



Disponible en ligne sur

ScienceDirect
www.sciencedirect.com

Elsevier Masson France

EM|consulte
www.em-consulte.com


Expert consensus

Consensus document from the Group Exercise Rehabilitation Sports–Prevention (GERS-P) of the French Society of Cardiology on cardiac rehabilitation outside cardiac rehabilitation centres, including light private rehabilitation structures and cardiac telerehabilitation



Dany Marcadet^a, Bruno Pavy^{b,*}, Sonia Corone^c, Antoine Faure^d, Marie Michelle Six^e, Ines Cazaubiel^a, Jean-Michel Guy^f, Frédéric Schnell^{g,h,i}, on behalf of GERS-P

^a Centre de Réadaptation Cardiaque Bernoulli, 75008 Paris, France^b Service de Réadaptation Cardiaque, Hôpital de Machecoul, CH Loire Vendée Océan, 44270 Machecoul-Saint-Même, France^c Centre de Réadaptation Cardiaque de Bligny, 91640 Briis-sous-Forges, France^d SMR Cardiovasculaire et Respiratoire, Centre Hospitalier de Bastia, 20600 Bastia, France^e Centre de Réadaptation Les Hauts, 62590 Oignies, France^f Centre de Réadaptation Cardiaque Le Clos Champirol, 42270 Saint-Priest-en-Jarez, France^g Service de Médecine du Sport, CHU Pontchaillou, 35000 Rennes, France^h LTSI-INSERM U1099, Université de Rennes, 35042 Rennes, Franceⁱ INSERM CIC 1014, CHU de Rennes, Université de Rennes, 35042 Rennes, France

ARTICLE INFO

Article history:

Received 18 January 2025

Received in revised form 19 February 2025

Accepted 21 February 2025

Available online 31 March 2025

Keywords:

Cardiac rehabilitation

Light private rehabilitation structures

Cardiac telerehabilitation

1. Background

Despite strong recommendations, cardiac rehabilitation (CR) continues to be underused. In 2019, only 22.3% of patients who had an acute coronary syndrome underwent CR within 6 months of the event. Disparities persist between men (26%) and women (15%), with an average delay of 32 days, and there are significant regional variations (16% in Hauts-de-France compared with 30% in

the Centre region, and even lower participation in overseas territories, e.g. 3.4% in Martinique). Data for other pathologies are unavailable [1]. Across Europe, rehabilitation rates after myocardial infarction range from <25% in 17 countries to 25–50% in 14 countries, 50–75% in seven countries and 75–100% in four countries [2]. In the USA, 24% of eligible patients participate in rehabilitation (28.6% men, 18.9% women) [3].

French guidelines for CR have been updated, emphasizing its strong indications (Type I) for numerous conditions. However, limited accessibility to CR combined with shorter stays in acute cardiology units hamper the optimal initiation of secondary prevention [4]. Another reason for the low percentage of patients undergoing CR is the fact that the current healthcare offering does not adequately address patients' concerns. Indeed, the barriers are numerous: fear of exercise and the hospital environment; lack of motivation; perceived lack of time; lack of prescriptions; family-related difficulties; socioprofessional responsibilities; and distant living arrangements [5].

Abbreviations: AACVPR, American Association of Cardiovascular and Pulmonary Rehabilitation; COVID-19, coronavirus disease 2019; CR, cardiac rehabilitation; CRC, cardiac rehabilitation centres; GERS-P, Group Exercise Rehabilitation Sports–Prevention; LPRS, light private rehabilitation structure; MGP, multiprofessional group practice; RARE, Risk of Activity-Related Events; VO₂, oxygen consumption.

* Corresponding author. Service de Réadaptation Cardiaque, Hôpital de Machecoul, CH Loire Vendée Océan, 4, Boulevard des Régents, 44270 Machecoul-Saint-Même, France.

E-mail address: pavy.bruno@wanadoo.fr (B. Pavy).

<https://doi.org/10.1016/j.acvd.2025.02.011>

1875-2136/© 2025 Elsevier Masson SAS. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

This underutilization of CR requires reliable alternatives to rehabilitation in cardiac rehabilitation centres (CRCs) to be found, with the aim of better meeting patients' needs and desires, while maintaining the same level of quality and safety.

2. Current experiments

The Social Security Financing Law for 2018 introduced, in its Article 51, a system allowing the trial of new healthcare organizations based on innovative funding models. This is possible as long as these organizations contribute to improving the patient journey, the efficiency of the healthcare system, access to care or the relevance of health product prescriptions. Thus, four "Article 51" initiatives were submitted, allowing the trial of new forms of rehabilitation in order to overcome some of the aforementioned obstacles.

