Current Concepts: Comprehensive "Cardiovascular Health" Rehabilitation—An Integrated Approach to Improve Secondary Prevention and Rehabilitation of Cardiovascular Diseases

Benjamin J. R. Buckley[1] Gregory Y. H. Lip[1,2,3]

[1] Liverpool Centre for Cardiovascular Science, University of Liverpool and Liverpool John Moores University, Liverpool, United Kingdom
[2] Liverpool Heart and Chest Hospital, Liverpool, United Kingdom
[3] Department of Clinical Medicine, Aalborg University, Aalborg, Denmark

Address for correspondence Gregory Y. H. Lip, MD, Liverpool Centre for Cardiovascular Science, University of Liverpool and Liverpool John Moores University, Liverpool L69 3GA, United Kingdom (e-mail: gregory.lip@liverpool.ac.uk).

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Definitions

Physical activity: any bodily movement produced by skeletal muscles that increases energy expenditure.
Moderate-to-vigorous intensity exercise: activities purposely undertaken to improve a component of fitness with an energy expenditure of $\geq$3 metabolic equivalents, e.g., brisk walking to running.
Exercise-based cardiac rehabilitation (ExCR): exercise training alone (typically two sessions/week) or in combination with psychological or educational interventions.

Physical activity and moderate-to-vigorous intensity exercise provides primary[1] and secondary[2] "cardio-protection." Further, the benefits of regular exercise training go beyond improvement in traditional cardiovascular disease risk factors (i.e., blood pressure, cholesterol, glycemia), and most notably, elicit an improvement in vascular endothelial function.[3]

As such, ExCR, often with general risk factor and some lifestyle advice, is an essential component of routine care for patients after presentation with an acute coronary syndrome, those undergoing revascularization (coronary artery bypass graft or percutaneous coronary intervention), and those with heart failure.[4] Indeed, a substantive evidence base supports ExCR as a clinically effective and cost-effective intervention for patients with acute coronary syndrome or heart failure with reduced ejection fraction and after coronary revascularization.[2] The evidence base for use of ExCR in other indications, including heart failure with preserved ejection fraction,[5] atrial fibrillation (AF),[6,7] congenital heart disease,[8] and stroke,[9] requires further research.

Although some evidence suggests that ExCR leads to improved outcomes for patients with AF,[10] traditional ExCR infrastructure is already struggling to cope with the existing demand. For example, our previous work suggested that only 1.6% of eligible patients with heart failure were referred or initiated an ExCR program.[5] Therefore, alternative models of rehabilitation support are needed for other cardiovascular conditions not yet eligible for ExCR referral (i.e., AF, stroke, and chronic coronary syndrome). This may provide an opportunity to go beyond exercise rehabilitation and focus on a more holistic comprehensive cardiovascular health rehabilitation program.

Herein, we propose comprehensive "cardiovascular health" rehabilitation as a potential "concept" approach to help cope with the growing demand for more holistic and integrated cardiovascular disease management. Such an integrated care approach is increasingly evident in various chronic long-term conditions.[11–14]

Comprehensive "cardiovascular health" rehabilitation could therefore go beyond exercise-based rehabilitation and incorporate three key pillars (►**Fig. 1**): (1) disease-specific management (medication optimization and symptom burden), (2) lifestyle behavior change support (exercise, physical activity, diet, smoking, alcohol, sleep, mental health, and social wellbeing), and (3) cardiovascular comorbidity and risk management (individual patient comorbidities and

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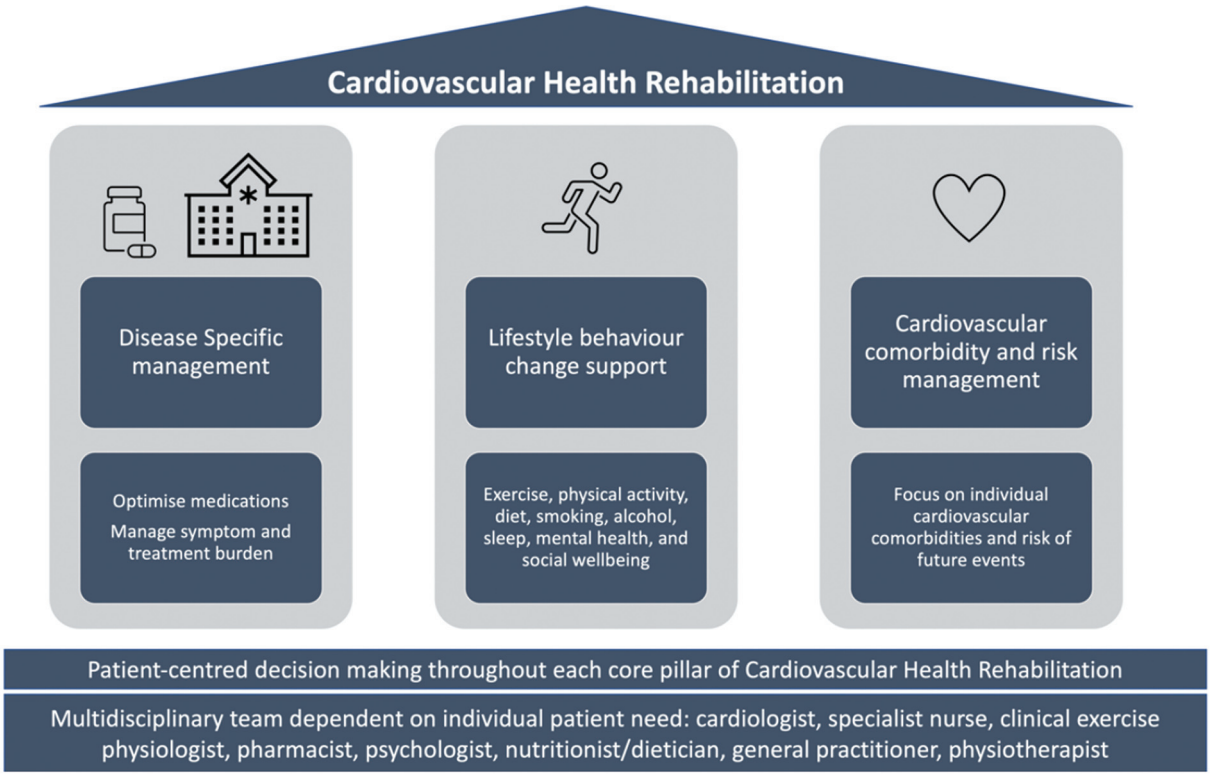

