



AACVPR
American Association of Cardiovascular
and Pulmonary Rehabilitation
Promoting Health & Preventing Disease



A MILLION HEARTS® ACTION GUIDE

Cardiac Rehabilitation **CHANGE PACKAGE**

Second Edition | August 2023



This Cardiac Rehabilitation Change Package was completed by the Centers for Disease Control and Prevention (CDC) in collaboration with the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) and other subject matter experts with the purpose of helping cardiac rehabilitation programs, hospital quality improvement teams, and public health professionals who partner with these groups to implement systems and strategies that improve care for patients who are eligible for cardiac rehabilitation. AACVPR is a multidisciplinary professional association comprised of health professionals who serve in the field of cardiac and pulmonary rehabilitation.

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Graphic Design and Editorial Assistance

Graphic and HTML design support was provided by Booker Daniels, MPH¹; Susan Davis (Peraton); and Marilyn Werner, MPH, CHES.¹ Editorial support was provided by Hannah Muerhoff, BA⁴; Mollie Corbett, BS⁴; and Erin Espy, BA.⁴

We would like to extend special thanks to the following organizations for their willingness to share tools and resources to improve cardiac rehabilitation referral, enrollment, and participation, as further denoted within the Cardiac Rehabilitation Change Package:

- Abt Associates, Atlanta, GA
- Agency for Healthcare Research and Quality, Bethesda, MD
- American College of Cardiology, Washington, DC
- Baystate Medical Center, Springfield, MA

- Beth Israel Deaconess Hospital—Milton, Milton, MA
- Christiana Care Health System, Wilmington, DE
- Clinical Exercise Physiology Association, Indianapolis, IN
- ECU Health Medical Center, Greenville, NC
- Emory Healthcare, Atlanta, GA
- Essentia Health, Duluth, MN
- Froedtert Health Community Memorial Hospital, Menomonee Falls, WI
- Genesis Hospital, Zanesville, OH
- Henry Ford Health System, Detroit, MI
- Holland Hospital, Holland, MI
- Indiana University Health, Muncie, IN
- Intermountain Health - St. Vincent Healthcare, Billings, MT
- International Council of Cardiovascular Prevention and Rehabilitation, Markham, Canada
- IPRO QIN-QIO, Lake Success, NY
- Johns Hopkins Medicine, Baltimore, MD
- KITE-Toronto Rehabilitation Institute, University Health Network, Toronto, Canada
- Lake Regional Health System, Osage Beach, MO
- Lifespan Cardiovascular Institute, Providence, RI
- Liverpool Hospital, Liverpool, New South Wales
- MacNeal Hospital, Berwyn, IL
- Massachusetts General Hospital, Boston, MA
- Mayo Clinic, Rochester, MN
- MedlinePlus, Bethesda, MD
- Memorial Hospital of Carbondale, Carbondale, IL
- Michigan Cardiac Rehab Network (Michigan Value Collaborative and Blue Cross Blue Shield of Michigan Cardiovascular Consortium), Ann Arbor, MI
- Mount Carmel Health System, Mount Carmel, OH
- NYU Langone Health, New York, NY
- Penn Medicine, Philadelphia, PA
- Quality Insights, Charleston, WV
- Rochester Regional, Rochester, NY
- Southwest Florida Heart Group, Fort Myers, FL
- University Hospital, Augusta, GA
- University of Alabama at Birmingham, Birmingham, AL
- University of California, San Francisco, San Francisco, CA
- University of Vermont Medical Center, Burlington, VT
- Wellstar Center for Cardiovascular Care, Marietta, GA

Million Hearts® and AACVPR would also like to acknowledge the contributions of the Agency for Healthcare Research and Quality's TAKEheart initiative, specifically Dina Moss, MPA,⁵ and Michael Harrison, PhD,⁵ the team at Abt Associates, the 18 technical expert panelists, the 14 members of the Hybrid Cardiac Rehabilitation Work Group, the 60 TAKEheart Training Curriculum and Learning Community contributors, the 120+ TAKEheart Partner Hospitals, and 850+ members of the TAKEheart Learning Community.

For More Information

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Suggested Citation

Centers for Disease Control and Prevention. Cardiac Rehabilitation Change Package, Second Edition. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2023.

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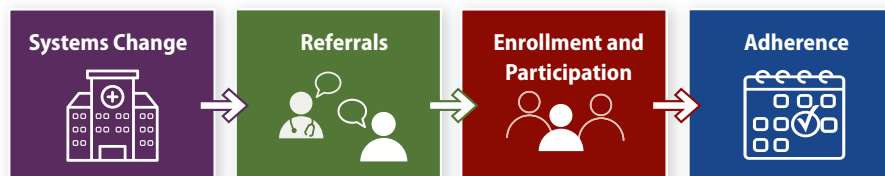
⁵Agency for Healthcare Research and Quality.

Contents

Cardiac Rehabilitation Change Package — Quick Reference	1
What Is Cardiac Rehabilitation?	3
What Can Be Done to Improve Referral, Enrollment, and Participation?	4
Figure 1. New Paradigm to Optimize Use of Cardiac Rehabilitation	4
What is the Cardiac Rehabilitation Change Package?	5
Figure 2. Cardiac Rehabilitation Change Package Focus Areas	5
How to Use the Cardiac Rehabilitation Change Package?	6
Figure 3. Institute for Healthcare Improvement (IHI) Model for Improvement	6
How to Measure Quality Improvement Efforts?	8
Figure 4. Example of a Run Chart	8
Change Concepts, Change Ideas, and Tools and Resources	9
Table 1. Systems Change	9
Table 2. Referrals	11
Table 3. Enrollment and Participation	15
Table 4. Adherence	20
Appendix A: Strategies to Increase Cardiac Rehabilitation Participation Among Patients with Heart Failure	22
Appendix B: Additional Quality Improvement Resources	23
Acronyms	24
References	25

Cardiac Rehabilitation Change Package — Quick Reference

Focus Areas



Change Concepts and Change Ideas

Systems Change
Make CR a Health System Priority
Establish a hospital champion, such as a quality-of-care leader or a CR administrator
Engage hospital administrators and senior staff in optimizing CR delivery
Secure and sustain a sufficient and multidisciplinary CR workforce
Engage the care team in CR and ensure their support for CR
Use CR referral, enrollment, and participation as quality-of-care indicators
Referrals
Incorporate Referral to CR Into Hospital Standardized Processes of Care for Eligible Patients
Support the verbal recommendation of CR to eligible patients by the referring clinician
Include referral to CR in order sets for appropriate patients; incorporate into EHR as appropriate
Include referral to CR in discharge checklists for appropriate patients; incorporate into EHR as appropriate
Include referral to CR in appropriate patient discharge forms; incorporate into EHR as appropriate
Develop a standard process for informing an external CR program of a referred patient
Develop a standard process for eligible patients to self-refer to CR
Standardize the CR Referral Process
Develop and communicate a standardized referral process or policy for patients
Develop and communicate a standardized outpatient CR referral process or policy for patients discharged to inpatient acute or subacute rehabilitation or to home care services
Implement standardized paper/faxed referral to CR from an inpatient setting
Implement standardized paper/faxed referrals to CR from an outpatient setting
Use inpatient EHR tools to automate referrals to CR for all eligible patients including default or “opt-out” orders for patients with qualifying diagnoses
Use outpatient EHR tools to automate referrals for patients with qualifying diagnoses who have not participated in CR
Use Data to Drive Improvement in Referrals to CR
Determine inpatient referral metrics to CR
Determine outpatient referral metrics to CR
Use CR referral performance measures in a quality improvement system
Regularly provide a dashboard with CR referral metrics, goals, and performance
Implement a CR registry to identify, track, and manage patients who are referred to a CR program
Identify patients who had a cardiac event without a referral to a CR program

Enrollment and Participation
Optimize CR Care Coordination
Develop the infrastructure for deploying inpatient CR “liaisons”
Train inpatient “liaisons”
Identify patients’ social needs for optimal CR participation
Engage patients’ families and/or advocates
Educate Patients About the Benefits of Outpatient CR
Promote CR to eligible patients and their families
Use videos to describe your CR program and the impact of CR on health outcomes before hospital discharge or at the beginning of outpatient CR
Provide patient education materials that convey CR benefits
Reduce Delay From Discharge to First CR Appointment
Before hospital discharge establish an early (within 12 days of discharge) outpatient follow-up appointment
Coordinate handoffs for patients with deferred CR enrollment
Use Data to Drive Improvement in CR Enrollment or Participation
Determine CR enrollment or participation metrics
Regularly provide a dashboard with CR enrollment or participation metrics, goals, and performance
Improve Efficiency of Enrollment
Incorporate group orientations
Develop Flexible Delivery Models That Better Accommodate Patient Needs
Offer accelerated CR programs
Modify program structure and hours of operation to match patient preferences to accommodate more patients
Shift from a class structure to an open gym model
Provide case management or patient support services
Offer Hybrid CR Programs
Make the case for offering hybrid CR
Design and develop work processes to deliver hybrid CR
Identify which patients may be most appropriate for hybrid CR
Establish an approach to bill for hybrid CR
Offer self-administered educational programs to supplement CR participation
Modify Some Program Procedures Based on Clinical Need
Match frequency and/or use of ECG telemetry monitoring to clinical need
Improve operational efficiency with BP management
Use Clinician Follow-Up to Bolster Enrollment or Participation
Engage referring clinicians by providing letters that highlight non-enrolled patients for clinician follow-up
Engage referring clinicians by providing progress reports and completion of program outcomes
Adherence
Identify Populations At Risk for Low Engagement
Know the characteristics that are predictive of attendance and dropout to identify patients at particular risk to offer extra support
Address Patient Barriers
Address the patient’s social needs related to CR participation
Offer transportation support
Offer gender-tailored CR sessions
Assist patients with high out-of-pocket costs or economic burden
Establish a philanthropic fund to partly underwrite CR costs for patients with high co-payments or without insurance
Improve Patient Engagement
Incorporate motivational and financial incentives for meeting goals for session attendance
Automate reminders and communication for CR sessions
Connect enrolled patients with a CR graduate patient ambassador or “sponsor”

What Is Cardiac Rehabilitation?