2.1. Light private rehabilitation structures [6]

Light private rehabilitation structures (LPRSs) are multidisciplinary teams, similar to those found in a CRC, including private cardiologists, physiotherapists, adapted physical activity instructors, psychologists, dietitians, nurses and/or advanced practice nurses, addiction specialists, medical assistants and secretaries. It is necessary for the entire team to receive continuous training in cardiology. These are local structures that offer customized rehabilitation programmes, which can range from 1 month to 6 months, with extended hours, thus allowing them to accommodate a large number of patients. An "Article 51" initiative is currently being used to test this concept in three centres. More than 3000 patients have been included, 30% of whom have heart failure, and more than 35% are women (which is significantly higher than in CRCs).

2.2. Telerehabilitation for patients with coronary heart disease: Walk Hop [7]

The Walk Hop programme has included more than 1000 patients after coronary angioplasty, mostly following an acute coronary syndrome. In a CRC, the patient undergoes an initial assessment of their risk of experiencing an adverse event while exercise training during CR, using the Risk of Activity-Related Events (RARE) risk score [8]. The team then proposes starting the programme in the centre (outpatient care or inpatient care if the patient lives too far away) for 3 to 5 days, followed by continuation at home for 3 weeks, with sessions recorded on a dedicated online platform. A cycle ergometer and a heart rate monitor are provided. The programme is followed remotely, asynchronously, on a daily basis by the CRC. Weekly video calls allow for updates on the training modalities. The patient can train at flexible hours, and may even return to work during this period. A final assessment is conducted in the CRC. The gains in exercise capacity were 15%, adherence was 89% and satisfaction was 91%.

2.3. A hybrid telerehabilitation programme: Read'hy [9]

The Read'hy programme is quite similar to the Walk Hop programme in its structure. However, the population is broader, including patients who have had an acute coronary syndrome and those with chronic coronary heart disease, heart failure, diabetes with other risk factors and congenital heart disease. The initial assessment is done in a CRC, after which the patient alternates between supervised sessions in the CRC (as part of an outpatient care programme) and home-based sessions recorded on an adapted telemedicine platform (asynchronously monitored by the CRC). The final assessment is conducted in the CRC after an average of 10 weeks and 40 physical activity sessions. Over 250 patients have

been included in three centres, with an adherence rate of more than 90%, a maximum exercise power gain of 22% and improvements in quality of life.

2.4. A rehabilitation programme incorporating collaborative care between a CRC and a multiprofessional group practice: EVA CORSE [10]

The EVA CORSE programme allows patients who are far from a CRC to benefit from a complete CR programme. Patients start their initial sessions in a reference CRC, and can then continue their rehabilitation, including therapeutic education and adapted physical activity, in a multiprofessional group practice (MGP) close to their home, managed by a team trained and supported by the CRC. A telemedicine platform enables synchronous monitoring and communication between teams. The final assessment is conducted at the CRC. Over 300 patients have been included in the programme, and eight multidisciplinary health centres have been trained. The average patient age was 68 years. The patients were generally vulnerable, with two thirds retired and 47% with a financial hardship score of less than 30, evaluated with the *Évaluation de la Précarité et des Inégalités de santé pour les Centres d'Examen de Santé* (EPICES) score. The programme led to an improvement in exercise capacity of over 20%.

2.5. Key takeaways from the four experimental programmes

These four experimental programmes share common features: care is provided by a specialized, multidisciplinary, trained team; the programme complies with CR standards within the framework of LPRSs; and in the three other programmes, initial and final assessments are conducted by a CRC, with the use of telerehabilitation modalities. The programmes share identical objectives: improving access to CR care despite geographic and economic disparities; diversifying the CR care offerings to meet the needs of all patients; increasing treatment capacity in centres for the most fragile patients; reducing morbidity and deaths; improving the quality of life for patients with cardiac conditions; strengthening patient adherence to rehabilitation programmes before phase III; and supporting patients in resuming work.

