Implementing PCOR To Increase Referral, Enrollment, and Retention in Cardiac Rehabilitation through Automatic Referral with Care Coordination

Final Evaluation Report: Executive Summary

Agency for Healthcare Research and Quality

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Contract # HHSP233201500013I

Prepared for:

Agency for Healthcare Research and Quality (AHRQ)

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Submitted December 9, 2022 by:*

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* Current version (with AHRQ edits and additional appendices): May 23, 2023. The full evaluation report is available on request from JanDeLaMare@ahrq.hhs.gov

Executive Summary

Introduction

The Agency for Healthcare Research and Quality (AHRQ) acted on evidence from patient-centered outcomes research (PCOR) to fund a three-and-a-half-year initiative, called TAKEheart, to increase the use of cardiac rehabilitation (CR) by eligible patients nationwide. TAKEheart built on the work of Million Hearts®, a joint effort between the Centers for Disease Control and Prevention (CDC) and the Centers for Medicare and Medicaid Services (CMS). Million Hearts®, in collaboration with the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR), reviewed materials and processes hospitals used to improve referral to CR, and compiled evidence- or practice-based resources into a Cardiac Rehabilitation Change Package (CRCP). These resources, which include tools and conceptual approaches, can be adapted by, or adopted in, a health care setting to improve use of CR and served as the foundation of all TAKEheart training and support materials.

TAKEheart was conducted between April 2019 and December 2022 by Abt Associates (Abt) and its partners, the Health Research & Educational Trust (HRET) of the American Hospital Association (AHA) and Crosby Marketing Communications, further referred to as the TAKEheart project team. The summary that follows provides a brief description of the project activities, key findings, lessons learned, and recommendations for future similar efforts.

Problem Addressed by the Project

By promoting the implementation of evidence-based strategies to increase the use of CR, the TAKEheart Initiative aimed to address the challenge of low participation in CR among eligible patients. CR is a comprehensive secondary prevention program designed to improve cardiovascular health following a cardiac-related event or procedure. Some CR is delivered in an inpatient setting (Phase 1); however the vast majority is delivered in an outpatient setting (Phase 2). An optimal CR experience consists of 36 one-hour sessions that include team-based, supervised exercise training, education and skills development for heart-healthy living, and counseling on stress and other psychosocial factors.

CR has been shown to improve outcomes for patients with heart disease – reducing hospitalization and risk of cardiovascular deaths by 30% each.[1] Despite the proven benefits of CR, as few as 20% of eligible patients are referred to it, with low-income populations, racial minority groups, and people with multiple comorbidities having consistently lower referral and enrollment rates than other groups.[1,2,3,4,5] Even fewer patients actually enroll and persist in CR through the end of the program; their participation varies by state/region, clinical condition, sex, race/ethnicity, age, income level, English language proficiency, and travel distance, and ranges from 10% to 34%.[1,3,6,7,8,9]

Project Overview

The TAKEheart Initiative was designed to address the problem of low referral to and use of CR and pursued the following objectives:

- Increase knowledge and awareness of CR PCOR evidence broadly, and
- Increase referral, enrollment, and retention in CR through automatic referral with care coordination.

Additional goals for this project were to:

- Inform future efforts to reach underserved populations and reduce known disparities in CR referral and retention, and
- Integrate efforts to increase utilization of CR within other system-level efforts to reduce hospital readmissions.

To achieve these goals, TAKEheart included three primary components: Partner Hospitals, Learning Community (LC), and the TAKEheart website.

- Three cohorts of **Partner Hospitals** participated in a 12-month TAKEheart training program based on the CRCP and additional materials developed by the project team and received peer-to-peer support through Partner Hospital Peer Action Groups (PH-PAGs) to increase referral, enrollment, and participation in CR by committing to adopt the two evidence-based strategies in the Million Hearts® CRCP: automatic referral and care coordination (AR+CC).
- The **Learning Community** was open to any facility or practitioner, and to other individuals interested in improving and expanding participation in cardiac rehabilitation. The LC was intended to focus on identifying strategies beyond AR and CC with a specific interest in strategies for increasing participation in underserved populations. The LC participants joined Affinity Group (AG) sessions led by experts in the field on CR-specific topics and providing opportunities for learning from CR peers and received topic-specific resources following each AG.
- Finally, the **TAKEheart website** was developed to promote awareness of CR generally and to serve as a repository for the project's information and resources for the Partner Hospitals, LC participants, and the general healthcare community interested in CR.

Adaptations Due to the Public Health Emergency and Contract Modification

Two months after TAKEheart had recruited the first cohort of Partner Hospitals and launched its training, the COVID-19 public health emergency (PHE) was declared on March 13, 2020.[10] TAKEheart suspended all recruitment and training activities for Partner Hospitals and shifted priorities to LC activities. The focus of LC initially pivoted from a broad set of CR topics to adapting CR operations to PHE impacts and then eventually moved back to less-PHE specific topics. The TAKEheart team used the suspension of the training and PH-PAG activities during the PHE to redesign the 10-module training curriculum and technical Assistance (TA) approach. Comprehensive re-recruitment efforts took place as more than 50% of hospitals needed to drop

out or move to the LC, because they were no longer able to undertake CR, lost leadership support, or their priorities had otherwise shifted due to the pandemic. The team also conducted readiness assessments with pre-PHE and newly recruited Partner Hospitals until they were ready to resume training and TA activities nearly a year after the PHE onset.

