

## EDITORIAL

# Access to Cardiac Rehabilitation: Hurdles and Hopes for Improvement

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## Introduction

Consistent evidence gathered over many years supports the benefits of cardiac rehabilitation, including decreases in mortality and hospitalizations, and increase in quality of life. In one study of 601,099 Medicare patients older than 65 years with coronary disease, 5-year mortality was lower in patients who participated in cardiac rehabilitation than those who did not (16.3% versus 24.6%, respectively,  $P < 0.0001$ ) [1]. Another study has shown significantly fewer hospitalizations for heart failure among patients who participated in cardiac rehabilitation than those who did not: the patients who underwent cardiac rehabilitation had 11 admissions for a total of 41 hospitalized days over a 24 week period, whereas those who did not had 33 admissions for a total of 187 hospitalized days ( $P < 0.001$ ) [2]. The clinical benefits of cardiac rehabilitation, as documented in both young and older participants, include increased exercise capacity, energy and total quality of life [3].

Although cardiac rehabilitation is a class 1 indication for patients who have sustained acute coronary syndrome as well as those with heart failure [4–6], it is grossly underused. In one study, only 24.4% of a cohort of 366,103 Medicare patients

with a qualifying diagnosis for cardiac rehabilitation assessed from 2016 to 2017 participated in cardiac rehabilitation. Of those who participated, only 26.9% completed the program [7]. A closer evaluation of the barriers preventing referral, enrollment and completion of cardiac rehabilitation is needed to better understand the limitations and to promote solutions to these problems.

## Hurdles

Multiple hurdles contribute to poor cardiac rehabilitation availability, referral and participation. One major factor is lack of referral. In a 2017 meta-analysis of 26 studies including 297,719 participants, significantly fewer women than men were enrolled (45% men, 38.5% women;  $P < 0.00001$ ) [8]. Moreover, in an evaluation of 48,993 patients referred to cardiac rehabilitation reported by Li et al., women had 12% less participation in cardiac rehabilitation than men. The investigators also noted that Black, Hispanic and Asian patients were 20%, 36% and 50% less likely than white patients, respectively, to be referred for cardiac rehabilitation [9].

Patient factors can also hinder participation in, and completion of, cardiac rehabilitation programs; these factors include low health literacy, cost, transportation and other health problems that prevent exercise [10]. Duncan et al. have evaluated the availability and initiation (attending at least one session) of cardiac rehabilitation distributed geographically across the United States. Interestingly,

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the urban areas were seen as “cardiac rehabilitation deserts,” in which the ratio of cardiac rehabilitation centers to the population was much lower than that in rural areas, the wait times were longer, and cardiac rehabilitation was less utilized [11]. Moreover, a review of studies of patients belonging to minority ethnic or racial groups has reported that limitations including language barriers and cultural differences might interfere with participation in cardiac rehabilitation [12].

## Hopes for Improvement

The solution to increasing referrals, participation and completion of cardiac rehabilitation is multifaceted. First, efforts are needed to educate medical providers and patients regarding the benefits of cardiac rehabilitation, and to encourage referrals from both inpatient and outpatient settings. These goals can be achieved in many ways, but the most effective might be through direct involvement of cardiac rehabilitation staff in championing their programs and making providers aware of program benefits and details, so that providers can relay this information to patients. Providers should ask patients where they live and write a prescription for cardiac rehabilitation for a center near the patients’ homes. Providers also have a role in encouraging patients to not only participate in but complete the program. For inpatient referrals, inserting prompts in the electronic medical record to automatically place a cardiac rehabilitation order before discharge for appropriate cardiac diagnoses can substantially increase referrals. In one study, an automated referral in the electronic medical record resulted in a greater than 50% increase in cardiac rehabilitation enrollment [13].

Providers also must recognize that patients of all abilities can benefit from cardiac rehabilitation. Beliefs that patients are either too fit or too frail to undergo the program are misconceptions. Kamiya et al. have assessed patients with heart failure who underwent cardiac rehabilitation after hospitalization compared with those who did not. The patients were divided into four groups according to their frailty index: fit ( $<0.21$ ), mild frailty ( $0.21\text{--}0.31$ ), moderate frailty ( $0.32\text{--}0.41$ ) and severe frailty ( $\geq 0.42$ ). Event-free survival was observed in the fit, mild frailty and moderate frailty groups; the only

group without increase in event-free survival was the severe frailty group [14]. The REHAB-HF trial, a randomized, controlled study, compared patients with heart failure who underwent cardiac rehabilitation with those who did not (97% of whom were frail or prefrail, according to the modified Fried criteria). The investigators found a significant increase in the physical performance battery (balance, 4-minute walk and chair rise) among patients who underwent cardiac rehabilitation for 3 months compared with those who did not [15]. These studies support that patients ranging from fit to moderately frail benefit from cardiac rehabilitation, and should be referred as a part of their treatment plans.

Hospital systems also have key roles in increasing access to cardiac rehabilitation. Every hospital system should have cardiac rehabilitation as a resource, advertise its benefits to providers and patients, and create a network system with other cardiac rehabilitation programs, so that options close to patients’ homes are provided. With the advancement and widespread use of technology, cardiac rehabilitation can be provided in a cost-conscious manner while increasing patient accessibility. One example is home-based cardiac rehabilitation. Chen et al. have compared outcomes of patients with heart failure who underwent home-based cardiac rehabilitation compared with those who did not. The latter group showed decreased maximal oxygen consumption ( $\text{VO}_2$ ) at 3 months, whereas those who participated in home-based cardiac rehabilitation showed increases in maximal oxygen consumption and quality of life [16].

Finally, insurance companies should play a role in covering the cost of cardiac rehabilitation. From 2017 to 2018, the estimated direct and indirect cost of inpatient cardiovascular disease management was \$99.6 billion [17]. Participation in cardiac rehabilitation has been shown to decrease hospitalizations and improve health. Thus, insurance companies should provide appropriate coverage for their customers, including home-based programs [18]. Incentivization can also facilitate adherence. For example, in insurance plans with copayments, if patients complete the cardiac rehabilitation program within a set time frame, such as 6 months or a year, they could receive reimbursement for their copayments. Just as providers and hospital systems are held accountable for providing care to cardiac

patients, insurance companies have important roles and should be held accountable for increasing access for these patients.

## Conclusion

Multiple factors play roles in the low referral, participation and completion rates of cardiac rehabilitation. Nonetheless, multiple opportunities exist for solutions to the underutilization of this valuable resource. Providers could increase referrals of patients with all activity levels and encourage patients to attend. Hospital systems could expand

their cardiac rehabilitation programs, both in-person and remote, by fostering a network system in the community. Insurance companies could recognize the need to cover remote cardiac rehabilitation, as well as to incentivize patients to participate and complete the programs. Providers, hospital systems and insurance companies must work together to improve access and affordability so that patients with heart disease can live more active and fulfilling lives.

## Conflict of Interests

The authors declare no conflict of interests.

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