3. Telerehabilitation in the literature

To validate the concept of sessions conducted both inside and outside CRCs, a Canadian study included 961 low-risk patients with coronary heart disease (RARE score <4) who were offered participation in a programme consisting of 51 training sessions, with a different distribution of sessions in and out of the centre. Group 1 completed 34 sessions in the centre compared with eight for Group 2. The improvement in exercise capacity was identical (1.4 vs 1.5 MET), with no particular complications [11]. A European study included nearly 180 patients (coronary and valvular), all aged >65 years, who participated in a 6-month cardiac telerehabilitation programme. Exercise capacity improved at 6 and 12 months by 1.2 mL oxygen/kg/min compared with 0.2 mL oxygen/kg/min in the control group, with no adverse effects [12]. An American study (Henry Ford Laboratory) compared a centre-based programme ($n = 21$) with a hybrid programme ($n = 26$), where patients performed an average of 9 sessions at home. There was no difference in training intensity, as measured by the percentage of heart rate reserve (63% vs 65%), and no adverse effects were observed [13]. A Czech study confirmed these results in two groups of 28 patients [14]. Smith et al. reported on a study of 222 patients who had undergone coronary artery bypass grafting, and were randomized to either centre-based or home-based CR over a 6-month period. Follow-up at 12 months showed sustained improvement

in oxygen consumption (VO_2) in the home-based group compared with a decline in the centre-based group. This may be explained by the fact that exercising at home probably facilitates better long-term adherence to physical activity [15]. A study conducted on American veterans, with an average age of 67 years, included 572 patients who completed a home-based CR programme. These patients included individuals with coronary artery disease, valvular disease and heart failure. The 6-minute walk test distance increased by 71 metres, depression scores decreased and self-esteem and self-confidence improved. Thirty-one patients (5%) were hospitalized, including five for coronary angioplasty, although these hospitalizations were not directly related to the training programme. This study included high-risk patients, according to the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) classification, among whom the rate of cardiac-related rehospitalizations was nearly three times higher than that of other patients [16].

A review with meta-analysis of mobile applications in CR included eight studies (185 patients), four of which were randomized. The results showed equivalent improvements in physical outcomes and better adherence compared with centre-based CR [17]. Japan, which is well equipped in information technology, faces the same transportation challenges as Corsica. As in Europe, the coronavirus disease 2019 (COVID-19) pandemic has accelerated experimentation with cardiac telerehabilitation to increase participation, which remains low [18]. A meta-analysis conducted during the COVID-19 pandemic included 14 randomized studies comparing home-based rehabilitation to usual care or centre-based rehabilitation. A total of 2869 patients with coronary heart disease were included. The 6-minute walk test showed an improvement of 26 metres, along with an increase in the number of steps and a reduction in depression scores compared with usual care. When comparing centre-based rehabilitation with home-based rehabilitation, the results were equivalent [19]. A more recent meta-analysis reviewed trials of smartphone-based telerehabilitation in patients with coronary heart disease. A total of 11 studies were included, involving 639 patients in the intervention group and 646 in the control group. Functional capacity (VO_2 or 6-minute walk test) was improved, and a higher smoking cessation rate was observed. However, no significant effects were noted on other risk factors [20]. A 2023 Cochrane review included 24 randomized studies with over 3000 patients, analysed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) method. The findings showed no significant differences in overall deaths, physical capacity or quality of life between the intervention and control groups. However, no long-term data were available [21].

A joint scientific statement from the AACVPR, the American Heart Association and the American College of Cardiology in 2019 provided a positive opinion on the concept of telerehabilitation with indirect supervision of exercises for clinically stable patients at low-to-moderate risk, who cannot or do not wish to participate in centre-based CR. The potential advantages include improved accessibility, personalized programmes and better integration with daily life. However, the disadvantages include less intensive training, reduced social support and safety concerns for higher-risk patients [22]. According to the European Society of Cardiology, telerehabilitation encompasses telecoaching (e-mails, SMS, telephone calls), social interaction, telemonitoring and online learning [23].

A recent review of 26 studies identified a beneficial effect on secondary prevention in 12 studies compared with usual care, in seven studies compared with centre-based CR and no effect in six studies. The review also highlighted factors that had a positive or negative impact on the outcomes of secondary prevention during a telerehabilitation programme (Table 1) [24].

Table 1

Factors impacting cardiac telerehabilitation outcomes.

Factors with a positive impact
Patients with previous experience of physical activity
Early enrolment and choice of modality
Hybrid programme model (centre- and home-based)
Regular personal contact (phone, video calls)
Personalized feedback
User-friendly technology
Accessibility through various channels
Equipment loans (smartphone, activity tracker)
Gamified applications
Measurement and monitoring of exercise
Factors with a negative impact
Perceived lack of usefulness of the intervention
Low bidirectional interaction (passive interventions)
Lack of technological support
Difficulty in using technology
Poor digital coverage

4. Consensus on the management of CR outside specialized CRCs

Based on the insights from this body of literature and the four ongoing “Article 51” pilot programmes, the Group Exercise Rehabilitation Sports–Prevention (GERS-P) of the French Society of Cardiology proposes a consensus on the management of CR outside specialized CRCs. This consensus complements the updated 2024 CR recommendations.

