **Intensity:** Borg scale 6 to 10 (light) to 11 to 13 (moderate) **Resistance training included?** Resistance bands, weights **Total duration:** 6 weeks **Co-interventions:** 1-h educational sessions on a weekly basis for 6 weeks
Outcomes	Adherence, risk factors (BP,* heart rate, weight, BMI, waist circumference (WC), lipid profile*), functional capacity (6-minute walk test (6MWT))* and HRQoL (EQ-5D)* * relevant to this review Costs are reported separately by Whittaker 2014.
Follow-up	6 weeks and 6 months
Source of funding	Funding for this project was provided through a Joint Venture between Australian eHealth Research Centre and Queensland Health and acknowledged Nokia Research for donating the smartphones and software applications.
Conflicts of interest	"None"
Notes	6-month outcome data provided by the author on request

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"computer-generated random numbers with variable block sizes of 4, 6 and 8"
Allocation concealment (selection bias)	Low risk	"…using sequentially numbered opaque, sealed envelopes, was conducted"
Blinding of outcome assessment (detection bias) All outcomes	High risk	"We conducted an unblinded RCT in four CR centres". Blinding of assessors not described
Incomplete outcome data (attrition bias) All outcomes	High risk	6-weeks follow-up: incomplete 44/120 (37%) (centre-based CR: 32/60 (53%) & home-based CR: 12/60 (20%) 6-month follow-up: incomplete 48/120 (40%) (centre CR: 34/60, 43%) and home CR: 14/60, 77%)
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods were reported in the results section.
Groups balanced at baseline?	Low risk	"There were no significant differences in baseline demographic and clinical characteristics of participants who commenced CR".
Groups received same co-intervention(s)?	Unclear risk	The home-based received an m-health intervention that included a range of risk factors and lifestyle behaviour modifications. It was unclear if the 1-hr education sessions in the centre-based programme also addressed the same issues.

Wu 2006

Study characteristics	
Methods	**Study design:** Single-centre RCT **No of centres:** 1 **Country:** Taiwan (China) **Dates patients recruited:** NR **When randomised:** NR **Maximum follow-up:** 12 weeks
Participants	**Inclusion criteria:** No previous CABG, no neurologic impairment like stroke/brain injury, no severe musculoskeletal disease, no complications during hospitalisations like infection, shock, arrhythmia, prolonged ventilation **Exclusion criteria:** uncontrolled dysrhythmia or continuous ventricular tachycardia during exercise testing, no possibility of completing test at discharge or 12 weeks later **N randomised:** total: 36; intervention: 18; comparator: 18 **Diagnosis (% of pts):** **Post-CABG**: 100% **Age (mean ± SD):** total: 61.9 ± 7.3 years **Percentage male:** total: 100% **Ethnicity:** NR
Interventions	**Description of home-based** cardiac rehabilitation**:** Exercise documented in record book. Prescription of exercise individually given and updated every 2 weeks by rehabilitation nurse **Components:** Exercise only **Aerobic exercise:** **Modality:** fast walking or jogging **Dose:** **Length of session:** 30 to 60 min + 10-min warm-up + 10-min cool-down/session **Frequency/no of sessions:** ≥ 3 sessions/week **Intensity:** 60% to 85% HRmax **Resistance training included?** NR **Total duration:** 12 weeks **Intermittent nurse or exercise specialist telephone support?** NR **Co-interventions:** NR **Description of centre-based** cardiac rehabilitation**:** Exercise supervised by cardiopulmonary physical therapist **Components:** Exercise only **Aerobic exercise:** **Modality:** cycle ergometer, treadmill

Wu 2006 *(Continued)*

	Dose: **Length of session:** 30 to 60 min + 10-min warm-up + 10-min cool-down/session **Frequency/no of sessions:** 3 sessions/week (total 36 sessions) **Intensity:** 60% to 85% HRmax **Resistance training included?** NR **Total duration:** 12 weeks **Co-interventions:** NR
Outcomes	(Primary and secondary outcomes not distinguished) exercise capacity (METs)
Follow-up	12 weeks post-randomisation
Source of funding	NR
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	“Subjects were randomly assigned by drawing lots”.
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Low risk	“The evaluators of the exercise stress test were also masked to the group assignments."
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not reported
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section were reported in the results.
Groups balanced at baseline?	Low risk	“Randomization did not result in statistical significances among subjects assigned to the three groups.”
Groups received same co-intervention(s)?	Low risk	Neither group received any co-interventions.

6MWT = six-minute walk test
ACS = acute coronary syndrome
AMI = acute myocardial infarction
BMI - body mass index
BOOMER = Balance Outcome Measure for Elder Rehabilitation
BP = blood pressure
CABG = coronary artery bypass graft
CAD = coronary artery disease

CAP-CR = care assessment platform cardiac rehabilitation
CCU = coronary care unit
CHD = coronary heart disease
CHF = congestive heart failure
CR = cardiac rehabilitation
CRT = cardiac resynchronisation therapy
CSQ-8 = Client Satisfaction Questionnaire
DBP = diastolic blood pressure
DVD = digital video disc
ECG = electrocardiogram
EQ-5D = EuroQol-5 Dimension
ESC = European Society of Cardiology
ET = exercise training
exCR = exercise-based cardiac rehabilitation
GLTPAQ = Godin Leisure Time Physical Activity Questionnaire
HETG = home-based exercise training group
HDL = high-density lipoprotein
HF = heart failure
HIT = high intensity training
HR = heart rate
HRmax = maximum heart rate
HRQoL = health-related quality of life
HT = home-based training
ICD = implantable cardioverter defibrillator
ISWT = incremental shuttle walking test
ITT = intention to treat
LDL = low-density lipoprotein
LVEF = left ventricular ejection fraction
METs = metabolic equivalents
MI = myocardial infarction
min = minutes
MLWHFQ = Minnesota living with heart failure questionnaire
NR = not reported
NSTEMI = non-ST-elevation myocardial infarction
NYHA = New York Heart Association
PCI =percutaneous coronary intervention
PTCA = percutaneous transluminal coronary angioplasty
pts = participants
QALY = quality-adjusted life year
RCT = randomised controlled trial
RPE = rating of perceived exertion
SBP = systolic blood pressure
SD = standard deviation
SETG = supervised exercise training group
SF-36/12 = Short Form (36/12) Health Survey
SR = systematic review
ST = portion of the ECG cycle from the end of the QRS complex
TCR = traditional centre-based cardiac rehabilitation
TDI = tissue doppler imaging
VO_{2max} = maximal oxygen consumption
WC = waist circumference
WHO = World Health Organisation

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Ades 2000	Not RCT

Study	Reason for exclusion
Adib-Hajbaghery 2013	Systematic review - no new citations noted
Aghamohammadi 2019	Wrong comparator
Ahmed 2002	Systematic review - no new citations noted
Al-Sutari 2017	Wrong study design
Almudena Castro Conde 2019	Wrong study design
Almukhanova 2019	Incorrect citation - cannot be traced
Amo-Setien 2019	Wrong intervention
Antoniou 2022a	Systematic review - no new citations noted
Antypas 2014	Wrong study design
Arietaleanizbeaskoa 2019	Abstract only with insufficient details. Attempts to seek further information were unsuccessful.
Aronov 2019	Wrong study design, wrong comparator and duplicate citation
Aronow 2019	Systematic review - no new citations noted
Athilingam 2017	Wrong study design
Athilingam 2018	Systematic review - no new citations noted
Austin 2005	Not home- versus centre-based cardiac rehabilitation comparison
Avila 2017	Abstract only with insufficient details. Attempts to seek further information were unsuccessful.
Avila 2018	Duplicate citation
Avila 2020	Wrong study design
Bailly 2018	Wrong intervention
Bakhshayesh 2020	Systematic review - no new citations noted
Bannon 2019	Systematic review - no new citations noted
Barnason 2006	Wrong study design
Bekelman 2015	Wrong study design
Bennett 2006	Wrong study design
Bensink 2006	Systematic review - no new citations noted
Booth 2015	Systematic review - no new citations noted
Bravo-Escobar 2017	Wrong intervention

Study	Reason for exclusion
Bravo-Escobar 2021	Wrong comparator
Brennan 2010	Wrong study design
Britto 2019	Abstract only with insufficient details. Attempts to seek further information were unsuccessful.
Broers 2020	Wrong intervention
Brors 2019	Irrelevant systematic review
Brouwers 2021	Wrong study design
Candelaria 2020	Systematic review - no new citations noted
Carballo 2019	Wrong study design
Cersit 2016	Abstract only with insufficient details. Attempts to seek further information were unsuccessful.
Chan 2016	Irrelevant systematic review
Chen 2018	Wrong comparator
Chen 2019	Abstract only with insufficient details. Attempts to seek further information were unsuccessful.
Chong 2022	Abstract only with insufficient details. Attempts to seek further information were unsuccessful.
Christa 2019	Wrong comparator
Cichosz 2019	Wrong intervention
Cinar 2015	All patients had a Left ventricular Assist Device
Claes 2019	Duplicate citation
Claes 2020	Duplicate citation
Clark 2007	Wrong intervention
Clark 2010	Abstract only with insufficient details. Attempts to seek further information were unsuccessful
Clark 2011	Irrelevant systematic review
Cleland 2011	Systematic review - no new citations noted
Conti 2006	Wrong intervention
Conway 2014	Irrelevant systematic review
Cowie 2014	Duplicate citation

Study	Reason for exclusion
Cugusi 2017	Irrelevant systematic review
Cui 2019	Wrong intervention
Cunha Matheus Rodrigues 2013	Wrong intervention
Dabbaghipour 2020	Systematic review - no new citations noted
Dalleck 2011	Wrong intervention
Dang 2017	Wrong intervention
Daskapan 2005a	Incorrect citation - cannot be traced
Davies 2014	Systematic review - no new citations noted
De Lima	Wrong comparator
Delaney 2013	Wrong intervention
Devi 2015	Irrelevant systematic review
Devi 2016	Commentary
Diez 2019	Abstract only with insufficient details. Attempts to seek further information were unsuccessful
Dinh 2019	Wrong intervention
Do Nascimento Júnior 2017	Irrelevant systematic review
Doletsky 2013	Unable to locate full text/future publication (was a study awaiting classification inAnderson 2017)
Dor-Haim 2019	Study design only/protocol with insufficient details. Attempts to seek further information were unsuccessful.
Dorje 2018	Wrong comparator
Dorsch 2019	Wrong comparator
Duan 2018	Wrong comparator
Estrela 2017	Systematic review - no new citations noted
Fang 2019	Wrong comparator
Fanget 2022	Wrong study design
Feltner 2014	Systematic review - no new citations noted
Ferrera 2021	Abstract only with insufficient details. Attempts to seek further information were unsuccessful.
Flodgren 2015	Irrelevant systematic review

Study	Reason for exclusion
Francis 2019	Irrelevant systematic review
Frederix 2013	Wrong comparator
Frederix 2015	Wrong comparator
Frederix 2015a	Wrong comparator
Frederix 2015b	Wrong comparator
Frederix 2015c	Wrong comparator
Frederix 2017	Wrong comparator
Fu 2019	Systematic review - no new citations noted
Fukuta 2019	Irrelevant systematic review
Garcia-Bravo 2020	Wrong setting
Garcia-Lizana 2007	Systematic review - no new citations noted
Gary 2012	Wrong comparator
Gelati 2013	Unable to locate full text/future publication
Gellis 2012	Wrong intervention
Gerlach 2020	Irrelevant systematic review
Giallauria 2006	Wrong study design
Giamouzis 2012	Irrelevant systematic review
Giordano 2009	Wrong intervention
Graham 2020	Irrelevant systematic review
Grant 2018	Wrong comparator
Greenhalgh 2017	Irrelevant systematic review
Hamilton 2018	Systematic review - no new citations noted
Hanlon 2017	Systematic review - no new citations noted
Hannan 2019	Systematic review - no new citations noted
Harbman 2006	Systematic review
Harter 2016	Wrong comparator
Haykowsky 2013	Systematic review - no new citations noted

Study	Reason for exclusion
Heather Arthur 2011	Abstract only with insufficient details. Attempts to seek further information were unsuccessful
Heron 2016	Irrelevant systematic review
Hill 1978	Wrong study design
Holly 2011	Wrong study design
Houchen-Wolloff 2018	Wrong study design
Huang 2015	Irrelevant systematic review
Hwang 2016	Abstract only with insufficient details. Attempts to seek further information were unsuccessful
Hwang 2017a	Wrong study design
Højskov 2020	Duplicate citation
Ilaslan 2021	Wrong comparator
Iliuta 2019	Abstract only with insufficient details. Attempts to seek further information were unsuccessful
Imran 2019	Systematic review - no new citations noted
Inglis 2010	Irrelevant systematic review
Inglis 2015	Irrelevant systematic review
Irct20200408046997N 2020	Abstract only with insufficient details. Attempts to seek further information were unsuccessful
Jenny 2001	Wrong study design
Jerant 2005	Irrelevant systematic review
Jiang 2018	Irrelevant systematic review
Jiménez-Marrero 2020	Wrong intervention
Jin 2016	Wrong comparator
Jin 2019	Irrelevant systematic review
Jovicic 2009	Irrelevant systematic review
Jprn 2013	Study design only/protocol with insufficient details. Attempts to seek further information were unsuccessful
Jprn 2020	Study design only/protocol with insufficient details. Attempts to seek further information were unsuccessful
Kabboul 2018	Irrelevant systematic review

Study	Reason for exclusion
Kairy 2009	Irrelevant systematic review
Karhula 2015	Wrong comparator
Karmali 2014	Irrelevant systematic review
Kitsiou 2015	Irrelevant systematic review
Knox 2017	Irrelevant systematic review
Konstam 2011	Wrong intervention
Kortke 2006	Wrong study design
Korzeniowska-Kubacka 2011	Wrong study design
Kotb 2015	Irrelevant systematic review
Kraal 2014a	Wrong setting
Kraal 2015	Wrong setting
Kraal 2017	Wrong setting
Kraal 2017a	Wrong setting
Kyriakou 2020	Irrelevant systematic review
LaFramboise 2003	Wrong study design
Lambrinou 2019	Abstract only with insufficient details. Attempts to seek further information were unsuccessful
Lans 2018	Wrong study design
Lear 2014	Comparator group did not receive exercise-based cardiac rehabilitation
Lear 2015	Wrong study design
Leavitt 2020	Wrong study design
Lee 2013	Wrong comparator
Li 2019	Wrong intervention
Li 2022	Wrong comparator
Lie 2009	Wrong intervention
Lin 2017	Irrelevant systematic review
Linne 2006	Wrong intervention
Long 2018	Irrelevant systematic review

Study	Reason for exclusion
Lounsbury 2015	Wrong study design
Lubinskaya 2014	Wrong comparator
Luhr 2019	Wrong intervention
Lunde 2020	Wrong study design
Lynggaard 2019	Wrong study design
Lynggaard 2020	Wrong study design
Ma 2020	Wrong comparator
Maddison 2015	Comparator group did not receive formal exercise-based cardiac rehabilitation
Mahfood Haddad 2017	Wrong patient population
Mares 2018	Irrelevant systematic review
Maru 2015	Intervention not exercise-based cardiac rehabilitation
Maru 2019	Wrong comparator
McDermott 2019	Wrong study design
McGhee 2010	Commentary
McGuire 2020	Wrong study design
Medical Advisory Secretariat	Systematic review - no new citations noted
Miranda 2018	Irrelevant systematic review
Mittag 2006	Wrong setting
Mizukawa 2019	Wrong intervention
Mohebbi 2018	Wrong comparator
Mudge 2018	Wrong intervention
Munro 2013	Irrelevant systematic review
Murphy 2020	Systematic review - no new citations noted
NCT 2010	Study design only/protocol with insufficient details. Attempts to seek further information were unsuccessful
NCT 2019	Study design only/protocol with insufficient details. Attempts to seek further information were unsuccessful
NCT 2022	Wrong comparator
NCT01567189	Wrong comparator

Study	Reason for exclusion
Neubeck 2009	Irrelevant systematic review
Neubeck 2018	Wrong study design
Nkonde-Price 2022	Wrong study design
Noonan 2018	Systematic review - no new citations noted
Noonan 2019	Irrelevant systematic review
Norman 2020	Wrong study design
O'Shea 2020	Wrong study design
Olivier 2019	Wrong comparator
Ong 2016	Wrong study design
Ong 2016a	Wrong comparator
Palacios 2017	Irrelevant systematic review
Pandey 2017	Abstract only with insufficient details. Attempts to seek further information were unsuccessful
Pandey 2017a	Wrong intervention
Papathanasiou 2020	Wrong setting
Pare 2010	Irrelevant systematic review
Parker 2013	Commentary
Pekmezaris 2018	Irrelevant systematic review
Peng 2018	Wrong comparator
Petersen 2019	Wrong intervention
Pfaeffli Dale 2015	Wrong comparator
Pfaeffli Dale 2015a	Wrong comparator
Piepoli 2015	Wrong study design
Piotrowicz 2013	Commentary
Piotrowicz 2015	Comparator group did not receive exercise-based cardiac rehabilitation
Piotrowicz 2019	Wrong comparator
Piotrowicz 2019a	Wrong comparator
Piotrowicz 2019b	Wrong comparator

Study	Reason for exclusion
Platz 2020	Wrong comparator
Pogosova 2019	Wrong comparator
Polisena 2010	Irrelevant systematic review
Prabhakaran 2020	Wrong comparator
Pratesi 2019	Wrong study design
Prince 2017	Wrong comparator
Purcell 2014	Irrelevant systematic review
Radhakrishnan 2012	Irrelevant systematic review
Rawstorn 2016	Systematic review - no new citations noted
Reid 2012	Wrong comparator
Resurreccion 2019	Systematic review - no new citations noted
Rosario 2018	Wrong study design
Ruiz-Pérez 2019	Systematic review - no new citations noted
Rush 2018	Irrelevant systematic review
Sabatier 2013	Abstract only with insufficient details. Attempts to seek further information were unsuccessful
Saeidi 2017	Wrong study design
Salvi 2018	Wrong setting
Salzwedel 2020	Irrelevant systematic review
Sankaran 2019	Wrong comparator
Santiago de Araujo Pio 2019	Wrong comparator
Sawo 2010	Irrelevant systematic review
Scalvini 2013	Wrong study design
Scalvini 2016	Wrong comparator
Schopfer 2020	Wrong study design
Schwaab 2007	Irrelevant systematic review
Scott 2020	Systematic review - no new citations noted
Seto 2011	Wrong intervention

Study	Reason for exclusion
Shoemaker 2018	Systematic review - no new citations noted
Sibilitz 2016	Irrelevant systematic review
Simerly 2013	Wrong study design
Skobel 2017	Wrong study design
Son 2020	Irrelevant systematic review
Song 2019	Wrong intervention
Song 2020	Wrong comparator
Soran 2010	Wrong intervention
Southard 2003	Wrong intervention
Spindler 2019	Wrong comparator
Srisuk 2017	Wrong intervention
Steele 2019	Wrong intervention
Stewart 2011	Study design only/protocol with insufficient details. Attempts to seek further information were unsuccessful'
Su 2020	Irrelevant systematic review
Sumner 2017	Irrelevant systematic review
Tang 2019	Wrong patient population
Taylor 2019a	Wrong comparator
Taylor 2019b	Systematic review - no new citations noted
Ter Hoeve 2019	Wrong comparator
Thomas 2019	Commentary
Thomas 2019a	Commentary
Thompson 2010	Irrelevant systematic review
Thorup 2016	Wrong comparator
Tomita 2008	Wrong comparator
Torri 2018	Wrong study design
Tsai 2019	Wrong intervention
Turan Kavradim 2020	Wrong intervention

Study	Reason for exclusion
Turan Kavradim 2020a	Irrelevant systematic review
VanSpall 2017	Systematic review - no new citations noted
VanSpall 2019	Wrong intervention
Varnfield 2018	Commentary
Verburg 2019	Systematic review - no new citations noted
Vestergaard 2020	Wrong intervention
Vieira 2018	Wrong comparator
Voigt 2013	Irrelevant systematic review
Wade 2017	Irrelevant systematic review
Wagenaar 2019	Wrong intervention
Wang 2018	Wrong intervention
Whitten 2007	Wrong intervention
Widmer 2017	Wrong intervention
Wolszakiewicz 2015	Wrong study design
Wong 2016	Wrong comparator
Wong 2016a	Wrong intervention
Xia 2018	Irrelevant systematic review
Xiang 2013	Irrelevant systematic review
Xu 2019	Systematic review - no new citations noted
Yanicelli 2020	Wrong intervention
Yudi 2021	Wrong comparator
Yun 2018	Irrelevant systematic review
Zhao 2020	Irrelevant systematic review
Zheng 2019	Irrelevant systematic review
Zutz 2007	Wrong comparator

RCT = randomised controlled trial

Characteristics of studies awaiting classification *[ordered by study ID]*

Andrade 2021

Methods	**Study design:** RCT, open-label, pilot trial with 2 parallel groups: home-based or centre-based **Number of centres:** 1 **Country:** Brazil **Dates patients recruited:** April 2015 to April 2018 **When randomised:** After baseline tests **Maximum follow-up**: 12 weeks
Participants	**Inclusion criteria:** Aged over 18 years with CHF, New York Heart Association (NYHA) functional class II or III, and left ventricular ejection fraction of < 40% **Exclusion criteria:** New-onset atrial fibrillation or atrial flutter, complex ventricular arrhythmia at rest or presenting with exertion, acute or decompensated HF, pulmonary hypertension (pulmonary artery systolic pressure > 35 mmHg), any orthopaedic, cognitive, or neurological problems that could affect functional capacity measures, respiratory infection in the previous 30 days, and peripheral oxygenation of < 92% in ambient air at rest **N randomised:** Total 29; home-based: 14, centre-based: 14 **Method of assessment:** NR **Diagnosis (% of pts):** NR **NYHA II:** home-based: 91%, centre-based: 92% **Previous MI:** home-based: 36%, centre-based: 50% **Age (mean ± SD):** Total: NR, home-based: 59 ± 5 years, centre-based: 61 ± 7 years **Percentage male:** Total: 61%, home-based: 46%, centre-based: 75% **Ethnicity:** NR
Interventions	Both groups exercised 3 times per week for 12 weeks at 60-70% HR reserve, plus peripheral muscle resistance training (50% 1RM). **Home-based:** Home-based training comprised walking (three times a week for 30 min) in which patients were instructed to maintain the target HR, combined with resistance exercises guided by an illustrated instruction manual for the upper limbs (elbow flexion and extension, and shoulder flexion and abduction) and lower limbs (hip flexion, extension and abduction, knee extension, and plantar flexion) using free weights. The exercise intensity to initiate the programme was one set of ten repetitions that followed a final progression to three sets of ten repetitions for each exercise with 50% of 1RM adjusted monthly over the training period. Free weights were provided for each patient according to the assessments. The patients were trained at least once per month with physiotherapist supervision, and the adherence and HR reached during the walks were monitored on a diary filled by the patients. Furthermore, the researcher made weekly phone calls to stimulate patients to continue performing daily exercises, to screen exercise adherence, and to answer possible doubts. **Time of start after event:** NR **Components:** Exercise only **Modality:** Walking and free weights **Dose:** NR **Length of sessions:** 30 min

Andrade 2021 *(Continued)*

	Frequency/no. of sessions: 3 times/week **Intensity:** 60-70% HR reserve, 50% of 1 maximum repetition for resistance exercise **Resistance training included?** Yes **Total duration:** 12 weeks **Intermittent nurse or exercise specialist telephone support?** Yes, physiotherapist **Co-interventions:** NR **Centre-based:** Centre-based training took place at a cardiac rehabilitation facility of a cardiac hospital. The training programme was supervised by physiotherapists and comprised cycle ergometer exercises (three times a week for 30 min) to maintain the target HR, and resistance exercises for the upper and lower limbs. A physiotherapist recorded the patient's adherence to each session. **Time of start after event:** NR **Components:** Exercise only **Modality:** Cycling was performed on a cycle ergometer and free weights **Dose:** NR **Length of sessions:** 30 min **Frequency/no. of sessions:** 3 times/week **Intensity:** 60-70% HR reserve, 50% of 1 maximum repetition for resistance exercise **Resistance training included?** Yes **Total duration:** 12 weeks **Intermittent nurse or exercise specialist telephone support?** Yes, physiotherapist **Co-interventions:** NR
Outcomes	Exercise capacity: Peak VO_2, 6-minute walk distance, HRQoL, steps per day, maximal inspiratory pressure, handgrip strength
Notes	

Antoniou 2022

Methods	**Study design:** RCT, single-blind, 2 parallel groups: home-based telerehabilitation or centre-based **Number of centres:** 1 **Country:** Greece **Dates patients recruited:** NR (protocol paper) **When randomised:** After baseline tests **Maximum follow-up**: 6 months
Participants	**Inclusion criteria:** Aged over 18 years with coronary artery disease (stable angina, myocardial infarction, patients after coronary revascularisation or coronary artery bypass grafting) in the last 6 months, with left ventricular ejection fraction of < 45%. Current outpatients, stable for at least 4