Given the increased focus on hybrid CR as a new modality for implementing CR programs during the PHE, in February 2022, AHRQ modified Abt's contract to include a Hybrid CR Workgroup aimed at scanning current developments in remote and hybrid CR and creating guidance to determine fit and to establish and implement a successful hybrid CR program across a variety of hospital settings. Workgroup members met monthly for six months working under the guidance of a dedicated technical expert panel to develop training and other implementation materials to further augment the TAKEheart curriculum. The contract modification also included an additional, third cohort of Partner Hospitals focused solely on improving care coordination during a 6-month training and TA period. See the Hybrid CR Workgroup Evaluation Report (Appendix E) for additional details on the key activities, lessons learned, and recommendations of the Hybrid CR Workgroup task.

Project Accomplishments at a Glance

Throughout the three-and-a-half-year project period, the TH team achieved several key accomplishments.

- Engaged an **11-member Technical Expert Panel that actively provided input and guidance** on recruitment, training, implementation and evaluation activities throughout the project.
- Created the **TAKEheart web site with a Resource Center** housing over **130 carefully curated CR resources** including the training materials and AG summaries.
- Developed **a 10-module online training curriculum with "how-to" implementation guides** based on the MH CRCP to support the implementation of two evidence-based interventions, AR and CC
- Worked with **50+ experts and practitioners in the CR field** to lead trainings and create tools, resources, and materials for dissemination
- **Met or exceeded all recruitment goals** for Partner Hospital, Learning Community, and Hybrid CR Workgroup participants
- **Coached staff in over 120 Partner Hospitals across 29 states** to implement evidence-based interventions
    - Approximately 70% of Partner Hospital champions in the first two cohorts reported at least **"some progress or "a lot of progress" on implementing AR** during the project period
    - Partner Hospital champions also reported **progress on enhancing CC, tracking referral rates, and an increased focus on patient retention**

- Led an **870+ member Learning Community** that participated in any of **20 AG sessions** seeking to increase referrals, enrollment, and participation in CR broadly and address underrepresented populations in CR
    - **Learning Community membership grew steadily over time and actively participated in AG sessions** through online polling and the chat feature.
- Developed **"how-to" guidance and considerations for hybrid CR** including tools for determining fit and steps to establish and implement a successful hybrid CR program
    - Based on recommendations from the Hybrid Workgroup, TAKEheart created **an 18-minute video** demonstrating how to implement a multi-person, CR session synchronously.
- Adapted the TAKEheart training materials and resources for use by hospitals independently after completion of the TAKEheart project and transferred these materials to a **TAKEheart Training Curriculum and Resources** page located on the AHRQ website at https://www.ahrq.gov/takeheart/training/index.html

Evaluation Methodology

To provide insights into the project approaches that were effective and inform lessons learned for future similar initiatives, TAKEheart's evaluation team members conducted an evaluation of the project's dissemination, recruitment, training, and TA activities. The evaluation sought to collect, analyze, and triangulate qualitative and quantitative data available from multiple sources. Thematic analysis was conducted on qualitative data including observations or recordings of PH-PAGs; interviews with Partner Hospitals, TAKEheart coaches, AHRQ and CDC; and open-ended responses to Partner Hospital and LC AG surveys. Descriptive statistical analysis was conducted on quantitative data from website analytics, event attendance, and Partner Hospital and LC AG session participant surveys.

Through triangulation -- examining and comparing data from multiple sources -- the evaluation ensured that the findings were robust, comprehensive, and well-developed. Not all Partner Hospitals provided direct feedback on TAKEheart and their progress in implementing AR and CC. Survey response rates were typical for this type of data collection activity. Partner Hospital survey response rates ranged from 26% to 51% and AG survey response rates ranged between 24% and 31%. Nonetheless, analysis of discussions during PH-PAGs, attended by all Partner Hospitals with varying frequency, ensured that the evaluation received input from *most, if not all*, Partner Hospital participants. The evaluation team used multiple investigators to analyze and cross-reference these multiple data sources and verify findings.

Although our methods provided a strong basis for evaluating the TAKEheart initiative, they suffer from some limitations. First, operating constraints on hospital staff during the pandemic led us to cancel or modify several planned data gathering activities. One result of these changes was that we obtained less direct information than originally sought from cardiologists involved in CR. Second, due to technical limitations and operating constraints, the partner hospitals did not provide us with data on CR enrollment and participation before and after the TAKEheart

initiative. Third, responses to the AG and PH surveys probably under-represent experiences and CR improvement activities in hospitals that were only partly or minimally engaged in TAKEheart.

Progress in Achieving Project Objectives

Despite the challenges presented by the pandemic, TAKEheart largely met its objectives. This three-and-a-half-year project was designed and launched before the PHE gripped the US and shocked its healthcare system, forcing hospitals to shut down their CR programs for extended time periods, adjust all operations and care to the new realities, and deal with tremendous staffing challenges.

The TAKEheart team nimbly adjusted its approaches to the changing environment. It revamped the project website to keep participants abreast of project changes and disseminate pertinent COVID-19 resources to help hospitals address the impacts of the pandemic. It relaxed requirements for Partner Hospital participation to attract and retain hospitals that wanted to implement AR and CC strategies but were also struggling with staffing shortages, shifting priorities, and lack of resources in the aftermath of PHE. In response to the pandemic, the project team activated the LC ahead of its originally planned launch date and temporarily shifted the LC's focus from broad CR topics to adapting to PHE impacts. This change allows the team to meet hospitals where they were and keep them engaged by demonstrating immediate value.