4.1. Teams responsible for the rehabilitation programmes

4.1.1. Specialized CRCs

Specialized CRCs are those that meet the conditions outlined in the 2022 decrees, and adhere to the 2024 recommendations of the French Society of Cardiology [4].

4.1.2. LPRSs

LPRSs are proximity health facilities with a team of coordinated private healthcare professionals. They must meet the same criteria as specialized CRCs; in particular, the stress and emergency test equipment must comply with legislation, and the premises must be large enough to allow training to take place in complete safety. Additionally, they are required to establish agreements with acute care hospitals and a CRC with inpatient beds. The medical team should include several cardiologists, at least one of whom has completed the interuniversity diploma in rehabilitation. Harmonization of practices, including initial and ongoing training of all the professionals involved, is essential to ensure the quality and consistency of care provided in the LPRS. Dedicated time for programme coordination is planned to oversee patient programmes effectively.

4.2. Pathways outside specialized CRCs or LPRSs

4.2.1. Rehabilitation with coupled care between CRCs and MGPs

A CRC acts as a reference point, and establishes agreements with multiple MGPs to create a territorial network. This allows patients living far from a CRC to benefit from CR closer to their homes, ensuring the same quality and safety as in a CRC setting. MGPs differ from LPRSs in that the staff are not specialists, and there is no cardiologist in the structure. The care provided is hybrid, i.e. the initial sessions are conducted at the reference CRC, providing a comprehensive patient evaluation and starting physical retraining and therapeutic education sessions. If the patient is clinically stable, the cardiologist authorizes the continuation of CR near to the patient's home in a group setting within an MGP selected by the CRC. The MGP's multiprofessional team is trained by the CRC staff in rehabilitation modalities (e.g. use of ergocycles, chairs, resistance

bands) and a therapeutic education programme authorized by the Regional Health Agency (*Agence Régionale de Santé*). Programmes are supervised by the CRC via a coordination mechanism that is critical for the effective implementation of rehabilitation. Continuous support is provided both remotely and in person, facilitated by a shared summary record and a dedicated telemedicine platform. Sessions are led by a physiotherapist or an adapted physical activity educator, with prescriptions issued and supervised by the CRC. Clinical follow-up data are entered into the platform, and are analysed by the CRC team. An emergency protocol is established jointly by the CRC and the MGP to handle any medical events requiring urgent care.

4.2.2. Home-based telerehabilitation

The programme begins with a short initiation stay of 3–5 days in a CRC or LPRS. This initial stay concludes with an assessment similar to the one conducted at the beginning of the programme. The entire home-based rehabilitation process is supervised remotely by the CRC/LPRS through a dedicated telemedicine platform. Telerehabilitation is also a hybrid programme. Depending on the target population, it begins with a short phase in the centre for a few days, and then continues either entirely at home or alternates between sessions at home and in the centre. Patients are monitored with an armband or belt that tracks heart rate and the duration of exercise performed at home. Home sessions are recorded and transmitted asynchronously to a dedicated telemedicine platform. These sessions are analysed daily by the CRC/LPRS. Adjustments to the programme are made by the CRC/LPRS, based on the recordings and written feedback from patients. For alternating programmes, these adjustments occur during the sessions in the centre. For continuous home-based programmes, regular (at least weekly) remote consultations via video call or telephone are required. Exercise equipment used at home is either the patient's own or is provided on loan as part of the programme, depending on the needs (e.g. ergocycle, gym equipment). Therapeutic patient education must begin at the CRC/LPRS and, if necessary, be supplemented by remote sessions or educational actions delivered via the platform (without direct interaction with a professional).

4.3. Safety measures

The safety of home-based telerehabilitation programmes is ensured by a number of measures, which are detailed below.

4.3.1. Patient selection

Only patients who meet specific criteria are offered this type of programme.

4.3.2. Symptom screening before exercise

Patients are required to complete a symptom questionnaire before starting each exercise session. The application is designed to block access if abnormal responses are detected. In such cases, patients are instructed to contact the CRC for further guidance.

4.3.3. Emergency instructions

Patients (and their families) are provided with clear instructions to call emergency services (15 in France) if warning symptoms occur. For non-urgent issues, they are instructed to contact the CRC before continuing the programme, either by commenting through the application or via telephone if necessary.

4.3.4. Adaptability of the programme

The programme allows for modifications, including the option to resume care in the centre if deemed necessary.