Antoniou 2022 *(Continued)*

	weeks prior to the intervention enrolment. Able to perform physical exercise. Able to speak, read and write Greek. Possession of a mobile phone/smartphone. Internet access at home **Exclusion criteria:** Severe ventricular arrhythmia, with functional or prognostic significance or exercise-induced myocardial ischaemia as assessed by cardiopulmonary exercise testing (CPET) at baseline. Heart failure. Comorbidity precluding exercise training (e.g. orthopaedic, neurological or cognitive conditions). Unstable angina. Uncontrolled atrial or ventricular arrhythmia. Acute pulmonary embolism. Acute myocarditis or pericardial effusion. Uncontrolled diabetes mellitus (type I, II). Severe obstructive respiratory disease (forced expiratory volume in 1 s (FEV_1) < 50%). **N randomised:** A minimum sample of 124 participants is required; home-based: 62, centre-based: 62 **Method of assessment:** Cardiac biomarkers (BNP, NT-proBNP, troponins, creatine kinase) **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	Individually determined CR programmes will be implemented in both study groups based on the participants' referral diagnosis, physical fitness level and expected training goals. All participants will undertake a 12-week, exercise-based CR programme, including three training sessions of 60 min/week. All participants will perform aerobic training at 70% of their maximal heart rate, as obtained from cardiopulmonary exercise testing (CPET) for 20 min plus 20 min for strengthening and balance training. Exercise will be prescribed individually, according to the results of the baseline CPET and to the frequency, intensity, time (duration) and type of exercise model. Each exercise circuit will consist of 20 structured stations for aerobic, strength and balance training of 2-min duration/station. **Home-based (telerehab):** Participants will receive a 12-week exercise-based rehabilitation programme, remotely monitored. The TELE-CR group will undertake three training sessions (or more if needed) in the hospital's outpatient clinic for familiarisation with the use of the wearable sensors, the uploading of the training data to the web application (Polar Flow) and the exercising within their individually determined exercise intensity. Following the training period, TELE-CR participants will be lent a Polar H10 chest strap that records HR data and a sports wristwatch (Polar M430, Kempele, Finland) and will proceed with the telerehabilitation programme at their homes. Participants in the TELE-CR group will be exercising in groups of up to maximum five participants in each session. Real-time supervision of this group-based exercise session by a specialised physiotherapist will be implemented via videoconference web platforms or applications. At the end of every training session, patients will upload training data to the web platform (Polar Flow) via Bluetooth or USB connection. CR-specialised staff from the corresponding hospital will have access to all patients' accounts to monitor successful data uploading, assess the collected data and provide them with training feedback once a week via telephone video calls. Participants will wear an accelerometer. **Time of start after event:** NR **Components:** Exercise only **Modality:** Body weight or resistance bands **Dose:** NR **Length of sessions:** 60 min

Antoniou 2022 *(Continued)*

	Frequency/no of sessions: 3 times/week **Intensity:** 70% HRmax, increasing by 5%–10%/week for aerobic exercise. For resistance training, load-lifted and rest periods will be increased progressively. **Resistance training included?** Yes **Total duration:** 12 weeks **Intermittent nurse or exercise specialist telephone support?** Physiotherapist supervision **Co-interventions:** NR **Centre-based:** Participants will receive a 12-week exercise-based rehabilitation programme, with standard supervision for the centre-based group. **Time of start after event:** NR **Components:** Exercise only **Modality:** Cycling or treadmill walking for aerobic training. Free weights or machines for resistance training **Dose:** NR **Length of sessions:** 60 min **Frequency/no of sessions:** **Intensity:** **Resistance training included?** **Total duration:** **Intermittent nurse or exercise specialist telephone support?** **Co-interventions:**
Outcomes	Primary outcomes: cardiorespiratory fitness: Peak VO_2 and 6-minute walk distance Secondary outcomes: physical activity level, safety, HRQoL, training adherence, depression and anxiety levels, nicotine dependence and cost-effectiveness
Notes	

Batalik 2021

Methods	**Study design:** Long-term follow-up of RCT with 2 parallel groups: home-based or centre-based **Number of centres:** 1 **Country:** Czech Republic. **Dates patients recruited:** August 2018 to May 2019 **When randomised:** After initial examinations **Maximum follow-up:** 12 months

Batalik 2021 *(Continued)*

Participants	**Inclusion criteria:** Aged over 18 years, diagnosed with coronary artery disease (angina pectoris, myocardial infarction in the last six months, with left ventricular ejection fraction > 45%) with low-to-moderate cardiovascular risk. All patients were after cardiac revascularisation (percutaneous coronary intervention or coronary artery bypass graft), and they were recommended pharmacological treatment. All patients had to own ICT equipment (personal computer, telephone or mobile connection, and internet access) and were able to operate these devices. **Exclusion criteria:** NR **N randomised:** 56 **Method of assessment:** NR **Diagnosis (% of pts):** 16% angina pectoris, 84% acute myocardial infarction **Previous AMI:** 38; home-based: 18, centre-based: 20 **Previous CABG:** 7; home-based: 4, centre-based: 3 **ACS:** NR **Age (mean ± SD):** Total: 56.6 ± 7.3, home-based: 56.1 ± 6.8 years, centre-based: 57.1 ± 7.9 years **Percentage male:** Total: 80%, home-based: 78%, centre-based: 86% **Ethnicity:** NR
Interventions	After completing the 12-week intervention, all patients were supported in their independent continuation and physical exercise adherence. No further contact was made during the following period of 1 year to ensure compliance after the intervention. **Home-based:** The intervention was based on the principles of II phase of CR and consisted of regular physical exercise in the patient's home environment and teleconsultations. Two mandatory training sessions initiated home-based CR at the clinic under a physiotherapist's guidance and a cardiologist's supervision. During the pilot sessions, the patients were instructed how to exercise (load time, intensity) and were lent the HR Polar M430 wrist monitor (Kempele, Finland). The home-based CR programme consisted of physical exercise 3 times a week, for 60 minutes at an intensity of 70-80% of heart rate reserve. Once a week, each patient received a telephone consultation (feedback, motivation, education) based on the telemonitoring. Using the Global Position System, the physiotherapist supervised patient's training sections and gave telephone feedback once a week. **Time of start after event:** NR **Components:** Exercise only **Modality:** Walking or cycling **Dose:** NR **Length of sessions:** 60 min **Frequency/no of sessions:** 3 times/week **Intensity:** 70-80% of heart rate reserve **Resistance training included?** No **Total duration:** 12 weeks supervised intervention, with 1-year follow-up after independent continuation of the programme **Intermittent nurse or exercise specialist telephone support?** Yes, by physiotherapist **Co-interventions:** NR

Batalik 2021 *(Continued)*

	Centre-based: Patients allocated to CBCR started the traditional programme of the II phase of CR under the direct supervision of a physiotherapist and cardiologist at the University Hospital. Patients trained three times a week for 60 minutes at an intensity of 70-80% HR reserve. **Time of start after event:** NR **Components:** Exercise only **Modality:** Combined walking and cycling **Dose:** NR **Length of sessions:** 60 min **Frequency/no of sessions:** 3 times/week **Intensity:** 70-80% of heart rate reserve **Resistance training included?** No **Total duration:** 12 weeks supervised intervention, with 1-year follow-up after independent continuation of the programme **Intermittent nurse or exercise specialist telephone support?** Direct supervision at sessions. Telephone support NR. **Co-interventions:** NR
Outcomes	Exercise capacity: Peak VO_2, self-reported HRQoL, anthropometric characteristics, mortality and hospitalisation rates
Notes	

Brouwers 2022

Methods	**Study design:** RCT, with 2 parallel groups: home-based (with web application and telephone coaching) or centre-based **Number of centres:** NR (see original paper) **Country:** NR (see original paper) **Dates patients recruited:** NR (see original paper) **When randomised:** NR (see original paper) **Maximum follow-up:** 4 years
Participants	**Inclusion criteria:** NR (see original paper) **Exclusion criteria:** NR (see original paper) **N randomised:** NR (see original paper). Total at 4-year follow-up: 55; home-based: 27, centre-based: 28 **Method of assessment:** NR **Diagnosis (% of pts):** Coronary artery disease - see original paper. 81.8% had undergone coronary revascularisation before the start of CR.

Brouwers 2022 *(Continued)*

	Previous AMI: NR (see original paper) **Previous CABG:** NR (see original paper) **ACS:** NR (see original paper) **Age (mean ± SD):** Total: 60.6 ± 8.2 years **Percentage male:** 92.7% **Ethnicity:** NR
Interventions	FIT@Home was a randomised controlled trial evaluating the clinical and cost-effectiveness of 12 weeks of cardiac telerehabilitation applying home-based training with a heart rate monitor, web application, and weekly telephone coaching (intervention group), compared with 12 weeks of centre-based CR (control group) in 90 low-to-moderate risk patients with clinically manifest CAD (i.e. secondary prevention) **Home-based:** 12 weeks of cardiac telerehabilitation with a heart rate monitor, web application, and weekly telephone coaching. **Time of start after event:** NR **Components:** Exercise only **Modality:** NR (see original paper) **Dose:** NR **Length of sessions:** NR (see original paper) **Frequency/no of sessions:** NR (see original paper) **Intensity:** NR (see original paper) **Resistance training included?** NR **Total duration:** 12 weeks, with 4-year follow-up **Intermittent nurse or exercise specialist telephone support?** Yes, telephone coaching, specialise: NR in this paper - see original **Co-interventions:** NR **Centre-based:** **Time of start after event:** NR **Components:** Exercise only **Modality:** NR (see original paper) **Dose:** NR **Length of sessions:** NR (see original paper) **Frequency/no of sessions:** NR (see original paper) **Intensity:** NR (see original paper) **Resistance training included?** NR **Total duration:** 12 weeks, with 4-year follow-up **Intermittent nurse or exercise specialist telephone support?** NR (see original paper)

Brouwers 2022 *(Continued)*

	Co-interventions: NR
Outcomes	Peak VO_2, physical activity levels & QoL
Notes	

Collins 2022

Methods	**Study design:** RCT, single-blinded, two-arm parallel, randomised non-inferiority trial: telehealth or onsite centre-based CR **Number of centres:** NR **Country:** Australia **Dates patients recruited:** NR - ongoing **When randomised:** After baseline tests **Maximum follow up:** 6 weeks
Participants	**Inclusion criteria:** Aged over 18 years, efficient verbal English skills, diagnosed with cardiovascular disease, exiting inpatient CR, physically able to complete exercise testing, available to meet time commitments, access to a phone **Exclusion criteria:** Diagnosed with heart failure or hypertrophic myopathy, heart transplant, unstable angina or myocardial infarction < 1 month **N randomised:** target recruitment = 50 **Method of assessment:** Primary outcomes: CPET, respiratory metabolism measured using open-circuit spirometry with a mixing chamber based metabolic system **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR (minimum 18 years, maximum no limit) **Percentage male:** NR **Ethnicity:** NR
Interventions	**Home-based:** The training sessions will be delivered individually via telehealth using a combination of audio and audio-video monitoring. **Time of start after event:** NR **Components:** Exercise only **Modality:** aerobic modes at participants' disposal (most likely walking or jogging) **Dose:** NR **Length of sessions:** 60 min **Frequency/no. sessions:** 3 times/week **Intensity:** Self-reported as average heart rate using heart rate monitors provided by research team via an online exercise app. Intensity should be equivalent to a ventilatory anaerobic threshold. **Resistance training included:** NR **Total duration:** 6 weeks **Intermittent nurse or exercise specialist telephone support:** NR

Collins 2022 *(Continued)*

	Co-interventions: NR **Centre-based:** The training sessions will be supervised (on-site) in a group exercise setting by qualified personnel with previous experience in implementing training programmes. **Time of start after event:** NR **Components:** exercise only **Modality:** stationary cycle ergometers or treadmill **Dose:** NR **Length of sessions:** 60 min **Frequency/no. sessions:** 3 times/week **Intensity:** Intensity should be equivalent to a ventilatory anaerobic threshold. **Resistance training included:** NR **Total duration:** 6 weeks **Intermittent nurse or exercise specialist telephone support:** NR (but supervised exercise sessions on-site) **Co-interventions:** NR
Outcomes	**Primary outcomes:** cardiorespiratory fitness as assessed by cardiopulmonary exercise test (CPET). Respiratory metabolism measured using open-circuit spirometry with a mixing chamber based metabolic system [within seven (7) days prior commencement of intervention and within seven (7) days post-final intervention session] **Secondary outcomes:** Training fidelity, lipid profile, heart rate variability, pulse wave velocity and sleep quality
Notes	

Dalli Peydro 2022

Methods	**Study design:** RCT, 2 parallel groups: home-based cardiac telerehabilitation or centre-based cardiac rehabilitation **Number of centres:** 2 **Country:** Spain **Dates patients recruited:** May 2019 to March 2020 **When randomised:** Participants were randomised and notified of allocation after baseline assessments. **Maximum follow up:** 10 months
Participants	**Inclusion criteria:** Age 18-72 years old; all included patients had to meet low-risk criteria, left ventricular ejection fraction ≥ 50%, and have minimum smartphone usage skills. **Exclusion criteria:** Reduced mobility, pulmonary diseases, neoplasms, or cognitive impairment **N randomised:** Total 67; home-based telerehab: 33, centre-based: 34

Dalli Peydro 2022 *(Continued)*

	Method of assessment: Symptom-limited CPET, heart rate, blood pressure, 12-lead ECG, gas exchange, blood samples (for cholesterol) were taken, weight, visceral fat, waist circumference measured. IPAQ. PREDIMED, HADS and EQ-5D-5L questionnaires **Diagnosis (% of pts):** **Previous AMI:** Telerehab: NSTEMI: 29%, STEMI: 41.9%. Centre-based: NSTEMI: 35.7%, STEMI: 42.9% **Previous CABG:** NR **ACS:** 100% **Age (mean ± SD):** Total: NR, telerehab: 57.5 ± 9 years, centre-based: 54.7 ± 9.9 years **Percentage male:** Total: NR, telerehab: 87.1%, centre-based: 96.4% **Ethnicity:** NR
Interventions	Both groups were given the same education. The target heart rate during exercise sessions was 60%–80% of the heart rate reserve based on the baseline treadmill test. During follow-up, patients were instructed to engage in recommended moderate physical activity guided by Borg's rating of perceived exertion scale of 12–14 (6–20 scale), as well as strength exercises twice a week. Warm-up, stretching, and resistance-band exercises were included in both groups. **Home-based telerehab:** A portion of hospital training, comprising 2 weeks with four supervised sessions of exercise, was completed. Physical activity consisted of walking down a corridor, adjusting their pace to attain a target heart rate as measured by their smartphone and heart rate monitor (Polar H7). The smartphone application guided participants through a daily exercise and data entry programme for 10 months. **Time of start after event:** After hospital discharge **Components:** Predominantly exercise with suggestions re diet **Modality:** Walking and resistance exercise **Dose:** NR **Length of sessions:** NR **Frequency/no of sessions:** Walking - daily, resistance exercise - twice per week **Intensity:** 60-80% heart rate reserve from baseline treadmill assessment **Resistance training included?** Yes, twice per week. Resistance bands used **Total duration:** Hospital training for 2 weeks with 4 supervised sessions, followed by 10 months of daily exercise **Intermittent nurse or exercise specialist telephone support?** Healthcare team monitored webpage entries and communicated with patients if necessary. **Co-interventions:** **Centre-based:** 2 months of treatment with 16 sessions of supervised exercise. Physical activity consisted of routine workouts and aerobic cycling training. **Time of start after event:** After hospital discharge **Components:** Exercise only **Modality:** Routine workouts and aerobic cycling training

Dalli Peydro 2022 *(Continued)*

	Dose: NR **Length of sessions:** NR **Frequency/no of sessions:** 16 sessions of supervised exercise over 2 months **Intensity:** 60-80% heart rate reserve from baseline treadmill assessment **Resistance training included?** Yes, twice per week. Resistance bands used **Total duration:** 16 sessions of supervised exercise over 2 months, 10-month follow-up **Intermittent nurse or exercise specialist telephone support?** NR **Co-interventions:** NR
Outcomes	Primary outcome: Physical activity (METS min/week): IPAQ Questionnaire Secondary outcomes: VO_2 max, changes in laboratory parameters, anthropometric variables, adherence to the rehabilitation programme, returning to work, adherence to a Mediterranean diet, psychological well-being, health-related quality of life, and smoking cessation
Notes	

Dalli-Peydro 2022a

Methods	**Study design:** RCT, 2 parallel groups: home-based cardiac telerehabilitation or centre-based cardiac rehabilitation **Number of centres:** 2 **Country:** Spain **Dates patients recruited:** May 2019 to March 2020 **When randomised:** Participants were randomised and notified of allocation after baseline assessments. **Maximum follow-up:** 10 months
Participants	**Inclusion criteria:** Age 18-72 years old; all included patients had to meet low-risk criteria, left ventricular ejection fraction ≥ 50%, and have minimum smartphone usage skills. **Exclusion criteria:** Reduced mobility, pulmonary diseases, neoplasms, or cognitive impairment **N randomised:** Total 67; home-based telerehab: 33, centre-based: 34 **Method of assessment:** Symptom-limited CPET, heart rate, blood pressure, 12-lead ECG, gas exchange, blood samples (for cholesterol) were taken, weight, visceral fat, waist circumference measured. IPAQ. PREDIMED, HADS and EQ-5D-5L questionnaires **Diagnosis (% of pts):** **Previous AMI:** Telerehab: NSTEMI: 29%, STEMI: 41.9%. Centre-based: NSTEMI: 35.7%, STEMI: 42.9% **Previous CABG:** NR **ACS:** 100% **Age (mean ± SD):** Total: NR, telerehab: 57.5 ± 9 years, centre-based: 54.7 ± 9.9 years **Percentage male:** Total: NR, telerehab: 87.1%, centre-based: 96.4%

Dalli-Peydro 2022a *(Continued)*

	Ethnicity: NR
Interventions	Both groups were given the same education. The target heart rate during exercise sessions was 60%–80% of the heart rate reserve based on the baseline treadmill test. During follow-up, patients were instructed to engage in recommended moderate physical activity guided by Borg's rating of perceived exertion scale of 12–14 (6–20 scale), as well as strength exercises twice a week. Warm-up, stretching, and resistance-band exercises were included in both groups. **Home-based telerehab:** A portion of hospital training, comprising 2 weeks with four supervised sessions of exercise, was completed. Physical activity consisted of walking down a corridor, adjusting their pace to attain a target heart rate as measured by their smartphone and heart rate monitor (Polar H7). The smartphone application guided participants through a daily exercise and data entry programme for 10 months. **Time of start after event:** After hospital discharge **Components:** Predominantly exercise with suggestions re diet **Modality:** Walking and resistance exercise **Dose:** NR **Length of sessions:** NR **Frequency/no of sessions:** Walking - daily, resistance exercise - twice per week **Intensity:** 60-80% heart rate reserve from baseline treadmill assessment **Resistance training included?** Yes, twice per week. Resistance bands used **Total duration:** Hospital training for 2 weeks with 4 supervised sessions, followed by 10 months of daily exercise **Intermittent nurse or exercise specialist telephone support?** Healthcare team monitored web-page entries and communicated with patients if necessary. **Co-interventions:** **Centre-based:** 2 months of treatment with 16 sessions of supervised exercise. Physical activity consisted of routine workouts and aerobic cycling training. **Time of start after event:** After hospital discharge **Components:** Exercise only **Modality:** Routine workouts and aerobic cycling training. **Dose:** NR **Length of sessions:** NR **Frequency/no of sessions:** 16 sessions of supervised exercise over 2 months **Intensity:** 60-80% heart rate reserve from baseline treadmill assessment **Resistance training included?** Yes, twice per week. Resistance bands used **Total duration:** 16 sessions of supervised exercise over 2 months; 10-month follow-up **Intermittent nurse or exercise specialist telephone support?** NR **Co-interventions:** NR

Dalli-Peydro 2022a *(Continued)*

Outcomes	VLDL, LDL, HDL, N-acetyl galactosamine (GlycA) and N-acetylneuraminic acid (GlycB)
Notes	

Etemadifar 2021

Methods	Data from abstract only **Study design:** RCT **Number of centres:** 1 **Country:** NR **Dates patients recruited:** NR **When randomised:** NR **Maximum follow-up:** 8 weeks
Participants	**Inclusion criteria:** Acute myocardial infarction **Exclusion criteria:** NR **N randomised:** 100 **Method of assessment:** NR **Diagnosis (% of pts):** **Previous AMI:** 100% **Previous CABG:** NR **ACS:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	**Home-based (telerehab):** The application of cardiac rehabilitation with weekly monitoring, medication reminders, tests, exercise, warning in case of shortness of breath and fatigue and chest pain, increase or decrease in blood pressure and heart rate, family education, risk factors, and reducing smoking was implemented for 8 weeks. **Time of start after event:** NR **Components:** Exercise, education, monitoring **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no of sessions:** NR **Intensity:** NR

Etemadifar 2021 *(Continued)*

	Resistance training included? NR **Total duration:** 8 weeks **Intermittent nurse or exercise specialist telephone support?** Weekly monitoring but NR who was monitoring **Co-interventions:** NR **Centre-based:** Routine hospital training was performed. **Time of start after event:** NR **Components:** NR **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no of sessions:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** 8 weeks **Intermittent nurse or exercise specialist telephone support?** **Co-interventions:** NR
Outcomes	Physical activity, fatigue, dyspnoea, activity tolerance
Notes	

Takroni 2022

Methods	**Study design:** RCT, single-blind, 3-arm trial: home-based, outpatient-based or usual care control **Number of centres:** 1 **Country:** Saudi Arabia **Dates patients recruited:** 2015-2016 **When randomised:** After eligibility assessment and consent **Maximum follow-up:** 8 weeks
Participants	**Inclusion criteria:** Patients 4 to 6 weeks post–coronary artery bypass graft surgery who completed inpatient cardiac rehabilitation at King Faisal Specialist Hospital and Research Centre were invited to take part in the study. Participants were eligible if they were clinically stable as defined by the American College of Cardiology/American Heart Association. Only participants stratified as low-to-moderate risk as identified by the American College of Sport Medicine were included. **Exclusion criteria:** Participants were excluded from this study if they were pregnant, had an ejection fraction of less than 40% at rest (high risk as defined by American Association of Cardiovascular and Pulmonary Rehabilitation Stratification), were diagnosed with mental health disorders

Takroni 2022 *(Continued)*

	(such as anxiety or depression), or had any vision or hearing defects or any neurological, respiratory, or musculoskeletal conditions that have an impact on ambulation. **N randomised:** Total 82; outpatient: 28, home-based: 27, control: 27 **Method of assessment:** Physical function was assessed using the ISWT following the original standardised instructions as recommended by the American College of Sports Medicine. **Diagnosis (% of pts):** **Previous AMI:** NR **Previous CABG:** 100% **ACS:** NR **Age (mean ± SD):** Total: NR, outpatient: 54 ± 7.51 years. home-based: 57 ± 7.71 years, centre-based: 61 ± 7 years **Percentage male:** Outpatient: 80%, home-based: 83%, control: 79% **Ethnicity:** NR
Interventions	Participants in the intervention groups completed an individualised exercise programme for 2 hours, 3 times a week for 8 weeks. The control group followed usual care (no intervention). **Home-based:** The home-based cardiac rehabilitation intervention was supported by use of Physiotools (Tampere, Finland). Physiotools is a professional exercise software package that includes a library of exercises appropriate for cardiovascular (CV) rehabilitation. Participants in the home-based cardiac rehabilitation group were provided with a data sheet to record their exercise, a colour-coded printed file of Physiotools home exercise programme, and a Polar watch. **Time of start after event:** Patients 4 to 6 weeks post–coronary artery bypass graft surgery who completed inpatient cardiac rehabilitation at King Faisal Specialist Hospital and Research Centre were invited to take part in the study. **Components:** Exercise **Modality:** Aerobic exercise (circuit training, active recovery, using Physiotools) **Dose:** NR **Length of sessions:** Total 45 min: 15-min warm-up, 20-min progressive aerobic exercise, 10-min cool-down **Frequency/no of sessions:** 3 times/week for 8 weeks **Intensity:** Moderate: RPE 12–14, 60%–75% HRmax, Borg scale < 15 **Resistance training included?** NR **Total duration:** 8 weeks **Intermittent nurse or exercise specialist telephone support?** Yes, weekly Physiotherapist **Co-interventions:** NR **Centre-based (outpatient):** The outpatient-based cardiac rehabilitation group completed a supervised cardiac rehabilitation programme 3 times a week for 8 weeks. Each session included 15 minutes of warm-up exercises, 20 minutes of progressive aerobic exercises (10 stations and active recovery [AR] exercises that allow the participant to work at a slightly lower intensity within their training zone), and 10 minutes of cool-down exercises.