Cardiac rehabilitation (CR) is a comprehensive secondary prevention program designed to improve cardiovascular health following a cardiac-related event or procedure. The vast majority of CR is delivered in an outpatient hospital setting, so that is the focus of this document. 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.¹

Strong evidence shows that CR programs can benefit individuals who have:

- Had a heart attack.²
- Chronic stable angina.³
- Received a coronary angioplasty or stent (also known as percutaneous coronary intervention or PCI).⁴
- Chronic heart failure.⁵
- Undergone coronary artery bypass surgery, heart valve replacement or repair, or a heart or heart-lung transplant.^{4,6,7}

Many insurance carriers cover CR for the conditions listed above, but it is necessary to review each patient's individual insurance benefits related to CR. Participation in a CR program can reduce the risk of death from all causes, subsequent cardiovascular events, and hospital readmissions.^{8,9} These benefits increase with the number of CR sessions attended in a dose-response association.¹⁰

Despite these benefits, enrollment in CR remains low and disparate. Only 29% of Medicare fee-for-service beneficiaries eligible for CR in 2017 participated in at least one CR session, with lower participation seen among non-Hispanic Black persons, Hispanic persons, persons at least

85 years old, women, and people living in certain states.¹¹ Participation also varied by CR qualifier, with people diagnosed with stable angina or qualifying heart failure having the lowest participation rates. Barriers to program enrollment may occur at the health system, policy, program, and patient levels.

Million Hearts®, a national initiative co-led by the Centers for Disease Control and Prevention (CDC) and the Centers for Medicare & Medicaid Services (CMS) with the goal of preventing 1 million acute cardiovascular events in 5 years, has worked with CR professionals to set a **national goal of 70% participation in CR for eligible patients**.¹ Improving awareness about the benefits of CR, increasing referral of eligible patients, expanding uptake of alternative CR delivery models, and reducing system and patient barriers to participation are all steps that may improve the referral, enrollment, and participation rates in CR programs. More importantly, effective strategies have been identified but are not yet widely and systematically implemented.

Although separate and distinct from CR, supervised exercise therapy (SET) and other exercise training programs can be delivered at CR program facilities and can benefit individuals with specific cardiovascular disease diagnoses. For example, SET can improve functional status and quality of life and reduce lower extremity symptoms for patients with peripheral artery disease (PAD) and intermittent claudication.¹² Uptake of SET remains low, with an estimated 1.3% of Medicare fee-for-service beneficiaries with a qualifying PAD diagnosis participating.¹³ Many of the care processes available to increase CR participation may also be adapted to increase participation in SET and other exercise training programs, given the similar workflow processes and co-location of service delivery.

What Can Be Done to Improve Referral, Enrollment, and Participation?

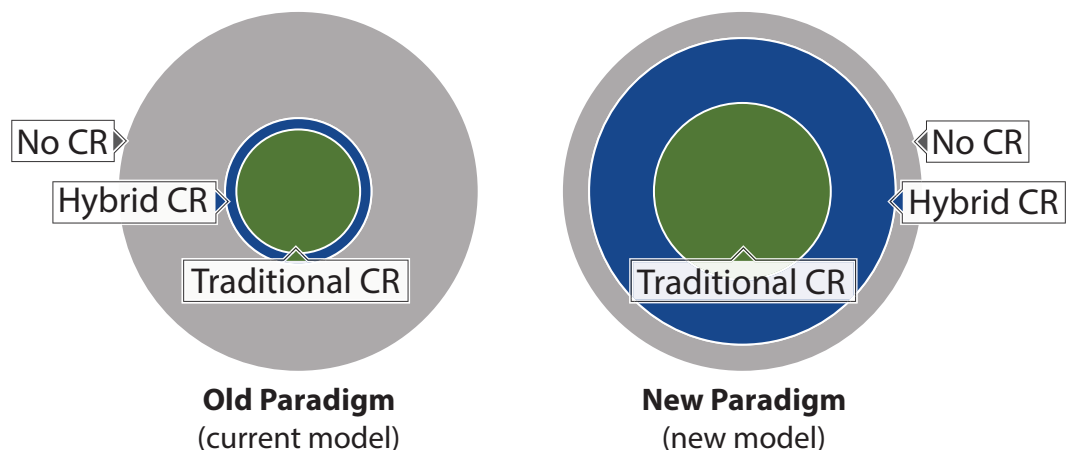
Program staff, other health care professionals, and administrators committed to improving rates of CR referral, enrollment, and/or participation have an opportunity to be change agents for their institutions. Improvement in CR utilization and delivery may benefit from one or more champions to identify needed changes, develop solutions, and measure and share progress. Multiple champions are likely needed since referral, enrollment, and participation involve a variety of:

- Processes (e.g., incorporating referral to CR into “opt-out” discharge order sets, integrating health information technology, changing workflows).
- Disciplines (e.g., cardiology, hospital medicine, primary care, rehabilitation).
- Professionals (e.g., physicians, nurses, exercise physiologists, registered dietitians, social workers, care coordinators, administrators).
- Locations (e.g., inpatient units, CR programs, physician offices).

Reaching the Million Hearts® goal of 70% participation may require the expanded delivery of traditional or in-person CR sessions while also increasing uptake of “hybrid CR.”

Champions can also expand traditional delivery models to accommodate more patients. Reaching the 70% CR participation target may require a paradigm shift (Figure 1) to extend the reach of CR. Recent estimates suggest 14% of adults live in counties that lack a CR center and an estimated 74% of adults live in counties with less than one center per 100,000 adults (i.e., “CR deserts”).¹⁴ Reaching the Million Hearts® goal of 70% participation may require the expanded delivery of traditional or in-person CR sessions while also increasing uptake of “hybrid CR” programs that deliver CR sessions both in person and virtually using synchronous audiovisual communication, with or without the use of remote asynchronous communication.¹⁵ It is important that hybrid models adhere to the provision of the core components of CR.^{15,16}

Figure 1. New Paradigm to Optimize Use of Cardiac Rehabilitation



Adapted from Olsen T. Balancing Technology with the Human Touch to Promote Exercise is Medicine. AACVPR 2018.

What Is the Cardiac Rehabilitation Change Package?

The Cardiac Rehabilitation Change Package (CRCP) presents a listing of process improvements that CR champions can implement as they seek optimal CR utilization. It is composed of **change concepts, change ideas, and tools and resources**. **Change concepts**, sometimes called key drivers, are general notions that are useful in the development of more specific ideas for changes that lead to improvement. **Change ideas** are actionable, specific ideas or strategies for changing a process. Change ideas can be rapidly tested on a small scale to determine whether they result in improvements in the local environment. With each change idea the CRCP lists one or more evidence- or practice-based **tools and resources** that can be adapted by or adopted in a health care setting to improve CR utilization.

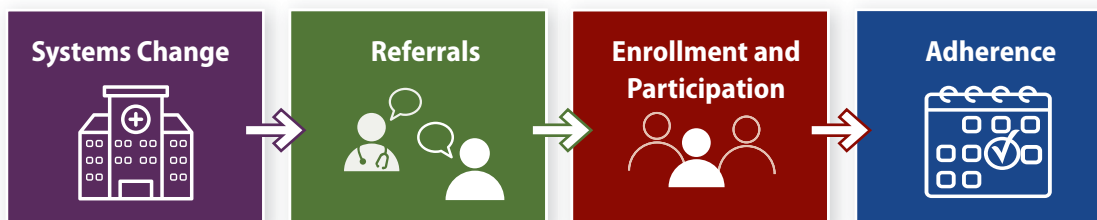
The purpose of the CRCP is to help quality improvement (QI) teams from hospitals and CR programs implement systems and strategies that target improved care for more patients eligible for CR. The CRCP is broken down into four focus areas ([Figure 2](#)).



The Cardiac Rehabilitation Change Package is an eye opener and bridge for success to the novice, intermediate, and advanced practice groups in cardiac rehabilitation settings across the continuum of care. The change package guidelines and implementation strategies are the building blocks to a successful cardiac rehabilitation program geared towards meeting... clinical and patient-reported outcomes.”

— Jonathan David, MSN, RN, AACC,
EBP-C, CCRP, NE-BC
Cardiac Rehab Nurse Coordinator,
Inpatient Cardiac Rehabilitation
Stanford Health Care
Palo Alto, California

Figure 2. Cardiac Rehabilitation Change Package Focus Areas



How Can I Use the Cardiac Rehabilitation Change Package?

The CRCP is meant to serve as a menu of options from which QI teams can select specific interventions to improve CR utilization. We do not recommend that teams attempt to implement all the interventions at once, nor is it likely that all interventions will be applicable to your clinical setting.