4.3.5. Secure telemedicine platform

A secure telemedicine platform ensures safe data exchange and communication between patients and the CRC team.

4.4. Specifications for the telemedicine platform

The telemedicine platform (accessible to both healthcare providers and patients via a mobile application) must be downloadable and compatible with both Google and Apple operating systems. The platform should allow the creation of physical activity programmes, with visualization of heart rate data recorded by a heart rate sensor connected via Bluetooth to the patient's mobile application. A notification system based on heart rate data must be included to alert patients and providers of any issues. A secure messaging system for communication between patients and healthcare providers, an integrated appointment scheduling calendar and support for both individual and group video conferencing must be included. Activities and progress should be viewable by both the patient and the healthcare team, with options for sharing comments and content (e.g. therapeutic education materials). It must be possible to configure access rights for healthcare professionals, and have a technical support team. The solution must be flexible to adapt and customize programmes (sessions with heart rate monitoring and/or perceived exertion scales, such as the Borg scale, free sessions, etc.). The solution must be a medical device, compliant with data protection and interoperability requirements.

4.5. Stages of the care pathway

4.5.1. Prescription

Based on the available regional resources, the prescriber can propose one of the CR modalities to the patient (Fig. 1). The decision criteria include: clinical and psychological condition of the patient; socioprofessional context; and patient preferences. The potential transition to telerehabilitation is validated during the initial assessment by the referring cardiologist.

4.5.2. Programme

The initial assessment in the CRC/LPRS includes a cardiology consultation, with echocardiography, exercise evaluation and a shared educational assessment. Cardiovascular risk factors are analysed and managed, and medications are titrated. The initial exercise sessions are supervised in the CRC/LPRS. The number of training sessions ranges from 20 to 40, renewable depending on the patient's condition. Therapeutic patient education is implemented and evaluated. Sessions conducted outside the centre are monitored regularly (training adjustments). A comprehensive summary is prepared in the CRC/LPRS with exercise evaluation. A written report is sent to the attending physician and cardiologist.

5. Profile of patients eligible for these new CR modalities

Patients must comply with the indications and contraindications specified in the updated recommendations of the GERS-P of the French Society of Cardiology [4]. Inpatient care in the CRC is prioritized for patients requiring close monitoring or complex care, as well as for patients who live far away or have limited social support. Outpatient care in the CRC or LPRS is suitable for stable patients whose homes are not too far away (ideally less than 30 mins). Cardiac telerehabilitation is appropriate for patients with low-to-moderate risk, particularly in cases of remote housing and professional or family obligations, provided that they are motivated and digitally autonomous. The programme always begins in the CRC, and the referring cardiologist recommends transitioning to telerehabilitation, either continuously at home (low risk) or alternately at home or in a MGP (for distant patients requiring