Takroni 2022 *(Continued)*

	Time of start after event: Patients 4 to 6 weeks post–coronary artery bypass graft surgery who completed inpatient cardiac rehabilitation at King Faisal Specialist Hospital and Research Centre were invited to take part in the study. **Components:** Exercise **Modality:** Aerobic exercise (circuit training, active recovery) **Dose:** NR **Length of sessions:** Total 45 min: 15-min warm-up, 20-min progressive aerobic exercise, 10-min cool-down **Frequency/no of sessions:** 3 times/week for 8 weeks **Intensity:** Moderate: RPE 12–14, 60%–75% HRmax, Borg scale < 15 **Resistance training included?** NR **Total duration:** 8 weeks **Intermittent nurse or exercise specialist telephone support?** NR **Co-interventions:** NR **Usual care (control);** The control group had no intervention programme. Based on current standard practice, all participants were given an instruction booklet that contains instructions and precautions about surgery, wound care and encouragement to be active.
Outcomes	Physical function: ISWT, METS, anxiety and depression (using Arabic version of HADS-A and HADS-D), QoL (Arabic version of SF-36)
Notes	

AHA/ACC = American Heart Association American College of Cardiology
AMI = acute myocardial infarction
AR = active recovery
BNP = brain natriuretic peptide
CABG = coronary artery bypass graft
CAD = coronary artery disease
CBCR = centre-based cardiac rehabilitation
CHF = chronic heart failure
CHS = Cardiovascular Health study frailty Score
CPET = cardiopulmonary exercise testing
CR = cardiac rehabilitation
CRP = C-reactive protein
CV = cardiovascular
DASI = Duke Activity Status Index
DM = diabetes mellitus
ECG = electrocardiogram
e/e = ratio between early mitral inflow velocity and mitral annular early diastolic velocity
eGFR = estimated glomerular filtration rate
EQ-5D-5L = EuroQol-5 Dimension health-related quality of life questionnaire
ESC = European Society of Cardiology
FEV_1 = forced expiratory volume in 1 second
FTND = Fagerstrom Test for Nicotine Dependence
GlycA = N-acetyl galactosamine
GlycB = N-acetylneuraminic acid
HADS = Hospital Anxiety and Depression Scale
HBCR = home-based cardiac rehabilitation

HDL = high-density lipoprotein
HF = heart failure
HR = heart rate
HR max = maximum heart rate
HRQoL = health-related quality of life
ICER = incremental cost-effectiveness ratio
ICT = information and communications technology
IPAQ = International Physical Activity Questionnaire
ISWT = Incremental Shuttle Walk Test
LDL = low-density lipoprotein
LVEF = left ventricular ejection fraction
MACE = major adverse cardiac events
METS = metabolic equivalent of task
MI = myocardial infarction
MIDAS = Myocardial Dimensional Assessment Scale
NR = not reported
NSTEMI = non-ST-elevation myocardial infarction
NT-proBNP = N-terminal pro brain natriuretic peptide
NYHA = New York Heart Association
Peak VO_2 = peak oxygen uptake
PHQ = Patient Health Questionnaire
PREDIMED = Prevencion Con Dieta Mediterranean Questionnaire
QALYs = quality-adjusted life years
QoL = quality of life
RCT = randomised controlled trial
RM = repetition maximum
RPE = rating of perceived exhaustion
SD = standard deviation
SF-36 = Short Form-36
STAI = State Trait Anxiety Inventory
STEMI = ST segment elevation myocardial infarction
TELE-CR = telerehabilitation cardiac rehabilitation
UAP = unstable angina pectoris
VE/VCO_2 slope = minute ventilation/carbon dioxide production
VLDL = very-low-density lipoprotein
VO_2 max = maximum oxygen uptake

Characteristics of ongoing studies *[ordered by study ID]*

ChiCTR2100050467

Study name	The effect of home-based cardiac rehabilitation on senile coronary heart disease patients' frailty
Methods	**Study design:** RCT with 2 parallel groups: home-based telerehabilitation or centre-based routine rehabilitation **Number of centres:** NR **Country:** China **Dates patients recruited:** NR - ongoing **When randomised:** NR **Maximum follow up:** NR
Participants	**Inclusion criteria:** Aged over 65 years CHS frailty scale score >= 1 point Meet the diagnostic criteria for coronary heart disease in the health industry standards issued by the Ministry of Health, and meet one of the following: (1) Typical clinical symptoms, ECG and myocardial marker monitoring comply with the diagnostic and treatment guidelines issued by the International Society and Society of Cardiology (ISFS) and the World Health Organization (WHO);

ChiCTR2100050467 *(Continued)*

	(2) Selective coronary angiography with 1 or more major coronary artery stenosis >= 50%; (3) Typical symptoms of angina pectoris or a clear history of old myocardial infarction. In the stable disease stage (the condition or symptoms will not change easily within a certain period of time). No language barriers Those who are informed and willing to participate, have good compliance, and are willing to cooperate with the follow-up work and rehabilitation treatment plan after discharge The patient has a smartphone and can use it properly. **Exclusion criteria:** Intermediate and high-risk patients, such as large-area myocardial infarction, malignant arrhythmia, cardiogenic shock, etc. Peripheral vascular disease, renal insufficiency, malignant tumour, anaemia, severe lung disease, etc. Bone and joint diseases that affect movement Those who have participated in cardiac rehabilitation exercise **N randomised:** Target: home-based: 60, centre-based: 60 **Method of assessment:** **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	**Control group (centre-based) routine rehabilitation** **Home-based tele-rehabilitation**
Outcomes	**Primary outcome:** Cardiac function status **Secondary outcomes:** Activity in daily life, readmission rate, number of adverse cardiac events, rehabilitation treatment compliance, quality of life, psychological states
Starting date	27.08.2021
Contact information	Name: Zheng Yan Address: 1 Zhifangwenhua Avenue, Jiangxia District, Wuhan, Hubei Telephone: +86 13638636562 Email: 717579806@qq.com Affiliation: The First People's Hospital of Jiangxia District
Notes	NR

IRCT20191117045462N8

Study name	Comparison of home based and supervised cardiac rehabilitation program on physical activity in myocardial infarction - IV patients
Methods	**Study design:** RCT, single-blinded, with 2 parallel groups: home-based or supervised clinical rehabilitation **Number of centres:** 1 **Country:** Pakistan **Dates patients recruited:** NR but completed. **When randomised:** NR **Maximum follow up:** NR
Participants	**Inclusion criteria:** Males and females aged over 18 years. Myocardial infarction-IV. Able to provide consent to abide by treatment **Exclusion criteria:** Pregnancy, unstable angina, any respiratory disease, myocardial infarction-I or II or III, rib fracture, red flags such as fever, night sweats, malaise **N randomised:** target sample size = 34 **Method of assessment:** Pulse oximeter (for oxygen saturation and heart rate), sphygmomanometer (for blood pressure measurement), accelerometer (for energy expenditure), International physical activity questionnaire (IPAQ -for self-reported physical activity) **Diagnosis (% of pts):** NR **NYHA II:** NR **Age (mean ± SD):** NR **Percentage male:** NR Ethnicity: NR
Interventions	**Home-based:** Home-based rehabilitation programme in individuals with myocardial infarction IV **Time of start after event:** NR **Components:** NR **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** NR **Intensity:** NR **Resistance training included:** NR **Total duration:** NR **Intermittent nurse of exercise specialist telephone support:** NR **Co-interventions:** NR **Centre-based:**Supervised clinical rehabilitation for individuals with myocardial infarction IV **Time of start after event:** NR **Components:** NR **Modality:** NR

IRCT20191117045462N8 *(Continued)*

	Dose: NR **Length of sessions:** NR **Frequency/no. sessions:** NR **Intensity:** NR **Resistance training included:** NR **Total duration:** NR **Intermittent nurse of exercise specialist telephone support:** NR **Co-interventions:** NR
Outcomes	**Primary outcomes:** heart rate, oxygen saturation, blood pressure **Secondary outcomes:** Energy expenditure, IPAQ
Starting date	09.05.2022
Contact information	Name: Wajeeha Zia Address: 28-M,Quaid-e Azam, Industrial Estate kot Lakhpat, Lahore 54000 Lahore Pakistan Telephone: +92 42 35126110 Email: wajeeha_z@yahoo.com Affiliation: Riphah International University
Notes	

IRCT20201028049181N1

Study name	Evaluation and comparison of two methods of cardiac rehabilitation, (at home and advanced cardiac rehabilitation in hospital) in terms of controlling risk factors and the status of cardiac indices in patients that are candidates for cardiac rehabilitation
Methods	**Study design:** RCT, single-blind, 2 parallel groups: home-based rehabilitation or centre-based routine rehabilitation **Number of centres:** 1 **Country:** Iran **Dates patients recruited:** NR - ongoing **When randomised:** After baseline discussion about home and centre-based rehabilitation **Maximum follow-up:** 2 months rehabilitation, 6 month follow-up
Participants	**Inclusion criteria:** Patients with heart failure, post-Coronary Artery Bypass Grafting (CABG), post-myocardial infarction (MI), ischaemic heart disease (IHD) who are candidates for cardiac rehabilitation

IRCT20201028049181N1 *(Continued)*

	Exclusion criteria: Lesion at left main (LM) artery; lesion at ostium of Left Circumflex Artery(LCX); patients who have had life-threatening arrhythmias in the past month; patients with stage 4 heart failure lesion at left anterior descending artery (LAD); dementia Male or female. No minimum or maximum age limit **N randomised:** Target sample size = 260 **Method of assessment:** Beck questionnaire (for depression score), Spielberger questionnaire (for anxiety score), blood sugar, automatic chemistry analyzer model "BIOTECNICA BT 3500" ~ (for dyslipidemia), Macnew questionnaire (for quality of life), METS (for exercise capacity), frequency of smoking, mercury sphygmomanometer (for blood pressure), incidence of myocardial infarction (via questionnaire) **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	**Home-based:** This group includes patients undergoing cardiac rehabilitation at home. Rehabilitation includes designing and implementing exercise programme and nutritional, psychological and occupational counselling and controlling the risk factors of cardiovascular disease. Most patients, except those who have had a recent heart attack, undergo a limited exercise test before starting rehabilitation to determine the baseline capacity of each patient. **Time of start after event:** NR **Components:** Exercise, psychological, nutritional and occupational counselling **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** 3 times/week (first 3 at hospital, then at home) **Intensity:** NR **Resistance training included:** NR **Total duration:** 2 months **Intermittent nurse or exercise specialist telephone support:** NR **Co-interventions:** NR **Centre-based:**Routine rehabilitation in the hospital. Rehabilitation performed in accordance with the latest available standards, including the design and implementation of an exercise programme and psychological and nutritional counselling and control of risk factors such as smoking and hypertension and lipid profile. Most patients, except recent "myocardial infarction" patients, undergo symptom-limited exercise testing before beginning rehabilitation to identify important symptoms, arrhythmia, or ischaemia that require intervention before exercise and to determine the person's basic athletic capacity and maximum heart rate. **Time of start after event:** NR **Components:** Exercise, psychological and nutritional counselling **Modality:** NR **Dose:** NR **Length of sessions:** NR

IRCT20201028049181N1 *(Continued)*

	Frequency/no. sessions: 3 times/week **Intensity:** NR **Resistance training included:** NR **Total duration:** 2 months **Intermittent nurse or exercise specialist telephone support:** NR **Co-interventions:** NR
Outcomes	**Primary outcomes:** Depression, anxiety, fasting blood sugar, dyslipidaemia, quality of life, exercise capacity, frequency of smoking, blood pressure.**Secondary outcomes:** Incidence of myocardial infarction
Starting date	17.02.21
Contact information	Name: Fereshteh Sattar Address: Unit3, Building num.3, Mojtama kohsar Ave, Kohsar St, Parvin St, Esfehan 8199874798 Esfehan Iran (Islamic Republic of) Telephone: +98 31 3228 6439 Email: fereshte_sattar@yahoo.com Affiliation: Esfahan University of Medical Sciences
Notes	NR

IRCT20210509051235N1

Study name	Evaluation and designing a home-based cardiac rehabilitation in myocardial infarction patients based on health action process approach
Methods	**Study design:** RCT, non-blinded, parallel groups: home-based (including use of android application based on the health action process approach), or centre-based rehabilitation. **Number of centres:** 1 **Country:** Iran **Dates patients recruited:** NR - ongoing. Target sample size = 165 **When randomised:** NR **Maximum follow-up:** 6 months
Participants	**Inclusion criteria:** Patients with myocardial infarction with any diagnosis and treatment. High risk people with a doctor's diagnosis.

IRCT20210509051235N1 *(Continued)*

	Having a licence from your doctor to participate in a cardiac rehabilitation program at home. Having a mobile phone or tablet (Android) to receive the application (patient or a family member living with her). Willingness to participate in the study. Have a minimum literacy **Exclusion criteria:** Mental dysfunction, musculoskeletal disorder, lack of application and discontinuing programmes in the educational process No minimum or maximum age limit. Male or female **N randomised:** NR. Target sample size = 165 **Method of assessment:** 6-minute walk test, IPAQ, flow mediated dilation, HADS **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	**Home-based:** group receives a home-based cardiac rehabilitation programme under the Android application based on the health action process approach for 8 weeks **Time of start after event:** NR **Components:** NR **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** NR **Intensity:** NR **Resistance training included:** NR **Total duration:** 8 weeks **Intermittent nurse or exercise specialist telephone support:** Android app. **Co-interventions:** NR **Centre-based:** This group receives the usual cardiac rehabilitation programmes at the hospital. **Time of start after event:** NR **Components:** NR **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** NR **Intensity:** NR **Resistance training included:** NR **Total duration:** 8 weeks **Intermittent nurse or exercise specialist telephone support:** NR

IRCT20210509051235N1 *(Continued)*

	Co-interventions: NR
Outcomes	**Primary outcomes:** functional capacity score, physical activity score in IPAQ, endothelial function of the heart **Secondary outcomes:** anxiety and depression score
Starting date	06.11.2021
Contact information	Name: Zahra Fallah Address: Shaheed ardestani Blvd, Shahid Babaei Air Base 8164173375 Isfahan Iran (Islamic Republic of) Telephone: +98 31 3577 3002 Email: zfallah88@yahoo.com Affiliation: Esfahan University of Medical Sciences
Notes	

ISRCTN18022985

Study name	Implementation and evaluation of a telemedicine-based service to support "e-supervised" regime in Phase II Cardiac Rehabilitation Programs: a randomised controlled trial
Methods	**Study design:** RCT, 2 groups: home-based telemedicine system or centre-based (on-site supervision at rehabilitation unit) **Number of centres:** 1 **Country:** Spain **Dates patients recruited:** 1/10/2014 until 30/11/2017. 256 enrolled **When randomised:** Following informed consent **Maximum follow-up:** 12 months
Participants	**Inclusion criteria:** Patients requiring phase II cardiac rehabilitation at the centre due to ischaemic heart disease (myocardial infarction, percutaneous or surgical revascularisation); operated valvular heart disease or mixed heart surgery. Patients able to commit to the demands of the trial: the ability to understand, read and write the Spanish language, cognitive and manual ability to use the technological devices intended for the study. Patients who agree to participate in the study (sign oral or written informed consent). Patients who have internet access at home **Exclusion criteria:** Severe injury of three vessels not appropriate for revascularisation, angina/severe ischaemia in provocation tests, severe arrhythmia, severe Left ventricle dysfunction (EF < 30%), musculoskeletal diseases or limited walking, arterial insufficiency of the lower limbs, age > 75 years, any type of

ISRCTN18022985 *(Continued)*

	physical or mental disability that prevents the use of technological devices in the system and not have family support or otherwise. Male or female **N randomised:** NR. Target recruitment = 256. Completed **Method of assessment:** Functional capacity via a ramp exercise protocol, echocardiogram, smoking status, cholesterol, blood pressure, glucose, glycated Hb, Beck depression score, state trait anxiety inventory (STAI) anxiety score, EQ-5D-5L, employment status, patient records (complications, mortality), Likert scale for motivation and satisfaction, system usability scale **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	Both groups follow a phase II cardiac rehabilitation programme; they are monitored for 8 weeks. After that, both groups continue unattended rehabilitation for 12 months (first year of phase III of cardiac rehabilitation). At the end of the first eight weeks, an intermediate visit is carried out in order to analyse the effectiveness during phase II (main and secondary outcomes). At the end of the last 12 months, all of them have a final visit for data collection (secondary outcomes). During phase II, systematic rehabilitation activities are carried out, limited in time (around eight weeks), in multiple areas: physical (resistance and strength); psychological (anxiety control, relaxation); education in cardiovascular risk factor control (medication, life habits); return to work; sexual dysfunction; amongst others. The activities are programmed in relation to their scope and intensity, according to the patient's conditions and a stratification of cardiovascular risk (usually low, medium and high risk) and the units' own capacities and resources. **Home-based (telemedicine):** Supervision is by telemedicine system. **Time of start after event:** NR **Components:** resistance physical rehabilitation components (walking sessions); psychological rehabilitation components (relaxation sessions in 5 modalities); multimedia educational program (12 educational environments and 70 resources); web messaging with guaranteed response in less than 24h (from both, the healthcare and the technical support teams); video call; and discussion forums **Modality:** Exercise -walking **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** NR **Intensity:** The activities are programmed in relation to their scope and intensity, according to the patient's conditions and a stratification of cardiovascular risk (usually low, medium and high risk) and the units' own capacities and resources. **Resistance training included:** Yes **Total duration:** 8 week intervention (60 week follow-up) **Intermittent nurse or exercise specialist telephone support:** virtual assistant service and messaging system for health professional/patient use **Co-interventions:** NR **Centre-based:** On-site supervision in the rehabilitation unit **Time of start after event:** NR **Components:** physical, psychological, education

ISRCTN18022985 *(Continued)*

	Modality: NR **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** NR **Intensity:** The activities are programmed in relation to their scope and intensity, according to the patient's conditions and a stratification of cardiovascular risk (usually low, medium and high risk) and the units' own capacities and resources. **Resistance training included:** Yes **Total duration:** 8-week intervention (60 week follow-up) **Intermittent nurse or exercise specialist telephone support:** NR **Co-interventions:** NR
Outcomes	**Primary outcomes:** Functional capacity (METS) **Secondary outcomes:** Improvement in functional capacity, LVEF, cardiovascular risk factors, depression score, anxiety score, quality of life score (EQ-5D-5L), individualised treatment (psychological/psychiatric), employment, complications, motivation, self-reported satisfaction with the programme, usability of the system
Starting date	07.12.2020
Contact information	Name: Mario Pascual Carrasco Address: Instituto de Salud Carlos III / Carlos III Health Institute Unidad de Investigación en Salud Digital / Digital health Research Area Pabellón 14, Dpcho 14.01.0006 / Pavilion 14th, Office 14.01.00 28029 Madrid Spain Telephone: +34 918 222 119 Email: mario.pascual@isciii.es Affiliation: NR
Notes	NR

JPRN-UMIN000045024

Study name	TELE cardiac REHAbilitation system using tele-nursing with apple watch - a large prospective randomized study - TELE-REHA Trial
Methods	**Study design:** RCT, parallel groups: centre-based (outpatient), home-based (remote) cardiac rehabilitation or non-cardiac rehabilitation **Number of centres:** NR

JPRN-UMIN000045024 *(Continued)*

	Country: Japan **Dates patients recruited:** NR - target sample size = 600 **When randomised:** NR **Maximum follow-up:** NR
Participants	**Inclusion criteria:** Aged 18 to 90 years. Male or female **Exclusion criteria:** AMI, UAP, pregnancy or nursing, uncontrolled arrhythmia, uncontrolled atrial fibrillation, uncontrolled heart failure, acute pulmonary thromboembolism, acute myocarditis, acute aortic dissection, difficulty walking, lack of mental capacity, pacemaker, implantable cardioverter-defibrillator, others **N randomised:** NR **Method of assessment:** NR **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	**Home-based:** remote cardiac rehabilitation **Centre-based:** outpatient cardiac rehabilitation **Non-cardiac rehabilitation** No other details reported for interventions
Outcomes	**Primary outcomes:** All death, cardiovascular events **Secondary outcomes:** Ejection fractions, ratio between early mitral inflow velocity and mitral annular early diastolic velocity (e/e'), brain natriuretic peptide (BNP), c-reactive protein (CRP), PeakVO2, VE/VCO2 slope, muscular mass, EQ5D, ICER
Starting date	10.08.2021
Contact information	Name: Atsuko Nakayama Address: Asahi-Chou, Fuchu-City Telephone: +81423143111 Email: atsukonakanaka@gmail.com Affiliation: Sakakibara Heart Institute Cardiac Rehabilitation Department
Notes	

KCT0006385

Study name	A comparative study assessing the secondary prevention effects between center-based vs. home-based cardiac rehabilitation in patients with LV dysfunction: a prospective randomized, open, parallel, multicenter study
Methods	Data from trial registration only **Study design:** A prospective randomised, open, parallel-group study: home-based or centre-based **Number of centres:** 10 **Country:** Republic of Korea **Dates patients recruited:** Not recruited yet **When randomised:** NR **Maximum follow-up:** 24 months
Participants	**Inclusion criteria:** Male or female patients aged 18-75 who had a history of recent admission in 6 months for 1) congestive heart failure (LVEF = 40%), or 2) acute myocardial infarction with enhanced risk factors *enhanced risk factors of MI: DM, history of old myocardial infarction, history of congestive heart failure, old stroke, peripheral artery obstructive disease, Killip class 2, left main disease or coronary artery multivessel disease, LVEF = 40% **Exclusion criteria:** 1) exercise is impossible or very difficult 2) high risk for exercise: ventricular arrhythmia or hypotension during basic cardiopulmonary exercise test 3) chronic kidney disease stage 4 (eGFR < 30 mL/min/1.73 m^2) 4) active infection 5) active cancer 6) long term treatment of immune-suppressive drugs or steroids 7) congestive heart failure class 4 8) genetic disorders such as familial hypercholesterolaemia 9) life expectancy < 2 yrs due to accompanied disease 10) patients already participated in another RCT (randomised controlled trial) **N randomised:** Not recruited yet **Method of assessment:** NR **Diagnosis (% of pts):** Not recruited yet **Previous AMI:** NR **Previous CABG:** NR **ACS:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	CR will be carried out either in the hospital (centre-based CR: CBCR) or at home (home-based CR: HBCR). And for each CR, two types of CR, i.e. exercise-based CR and comprehensive CR (addition of diet/nutrition and psychological counselling to exercise-based CR) will be applied (2 x 2 factorial design). Therefore, each patient, after randomisation, will participate in one of the 4 types of CR: 1) exercise-based CBCR, 2) comprehensive CBCR, 3) exercise-based HBCR, 4) comprehensive HBCR.

KCT0006385 *(Continued)*

Each CR programme is composed of phase 2 CR (first 12 weeks) and phase 3 CR (4-24 months): Phase 2 CR is a programme where intensive intervention will be performed, and phase 3 CR is designed for a maintenance programme.

Home-based:

Central CR team, composed of specialists in the field of diet, psychology, and physical exercise, will provide an intervention for all components of HBCR (exercise, diet, psychology).

Time of start after event: NR

Components: Exercise, diet, psychology

Modality: aerobic and resistance exercise (using body weight)

Dose: NR

Length of sessions: aerobic 30-60 min plus 20-min resistance exercise

Frequency/no of sessions: 6 sessions of exercise (2 times of face-to-face group practice at hospital + 6 times of contact-free exercise training through telephone/mobile video calling). Dietary intervention during phase 2 CR provides contact-free dietary counselling (5 times) based on AHA/ACC and ESC guideline after analysing dietary patterns through food frequency questionnaire.

Intensity: 40-80% heart rate reserve

Resistance training included? Yes

Total duration: 12-week intervention, 24-month follow-up

Intermittent nurse or exercise specialist telephone support? Yes

Co-interventions: NR

Centre-based:

Central CR team, composed of specialists in the field of diet, psychology, and physical exercise, will provide an intervention for all components of diet/psychological intervention in comprehensive CBCR.

Time of start after event: NR

Components: Exercise

Modality: NR

Dose: NR

Length of sessions: NR

Frequency/no of sessions: Maximum 36 sessions

Intensity: NR

Resistance training included? NR

Total duration: 12-week intervention, 24-month follow-up

Intermittent nurse or exercise specialist telephone support?

