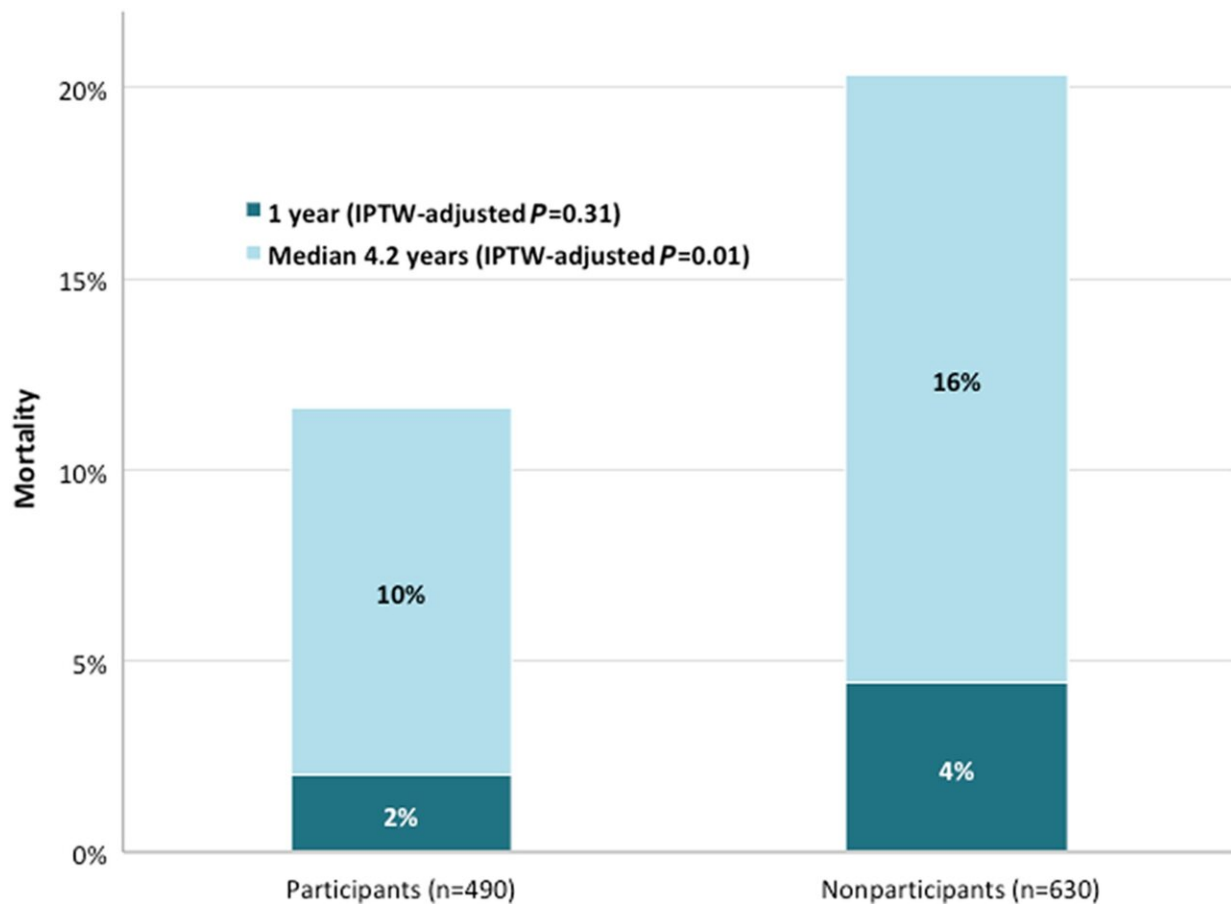


Home-based cardiac rehabilitation may help people live longer

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Mortality in home-based cardiac rehabilitation participants vs nonparticipants with inverse probability of treatment weighted P values. IPTW indicates inverse probability of treatment weighting. Credit: *Journal of the American Heart Association* (2023). DOI: 10.1161/JAHA.122.025856

Participating in home-based cardiac rehabilitation after a heart attack or cardiac procedure was associated with a 36% lower likelihood of death from heart-related complications among U.S. military veterans within four years compared to those who opted out of rehabilitation programs, according to new research published today in the *Journal of the American Heart Association*.

Although [cardiac rehabilitation](#) has been shown to reduce the risks of hospital readmissions and death, it is significantly underused, according to the American Heart Association. Cardiac rehabilitation emphasizes eliminating tobacco use, improving diet, engaging in physical exercise, managing stress and taking medications that treat high blood pressure or high cholesterol.

"Whether in a hospital or home, cardiac rehabilitation is all about healthy behavior changes," said senior study author Mary A. Whooley, M.D., a primary care physician at the San Francisco Veterans Affairs (VA) Medical Center and professor of medicine at the University of California, San Francisco.

"However, changing behaviors is difficult, and while [care facilities](#) may offer on-site cardiac rehabilitation, many patients don't choose to take advantage of follow-up treatment. The biggest surprise of our analysis was how few patients chose to participate in cardiac rehabilitation."

While cost can be a barrier to participating in cardiac rehabilitation, along with geography and logistics, cost should not have been a factor as [health care services](#) were covered by the VA in this study.

"We don't know why so many patients opted out of rehabilitation," Whooley said. "Even when home-based cardiac rehabilitation was offered at the time and place of their choosing, only 44% of eligible patients chose to participate. Many patients were simply not interested in

changing their behaviors."