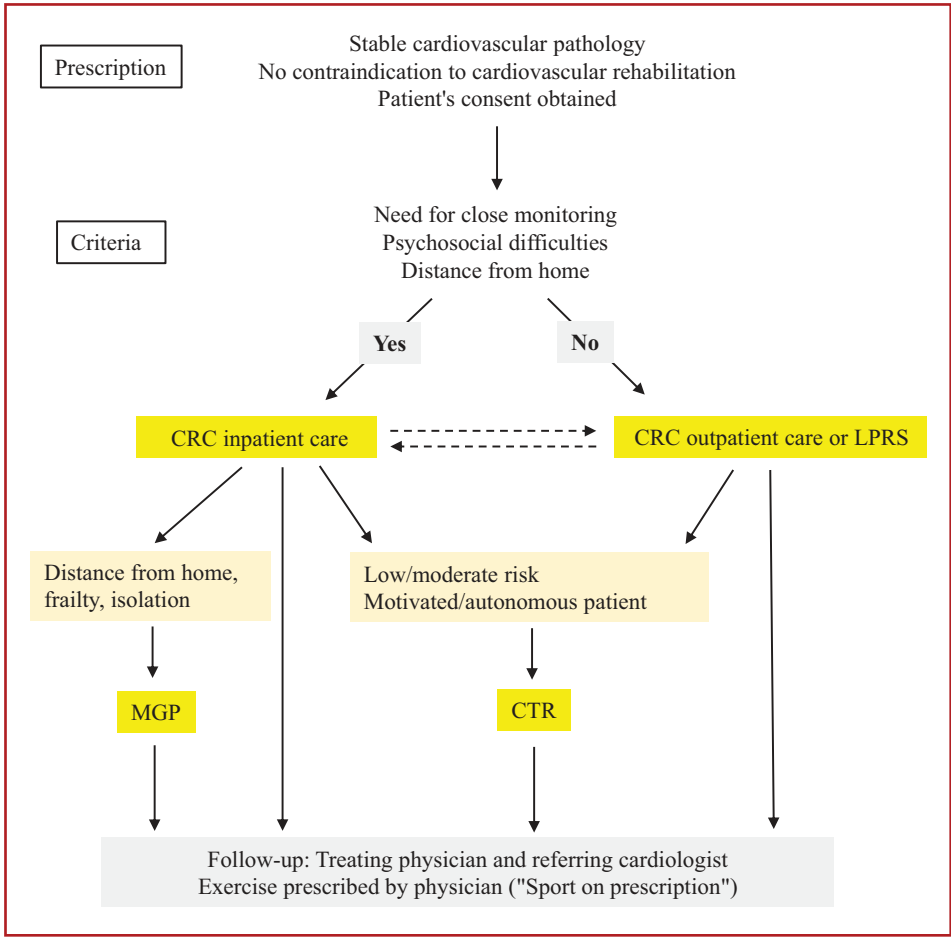


Fig. 1. New modalities in cardiac rehabilitation care pathways. CRC: cardiac rehabilitation centre; CTR: cardiac telerehabilitation; LPRS: light private rehabilitation structure; MGP: multiprofessional group practice.

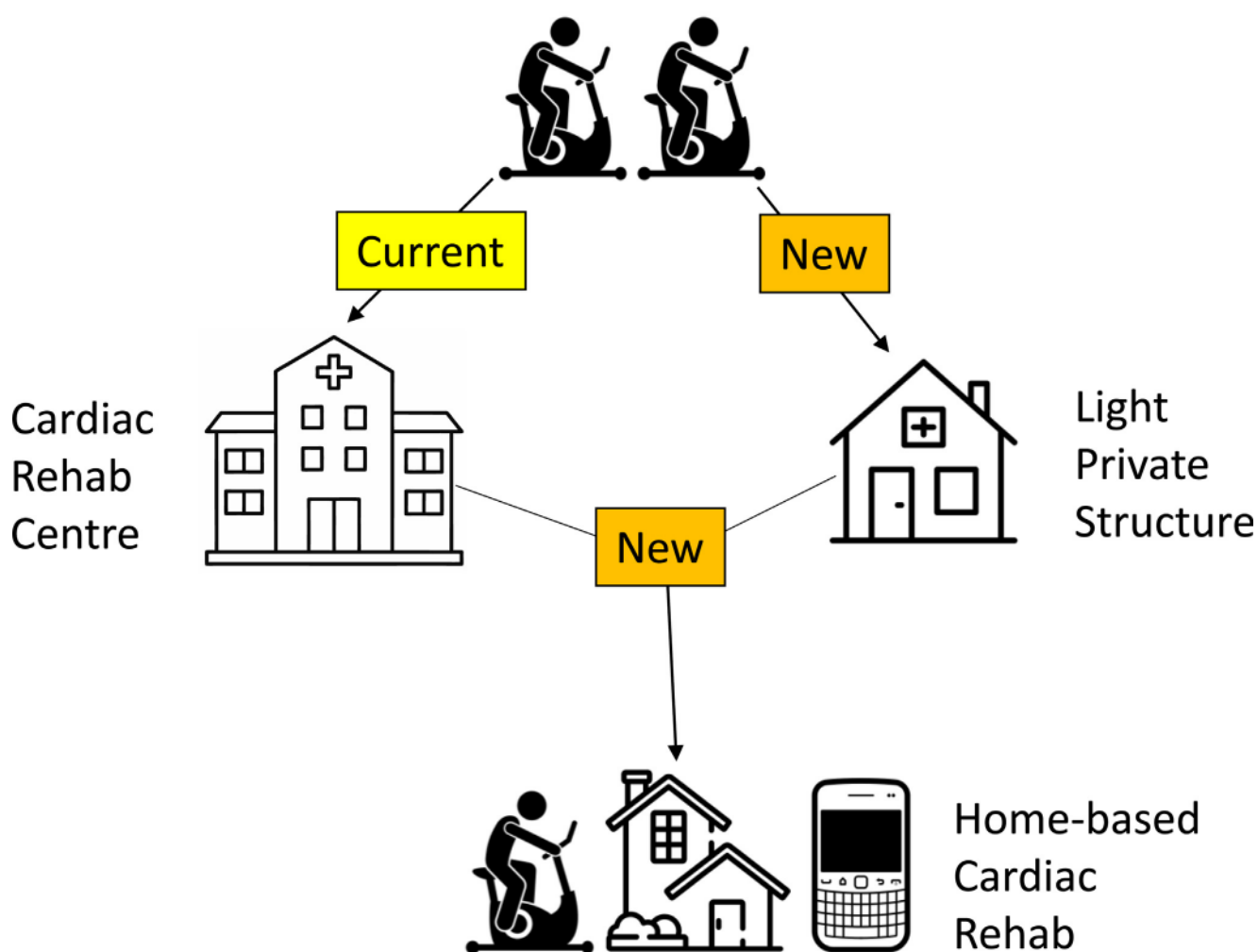
supervised care). The cardiologist responsible for the patient evaluates the benefit-risk balance, and determines the most appropriate care pathway to propose. The care pathway can be redirected at any time if necessary. This consensus is consistent with the referral criteria for cardiac and vascular rehabilitation in the report by the French High Health Authority (17 October 2024) [25].