TAKEheart conducted seven AG sessions to help hospitals adapt to and cope with PHE, serving as one of the first federally funded resources for CR programs at the start of the pandemic. The TAKEheart's first AG session took place on April 3, 2020, just two weeks after the PHE declaration, to offer information and strategies for *Addressing Challenges with Cardiac Rehabilitation amid the COVID-19 Pandemic*. Attendance of AG sessions grew with each session, culminating in 195 LC members attending the *CMS Final Rule and Strategic Planning for 2021* conducted on December 10, 2020. From there on, the LC expanded its focus from addressing the impacts of the PHE to CR innovations, adapting electronic health records (EHR) system for AR, physician buy-in, and patient engagement, reaching 870 LC participants by the end of the project.

TAKEheart thus turned PHE challenges into opportunities by pivoting the project to meet the hospitals and CR community where they were and helping them address their most immediate needs – while still pursuing the original goal of promoting and supporting hospitals' implementation of strategies to increase referral, enrollment, and retention in CR. When Partner Hospital training restarted, the team offered one-on-one coaching opportunities to all Partner Hospitals in addition to the training and PH-PAGs to help participants develop tailored processes to AR and CC implementation. Heeding the Cohort 1 participants' feedback that it was difficult to participate in the monthly PH-PAG sessions due to scheduling conflicts, the TAKEheart team offered PH-PAG Cohort 2 training sessions at three different times a month to accommodate participants' busy schedules.

A brief summary of TAKEheart's progress in reaching its objectives is presented below.

1. **TAKEheart exceeded the objective of recruiting and training 100 Partner Hospitals in AR + CC** by recruiting and training 136 hospitals. Of 136 Partner Hospitals, 109 stayed through the end of the project, benefiting from the TAKEheart training, PH-PAGs, and resources.

2. **TAKEheart met its objective of recruiting Partner Hospitals that serve high-priority populations**: 1) people who live in high cardiac event areas and 2) people in demographic groups that tend to be enrolled in CR at disproportionately low rates.
    - At least one-quarter of Partner Hospitals' populations were in the top two cardiac risk quartiles (from 50% to the maximum risk), reflecting that TAKEheart recruited hospitals that served individuals at a higher-than-normal cardiac risk. In Cohort 3, this representation was almost doubled, with almost half of the Partner Hospitals' populations being in the top two risk quartiles and almost one-quarter being in the top risk quartile alone.
    - In every cohort, at least two-thirds of Partner Hospitals served counties where the proportion of people living in poverty exceeded the national average (of 11.4% in 2020).
    - Partner Hospitals served counties with higher populations of Black/African Americans or Native Americans than the national average. Cohort 1: 22% and 20%; Cohort 2: 32% and 16%; and Cohort 3: 48% and 21% of Partner Hospitals in counties with populations of Black/African Americans and Native Americans respectively.
    - At least a third of Partner Hospitals in each cohort were in rural areas, with 9% in Cohort 1, 22% in Cohort 2, and 21% in Cohort 3 being in truly rural areas of less than 10,000 population.

3. **The project partially met its recruitment priority for Partner Hospitals that serve people living in the "Stroke Belt"** within the US (states with a 34% higher risk of stroke than the general U.S. population). It achieved a relatively low rate for Cohorts 1 and 3 (14% and 12% respectively), and a significant share of "Stroke Belt" Partner Hospitals in Cohort 2, 22%. A potential explanation for not meeting this priority may be that Stroke Belt states have a relatively low number of healthcare workers per capita and, therefore, a lower number of hospital staff available to engage in the project, particularly during the PHE.

4. Despite the pandemic of historic proportions, the level of **Partner Hospital retention was high** – with the training and TA completion rate among all three cohorts above 75%: Cohort 1=77%; Cohort 2= 86%; and Cohort 3=85%. Partner Hospitals that withdrew from the project cited lack of resources, changes in institutional priorities, and staffing changes/loss of staff. During the year following the start of the PHE, TAKEheart developed and used a readiness tool to help facilitate constructive conversations around when Partner Hospitals could rejoin the project, and engaged all Partner Hospitals that expressed interest in TAKEheart resources in the during Learning Community events. To keep the Partner

Hospital champions engaged, the team asked the most engaged and experienced champions to review the training materials and serve as training presenters.

5. **Many hospitals reported making progress in implementation of AR and CC.** In preparation for AR+CC implementation and refinement activities, Partner Hospitals worked to increase buy-in throughout organizational leadership levels and departments, created implementation teams, developed action plans, mapped workflow of CR related processes, and identified data gaps and prepared data. Partner Hospitals perceived both the Action Plan template and process mapping tool introduced by TAKEheart as useful tools for prioritizing needs and initiating QI work, and for learning critical information about current processes. The Action Plan template was not used to its full extent/continuously.

   Many Partner Hospitals made progress in building or refining their AR processes during TAKEheart, despite reporting many challenges related to setting up or refining their AR processes in EHR. In Cohorts 1 and 2 respectively, 57% and 80% of survey respondents reported making some or a large degree of progress customizing their EHR for CR. (Survey response rates were between 26% and 51%; 10%-30% is a typical response rate for this type of surveys, 50% and above is considered to be excellent.)