Data indicated that among patients hospitalized for heart attack from 2007-2011, only 16% of Medicare patients and 10% of veterans participated in cardiac rehabilitation. Among eligible Medicare beneficiaries in 2016, only 24% opted to participate in on-site/facility-based cardiac rehabilitation.

According to the Million Hearts Cardiac Rehabilitation Collaborative, a national initiative co-led by the Centers for Disease Control and Prevention and the Centers for Medicare & Medicaid Services, it's estimated that increasing cardiac rehabilitation participation to 70% of cardiac patients after hospitalization could save 25,000 lives and prevent 180,000 additional hospitalizations each year.

"Many randomized trials have demonstrated similar mortality benefits from home-based and facility-based cardiac rehabilitation," Whooley said.

This is the first U.S. study to provide evidence of survival benefit with home-based cardiac rehabilitation in people with heart disease, according to the study authors. The ongoing COVID-19 pandemic which temporarily closed countless facility-based [rehabilitation programs](#) indicates a growing need to explore opportunities in telehealth care for people with heart disease, they said.

This study analyzed data for 1,120 veterans who were eligible for cardiac rehabilitation at the San Francisco VA Medical Center between August 2013 and December 2018. Among this study group, 98% were men, 2% were women, 76% were white, 88% were non-Hispanic and 68% lived in an urban area. About half had been hospitalized for percutaneous coronary intervention—also known as angioplasty, 20% for coronary artery bypass grafting, 14% for heart attack and 18% for

other reasons. Enrolling in the San Francisco Healthy Heart home-based cardiac rehabilitation program was voluntary, and only 44% (490 people) enrolled.

The home-based cardiac rehabilitation program lasted 12 weeks, during which participants received up to nine coaching calls, motivational interviews, a workbook and a personal health journal to document vital signs, exercise and diet. They also received a blood pressure monitor, a scale and (if desired) a stationary bike. A nurse or exercise physiologist worked one-on-one with participants to create achievable physical activity goals. Participants received follow-up phone calls from program staff at three and six months after program completion and were followed for an average of 4.2 years after hospitalization.

Among the researchers' findings:

- The death rate at one-year after hospitalization was 4% among those who did not participate in cardiac rehabilitation versus 2% among those who participated in home-based cardiac rehabilitation.
- Overall, those who participated in the cardiac rehabilitation program were linked with a 36% reduction in odds of dying from complications compared with those who did not.
- Deaths during the entire follow-up period occurred in 12% of rehabilitation participants versus 20% of non-participants.

Researchers note scientists don't yet know the optimal number of at-home cardiac rehabilitation sessions are needed to achieve lasting success for people with [heart disease](#), and this warrants further research. Moreover, when compared with traditional, facility-based programs, researchers believe home-based cardiac rehabilitation may lead to more lasting behavior changes that improve outcomes, because integrating healthy behaviors into a participant's home routine from the outset has

been associated with better adherence rates.

While there is no standardized approach to delivering home-based cardiac rehabilitation, it is generally shorter than on-site care, and "as technology expands, behavior modification in a participants' own home environment may help make cardiac rehabilitation more accessible and lifestyle changes more sustainable," Whooley said.

Another advantage of home-based cardiac rehabilitation is that, because capacity is not constrained by the availability of facility-based programs, it has shorter wait times to begin therapy (average of 25 days versus 77 days after a cardiac event).

"Our biggest challenge in the U.S. is that home-based cardiac rehabilitation is not covered by many health insurers," she said.

"Currently, Medicare only pays for on-site or facility-based cardiac rehabilitation."

The American Heart Association supports congressional legislation such as the bipartisan "Increasing Access to Quality Cardiac Rehabilitation Care Act," which calls for expanding cardiac rehabilitation resources.

Randal J. Thomas, M.D., chair of the 2019 joint American Heart Association/American College of Cardiology statement on the effectiveness of home-based cardiac rehabilitation called this study a "unique, landmark report."

"This study suggests that home-based cardiac rehabilitation is associated with a lower death rate when compared to individuals who receive no cardiac rehabilitation," said Thomas, who is professor of medicine in the Mayo Clinic Alix School of Medicine working with the Mayo Clinic Cardiac Rehabilitation Program in Rochester, Minnesota. "Previous home-based cardiac rehabilitation studies have not been designed to

address this important benefit. Additional studies are needed, but this study strongly suggests a mortality benefit from home-based cardiac rehabilitation.

"Even though the study did not clarify if home-based cardiac rehabilitation impacts death rates as well or even better than center-based rehabilitation, it does show that home-based cardiac rehabilitation reduces death rates compared to those patients who do not participate in cardiac rehabilitation."

The joint statement strongly recommends cardiac rehabilitation for people diagnosed with [heart attack](#), chest pain, heart failure or after having bypass surgery, [percutaneous coronary intervention](#), heart valve surgery or heart transplantation. In addition, an American Heart Association scientific statement notes that home-based rehabilitation is an effective alternative to cardiac rehabilitation for those unable to participate in an on-site cardiac rehabilitation program.

The study has several limitations, including that there was no comparison to facility-based cardiac rehabilitation; participants were not randomized; and most were English-speaking, older men. Researchers note it's unclear whether the benefits of home-based cardiac rehabilitation would produce similar benefits in women or non-English speaking people.

More information: Nirupama Krishnamurthi et al, Association of Home-Based Cardiac Rehabilitation With Lower Mortality in Patients With Cardiovascular Disease: Results From the Veterans Health Administration Healthy Heart Program, *Journal of the American Heart Association* (2023). [DOI: 10.1161/JAHA.122.025856](https://doi.org/10.1161/JAHA.122.025856)

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