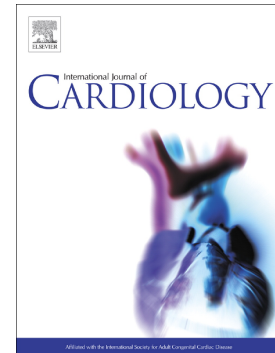


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Promoting patient utilization of outpatient cardiac rehabilitation:
A joint International Council and Canadian Association of
Cardiovascular Prevention and Rehabilitation position statement

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Promoting Patient Utilization of Outpatient Cardiac Rehabilitation: A Joint International Council and Canadian Association Of Cardiovascular Prevention and Rehabilitation Position Statement

Endorsed by: American Society for Preventive Cardiology, Association Francophone de Cardiologie Préventive, Australian Cardiovascular Health and Rehabilitation Association, Brazilian Association of Cardiorespiratory and Intensive Care Physiotherapy, Brazilian Group of Cardiopulmonary and Metabolic Rehabilitation, British Association for Cardiovascular Prevention and Rehabilitation, Canadian Association of Cardiovascular Prevention and Rehabilitation, Canadian Cardiovascular Society, Canadian Council of Cardiovascular Nurses, Cardiac Health Foundation of Canada, Cardiac Society Brunei Darussalam, Indonesian Heart Association, International Council of Cardiovascular Prevention and Rehabilitation, International Society of Physical and Rehabilitation Medicine, Iranian Heart Foundation, Grupo Latinoamericano de Trabajo en Prevencion y Rehabilitacion Cardiaca, Nepal Physiotherapy Society, Philippine Heart Association, Preventive Cardiovascular Nurses Association, Russian National Society of Preventive Cardiology, Society of Indian Physiotherapists, South African Sports Medicine Association, Taiwan Academy of Physical Medicine and Rehabilitation.

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Key words: Coronary artery disease; secondary prevention; health services accessibility; disease management; cardiac rehabilitation

Abstract

Background: Cardiac Rehabilitation (CR) is a recommendation in international clinical practice guidelines given its' benefits, however use is suboptimal. The purpose of this position statement was to translate evidence on interventions that increase CR enrolment and adherence into implementable recommendations.

Methods: The writing panel was constituted by representatives of societies internationally concerned with preventive cardiology, and included disciplines that would be implementing the recommendations. Patient partners served, as well as policy-makers. The statement was developed in accordance with AGREE II, among other guideline checklists. Recommendations were based on our update of the Cochrane review on interventions to promote patient utilization of CR. These were circulated to panel members, who were asked to rate each on a 7-point Likert scale in terms of scientific acceptability, actionability, and feasibility of assessment. A web call was convened to achieve consensus and confirm strength of the recommendations (based on GRADE). The draft underwent external review and public comment.

Results: The 3 drafted recommendations were that to increase enrolment, healthcare providers, particularly nurses (strong), should promote CR to patients face-to-face (strong), and that to increase adherence part of CR could be delivered remotely (weak). Ratings for the 3 recommendations were 5.95 ± 0.69 (mean \pm standard deviation), 5.33 ± 1.12 and 5.64 ± 1.08 , respectively.

Conclusions: Interventions can significantly increase utilization of CR, and hence should be widely applied. We call upon cardiac care institutions to implement these strategies to augment CR utilization, and to ensure CR programs are adequately resourced to serve enrolling patients and support them to complete programs.

Introduction

Cardiovascular diseases (CVD) are among the leading burdens of disease and disability globally.¹ Cardiac rehabilitation (CR) is a model of secondary prevention to mitigate this burden. Outpatient (phase II) CR, regardless of delivery setting, is comprised of specific core components such as structured exercise, risk factor management, patient education and psychosocial counseling.^{2,3} Utilization of CR is associated with 25% lower cardiovascular mortality, 18% less hospitalization, and improved quality of life,⁴ among other benefits.

Accordingly, CR is a recommendation in international CVD clinical practice guidelines. It is recommended for patients with acute coronary syndrome,^{5,6,7} following revascularization procedures,^{8,9} heart failure,^{10,11} and in specific populations such as women with CVD.¹²

CR utilization is comprised of 4 elements (Figure 1).¹³ Patients must first be referred to CR by a healthcare provider. A Canadian Cardiovascular Society–Canadian Association of Cardiovascular Prevention and Rehabilitation (CACPR) position paper regarding promoting CR referral is available elsewhere.¹⁴ The patient-related aspects of CR utilization which are the focus of this position statement are three-fold: enrolment, adherence and completion (definitions in Figure 1).