Start by bringing together a team of CR professionals, physicians, administrators, and other relevant stakeholders to discuss the aspects of CR utilization that are most in need of improvement. The team can then select corresponding interventions from the CRCP that best address those issues.

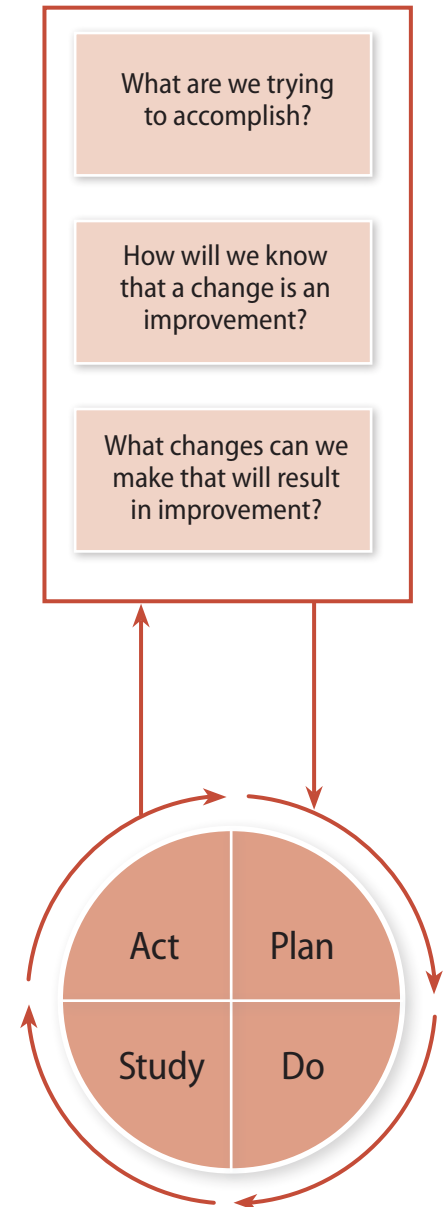
Figure 3 depicts the Institute for Healthcare Improvement's (IHI) Model for Improvement.¹⁷ The Model for Improvement suggests first posing three questions:

1. What are we trying to accomplish?
2. How will we know that a change is an improvement?
3. What changes can we make that will result in improvement?

The answers to these questions will point you to your QI objectives and related metrics. You can choose strategies from the many listed in this CRCP that align with your objectives and have been shown to result in improvement.

Read through Tables 1–4 for a list of change concepts and ideas that hospitals and CR programs can implement to improve CR utilization for their patient populations. Each change concept and idea is paired with tools and resources suggested by experts in the field who have successfully used them. See the [acknowledgments and contributors page](#) for content contributors.

Figure 3. Institute for Healthcare Improvement (IHI) Model for Improvement¹⁷



- **Systems Change (Table 1)** offers ways to establish foundations for effective CR utilization efforts and is likely the best place on which to focus initial QI efforts. These include identifying a champion to provide leadership on focused QI efforts and making CR utilization a priority.
- **Referrals (Table 2)** provides approaches aimed at bolstering CR referral. These include using standardized processes, electronic referrals, and health system data to drive improvement.
- **Enrollment and Participation (Table 3)** lists strategies that health systems can use to encourage enrollment and participation in CR. These include various modes of patient education and engagement, and different ways in which CR programs can be modified to better accommodate patient needs and preferences.
- **Adherence (Table 4)** strategies are about understanding patient characteristics that are predictive of program dropout and deploying strategies to encourage adherence.

Given the unique care processes for referral, enrollment, and participation in CR for patients with a qualifying diagnosis of heart failure, an additional table depicting strategies to increase CR participation for this patient population was added in [Appendix A](#).

There are four types of tools showcased in the CRCP:

1. **American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) cardiac rehabilitation systems change, referral, enrollment, or adherence “turnkey” strategies**—high-level summaries with concise guidance to aid implementation of programmatic strategies.
2. **Case studies**—detailed examinations of how a specific CR program was able to make a given change. They include motivation for program changes, timeline, staffing, facilitators and barriers, and supplemental materials.
3. **Program-specific tools**—tangible resources that have been implemented by CR programs or researchers that can be adopted as is or adapted to meet other programs’ needs.
4. **Organization-specific tools**—resources from clinical and public health organizations that support cardiac rehabilitation.

The tools contained in the CRCP have been used in the field over the past several years to systematize and improve CR utilization. Consequently, some clinical details in the tools may reflect treatment and management decisions that do not apply to or differ from your setting. However, these tools can be adapted by filtering in the evidence, practices, and characteristics that are unique to your patient population. Because the science behind CR utilization continues to evolve, the CRCP will be periodically updated.

This second edition uses the notation **(New)** to identify new tools added to those from the first (2018) edition. The second edition also identifies tools or resources that may be adapted to increase participation in SET **(SET)** and that address the characteristics of equitable quality care **(HQE)**.

To support the CR paradigm shift, this second edition includes new change concepts, change ideas, and tools and resources that reflect the latest evidence and experience of hospitals, CR programs, and national organizations and quality improvement organizations. Specifically, the second edition of the CRCP includes new content to help users:

- Make the business case for CR.
- Establish innovative CR program staffing models for optimal staff retention, recruitment, and diversity.
- Implement automatic referrals with care coordination (largely generated from the [Agency for Healthcare Research and Quality's TAKEheart initiative](#)).
- Improve equity in CR referral, enrollment, and participation.
- Develop and implement hybrid CR programs.

Once you have selected a change idea to implement, work through a [Plan-Do-Study-Act \(PDSA\) cycle](#) with a small number of patients (i.e., a “small test of change”) to test the change idea in your clinical setting.

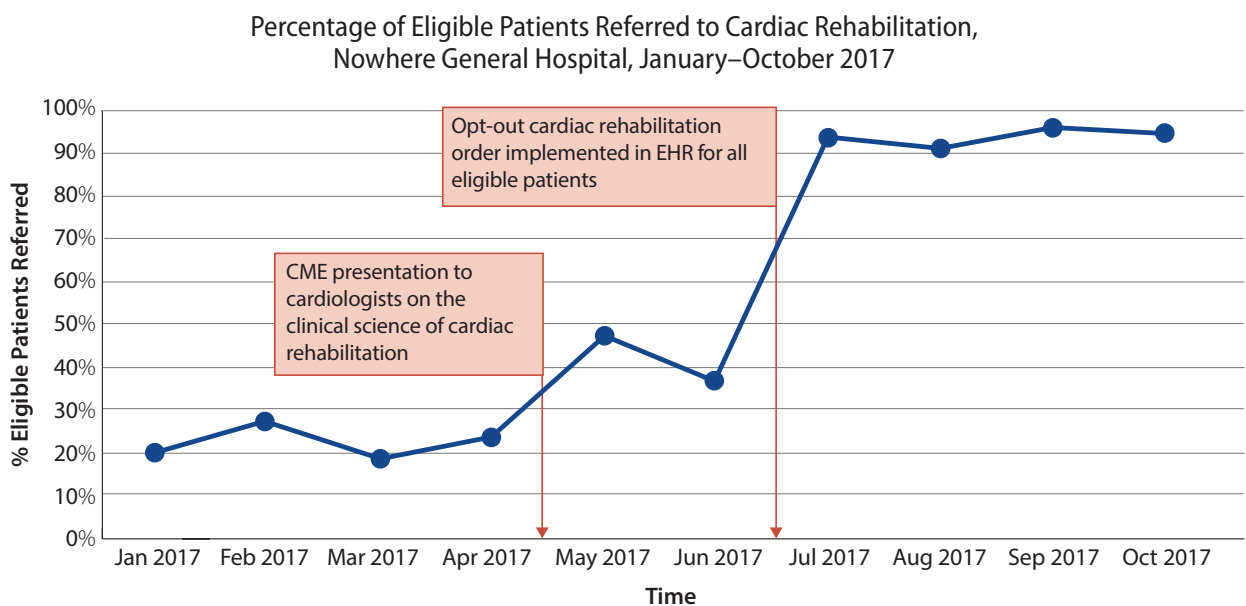
How Do I Measure Quality Improvement Efforts?

It is essential to monitor and measure QI efforts—both outcomes and processes. Overall outcomes such as improved CR enrollment rates or the percentage of patients who improve their functional capacity by 40% or more are important to measure, but it is also important

to monitor process measures, such as the percentage of eligible patients who are seen by a CR liaison while in the hospital. This type of data can provide much-needed feedback on whether the interventions you are using are successful. Begin by collecting baseline data on a process that you are interested in improving. Then test your “change ideas” on a pilot scale using a small number of patients and discuss identified potential barriers to implementation with clinical staff. These small tests of change can be used to assess the success of implementing an intervention and allow staff to make needed refinements prior to scaling up the project to a larger level.

A helpful tool for displaying and monitoring efforts over time is a [run chart](#), a graph that displays performance on a given process or outcome longitudinally. It can be useful to chart performance over time to inform decision makers and other stakeholders of the reasons recommended changes are needed. You can then document when specific changes were made to show the impact that implemented changes yielded on performance ([Figure 4](#)). See [Appendix B](#) for additional QI tools and resources.

Figure 4. Example of a Run Chart





Change Concepts, Change Ideas, and Tools and Resources

Bold font indicates CR programs in the United States that contributed content to Tables 1–4.

