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

A MILLION HEARTS® ACTION GUIDE

Cardiac Rehabilitation

CHANGE PACKAGE

HHS CDC

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) 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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Contents

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. While there are some instances of inpatient (Phase 1) CR, the vast majority of CR is delivered in an outpatient (Phase 2) setting and, therefore, is the focus of this publication. 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.[4]
- Chronic heart failure.[5]
- Undergone coronary artery bypass surgery, heart valve replacement or repair, or a heart or heart-lung transplant.[6,7]

Many insurance companies cover CR for the conditions listed above,* but it is necessary to review each patient's individual insurance benefits for CR.

Participation in a CR program can reduce the risk of death from any cause[8,9] and from cardiac causes,[9,10] as well as decrease hospital readmissions.[9,11] CR participation also improves functional status,[11] quality of life,[9–11] and mood.[12]

Participation in a CR program can reduce the risk of death from any cause and from cardiac causes, as well as decrease hospital readmissions. CR participation also improves functional status, quality of life, and mood.

Despite these benefits, enrollment in CR remains low, ranging from 10% to 34% in national analyses,[13–15] with strong state-by-state geographic variations[14,16] and differences by cardiac diagnosis.[14,15,17] Barriers to program enrollment are many, occurring at the health system, policy, program, and patient levels. For example, although CR services are widely covered by public and private health insurance plans, co-payments per session represent a financial obstacle for many patients.

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 one million acute cardiovascular events by 2022, has worked with CR professionals to set a **national goal of 70% participation in CR for eligible patients.**[1] Improving awareness about the value of CR, increasing referral of eligible patients, and reducing system and patient barriers to participation are all critical steps in improving the referral, enrollment, and participation rates in CR programs. More importantly, effective remedies have been identified but are not being widely and systematically implemented.

* In addition, individuals with peripheral arterial disease (PAD) and intermittent claudication benefit from supervised exercise therapy (SET). Although SET for PAD is a separate and distinct service from CR, CR programs are an ideal setting for the delivery of SET.

What Can Be Done?

Because CR is so underutilized, program staff, other health care professionals, and others interested in improving rates of referral, enrollment, and/or participation have a unique opportunity to be change agents for their institutions. Improvement in CR utilization and delivery will require one or more champions to identify needed changes, find solutions, and measure and share progress. Multiple champions are likely needed since referral, enrollment, and participation often involve many:

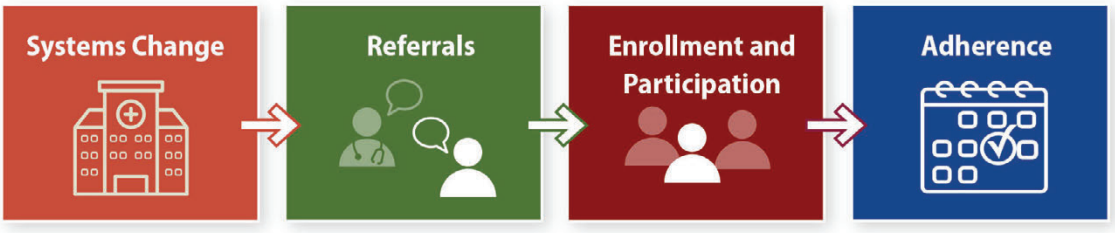
- Processes (e.g., incorporating referral to CR into discharge order sets, integrating health information technology, changing workflows).
- Disciplines (e.g., cardiology, hospital medicine, rehabilitation).
- Professionals (e.g., physicians, nurses, exercise physiologists, administrators).
- Locations (e.g., inpatient units, CR programs, physician offices).

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 put systems and strategies in place that target improved care for more of the eligible patients. The CRCP is broken down into four main focus areas (Figure 1):

Figure 1. 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 any teams attempt to implement all of 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.