Although CR is strongly recommended after a cardiac event, its' use is suboptimal. CR utilization rates vary by jurisdiction, owing to multi-level factors,¹⁵ and hence global utilization rates are not established. A meta-analysis of CR enrolment in the literature reported an overall rate of $42.3 \pm 18.7\%$ (median=39.3%),¹⁶ and of adherence of $66.5 \pm 18.2\%$ (median=72.5%) of prescribed sessions;¹⁷ however caution should be warranted in over-interpreting these rates as inclusion criteria was not limited to population-based studies.

With regard to enrolment, the largest and most recent cohort where this was assessed using administrative data was in the United States, where enrolment rates of 16.3% were reported in Medicare beneficiaries (≥ 65 years) post-myocardial infarction or revascularization.¹⁸ Again, the only population-based data of which we are aware with verified adherence stems from the United States, and showed that 40% of Medicare beneficiaries attended $\geq 30/36$ and 13% of included participants attended < 6 of 36 prescribed sessions.¹⁹ The ASPIRE-2-PREVENT study in 19 randomly-selected hospitals in the United Kingdom reported that while 70% were “advised” to attend, 52% of all patients self-reported attending half of prescribed sessions²⁰ (which is only on average about 10);²¹ EUROASPIRE-IV which assessed cardiac patients from 78 hospitals across 24 European countries revealed that while 51% were advised to attend CR, 41% of all patients self-reported attending half of prescribed sessions²² (these are likely over-estimates due to socially-desirable responding).

Representative population-based data on completion rates are available in the United Kingdom’s CR registry; results suggest 77% of participants complete CR²³ (but caution is warranted in over-interpretation as sites may not enter data for patients who only attend an initial session). Utilization rates are even lower in lower-income countries^{24,25} where the epidemic of CVD is at its’ worst.

Rationale and Purpose

Given the benefits of CR, benchmarks for utilization have been previously established. Indeed, the purpose of this position statement is to provide current, evidence-based guidance on interventions that will ensure these benchmarks are met. Specifically, the aim is that 70% of indicated patients enroll in CR¹⁴ (given that some patients may have legitimate contraindications; see exclusions below), and that they participate in at least 12 sessions (although 36 sessions is

associated with even better benefit).²⁶ We ambitiously set a target of CR completion by 70% of enrollees.

The impact of achieving greater CR utilization is apparent. For example, based on 2005 CR utilization rates post-myocardial infarction in Ontario, Canada, it was projected that if CR use was increased to a 90% benchmark, there would be 135 deaths prevented or postponed annually, with a 1.3% (95% confidence interval=1.0-1.6) reduction in CVD mortality.²⁷ In a study conducted in the United States, the number of deaths that could be delayed or postponed if “perfect” guideline-based care (e.g., revascularization, optimal medication therapy, CR) was provided following acute cardiac events was estimated; Out of 10 treatments of known effectiveness for myocardial infarction, other than acute revascularization, the greatest number of patient deaths could be prevented or postponed with optimal CR utilization. Similarly, optimal CR utilization was estimated to prevent or postpone the greatest number of deaths in patients with unstable angina and heart failure, compared with other guideline-based treatments.²⁸

With regard to adherence, the dose-response relationship between CR use and outcomes has been well-established; the more sessions patients attend, the better their outcomes.^{29,30} A recent review examining CR dose showed adherence to a minimum of 12 comprehensive CR sessions was associated with a 42% reduction in all-cause mortality, and adherence to 36 sessions was associated with a 35% reduction in percutaneous coronary intervention.²⁶ Finally, it is also well-established that CR completers have lower death rates than non-completers.³¹

Therefore, the objective of this position statement is to develop evidence-based recommendations on increasing patient enrolment in, adherence to and completion of CR. While the National Institutes for Health and Care Excellence (United Kingdom⁷) made

recommendations for “encouraging people to attend” CR, these were published in 2013 prior to the Cochrane review update and first meta-analysis on CR utilization interventions.³²

The recommendations provided herein are directed to healthcare practitioners providing inpatient acute cardiac care (e.g., nurses, physiotherapists, pharmacists, physicians), any referring providers (e.g., cardiologist, cardiac surgeon, physiatrist / physical medicine and rehabilitation specialist, internist, family physicians), and CR providers. CR promotion interventions should be initiated in the inpatient setting, and also delivered during CR.