6. Conclusions

The implementation of new CR modalities is prompted by the limited access that patients have to CRC-based rehabilitation pro-

grammes. LPRS, coupled CRC-MGP care and telerehabilitation are viable alternatives to traditional cardiovascular rehabilitation in CRC facilities. These approaches complement the existing care offering, provide flexibility in care delivery and promote access to CR for patients regardless of their age, socioeconomic status or geographic location. These new rehabilitation modalities must be implemented by CRC teams that are motivated and well-organized, with the necessary resources and dedicated personnel (Central illustration).

Cardiac rehabilitation



Central illustration

Central illustration.

Sources of funding

None.

Disclosure of interest

The authors declare that they have no competing interest.

References

- [1] Grave C, Gabet A, Iliou MC, Cinaud A, Tuppin P, Blacher J, et al. Temporal trends in admission for cardiac rehabilitation after an acute coronary syndrome in France from 2009 to 2021: persistent sex, age and social disparities. *Arch Cardiovasc Dis* 2024;117:234–43.
- [2] Ruivo J, Moholdt T, Abreu A. Overview of cardiac rehabilitation following post-acute myocardial infarction in European Society of Cardiology member countries. *Eur J Prev Cardiol* 2023;30:758–68.
- [3] Ritchey MD, Maresh S, McNeely J, Shaffer T, Jackson SL, Keteyian SJ, et al. Tracking cardiac rehabilitation participation and completion among medicare

beneficiaries to inform the efforts of a national initiative. *Circ Cardiovasc Qual Outcomes* 2020;13:e005902.

- [4] Bigot M, Guy JM, Monpere C, Cohen-Solal A, Pavy B, Iliou MC, et al. Cardiac rehabilitation recommendations of the Group Exercise Rehabilitation Sports - Prevention (GERS-P) of the French Society of Cardiology: 2023 update. *Arch Cardiovasc Dis* 2024;117:521–41.
- [5] Platz K, Kools S, Howie-Esquivel J. Benefits, facilitators, and barriers of alternative models of cardiac rehabilitation: a qualitative systematic review. *J Cardiopulm Rehabil Prev* 2023;43:83–92.
- [6] Légifrance. Arrêté du 11 février 2020 relatif à l'expérimentation de structures libérales légères (SLL) pour la rééducation des patients coronariens et insuffisants cardiaques. *JORF* 2020;0043. Available at: <https://www.legifrance.gouv.fr/eli/arrete/2020/2/11/SSAH2004330A/jo/texte>.
- [7] Légifrance. Arrêté du 13 juillet 2021 relatif à l'expérimentation « Walk Hop, Télé-réadaptation cardiaque un nouveau mode de réadaptation cardiaque hors les murs des SSR ». *JORF* 2021;0173. Available at: <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000047411785>.
- [8] Lacombe SP, LaHaye SA, Hopkins-Rosseel D, Ball D, Lau W. Identifying patients at low risk for activity-related events: the RARE Score. *J Cardiopulm Rehabil Prev* 2014;34:180–7.
- [9] Légifrance. Arrêté du 7 juillet 2021 relatif à l'expérimentation « Read'hy, programme de réadaptation cardiaque connecté : le futur ». *JORF* 2021;0159. Available at: <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043775981>.