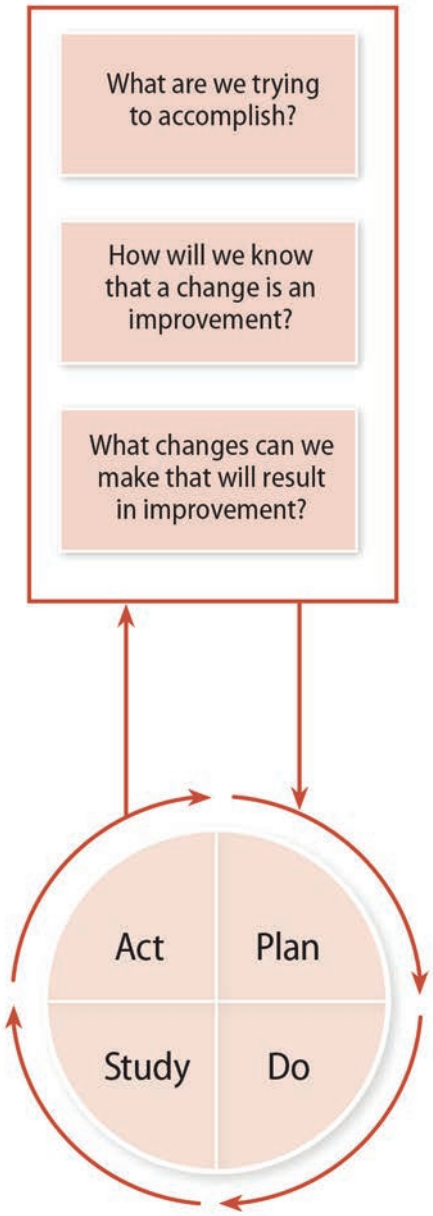
Figure 2 depicts the Institute for Healthcare Improvement's (IHI) Model for Improvement.[18] The Model for Improvement suggests first posing three questions:

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

Figure 2. Institute for Healthcare Improvement Model for Improvement



CR programs can implement to improve CR utilization for their patient population. Each change concept and idea is paired with tools and resources suggested by experts in the field who have successfully used them. The Acknowledgments and Contributors section lists content contributors.

- 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 drop-out and deploying strategies to encourage adherence.

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 Strategies—high-level issue summaries with concise guidance to aid implementation of programmatic strategies.
2) Case studies—detailed examinations of how a specific cardiac rehabilitation program was able to make a given change; they include motivation for program changes, timeline, staffing, and facilitators and barriers.
3) Program-specific tools—tangible resources that have been implemented by CR programs or researchers and 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 is ever-changing, the CRCP will be periodically updated.

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.

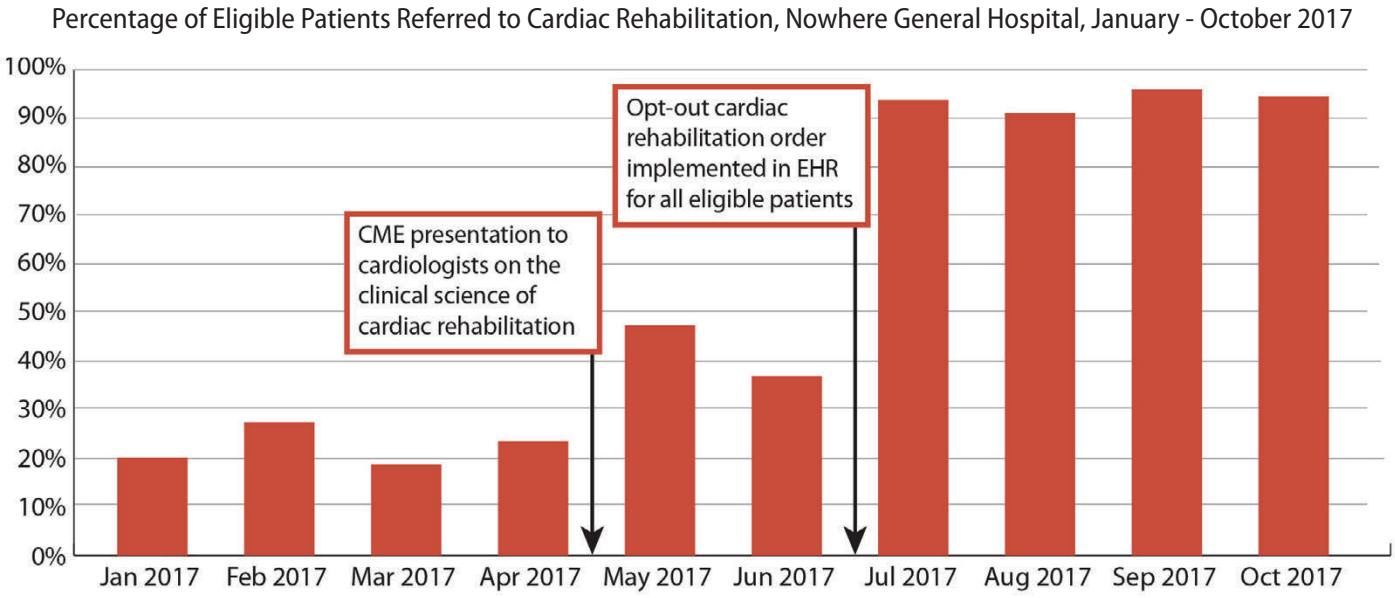
How Do I Measure Quality Improvement Efforts?