Methods

Writing Panel Composition & Stakeholder Engagement

The writing panel was constituted based on the process of the CACPR Guidelines Executive Committee, and with input of the International Council of Cardiovascular Prevention and Rehabilitation (ICCPR) Executive Committee. They recommended representatives of major CR societies (where possible the corresponding authors of trials which were included in the Cochrane review³² which forms the evidentiary basis for this position statement were invited to represent their corresponding national CR association), while ensuring that the panel had diverse geographic representation, and included the healthcare provider types that would be implementing the recommendations (e.g., nurses, physiotherapists, physiatrists, among others). Panel co-chairs were approved by both committees (CSP, SLG).

Patient partners (JS, PM) were solicited to serve as well as policy-makers (AA, NZ, SC, BR, SB, AG) to ensure implementability and uptake of the recommendations. The World Health Organization and World Heart Federation were informed about the initiative, with a request for advice regarding implementation. A methodologist was secured (AG).

All members were required to disclose conflicts of interest, financial relationships or personal interests from 12 months before initiation of the writing effort that could impact their contributions to this statement at the time of statement initiation. These were collated and reviewed on a web call of the writing panel. Only 1 was raised, and was considered not to influence the writing of the statement (declaration available from corresponding author upon request). Finally, an external review panel was also populated, comprised of scientific and clinical experts, as well as representatives of relevant organizations and agencies.

Evidence collection, Grading criteria and Synthesis

This position statement is based on the results of the Cochrane systematic review update with meta-analysis on interventions to promote patient utilization of CR undertaken by the co-chairs.³² In brief, comprehensive literature searches were performed in July 2018 of 6 databases. The search strategy consisted of 4 elements: (1) Cardiovascular diseases, (2) Patient compliance (enrolment, adherence and completion outcomes), (3) Rehabilitation, (4) Motivational interventions and education.

Articles were included in the review if the following criteria were met: (i) included patients had a CR-qualifying condition, (ii) there was an intervention targeted to patients / groups, their partners / caregivers or other family members, or healthcare professionals with the specific aim of increasing patient utilization of phase 2 comprehensive CR, (iii) their design was randomized or quasi-randomized. The Population, Intervention, Comparator and Outcomes (PICO) can be found there. Risk of bias in each included trial was assessed using Cochrane's tool.³³ Evidence for each outcome was evaluated according to the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system.³⁴

Development Process

The statement was developed in accordance with the Appraisal of Guidelines for Research and Evaluation (AGREE)-II,³⁵ the Institute of Medicine's Trustworthiness Standards³⁶ and the Reporting Items for practice Guidelines in Health care (RIGHT) reporting guidelines.³⁷ Recommendations were initially developed by the panel co-chairs, with certainty of evidence and strength of recommendation ratings based on GRADE.³⁴ Exclusions were also drafted for rating. The 3 drafted recommendations and exclusions were circulated to all other authors, who were asked to rate each on a 7-point Likert scale in terms of scientific acceptability, actionability, and feasibility of assessment³⁸ (higher scores more positive). Additionally, overall comments were requested. The ratings and comments from the authors were collated anonymously and shared with authors. It was established a priori that recommendations with mean overall ratings <5/7 would not be accepted as is.³⁹ A web call was convened to discuss areas where consensus was lacking (as per standard deviations below, there was very high consensus), revisions based on comments provided, and to confirm strength of the recommendations. The senior author chaired the call to ensure all perspectives were voiced. The recommendations were revised accordingly.

The position statement outline was developed by the co-chairs as well. Benefits and harms of the recommendations were considered, as well as costs and implementability. The first draft of the position statement was circulated to the writing panel for input concurrent with the recommendations. Feedback was incorporated by the co-chairs. A written record of feedback and corresponding edits has been archived. The revised position statement was circulated to the writing panel for discussion on the web call, as well as to an independent external review panel of experts (see acknowledgments).