Co-interventions: NR

Outcomes	Primary outcomes: A composite of total death, sudden cardiac death, nonfatal MI, nonfatal stroke, revascularisation [percutaneous coronary intervention, coronary artery bypass graft surgery], hospitalisation due to cardiovascular cause, cardiac transplantation

KCT0006385 *(Continued)*

	Secondary outcomes: Compliance, exercise capacity (VO_2 max, 6-minute walking test), hospital admission, HRQoL, drug compliance, economic efficiency, diabetic complications
Starting date	27.07.21
Contact information	Name: Sae seul IM Address: 1071 Anyangcheon-ro, Yangcheon-gu, Seoul 07985, Republic of Korea Telephone: +82-2-2650-5748 Email: dlato@ewhain.net Affiliation: Ewha Womans University Medical Center
Notes	

NCT04938661

Study name	Improving cardiac rehabilitation outcomes through mobile case management (iCARE)
Methods	**Study design:** RCT, 3 parallel groups: home-based, centre-based or centre-based + mHealth **Number of centres:** 1 **Country:** USA **Dates patients recruited:** Ongoing. Target recruitment sample size = 333 **When randomised:** At identification of eligibility for participation **Maximum follow-up:** 3 months on completion of rehabilitation programme. Additional follow-up at 12 months
Participants	**Inclusion criteria:** Aged 18 to 80 years, male or female. Own or have reliable access to a smartphone or desktop computer with internet access and email address. History of one of the following; acute myocardial infarction/acute coronary syndrome, stable angina pectoris, percutaneous coronary intervention, or heart failure. Patients who have undergone a surgical procedure which includes an indication for cardiac rehabilitation (coronary artery bypass surgery, heart valve repair/replacement, or heart transplant).**Exclusion criteria:** Patients referred to cardiac rehab with ventricular assist devices. **N randomised:** NR **Method of assessment:** VO2 peak, no. rehospitalisations, body weight, fasting bloods, 6-minute walk test, IPAQ, DASI questionnaire, food frequency questionnaire, PHQ-9, Dartmouth 9-item Short Health Survey **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR

NCT04938661 *(Continued)*

	Age (mean ± SD): NR **Percentage male:** NR **Ethnicity:** NR
Interventions	Arm 1 consists of patients randomised to conventional cardiac rehab only, Arm 2 consists of patients randomised to conventional cardiac rehab with the addition of the mHealth platform, and Arm 3 consists of patients randomised to remote case management using the mHealth platform only. Clinical metrics will include traditional cardiovascular risk factors with additional tracking of service utilisation and adherence, and quality of life. Measures will be made at baseline (pre-intervention) and ~3-months (coinciding with completion of conventional CR). Additional follow-up will occur at 12 months post-CR entry. **Home-based:** Participants will be provided paper copies of educational content at the time of event/discharge. In addition, these participants will be provided access to the same mHealth platform as the CON+ group. Participants in this group will be encouraged to exercise three days per week while also completing the additional questionnaires and educational content provided by the mHealth platform in accordance with the CR programme. Participation will be tracked using web/internet analytics. **Time of start after event:** NR **Components:** Comprehensive rehabilitation (exercise, education, psychological + mobile health platform/social network/personal health data tracker). **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** 3 times/week **Intensity:** NR **Resistance training included:** NR **Total duration:** 3 months **Intermittent nurse or exercise specialist telephone support:** Tracking via web analytics **Co-interventions:** NR **Centre-based:** Participants will be prescribed 36 sessions of centre-based CR. This includes supervised exercise sessions, cooking demonstrations, didactic lectures, video presentations, group support, and stress management education. During sessions, participants have direct access to the medical director, case manager, registered nurse, exercise physiologist, and stress management specialists. **Time of start after event:** NR **Components:** Comprehensive rehabilitation (exercise, education, psychological) **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** 3 times/week **Intensity:** NR **Resistance training included:** NR **Total duration:** 3 months

NCT04938661 *(Continued)*

	Intermittent nurse or exercise specialist telephone support: NR **Co-interventions:** NR **Centre-based + mHealth:** Participants will be prescribed 36 sessions of centre-based CR as noted above. In addition, participants will be provided access to the mHealth platform which provides "e-Learning modules" with factsheets, videos, quizzes, and questionnaires (coinciding with activities being conducted during the CON programme); a Social Network Module will allow patients to communicate via secure network with other patients who are part of their invited network. The Social Network Module also allows for secure two-way interaction with healthcare providers in the event that patients are experiencing signs or symptoms suggestive of a worsening condition. This platform also contains a Personal Health Record Module allowing patients to upload, archive, and retrieve personal health data (e.g. fitness tracker data, heart rate monitor data, blood pressure recordings, etc.) and record vital signs, symptoms, treatments, and medical history. **Time of start after event:** NR **Components:** Comprehensive rehabilitation (exercise, education, psychological + mobile health platform/social network/personal health data tracker). **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** 3 times/week **Intensity:** NR **Resistance training included:** NR **Total duration:** 3 months **Intermittent nurse or exercise specialist telephone support:** NR **Co-interventions:** NR
Outcomes	**Primary outcomes:** Functional capacity (VO2 peak), number of participants rehospitalised during the trial **Secondary outcomes:** Change in body weight, fasting basic lipid profile, fasting blood glucose, fasting haemoglobin, fasting Haemoglobin A1C, exercise capacity (6-min walk test), self-reported physical activity, dietary patterns and quality of life
Starting date	24.06.2021
Contact information	Contact: Thomas P Olson, Ph.D., M.S. 507-284-4441 olson.thomas2@mayo.edu Contact: Monica L Olson 507-255-2649 olson.monica2@mayo.edu
Notes	

NCT05019157

Study name	Cardiac telerehabilitation effectiveness using wearable sensors (TELE-WEAR)
Methods	**Study design:** RCT, single blind, 3 parallel groups: home-based (tele-rehabilitation): n=34, centre-based: n=34 and usual care control group: n=34 **Number of centres:** NR **Country:** Greece **Dates patients recruited:** NR **When randomised:** NR **Maximum follow-up:** 12 weeks on completion of the intervention. Additional 6 month follow-up.
Participants	**Inclusion criteria:** adults aged ≥18 years stable cardiovascular disease ; acute coronary syndrome; coronary artery bypass grafting within the previous six months, ability to perform physical exercise, to speak, read and write Greek, possession of a mobile phone/smartphone, internet access at home **Exclusion criteria:** ventricular arrhythmia or myocardial ischemia during low to moderate exercise intensity as assessed by symptom limited exercise testing at baseline heart failure New York Heart Association (NYHA) class IV, comorbidity precluding exercise training (e.g. orthopaedic, neurological or cognitive conditions), acute myocardial infarction (within two days), stenosis, unstable angina, uncontrolled atrial or ventricular arrhythmia, aortic uncontrolled congestive heart failure, acute pulmonary embolism, acute myocarditis or pericardial effusion, uncontrolled diabetes mellitus (Type I, II), hemodynamic instability or exercise-induced arrhythmia in baseline (initial) assessment, severe obstructive respiratory disease **N randomised:** NR **Method of assessment:** CPET, accelerometer, IPAQ, HRQoL questionnaire, QALYs, EuroQol-5D, ICER, adherence monitored through number of completed training sesssion and using polar flow web app, HADS, Smoking cessation using fagerstrom Test for Nicotine Dependence (FTND) **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	**Home-based:**Participants will undertake the first three training sessions in the outpatient clinic for familiarization with the training modalities, the wearable sensors and the data uploading. Afterwards, the participants will proceed with the telerehabilitation program at their homes. The participants will be lent the wearable sensors and will undergo an exercise - based program 3 times/week, comprising of 10' warm up exercises, 40' aerobic, resistance, balance exercises and 10' cool down.Training sessions will be monitored, in real time, by the study investigator. Participants should upload the recorded data to Polar Flow web platform after every training session and should visit the outpatient clinic every month to upload the accelerometry's recorded data to a secure personal computer) application. Educational and informational videoconferences will be held every week for upright training exercise sessions, physical activity counseling, diet/nutritional and smoking cessation counseling. **Time of start after event:** NR **Components:** Exercise and education. **Modality:** NR **Dose:** NR

NCT05019157 *(Continued)*

Length of sessions: 60 min

Frequency/no. sessions: 3 times/week

Intensity: NR

Resistance training included: NR

Total duration: 12 weeks

Intermittent nurse or exercise specialist telephone support: Training monitored in real time by study investigator.

Co-interventions: NR

Centre-based: Participants will attend an exercise - based cardiac rehabilitation program at the outpatient clinic's facilities under the supervision of cardiac rehabilitation specialized staff. The participants will receive an individually tailored training program on a treadmill or a cycle ergometer. Total training attendance rate will be documented by the cardiac rehabilitation centre staff. Patients will be instructed to wear a tri - axial accelerometer during the entire 12 weeks study period. Participants should upload recorded data to the local server every month. Educational videoconferences will be held every week for physical activity counseling, diet/nutritional and smoking cessation counseling.

Time of start after event: NR

Components: Exercise and education.

Modality: treadmill or cycle ergometer, resistance and balance exercise too.

Dose: NR

Length of sessions: 60 min

Frequency/no. sessions: 3 times/week

Intensity: NR

Resistance training included: Yes.

Total duration: 12 weeks

Intermittent nurse or exercise specialist telephone support: NR

Co-interventions: NR

Usual care:

Patients will not undertake any exercise based intervention and will only follow their usual medication treatment. The patients will wear the accelerometer for the 12 week study duration and visit the corresponding outpatient cardiac clinic every 4 weeks to upload the recorded data. The patients will also receive educational phone videoconference sessions every week for physical activity, diet/nutritional and smoking cessation counseling.

Outcomes	**Primary outcomes:** Change in the levels of physical fitness (VO2peak) **Secondary outcomes:** Change in the levels of physical activity (daily physical activity - high and low intensity steps), change in QoL, cost-effectiveness, adherence, change in level of anxiety and depression, change in smoking behaviour
Starting date	24.08.2021
Contact information	Varsamo Antoniou, PhD student +306944635309

NCT05019157 *(Continued)*

	varsamoantoniou@uth.gr
Notes	

NCT05201976

Study name	A clinical trial investigating the effects of a Virtually Implemented Home Based Cardiac Rehab Program With Real-time, Video-based Exercise Supervision and Vitals Monitoring
Methods	**Study design:** RCT, parallel groups: home-based (virtual) or centre-based cardiac rehabilitation **Number of centres:** NR **Country:** USA **Dates patients recruited:** NR - target sample size = 225 **When randomised:** NR **Maximum follow-up:** 27 months
Participants	**Inclusion criteria:** Patients who have been prescribed cardiac rehabilitation as part of their standard of care, aged 18 years or over. Male or female **Exclusion criteria:** Patients with significant exercise limitations other than cardiovascular disease. Patients who are unable to exercise at home. Patients with active cancer treatment. Patients who do not have an email address or a cell phone **N randomised:** NR **Method of assessment:** VO2max, blood pressure, bloods, MACE, QoL **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	**Home-based (virtual) cardiac rehabilitation** **Centre-based (standard of care in person) cardiac rehabilitation** No other information provided
Outcomes	**Primary outcomes:** Change in VO2 max (ml/kg/min) **Secondary outcomes:** Blood pressure, change in triglycerides, LDL and HDL, attendance, MACE, QoL
Starting date	05.12.2021
Contact information	Name: Kimberly Clinton Address: NR Telephone:

NCT05201976 *(Continued)*

	215-662-2803 Email: kimberly.clinton@pennmedicine.upenn.edu Affiliation: NR
Notes	

NCT05264701

Study name	Investigation of the Effects of the Technology-based Cardiac Rehabilitation Program in Coronary Artery Patients
Methods	**Study design:** RCT, 3 parallel groups: home-based (including use of a phone app), supervised exercise training group or control group (physical activity recommendations for home) **Number of centres:** NR **Country:** Turkey **Dates patients recruited:** NR - target sample size = 90 **When randomised:** NR **Maximum follow-up:** 12-week intervention. Additional 24-week follow-up
Participants	**Inclusion criteria:** Aged 40 to 70 years, male or female. Patients with coronary artery disease, access to the online programme, volunteering to participate in the research, having an iOS or Android operating system compatible phone **Exclusion criteria:** Having a musculoskeletal problem, uncontrolled hypertension, chronic heart failure (NYHA III-IV), history of acute coronary syndrome or surgical revascularisation less than 12 months ago, more than 50% occlusion on the main coronary artery, arrhythmia **N randomised:** NR **Method of assessment:** incremental shuttle walk test, number of sessions attended, cardiovascular stress test, dynamometer, echocardiography, blood pressure, health lifestyle behaviours scale-II, MIDAS, SF-36 **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	**Home-based:** Exercise training for 12 weeks will be given over the developed phone application. **Supervised exercise training:** Exercise training for 12 weeks will be given by video talk accompanied by a physiotherapist. **Control:** The programme will consist of 12 weeks of physical activity recommendations.

NCT05264701 *(Continued)*	
	No other information provided
Outcomes	**Primary outcomes:** Exercise capacity, participation **Secondary outcomes:** Maximal effort capacity, peripheral muscle strength, endothelial function, HRQoL (MIDAS), QoL (SF-36)
Starting date	03.03.2022
Contact information	Contact: Dilara Saklica, MSc +903123051576 ext 178 dilarasaklica@gmail.com Hacettepe University Ankara, Turkey, 06100
Notes	

NCT05270993	
Study name	An Integrative Cardiac Rehabilitation Employing Smartphone Technology (iCREST)
Methods	**Study design:** RCT, single-blind, 2 parallel groups: home-based (including I-CREST application and smartwatch) or centre-based rehabilitation **Number of centres:** NR **Country:** Singapore **Dates patients recruited:** Ongoing. Target recruitment = 124 **When randomised:** NR **Maximum follow-up:** 6 weeks on completion of intervention. Additional follow-up at 3 and 6 months post-intervention
Participants	**Inclusion criteria:** Aged 21 years or older, male or female. Have a confirmed medical diagnosis of acute MI, are planning to be discharged to home, do not intend to join any other CR programmes offered by other institutions, use smart mobile phone in their daily lives frequently and who have the basic knowledge of app use; and able to speak and understand English or Chinese. **Exclusion criteria:** Have suffered severe complications such as uncontrolled arrhythmias, heart failure with ejection fraction (EF) < 40%, are scheduled for coronary artery bypass grafting (CABG), have undergone cancer treatment, and other illnesses that will limit participation, have readmission plans for further revascularisation, have implanted devices, have a known history of major psychiatric illness, have pre-existing mobility problems, and have major reading and/or hearing difficulties **N randomised:** NR **Method of assessment:** Completion, cardiac Self-efficacy Scale, EQ5D-5L, MIDAS, HADS, Exercise goal setting scale, Medication adherence report scale -5, Medical Outcomes Study Social Support Survey (MOS-SSS), 6-minute walk test, medical history from patient record, patient reported smoking status **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR

NCT05270993 *(Continued)*

	Age (mean ± SD): NR **Percentage male:** NR **Ethnicity:** NR
Interventions	**Home-based:** A 6-week home-based, remote supervision, cardiac rehabilitation programme with an I-CREST application and smartwatch. Participants will also receive all the usual nursing, medical and follow-up service provided by the hospital. **Time of start after event:** NR **Components:** Exercise, education, medication reminders, physical activity tracker, vital monitoring **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** NR **Intensity:** Target heart rate - moderate. **Resistance training included:** NR **Total duration:** 6 weeks **Intermittent nurse or exercise specialist telephone support:** Research nurse will remotely monitor patient on I-CREST app. Nursing and medical services provided as normal (usual care) **Co-interventions:** NR **Centre-based:** A 4-week centre-based outpatient cardiac rehabilitation programme. Participants will also receive all the usual nursing, medical and follow-up service provided by the hospital. **Time of start after event:** NR **Components:** Exercise, counselling, education **Modality:** NR **Dose:** NR **Length of sessions:** NR **Frequency/no. sessions:** 12 sessions over 4 weeks. **Intensity:** Target heart rate - moderate. **Resistance training included:** NR **Total duration:** 4 weeks **Intermittent nurse or exercise specialist telephone support:** nursing and medical services provided as normal (usual care) **Co-interventions:** NR
Outcomes	**Primary outcomes:** Cardiac rehabilitation utilisation **Secondary outcomes:** Cardiac self-efficacy, HRQoL - generic, HRQoL - specific, anxiety and depression, self-regulatory behaviour, medication adherence, perceived social support, physical function-

NCT05270993 *(Continued)*	
	al capacity, cardiac risk factors - lipid profile, fasting blood glucose, blood pressure, BMI, smoking status
Starting date	08.03.2022
Contact information	Contact: Wenru Wang, PhD (65) 66011761 nurww@nus.edu.sg National University of Singapore Singapore, Singapore
Notes	

NCT05326529	
Study name	Comparison of Traditional, Web-based or a Combined Cardiac Rehabilitation Programme
Methods	**Study design:** RCT, parallel groups: home-based (web) or centre-based (hospital) cardiac rehabilitation exercise classes **Number of centres:** NR **Country:** England **Dates patients recruited:** NR. Target recruitment sample size = 57 **When randomised:** NR **Maximum follow-up:** 8 weeks
Participants	**Inclusion criteria:** Aged 50 to 70 years, male and female. Low-moderate-risk patients (low-moderate Ejection Fraction (EF) (> 40%), including clinically stable Myocardial Infarction (MI), Percutaneous Coronary Intervention (PCI), Coronary Artery Bypass Grafts (CABG) patients. Acute patients, in-hospital patients (phase 3 rehab) to reflect true clinical representation. Combination of male and female, as previous studies were predominately male. Low-moderate anxiety and depression scores (< 11). Achieve level 4 (180 metres, 5.1 METs) on the Incremental Shuttle Walking Test. Internet and device access **Exclusion criteria:** < 40% ejection fraction, high-risk heart failure patients, comorbidities preventing exercise, no internet access, unstable angina, language barrier (English only), clinically depressed anxiety or depression score (> 11), Incremental Shuttle Walk test **N randomised:** NR **Method of assessment:** Dartmouth Coop Questionnaire, HADS, Incremental Shuttle Walk test **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR **Ethnicity:** NR
Interventions	**Home-based:** Web-based Cardiac Rehabilitation Exercise sessions **Centre-based**:Hospital Based Cardiac Rehabilitation Exercise classes

NCT05326529 *(Continued)*

	No other information reported
Outcomes	**Primary outcomes:** energy expenditure **Secondary outcomes:** psychological outcomes, anxiety and depression, heart rate
Starting date	07.07.2022
Contact information	Name: Mike Morris Affiliation: University of Chester
Notes	

NCT05385341

Study name	Rehabilitation Exercise With MObile Technology and Education After Acute Coronary Syndrome (REMOTE-ACS)
Methods	**Study design:** RCT, 2 parallel groups: home-based (tele-rehabilitation) or centre-based rehabilitation **Number of centres:** NR **Country:** France **Dates patients recruited:** NR **When randomised:** After some baseline assessments **Maximum follow-up:** 1 month, and additional follow-up at 2 months, and 26 months
Participants	**Inclusion criteria:** Aged 18 to 79 years, male and female. Patient with acute coronary syndrome less than 6 months, addressed to ambulatory cardiac rehabilitation, equipped with a smartphone compatible with the protocol's application, connected to web, having signed an informed consent, affiliated to the French national health insurance **Exclusion criteria:** Incapacity to use application on smartphone, contraindication to exercise training, pregnancy, juridical protection left ventricular ejection fraction < 45%, significant ventricular arrhythmia (frequent or polymorph PVC during initial exercise testing, ventricular tachycardia or sudden cardiac death at the beginning), flutter or atrial fibrillation (transient or permanent), coronary revascularisation needing supplementary procedure, residual myocardial ischaemia determined by initial exercise testing or alternative testing (nuclear imaging or stress echocardiography), mini Mental State < 26, patients living alone at home, comorbidities limiting participation to the protocol: kidney dialysis, insulin-requiring diabetes, residuals sequels of central and/or peripheral nervous system injuries **N randomised:** NR **Method of assessment:** walking test **Diagnosis (% of pts):** NR **NYHA II:** NR **Previous MI:** NR **Age (mean ± SD):** NR **Percentage male:** NR

NCT05385341 *(Continued)*

	Ethnicity: NR
Interventions	**Home-based:** Experimental group (Tele-RCV): the treatment will consist of 20 home-based sessions monitored by the REMOTE-ACS device and containing 2 hours/day 5 days/7 of exercise training (the first session in centre to inform the patient) associated with 8 education sessions. **Centre-based:**Group control (RCV) : 20 sessions of cardiac rehabilitation will be realised in a rehabilitation centre containing exercise training during 2 hours/day 5 days/7 and education programme. No further information reported
Outcomes	**Primary outcomes:** Change in the peak oxygen volume **Secondary outcomes:** Change in walking distance travelled, number of rehabilitation sessions attended, incremental cost-effectiveness ratio, cost-utility ratio, production cost, acceptability, satisfaction
Starting date	23.05.2022
Contact information	Marc Labrunee University Hospital, Toulouse Toulouse, France
Notes	

AHA/ACC = American Heart Association/American College of Cardiology
AMI = acute myocardial infarction
app = application
BMI = body mass index
BNP = brain natriuretic peptide
CABG = coronary artery bypass grafting
CBCR = centre-based cardiac rehabilitation
CBCR = centre-based cardiac rehabilitation
CHS = cardiovascular health study
CON = control
CPET = cardiopulmonary exercise test
CR = cardiac rehabilitation
CRP = c-reactive protein
DASI = Duke Activity Status Index
DM = diabetes mellitus
ECG = electrocardiogram
e/e' = early diastolic velocity
EF = ejection fraction
eGFR = estimated glomerular filtration rate
EQ-5D-5L = EuroQoL 5 Dimension 5 Level score
ESC = European Society of Cardiology
FTND = Fagerstrom Test for Nicotine Dependence
HADS = Hospital Anxiety and Depression Scale
Hb = haemoglobin
HbA1c = glycated haemoglobin
HBCR = home-based cardiac rehabilitation
HDL = high-density lipoprotein
HRQoL = health-related quality of life
ICER = incremental cost-effectiveness ratio
IHD = ischaemic heart disease
IPAQ = International Physical Activity Questionnaire
ISFS = International Society and Society of Cardiology

LAD = left anterior descending
LCX = left circumflex
LDL = low-density lipoprotein
LM = left main
LVEF = left ventricular ejection fraction
MACE = major adverse cardiovascular events
MET = metabolic equivalent of task
MI = myocardial infarction
MIDAS = Myocardial Infarction Dimensional Assessment Scale
MOS-SSS = Medical Outcomes Study Social Support Survey
NR = not reported
NYHA = New York Heart Association
PCI = percutaneous coronary intervention
PHQ-9 = Patient Health Questionnaire-9;
PVC = premature ventricular contractions
QALYs = quality-adjusted life years
RCT = randomised controlled trial
SD = standard deviation
SF-36 = short-form survey 36
STAI = State Trait Anxiety Inventory
UAP = unstable angina pectoris
VE/VCO_2 = ventilatory equivalent of carbon dioxide
Peak VO_2 or VO_2 peak = peak oxygen uptake
VO_2 max = maximum oxygen uptake
WHO = World Health Organization

DATA AND ANALYSES

Comparison 1. Home-base vs. centre-based cardiac rehabilitation (CR)

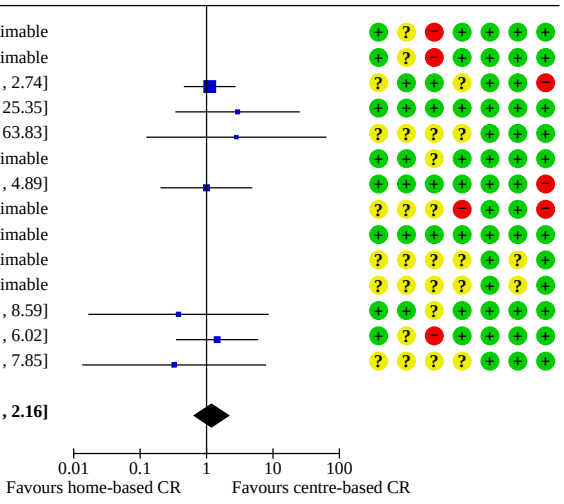
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.1 Total mortality	12	1647	Risk Ratio (M-H, Fixed, 95% CI)	1.19 [0.65, 2.16]
1.2 Exercise capacity ≤ 12 months	24	2343	Std. Mean Difference (IV, Random, 95% CI)	-0.10 [-0.24, 0.04]
1.3 Exercise capacity 12 to 24 months	3	1074	Std. Mean Difference (IV, Fixed, 95% CI)	0.11 [-0.01, 0.23]
1.4 Completers	22	2638	Risk Ratio (M-H, Random, 95% CI)	1.04 [0.99, 1.08]
1.5 Total cholesterol 3 to 12 months (mmol/L)	10	1290	Mean Difference (IV, Random, 95% CI)	0.06 [-0.09, 0.21]
1.6 HDL cholesterol 3 to 12 months (mmol/L)	8	1064	Mean Difference (IV, Fixed, 95% CI)	-0.06 [-0.10, -0.03]
1.7 LDL cholesterol 3 to 12 months (mmol/L)	5	429	Mean Difference (IV, Random, 95% CI)	0.04 [-0.14, 0.22]
1.8 Triglycerides 3 to 12 months (mmol/L)	6	535	Mean Difference (IV, Fixed, 95% CI)	-0.02 [-0.17, 0.13]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.9 Systolic blood pressure 3 to 12 months (mmHg)	12	1455	Mean Difference (IV, Fixed, 95% CI)	1.17 [-0.44, 2.77]
1.10 Diastolic blood pressure 3 to 12 months (mmHg)	11	1309	Mean Difference (IV, Random, 95% CI)	0.80 [-0.76, 2.35]
1.11 Smoking 3 to 12 months	5	986	Risk Ratio (M-H, Fixed, 95% CI)	1.02 [0.83, 1.27]

Analysis 1.1. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 1: Total mortality

Study or Subgroup	Home-based CR Events	Home-based CR Total	Centre-based CR Events	Centre-based CR Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Aamot 2014	0	14	0	34		Not estimable
Aamot 2014	0	14	0	28		Not estimable
Bell 1998	12	152	7	99	44.7%	1.12 [0.46 , 2.74]
Dalal 2007	4	60	1	44	6.1%	2.93 [0.34 , 25.35]
Daskapan 2005	1	15	0	14	2.7%	2.81 [0.12 , 63.83]
Hwang 2017	0	24	0	26		Not estimable
Jolly 2007	3	263	3	262	15.9%	1.00 [0.20 , 4.89]
Kraal 2014	0	29	0	26		Not estimable
Maddison 2019	0	82	0	80		Not estimable
Miller 1984	0	31	0	30		Not estimable
Miller 1984	0	30	0	33		Not estimable
Moholdt 2012	0	14	1	16	7.4%	0.38 [0.02 , 8.59]
Oerkild 2011	4	36	3	39	15.2%	1.44 [0.35 , 6.02]
Piotrowicz 2010	0	77	1	75	8.0%	0.32 [0.01 , 7.85]
Total (95% CI)		**841**		**806**	**100.0%**	**1.19 [0.65 , 2.16]**
Total events:	24		16			

Heterogeneity: Chi² = 2.26, df = 6 (P = 0.89); I² = 0%
Test for overall effect: Z = 0.56 (P = 0.58)
Test for subgroup differences: Not applicable

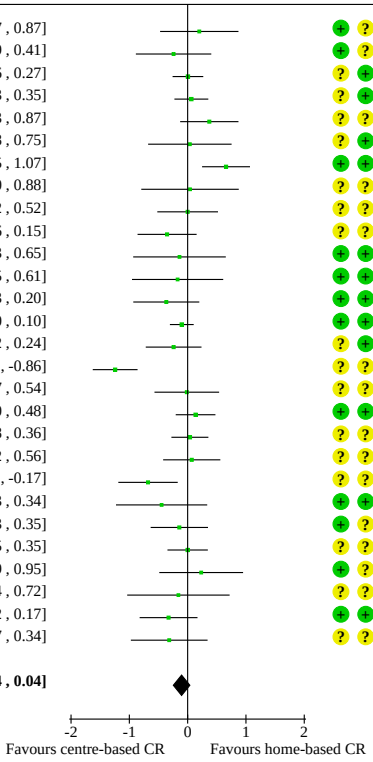


Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of outcome assessment (detection bias)
(D) Incomplete outcome data (attrition bias)
(E) Selective reporting (reporting bias)
(F) Groups balanced at baseline?
(G) Groups received same co-intervention(s)?