- [10] Agence Régionale de Santé de Corse. Arrêté no 2021-46 en date du 25 janvier 2021 relatif au projet régional EVA CORSE dispositif organisationnel qui propose une nouvelle modalité organisationnelle mobilisant des acteurs hospitaliers et des professionnels de ville autour de programmes de réadaptation cardiaque en région Corse. Available at: <https://sante.gouv.fr/IMG/pdf/eva-corse-arrete-et.cdc.pdf>.
- [11] LaHaye SA, Lacombe SP, Koppikar S, Lun G, Parsons TL, Hopkins-Rossee D. High and low contact frequency cardiac rehabilitation programmes elicit similar improvements in cardiorespiratory fitness and cardiovascular risk factors. *Eur J Prev Cardiol* 2014;21:1456–64.
- [12] Snoek JA, Prescott EI, van der Velde AE, Eijsvogels TMH, Mikkelsen N, Prins LF, et al. Effectiveness of home-based mobile guided cardiac rehabilitation as alternative strategy for nonparticipation in clinic-based cardiac rehabilitation among elderly patients in europe: a randomized clinical trial. *JAMA Cardiol* 2021;6:463–8.
- [13] Keteyian SJ, Grimshaw C, Brawner CA, Kerrigan DJ, Reasons L, Berry R, et al. A comparison of exercise intensity in hybrid versus standard phase two cardiac rehabilitation. *J Cardiopulm Rehabil Prev* 2021;41:19–22.
- [14] Batalik L, Pepera G, Papathanasiou J, Rutkowski S, Liska D, Batalikova K, et al. Is the training intensity in phase two cardiovascular rehabilitation different in telehealth versus outpatient rehabilitation? *J Clin Med* 2021;10:4069.
- [15] Smith KM, Arthur HM, McKelvie RS, Kodis J. Differences in sustainability of exercise and health-related quality of life outcomes following home or hospital-based cardiac rehabilitation. *Eur J Cardiovasc Prev Rehabil* 2004;11:313–9.
- [16] Drwal KR, Wakefield BJ, Forman DE, Wu WC, Haraldsson B, El Accaoui RN. Home-Based Cardiac Rehabilitation: experience from the veterans affairs. *J Cardiopulm Rehabil Prev* 2021;41:93–9.
- [17] Xu L, Li F, Zhou C, Li J, Hong C, Tong Q. The effect of mobile applications for improving adherence in cardiac rehabilitation: a systematic review and meta-analysis. *BMC Cardiovasc Disord* 2019;19:166.
- [18] Kaihara T, Scherrenberg M, Falter M, Frederix I, Itoh H, Makita S, et al. Cardiac telerehabilitation - a solution for cardiovascular care in Japan. *Circ Rep* 2021;3:733–6.
- [19] Ramachandran HJ, Jiang Y, Tam WWS, Yeo TJ, Wang W. Effectiveness of home-based cardiac telerehabilitation as an alternative to Phase 2 cardiac rehabilitation of coronary heart disease: a systematic review and meta-analysis. *Eur J Prev Cardiol* 2022;29:1017–43.
- [20] Dwiputra B, Santoso A, Purwowyoto BS, Radi B, Ambari AM, Desandri DR, et al. Smartphone-based cardiac rehabilitation program improves functional capacity in coronary heart disease patients: a systematic review and meta-analysis. *Glob Heart* 2023;18:42.
- [21] McDonagh ST, Dalal H, Moore S, Clark CE, Dean SG, Jolly K, et al. Home-based versus centre-based cardiac rehabilitation. *Cochrane Database Syst Rev* 2023;10:CD007130.
- [22] Thomas RJ, Beatty AL, Beckie TM, Brewer LC, Brown TM, Forman DE, et al. Home-based cardiac rehabilitation: a scientific statement from the American Association of Cardiovascular and Pulmonary Rehabilitation, the American Heart Association, and the American College of Cardiology. *J Am Coll Cardiol* 2019;74:133–53.
- [23] Frederix I, Caiani EG, Dendale P, Anker S, Bax J, Bohm A, et al. ESC e-Cardiology Working Group Position Paper: Overcoming challenges in digital health implementation in cardiovascular medicine. *Eur J Prev Cardiol* 2019;26:1166–77.
- [24] Gallegos-Rejas VM, Rawstorn JC, Gallagher R, Mahoney R, Thomas EE. Key features in telehealth-delivered cardiac rehabilitation required to optimize cardiovascular health in coronary heart disease: a systematic review and realist synthesis. *Eur Heart J Digit Health* 2024;5:208–18.
- [25] Haute Autorité de Santé. Critères d'orientation en réadaptation cardiaque et vasculaire. Saint-Denis La Plaine: HAS. https://www.has-sante.fr/jcms/p_3551950/fr/criteres-d-orientation-en-readaptation-cardiaque-et-vasculaire#:~:text=L'orientation%20d'un%20patient,absence%20de%20contre%20indication%20définitive.