With integration of further input, it was submitted to the ICCPR Executive Committee and CACPR Guideline Executive for approval, and then to the major cardiac societies globally for endorsement consideration. The draft was also posted on ICCPR's website for a 45-day period to enable interested public stakeholders to provide input. Input received from associations and stakeholders was documented and considered, and integrated where appropriate. Input did not result in substantive alteration to the recommendations, but some sections of the text were clarified. The writing panel will consider updating this position statement in accordance with updates to the corresponding Cochrane review, where changes to conclusions are found, new and superior interventions are identified or harms raised.³²

CR Utilization Recommendations

As outlined below, effective strategies to increase patient utilization of CR were identified for each indicator/outcome.³² Therefore, all inpatient and outpatient settings as applicable treating CR-indicated patients should be implementing these strategies to promote utilization.

Recommendations are shown in Table 1. Overall ratings for the 3 recommendations were 5.95 ± 0.69 (mean \pm standard deviation), 5.33 ± 1.12 and 5.64 ± 1.08 on the 7-point scale respectively, all exceeding the threshold for inclusion (see Table 2 for component ratings). For each recommendation, comments received formed the basis for revision (see differences between Table 1 and Table 2).

All authors of successful interventions (i.e., point estimate on right side of line of unity and confidence intervals did not cross) were contacted to request their materials used, along with their permission to post them open source for use by others. Received tools are available at <http://sgrace.info.yorku.ca/tools-to-promote-cardiac-rehabilitation-utilization/>.

Enrolment Strategies

The meta-analysis demonstrated that enrolment interventions resulted in 27% greater utilization than was observed with usual care.³² Subgroup analyses revealed interventions were most successful if they targeted nurses (sometimes with peers or allied healthcare providers; no trials intervened with physicians), to deliver them face-to-face, although these were only trends (i.e., $p > .05$ but $< .1$).

Successful interventions included: home visits and telephone calls^{40,41} (including women-centered telephone calls⁴²); coordination of the transfer of care between the hospital and general practice (where CR was provided);⁴³ reducing the time to start CR (within 10 days);⁴⁴ peer navigation (at the hospital bedside, then by phone or mail post-discharge; tools available online);⁴⁵ text messaging;⁴⁶ and Theory of Planned Behavior-based letters.⁴⁷

Adherence Strategies

The meta-analysis demonstrated that adherence interventions resulted in significantly greater utilization than was observed with usual care.³² Successful interventions included: a gender-tailored CR program;⁴⁸ a brief program⁴⁹ (there may be bias here in that it would be easier for patients to adhere to fewer sessions, and it key that patients participate in a sufficient number of sessions to achieve the benefits); cognitive-behavioral theory-based group⁵⁰ and individual (tool available online)⁵¹ sessions; and exploitation of unsupervised settings^{52,53} (please see online supplement for subsequent references). Indeed, subgroup analyses revealed unsupervised delivery appears to be key, although this should be interpreted with caution as participation in a phone call is much easier for patients than attending a session on-site (i.e., low comparability of adherence operationalization).

Completion Strategies

Again, the meta-analysis demonstrated that adherence interventions resulted 13% greater completion than is observed with usual care. Successful interventions included: theoretically-based patient education (tool available online)⁵¹ and a smartphone-based intervention.⁴⁶ None of the subgroup analyses were significant.

Limitations

The limitations of the evidence review are reported elsewhere.³² Chiefly, the interventions evaluated were varied and often multifaceted, resulting in high heterogeneity. Moreover, caution is warranted in over-interpretation of the meta-regression analyses, given there were few trials included, with relatively small sample sizes, and statistical significance was weak.

Implementation Considerations

Barriers to implementing these recommendations have been contemplated. Healthcare systems vary, in terms of inpatient length of stay, availability and reimbursement for CR services, as well as types of providers interacting with patients, which could all impact which interventions may be more feasible and effective. Benefit-harm considerations, cost implications, capacity issues, as well as applicability in low-resource settings are outlined in the supplemental material.

Of particular importance, it is unclear what impact type of provider promoting CR would have on patient utilization as there are no trials comparing provider types; most involved nurses.

It is assumed this physician discussion with patients has not been tested in a trial due to greater perceived time constraints, but data from observational studies suggests physician encouragement in particular greatly impacts patient utilization.^{54,55} The feasibility and impact of CR promotion by all types of healthcare providers that treat cardiac patients should be considered in future.