   Many Cohort 1 and 2 Partner Hospitals that reported that they had not completed the development of AR or made progress with it, nonetheless, had made other strides, or simply expressed commitment to continuing the work they had begun to increase CR uptake.

   Partner Hospitals made progress towards modifying care coordination support during TAKEheart, reporting improvements in the following areas:

   - Use of data to enhance CC protocols
   - Communication with physicians and patients
   - Education on CR for providers, hospital staff, and patients

   Many Partner Hospitals expressed resolve to continue their work to improve and enhance CC after the completion of the program.

6. **Partner Hospitals showed an increased level of interest in patient engagement**, with six out of 24 (25%) Action Plans obtained from hospitals in Cohorts 2 and 3 including activities that would improve patients' engagement in their CR program planning and implementation.

7. **TAKEheart partially achieved its objective of disseminating knowledge to help LC members and Partner Hospitals reach underserved populations** and help them identify strategies to reduce known disparities in CR referral and retention. Three Learning **Community AG sessions** on the topics focused on increasing participation by the underserved populations were **impactful in spreading the knowledge and prompting changes** in LC members' organizations. AG sessions that included a focus on referral, enrollment, and retainment of populations that have been historically underserved by CR programs (Improving Support for Women that Need Cardiac Rehabilitation; Heart Failure

Patients in Your CR; and Maximizing Physician Support for Cardiac Rehabilitation) were well attended (ranging from 76 to 141 LC attendees). In the surveys several weeks after each of the sessions, respondents reported the following influence of the AG sessions (percentages varied by session):

- 63% to 92% shared information they learned at the AG session with others
- 68% to 76% sought additional information on the topic from other sources
- 61% to 80% discussed making changes or started making changes in their organizations.

(Response rates varied by survey and ranged from 25% to 31%.)

However, **Partner Hospitals demonstrated limited uptake** in this area**.** Thus, 65% of Cohort 2 Partner Hospital champions who submitted a hospital reflection form either did not respond to the question about their planned or ongoing efforts to increase participation of population groups that have been traditionally underserved by CR, or reported not having focused on such population. Other Partner Hospitals reported efforts to reduce cost barriers related to copay and transportation – reflecting focus on people with low income and people with limited insurance, but lack focus on patients with low education level, women, and people of color.

8. **The TAKEheart team developed materials and resources** using CRCP and engaged CR leaders in their review and revision, and then tested those materials with Cohorts 1, 2, and 3 Partner Hospitals. Across PH-PAG discussions, close-out reflection forms, and champion surveys, **participants had an overwhelmingly positive assessment of the TAKEheart training program and its influence on the hospitals**, and said they would continue using TAKEheart resources after the project ends. Many participants found that TAKEheart materials validated that they were on the right track, while many others made new discoveries of strategies, processes, and tools that they reported applying in their CR programs. Across all three cohorts, 100% of Partner Hospital survey respondents said TAKEheart training modules were somewhat or very applicable to their organizations (response rates of 26% to 51%).

9. **TAKEheart established and led a 14-member Hybrid CR (HYCR) Workgroup** of well-respected nationally recognized experts in the field **that captured insights and created resources for the development of an effective hybrid CR program** tailored to the unique operational environment of the hospital. This work was accomplished over a six-month period and produced:
    - An HYCR Implementation Guide that includes new content addressed by the Workgroup
    - An 18-minute video to demonstrate how a multi-person HYCR session could be initiated and conducted
    - An Environmental Scan comprised of (a) the results of a brief literature scan on select HYCR topics summarizing what is known, what is still unknown, and

future directions for research, (b) the results of the "real world" scanning activities conducted in associated with the HYCR Workgroup.
- Lessons learned for implementation of similar working groups on high priority health care topics in the future (presented to AHRQ in a separate report).

The HYCR Workgroup's insights and resources about creating and successfully administering a hybrid CR option were presented at the end of the project to the larger LC community at an AG session open to the entire Learning Community. In addition to using this AG event to promote HYCR knowledge and resources, the TAKEheart team created a designated space on the legacy TAKEheart subsite, https://www.ahrq.gov/takeheart/training/expanding-cardiac-rehab-capacity/index.html to host HYCR resources.

10. At the end of the project, the TAKEheart **team developed a final package of training tools and materials for improving AR and CC** for use by the TAKEheart Partner Hospitals, LC members, and anyone interested in improving CR. During the TAKEheart implementation, the team learned that some hospitals were not ready, did not need, or did not desire to implement all components offered by TAKEheart. Some wanted to focus on improving CC without committing to AR; others had functioning AR in place and only needed to improve their CC and/or tweak AR to improve eligibility protocols. Yet others were increasingly interested in providing hybrid CR to meet the needs of their populations. To allow more flexibility, and ultimately more hospitals, to implement AR +CC strategies, the TAKEheart team revised, reorganized, and updated its ten training modules into four coordinated curricula: (1) Getting Started, (2) Implementing Automatic Referral, (3) Implementing Effective Care Coordination, and (4) Expanding CR Capacity (which incorporated results of the HYCR Workgroup described in #8 above). Each training curriculum includes:
    - One set of **training slides** that hospitals can customize to train staff on all or selected concepts and tools. (This was developed in response to the Partner Hospitals expressed desire for customization and ability to add their specific information to the slides before presenting them to their leadership and staff.)
    - A consolidated **Implementation Guide** that presents actionable guidance for executing the process changes needed to support AR and CC
    - A **Guide to Additional Tools and Resources** including externally and internally developed materials to assist with implementing process changes
    - Links to materials (slides, recordings, and event summaries) from **LC Affinity Groups** on topics relevant to each curriculum.
    - Links to **audio-visual recordings of the original training modules** that were consolidated to create the curriculum