Fig. 1 Three key pillars of "cardiovascular health rehabilitation" to be incorporated within an integrated care pathway for patients with cardiovascular disease. (1) *Disease-specific management*: first, the focus should be on optimizing the clinical management of the patient and their disease-specific symptoms. This includes optimizing any medication and discussion of potential treatment options. It is important to also consider treatment burden on an individual patient basis. (2) *Lifestyle behavior change support*: this should be patient-driven and allow choosing and tailoring of the cardiovascular health rehabilitation program. For some, an exercise-based program may be highly suitable, whereas others may not yet be able to exercise and may want to focus on physical activity levels and diet, or in fact, others may first want to focus on their mental wellbeing and are not yet able to exercise. The type and intensity of rehabilitation should be malleable and able to progress with evolving patient goals. Some patients will need more support than others, whether that is face-to-face, virtual, or hybrid should be discussed with the patient and consideration given to available resources. (3) *Cardiovascular comorbidity and risk management*: patients with cardiovascular disease often have comorbidities and are at an elevated risk of future cardiovascular events. Therefore, as part of an integrated rehabilitation approach, management of other risk factors and conditions such as obesity, hypertension, diabetes mellitus, sleep apnea, and other secondary cardiovascular conditions should be managed to help reduce the risk of future adverse events and the underlying cardiovascular burden. This should also facilitate a patient with cardiovascular disease to better manage their multimorbidity and improve their overall quality of life. Education and counseling can be used to improve a patient's understanding, adherence, and compliance to rehabilitation.

cardiovascular event risk). This is highly relevant given the typical clustering of cardiovascular disease and risk factors (for example, multimorbidity can be seen in two-thirds of older adults),[15] and the clustering of healthy/maladaptive lifestyle behaviors such as exercise, physical activity, smoking, alcohol consumption, and diet in people with cardiovascular disease.[16]

There are some existing examples of promising efforts toward a more comprehensive lifestyle/cardiovascular health lens, such as the American Heart Associations' "Life's simple 7."[17] This concept identified seven key risk factors for cardiovascular disease (smoking, body mass index, physical activity, diet, total cholesterol, blood pressure, and fasting serum glucose) and demonstrated that maintaining ideal cardiovascular health in all seven variables was related to a lower lifetime risk of coronary heart disease.[18] Further, the American Heart Association has recently highlighted a primary care agenda,[19] highlighting modifiable risk factors for cognitive decline including depression, hypertension, physical inactivity, diabetes, obesity, hyperlipidemia, poor diet, smoking, social isolation, excessive alcohol use, sleep disorders, and hearing loss.

This focus on both heart and brain health is topical, since new-onset cardiovascular complications diagnosed following an ischemic stroke (termed "stroke-heart syndrome") are very common and associated with significantly worse 5-year prognosis, compared with stroke survivors without cardiovascular complications.[20] This further reinforces the need for a holistic and personalized cardiovascular health rehabilitation pathway, especially for those with multimorbidity such as brain–heart conditions.[12,20]

Another example of integrated cardiovascular disease management includes the ABC (Atrial fibrillation Better Care) pathway, including three guiding concepts: "A"—avoid stroke (with anticoagulants); "B"—better symptom management (with rate or rhythm control); and "C"—cardiovascular and comorbidity risk optimization.[11] This guideline-recommended approach[21] incorporates both disease-specific

treatment (for AF and stroke prevention) and management of individual cardiovascular comorbidities (and lifestyle changes), which are associated with lower major adverse cardiovascular events.[22] Indeed, clustering of healthy lifestyle behaviors is associated with less incident AF,[16] and a reduction of AF-related adverse complications, such as stroke, heart failure, and mortality.[23]

Conclusion

Comprehensive "cardiovascular health rehabilitation" provides a simple integrated care pathway guide for primary and secondary prevention and holistic "vascular health" rehabilitation of patients with cardiovascular disease. Promotion and evaluation of such an approach may provide an opportunity to improve patient-centered and integrated care pathways for patients with cardiovascular disease, especially those with multimorbidity.

Conflict of Interest
None declared.

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