Exclusions

Endorsement of CR should be given to all indicated patients as per the guidelines cited in the introduction, however there are a few valid instances where CR is contraindicated (i.e., severe mental illness/cognitive disorders [e.g., schizophrenia, advanced dementia; but not depression], comorbid terminal illness/palliative care [e.g., non-curable cancer with expected life expectancy <1 year], permanent resident in a long-term care facility). There can also be cardiac reasons that a patient may not be appropriate for the exercise portion of CR, but these patients should utilize all other core components (i.e., unstable angina, acute decompensated heart failure, cardiac infections, uncontrolled ventricular arrhythmias, aortic dissection, severe aortic stenosis, severe valvular regurgitation, acute thrombophlebitis, pulmonary or systemic embolism). These exclusions had an overall rating of 6.33/7 (Table 2). However, inability to ambulate (i.e., patient should receive non-exercise components; could use ergometer for upper extremity), lack of proficiency in the primary language in which the program is delivered (i.e., interpretation and translation services should be used), perceived lack of motivation (i.e., assuming patient would not be interested due to age or socioeconomic considerations) are not valid reasons to fail to promote CR utilization (overall rating 5.92/6).

Role of Patient Preferences

Patients need to be aware of the existence of CR, and its' benefits. Intervention tools and scripts should be tailored to match patients' culture/language (i.e., translations, adaptations) and gender (i.e., consideration of women's unique needs),⁵⁶ among other sociodemographic characteristics (e.g., socioeconomic status, rurality), and delivered in a patient-centered manner (i.e., make sure patients have sufficient time to ask questions about CR, and that their emotions related to recovery from a life-threatening cardiac event are validated and addressed).⁵⁷ It may be helpful if the provider or peer discussing CR with patients is of a similar sex⁵⁸ or ethnocultural background so they can understand some of the barriers patients may raise. Indeed, interventions to increase utilization should also take into consideration patient's barriers (e.g., transportation, return-to-work, costs).⁵⁹ Where possible, informal caregivers should be involved in CR discussions.

Patient's emotional and cognitive state should also be considered. Many patients experience anxiety due to worry of repeat events, and CR is a setting where patients are monitored by clinical staff and are supported to feel more comfortable in resuming activities of daily living. Moreover, approximately 20% of patients (even higher in heart failure) experience depression.⁶⁰ This can lead to low motivation, feelings of helplessness and psychomotor retardation – all factors which can impede CR participation but also be ameliorated by it. With regard to cognition, patients may have difficulty understanding and remembering discussions about CR if they have mild cognitive impairment (which may be temporarily caused by bypass surgery or cardiopulmonary resuscitation), have been sedated or are on medications which have cognitive effects, or dementia (depression can also impact cognition and decision-making). Provision of hard copy resources such as CR program flyers or cards with website information

for patients to take home, and again inclusion of informal caregivers in referral discussions, could mitigate these cognitive issues.

Once referred, patients should be given the choice to attend a centre-based or home-based CR program based on their needs and preferences (including geographic barriers), particularly considering the results of the subgroup analysis showing adherence interventions are most effective when at least part of it is offered in an unsupervised setting (e.g., eCR). Patients electing home-based programs still need support (from peers and providers) to promote adherence.

Potential Organizational Barriers to Applying the Recommendations

In addition to capacity constraints within CR programs, limited inpatient human resources (staff availability, time), lack of clarity on referral processes and which providers are (and should be) discussing CR with patients, as well as lack of provider awareness regarding which patients are indicated and the nature of services delivered could hamper enrolment recommendation implementation. Moreover, many CR programs do not offer any, or have much, unsupervised CR capacity.⁶¹ Some guidance is available on best practices in delivery of CR in unsupervised settings through ICCPR's provider certification program (<http://globalcardiacrehab.com/training-opportunities/certification/>).

Implementation Tools

As outlined above, the available tools used in the successful trials have been collated online. It is hoped that their availability will facilitate implementation of these recommendations and further testing. Other implementation tools are available through the United States' Million Hearts initiative (<https://millionhearts.hhs.gov/tools-protocols/action-guides/cardiac-change->

package/index.html).⁶² Moreover, there are quality indicators/performance measures on CR enrolment^{13,63,64} adherence^{13,63,65} and completion.^{13,64–66} Adoption can facilitate assessment of whether utilization rates meet recommended benchmarks, and the impact of utilization interventions. Financial incentives, such as pay-for-performance may enhance implementation.