Analysis 1.2. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 2: Exercise capacity ≤ 12 months

Study or Subgroup	Home-based CR Mean	SD	Total	Centre-based CR Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Risk of Bias A B C D E F G
Aamot 2014	37.2	5.2	13	36	6.2	25	2.7%	0.20 [-0.47 , 0.87]	+ ? − + + + +
Aamot 2014	37.2	5.2	13	39	8	32	2.8%	-0.24 [-0.89 , 0.41]	+ ? − + + + +
Arthur 2002	5.22	2.1	113	5.21	2	109	5.5%	0.00 [-0.26 , 0.27]	? + + + + − +
Bell 1998	7.29	2.81	91	7.1	3.12	91	5.3%	0.06 [-0.23 , 0.35]	? + + ? + + −
Carlson 2000	7.4	1.5	34	6.8	1.7	29	3.7%	0.37 [-0.13 , 0.87]	? ? ? − + + −
Cowie 2012	318	153	15	312	155	15	2.5%	0.04 [-0.68 , 0.75]	? + + + + − +
Dalal 2007	9.66	3.1	60	7.68	2.8	40	4.3%	0.66 [0.25 , 1.07]	+ + + + + + +
Daskapan 2005	23.6	7.4	11	23.3	6.8	11	2.0%	0.04 [-0.80 , 0.88]	? ? ? ? + + +
Gordon 2002	1.6	2.2	40	1.6	2.1	22	3.5%	0.00 [-0.52 , 0.52]	? ? ? + + + +
Gordon 2002	0.9	1.9	49	1.6	2.1	22	3.6%	-0.35 [-0.86 , 0.15]	? ? ? + + + +
Grace 2016	18.63	6.11	9	19.4	4.97	19	2.2%	-0.14 [-0.93 , 0.65]	+ + + − + + +
Grace 2016	18.63	6.11	9	19.54	4.7	21	2.2%	-0.17 [-0.95 , 0.61]	+ + + − + + +
Hwang 2017	374	89	23	410	103	26	3.2%	-0.37 [-0.93 , 0.20]	+ + ? + + + +
Jolly 2007	391.3	162.11	191	407.4	157.6	179	6.0%	-0.10 [-0.30 , 0.10]	+ + + + + + −
Karapolat 2009	18.12	6	36	19.43	4.59	32	3.8%	-0.24 [-0.72 , 0.24]	? + ? + + + +
Kassaian 2000	8.9	2.9	60	12.4	2.7	65	4.5%	-1.24 [-1.63 , -0.86]	? ? ? ? ? + ?
Kraal 2014	26	5.9	25	26.1	7.6	25	3.3%	-0.01 [-0.57 , 0.54]	? ? ? − + + −
Maddison 2019	30.52	9.63	64	29.39	6.75	69	4.9%	0.14 [-0.20 , 0.48]	+ + + + + + +
Marchionni 2003	3650.67	3957.23	74	3509.33	3343.82	79	5.1%	0.04 [-0.28 , 0.36]	? ? + + + + +
Miller 1984	8	1.5	33	7.9	1.3	31	3.7%	0.07 [-0.42 , 0.56]	? ? ? ? + ? +
Miller 1984	7.9	1.5	33	8.9	1.4	30	3.6%	-0.68 [-1.19 , -0.17]	? ? ? ? + ? +
Moholdt 2012	27.7	6.5	12	30.2	4.3	14	2.2%	-0.45 [-1.23 , 0.34]	+ + ? + + + +
Oerkild 2011	-2.5	3.63	30	-2	3.3	34	3.7%	-0.14 [-0.63 , 0.35]	+ ? − + + + +
Piotrowicz 2010	462	91	75	462	92	56	4.8%	0.00 [-0.35 , 0.35]	? ? ? ? + + +
Sagar 2012	490.75	91.49	15	465.37	119.28	15	2.5%	0.23 [-0.49 , 0.95]	+ ? ? ? + + +
Sparks 1993	1900	400	10	1950	150	10	1.9%	-0.16 [-1.04 , 0.72]	? ? ? + + + +
Varnfield 2014	571	88	43	601	95	25	3.7%	-0.33 [-0.82 , 0.17]	+ + − − + + ?
Wu 2006	22.9	3.6	18	24.2	4.4	18	2.7%	-0.32 [-0.97 , 0.34]	? ? + ? + + +
Total (95% CI)			**1199**			**1144**	**100.0%**	**-0.10 [-0.24 , 0.04]**	

Heterogeneity: Tau² = 0.08; Chi² = 67.04, df = 27 (P < 0.0001); I² = 60%
Test for overall effect: Z = 1.44 (P = 0.15)
Test for subgroup differences: Not applicable

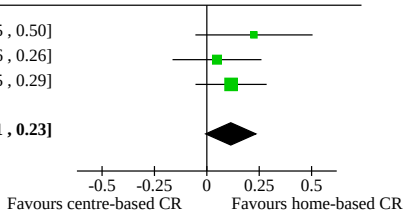


Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of outcome assessment (detection bias)
(D) Incomplete outcome data (attrition bias)
(E) Selective reporting (reporting bias)
(F) Groups balanced at baseline?
(G) Groups received same co-intervention(s)?

Analysis 1.3. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 3: Exercise capacity 12 to 24 months

Study or Subgroup	Home-based CR Mean	SD	Total	Centre-based CR Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Arthur 2002	5.79	1.6	96	5.44	1.5	102	18.4%	0.23 [-0.05 , 0.50]
Jolly 2007	5.35	1.44	179	5.28	1.44	163	31.9%	0.05 [-0.16 , 0.26]
Marchionni 2003	4050.33	4421.88	267	3580.67	3650.13	267	49.8%	0.12 [-0.05 , 0.29]
Total (95% CI)			**542**			**532**	**100.0%**	**0.11 [-0.01 , 0.23]**

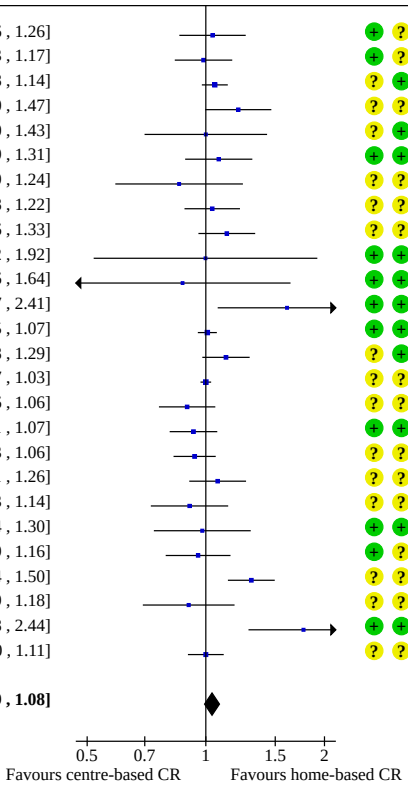
Heterogeneity: Chi² = 0.97, df = 2 (P = 0.62); I² = 0%
Test for overall effect: Z = 1.87 (P = 0.06)
Test for subgroup differences: Not applicable



Analysis 1.4. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 4: Completers

Study or Subgroup	Home-based CR Events	Total	Centre-based CR Events	Total	Weight	Risk Ratio M-H, Random, 95% CI	Risk of Bias A	B	C	D	E	F	G
Aamot 2014	13	14	25	28	3.4%	1.04 [0.86 , 1.26]	+	?	−	+	+	+	+
Aamot 2014	13	14	32	34	4.0%	0.99 [0.83 , 1.17]	+	?	−	+	+	+	+
Arthur 2002	113	120	109	122	7.8%	1.05 [0.98 , 1.14]	?	+	+	+	+	−	+
Carlson 2000	35	38	32	42	3.4%	1.21 [1.00 , 1.47]	?	?	?	−	+	+	−
Cowie 2012	15	20	15	20	1.3%	1.00 [0.70 , 1.43]	?	+	+	+	+	−	+
Dalal 2007	50	60	34	44	3.3%	1.08 [0.89 , 1.31]	+	+	+	+	+	+	+
Daskapan 2005	11	15	12	14	1.2%	0.86 [0.59 , 1.24]	?	?	?	?	+	+	+
Gordon 2002	45	49	23	26	4.2%	1.04 [0.88 , 1.22]	?	?	?	+	+	+	+
Gordon 2002	52	54	23	27	4.1%	1.13 [0.96 , 1.33]	?	?	?	+	+	+	+
Grace 2016	9	28	19	59	0.4%	1.00 [0.52 , 1.92]	+	+	+	−	+	+	+
Grace 2016	9	27	21	55	0.5%	0.87 [0.46 , 1.64]	+	+	+	−	+	+	+
Hwang 2017	20	24	14	27	1.0%	1.61 [1.07 , 2.41]	+	+	?	+	+	+	+
Jolly 2007	239	263	236	262	8.7%	1.01 [0.95 , 1.07]	+	+	+	+	+	+	−
Karapolat 2009	36	37	32	37	5.0%	1.13 [0.98 , 1.29]	?	+	?	+	+	+	+
Kassaian 2000	60	60	65	65	9.7%	1.00 [0.97 , 1.03]	?	?	?	?	?	+	?
Kraal 2014	25	29	25	26	4.1%	0.90 [0.76 , 1.06]	?	?	?	−	+	+	−
Maddison 2019	65	81	69	80	5.0%	0.93 [0.81 , 1.07]	+	+	+	+	+	+	+
Marchionni 2003	74	90	79	90	5.6%	0.94 [0.83 , 1.06]	?	?	+	+	+	+	+
Miller 1984	28	30	27	31	4.1%	1.07 [0.91 , 1.26]	?	?	?	?	+	?	+
Miller 1984	26	33	26	30	2.7%	0.91 [0.73 , 1.14]	?	?	?	?	+	?	+
Moholdt 2012	12	14	14	16	1.9%	0.98 [0.74 , 1.30]	+	+	?	+	+	+	+
Oerkild 2011	30	36	34	39	3.5%	0.96 [0.79 , 1.16]	+	?	−	+	+	+	+
Piotrowicz 2010	75	77	56	75	5.1%	1.30 [1.14 , 1.50]	?	?	?	?	+	+	+
Sparks 1993	9	10	10	10	2.1%	0.90 [0.69 , 1.18]	?	?	?	+	+	+	+
Varnfield 2014	46	60	26	60	1.6%	1.77 [1.28 , 2.44]	+	+	−	−	+	+	?
Wu 2006	18	18	18	18	6.4%	1.00 [0.90 , 1.11]	?	?	+	?	+	+	+
Total (95% CI)		**1301**		**1337**	**100.0%**	**1.04 [0.99 , 1.08]**							
Total events:	1128		1076										

Heterogeneity: Tau² = 0.00; Chi² = 56.02, df = 25 (P = 0.0004); I² = 55%
Test for overall effect: Z = 1.63 (P = 0.10)
Test for subgroup differences: Not applicable

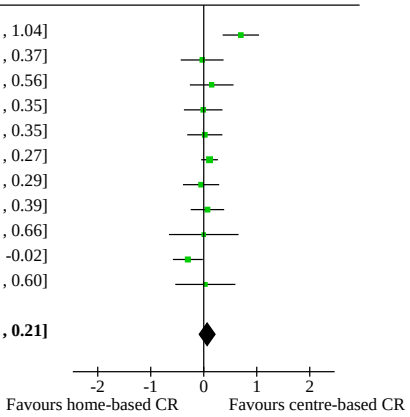


Risk of bias legend
(A) Random sequence generation (selection bias)
(B) Allocation concealment (selection bias)
(C) Blinding of outcome assessment (detection bias)
(D) Incomplete outcome data (attrition bias)
(E) Selective reporting (reporting bias)
(F) Groups balanced at baseline?
(G) Groups received same co-intervention(s)?

Analysis 1.5. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 5: Total cholesterol 3 to 12 months (mmol/L)

Study or Subgroup	Home-based CR Mean	SD	Total	Centre-based CR Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Bell 1998	5.9	1.1	60	5.2	0.8	61	9.5%	0.70 [0.36 , 1.04]
Carlson 2000	4.68	0.78	34	4.71	0.83	28	7.9%	-0.03 [-0.43 , 0.37]
Dalal 2007	4.6	1.12	60	4.45	1.01	44	7.8%	0.15 [-0.26 , 0.56]
Gordon 2002	-0.32	0.89	45	-0.31	0.61	22	8.9%	-0.01 [-0.37 , 0.35]
Gordon 2002	-0.29	0.78	52	-0.31	0.61	22	9.8%	0.02 [-0.31 , 0.35]
Jolly 2007	3.99	0.9	232	3.88	0.83	233	15.7%	0.11 [-0.05 , 0.27]
Kassaian 2000	5.58	1.09	60	5.63	0.83	65	9.5%	-0.05 [-0.39 , 0.29]
Maddison 2019	3.62	0.98	68	3.55	0.92	72	10.3%	0.07 [-0.25 , 0.39]
Moholdt 2012	4.3	0.7	12	4.3	1	14	4.1%	0.00 [-0.66 , 0.66]
Oerkild 2011	-0.2	0.56	30	0.1	0.59	34	11.3%	-0.30 [-0.58 , -0.02]
Varnfield 2014	3.3	1	29	3.27	0.8	13	5.1%	0.03 [-0.54 , 0.60]
Total (95% CI)			**682**			**608**	**100.0%**	**0.06 [-0.09 , 0.21]**

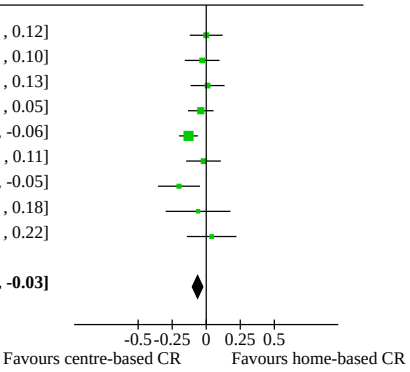
Heterogeneity: Tau² = 0.03; Chi² = 21.00, df = 10 (P = 0.02); I² = 52%
Test for overall effect: Z = 0.84 (P = 0.40)
Test for subgroup differences: Not applicable



Analysis 1.6. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 6: HDL cholesterol 3 to 12 months (mmol/L)

Study or Subgroup	Home-based CR Mean	SD	Total	Centre-based CR Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Carlson 2000	0.98	0.21	32	0.98	0.26	28	10.2%	0.00 [-0.12 , 0.12]
Gordon 2002	-0.01	0.25	45	0.02	0.25	22	9.2%	-0.03 [-0.16 , 0.10]
Gordon 2002	0.03	0.25	52	0.02	0.25	22	9.6%	0.01 [-0.11 , 0.13]
Jolly 2007	1.29	0.39	233	1.33	0.62	233	16.9%	-0.04 [-0.13 , 0.05]
Kassaian 2000	0.85	0.21	60	0.98	0.18	65	31.5%	-0.13 [-0.20 , -0.06]
Maddison 2019	1.13	0.37	68	1.15	0.4	72	9.2%	-0.02 [-0.15 , 0.11]
Moholdt 2012	1.2	0.2	12	1.4	0.2	14	6.3%	-0.20 [-0.35 , -0.05]
Oerkild 2011	-0.03	0.47	30	0.03	0.5	34	2.6%	-0.06 [-0.30 , 0.18]
Varnfield 2014	1.02	0.4	29	0.98	0.2	13	4.5%	0.04 [-0.14 , 0.22]
Total (95% CI)			**561**			**503**	**100.0%**	**-0.06 [-0.10 , -0.03]**

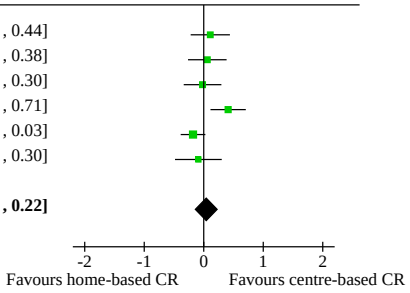
Heterogeneity: Chi² = 11.19, df = 8 (P = 0.19); I² = 29%
Test for overall effect: Z = 3.23 (P = 0.001)
Test for subgroup differences: Not applicable



Analysis 1.7. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 7: LDL cholesterol 3 to 12 months (mmol/L)

Study or Subgroup	Home-based CR Mean	SD	Total	Centre-based CR Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Carlson 2000	2.98	0.67	30	2.87	0.6	27	15.5%	0.11 [-0.22 , 0.44]
Gordon 2002	-0.22	0.72	45	-0.28	0.59	22	15.8%	0.06 [-0.26 , 0.38]
Gordon 2002	-0.3	0.73	52	-0.28	0.59	22	16.2%	-0.02 [-0.34 , 0.30]
Kassaian 2000	3.72	0.96	60	3.31	0.7	65	17.2%	0.41 [0.11 , 0.71]
Oerkild 2011	-0.2	0.28	30	-0.02	0.54	34	22.4%	-0.18 [-0.39 , 0.03]
Varnfield 2014	1.6	0.6	29	1.69	0.6	13	12.8%	-0.09 [-0.48 , 0.30]
Total (95% CI)			**246**			**183**	**100.0%**	**0.04 [-0.14 , 0.22]**

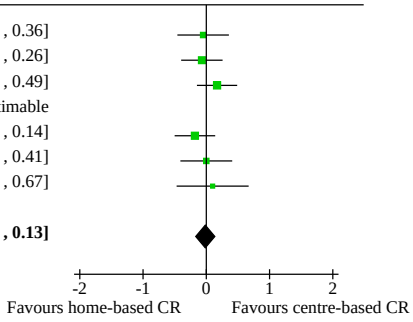
Heterogeneity: Tau² = 0.03; Chi² = 10.92, df = 5 (P = 0.05); I² = 54%
Test for overall effect: Z = 0.45 (P = 0.65)
Test for subgroup differences: Not applicable



Analysis 1.8. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 8: Triglycerides 3 to 12 months (mmol/L)

Study or Subgroup	Home-based CR Mean	SD	Total	Centre-based CR Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Carlson 2000	1.58	0.86	34	1.63	0.76	27	13.7%	-0.05 [-0.46 , 0.36]
Gordon 2002	-0.21	0.72	45	-0.14	0.6	22	21.2%	-0.07 [-0.40 , 0.26]
Gordon 2002	0.03	0.72	52	-0.14	0.6	22	22.5%	0.17 [-0.15 , 0.49]
Kassaian 2000	2.16	0.94	60	1.69	0	65		Not estimable
Maddison 2019	1.48	0.81	68	1.66	1.11	72	22.1%	-0.18 [-0.50 , 0.14]
Moholdt 2012	1.4	0.7	12	1.4	0.2	14	13.5%	0.00 [-0.41 , 0.41]
Varnfield 2014	1.32	0.8	29	1.22	0.9	13	7.0%	0.10 [-0.47 , 0.67]
Total (95% CI)			**300**			**235**	**100.0%**	**-0.02 [-0.17 , 0.13]**

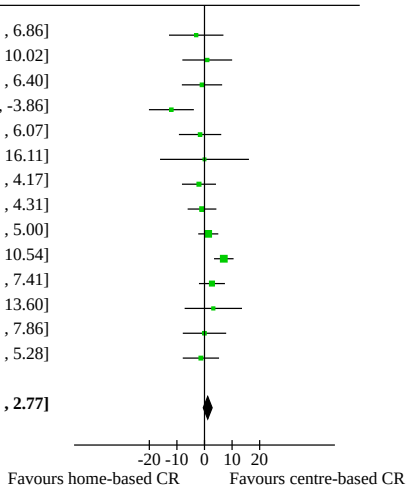
Heterogeneity: Chi² = 2.62, df = 5 (P = 0.76); I² = 0%
Test for overall effect: Z = 0.21 (P = 0.83)
Test for subgroup differences: Not applicable



Analysis 1.9. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 9: Systolic blood pressure 3 to 12 months (mmHg)

Study or Subgroup	Home-based CR Mean	SD	Total	Centre-based CR Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
Aamot 2014	135	14	13	138	16	25	2.6%	-3.00 [-12.86 , 6.86]
Aamot 2014	135	14	13	134	14	32	3.2%	1.00 [-8.02 , 10.02]
Bell 1998	136.3	20.9	63	137.2	20.9	63	4.8%	-0.90 [-8.20 , 6.40]
Carlson 2000	125	18	35	137	16	32	3.9%	-12.00 [-20.14 , -3.86]
Dalal 2007	133.8	16.1	60	135.4	22	44	4.4%	-1.60 [-9.27 , 6.07]
Daskapan 2005	113.6	16.9	11	113.6	21.4	11	1.0%	0.00 [-16.11 , 16.11]
Gordon 2002	-6.3	13.9	45	-4.3	11.1	22	6.8%	-2.00 [-8.17 , 4.17]
Gordon 2002	-5.2	8.7	52	-4.3	11.1	22	9.5%	-0.90 [-6.11 , 4.31]
Jolly 2007	133.55	18.37	235	132.18	21.54	232	19.4%	1.37 [-2.26 , 5.00]
Kassaian 2000	120	11	60	113	9	65	20.5%	7.00 [3.46 , 10.54]
Maddison 2019	135.4	18.2	65	132.7	6.8	69	11.6%	2.70 [-2.01 , 7.41]
Oerkild 2011	4.6	20.7	30	1.4	21.7	34	2.4%	3.20 [-7.20 , 13.60]
Sagar 2012	123.66	9.67	15	123.66	12.16	15	4.2%	0.00 [-7.86 , 7.86]
Varnfield 2014	123.1	17.12	46	124.4	15	46	5.9%	-1.30 [-7.88 , 5.28]
Total (95% CI)			**743**			**712**	**100.0%**	**1.17 [-0.44 , 2.77]**