Table 1. Systems Change		
Change Concept	Change Ideas	Tools and Resources
Make CR a Health System Priority	Establish a hospital champion, such as a quality-of-care leader or a CR administrator	<ul style="list-style-type: none"> • Lake Regional Health System—<u>Cardiopulmonary Rehabilitation: Presentation for Board of Trustees</u> • Liverpool Hospital—<u>Clinical Champions</u> • AACVPR—<u>Vital Conversations with Medical Providers & Hospital Administrators About Cardiac Rehabilitation Services Delivering Value Based Care</u>
	Engage hospital administrators and senior staff in optimizing CR delivery	<ul style="list-style-type: none"> • TAKEheart—<u>Consolidated Curriculum for Getting Started</u> ^{New} • Wellstar Center for Cardiovascular Care—<u>How to Advocate for Your Program: Administration (slides)</u> ^{New} • Wellstar Center for Cardiovascular Care—<u>How to Advocate for Your Program (recording)</u> ^{New} • Million Hearts® 2027—<u>Getting to 70% Cardiac Rehabilitation Participation: Action Steps for Clinicians, Hospitals, and Health Systems</u> ^{New} • Million Hearts®—<u>CR is Underused Infographic</u> ^{New} • Million Hearts®—<u>Cardiac Rehabilitation 101: Needs and Opportunities to Address Disparities</u> (Passcode: lfbf92w\$) ^{New}
	Secure and sustain a sufficient and multidisciplinary CR workforce	<ul style="list-style-type: none"> • Clinical Exercise Physiology Association—<u>Clinical Exercise Physiologist Compensation Strategies: Recommendations by the Clinical Exercise Physiology Association</u> ^{New SET} • <i>Case Study: Froedtert Health Community Memorial Hospital—<u>Recruitment and Retention of Clinical Exercise Physiologists</u></i> ^{New SET} • <i>Case Study: MacNeal Hospital—<u>Cardiac Rehabilitation Internship Program</u></i> ^{New SET} • TAKEheart Affinity Group—<u>Coping with Staffing Challenges in Today's Cardiac Rehabilitation Programs</u> ^{New SET}

(^{New})=New tools added to the CRCP 2nd edition. (^{SET})=Tools/resources that may be adapted to increase participation in SET.

(^{HE})=Addresses the characteristics of equitable quality care.



Change Concepts, Change Ideas, and Tools and Resources (continued)

Bold font indicates CR programs that contributed content to Tables 1–4.

Table 1. Systems Change (continued)		
Change Concept	Change Ideas	Tools and Resources
Make CR a Health System Priority (continued)	Engage the care team in CR and ensure their support for CR	<ul style="list-style-type: none"> • TAKEheart Training—Module 3: Systems Change: Understanding Your Workflow Processes to Prepare for System Change ^{New} • AACVPR—Vital Conversations with Medical Providers & Hospital Administrators About Cardiac Rehabilitation Services Delivering Value Based Care • Lake Regional Health System—Cardiopulmonary Rehabilitation – Update to Department Managers
	Use CR referral, enrollment, and participation as quality-of-care indicators	<ul style="list-style-type: none"> • AACVPR—The Pulse Pod: The Importance of Performance Measures with Dr. Quinn Pack ^{New} • 2018 ACC/AHA Clinical Performance and Quality Measure for Cardiac Rehabilitation. Thomas RJ, et al., 2018¹⁸ • AACVPR Cardiac Rehabilitation Systems Change Strategy—Using Cardiac Rehabilitation Referral Performance Measures in a Quality Improvement System • AACVPR—Sample Performance Measures Letter for Physicians and Providers • Michigan Cardiac Rehab Network—Sample Blinded Hospital Report Cardiac Rehab Performance ^{New} • Million Hearts®—Outpatient Cardiac Rehabilitation Use Surveillance Methodology ^{New} • Cardiac Rehabilitation: A New HEDIS Measure for Heart Health ^{New} • Centers for Disease Control and Prevention—How to Access Cardiac Rehabilitation Data Using the CDC Interactive Atlas of Heart Disease and Stroke ^{New}

(^{New})=New tools added to the CRCP 2nd edition. (^{SET})=Tools/resources that may be adapted to increase participation in SET.

(^{HE})=Addresses the characteristics of equitable quality care.



The CRCP served as a roadmap for our team as we worked through the quality improvement process. Our goal was to increase the number of eligible patients that enrolled in our CR program and the CRCP helped us develop an action plan to achieve that goal. Using the tools and resources provided in the CRCP, we were able to implement strategies from each of the different focus areas. The changes that we made resulted in both greater participation in CR by eligible patients and improved patient satisfaction scores.”

— Kathe Briggs, MS, ACSM-CEP, FAACVPR
 Manager, Cardiac & Pulmonary Rehabilitation
 East Alabama Medical Center
 Opelika, AL



Table 2. Referrals		
Change Concepts	Change Ideas	Tools and Resources
Incorporate Referral to CR Into Hospital Standardized Processes of Care for Eligible Patients	Support the verbal recommendation of CR to eligible patients by the referring clinician	<ul style="list-style-type: none"> KITE-Toronto Rehabilitation Institute, University Health Network—Cardiac Rehabilitation Referral Promotion Scripts for Referring Clinicians and Referral Liaisons New SET HE KITE-Toronto Rehabilitation Institute, University Health Network—Patient Cardiac Rehabilitation Conversation Documentation Form New
	Include referral to CR in order sets for appropriate patients; incorporate into EHR as appropriate	<ul style="list-style-type: none"> TAKEheart—Consolidated Curriculum - Implementation Guide for Automatic Referral New TAKEheart Training—Module 5: Building and Implementing a Successful Automatic Referral System New TAKEheart Training—Module 7: Troubleshooting Your Automatic Referral System New <i>Case Study: Lifespan Cardiovascular Institute—Improving Inpatient Cardiac Rehabilitation Referrals for Patients Receiving a PCI</i> New Henry Ford Health System—EMR Discharge Order Set, 'Opt Out' Cardiac Rehabilitation Referral Screenshot Template AMI Orders. Pages 24B–25B, Montoye CK, et al., 2005¹⁹
	Include referral to CR in discharge checklists for appropriate patients; incorporate into EHR as appropriate	<ul style="list-style-type: none"> Multidisciplinary Cardiac Discharge Checklist/Instructions. Page 1409, Thomas RJ, et al., 2007²⁰
	Include referral to CR in appropriate patient discharge forms; incorporate into EHR as appropriate	<ul style="list-style-type: none"> <i>Case Study: ECU Health Medical Center—Inclusion of the Cardiac Rehabilitation Referral within the Patient's After Visit Summary (AVS)/ Discharge Paperwork</i> New Heart Attack Discharge Form. Page 29B, Montoye CK, et al., 2005¹⁹
	Develop a standard process for informing an external CR program of a referred patient	<ul style="list-style-type: none"> <i>Case Study: Massachusetts General Hospital—Referral of Patient to External Cardiac Rehabilitation Program</i> SET Centers for Disease Control and Prevention—How to Access Cardiac Rehabilitation Data Using the CDC Interactive Atlas of Heart Disease and Stroke New AACVPR—Program Directory <i>Case Study: IPRO QIN-QIO—Developing and Maintaining A List of Local Cardiac Rehabilitation Programs</i> New SET IPRO QIN-QIO Resource Library—Cardiac Rehabilitation Programs – New England, New York, New Jersey, Ohio & Mid Atlantic Regions Massachusetts General Hospital—Fax Cover Sheet for External Cardiac Rehabilitation Referrals SET Massachusetts General Hospital—Cardiac Rehabilitation Referral Form SET

New = New tools added to the CRCP 2nd edition. (SET) = Tools/resources that may be adapted to increase participation in SET. (HE) = Addresses the characteristics of equitable quality care.



Table 2. Referrals (continued)

Change Concepts	Change Ideas	Tools and Resources
<p>Incorporate Referral to CR Into Hospital Standardized Processes of Care for Eligible Patients (continued)</p>	<p>Develop a standard process for eligible patients to self-refer to CR</p>	<ul style="list-style-type: none"> • <i>Case Study: Massachusetts General Hospital—Process for Patient Self-Referral to Cardiac Rehabilitation</i> • <i>Massachusetts General Hospital—Fax Cover Sheet for Cardiac Rehabilitation Patient Self-Referral</i> • <i>Massachusetts General Hospital—Cardiac Rehabilitation Physician Referral for Patients who Self Refer</i> • <i>Case Study: ECU Health Medical Center—Inclusion of the Cardiac Rehabilitation Referral within the Patient’s After Visit Summary (AVS)/ Discharge Paperwork</i> New
<p>Standardize the CR Referral Process</p>	<p>Develop and communicate a standardized referral process or policy for patients</p>	<ul style="list-style-type: none"> • <i>Case Study: Emory Healthcare—Multidisciplinary-Developed Cardiac Rehabilitation Referral</i> • <i>Emory Healthcare—Cardiac Rehabilitation Electronic Referral Process and Communication Tool Presentation</i> • <i>Case Study: Penn Medicine—A Systematic Approach to Increasing Cardiac Rehabilitation Referrals</i> • <i>Penn Medicine—Cardiac ICU CR Referral Process</i> • <i>Lake Regional Health System—Referral Process Map</i> • <i>Lake Regional Health System—Physician Referral/Order Policy</i> • <i>Lake Regional Health System—Admission Guidelines, Cardiac Rehabilitation</i> SET • <i>Case Study: Lifespan Cardiovascular Institute—Improving Inpatient Cardiac Rehabilitation Referrals for Patients Receiving a PCI</i> New • <i>Lifespan Cardiovascular Institute—EPIC Tip Sheet for Ordering Cardiac Rehab</i> New SET • KITE-Toronto Rehabilitation Institute, University Health Network—<i>Inpatient Motivational Letter</i> New
	<p>Develop and communicate a standardized outpatient CR referral process or policy for patients discharged to inpatient acute or subacute rehabilitation or to home care services</p>	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Referral Strategy—<i>Bridging the Rehabilitation Care Continuum: Spotlight on NYU Langone Health</i>
	<p>Implement standardized paper/faxed referral to CR from an inpatient setting</p>	<ul style="list-style-type: none"> • <i>Massachusetts General Hospital—Cardiac Rehabilitation Referral Form</i> SET • <i>Beth Israel Deaconess Hospital, Milton—Cardiac Rehabilitation Physician Referral Form</i> SET • <i>Referral Order to an Early Outpatient Cardiac Rehabilitation/Secondary Prevention Program: From an Inpatient Setting.</i> Page 1407, Thomas RJ, et al., 2007²⁰

New =New tools added to the CRCP 2nd edition. (SET)=Tools/resources that may be adapted to increase participation in SET.