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 visited by a CR liaison while in the hospital. This type of data can provide much-needed feedback on whether or not the interventions you are using are being successfully carried out. Begin by collecting baseline data on a process that you are interested in improving. Then test your "change ideas" on a smaller scale using a small number of patients, and discuss with clinical staff any identified potential barriers to implementation. These small tests of change can be used to assess the success of implementing the intervention and allow staff to make needed refinements prior to scaling up the project to a larger level.

One very helpful tool for displaying and monitoring efforts over time is a run chart. A run chart is a graph that displays performance on a given process or outcome longitudinally. It can be useful to chart performance over time to concretely show decision makers and other stakeholders why recommended changes are needed. You can then document when specific changes were made to show the impact that implemented changes yielded on performance (Figure 3). See Appendix A for additional QI tools and resources.

Figure 3. Example of a Run Chart



Change Concepts, Change Ideas, and Tools and Resources

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

Table 1. Cardiac Rehabilitation Change Package—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	• **Lake Regional Health System**—Cardiopulmonary Rehabilitation: Presentation for Board of Trustees • Liverpool Hospital—Clinical Champions PowerPoint • AACVPR—Crucial Conversations with Medical Providers & Hospital Administrators About Cardiac Rehabilitation Services Delivering Value Based Care • Million Hearts®—Getting to 70% Cardiac Rehabilitation Participation: Action Steps for Hospitals
	Engage the care team in CR and ensure their buy-in in CR	• AACVPR—Crucial Conversations with Medical Providers & Hospital Administrators About Cardiac Rehabilitation Services Delivering Value Based Care • **Lake Regional Health System**—Cardiopulmonary Rehabilitation: Update to Department Managers • Million Hearts®—Cardiac Rehabilitation Infographic
	Use CR referral, enrollment, and participation as quality of care indicators	• 2018 ACC/AHA Clinical Performance and Quality Measure for Cardiac Rehabilitation. Thomas RJ, et al. 2018.[19] • 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

Table 2. Cardiac Rehabilitation Change Package—Referrals		
Change Concepts	**Change Ideas**	**Tools and Resources**
Incorporate Referral to CR into Hospital Standardized Processes of Care for Eligible Patients	Include referral to CR in order sets for appropriate patients; incorporate into EHR as appropriate	• **Henry Ford Health System**—EMR Discharge Order Set, "Opt Out" Cardiac Rehabilitation Referral Screenshot • Template AMI Orders. Pages 24B–25B, Montoye CK, et al., 2005.[20]
	Include referral to CR in discharge checklists for appropriate patients; incorporate into EHR as appropriate	• Multidisciplinary Cardiac Discharge Checklist/Instructions. Page 1409, Thomas RJ, et al., 2007.[21]
	Include referral to CR in appropriate patient discharge forms; incorporate into EHR as appropriate	• Heart Attack Discharge Form. Page 29B, Montoye CK, et al., 2005.[20]
	Develop a standard process for informing an external CR program of a referred patient	• *Case Study:* **Massachusetts General Hospital**—Referral of Patient to External Cardiac Rehabilitation Program • How to Find Cardiac Rehabilitation Programs in the United States Using the CDC Interactive Atlas of Heart Disease and Stroke • AACVPR—Program Directory • **Massachusetts General Hospital**—Fax Cover Sheet for External Cardiac Rehabilitation Referrals • **Massachusetts General Hospital**—Cardiac Rehabilitation Referral Form
	Develop a standard process for eligible patients to self-refer to CR	• *Case Study:* **Massachusetts General Hospital**—Self-Referral of Patient to a Cardiac Rehabilitation Program • **Massachusetts General Hospital**—Fax Cover Sheet for Cardiac Rehabilitation Patient Self-Referral • **Massachusetts General Hospital**—Cardiac Rehabilitation Physician Referral for Patients who Self-Refer

Table 2. Cardiac Rehabilitation Change Package—Referrals (continued)