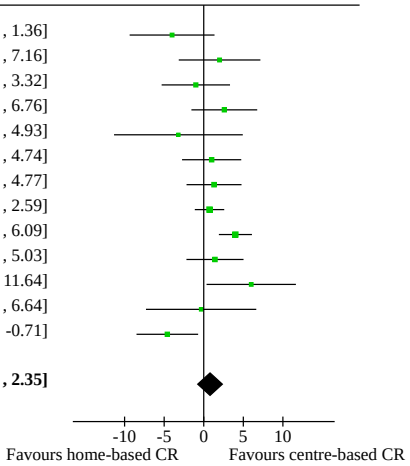
Heterogeneity: Chi² = 24.80, df = 13 (P = 0.02); I² = 48%
Test for overall effect: Z = 1.43 (P = 0.15)
Test for subgroup differences: Not applicable



Analysis 1.10. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 10: Diastolic blood pressure 3 to 12 months (mmHg)

Study or Subgroup	Home-based CR Mean	SD	Total	Centre-based CR Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Aamot 2014	83	8	13	87	8	25	5.6%	-4.00 [-9.36 , 1.36]
Aamot 2014	83	8	13	81	8	32	5.9%	2.00 [-3.16 , 7.16]
Carlson 2000	81	10	35	82	8	32	7.3%	-1.00 [-5.32 , 3.32]
Dalal 2007	81.3	10.8	60	78.7	10.6	44	7.7%	2.60 [-1.56 , 6.76]
Daskapan 2005	76.8	8.4	11	80	10.9	11	3.0%	-3.20 [-11.33 , 4.93]
Gordon 2002	-2.3	7.4	45	-3.3	7.3	22	8.6%	1.00 [-2.74 , 4.74]
Gordon 2002	-2	6.1	52	-3.3	7.3	22	9.2%	1.30 [-2.17 , 4.77]
Jolly 2007	74.94	9.82	235	74.21	10.66	232	13.6%	0.73 [-1.13 , 2.59]
Kassaian 2000	80	3	60	76	8	65	13.0%	4.00 [1.91 , 6.09]
Maddison 2019	79.18	10.5	65	77.76	10.79	69	8.9%	1.42 [-2.19 , 5.03]
Oerkild 2011	3.9	11.4	30	-2.1	11.6	34	5.2%	6.00 [0.36 , 11.64]
Sagar 2012	78.33	10.8	15	78.66	8.54	15	3.8%	-0.33 [-7.30 , 6.64]
Varnfield 2014	71.6	8.9	46	76.2	7.6	26	8.2%	-4.60 [-8.49 , -0.71]
Total (95% CI)			**680**			**629**	**100.0%**	**0.80 [-0.76 , 2.35]**

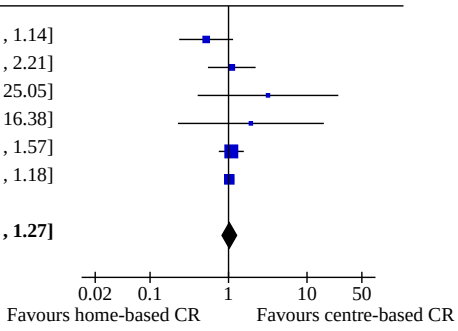
Heterogeneity: Tau² = 3.71; Chi² = 24.94, df = 12 (P = 0.02); I² = 52%
Test for overall effect: Z = 1.00 (P = 0.32)
Test for subgroup differences: Not applicable



Analysis 1.11. Comparison 1: Home-base vs. centre-based cardiac rehabilitation (CR), Outcome 11: Smoking 3 to 12 months

Study or Subgroup	Home-based CR Events	Total	Centre-based CR Events	Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Bell 1998	8	70	15	68	14.7%	0.52 [0.24 , 1.14]
Dalal 2007	15	60	10	44	11.1%	1.10 [0.55 , 2.21]
Gordon 2002	6	49	1	26	1.3%	3.18 [0.40 , 25.05]
Gordon 2002	4	54	1	26	1.3%	1.93 [0.23 , 16.38]
Jolly 2007	49	263	45	262	43.5%	1.08 [0.75 , 1.57]
Oerkild 2011	28	30	31	34	28.1%	1.02 [0.89 , 1.18]
Total (95% CI)		**526**		**460**	**100.0%**	**1.02 [0.83 , 1.27]**
Total events:	110		103			

Heterogeneity: Chi² = 4.48, df = 5 (P = 0.48); I² = 0%
Test for overall effect: Z = 0.21 (P = 0.83)
Test for subgroup differences: Not applicable



ADDITIONAL TABLES

Table 1. Results of univariate meta-regression analysis for total mortality

Explanatory variable (n trials)	Exp(slope)*	95% CI univariate P value	Proportion of variation explained	Interpretation
Case mix (CHD vs HF vs revasc) (n = 6)	RR = 1.30	0.12 to 14.24 P = 0.790	Not calculable[1]	No evidence that RR is associated with case mix
Dose of exercise (number of weeks of exercise training x average number of ses-	RR = 1.00	0.99 to 1.01	Not calculable[1]	No evidence that RR is associated with increased dose of exercise

Table 1. Results of univariate meta-regression analysis for total mortality *(Continued)*

sions/week x average duration of session in min) (n = 5)				
Type of cardiac rehabilitation (exercise only versus comprehensive cardiac rehabilitation) (n = 7)	RR = 0.40	0.006 to 26.44 P = 0.603	Not calculable[1]	No evidence that RR is associated with type of cardiac rehabilitation
Duration of follow-up (months) (n = 7)	RR = 0.98	0.83 to 1.14 P = 0.737	Not calculable[1]	No evidence that RR is associated with duration of follow-up
Year of publication (n = 7)	RR = 1.01	0.99 to 1.00 P = 0.73	Not calculable[1]	No evidence that RR is associated with year of publication
Risk of bias (low risk in ≥ 4 items versus < 4 items) (n = 7)	RR = 1.02	0.25 to 4.26 P = 0.967	Not calculable[1]	No evidence that RR is associated with risk of bias
Study location (n = 7)	RR = 1.18	0.55 to 2.55 P = 0.613	Not calculable[1]	No evidence that RR is associated with study location
Sample size (n = 7)	RR = 1.01	0.99 to 1.00 P = 0.967	Not calculable[1]	No evidence that RR is associated with sample size
Telerehab or nor (n = 7)	not estimable			

[1] Not calculable due to insufficient observations; 2 Not calculable due to limited range of study categories
Abbreviations:
CHD: coronary heart disease
CI: confidence interval
HF: heart failure
revasc: revascularisation
RR: risk ratio

Table 2. Results of univariate meta-regression analysis for exercise capacity

Explanatory variable (n trials)	Coefficient (slope)	95% CI univariate P value	Proportion of variation explained	Interpretation
Case mix (CHD vs HF vs revasc) (n = 28)	0.01	-0.27 to 0.29 P = 0.941	-8.6%	No evidence that effect size is associated with case mix
Dose of exercise (number of weeks of exercise training x average number of sessions/week x average duration of session in min) (n = 25)	0.00003	-0.00007 to 0.0001 P = 0.521	-7.3%	No evidence that effect size is associated with increased dose of exercise
Type of cardiac rehabilitation (exercise only versus comprehensive cardiac rehabilitation)	-0.30	-0.57 to -0.03 P = 0.032	32.7%	Weak evidence that effect size is associated with type of cardiac rehabilitation. Larger effect with exercise only trials

Table 2. Results of univariate meta-regression analysis for exercise capacity *(Continued)*
(n = 29)

Duration of follow-up (months) (n = 29)	-0.003	-0.012 to 0.007 P = 0.527	-8.27%	No evidence that effect size is associated with duration of follow-up
Year of publication (n = 25)	-0.005	-0.0242 to 0.012 P = 0.536	-4.67%	No evidence that effect size is associated with year of publication
Risk of bias (low risk in ≥ 4 items versus < 4 items) (n = 29)	0.005	-0.30 to 0.30 P = 0.72	-9.7%	No evidence that effect size is associated with risk of bias
Study location (n = 29)	0.181	0.018 to 0.345 P = 0.031	15.80%	Weak evidence that effect size is associated with study location. Non-EU/North America studies associated with largest effects
Sample size (n = 29)	-0.0002	-0.002 to 0.001 P = 0.719	-15.75%	No evidence that effect size is associated with sample size
Telerehab (n = 28)	0.0174	-0.0128 to 0.439	-7.48%	No evidence that effect size is associated with use of telerehab

Abbreviations:
CHD: coronary heart disease
CI: confidence interval
HF: heart failure
revasc: revascularisation

Table 3. Summary of health-related quality of life (HRQoL) at follow-up for home and centre-based cardiac rehabilitation

Study ID	Follow-up	HRQoL measure	Outcome values at follow-up Mean (SD or range) Home versus centre-based, between-group P value	Between-group difference
Aamot 2014	12 weeks Home versus treadmill group Home versus group exercise	**MacNew**	6.1 (3.9 to 6.7) versus 6.0 (4.8 to 6.5) NS	Home = Centre
		Emotional domain	6.8 (4.9 to 7.0) versus 6.7 (5.6 to 6.9) NS	Home = Centre
		Social domain	6.4 (4.9 to 6.9) versus 6.6 (5.4 to 6.9) NS	Home = Centre
		Physical domain	6.4 (4.7 to 6.8) versus 6.3 (5.2 to 6.7) NS	Home = Centre
		Global	6.1 (3.9 to 6.7) versus 6.2 (3.6 to 6.9) NS	Home = Centre
		Emotional domain	6.8 (4.9 to 7.0) versus 6.5 (5.0 to 7.0) NS	Home = Centre
		Social domain	6.4 (4.9 to 6.9) versus 6.4 (5.2 to 7.0) NS	Home = Centre
		Physical domain	6.4 (4.7 to 6.8) versus 6.3 (4.5 to 6.7) NS	Home = Centre
		Global		
Arthur 2002	6 months	**SF-36** PCS	51.2 (6.4) versus 48.6 (7.1) P = 0.003*	Home > Centre

Table 3. Summary of health-related quality of life (HRQoL) at follow-up for home and centre-based cardiac rehabilitation *(Continued)*

/Smith 2004	18 months	MCS	53.5 (6.4) versus 52.0 (8.1) P = 0.13*	Home = Centre
		SF-36 PCS	48.3 (11.7) versus 47.6 (11.7) P = 0.67*	Home = Centre
		MCS	53.0 (10.9) versus 50.2 (10.9) P = 0.07*	Home = Centre
Bell 1998	10.5 months	**Nottingham Health Profile**	18.6 (28.4) versus 17.3 (30.7) P = 0.78*	Home = Centre
		Energy	6.6 (15.3) versus 7.4 (15.5) P = 0.74*	Home = Centre
		Pain	6.6 (15.3) versus 7.4 (15.5) P = 0.74*	Home = Centre
		Emotional reactions	6.6 (15.3) versus 16.9 (22.8) P = 0.0007*	Home < Centre
		Sleep	3.7 (13.6) versus 6.7 (15.0) P = 0.18*	Home = Centre
		Social isolation	6.9 (13.5) versus 9.1 (15.9) P = 0.33*	Home = Centre
		Physical mobility		
Cowie 2012	3 months	**SF-36** PCS	34.01 (11.04) versus 31.33 (7.97) P = 0.82	Home = Centre
		MCS	44.44 (12.23) versus 48.25 (11.21) P = 0.04	Home < Centre
		MLWHF total	37 (NR) vs 32 (NR) P = 0.18	Home = Centre
		Physical	21 (NR) vs 19 (NR) P = 0.31	Home = Centre
		Emotional	7 (NR) vs 7 (NR) P = 0.13	Home = Centre
Marchionni 2003	2 months	**Sickness Impact Profile**	2.83 (14.5) versus 4.71 (11.1) P = 0.09*	Home = Centre
	8 months		2.83 (14.5) versus 3.40 (11.1) P = 0.61*	Home = Centre
	14 months		2.00 (8.3) versus 3.70 (11.8) P = 0.06*	Home = Centre
Dalal 2007/Taylor 2007	9 months	**MacNew Global score**	5.61 (1.14) versus 5.54 (1.10) P = 0.71	Home = Centre
		EQ-5D	0.74 (0.04) versus 0.78 (0.04) P = 0.57	Home = Centre
Hwang 2017	3 months	**EQ-5D**	0.73 (0.21) versus 0.74 (0.21) P = NS	Home = Centre
	6 months	**MLWHF**	32 (19) versus 35 (24) P = NS	Home = Centre
		EQ-5D	0.73 (0.22) versus 0.74 (0.45) P = NS	Home = Centre
		MLWHF	34 (23) versus 33 (21) P = NS	Home = Centre
Jolly 2007	6 months	**EQ-5D**	0.74 (0.26) versus 0.76 (0.23) P = 0.37	Home = Centre
	12 months	**SF-12** PCS **SF-12** MCS	42.28 (10.9) 42.56 (10.8) P = 0.8	Home = Centre
	24 months		49.19 (10.1) 50.33 (9.6) P = 0.3	Home = Centre
		EQ-5D	0.74 (0.27) versus 0.76 (0.23) P = 0.52*	Home = Centre
		EQ-5D	0.73 (0.29) versus 0.75 (0.26) P = 0.39*	Home = Centre
Karapolat 2009	8 weeks	**SF-36**	59.39 (25.35) versus 69.57 (20.94), P = 0.08*	Home = Centre
		Physical function	39.81 (41.75) versus 48.21 (45.10), P = 0.43*	Home = Centre

Table 3. Summary of health-related quality of life (HRQoL) at follow-up for home and centre-based cardiac rehabilitation *(Continued)*

		Physical role	62.42 (30.45) versus 74.23 (19.66) P = 0.07*	Home = Centre
		Bodily pain	47.25 (23.42) versus 53.98 (25.00) P = 0.33*	Home = Centre
		General health	66.67 (19.82) versus 69.81 (17.41) P = 0.49*	Home = Centre
		Vitality	65.33 (25.60) versus 69.33 (25.14) P = 0.52*	Home = Centre
		Social function	44.74 (39.77) versus 37.16 (39.24) P = 0.44*	Home = Centre
		Emotional role	64.67 (19.04) versus 70.52 (20.37) P = 0.22*	Home = Centre
		Mental health		
Kraal 2014	12 weeks	**MacNew** (Dutch translation)	6.1 (0.6) versus 5.7 (0.8) P = 0.16	Home = Centre
		Physical scale	5.9 (0.8) versus 5.6 (0.9) P = 0.88	Home = Centre
		Emotional scale	6.4 (0.6) versus 6.1 (0.7) P = 0.26	Home = Centre
		Social scale	6.1 (0.5) versus 5.8 (0.7) P = 0.50	Home = Centre
		Total score		
Maddison 2019	4 months	**EQ-5D index**	0.92 (0.09) versus 0.93 (0.09) P > 0.05	Home = Centre
	6 months		0.89 (0.13) versus 0.90 (0.13) P > 0.05	Home = Centre
Moholdt 2012	6 months	**MacNew**	1.2 (0.2) versus 1.4 (0.2) P > 0.05	Home = Centre
		Emotional domain	1.4 (0.7) versus 1.6 (1.1) P > 0.05	Home = Centre
		Physical domain	4.3 (0.7) versus 4.3 (1.0) P > 0.05	Home = Centre
		Social domain		
Oerkild 2011	3 months	**SF-36** PCS	1.4 (-1.5 to 4.3) versus 0.5 (-2.4 to 3.4) P > 0.05	Home = Centre
	6 months	**SF-36** MCS	0.8 (-2.6 to 4.3) versus -0.2 (-3.6 to 3.4) P > 0.05	Home = Centre
		SF-36 PCS	1.0 (-1.6 to 3.6) versus 1.2 (-1.4 to 3.8) P > 0.05	Home = Centre
		SF-36 MCS	2.3 (-1.1 to 5.7) versus 2.6 (-0.9 to -6.0) P > 0.05	Home = Centre
Piotrowicz 2010/ Piotrowicz 2014	8 weeks	**SF-36**	21.60 (9.65) versus 23.20 (10.71) NS	Home = Centre
		Physical function	12.74 (7.17) versus 11.39 (8.43) NS	Home = Centre
		Physical role limitation	2.66 (2.22) versus 2.00 (2.07) NS	Home = Centre
		Bodily pain	13.14 (3.80) versus 14.59 (4.03) P < 0.05	Home < Centre
		General health	50.27 (17.06) versus 51.37 (19.60) NS	Home = Centre
		Physical component summary	2.64 (2.84) versus 1.63 (1.54) P < 0.05	Home > Centre
		Social function	7.15 (4.00) versus 5.89 (3.58) NS	Home = Centre
		Mental health	4.93 (6.15) versus 4.35 (6.07) NS	Home = Centre
		Mental role limitation	7.25 (3.78) versus 6.76 (3.17) NS	Home = Centre
			21.68 (12.46) versus 18.56 (9.18) NS	Home = Centre

Table 3. Summary of health-related quality of life (HRQoL) at follow-up for home and centre-based cardiac rehabilitation *(Continued)*

		Vitality	70.50 (25.40) versus 69.20 (26.40) NS	Home = Centre
		Mental component summary		
		Total quality of life index		
Sagar 2012	4 weeks	**SF-36**	64.76 (27.02) vs 65.52 (19.96), P > 0.05	Home = Centre
		Physical function	68.33 (31.99) vs 73.33 (25.81), P > 0.05	Home = Centre
		Role physical	69.03 (21.03) vs 80.83 (18.81), P > 0.05	Home = Centre
		Bodily pain	57.5 (23.52) vs 78.33 (13.74), P = 0.006 (in favour of centre)	Home < Centre
		Social function	66.93 (19.45) vs 75.46 (17.36), P > 0.05	Home = Centre
		General mental health	75.24 (33.79) vs 76.1 (31.96), P > 0.05	Home = Centre
		Mental health	59.66 (22.71) vs 70.66 (16.02), P > 0.05	Home = Centre
		Role emotional	57.66 (24.84) vs 75.33 (14.57), P = 0.025 (in favour of centre)	Home < Centre
		Vitality		
		General health		
Varnfield 2014	6 weeks	**EQ5D-Index**	0.92 (0.9–1.0) versus 0.82 (0.7–0.9)	Home > Centre
	6 months	median (IQR)	P < 0.01	Home = Centre
		mean (SD)	0.85 (0.1) versus 0.86 (0.2)	
			"Between-group difference for changes in EQ-5D-Index was not significant at 6 months"	

*P value calculated by the authors of this report based on an independent 2-group t-test
Home = Centre: no statistically significant difference (P > 0.05) in HRQoL between home and centre-based groups at follow-up
Home > Centre: statistically significant (P ≤ 0.05) higher HRQoL in home versus centre-based groups at follow-up
Home < Centre: statistically significant (P ≤ 0.05) lower HRQoL in home versus centre-based groups at follow-up
Abbreviations:
EQ-5D: Euroqol version 5-D
HRQoL = health related quality of life
IQR: interquartile range
MCS: mental component score
MLWHF: Minnesota Living With Heart Failure
NS: not significant
PCS: physical component score
SD: standard deviation
SF-12: 12-Item Short Form Health Survey
SF-36: Short Form (36) Health Survey

Table 4. Results of univariate meta-regression analysis for withdrawals from the intervention programme (measured as no. of completers)

Explanatory variable (n trials)	Exp (slope)	95% CI univariate P value	Proportion of variation explained	Interpretation

Table 4. Results of univariate meta-regression analysis for withdrawals from the intervention programme (measured as no. of completers) *(Continued)*

Case mix (CHD vs HF vs revasc) (n = 25)	RR = 1.06	0.99 to 1.15 P = 0.110	20.54%	No evidence that RR is associated with case mix
Dose of exercise (number of weeks of exercise training x average number of sessions/week x average duration of session in min) (n = 10)	RR = 0.999	0.999 to 1.000 P = 0.148	0.93%	No evidence that RR is associated with increased dose of exercise
Type of cardiac rehabilitation (exercise only versus comprehensive cardiac rehabilitation) (n = 25)	RR = 1.04	0.93 to 1.18 P = 0.445	-20.03%	No evidence that RR is associated with type of cardiac rehabilitation
Duration of follow-up (months) (n = 25)	RR = 1.00	0.997 to 1.00 P = 0.999	-23.85%	No evidence that RR is associated with duration of follow-up
Year of publication (n = 25)	RR = 1.00	0.99 to 1.02 P = 0.457	-14.44%	No evidence that RR is associated with year of publication
Risk of bias (low risk in ≥ 4 items versus < 4 items) (n = 25)	RR = 0.949	0.83 to 1.09 P = 0.498	4.87%	No evidence that RR is associated with risk of bias
Study location (n = 25)	RR = 1.05	0.97 to 1.13 P = 0.192	-17.81%	No evidence that RR is associated with study location
Sample size (n = 23)	RR = 1.00	1.00 to 1.00 P = 0.843	-20.47%	No evidence that RR is associated with sample size
Telerehab	RR = 1.02	0.86 to 1.21 P = 0.771	-24.61%	No evidence that RR is associated with use of telerehab

Abbreviations:
CHD: coronary heart disease
CI: confidence interval
HF: heart failure
revasc: revascularisation
RR: risk ratio

Table 5. Results of univariate meta-regression analysis for total cholesterol

Explanatory variable (n trials)	Coefficient (slope)	95% CI univariate P value	Proportion of variation explained	Interpretation
Case mix (CHD vs HF vs revasc) (n = 11)	-0.07	-0.83 to -0.96 P = 0.870	-9.08%	No evidence that effect size is associated with case mix

Table 5. Results of univariate meta-regression analysis for total cholesterol *(Continued)*

Dose of exercise (number of weeks of exercise training x average number of sessions/week x average duration of session in min) (n = 9)	-0.0005	-0.0003 to 0.002 P = 0.62	-8.11%	No evidence that effect size is associated with increased dose of exercise
Type of cardiac rehabilitation (exercise only vs comprehensive cardiac rehabilitation) (n = 9)	0.13	-0.51 to 0.76 P = 0.664	-16.05%	No evidence that effect size is associated with type of cardiac rehabilitation
Duration of follow-up (months) (n = 11)	0.007	-0.02 to 0.03 P = 0.582	-21.70%	No evidence that effect size is associated with duration of follow-up
Year of publication (n = 11)	-0.018	-0.009 to 0.01 P = 0.225	17.12%	No evidence that effect size is associated with year of publication
Risk of bias (low risk in ≥ 4 items versus < 4 items) (n = 11)	-0.21	-0.60 to 0.18 P = 0.250	10.82%	No evidence that effect size is associated with risk of bias
Study location (n = 11)	-0.06	-0.28 to 0.16 P = 0.548	-15.33%	No evidence that effect size is associated with study location
Sample size (n = 11)	0.0005	-0.006 to 0.002 P = 0.311	-7.36%	No evidence that effect size is associated with sample size
Telerehab (n = 11)	-0.009	-0.53 to 0.51 P = 0.97	-18.58%	No evidence that effect size is associated with sample size

Abbreviations:
CHD: coronary heart disease
CI: confidence interval
HF: heart failure
revasc: revascularisation

Table 6. Results of univariate meta-regression analysis for systolic blood pressure

Explanatory variable (n trials)	Coefficient (slope)	95% CI univariate P value	Proportion of variation explained	Interpretation
Case mix (CHD vs HF vs revasc) (n = 14)	0.061	-9.66 to 9.79 P = 0.989	-9.57%	No evidence that effect size is associated with case mix
Dose of exercise (number of weeks of exercise training x average number of sessions/week x average duration of session in min) (n = 4)	-0.004	-0.009 to 0.001 P = 0.142	14.08%	No evidence that effect size is associated with increased dose of exercise

Table 6. Results of univariate meta-regression analysis for systolic blood pressure *(Continued)*

Type of cardiac rehabilitation (exercise only versus comprehensive cardiac rehabilitation) (n = 14)	-3.76	-9.07 to 1.54 P = 0.148	36.93%	No evidence that effect size is associated with type of cardiac rehabilitation
Duration of follow-up (months) (n = 14)	0.032	-0.388 to 0.451 P = 0.873	-21.76%	No evidence that effect size is associated with duration of follow-up
Year of publication (n = 14)	0.06	-0.42 to 0.54 P = 0.780	-18.53%	No evidence that effect size is associated with year of publication
Risk of bias (low risk in ≥ 4 items versus < 4 items) (n = 14)	0.005	-0.01 to 0.02 P = 0.560	-16.42%	No evidence that effect size is associated with risk of bias
Study location (n = 14)	1.32	-1.68 to 4.32 P = 0.356	9.20%	Evidence that effect size is associated with study location
Sample size (n = 14)	-0.005	-0.01 to 0.02 P = 0.560	-16.42%	No evidence that effect size is associated with sample size
Telerehab (n = 14)	1.08	-6.28 to 8.44 P = 0.755	-17.25%	No evidence that effect size is associated with telerehab delivery