HE)=Addresses the characteristics of equitable quality care.



Table 2. Referrals (continued)

Change Concepts	Change Ideas	Tools and Resources
Standardize the CR Referral Process (continued)	Implement standardized paper/faxed referrals to CR from an outpatient setting	<ul style="list-style-type: none"> • Referral Order to an Early Outpatient Cardiac Rehabilitation/Secondary Prevention Program: From an Outpatient Setting. Page 1408, Thomas RJ, et al., 2007²⁰
	Use inpatient EHR tools to automate referrals to CR for all eligible patients including default or “opt-out” orders for patients with qualifying diagnoses	<ul style="list-style-type: none"> • TAKEheart Training—Module 5: Building and Implementing a Successful Automatic Referral System ^{New} • TAKEheart Training—Module 7: Troubleshooting Your Automatic Referral System ^{New} • Emory Healthcare—Cardiac Rehabilitation Electronic Referral Process and Communication Tool Presentation (slides 3–8) • Massachusetts General Hospital—EHR Automatic Referral Screenshots • Henry Ford Health System—EMR Discharge Order Set, ‘Opt Out’ Cardiac Rehabilitation Referral Screenshot • Figure 1: eReferral Screenshot from Electronic Discharge Summary. Page 3, Ali-Faisal SF, et al., 2016²¹ • Essentia Health—Epic EMR inpatient cardiac rehab order ^{New} • Essentia Health—Pre-checked Epic EMR order sets post-procedure ^{New} • Lifespan Cardiovascular Institute—Best Practice Alert for Inpatient Referral to Cardiac Rehab ^{New}
	Use outpatient EHR tools to automate referrals for patients with qualifying diagnoses who have not participated in CR	<ul style="list-style-type: none"> • Massachusetts General Hospital—Outpatient Order to Cardiac Rehabilitation EHR Screenshot • Essentia Health—Epic EMR outpatient cardiac rehab order ^{New}
Use Data to Drive Improvement in Referrals to CR	Determine inpatient referral metrics to CR	<ul style="list-style-type: none"> • Performance Measure 1. Cardiac Rehabilitation Patient Referral From an Inpatient Setting. Page 1825, Thomas RJ, et al., 2018¹⁸ • Performance Measure 2. Exercise Training Referral for HFrEF From Inpatient Setting. Page 1827, Thomas RJ, et al., 2018¹⁸ • AACVPR—Introduction to Cardiac Rehabilitation Performance Measures • AACVPR—Example Application of Cardiac Rehabilitation Performance Measures

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Table 2. Referrals (continued)

Change Concepts	Change Ideas	Tools and Resources
<p>Use Data to Drive Improvement in Referrals to CR (continued)</p>	<p>Determine outpatient referral metrics to CR</p>	<ul style="list-style-type: none"> • Performance Measure 3. Cardiac Rehabilitation Patient Referral From an Outpatient Setting. Page 1828, Thomas RJ, et al., 2018¹⁸ • Performance Measure 4. Exercise Training Referral for HFrEF From Outpatient Setting. Page 1830, Thomas RJ, et al., 2018¹⁸ • AACVPR—Introduction to Cardiac Rehabilitation Performance Measures • AACVPR—Example Application of Cardiac Rehabilitation Performance Measures
	<p>Use CR referral performance measures in a quality improvement system</p>	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Referral Strategy—Using Cardiac Rehabilitation Referral Performance Measures in a Quality Improvement System • Figure: Cardiac Rehabilitation Referral Rates by Site and Time. Page 2, Adusumalli S, et al., 2021²² New • Essentia Health—Cardiac Rehab at Essentia Health New
	<p>Regularly provide a dashboard with CR referral metrics, goals, and performance</p>	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Referral Strategy—Using Clinical Data Registries to Access Cardiac Rehabilitation Referral Data • Case Study: Lifespan Cardiovascular Institute—Improving Inpatient Cardiac Rehabilitation Referrals for Patients Receiving a PCI New • Lifespan Cardiovascular Institute—Improving Inpatient PCI Referral Rates: A Roadmap to Improving the NCDR CathPCI Registry Referral to Cardiac Rehab Quality Metric New • Lake Regional Health System—Percent of Patients Referred to CR by Physician
	<p>Implement a CR registry to identify, track, and manage patients who are referred to a CR program</p>	<ul style="list-style-type: none"> • Penn Medicine—Dashboard of Patients with Qualifying Diagnoses to Track Who Was Eligible, Ineligible, Referred, and Declined Services • Emory Healthcare—Cardiac Rehabilitation Electronic Referral Process and Communication Tool Presentation (slides 9–11) • AACVPR—Inpatient Tracking Form
	<p>Identify patients who had a cardiac event without a referral to a CR program</p>	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Referral Strategy—Using Clinical Data Registries to Access Cardiac Rehabilitation Referral Data • Penn Medicine—Dashboard of Patients with Qualifying Diagnoses to Track Who Was Eligible, Ineligible, Referred, and Declined Services

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Table 3. Enrollment and Participation

Change Concepts	Change Ideas	Tools and Resources
Optimize CR Care Coordination	Develop the infrastructure for deploying inpatient CR “liaisons”	<ul style="list-style-type: none"> • TAKEheart Training—Module 6: Laying the Groundwork for Care Coordination ^{New} • <i>Case Study</i>: IPRO QIN-QIO—Developing and Maintaining a List of Local Cardiac Rehabilitation Programs ^{New} ^{SET} • AACVPR Cardiac Rehabilitation Enrollment Strategy—Inpatient Liaison for Outpatient Cardiac Rehabilitation • <i>Case Study</i>: Memorial Hospital of Carbondale—Phase I Cardiac Rehabilitation • Memorial Hospital of Carbondale—Welcome to Phase I Cardiac Rehab • Lake Regional Health System—Cardiopulmonary Rehabilitation Center: Phase 1 Program Guideline for Inpatient Educators
	Train inpatient “liaisons”	<ul style="list-style-type: none"> • TAKEheart—Consolidated Curriculum for Enhancing Care Coordination: Implementation Guide ^{New} • TAKEheart—Module 8: Implementing Effective Care Coordination ^{New} • International Council of Cardiovascular Prevention and Rehabilitation (ICCP)R—Implementing Automatic/Systematic Cardiac Rehab Referral with Bedside Encouragement for Enrolment ^{New} • KITE-Toronto Rehabilitation Institute, University Health Network—Cardiac Rehabilitation Referral Promotion Scripts for Referring Clinicians and Referral Liaisons ^{New} ^{SET} ^{HE} • KITE-Toronto Rehabilitation Institute, University Health Network—Patient Cardiac Rehabilitation Conversation Documentation Form ^{New}
	Identify patients’ social needs for optimal CR participation	<ul style="list-style-type: none"> • National Association of Community Health Centers—PRAPARE Screening Tool ^{New} ^{SET} ^{HE} • Oregon Primary Care Association—The Patient Support Questionnaire (English and Spanish) ^{New} ^{SET} ^{HE} • Oregon Primary Care Association—Patient-Centered Social Needs Screening Conversation Guide ^{New} • American Hospital Association—Screening for Social Needs: Guiding Care Teams to Engage Patients ^{New} ^{SET} ^{HE}
	Engage patients’ families and/or advocates	<ul style="list-style-type: none"> • TAKEheart Training—Module 9: Engaging and Empowering Patients and Families for Success in Cardiac Rehabilitation ^{New} ^{SET}

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Table 3. Enrollment and Participation (continued)