11. Last, the team **created a final TAKEHeart website within the AHRQ website infrastructure to house all of the products created through the Initiative** for those wishing to complete their QI efforts and those looking to begin this journey. This legacy

website includes an overview of TAKEheart for those not familiar with the project, all original and combined training curricula materials (slides, recordings, implementation guides and resource guides), relevant Learning Community AG materials (slides, recordings and event summaries), and a user's guide to help those t navigating this content on their own.

Lessons Learned

Several themes emerged from the evaluation and are summarized below.

Key Challenges to Hospitals' Ability to Implement AR+CC

Challenges faced by the TAKEheart Partner Hospitals in implementing evidence-based strategies for AR+CC fall within commonly known challenges to CR. These challenges can be categorized into three groups: enduring challenges faced by the Partner Hospitals' CR programs; challenges exacerbated or presented by the COVID-19 PHE; and challenges faced by patients eligible for or participating in CR. Understanding these challenges will help inform future efforts aimed at dissemination and implementation of evidence-based CR strategies.

Challenges Faced by CR Programs

- **Staffing shortages/turnover**. Difficulties filling CR positions, loss of staff in CR, in departments instrumental to CR process improvement (such as QI and IT), as well as across the hospital/health system, and changes in medical and IT leadership presented tremendous obstacles to Partner Hospitals' AR and CC implementation and participation in project activities.
- **Being under-resourced.** Overwhelmingly, except for those in academic medical centers, CR programs were low on the priority list for their organizations. CR programs are often one of the first to have their funds cut when a health system or a hospital looks to cut costs; among the first to have staff delegated to other parts of the hospital to meet surge needs; and among the last to have personnel requisitions approved. CR staff in critical access hospitals are even more under-resourced -- with staff stretched thinly, compared to other CR programs.
- **Limited data access and data capacity.** Access to data is critical for improving CR programs. In many cases, a key strategy of Partner Hospitals' TAKEheart activities was building a better data system. Yet virtually all Partner Hospitals faced data-related challenges, such as lack of data or lack of staff capacity to meaningfully use data due to data fragmentation and/or limited data management skills; lack of knowledge about data availability; unavailability of data to small hospitals in a large system; and paper-based, manually collected data.
- **Insufficient IT involvement.** AR implementation efforts often suffered from the lack of IT/EHR team's direct and early involvement in implementation and prolonged (up to several months) wait of CR requests in the IT/EHR work queue.
- **EHR limitations**. Some Partner Hospital teams reported that their EHR versions did not have automatic referrals to outpatient CR or functionality to collect data for cardiac rehabilitation or ICD-10 codes.

- **Lack of provider and staff buy-in.** Partner Hospital participants identified educating providers and staff about CR as a critical step for building buy-in for AR+CC implementation. Main issues that call for further education include misperceptions about CR and lack of understanding of the referral process among cardiology providers and general lack of understanding of CR among hospitalists, in-patient nursing teams, and care coordination managers.
- **Patient recruitment and retention.** Patient recruitment and retention was an important focus of TAKEheart participation for many Partner Hospital participants across all three cohorts. Partner Hospital staff used innovative approaches to sign-up patients for CR and keep them engaged to the full completion of the Individualized Treatment Plans (ITP).
- **Not being part of intervention hospital.** A few Partner Hospitals that were not part of an intervention hospital or hospital that has Phase 1[1] CR found it challenging to apply TAKEheart methodologies for increasing referrals and enrolling patients. They also found TAKEheart materials and offerings to be geared more towards larger, intervention hospitals.
- **Competition with other CR programs.** A few Partner Hospital participants in Cohort 2 mentioned having to compete with other CR programs in the area for CR patients, both due to those programs' advantageous distance for patients and smaller co-pay.

Challenges Due to Public Health Emergency

- **Staffing shortages/turnover.** The COVID-19 PHE exacerbated staffing shortages and turnover in the hospitals and presented an ongoing challenge for maintaining care coordination, as many hospital staff were reassigned for significant periods during regional spikes in the virus.
- **Spacing restrictions.** PHE spacing restrictions reduced CR programs' on-site capacity to serve patients.
- **Competing hospital priorities.** COVID-19 priorities pushed CR program needs to the back burner. Competing priorities among hospital leadership during COVID-19 resulted in very slow movement in TAKEheart for many Partner Hospitals.