Abbreviations:
CHD: coronary heart disease
CI: confidence interval
HF: heart failure
MI: myocardial infarction

Table 7. Results of univariate meta-regression analysis for diastolic blood pressure

Explanatory variable (n trials)	Coefficient (slope)	95% CI univariate P value	Proportion of variation explained	Interpretation
Case mix (CHD vs HF vs revasc) (n = 13)	-1.1	-8.0 to 5.7 P = 0.724	-7.74%	No evidence that effect size is associated with case mix
Dose of exercise (number of weeks of exercise training x average number of sessions/week x average duration of session in min) (n = 12)	0.0005	-0.003 to 0.004 P = 0.872	-21.95%	No evidence that effect size is associated with increased dose of exercise
Type of cardiac rehabilitation (exercise only versus comprehensive cardiac rehabilitation) (n = 13)	-0.13	-4.08 to 3.83 P = 0.946	-17.79%	No evidence that effect size is associated with type of cardiac rehabilitation

Table 7. Results of univariate meta-regression analysis for diastolic blood pressure *(Continued)*

Duration of follow-up (months) (n = 13)	0.04	-0.23 to 0.32 P = 0.743	-32.53%	No evidence that effect sizeis associated with duration of follow-up
Year of publication (n = 13)	-0.18	-0.49 to 0.12 P = 0.1212	32.42%	No evidence that effect size is associated with year of publication
Risk of bias (low risk in ≥ 4 items versus < 4 items) (n = 13)	0.14	-3.4 to 3.6 P = 0.944	-19.13%	No evidence that effect size is associated with risk of bias
Study location (n = 13)	-0.17	-2.32 to 1.98 P = 0.864	-23.10%	No evidence that effect size is associated with study location
Sample size (n = 13)	0.001	-0.012 to 0.013 P = 0.880	-29.81%	No evidence that effect size is associated with sample size
Telerehab (n = 13)	-2.75	-7.23 to 1.71 P = 0.202	19.60%	No evidence that effect size is associated with telrehab delivery

Abbreviations:
CHD: coronary heart disease
CI: confidence interval
HF: heart failure
revasc: revascularisation

Table 8. Summary of adherence at follow-up in home and centre-based cardiac rehabilitation

Trial	Follow-up	Method/definition of adherence assessment	Findings	Between-group difference
Aamot 2014	12 weeks Home versus treadmill group Home versus group exercise	Completion of 70% of the exercise sessions (considered to be training per protocol). Median (range) number of exercise sessions completed Completion of 70% of the exercise sessions (considered to be training per protocol). Median (range) number of exercise sessions completed	Home: 24/28 (86%) versus centre: 34/34 (100%) P = 0.04 Home: 24 (10–24) versus centre: 24 (7–24) Home: 24/28 (86%) versus centre: 28/28 (100%) P = 0.04 Home: 24 (10–24) versus centre: 23 (17–24)	Home < Centre Home < Centre
Arthur 2002 /Smith 2004	6 months 18 months	Number of exercise session reported/week Percentage of patients seeking dietitian consultation Percentage of patients seeking psychologist consultation Level of physical activity – Physical Activity Scale for the Elderly	Home: mean 6.5 (SD 4.6) Centre: mean 3.7 (SD 2.6) P < 0.0001† Home 50% (mean 3.5, SD 2.5 visits) Centre: 53% (mean 3.6, SD 2.3 visits)	Home > Centre ? Home = Centre** Home > Centre

Table 8. Summary of adherence at follow-up in home and centre-based cardiac rehabilitation *(Continued)*

			Home: 42% (mean 2.6, SD 2.4 visits) Centre: 51% (mean 2.5, SD 2.2 visits) Home: mean 232.6 (SD 99.4) Centre: mean 170.0 (SD 89.2) P < 0.0001†	
Carlson 2000	6 months	Attendance at all 3 nutrition/risk factor classes Total exercise over follow-up – number of sessions ≥ 30 min	Home: 27/38 (71%) Centre: 33/42 (79%) P = 0.438* Home: mean 111.8 (SD 29.1) Centre: mean 98.1 (SD 33.4) P = 0.06†	Home = Centre Home = Centre
Cowie 2012	3 months	Percentage completion of 16 exercise sessions	Home: 77% Centre: 86% P = 0.32	Home = Centre
Dalal 2007	9 months	Number who participated in intervention	Home: 40/60 (67%) Centre: 32/44 (72%) P = 0.51*	Home = Centre
Daskapan 2005	3 months	Percentage of sessions attended	Home: 97% Centre: 81% P value not calculable	?
Gordon 2002	3 months	Percentage of completed scheduled appointments (exercise sessions, office/on site visits, "telephone visits" in accordance with intervention protocol)	Home (MD supervised): 83% Home (community-based): 86% Centre: 81%	Home = Centre**
Grace 2016	6 months	Percentage of cardiac rehabilitation sessions attended	Home: 58.12% (SD 34.68) Mixed sex centre: 51.33% (SD 35.75) P = 0.63 Single sex centre: 54.4% (SD 34.72) P = 0.63	Home = Centre Home = Centre
Hwang 2017	3 months	Number of sesssions attended	Home: 20 (SD 6) Centre: 14 (SD 7) Between group: 6 (95% CI: 2 to 9)	Home > Centre

Table 8. Summary of adherence at follow-up in home and centre-based cardiac rehabilitation *(Continued)*

Jolly 2007	3 months 6 months 12 months 24 months	Hours of self-reported activity weighted for intensity	Home: mean 23.2 (SD 22.1) Centre: mean 18.7 (SD 19.3) P = 0.06† Home: mean 16.4 (SD 17.0) Centre: mean 18.1 (SD 25.4) P = 0.4† Home: mean 19.2 (SD 20.8) Centre: mean 15.9 (SD 16.7) P = 0.06† Home: mean 18.9 (SD 18.4) Centre: mean 16.6 (SD 16.4) P = 0.16†	Home = Centre Home = Centre Home = Centre Home = Centre
Karapolat 2009	8 weeks	Attendance at exercise sessions	Home: (32/37) 87.5% Centre: (33/37) 90% P = 0.72*	Home = Centre
Kraal 2014	12 weeks	Number of sessions attended	Home: Mean = 24 (100 %; SD 7.2; range: 13 to 41) Centre: Mean = 20.5 (86%; SD 4.5 range: 6 to 25) P = 0.049	Home > Centre
Maddison 2019	4 months	Number of sessions completed (of 36 sessions possible)	Home: 21 (13) Centre: 23 (11) Between group difference: -1.97 (95% CI: -5.74 to 1.81)	Home = Centre
Marchionni 2003	4 months	Number of exercise sessions completed	Home: 37.3 (SD 3.4) Centre: 34.3 (SD 4.4) P < 0.0001†	Home > Centre
Miller 1984/ DeBusk 1985/ Taylor 1986	6 months	Ratio of exercise sessions completed versus prescribed	Home: 50/70 (72%) Centre: 28/40 (71%) P value not calculable	Home = Centre**
Moholdt 2012	6 months	Training diaries (only reported for home group)	Home: 7/10 patients (with complete diary data) reported ≥ 2 weekly interval sessions over 6 months follow-up	?
Piotrowicz 2010	8 weeks	Percentage of patients who carried out the prescribed exercise	Home: 77/77 (100%)	Home > Centre

Table 8. Summary of adherence at follow-up in home and centre-based cardiac rehabilitation *(Continued)*

		training (home group: daily telephone contacts with monitoring centre; centre group: attendance at supervised sessions)	Centre: 59/75 (79%) P < 0.0001†	
Sparks 1993	3 months	Percentage of cardiac rehabilitation sessions attended	Home: 93% Centre: 88% P value not calculable	?
Varnfield 2014	6 weeks	"Attended baseline assessment and at least 4 weeks (8 of 12 sessions) of centre-based gym sessions/uploaded exercise data to web portal for a minimum of 4 weeks"	Home: 45/48 (94%) Centre: 25/37 (68%) P < 0.005	Home > Centre

*calculated by authors of this report based on Chi^2 test
†calculated by authors of this report based on independent t-test
Home = Centre: no statistically significant difference (P > 0.05) in health-related quality of life (HRQoL) between home- and centre-based groups at follow-up
Home > Centre: statistically significant (P ≤ 0.05) higher HRQoL in home- versus centre-based groups at follow-up
Home < Centre: statistically significant (P ≤ 0.05) lower HRQoL in home- versus centre-based groups at follow-up
**Home- and centre-based groups at follow-up appear to be similar but P value not reported or calculable
? Home- and centre-based groups at follow-up appear different but P value not reported or calculable
Abbreviations:
CI: confidence interval
MD: medical doctor
SD: standard deviation

Table 9. Summary of costs in home- and centre-based settings

Study	**Currency/year of costs/follow-up**	**Cardiac rehabilitation programme cost** (per patient)	**Programme costs considered**	**Total healthcare cost** (per patient)	**Additional healthcare costs considered**	**Comments**
Carlson 2000	USD Not reported 6 months	Home: mean USD 1519 Centre: mean USD 2349	Staff, ECG monitoring	Not reported		
Cowie 2012	GBP 2013 to 2014 60 months	Home: GBP mean 197 Centre: GBP mean 221	Staff, HR monitors, DVD	Home: mean GBP 7932 Centre: mean GBP 7452	Hospitalisations, emergency admissions	
Maddison 2019	NZ$ 2014 6 months	Home: NZ$ mean 1130 Centre: NZ$ mean 3466	Staff, technology (digital and exercise equipment), centre occupancy	Home: mean $NZ 4920 Centre: mean $NZ 9535 NS	Hospitalisations and emergency department admissions, medications	

Table 9. Summary of costs in home- and centre-based settings *(Continued)*

		Difference: NZ$ mean -2336, NS				
Marchionni 2003	USD 2000 14 months	Home: mean USD 1650 Centre: mean USD 8841	Not reported	Home: USD 13,246 Centre: USD 21,298	Not reported	
Dalal 2007	GBP 2002 to 2003 9 months	Home: mean GBP 170 (SD 8) Centre: mean GBP 200 (SD 3) Difference: mean GBP 30 (95% CI -45 to -12) P < 0.0001	Staff, exercise, equipment, staff travel	Home: mean GBP 3279 (SD 374) Centre: mean GBP 3201 (SD 443) Difference: mean GBP 78(95% CI -1103 to 1191) P = 0.894	Rehospitalisations, revascularisations, secondary preventive medication, investigations, primary care consultations	
Hwang 2017	AUD 2013 6 months	Home: mean $1788 Centre: mean $2960	Staff, exercise, equipment, staff travel	Home: mean $2325.00 Centre: mean $3915.55 Differece: mean $-1590.45 (95% CI: -2821.69 to -339.21)	HF hospitalisations	Authors concluded home (tele)-based rehab was less costly.
Jolly 2007	GBP 2003 24 months	Home: mean GBP 198 (95% CI 189 to 209) Centre: mean GBP 157 (95% CI 139 to 175) P < 0.05	Staff, telephone, consultations, staff travel	Not reported		With inclusion of patient costs (travel and time), the societal costs of home- and centre-based cardiac rehabilitation were not significantly different.
Varnfield 2014/ Whittaker 2014	AUD Not reported Based on a 6-week programme	Home: $1633 Centre: $1845	Education, assessment, coaching and mentoring, gymnasium, communication, facility, technology, administration	Patient travel: Home: $80 Centre: $400	Re-admissions - Estimated $39,670 per re-admission (Collins 2001)	Based on evidence suggesting that completing a formal rehabilitation programme significantly reduces the risk of a secondary event and readmission; the net-present value was calculated at $4008 per patient, equating to a saving in health care costs of $2375 per patient

Abbreviations:
AUD: Australian dollars
DVD: digital video disc
ECG: electrocardiogram
GBP: Great Britain pounds
HF: heart failure
NS: not significant
NZ$: NZ dollars
SD: standard deviation
USD: US dollars

Table 10. Summary of healthcare utilisation in home- and centre-based settings

Study	Dalal 2007	Gordon 2002	Bell 1998		Carlson 2000	Marchionni 2003	Jolly 2007	
Follow-up	9 months	3 months	0 to 6 months	6 to 12 months	6 months	14 months	12 months	24 months
Rehospitalisations N patient (%) Mean (SD)	Home 9/60 (15%) Centre 6/44 (14%) P = 0.845 Home 2.2 (0.9)† Centre 1.2 (0.6) P = 0.383		Home 21/90 (23%) Centre 19/88 (22%) P = 0.78#	13/89 (15%) 12/84 (14%) P = 0.95#		Home 0.46 (SE 0.1) Centre 0.33 (SE 0.1) P = 0.49	Home 0.08 (0.34) Centre 0.12 (0.41) P = 0.3	Home 0.20 (0.45) Centre 0.26 (0.57) P = 0.3
Primary care consultations Mean (SD)	Home 6.3 (0.6) Centre 7.0 (0.9) P = 0.514		Home 6.6 (3.6)* Centre 6.6 (4.1) P = 1.00#	5.4 (4.1) 4.6 (3.7) P = 0.19#			Home 0.65 (1.14) Centre 0.72 (1.54) P = 0.8	Home 0.53 (1.14) Centre 0.66 (1.42) P = 0.7
Secondary prevention medication N patients (%) beta-blockers ACE inhibitors Statins Antiplatelets	Home 31/49 (63%) Centre 24/34 (71%) P = 0.49 Home 30/49 (61%) Centre 24/33 (73%) P = 0.28 Home 48/49 (98%)* Centre 30/35 (88%)* P = 0.18 Home 46/49 (94%) Centre 30/35 (86%)	Home 36/97 (37%) Centre 17/45 (38%) NS Home 25/97 (26%) Centre 8/45 (18%) NS Home 73/97 (75%) Centre 33/45 (73%)			Home 19/38 Centre 18/42 P = 0.52# Home 4/38 Centre 4/42 P = 0.88# Home 5/38 Centre 8/42 P = 0.47# Home 15/38		Home 169 (72.2%) Centre 171 (73.4%) P = 0.8 Home 176 (75.2%)* Centre 161 (69.1%)* P = 0.1 Home 216 (92.3%)** Centre 221 (94.8%)** P = 0.3 Home 227 (97.0%)† Centre 226 (97.0%)†	Home 161 (71.6%) Centre 164 (72.2%) P = 0.9 Home 177 (78.7%)* Centre 156 (68.7%)* P = 0.02 Home 195 (86.7%)** Centre 206 (90.7%)**

Table 10. Summary of healthcare utilisation in home- and centre-based settings *(Continued)*

	P = 0.21	NS Home 94/97 (97%)* Centre 45/45 (100%)* NS		Centre 20/42 P = 0.54#	P = 1.0	P = 0.2 Home 214 (95.1%)+ Centre 220 (96.9%)+ P = 0.3
Comments	†number of nights *lipid-lowering drugs	*antiplatelets & anticoagulants	*GP consultations		*ACEi or Angiotensin II receptor antagonist **cholesterol-lowering drugs †Aspirin or antiplatelet drugs	

#P value calculated by the authors of the present report
Abbreviations:
ACE: angiotensin converting enzyme
GP: general practitioner
NS: not statistically significant
SD: standard deviation
SE: standard error

Table 11. Summary of healthcare in hospital- and centre-based settings, continued

Study	Moholdt 2012	Oerkild 2011
Follow-up	6 months	12 months
Rehospitalisations N patient (%) Number Mean (SD)	Not reported	Number and length of admissions the same between groups
Primary care Consultations Mean (SD)	Not reported	Not reported
Secondary prevention medication N patients (%) beta-blockers ACE inhibitors Antihypertensives Statins Antiplatelets	Home: 8/14 (57%) Centre: 15/16 (94%) P = 0.02* Home: 1/14 (7%) Centre: 0/16 (0%) P = 0.28* Home: 6/14 (43%) Centre: 2/16 (13%) P = 0.07* Home: 14/14 (100%) Centre: 14/16 (100%) P = 0.18*	Not reported
Comments		

*P value calculated by review authors
Abbreviations:
ACE: angiotensin-converting-enzyme
SD: standard deviation

APPENDICES

Appendix 1. Search strategies 2022

CENTRAL

#1 MeSH descriptor: [Myocardial Ischemia] explode all trees

#2 (myocard* near isch*mi*):ti,ab,kw

#3 (isch*mi* near heart):ti,ab,kw

#4 MeSH descriptor: [Coronary Artery Bypass] explode all trees

#5 coronary:ti,ab,kw

#6 MeSH descriptor: [Coronary Disease] explode all trees

#7 MeSH descriptor: [Myocardial Revascularization] explode all trees

#8 MeSH descriptor: [Myocardial Infarction] explode all trees

#9 (myocard* near infarct*):ti,ab,kw

#10 (heart near infarct*):ti,ab,kw

#11 MeSH descriptor: [Angina Pectoris] explode all trees

#12 angina:ti,ab,kw

#13 MeSH descriptor: [Heart Failure] explode all trees

#14 heart and (failure or attack):ti,ab,kw

#15 MeSH descriptor: [Heart Diseases] explode all trees

#16 heart near disease*:ti,ab,kw

#17 myocard*:ti,ab,kw

#18 cardiac*:ti,ab,kw

#19 CABG:ti,ab,kw

#20 PTCA:ti,ab,kw

#21 stent* near (heart or cardiac*):ti,ab,kw

#22 MeSH descriptor: [Heart Bypass, Left] explode all trees

#23 MeSH descriptor: [Heart Bypass, Right] explode all trees

#24 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23

#25 MeSH descriptor: [Percutaneous Coronary Intervention] explode all trees

#26 (percutaneouscoronary near/2 (interven* or revascular*)):ti,ab,kw

#27 MeSH descriptor: [Angioplasty] explode all trees

#28 angioplast*:ti,ab,kw

#29 ((coronary or arterial) near/4 dilat*):ti,ab,kw

#30 endoluminal repair*:ti,ab,kw

#31 MeSH descriptor: [Stents] explode all trees

#32 stent*:ti,ab,kw

#33 (pci or ptca):ti,ab,kw

#34 MeSH descriptor: [Atherectomy] explode all trees

#35 atherectom*:ti,ab,kw

#36 acute coronary syndrom*:ti,ab,kw

#37 #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36

#38 #24 or #37

#39 MeSH descriptor: [Rehabilitation Centers] explode all trees

#40 MeSH descriptor: [Exercise Therapy] explode all trees

#41 MeSH descriptor: [Sports] this term only

#42 MeSH descriptor: [Physical Exertion] explode all trees

#43 rehabilitat*:ti,ab,kw

#44 (physical* near (fit* or train* or therap* or activit*)):ti,ab,kw

#45 MeSH descriptor: [Exercise] explode all trees

#46 train* near (strength* or aerobic or exercise*):ti,ab,kw

#47 ((exercise* or fitness) near/3 (treatment or intervent* or program*)):ti,ab,kw

#48 MeSH descriptor: [Rehabilitation] explode all trees

#49 MeSH descriptor: [Patient Education as Topic] explode all trees

#50 (patient* near/3 educat*):ti,ab,kw

#51 ((lifestyle or life-style) near/3 (intervent* or program* or treatment*)):ti,ab,kw

#52 MeSH descriptor: [Self Care] explode all trees

#53 MeSH descriptor: [Ambulatory Care] explode all trees

#54 MeSH descriptor: [Psychotherapy] explode all trees

#55 psychotherap*:ti,ab,kw

#56 psycholog* near intervent*:ti,ab,kw

#57 relax*:ti,ab,kw

#58 MeSH descriptor: [Relaxation Therapy] explode all trees

#59 MeSH descriptor: [Counseling] explode all trees

#60 counsel*ing:ti,ab,kw

#61 MeSH descriptor: [Cognitive Behavioral Therapy] explode all trees

#62 MeSH descriptor: [Behavior Therapy] explode all trees

#63 behavio*r* near/4 (modif* or therap* or rehab* or change):ti,ab,kw

#64 MeSH descriptor: [Stress, Psychological] explode all trees

#65 stress near manage*:ti,ab,kw

#66 cognitive* near therap*:ti,ab,kw

#67 MeSH descriptor: [Meditation] explode all trees

#68 meditat*:ti,ab,kw

#69 MeSH descriptor: [Anxiety] this term only

#70 manage* near (anxiety or depres*):ti,ab,kw

#71 CBT:ti,ab,kw

#72 hypnotherap*:ti,ab,kw

#73 goal near/3 setting:ti,ab,kw

#74 psycho-educat* or psychoeducat*:ti,ab,kw

#75 motivat* near interv*:ti,ab,kw

#76 MeSH descriptor: [Psychopathology] explode all trees

#77 psychopathol*:ti,ab,kw

#78 MeSH descriptor: [Autogenic Training] explode all trees

#79 autogenic*:ti,ab,kw

#80 self near (manage* or care or motivat*):ti,ab,kw

#81 distress*:ti,ab,kw

#82 psychosocial* or psycho-social:ti,ab,kw

#83 MeSH descriptor: [Health Education] explode all trees

#84 ((nutrition or diet or health) near education):ti,ab,kw

#85 heart manual:ti,ab,kw

#86 home-based:ti,ab,kw

#87 #39 or #40 or #41 or #42 or #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53 or #54 or #55 or #56 or #57 or #58 or #59 or #60 or #61 or #62 or #63 or #64 or #65 or #66 or #67 or #68 or #69 or #70 or #71 or #72 or #73 or #74 or #75 or #76 or #77 or #78 or #79 or #80 or #81 or #82 or #83 or #84 or #85 or #86

#88 MeSH descriptor: [Text Messaging] this term only

#89 ((mms or sms) and (text* or messag*)):ti,ab,kw

#90 (multimedia messag* service* or short messag* service*):ti,ab,kw

#91 (text messag* or texting):ti,ab,kw

#92 MeSH descriptor: [Cell Phone] explode all trees

#93 ((car or cell* or smart or mobile) near/3 phone*):ti,ab,kw

#94 (carphone* or cellphone* or smartphone* or mobilephone*):ti,ab,kw

#95 (iphone* or ipod* or podcast* or ipad* or android* or blackberr* or palm pilot*):ti,ab,kw

#96 MeSH descriptor: [Computers, Handheld] explode all trees

#97 (pda* or personal digital assistant*):ti,ab,kw

#98 ((tablet or portable) near/4 (computer or pc)):ti,ab,kw

#99 ((wireless or handheld) near/3 (device* or technolog*)):ti,ab,kw

#100 MeSH descriptor: [Mobile Applications] this term only

#101 ((app or apps or application*) near/3 (mobile* or portable or phone*)):ti,ab,kw

#102 MeSH descriptor: [Telemedicine] this term only

#103 telemedicine:ti,ab,kw

#104 telehealth:ti,ab,kw

#105 telemonitor*:ti,ab,kw

#106 ehealth:ti,ab,kw

#107 e-health:ti,ab,kw

#108 (mobile near/3 health*):ti,ab,kw

#109 mhealth:ti,ab,kw

#110 m-health:ti,ab,kw

#111 MeSH descriptor: [Computer-Assisted Instruction] this term only

#112 ((computer or online or internet or web) near/3 (learn* or educat* or instruct*)):ti,ab,kw

#113 (elearning or e-learning):ti,ab,kw

#114 MeSH descriptor: [Electronic Mail] this term only

#115 ("electronic mail" or email* or e-mail*):ti,ab,kw

#116 MeSH descriptor: [Internet] explode all trees

#117 (web or website* or internet):ti,ab,kw

#118 (social near/3 (media or network*)):ti,ab,kw

#119 #88 or #89 or #90 or #91 or #92 or #93 or #94 or #95 or #96 or #97 or #98 or #99 or #100 or #101 or #102 or #103 or #104 or #105 or #106 or #107 or #108 or #109 or #110 or #111 or #112 or #113 or #114 or #115 or #116 or #117 or #118

#120 #87 or #119

#121 #38 and #120 Date added to CENTRAL trials database 21/09/2016-16/09/2022

MEDLINE

1 exp Myocardial Ischemia/

2 (myocard* adj3 isch?mi*).tw.

3 (isch?mi* adj3 heart).tw.

4 exp Coronary Artery Bypass/

5 coronary.tw.

6 exp Coronary Disease/

7 exp Myocardial Revascularization/

8 exp Myocardial Infarction/

9 (myocard* adj3 infarct*).tw.

10 (heart adj3 infarct*).tw.

11 exp Angina Pectoris/

12 angina.tw.

13 exp Heart Failure/

14 (heart adj3 (failure or attack)).tw.

15 exp Heart Diseases/

16 (heart adj3 disease*).tw.

17 myocard*.tw.

18 cardiac*.tw.

19 CABG.tw.

20 PTCA.tw.

21 (stent* adj3 (heart or cardiac*)).tw.