Change Concepts	Change Ideas	Tools and Resources
<p>Educate Patients About the Benefits of Outpatient CR</p>	<p>Promote CR to eligible patients and their families</p>	<ul style="list-style-type: none"> • Million Hearts® Cardiac Rehabilitation Communications Toolkit ^{New} • American College of Cardiology—CardioSmart Cardiac Rehabilitation Infographic ^{New} • Michigan Cardiac Rehab Network—Cardiac Rehabilitation: What to Know ^{New} • University of California, San Francisco—Cardiac Rehabilitation and Wellness Center ^{New} • Quality Insights—Million Hearts® Cardiac Rehabilitation Collaborative YouTube Playlist ^{New}
	<p>Use videos to describe your CR program and the impact of CR on health outcomes before hospital discharge or at the beginning of outpatient CR</p>	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Enrollment Strategy—Use of Video • University of California, San Francisco—Cardiac Rehabilitation and Wellness Center ^{New} • Johns Hopkins Medicine—Cardiac Rehab at Johns Hopkins Medicine ^{New} • Quality Insights—Million Hearts® Cardiac Rehabilitation Collaborative YouTube Playlist ^{New}
	<p>Provide patient education materials that convey CR benefits</p>	<ul style="list-style-type: none"> • Mayo Clinic—Cardiovascular Rehabilitation Program • American Heart Association—What is Cardiac Rehabilitation? • AACVPR—2016 Cardiac Rehabilitation Fact Sheet: Cardiac Rehabilitation – An Individualized Supervised Program for You • MedLine Plus—Rehabilitaci3n cardíaca (Spanish) ^{New} • American College of Cardiology—CardioSmart Cardiac Rehabilitation Infographic ^{New}
<p>Reduce Delay From Discharge to First CR Appointment</p>	<p>Before hospital discharge establish an early (within 12 days of discharge) outpatient follow-up appointment</p>	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Enrollment Strategy—Reducing the Delay Between Hospital Discharge and Enrollment into Cardiac Rehabilitation • Baystate Medical Center—Cardiovascular Rehabilitation and Wellness: Admission, Orders and Enrollment Policy and Procedure
	<p>Coordinate handoffs for patients with deferred CR enrollment</p>	<ul style="list-style-type: none"> • <i>Case Study: Holland Hospital</i>—Referral Handoff for Deferred Cardiac Rehabilitation Enrollment: A Process for Better Continuity of Care ^{New}

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Table 3. Enrollment and Participation (continued)

Change Concepts	Change Ideas	Tools and Resources
<p>Use Data to Drive Improvement in CR Enrollment or Participation</p>	<p>Determine CR enrollment or participation metrics</p>	<ul style="list-style-type: none"> • Performance Measure 5A. Enrollment (Claims-Based). Page 1831, Thomas RJ, et al., 2018¹⁸ • Performance Measure 5B. Enrollment (Medical Records and/or Databases/Registries). Page 1832, Thomas RJ, et al., 2018¹⁸ • AACVPR Program Certification—Performance Measure for Enrollment in Cardiac Rehabilitation New • Million Hearts®—Outpatient Cardiac Rehabilitation Use Surveillance Methodology New • Cardiac Rehabilitation: A New HEDIS Measure for Heart Health New • Centers for Disease Control and Prevention—How to Access Cardiac Rehabilitation Data Using the CDC Interactive Atlas of Heart Disease and Stroke New • Quality Measure 1. Time to Enrollment. Page 1833, Thomas RJ, et al., 2018¹⁸ • Cardiac Rehabilitation Wait Time from Referral to Enrollment. Page 6, The Canadian Cardiovascular Society Quality Indicators for Cardiac Rehabilitation and Secondary Prevention, 2013²³
	<p>Regularly provide a dashboard with CR enrollment or participation metrics, goals, and performance</p>	<ul style="list-style-type: none"> • Lake Regional Health System—CR Enrollment Rate • Lake Regional Health System—Enrolled Participants by Diagnosis • AACVPR—Sample Spreadsheet for Enrollment Rates of Cardiac Rehabilitation • Michigan Cardiac Rehab Network—Sample Blinded Hospital Report Cardiac Rehab Performance New
<p>Improve Efficiency of Enrollment</p>	<p>Incorporate group orientations</p>	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Enrollment Strategy—Cardiac Rehabilitation Pre-Enrollment Group Screening • <i>Case Study: Genesis Health System—Group Orientation</i> • Genesis Health System—Phase II/III/IV Admission, Orientation, and Discharge Policy • Genesis Health System—Group Orientation Process Flowsheet • Genesis Health System—“Using Group Orientations for Cardiac Rehabilitation” PowerPoint • Genesis Health System—“Group Orientations” PowerPoint for Patients • <i>Case Study: Rochester Regional—Group Orientation</i> • <i>Case Study: University of Alabama at Birmingham—Increase Enrollment and Session Adherence</i>

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Table 3. Enrollment and Participation (continued)

Change Concepts	Change Ideas	Tools and Resources
Develop Flexible Delivery Models That Better Accommodate Patient Needs	Offer accelerated CR programs	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Enrollment Strategy—Accelerated Use of CR
	Modify program structure and hours of operation to match patient preferences to accommodate more patients	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Enrollment Strategy—Cardiac Rehabilitation Timeline and Program Structure – Spotlight on Mount Carmel Health System • <i>Case Study: University of California, San Francisco</i>—Strength Training Exercise Station and Worksheet <small>New</small>
	Shift from a class structure to an open gym model	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Enrollment Strategy—Matching Capacity to Demand: Open Gym <small>SET</small> • <i>Case Study: Southwest Florida Heart Group</i>—Open Gym Concept • <i>Case Study: Mount Carmel Health System</i>—Cardiac Rehab Open Gym
	Provide case management or patient support services	<ul style="list-style-type: none"> • <i>Case Study: University of Vermont</i>—Case Management to Improve Cardiac Rehabilitation Participation <small>New HE</small> • <i>Case Study: Indiana University Health</i>—Utilization of Hybrid Cardiopulmonary Rehabilitation in Coordination with Integrated Mobile Healthcare/Community Paramedicine <small>New HE</small>
Offer Hybrid CR Programs	Make the case for offering hybrid CR	<ul style="list-style-type: none"> • TAKEheart Training—Module 10: Options to Expand System Capacity and Patient Centeredness <small>New</small> • ACC CardiaCast: The Dynamic State of Cardiac Rehabilitation: New Models of Care that Respond to Contemporary Healthcare Challenges <small>New</small>
	Design and develop work processes to deliver hybrid CR	<ul style="list-style-type: none"> • A Review of the Design and Implementation of a Hybrid Cardiac Rehabilitation Program. Keteyian SJ, et al., 2022 ²⁴ <small>New</small> • TAKEheart—Consolidated Curriculum for Implementing Hybrid Cardiac Rehabilitation To Expand Access and Capacity <small>New</small> • TAKEheart Hybrid CR Video <small>New</small> • University of California, San Francisco—Cardiac Rehab Toolkit <small>New</small> • Million Hearts®—New Care Models in Cardiac Rehabilitation (Passcode: i?bHDC5C) <small>New</small> • University of California, San Francisco—Cardiac Rehab at UCSF <small>New</small>
	Identify which patients may be most appropriate for hybrid CR	<ul style="list-style-type: none"> • 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. Thomas RJ, et al 2019 ²⁵ <small>New</small> • University of California, San Francisco—Cardiac Rehabilitation Model Matrix <small>New</small>

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Table 3. Enrollment and Participation (continued)

Change Concepts	Change Ideas	Tools and Resources
Offer Hybrid CR Programs (continued)	Establish an approach to bill for hybrid CR	<ul style="list-style-type: none"> • Henry Ford Health System—Securing Reimbursement for Home-based Cardiac Rehab
	Offer self-administered educational programs to supplement CR participation	<ul style="list-style-type: none"> • Henry Ford Health System—Home/Community-Based Cardiac Rehabilitation (HBCR) Program • Health e-University (UHN Toronto Rehabilitation Institute)—Cardiac College ^{New}
Modify Some Program Procedures Based on Clinical Need	Match frequency and/or use of ECG telemetry monitoring to clinical need	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Enrollment Strategy—ECG Monitoring Based on Clinical Need • <i>Case Study: Henry Ford Health System</i>—ECG Monitoring Based on Clinical Need
	Improve operational efficiency with BP management	<ul style="list-style-type: none"> • <i>Case Study: NYU Langone Health</i>—A Value-based management approach to efficient blood pressure monitoring during outpatient cardiac rehabilitation (with BP flow chart)
Use Clinician Follow-Up to Bolster Enrollment or Participation	Engage referring clinicians by providing letters that highlight non-enrolled patients for clinician follow-up	<ul style="list-style-type: none"> • <i>Case Study: Christiana Care Health System</i>—Provider Follow Up ^{SET} • AACVPR—Sample of Cardiac Rehabilitation/Secondary Prevention Non-Enrollment Letter Sent to Cardiologist ^{SET}
	Engage referring clinicians by providing progress reports and completion of program outcomes	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Enrollment Strategy—Sample Progress Report ^{SET} • AACVPR Cardiac Rehabilitation Enrollment Strategy—Sample Outcomes Report ^{SET}

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We have leveraged many ideas from the cardiac rehab change package to improve referrals from the inpatient setting. We have enacted systems change by creating a team of professionals from all areas of the health system who have the potential to touch a CR referral, including cardiology directors, cardiac rehab and invasive cardiology managers, a medical director, and an office manager as well as the quality department, hospital advance practice providers, cardiologists, data abstractors and Information Services technicians. When everyone had an equal seat at the table, we were able to...benchmark, track our progress, and eliminate barriers to referral. This resulted in referral rates increasing from 12% to 69% within one year."