Patient-facing Challenges

- **Transportation.** Distance to the CR program site and transportation costs are key patient-facing barriers, cited by most, if not all, Partner Hospitals in all TAKEheart cohorts. Transportation and travel time become especially challenging for patients at rural hospitals serving several counties
- **Insurance copay.** Patients' insurance coverage for CR presents another significant barrier to increasing patient participation. The patient cost is high for the 36-session, 12-week treatment program. The Medicare copay is $71/week (for three sessions); there is

[1] Phase 1 of cardiac rehab engages inpatients who underwent a heart related procedure in patient education and monitored, low-level exercise before they are discharged from the hospital.

no Medicaid coverage of CR in some states; Medicaid Advantage patients pay about $90-$150 weekly for CR.,

- **Telehealth.** As a response to distance and transportation barriers, a few Partner Hospitals in each of the three cohorts considered telehealth as an option. They found that telehealth for CR presents its own set of patient-facing challenges, including lack of or uncertainty about insurance coverage, lack of computers and insufficient Internet bandwidth, and diminished or lack of opportunity for social interaction.

These challenges to CR use by the patients are not unique to the TAKEheart Partner Hospitals, but they presented significant obstacles to Partner Hospital effort to implement evidence-based strategies disseminated by TAKEheart.

Implementation Lessons Learned

The results of the TAKEheart evaluation suggest a number of lessons learned from the implementation of the project that can be considered by future similar projects.

Project Website

- The TAKEheart website appears to have been a useful tool for the project purposes. It **provided credibility to the project, allowed for nimble adjustments in the changing operational environment during the PHE, and was used by the project team to continually add resources and refine the site navigation**. However, its **usage by Partner Hospital participants was somewhat limited.** Traffic to the website in general was relatively low (with approximately 45,000 pageviews over 18 months) and Partner Hospitals champions did not use the website as a frequent, go-to source (with 31% of Cohort 1 and 40% of Cohort 2 Partner Hospital champion survey respondents visiting the website within two months prior to the survey). Among the reasons for low usage may be that the TAKEheart team emailed all AG session and Partner Hospital training materials to participants to make it easy for them to access resources. Also, the website was competing for an audience with well-established go-to websites in the cardiac rehabilitation space, Million Hearts® and AACVPR.

Partner Hospitals

- **Leadership commitment to their CR programs and resource allocation to quality improvement[2] is of paramount importance to hospital success in a QI project like TAKEheart, which targeted a systems change approach**. Partner Hospitals that stayed with the project, were engaged, and showed progress were those that had commitment

[2] "Quality improvement is the framework used to systematically improve care. It seeks to standardize processes and structure to reduce variation, achieve predictable results, and improve outcomes for patients, healthcare systems, and organizations. Centers for Medicare and Medicaid Services (CMS), Quality Measurement and Quality Improvement." Assessed at https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/Quality-Measure-and-Quality-Improvement-#:~:text=Quality%20improvement%20is%20the%20framework,%2C%20healthcare%20systems%2C%20and%20organizations on December 1, 2022

from leadership (e.g., chief cardiologist) and resources to undertake QI efforts at their CR programs. With diminished leadership buy-in and resourcing due to the PHE, and the associated relaxing of TAKEheart requirements for leadership commitment, many Partner Hospitals found it challenging to make progress.

- **CR leaders who had the *authority* to implement QI activities and engage with relevant departments and *time* to participate in TAKEheart activities appeared to be more likely to make progress towards achieving their TAKEheart goals**. It also helped to have champions who, because of their experience and drive, could serve as advocates for their CR program vis-à-vis the hospital leadership, cardiac providers and nurses, IT and QI departments, and other stakeholders.

- It appears that **hospitals selected for participation were not on an even footing when they joined the project in terms of their resources, infrastructure, and the degree of advancement of AR**. **As a result, participants had diverse needs and objectives**. Some wanted to focus only on AR, others only on CC. Some moved at a quick pace to tweak their AR, while others needed more time to make any AR or CC changes. Additional gaps among participating hospitals emerged due to divergent impacts of the pandemic across regions and among types of hospitals.

- Interviews with TAKEheart coaches and Partner Hospital champion reflection forms showed the **neither the 10-month (Cohorts 1 and 2 – AR+CC focus) nor the 6-month (Cohort 3 – CC focus only) duration was long enough for Partner Hospitals to meet the initiative's goals for participation in TAKEheart.** The project underestimated the time and EHR software-specific tailoring that are needed to put effective AR in place.

- Participation in the project and implementing system changes in AR and CC required time and commitment from CR programs that were already facing enduring challenges with staffing shortages and limited resources. **The only incentive that TAKEheart offered was knowledge and resources; this was not sufficient to keep everyone engaged, and some Partner Hospital teams dropped out, while others reduced their participation.**

- **The ability to engage with the hospital's EHR/IT team to establish or enhance automatic referral was** seen by project participants and the TAKEheart team **as a critical element of success**, and the lack of this engagement was viewed as a key barrier that slowed down or outright prevented Partner Hospitals' progress in implementation of AR strategies.