22 Heart Bypass, Left/

23 exp Heart Bypass, Right/

24 or/1-23

25 exp Percutaneous Coronary Intervention/

26 (percutaneous coronary adj2 (interven* or revascular*)).tw.

27 exp Angioplasty/

28 angioplast*.tw.

29 ((coronary or arterial) adj4 dilat*).tw.

30 endoluminal repair*.tw.

31 exp Stents/

32 stent*.tw.

33 (pci or ptca).tw.

34 exp Atherectomy/

35 atherectom*.tw.

36 acute coronary syndrom*.tw.

37 or/25-36

38 24 or 37

39 Rehabilitation Centers/

40 exp Exercise Therapy/

41 Sports/

42 Physical Exertion/

43 rehabilitat*.tw.

44 (physical* adj3 (fit* or train* or therap* or activit*)).tw.

45 exp Exercise/

46 (train* adj3 (strength* or aerobic or exercise*)).tw.

47 ((exercise* or fitness) adj3 (treatment or intervent* or program*)).tw.

48 exp Rehabilitation/

49 Patient Education as Topic/

50 (patient* adj3 educat*).tw.

51 ((lifestyle or life-style) adj3 (intervent* or program* or treatment*)).tw.

52 exp Self Care/

53 exp Ambulatory Care/

54 exp Psychotherapy/

55 psychotherap*.tw.

56 (psycholog* adj3 intervent*).tw.

57 relax*.tw.

58 Relaxation Therapy/

59 exp Counseling/

60 counsel?ing.tw.

61 exp Cognitive Therapy/

62 exp Behavior Therapy/

63 (behavio?r* adj4 (modif* or therap* or rehab* or change)).tw.

64 exp Stress, Psychological/

65 (stress adj3 manage*).tw.

66 (cognitive* adj3 therap*).tw.

67 exp Meditation/

68 meditat*.tw.

69 Anxiety/

70 (manage* adj3 (anxiety or depres*)).tw.

71 CBT.tw.

72 hypnotherap*.tw.

73 (goal adj3 setting).tw.

74 (psycho-educat* or psychoeducat*).tw.

75 (motivat* adj3 interv*).tw.

76 exp Psychopathology/

77 psychopathol*.tw.

78 exp Autogenic Training/

79 autogenic*.tw.

80 (self adj3 (manage* or care or motivat*)).tw.

81 distress*.tw.

82 (psychosocial* or psycho-social*).tw.

83 exp Health Education/

84 ((nutrition or diet or health) adj3 education).tw.

85 heart manual.tw.

86 home based.tw.

87 or/39-86

88 Text Messaging/

89 ((mms or sms) and (text* or messag*)).tw.

90 (multimedia messag* service* or short messag* service*).tw.

91 (text messag* or texting).tw.

92 exp Cellular Phone/

93 ((car or cell* or smart or mobile) adj3 phone*).tw.

94 (carphone* or cellphone* or smartphone* or mobilephone*).tw.

95 (iphone* or ipod* or podcast* or ipad* or android* or blackberr* or palm pilot*).tw.

96 exp Computers, Handheld/

97 (pda* or personal digital assistant*).tw.

98 ((tablet or portable) adj4 (computer or pc)).tw.

99 ((wireless or handheld) adj3 (device* or technolog*)).tw.

100 Mobile Applications/

101 ((app or apps or application*) adj3 (mobile* or portable or phone*)).tw.

102 Telemedicine/

103 telemedicine.tw.

104 telehealth.tw.

105 telemonitor*.tw.

106 ehealth.tw.

107 e-health.tw.

108 (mobile adj3 health*).tw.

109 mhealth.tw.

110 m-health.tw.

111 Computer-Assisted Instruction/

112 ((computer or online or internet or web) adj3 (learn* or educat* or instruct*)).tw.

113 (elearning or e-learning).tw.

114 Electronic Mail/

115 (electronic mail or email* or e-mail*).tw.

116 exp Internet/

117 (web or website* or internet).tw.

118 (social adj3 (media or network*)).tw.

119 or/88-118

120 87 or 119

121 38 and 120

122 randomized controlled trial.pt.

123 controlled clinical trial.pt.

124 randomized.ab.

125 placebo.ab.

126 drug therapy.fs.

127 randomly.ab.

128 trial.ab.

129 groups.ab.

130 122 or 123 or 124 or 125 or 126 or 127 or 128 or 129

131 exp animals/ not humans.sh.

132 130 not 131

133 121 and 132

134 limit 133 to ed=20160921-20220916

Embase

1 exp Myocardial Ischemia/

2 (myocard* adj3 isch?mi*).tw.

3 (isch?mi* adj3 heart).tw.

4 exp Coronary Artery Bypass/

5 coronary.tw.

6 exp Coronary Disease/

7 exp Myocardial Revascularization/

8 exp Myocardial Infarction/

9 (myocard* adj3 infarct*).tw.

10 (heart adj3 infarct*).tw.

11 exp Angina Pectoris/

12 angina.tw.

13 exp Heart Failure/

14 (heart adj3 (failure or attack)).tw.

15 exp Heart Diseases/

16 (heart adj3 disease*).tw.

17 myocard*.tw.

18 cardiac*.tw.

19 CABG.tw.

20 PTCA.tw.

21 (stent* adj3 (heart or cardiac*)).tw.

22 Heart Bypass, Left/

23 exp Heart Bypass, Right/

24 or/1-23

25 exp percutaneous coronary intervention/

26 (percutaneous coronary adj2 (interven* or revascular*)).tw.

27 exp angioplasty/

28 angioplast*.tw.

29 ((coronary or arterial) adj4 dilat*).tw.

30 endoluminal repair*.tw.

31 exp stent/

32 stent*.tw.

33 (pci or ptca).tw.

34 exp atherectomy/

35 atherectom*.tw.

36 acute coronary syndrom*.tw.

37 or/25-36

38 24 or 37

39 Rehabilitation Centers/

40 exp Exercise Therapy/

41 Sports/

42 Physical Exertion/

43 rehabilitat*.tw.

44 (physical* adj3 (fit* or train* or therap* or activit*)).tw.

45 exp Exercise/

46 (train* adj3 (strength* or aerobic or exercise*)).tw.

47 ((exercise* or fitness) adj3 (treatment or intervent* or program*)).tw.

48 exp Rehabilitation/

49 Patient Education as Topic/

50 (patient* adj3 educat*).tw.

51 ((lifestyle or life-style) adj3 (intervent* or program* or treatment*)).tw.

52 exp Self Care/

53 exp Ambulatory Care/

54 exp Psychotherapy/

55 psychotherap*.tw.

56 (psycholog* adj3 intervent*).tw.

57 relax*.tw.

58 Relaxation Therapy/

59 exp Counseling/

60 counsel?ing.tw.

61 exp Cognitive Therapy/

62 exp Behavior Therapy/

63 (behavio?r* adj4 (modif* or therap* or rehab* or change)).tw.

64 exp Stress, Psychological/

65 (stress adj3 manage*).tw.

66 (cognitive* adj3 therap*).tw.

67 exp Meditation/

68 meditat*.tw.

69 Anxiety/

70 (manage* adj3 (anxiety or depres*)).tw.

71 CBT.tw.

72 hypnotherap*.tw.

73 (goal adj3 setting).tw.

74 (psycho-educat* or psychoeducat*).tw.

75 (motivat* adj3 interv*).tw.

76 exp Psychopathology/

77 psychopathol*.tw.

78 exp Autogenic Training/

79 autogenic*.tw.

80 (self adj3 (manage* or care or motivat*)).tw.

81 distress*.tw.

82 (psychosocial* or psycho-social*).tw.

83 exp Health Education/

84 ((nutrition or diet or health) adj3 education).tw.

85 heart manual.tw.

86 home based.tw.

87 or/39-86

88 Text Messaging/

89 ((mms or sms) and (text* or messag*)).tw.

90 (multimedia messag* service* or short messag* service*).tw.

91 (text messag* or texting).tw.

92 exp Cellular Phone/

93 ((car or cell* or smart or mobile) adj3 phone*).tw.

94 (carphone* or cellphone* or smartphone* or mobilephone*).tw.

95 (iphone* or ipod* or podcast* or ipad* or android* or blackberr* or palm pilot*).tw.

96 exp Computers, Handheld/

97 (pda* or personal digital assistant*).tw.

98 ((tablet or portable) adj4 (computer or pc)).tw.

99 ((wireless or handheld) adj3 (device* or technolog*)).tw.

100 Mobile Applications/

101 ((app or apps or application*) adj3 (mobile* or portable or phone*)).tw.

102 Telemedicine/

103 telemedicine.tw.

104 telehealth.tw.

105 telemonitor*.tw.

106 ehealth.tw.

107 e-health.tw.

108 (mobile adj3 health*).tw.

109 mhealth.tw.

110 m-health.tw.

111 Computer-Assisted Instruction/

112 ((computer or online or internet or web) adj3 (learn* or educat* or instruct*)).tw.

113 (elearning or e-learning).tw.

114 Electronic Mail/

115 (electronic mail or email* or e-mail*).tw.

116 exp Internet/

117 (web or website* or internet).tw.

118 (social adj3 (media or network*)).tw.

119 or/88-118

120 38 and 87

121 38 and 119

122 120 or 121

123 random$.tw.

124 factorial$.tw.

125 crossover$.tw.

126 cross over$.tw.

127 cross-over$.tw.

128 placebo$.tw.

129 (doubl$ adj blind$).tw.

130 (singl$ adj blind$).tw.

131 assign$.tw.

132 allocat$.tw.

133 volunteer$.tw.

134 crossover procedure/

135 double blind procedure/

136 randomized controlled trial/

137 single blind procedure/

138 123 or 124 or 125 or 126 or 127 or 128 or 129 or 130 or 131 or 132 or 133 or 134 or 135 or 136 or 137

139 (animal/ or nonhuman/) not human/

140 138 not 139

141 122 and 140

142 limit 141 to embase

143 limit 142 to dd=20160921-20220916

PsycINFO

1 (myocard* adj3 isch?mi*).tw.

2 (isch?mi* adj3 heart).tw.

3 coronary.tw.

4 exp Myocardial Infarction/

5 (myocard* adj3 infarct*).tw.

6 (heart adj3 infarct*).tw.

7 exp Angina Pectoris/

8 angina.tw.

9 (heart adj3 (failure or attack)).tw.

10 (heart adj3 disease*).tw.

11 myocard*.tw.

12 cardiac*.tw.

13 CABG.tw.

14 PTCA.tw.

15 (stent* adj3 (heart or cardiac*)).tw.

16 or/1-15

17 exp percutaneous coronary intervention/

18 (percutaneous coronary adj2 (interven* or revascular*)).tw.

19 exp angioplasty/

20 angioplast*.tw.

21 ((coronary or arterial) adj4 dilat*).tw.

22 endoluminal repair*.tw.

23 exp stent/

24 stent*.tw.

25 (pci or ptca).tw.

26 exp atherectomy/

27 atherectom*.tw.

28 acute coronary syndrom*.tw.

29 or/17-28

30 16 or 29

31 Rehabilitation Centers/

32 exp Exercise Therapy/

33 Sports/

34 rehabilitat*.tw.

35 (physical* adj3 (fit* or train* or therap* or activit*)).tw.

36 exp Exercise/

37 (train* adj3 (strength* or aerobic or exercise*)).tw.

38 ((exercise* or fitness) adj3 (treatment or intervent* or program*)).tw.

39 exp Rehabilitation/

40 (patient* adj3 educat*).tw.

41 ((lifestyle or life-style) adj3 (intervent* or program* or treatment*)).tw.

42 exp Self Care/

43 exp Ambulatory Care/

44 exp Psychotherapy/

45 psychotherap*.tw.

46 (psycholog* adj3 intervent*).tw.

47 relax*.tw.

48 Relaxation Therapy/

49 exp Counseling/

50 counsel?ing.tw.

51 exp Cognitive Therapy/

52 exp Behavior Therapy/

53 (behavio?r* adj4 (modif* or therap* or rehab* or change)).tw.

54 (stress adj3 manage*).tw.

55 (cognitive* adj3 therap*).tw.

56 exp Meditation/

57 meditat*.tw.

58 Anxiety/

59 (manage* adj3 (anxiety or depres*)).tw.

60 CBT.tw.

61 hypnotherap*.tw.

62 (goal adj3 setting).tw.

63 (psycho-educat* or psychoeducat*).tw.

64 (motivat* adj3 interv*).tw.

65 exp Psychopathology/

66 psychopathol*.tw.

67 exp Autogenic Training/

68 autogenic*.tw.

69 (self adj3 (manage* or care or motivat*)).tw.

70 distress*.tw.

71 (psychosocial* or psycho-social*).tw.

72 exp Health Education/

73 ((nutrition or diet or health) adj3 education).tw.

74 heart manual.tw.

75 home based.tw.

76 or/31-75

77 Text Messaging/

78 ((mms or sms) and (text* or messag*)).tw.

79 (multimedia messag* service* or short messag* service*).tw.

80 (text messag* or texting).tw.

81 exp Mobile Phones/

82 ((car or cell* or smart or mobile) adj3 phone*).tw.

83 (carphone* or cellphone* or smartphone* or mobilephone*).tw.

84 (iphone* or ipod* or podcast* or ipad* or android* or blackberr* or palm pilot*).tw.

85 exp mobile devices/

86 (pda* or personal digital assistant*).tw.

87 ((tablet or portable) adj4 (computer or pc)).tw.

88 ((wireless or handheld) adj3 (device* or technolog*)).tw.

89 Mobile Applications/

90 ((app or apps or application*) adj3 (mobile* or portable or phone*)).tw.

91 Telemedicine/

92 telemedicine.tw.

93 telehealth.tw.

94 telemonitor*.tw.

95 ehealth.tw.

96 e-health.tw.

97 (mobile adj3 health*).tw.

98 mhealth.tw.

99 m-health.tw.

100 Computer Assisted Instruction/

101 ((computer or online or internet or web) adj3 (learn* or educat* or instruct*)).tw.

102 (elearning or e-learning).tw.

103 Computer Mediated Communication/

104 (electronic mail or email* or e-mail*).tw.

105 exp Internet/

106 (web or website* or internet).tw.

107 (social adj3 (media or network*)).tw.

108 or/77-107

109 30 and 76

110 30 and 108

111 109 or 110

112 random$.tw.

113 factorial$.tw.

114 crossover$.tw.

115 cross-over$.tw.

116 placebo$.tw.

117 (doubl$ adj blind$).tw.

118 (singl$ adj blind$).tw.

119 assign$.tw.

120 allocat$.tw.

121 volunteer$.tw.

122 control*.tw.

123 "2000".md.

124 or/112-123

125 111 and 124

126 limit 125 to up=20160921-20220916

CINAHL

S121 S117 AND S120 Limiters - Published Date: 20160921-20220916

S120 S118 OR S119

S119 (MH "Clinical Trials+")

S118 random* or blind* or allocat* or assign* or trial* or placebo* or crossover* or cross-over*

S117 S37 AND S116

S116 S83 OR S115

S115 S84 OR S85 OR S86 OR S87 OR S88 OR S89 OR S90 OR S91 OR S92 OR S93 OR S94 OR S95 OR S96 OR S97 OR S98 OR S99 OR S100 OR S101 OR S102 OR S103 OR S104 OR S105 OR S106 OR S107 OR S108 OR S109 OR S110 OR S111 OR S112 OR S113 OR S114

S114 (social N3 (media or network*))

S113 (web or website* or internet)

S112 (MH "Internet+")

S111 (electronic mail or email* or e-mail*)

S110 (MH "Email")

S109 (elearning or e-learning)

S108 ((computer or online or internet or web) N3 (learn* or educat* or instruct*))

S107 (MH "Computer Assisted Instruction")

S106 m-health

S105 mhealth

S104 (mobile N3 health*)

S103 e-health

S102 ehealth

S101 telemonitor*

S100 telehealth

S99 telemedicine

S98 (MH "Telemedicine")

S97 ((app or apps or application*) N3 (mobile* or portable or phone*))

S96 (MH "Mobile Applications")

S95 ((wireless or handheld) N3 (device* or technolog*))

S94 ((tablet or portable) N4 (computer or pc))

S93 (pda* or personal digital assistant*)

S92 (MH "Computers, Hand-Held+")

S91 (iphone* or ipod* or podcast* or ipad* or android* or blackberr* or palm pilot*)

S90 (carphone* or cellphone* or smartphone* or mobilephone*)

S89 ((car or cell* or smart or mobile) N3 phone*)

S88 (MH "Cellular Phone+")

S87 (text messag* or texting)

S86 (multimedia messag* service* or short messag* service*)

S85 ((mms or sms) and (text* or messag*))

S84 (MH "Text Messaging")

S83 S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 OR S54 OR S55 OR S56 OR S57 OR S58 OR S59 OR S60 OR S61 OR S62 OR S63 OR S64 OR S65 OR S66 OR S67 OR S68 OR S69 OR S70 OR S71 OR S72 OR S73 OR S74 OR S75 OR S76 OR S77 OR S78 OR S79 OR S80 OR S81 OR S82

S82 (heart manual) OR (home based)

S81 ((nutrition or diet or health) N3 education)

S80 (MH "Health Education+")

S79 (psychosocial* or psycho-social)

S78 (distress*)

S77 (self N3 (manage* or care or motivat*))

S76 (autogenic*)

S75 (psychopathol*)

S74 (MH "Psychopathology")

S73 (motivat* N3 interv*)

S72 (psycho-educat*) or (psychoeducat*)

S71 (goal N3 setting)

S70 (hypnotherap*)

S69 (CBT)

S68 (manage*) N3 (anxiety or depres*)

S67 (MH "Anxiety")

S66 (meditat*)

S65 (MH "Meditation")

S64 (cognitive* N3 therap*)

S63 (stress N3 manage*)

S62 (MH "Stress, Psychological+")

S61 (behavio?r*) N4 (modif* or therap* or rehab* or change)

S60 (MH "Behavior Therapy+")

S59 (MH "Cognitive Therapy")

S58 (counsel?ing)

S57 (MH "Counseling+")

S56 (relax*)

S55 (psycholog* N3 intervent*)

S54 (psychotherap*)

S53 (MH "Psychotherapy+")

S52 (MH "Ambulatory Care")

S51 (MH "Self Care+")

S50 ((lifestyle or life-style) N3 (intervent* or program* or treatment*))

S49 (patient* N3 educat*)

S48 (MH "Patient Education+")

S47 (MH "Rehabilitation+")

S46 ((exercise* or fitness) N3 (treatment or intervent* or program*))

S45 (train*) N3 (strength* or aerobic or exercise*)

S44 (MH "Exercise")

S43 (physical* N3 (fit* or train* or therap* or activit*))

S42 (rehabilitat*)

S41 (MH "Exertion+")

S40 (MH "Sports")

S39 (MH "Therapeutic Exercise+")

S38 (MH "Rehabilitation Centers+")

S37 S23 OR S36

S36 S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35

S35 acute coronary syndrom*

S34 atherectom*

S33 (MH "Atherectomy+")

S32 (pci or ptca)

S31 stent*

S30 (MH "Stents+")

S29 endoluminal repair*

S28 ((coronary or arterial) n4 dilat*)

S27 angioplast*

S26 (MH "Angioplasty+")

S25 (percutaneous coronary n2 (interven* or revascular*))

S24 (MH "Angioplasty, Transluminal, Percutaneous Coronary")

S23 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22

S22 (MH "Cardiopulmonary Bypass")

S21 (stent* N3 (heart or cardiac*))

S20 (PTCA)

S19 (CABG)

S18 (cardiac*)

S17 (myocard*)

S16 (heart N3 disease*)

S15 (MH "Heart Diseases+")

S14 (heart N3 (failure or attack))

S13 (MH "Heart Failure+")

S12 (angina)

S11 (MH "Angina Pectoris+")

S10 (heart N3 infarct*)

S9 (myocard* N3 infarct*)

S8 (MH "Myocardial Infarction+")

S7 (MH "Myocardial Revascularization+")

S6 (MH "Coronary Disease+")

S5 (coronary)

S4 (MH "Coronary Artery Bypass+")

S3 (isch?mi* N3 heart)

S2 (myocard* N3 isch?mi*)

S1 (MH "Myocardial Ischemia+")

UK Clinical Trials Gateway (www.ukctg.nihr.ac.uk/)

"cardiac rehabilitation" AND "home"

WHO ICTRP

"cardiac rehabilitation" AND "home"

Clinicaltrials.gov

"cardiac rehabilitation" AND "home"

WHAT'S NEW

Date	Event	Description
27 October 2023	New search has been performed	Updated review with a search up to 16 September 2022.
27 October 2023	New citation required but conclusions have not changed	3 new studies included, but conclusions have not changed since previous review update in 2017.

HISTORY

Protocol first published: Issue 2, 2008
Review first published: Issue 1, 2010

Date	Event	Description
20 October 2017	Amended	correction of mistake in Table 9
14 October 2014	New search has been performed	The review has been updated following a new search in October 2014.
9 October 2014	New citation required but conclusions have not changed	Five new studies were found for inclusion but did not change the conclusions of this review.
19 April 2010	Amended	Minor changes to the Background section.
10 February 2010	Amended	Forest plots of 'Mortality' and 'Completers' have been updated as home and hospital group headings were inadvertently reversed in the original review. Added citation in 'Other published versions of this review'.

CONTRIBUTIONS OF AUTHORS

JA, CEC, HD, STJMcD, SM undertook the study selection for this update.

JA and RST undertook data extraction and risk of bias assessment for this update.

RST led the writing of the updated review supported by STJMcD. All authors reviewed the updated review text manuscript and approved the final version.

DECLARATIONS OF INTEREST

Jannat Afzal: no relevant interests; published opinions relevant to the interventions in the work - the Promise and Challenge of Telerehabilitation in Cardiac Rehabilitation University of Glasgow.

Christopher Clark: Bayer (Consultant); ReCor Medical (Consultant).

Aynsley Cowie: no relevant interests; works as a health professional - NHS Ayrshire and Arran; lead author on Cowie 2012 - a study comparing home and hospital-based exercise in heart failure. This was conducted as part of a PhD and funded entirely by employer, NHS Ayrshire and Arran. The study took place entirely within this institution.

Hasnain Dalal: no relevant interests; published opinions - BMJ Clinical Reviews in 2015 and 2021 on Cardiac Rehabilitation; chief investigator for the Cornwall Heart Attack Rehabilitation Management Study - Dalal HM, Evans PH, Campbell JL, Taylor RS, Watt A, Read KL, et al. Home-based versus hospital-based rehabilitation after myocardial infarction: a randomized trial with preference arms - Cornwall Heart Attack Rehabilitation Management Study (CHARMS). International Journal of Cardiology 2007;119(2):202-11; Taylor RS, Watt A, Dalal HM, Evans PH, Campbell JL, Read KL, et al. Home-based cardiac rehabilitation versus hospital-based rehabilitation: a cost-effectiveness analysis. International Journal of Cardiology 2007;119(2):196-201. Funding: NHS R&D (now the National Institute of Health Research, UK).

Sarah Dean: other IP - textbook 'Interprofessional Rehabilitation: a person-centred approach'.

Kat Jolly: National Institute for Health Research (Sub-committee chair of NIHR Programme Grants for Applied Health Research); Chief investigator of Jolly 2007 - funded by UK NIHR HTA programme.

Sinead McDonagh: National Institute for Health Research (Grant/contract).

Sarah Moore: no relevant interests; works as a GP for Wonford Green Surgery, Exeter, UK.

Rod Taylor: no relevant interests; Cochrane Heart (now closed) Editor, and not involved in the editorial process of this review update.

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- Transparency of the National Health System Drug Reimbursement Decisions, Poland

  co-financed by EU

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

Previous updates:

To reflect current practice and terminology, “percutaneous transluminal coronary angioplasty” (PTCA) was replaced by “percutaneous coronary intervention” (PCI), a term which encompasses the use of balloons, stents and atherectomy.

The order of primary and secondary outcomes has been updated, for clarity.

Due to the increase in the number of studies included in this review, we undertook meta-regression analysis to examine potential treatment effect modifiers and the text has been updated to reflect this change.

We created a Summary of findings table using the following outcomes: total mortality, exercise capacity, withdrawal and health-related quality of life.

This most recent update:

In the most recent version of this review, we have added digital/telehealth platforms to our inclusion definition of home-based cardiac rehabilitation.

INDEX TERMS

Medical Subject Headings (MeSH)

Cardiac Rehabilitation [*methods]; Exercise Tolerance; Heart Failure [mortality] [*rehabilitation]; *Home Care Services; Myocardial Infarction [mortality] [*rehabilitation]; Myocardial Revascularization [mortality] [*rehabilitation]; Patient Dropouts; Quality of Life; Randomized Controlled Trials as Topic; *Rehabilitation Centers; Risk Factors

MeSH check words

Adult; Aged; Female; Humans; Male; Middle Aged