— Julianne DeAngelis, MS, CCRP, CEP, FAACVPR
 Program Manager, Cardiac, Pulmonary and Vascular Rehabilitation
 Miriam Hospital, Cranston, RI



Table 4. Adherence*

Change Concepts	Change Ideas	Tools and Resources
<p>Identify Populations At Risk for Low Engagement</p>	<p>Know the characteristics that are predictive of attendance and dropout to identify patients at particular risk to offer extra support</p>	<ul style="list-style-type: none"> • <i>Case Study: University of Alabama at Birmingham—Increase Enrollment and Session Adherence</i> New • <i>Case Schedule: University of Alabama at Birmingham—Cardiopulmonary Rehabilitation</i> New • <i>Case Study: Baystate Medical Center—Apply a Simple Clinical Tool to Predict Early Dropout in Cardiac Rehabilitation</i> New • Appendix A: Semistructured Telephone Script. La Valley G, et al., 2019²⁶ New SET • Centers for Disease Control and Prevention—How to Access Cardiac Rehabilitation Data Using the CDC Interactive Atlas of Heart Disease and Stroke New
<p>Address Patient Barriers</p>	<p>Address the patient's social needs related to CR participation</p>	<ul style="list-style-type: none"> • findhelp.org New SET HE • Eldercare Locator New SET HE • Working Effectively with an Interpreter New SET HE
	<p>Offer transportation support</p>	<ul style="list-style-type: none"> • Michigan Cardiac Rehab Network—Eliminating Transportation as a Barrier to Participation New SET HE • Centers for Medicare & Medicaid Services—Non-Emergency Medical Transportation New • AARP—Mobility Managers: Transportation Coordinators for Older Adults, People with Disabilities, Veterans, and Other Members of the Riding Public New
	<p>Offer gender-tailored CR sessions</p>	<ul style="list-style-type: none"> • <i>Case Study: Lifespan Cardiovascular Institute—Impact of Women-Only Cardiac Rehabilitation on Adherence</i> New HE • Women-Focused Cardiovascular Rehabilitation: An International Council of Cardiovascular Prevention and Rehabilitation Clinical Practice Guideline. Ghisi GLM, et al., 2022²⁷ New HE
	<p>Assist patients with high out-of-pocket costs or economic burden</p>	<ul style="list-style-type: none"> • AACVPR—Cardiac Rehab Pre-Authorization Template New SET HE • <i>Case Study: Christiana Care Health System—Navigating Payment Options</i> New SET HE • <i>Case Study: University Hospital—Applying Charity Care</i> New SET HE • <i>Case Study: Holland Hospital—Using State-Based Vocational Rehabilitation Programs for Co-Pay Assistance</i> New SET HE
	<p>Establish a philanthropic fund to partly underwrite CR costs for patients with high co-payments or without insurance</p>	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Enrollment Strategy—Establish a Philanthropic Fund: Spotlight on Henry Ford Health System New SET HE

New =New tools added to the CRCP 2nd edition. SET =Tools/resources that may be adapted to increase participation in SET.

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Table 4. Adherence* (continued)

Change Concepts	Change Ideas	Tools and Resources
Improve Patient Engagement	Incorporate motivational and financial incentives for meeting goals for session attendance	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Adherence Strategy—Incorporating Motivational and Financial Incentives SET • <i>Case Study: University of Vermont Medical Center—Financial Incentives to Improve CR Attendance Among Medicaid Enrollees</i>
	Automate reminders and communication for CR sessions	<ul style="list-style-type: none"> • AACVPR Cardiac Rehabilitation Adherence Strategy—Use of Text Messaging and Mobile Applications • <i>Case Study: Intermountain Health - St. Vincent Healthcare—Patient Outreach to Reduce the Number of No Shows</i> New SET • Figure 1: A dashboard of the Wellframe application on the computer screen and the smartphone interface is shown. Page 4, Imran, TF, et al., 2021 ²⁸ New
	Connect enrolled patients with a CR graduate patient ambassador or “sponsor”	<ul style="list-style-type: none"> • <i>Case Study: Lifespan Cardiovascular Institute—Patient Ambassador Program</i> SET • Lifespan Cardiovascular Institute—Patient Ambassador Program Guidelines • Lifespan Cardiovascular Institute—Patient Ambassador Program Invitation Flyer • Lifespan Cardiovascular Institute—Patient Ambassador Profile Sheet • Lifespan Cardiovascular Institute—Patient Ambassador Program Welcome Packet • Lifespan Cardiovascular Institute—Patient Ambassador Program Letter of Thanks • Lifespan Cardiovascular Institute—Patient Ambassador Program Evaluation Survey

* If you would like more information about addressing specific factors that influence adherence, such as nutrition education, psychosocial counseling, and self-management approaches, please visit the AACVPR website: <https://www.aacvpr.org>.

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Appendix A: Strategies to Increase Cardiac Rehabilitation Participation Among Patients with Heart Failure

In 2014, CMS extended coverage of CR for fee-for-service Medicare beneficiaries with chronic stable heart failure with reduced ejection fraction.²⁹ New guidelines for management of chronic heart failure released in 2022 reinforce the recommendation for exercise training and cardiac rehabilitation to improve functional status and capacity,

exercise performance and tolerance, and quality of life.³⁰ Unfortunately, patients with heart failure who are eligible to participate in CR have the lowest participation rate compared with patients with other diagnostic or procedural qualifiers.¹¹ This table provides tailored strategies to increase CR participation among patients with qualifying heart failure.

Focus Area	Change Ideas	Tools and Resources
Referral	<p>Include language in echo reports that suggests a patient with heart failure with reduced ejection fraction could be eligible for CR (e.g., “This patient’s ejection fraction is less than 35%; consider referral to CR”)</p>	<ul style="list-style-type: none"> • Baystate Medical Center and Northwestern University—Sample Echo Report ^{New}
	<p>Include referral to CR in order sets or discharge checklists for patients with heart failure</p>	<ul style="list-style-type: none"> • Baystate Medical Center—Automatic CR Order for Patients with Heart Failure ^{New}
	<p>Add CR to guideline-directed medical therapy (GDMT) algorithms for patients with heart failure</p>	
	<p>Refer patients with heart failure to ancillary programs or services to facilitate CR enrollment</p>	<ul style="list-style-type: none"> • Strategies for supporting intervention fidelity in the Rehabilitation Therapy in Older Acute Heart Failure Patients (REHAB-HF) trial. Pastva AM, et al., 2021 ³¹ ^{New} • Supplemental File 1. REHAB-HF Intervention Manual of Procedures • Supplemental File 2. REHAB-HF Exercise Guide By Level • Supplemental File 3. REHAB-HF Functional Strengthening Quick Reference Guide • Supplemental File 4. REHAB-HF Intervention Log • Supplemental File 5. REHAB-HF Participant Commitment Agreement • Supplemental File 6. REHAB-HF Outpatient Intervention Missed Visit Form Example • Supplemental File 7. REHAB-HF Home and Proximate Environment Assessment • <i>Case Study: Holland Hospital—Referral Handoff for Deferred Cardiac Rehabilitation Enrollment: A Process for Better Continuity of Care</i> ^{New} • The Grady Heart Failure Program: A Model to Address Health Equity Barriers ^{New} • Mended Hearts—MyHeartVisit® Welcome Home Program ^{New}

(^{New})=New tools added to the CRCP 2nd edition. (^{SET})=Tools/resources that may be adapted to increase participation in SET.

(^{HE})=Addresses the characteristics of equitable quality care.

Focus Area	Change Ideas	Tools and Resources
Enrollment and Participation	Have a CR champion or staff make home visits to referred patients	<ul style="list-style-type: none"> • <i>Case Study: University of Vermont—Case Management to Improve Cardiac Rehabilitation Participation</i> <small>New HE</small> • <i>Case Study: Indiana University Health—Utilization of Hybrid Cardiopulmonary Rehabilitation in Coordination with Integrated Mobile Healthcare/Community Paramedicine</i> <small>New HE</small>
Adherence	Create peer support groups for patients with heart failure in CR	<ul style="list-style-type: none"> • Mended Hearts—MyHeartVisit® Welcome Home Program <small>New</small>

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Appendix B: Additional Quality Improvement Resources

If you are new to continuous quality improvement (QI), there are many useful QI tools that can assist you in your efforts. For example, the Institute for Healthcare Improvement (IHI) provides a number of QI tools that support its Model for Improvement (**Figure 3**). Their **Quality Improvement Essentials Toolkit** is a good primer for those beginning their quality improvement journey. It includes the **Improvement Project Planning Form** to help teams think systematically about their improvement project and the **PDSA Worksheet for Testing Change**, which walks the user through documenting a test of change. These resources may be helpful for planning, assigning responsibilities, and carrying out small tests of change for improving CR utilization.

Another useful QI reference and toolkit is the **Guide to Improving Care Processes and Outcomes**, available from the Health Resources and Services Administration (HRSA), which supports the U.S. health care safety net. This resource includes worksheets, such as the **Clinical Decision Support-enabled Quality**

Improvement Worksheet, for analyzing current workflows and information flows and considering improvements for targets such as increasing CR utilization. The CRCP can help identify promising evidence-based approaches to enhancing care processes to achieve this goal.

Finally, the Healthcare Information and Management Systems Society (HIMSS) publishes a **CDS 5 Rights framework** on improving care delivery and outcomes with clinical decision support (CDS).^{32,33} These guidebooks can help you apply the CDS 5 Rights framework to ensure that all the right people (including patients) get the right information in the right formats via the right channels at the right times to optimize health-related decisions and actions. The guidebooks help health care practices and their partners set up programs that reliably deliver outcome improving CDS interventions. They also provide detailed guidance on how to successfully develop, launch, and monitor such interventions so that all stakeholders benefit.