Finally, to support implementation, an online course was developed by the co-chairs to inform inpatient cardiac healthcare providers about the important role they play in promoting patient utilization of CR over-and-above referral, and providing tangible recommendations on how to encourage patients to enroll at the bedside (http://learnonthego.ca/Courses/promoting_patient_participation_in_CR/story_html5.html). It informs healthcare providers about the nature of CR and the benefits of participation, which patients are eligible for CR utilization, key talking points (i.e., describe CR, its' benefits, the reason for patient referral, and that they highly encourage their patient fully participate; an accompanying point-of-care checklist is embedded for clinicians to download), as well as responses to some common barriers patients may raise (e.g., patients who live afar can access home-based programming; costs). It is applicable to all relevant provider types. It seeks to ensure providers' patients perceive they need CR, and that their providers strongly promote their participation. It is currently being evaluated, and if beneficial, will be disseminated more broadly.

Research Directions

First, more population-level data are needed on CR utilization rates globally, which will also enable robust assessment of the impact of utilization interventions. With regard to interventions to increase CR utilization specifically, some interventions tested in the included trials were developed in an evidence-based manner and were grounded in theory, and some are

available open source for future testing. Trials are needed to determine whether successful interventions can be replicated, and to establish generalizability as well.

Research is needed to establish and test simple, brief, specific talking points for providers and text for patients to encourage enrolment. This would be more amenable to translation and cross-cultural adaptation, which could have much broader application and impact. The impact of type of provider promoting CR referral also requires more investigation.

Finally, while overall CR utilization is sub-optimal there remain vulnerable populations who are often under-represented in CR. This includes patients of low socio-economic status, ethnoculturally-diverse, and “complex” patients (e.g., comorbidities, smokers). More trials are needed to establish whether offering gender-tailored CR is associated with increased utilization in women.

Conclusions

CR utilization is sub-optimal, despite the established benefits. Interventions can significantly increase utilization of CR, and hence should be widely applied. Enrolment interventions should be delivered face-to-face by a nurse, and adherence may be improved through remote delivery of CR. We call upon cardiac care institutions to implement these strategies to augment CR utilization, and to ensure CR programs are adequately-resourced to serve enrolling patients and support them to complete programs.

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ACCEPTED MANUSCRIPT

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Figure Title and Legend:

FIGURE 1 – Definition of Cardiac Rehabilitation Utilization Indicators

CR = cardiac rehabilitation

Source: ¹³

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Table 1: Recommendations for cardiac rehabilitation utilization interventions with level of evidence and evidence sources

Recommendation	Certainty of the Evidence (GRADE)	Strength of the Recommendations	Evidentiary Basis
1. Interventions to increase CR enrolment should target healthcare providers, particularly nurses, but also allied healthcare providers, to impact delivery to indicated ^a patients. Their messages promoting enrolment could be reinforced by physicians and peers.	⊕⊕⊖⊖ LOW	Strong	Carroll et al., 2007 ⁴⁰ ; Cossette et al., 2012 ⁴¹ ; Jolly et al., 1999 ⁴³ ; Scott et al., 2013 ⁴⁵
2. Interventions to increase CR enrolment should be delivered face-to-face.	⊕⊕⊖⊖ LOW	Strong	Carroll et al., 2007 ⁴⁰ ; Cossette et al., 2012 ⁴¹ ; Jolly et al., 1999 ⁴³ ; Price et al., 2012 ⁴²
3. To increase CR adherence, interventions should be delivered remotely, or some of the CR program should be delivered unsupervised	⊕⊕⊕⊖ MODERATE	Weak	Focht et al., 2004 ⁵⁰ ; Hwang et al., 2017 ⁵² ; Kraal et al., 2014 ⁵³

^aacute coronary syndrome, revascularization, and heart failure, including women^{5,6,7,8,9,10,11,12.}

CR=cardiac rehabilitation.