Change Concepts	Change Ideas	Tools and Resources
Standardize the CR Referral Process	Develop and communicate a standardized referral process or policy for patients	• *Case Study:* **Emory Healthcare**—Multidisciplinary-Developed Cardiac Rehabilitation Referral • **Emory Healthcare**—Cardiac Rehabilitation Electronic Referral Process and Communication Tool Presentation • *Case Study:* **Penn Medicine**—A Systematic Approach to Increasing Cardiac Rehabilitation Referrals • **Penn Medicine**—Cardiac ICU CR Referral Process • **Lake Regional Health System**—Cardiopulmonary Rehabilitation Referral Process Map • **Lake Regional Health System**—Physician Referral/Order Policy • **Lake Regional Health System**—Admission Guidelines, Cardio Pulmonary Rehab • **Genesis HealthCare System**—Phase II/III/IV Admission, Orientation, and Discharge Policy and Procedure
	Develop and communicate a standardized outpatient CR referral process or policy for patients discharged to inpatient acute or subacute rehabilitation or to homecare services	• AACVPR Cardiac Rehabilitation Referral Strategy—*Bridging the Rehabilitation Care Continuum: Spotlight on **NYU Langone Health***
	Implement standardized paper/faxed referral to CR from an **inpatient** setting	• **Massachusetts General Hospital**—Cardiac Rehabilitation Referral Form • **Beth Israel Deaconess Hospital, Milton**—Cardiac Rehabilitation Physician Referral Form • Referral Order to an Early Outpatient Cardiac Rehabilitation/ Secondary Prevention Program: From an Inpatient Setting. Page 1407, Thomas RJ, et al., 2007.[21]
	Implement standardized paper/faxed referrals to CR from an **outpatient** setting	• Referral Order to an Early Outpatient Cardiac Rehabilitation/ Secondary Prevention Program: From an Outpatient Setting. Page 1408, Thomas RJ, et al., 2007.[21]
	Use **inpatient** EHR tools to automate referrals to CR for all eligible patients including default or "opt out" orders for patients with qualifying diagnoses	• **Emory Healthcare**—Cardiac Rehabilitation Electronic Referral Process and Communication Tool Presentation (slides 3–8) • **Massachusetts General Hospital**—EHR Automatic Referral to CR Screenshots • **Henry Ford Health System**—EMR-based Cardiac Rehabilitation Referral as an "Opt Out" Process in Diagnosis-Related Order Sets • Figure 1: eReferral Screenshot from Electronic Discharge Summary. Ali-Faisal SF, et al., 2016.[22]
	Use **outpatient** EHR tools to automate referrals for patients with qualifying diagnoses who have not participated in CR	• **Massachusetts General Hospital**—EHR Outpatient Referral to CR Screenshot

Table 2. Cardiac Rehabilitation Change Package—Referrals (continued)

Change Concepts	Change Ideas	Tools and Resources
Use Data to Drive Improvement in Referrals to CR	Determine **inpatient** referral metrics to CR	• Performance Measure 1. Cardiac Rehabilitation Patient Referral From an Inpatient Setting. Pages 12–13, Thomas RJ, et al., 2018.[19] • Performance Measure 2. Exercise Training Referral for HF*r*EF From an Inpatient Setting. Page 14, Thomas RJ, et al., 2018.[19] • AACVPR—Introduction to Cardiac Rehabilitation Performance Measures • AACVPR—Example Application of Cardiac Rehabilitation Performance Measures
	Determine **outpatient** referral metrics to CR	• Performance Measure 3. Cardiac Rehabilitation Patient Referral From an Outpatient Setting. Page 15–16, Thomas RJ, et al., 2018.[19] • Performance Measure 4. Exercise Training Referral for HF*r*EF From an Outpatient Setting. Page 17, Thomas RJ, et al., 2018.[19] • AACVPR—Introduction to Cardiac Rehabilitation Performance Measures • AACVPR—Example Application of Cardiac Rehabilitation Performance Measures
	Use CR referral performance measures in a quality improvement system	• AACVPR Cardiac Rehabilitation Systems Change Strategy—*Using Cardiac Rehabilitation Referral Performance Measures in a Quality Improvement System*
	Regularly provide a dashboard with CR referral metrics, goals, and performance	• AACVPR Cardiac Rehabilitation Referral Strategy—*Using Clinical Data Registries to Access Cardiac Rehabilitation Referral Data* • **Lake Regional Health System**—Percent of Patients Referred to CR by Physician
	Implement a CR Registry to identify, track, and manage patients who are referred to a CR program	• **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
	Identify patients who had a cardiac event without a referral to a CR program	• 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