- **TAKEheart had a well-designed technical assistance program**. Every training module provided Partner Hospitals with information and resources, and PH-PAGs served to reinforce learning that happened at the training. Following PH-PAGs, **coaches reached out to participants offering individual assistance, but few hospitals sought this assistance. Both Partner Hospital participants and coaches found** that **trainings delivered live were more beneficial for learning.**

- **PH-PAGs provided valuable peer support for Partner Hospital participants**. They engaged in consistent dialogue during PH-PAGs and interacted with each other between the meetings to discuss specific practices that they had shared during PH-PAGs. Many Partner Hospitals expressed interest in being grouped with peers who pursued similar CR goals, used the same EHR for AR implementation, and had otherwise similar characteristics (e.g., rural hospitals or hospitals without Phase 1 CR).
- The **TAKEheart team operated PH-PAGs much like a community of practice or learning collaborative,** building PH-PAGs on a formula of innovation, communication, time, and social systems. **TAKEheart coaches' clinical and QI expertise served as an added benefit to this TA activity.**
- **Participating TAKEheart hospitals experienced the same barriers to serving their patients as do many other health services providers and programs**, such as: affordability, transportation, wait times/limited space, and staffing limitations. These challenges are complex and – for CR programs – they are exacerbated by the length of expected CR treatment, which is 36 sessions over three months. Partner Hospitals wanted guidance and assistance on how to address these barriers to participation in CR.
- **Partner Hospitals focused a lot of discussion on patient retention**. Many in Cohort 3, which took place after the PHE subsided, said that they had plenty of or even too many referrals, but their larger challenge was retaining patients in the program.
- The **inability of many Partner Hospitals to collect and report CR data (on referrals, enrollment, and retention)** and the TAKEheart team's decision during the PHE not to burden the hospitals with data collection **resulted in the project's inability to quantify Partner Hospitals' progress in implementing AR and CC during their participation in the project.** In addition, realizing referral and retention gains would take longer than the project period; the evaluation did not examine these rates.
- There appeared to be **some interest, but limited uptake, among hospitals of strategies for increasing use of CR by underserved populations,** such as women, people of color, the under- and uninsured, and patients with heart failure. A few Partner Hospitals that did report efforts on the underserved populations focused on reducing cost barriers (transportation and copy) to low-income and underinsured population.

Learning Community

- **In response to the pandemic, activating the Learning Community ahead of schedule was an effective and successful strategy. The TAKEheart team implemented an earlier-than-planned launch of Learning Community and focused its first seven sessions on topics relating to pandemic-driven operational challenges to CR**, in place of topics relating to strategies beyond AR +CC to increase CR utilization. The purpose of the pivot was to keep hospitals engaged during the period when training was suspended by providing something of value to address pressing needs. The result was a series of

very well attended single-topic-focused sessions in place of the originally planned, multiple small-group sessions focused on a given topic. **The strategy of engaging a large community around PHE-focused topics – meeting hospitals where they were, rather than "not bothering them" until the pandemic subsided – paid off when recruitment targets were met for the re-start of training. TAKEheart's LC sessions may have been the only source where CR professionals and the wider heart disease healthcare community were learning about improving access to, and operating CR in the context of the pandemic**. However, the shift to widely attended, virtual sessions on a range of topics also came at the cost of forgoing the deeper probes and more active give-and-take that are possible when small groups meet repeatedly on a single topic of shared interest.

- **Through the HYCR Workgroup component, the TAKEheart team met its original Learning Community goal of producing topic-centered CR content.** By recruiting HYCR Workgroup members with diverse CR program experience and individual characteristics for a short time commitment of six months, effectively managing the workgroup's collaboration, providing it with a brief, just-in-time literature scan, and, importantly, securing leadership of the group by a nationally recognized expert, **the TAKEheart team created resources for the development of effective hybrid CR tailored to the hospital's operational environment and facilitating expansion of CR to the historically underserved populations**.

Recommendations

Lessons learned from the TAKEheart implementation and evaluation resulted in the following recruitment and design recommendations for consideration by future QI and dissemination & implementation projects aimed at increasing the use of cardiac rehabilitation. Some of these lessons will likely also apply to other types of dissemination, implementation, and QI projects.

Recruitment

1. **Reduce participant variation**. To increase the likelihood of meeting the needs of participating hospitals and achieving project goals, a future similar project would benefit from recruiting hospitals with similar capacity and readiness for QI. The heterogeneity of participating hospitals can be reduced by establishing additional and more explicit requirements for participation. Requirements may include: a written leadership commitment to the goals of the project and participation requirements, including but not limited to allocation of CR and EHR/IT staff time and commitment to implementing QI activities; EHR in place; no plans to transition to another EHR software in the next 1-3 years; and leadership commitment to establish/refine automatic referral for CR in the EHR. For a project with multiple pathways, each pathway would have its own set of entry requirements.
2. **Specify level of effort needed**. A future QI project should consider establishing a clear understanding of expected level of effort for potential project participants. This may include the time required for participation in project events (as was done in TAKEheart) and the

anticipated effort needed to implement relatively resource-intensive QI activities to establish AR and improve CC. The estimated level of effort may include a time range for implementation of each of the key QI activities (e.g., establishing a multi-disciplinary team, developing an Action Plan, data collection and development of a CR report, etc.). It would be beneficial for the level of effort to be specific to hospital characteristics to allow hospital teams to realistically assess their readiness to commit the required time and resources to become a Partner Hospital.

3. **Provide guidance on champion selection**. Another critical part of the recruitment strategy should be the selection of CR champions. Champions are an important piece of the success puzzle – they need to have the drive, authority, and time to be part of the project and lead QI activities at their CR programs. A future similar program might consider providing guidance to participating hospitals on how to select the right champion for the effort and/or selecting the champions as part of the recruitment process.