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Table 2: Ratings by writing panel members

	Scientific Acceptability	Importance / Actionability	Feasibility of Assessment	Overall Rating
Recommendation (initial draft)				
1. Enrolment interventions should target healthcare providers, to impact delivery to patients	5.57 ±1.45 (6)	6.20 ±0.65 (6)	5.86 ±0.83 (5.5)	5.95 ±0.69 (6)
2. Enrolment interventions should be delivered by a nurse, potentially in conjunction with an allied healthcare provider or peer	4.87 ±1.54 (5)	5.53 ±1.25 (6)	5.07 ±1.33 (5.5)	5.33 ±1.12 (6)
3. To increase adherence, interventions should be delivered remotely or at least some of the CR program should be delivered unsupervised	5.50 ±1.20 (6)	5.64 ±1.36 (6)	5.38 ±1.29 (5.5)	5.64 ±1.08 (6)
Exclusions (initial draft)				
1. CR is contraindicated for some cardiac (i.e., unstable angina, acute decompensated heart failure, cardiac infections,	6.33 ±0.72 (6)	NA	6.09 ±1.44 (7)	6.33 ±0.99 (7)

<p>ventricular arrhythmias, aortic dissection, acute thrombophlebitis, pulmonary or systemic embolism), and other reasons (i.e., severe mental illness / cognitive disorders [e.g., schizophrenia, advanced dementia], comorbid terminal illness / palliative care, living in long-term care)</p>				
<p>2. Inability to ambulate (i.e., patient should receive non-exercise components), lack of proficiency in the primary language in which the program is delivered (i.e., interpretation and translation services should be used), perceived lack of motivation (i.e., assuming patient would not be interested due to age or</p>	<p>5.54 ±1.22 (6)</p>	<p>NA</p>	<p>5.85 ±0.95 (6)</p>	<p>5.92 ±0.92 (6)</p>

socioeconomic considerations) are not valid reasons to fail to promote CR utilization				
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Rating values expressed by mean, standard deviation and median. CR: cardiac rehabilitation; NA: not applicable

Note: scores range from 1 “strongly disagree” to 7 “strongly agree”.

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Scientific acceptability: *Evidence base:* high-quality evidence is available to support the recommendation. *Clarity of presentation:* the definitions of the numerator and denominator are specific and unambiguous. *Validity:* the recommendation accurately reflects the intended aspects of care being evaluated. *Reliability:* the recommendation is highly reproducible when utilized by intended users.

Importance / Actionability: *Health importance:* the recommendation addresses a clinically-important aspect of health considering the variation of care and the prevalence, incidence and effect on the burden of illness. *Relevance:* the recommendation addresses an area of significant importance for stakeholders, including policy-makers, managers, clinicians, patients and the public. *Actionability:* information produced by the recommendation can be used by intended users (e.g., policy-makers, clinicians) to improve care.

Feasibility of Assessment: *Data collection effort:* the data collection effort is reasonable considering the potential for improvement. *Data availability:* the data source of the recommendation is available and accessible.

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Highlights

- Cardiac rehabilitation (CR) is grossly under-utilized, despite its' proven benefits
- A recently-updated Cochrane review established interventions to increase use
- These were translated into implementable recommendations, using best practices.
- Implementation tools include an online course to educate inpatient care providers
- Patient preferences and barriers should be considered to optimize use

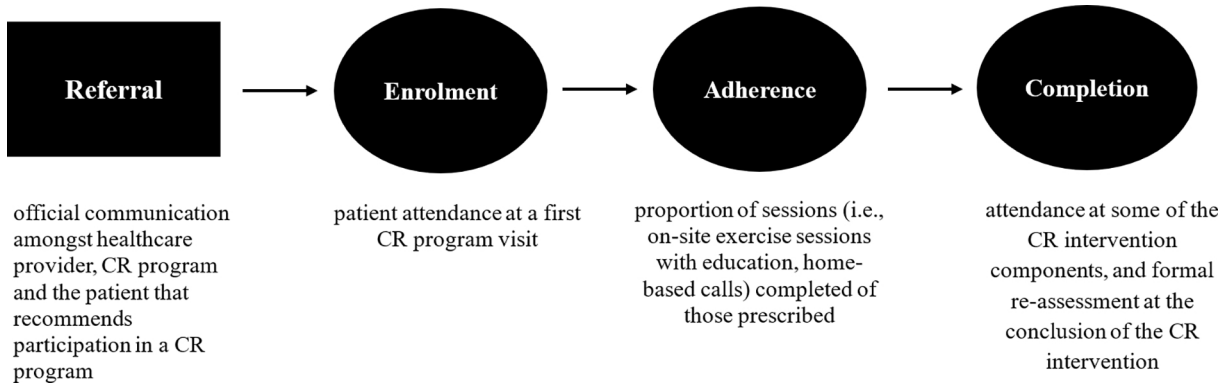


Figure 1