Table 3. Cardiac Rehabilitation Change Package—Enrollment and Participation

Change Concepts	Change Ideas	Tools and Resources
Educate Patients About the Benefits of Outpatient CR	Deploy an inpatient "liaison" to help educate, refer, schedule, and enroll eligible patients in outpatient CR	• AACVPR Cardiac Rehabilitation Enrollment Strategy—*Inpatient Liaison for Outpatient Cardiac Rehabilitation* • *Case Study:* **Memorial Hospital of Carbondale**—Phase I Cardiac Rehabilitation • **Memorial Hospital of Carbondale**—"Welcome to Phase I Cardiac Rehab" Binder • **Lake Regional Health System**—Cardiopulmonary Rehabilitation Center: Phase 1 Program Guideline for Inpatient Educators
	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	• AACVPR Cardiac Rehabilitation Enrollment Strategy—*Use of Video* • **St. Mary's Hospital**—Cardiac Rehab Program • Cardiac Rehab at **Johns Hopkins Medicine** • Home Health Quality Improvement—Cardiac Rehab YouTube Playlist
	Provide patient education materials that convey CR benefits	• **Mayo Clinic**—Cardiovascular Rehabilitation Program • American Heart Association—Answers by Heart: What Is Cardiac Rehabilitation? • AACVPR—2016 Cardiac Rehabilitation Fact Sheet: Cardiac Rehabilitation—An Individualized Supervised Program for You • American College of Cardiology—CardioSmart "What is Cardiac Rehabilitation?" Infographic • American Heart Association—Cardiac Rehab: Your Roadmap to Recovery
Reduce Delay from Discharge to First CR Appointment	Before hospital discharge establish an early, within 12 days of discharge, outpatient appointment	• 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
Use Data to Drive Improvement in Enrollment or Participation	Determine CR enrollment or participation metrics	• Performance Measure 5A. Enrollment (Claims-Based). Page 18, Thomas RJ, et al., 2018.[19] • Performance Measure 5B. Enrollment (Medical Records and/or Databases/Registries). Page 19, Thomas RJ, et al., 2018.[19] • Quality Measure 1. Time to Enrollment. Page 20, Thomas RJ, et al., 2018.[19] • Cardiac Rehabilitation Wait Time from Referral to Enrollment. Page 6, The Canadian Cardiovascular Society Quality Indicators for Cardiac Rehabilitation and Secondary Prevention, 2013.
	Regularly provide a dashboard with enrollment or participation metrics, goals, and performance	• **Lake Regional Health System**—CR Enrollment Rate • **Lake Regional Health System**—Enrolled Participants by Diagnosis • AACVPR—Sample Spreadsheet for Enrollment Rates of Cardiac Rehabilitation

Table 3. Cardiac Rehabilitation Change Package—Enrollment and Participation (continued)		
Change Concepts	**Change Ideas**	**Tools and Resources**
Reduce Cost-Sharing Barriers for CR Services	Assist patients with high out-of-pocket costs or economic burden to navigate payment options	• AACVPR—Commercial Insurance Pre-Authorization Template for Cardiac Rehabilitation • *Case Study:* **Christiana Care Health System**—Reducing Cost-Sharing Barriers for CR Services with Creative Options • **Lake Regional Health System**—Referral Process Map
	Establish a philanthropic fund to partly underwrite CR costs for patients with high co-payments or without insurance	• AACVPR Cardiac Rehabilitation Enrollment Strategy—*Establish a Philanthropic Fund: Spotlight on **Henry Ford Health System***
Improve Efficiency of Enrollment	Incorporate group orientations	• AACVPR Cardiac Rehabilitation Enrollment Strategy—*Cardiac Rehabilitation Pre-Enrollment Group Screening* • *Case Study:* **Genesis HealthCare System**—Group Orientation • **Genesis HealthCare System**—Phase II/III/IV Admission, Orientation, and Discharge Policy and Procedure • **Genesis HealthCare System**—Group Orientation Process Flowsheet • **Genesis HealthCare System**—Group Orientations PowerPoint for CR Program Teams • **Genesis HealthCare System**—Welcome to Heart & Vascular and Pulmonary Rehabilitation PowerPoint for Patients • *Case Study:* **Rochester Regional**—Group Orientation • *Case Study:* **University of Alabama at Birmingham**—Increase Enrollment and Session Adherence

Table 3. Cardiac Rehabilitation Change Package—Enrollment and Participation (continued)