Acronyms

AACVPR	American Association of Cardiovascular and Pulmonary Rehabilitation
ACC	American College of Cardiology
AHA	American Heart Association
AMI	Acute myocardial infarction
BP	Blood pressure
CDC	Centers for Disease Control and Prevention
CDS	Clinical decision support
CME	Continuing medical education
CMS	Centers for Medicare & Medicaid Services
CR	Cardiac rehabilitation
CRCP	Cardiac Rehabilitation Change Package
ECG	Electrocardiogram
EHR	Electronic health record
EMR	Electronic medical record
GDMT	Guideline-directed medical therapy
HFrEF	Heart failure with reduced ejection fraction
HHS	Department of Health and Human Services
HIMSS	Healthcare Information and Management Systems Society
HRSA	Health Resources and Services Administration
ICU	Intensive care unit
IHI	Institute for Healthcare Improvement
PAD	Peripheral artery disease
PDSA	Plan-Do-Study-Act
QI	Quality improvement
SET	Supervised exercise training

References

- Ades PA, Keteyian SJ, Wright JS, et al. Increasing cardiac rehabilitation participation from 20% to 70%: a road map from the Million Hearts Cardiac Rehabilitation Collaborative. *Mayo Clin Proc.* 2017;92(2):234–242.
- Smith SC Jr, Benjamin EJ, Bonow RO, et al. AHA/ACCF secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease: 2011 update: a guideline from the American Heart Association and American College of Cardiology Foundation endorsed by the World Heart Federation and the Preventive Cardiovascular Nurses Association [published correction appears in *J Am Coll Cardiol.* 2015;65(14):1495]. *J Am Coll Cardiol.* 2011;58(23):2458–2473.
- Fraker TD, Fihn SD, 2002 Chronic Stable Angina Writing Committee, et al. 2007 chronic angina focused update of the ACC/AHA 2002 guidelines for the management of patients with chronic stable angina: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines Writing Group to develop the focused update of the 2002 guidelines for the management of patients with chronic stable angina. *J Am Coll Cardiol.* 2007;50(23):2264–2274.
- Writing Committee Members, Lawton JS, Tamis-Holland JE, Bangalore S, et al. 2021 ACC/AHA/SCAI guideline for coronary artery revascularization: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol.* 2022;79(2):e21–e129.
- Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA guideline for the management of heart failure: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol.* 2022;79(17):1757–1780.
- Sibilitz KL, Berg SK, Tang LH, et al. Exercise-based cardiac rehabilitation for adults after heart valve surgery. *Cochrane Database Syst Rev.* 2016;7(5):CD010876.
- Anderson L, Nguyen TT, Dall CH, et al. Exercise-based cardiac rehabilitation in heart transplant recipients. *Cochrane Database Syst Rev.* 2017;4(4):CD012264.
- Dibben G, Faulkner J, Oldridge N, et al. Exercise-based cardiac rehabilitation for coronary heart disease. *Cochrane Database Syst Rev.* 2021;11(11):CD001800.
- Long L, Mordi IR, Bridges C, et al. Exercise-based cardiac rehabilitation for adults with heart failure. *Cochrane Database Syst Rev.* 2019;1(1):CD003331.
- Medina-Inojosa JR, Grace SL, Supervia M, et al. Dose of cardiac rehabilitation to reduce mortality and morbidity: a population-based study. *J Am Heart Assoc.* 2021;10(20):e021356.
- Keteyian SJ, Jackson SL, Chang A, et al. Tracking cardiac rehabilitation utilization in Medicare beneficiaries: 2017 update. *J Cardiopulm Rehabil Prev.* 2022;42(4):235–245.
- Gerhard-Herman MD, Gornik HL, Barrett C, et al. 2016 AHA/ACC guideline on the management of patients with lower extremity peripheral artery disease: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol.* 2017;69(11):1465–1508.

13. Divakaran S, Carroll BJ, Chen S, et al. Supervised exercise therapy for symptomatic peripheral artery disease among Medicare beneficiaries between 2017 and 2018: participation rates and outcomes. *Circ Cardiovasc Qual Outcomes*. 2021;14(8):e007953.
14. Wall HK, Stolp H, Wright JS, et al. The Million Hearts initiative: catalyzing utilization of cardiac rehabilitation and accelerating implementation of new care models. *J Cardiopulm Rehabil Prev*. 2020;40(5):290–293.
15. Beatty AL, Brown TM, Corbett M, et al. Million Hearts Cardiac Rehabilitation Think Tank: accelerating new care models. *Circ Cardiovasc Qual Outcomes*. 2021;14(10):e008215.
16. Balady GJ, Williams MA, Ades PA, et al. AHA/AACVPR Scientific Statement: Core components of cardiac rehabilitation/secondary prevention programs: 2007 update: a scientific statement from the American Heart Association Exercise, Cardiac Rehabilitation, and Prevention Committee, the Council on Clinical Cardiology; the Councils on Cardiovascular Nursing, Epidemiology and Prevention, and Nutrition, Physical Activity, and Metabolism; and the American Association of Cardiovascular and Pulmonary Rehabilitation. *Circulation*. 2007;115(20):2675–2682.
17. Institute for Healthcare Improvement. The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement. IHI Innovation Series white paper. Boston: IHI; 2003.
18. Thomas RJ, Balady G, Banka G, et al. 2018 ACC/AHA clinical performance and quality measures for cardiac rehabilitation: a report of the American College of Cardiology/American Heart Association Task Force on Performance Measures. *J Am Coll Cardiol*. 2018;71(16):1814–1837.
19. Montoye CK, Eagle KA; Michigan ACC-GAP Investigators; ACC-GAP Steering Committee; American College of Cardiology. An organizational framework for the AMI ACC-GAP Project. *J Am Coll Cardiol*. 2005;46(10 Suppl):1–29.
20. Thomas RJ, King M, Lui K, et al. AACVPR/ACC/AHA 2007 performance measures on cardiac rehabilitation for referral to and delivery of cardiac rehabilitation/secondary prevention services endorsed by the American College of Chest Physicians, American College of Sports Medicine, American Physical Therapy Association, Canadian Association of Cardiac Rehabilitation, European Association for Cardiovascular Prevention and Rehabilitation, Inter-American Heart Foundation, National Association of Clinical Nurse Specialists, Preventive Cardiovascular Nurses Association, and the Society of Thoracic Surgeons. *J Am Coll Cardiol*. 2007;50(14):1400–1433.
21. Ali-Faisal SF, Benz Scott L, Johnston L, Grace SL. Cardiac rehabilitation referral and enrolment across an academic health sciences centre with eReferral and peer navigation: a randomised controlled pilot trial. *BMJ Open*. 2016;6(3):e010214.
22. Adusumalli S, Jolly E, Chokshi NP, et al. Referral rates for cardiac rehabilitation among eligible inpatients after implementation of a default opt-out decision pathway in the electronic medical record. *JAMA Netw Open*. 2021;4(1):e2033472.
23. Canadian Cardiovascular Society. The Canadian Cardiovascular Society Quality Indicators E-Catalogue: Quality Indicators for Cardiac Rehabilitation and Secondary Prevention. 2013. Accessed August 1, 2023. https://ccs.ca/app/uploads/2020/12/Indicator_CR.pdf.

24. Keteyian SJ, Philip AA, Beatty AL, et al. A review of the design and implementation of a hybrid cardiac rehabilitation program: an expanding opportunity for optimizing cardiovascular care. *J Cardiopulm Rehabil Prev*. 2022;42(1):1–9.
25. Thomas RJ, Beatty AL, Beckie TM, 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(1):133–153.
26. LaValley G, Storer A, Szalai H, Farah M, Pack QR. A motivational telephone intervention to reduce early dropouts in cardiac rehabilitation: a feasibility pilot study. *J Cardiopulm Rehabil Prev*. 2019;39(5):318–324.
27. Ghisi GLM, Kin SMR, Price J, et al. Women-focused cardiovascular rehabilitation: an International Council of Cardiovascular Prevention and Rehabilitation clinical practice guideline. *Can J Cardiol*. 2022;38(12):1786–1798.
28. Imran TF, Wang N, Zombeck S, Balady GJ. Mobile technology improves adherence to cardiac rehabilitation: a propensity score-matched study. *J Am Heart Assoc*. 2021;10(15):e020482.
29. Centers for Medicare & Medicaid Services. Decision memo for cardiac rehabilitation (CR) programs—chronic heart failure (CAG-00437N). 2014. Accessed May 18, 2023. <https://www.cms.gov/medicare-coverage-database/view/ncacal-decision-memo.aspx?proposed=N&NCAId=270>.
30. Heidenreich P, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA Guideline for the management of heart failure: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2022;79(17):e263–e421.
31. Pastva AM, Duncan PW, Reeves GR, et al. Strategies for supporting intervention fidelity in the rehabilitation therapy in older acute heart failure patients (REHAB-HF) trial. *Contemp Clin Trials*. 2018;64:118–127.
32. Osheroff JA, Teich JM, Levick D, et al. *Improving Outcomes with Clinical Decision Support: An Implementer's Guide*. 2nd ed. HIMSS; 2012.
33. Osheroff JA, ed. *Improving Medication Use and Outcomes with Clinical Decision Support: A Step-by-Step Guide*. HIMSS; 2009.



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August 2023