Design

4. **Secure leadership buy-in**. A future CR program would benefit from securing leadership buy-in and expressed commitment (through a signed LOI or similar instrument) as the cornerstone of its recruitment efforts. To keep the leadership informed during the project, the project can provide written updates to leaders on the participating hospitals' progress toward key milestones. The project can also work with the individual champions to assist them in the development of outcomes reports showing CR progress.

5. **Provide alternative participation pathways.** If hospitals with divergent levels of readiness and capacity are to be recruited, a future, similar project should consider providing different pathways to participation for different groups of hospitals based on their goals (i.e., focus on AR only, focus on CC only, or focus on CR and CC); readiness (as expressed by commitment of, e.g., staff time and readiness to collect and analyze CR data); QI experience; and the hospital's AR capacity. One pathway, for well-resourced hospitals with high levels of commitment and their own QI departments (such as academic centers), might include a quicker Getting Started period followed by in-depth QI for AR and CC. A second pathway, for hospitals with limited resources and QI experience (such as critical access hospitals), might include intensive Getting Started technical assistance before delving into CC that is tailored to small hospitals. A third pathway, for non-interventionist, non-Phase 1 hospitals, could include approaches to referral increase and patient engagement that can be used by small hospitals and those without cardiac surgery or a catheterization lab.

6. **Allow more time for hospital participation** in the training and TA offered by the project. Each project pathway (as proposed in Recommendation #3) may have a different length of engagement, with hospitals having limited resources and QI experience needing as much as up to two years to implement evidence-based strategies in AR+CC.

7. **Develop retention strategies**. In anticipation of participant attrition, in addition to overrecruiting, develop retention strategies, such as celebrating milestones – e.g., completion

of the mapping process, collection of new data and development of the first report, or rollout of the first AR order set – to help participants recognize their incremental achievements can help reduce attrition.

8. **Consider incentivizing participation**. For a future QI or dissemination and implementation project on improvements in clinical healthcare, project sponsors may want to consider providing financial incentives to participating organizations, possibly through partnerships with other federal agencies. Such incentives could be tied to milestones, for example, development of an Action Plan, completion of a mapping process, development of a data analysis structure and tool, or 50%-75%-100% completion of the EHR customization to the CR plan. Financial incentives for under-resourced hospitals would serve as a powerful lever for keeping the hospitals engaged and giving them an advocacy tool vis-à-vis their leadership.

9. **Increase focus on patient retention.** Future similar projects should consider enhancing the focus on patient retention in CR, as opposed to concentrating only on CR referral and enrollment. Additionally, training and resources on CC implementation should reflect CC as a continuum that does not end until patient's participation in the CR program is completed so as to enhance retention.

10. **Engage EHR vendors**. A future initiative focused on process-level or care delivery improvements in CR should explore the feasibility of engaging the top system-wide EHR vendors, such as Epic, Cerner, and Meditech (or those more applicable to the project at hand), in determining how to make improvements in AR, data functions, and analytics for CR in their respective products. This engagement would enable participating health systems to make systems changes in the context of their EHR and maximize EHR technological capabilities for the benefit of CR use.

11. **Use live training sessions**. Make live training and dedicated peer discussion and learning sessions the backbone of hospital engagement. Live training provides an opportunity to ask panelists questions and have discussions via chat, increasing engagement with the project, experts, and peers. Trainings recording and associated resources should then be provided online for self-paced, asynchronous study. Many Partner Hospital participants in this initiative asked to be part of a PH-PAG grouped together based on likeness, such as use of the same EHR software, hospital type, level of resources, and extent of AR and CC advancement.

12. **Allow flexibility in carrying out the original project plan.** Allow flexibility in response to the deeper understanding of participants' needs and changing environment and leverage one project component to jump start or augment another, as was done in TAKEheart with the transformation of LC into a larger community during the PHE.

13. **Require data reporting**. Include CR program's referral, enrollment, and retention data reporting (both at the start of the project and at certain time increments) as a requirement for participation in the future similar project focused on QI and improvements in CR. This will

(1) help project leads understand the extent of the project's effect on participating organizations, and (2) empower them to monitor and celebrate their own progress well after the project ends.

14. **Create equity-focused resources.** Create CR-focused materials for hospitals' Diversity, Equity, and Inclusion (DEI) offices in order to help decrease disparities in CR as part of a larger effort by the hospitals. As a Partner Hospital champion said in an interview: *"CR staff are overwhelmingly white. Underserved black patients don't see in their providers people who look like them. There needs to be more people of color in the space."* Promoting CR specific issues, including staffing, for inclusion in the DEI office agenda may help to get these issues the attention they need.

15. **Consider alternatives to an independent project web site**. Consider establishing the website of the future similar project as a subsite of the sponsoring government agency's website to increase traffic to project materials. However, consideration should be given that continued adjustments to such a project site may not be as agile as those on an independent, contractor-developed site. In addition, access to and engagement with project materials can be achieved through collaboration with well-established long-standing organizations in cardiac rehabilitation (such as Million Hearts® and AACVPR). Organizations like these could include project information and prominent links to the project's subsite on their websites.

16. **Continue dissemination after end of contract.** Continue dissemination activities to promote the TAKEheart website to increase traffic to reach a wider audience interested in CR and promote evidence-based practices in AR and CC and the use of the TAKEheart's four coordinated curricula: Getting Started, Implementing Automatic Referral, Implementing Effective Care Coordination, and Expanding CR Capacity.

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AHRQ Pub. No. 23-0064
August 2023