Change Concepts	Change Ideas	Tools and Resources
Develop Flexible Models That Better Accommodate Patient Needs	Offer accelerated CR programs	• AACVPR Cardiac Rehabilitation Enrollment Strategy—*Accelerated Usage of CR*
	Modify program structure and hours of operation to match patient preferences, to accommodate more patients	• AACVPR Cardiac Rehabilitation Enrollment Strategy—*Cardiac Rehabilitation Timeline and Program Structure: Spotlight* on ***Mount Carmel Health System***
	Shift from class structure to open-gym model	• AACVPR Cardiac Rehabilitation Enrollment Strategy—*Matching Capacity to Demand: Open Gym* • *Case Study:* **Southwest Florida Heart Group**—Open Gym Model • *Case Study:* **Mount Carmel Health System**—Cardiac Rehab Open Gym
	Develop hybrid model of home-based and facility-based program that includes key components of CR	• **Henry Ford Health System**—Welcome to the Henry Ford Home/Community Based Cardiac Rehabilitation (HBCR) Program • Home-based Cardiac Rehab: What's the Evidence? • Securing Reimbursement for Home-based Cardiac Rehab • Virtual Cardiac Rehab Program at Lourdes Health System
Modify Some Program Procedures Based on Clinical Need	Match frequency and/or use of ECG telemetry monitoring to clinical need	• AACVPR Cardiac Rehabilitation Enrollment Strategy—*ECG Monitoring Based on Clinical Need* • *Case Study:* **Henry Ford Health System**—Electrocardiography Monitoring Based on Clinical Need
	Improve operational efficiency with BP management	• *Case Study:* **NYU Langone Health**—A Value-Based Management Approach to Efficient Blood Pressure Monitoring During Outpatient Cardiac Rehabilitation (with BP Flowchart)
Use Clinician Follow-up to Bolster Enrollment or Participation	Engage referring clinicians by providing letters that highlight non-enrolled patients for clinician follow-up	• *Case Study:* **Christiana Care Health System**—Use Clinician Follow-up to Bolster Enrollment • AACVPR—Sample of Cardiac Rehabilitation/Secondary Prevention Non-Enrollment Letter Sent to Cardiologist
	Engage referring clinicians by providing progress reports and completion of program outcomes	• AACVPR Cardiac Rehabilitation Enrollment Strategy—*Cardiac Rehabilitation Patient Progress Report* • AACVPR Cardiac Rehabilitation Enrollment Strategy—*Cardiac Rehabilitation Outcome Report Sheet*

Table 4. Cardiac Rehabilitation Change Package—Adherence*		
Change Concepts	**Change Ideas**	**Tools and Resources**
Identify Populations at Risk for Low Engagement	Know the characteristics that are predictive of attendance and drop-out to identify patients at particular risk, to offer extra support	• *Case Study:* **University of Alabama at Birmingham**—Increase Enrollment and Session Adherence • *Class Schedule:* **University of Alabama at Birmingham**—Cardiopulmonary Rehabilitation
Improve Patient Engagement	Incorporate motivational and financial incentives for meeting goals for session attendance	• AACVPR Cardiac Rehabilitation Adherence Strategy—*Incorporating Motivational and Financial Incentives* • *Case Study:* **University of Vermont Medical Center**—Financial Incentives to Improve Cardiac Rehabilitation Attendance Among Medicaid Enrollees
	Automate reminders and communication	• AACVPR Cardiac Rehabilitation Adherence Strategy—*Use of Text Messaging and Mobile Applications*
	Connect enrolled patients with a graduate or phase 3 participant Patient Ambassador or "sponsor"	• *Case Study:* **Miriam Hospital** Center for Cardiac Fitness—Patient Ambassador Program • **Miriam Hospital** Center for Cardiac Fitness—Patient Ambassador Program Guidelines • **Miriam Hospital** Center for Cardiac Fitness—Patient Ambassador Program Invitation Flyer • **Miriam Hospital** Center for Cardiac Fitness—Patient Ambassador Profile Sheet • **Miriam Hospital** Center for Cardiac Fitness—Patient Ambassador Program Welcome Packet • **Miriam Hospital** Center for Cardiac Fitness—Patient Ambassador Program Letter of Thanks • **Miriam Hospital** Center for Cardiac Fitness—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.

Appendix A: 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 2). 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. 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 guidebook series on improving care delivery and outcomes with clinical decision support (CDS).[23,24] These guidebooks can help you apply the CDS Five 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
HF*r*EF	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
ONC	Office of the National Coordinator for Health Information Technology
PAD	Peripheral artery disease
PDSA	Plan-Do-Study-Act
QI	Quality improvement
SET	Supervised exercise training

References

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