PREAMBLE

Medicine is experiencing an unprecedented focus on quantifying and improving healthcare quality. The American College of Cardiology (ACC) and the American Heart Association (AHA) have developed a multifaceted strategy to facilitate the process of improving clinical care. The initial phase of this effort was to create clinical practice guidelines that carefully review and synthesize available evidence to better guide patient care. Such guidelines are written in a spirit of suggesting diagnostic or therapeutic interventions for patients in most circumstances. Accordingly, significant judgment by clinicians is required to adapt these guidelines for the care of individual patients, and these guidelines can be generated with varying degrees of confidence on the basis of available evidence.

Occasionally, the evidence supporting a particular structural aspect or process of care is so strong that failure to perform such actions reduces the likelihood that optimal patient outcomes will occur. Creating a mechanism for quantifying these opportunities to improve the outcomes of care is an important and pressing challenge. In the next phase of its quality improvement (QI) efforts, the ACC and the AHA created the ACC/AHA Task Force on Performance Measures in February 2000 to spearhead the development of performance measures that allow the quality of cardiovascular care to be assessed and improved. Three nominees from each organization were charged with the task of assembling teams of clinical and methodological experts, both from within the sponsoring organizations and from other organizations dedicated to the care of patients covered by the performance measurement set. These writing committees were given careful guidance with respect to the necessary attributes of good performance measures and the process of identifying, constructing, and refining these measures so that they can accurately achieve their desired goals.

This article is being copublished in the October 2, 2007, issues of Circulation and the Journal of the American College of Cardiology.

Copies: This document is available on the World Wide Web sites of the American Association of Cardiovascular and Pulmonary Rehabilitation (www.aacvpr.org), American College of Cardiology (www.acc.org), and American Heart Association (my.americanheart.org). For copies of this document, please contact Elsevier Inc. Reprint Department, fax (212) 633-3820, e-mail: reprints@elsevier.com.

Permissions: Modification, alteration, enhancement, and/or distribution of this document are not permitted without the express permission of the American Association of Cardiovascular and Pulmonary Rehabilitation, American College of Cardiology Foundation, or American Heart Association. Please contact the American Heart Association: Instructions for obtaining permission are located at http://www.americanheart.org/presenter.jhtml?identifier=4431.

Task Force members are as follows: Robert O. Bonow, MD, FACC, FAHA; N. A. Mark Estes III, MD, FACC; David C. Goff; Kathleen L. Grady, PhD, RN; Ann R. Hiniker, CNS; Frederick A. Masoudi, MD, MPH, FACC; Ileana L. Piña, MD, FACC; Martha J. Radford, MD; John S. Rumsfeld, MD, PhD, FACC; Gayle R. Whitman, PhD, RN.

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.

This document was approved by the American Association of Cardiovascular and Pulmonary Rehabilitation Board of Trustees and the American Heart Association Science Advisory and Coordinating Committee in April 2007. When citing this document, the AACVPR, American College of Cardiology Foundation, and the American Heart Association would appreciate the following citation format: Thomas RJ, King M, Lui K, Oldridge N, Piña IL, Spertus J. AACVPR/ACC/AHA 2007 performance measures on cardiac rehabilitation for referral to and delivery of cardiac rehabilitation/secondary prevention services. J Cardiopulm Rehabil Prevent. 2007;27:260–290.

Copyright © 2007 American Association of Cardiovascular and Pulmonary Rehabilitation, American College of Cardiology, and American Heart Association.
The role of performance measurement writing committees is not to perform a primary evaluation of the medical literature; this is undertaken by ACC/AHA guidelines committees. However, performance measurement writing committees work collaboratively with guidelines committees so that the guideline recommendations are written with a degree of specificity that supports performance measurement and so that new knowledge can be rapidly incorporated into performance measurement. Development of the ACC/AHA guidelines includes a detailed review of and ranking of the evidence available for the diagnosis and treatment of specific disease areas. Published guideline recommendations employ the ACC/AHA classification systems I, IIa, IIb, and III (Table 1).

So as not to duplicate performance measure development efforts, writing committees were also instructed to evaluate existing nationally recognized performance measures using the ACC/AHA “attributes of good performance measures.” The measure specifications were adopted for those performance measures that meet these criteria. Such measures have established validity, reliability, and feasibility and would form the foundation of the ACC/AHA measurement sets. Furthermore, writing committees are encouraged to identify additional performance measures that correspond to those key areas of quality proven to improve patient outcomes.

The ACC/AHA Performance Measurement Sets are to be applied in the inpatient and/or outpatient setting depending upon the topic. Although inpatient measures have traditionally been captured by retrospective data collection, the increased use of electronic medical records allows for prospective collection in the inpatient and outpatient settings. Prospective data collection is itself a continuous QI process. The performance measures quantify explicit actions performed in carefully specified patients for whom adherence should be advocated in all but the most unusual circumstances. In addition, the measures are constructed with the intent to facilitate both retrospective and prospective data collection using explicit administrative and/or easily documented clinical criteria. Furthermore, the data elements required to construct the performance measures are identified and linked to existing ACC/AHA Clinical Data Standards to encourage the standardization of cardiovascular measurement.

Although the focus of the performance measures writing committees is to develop measures for internal QI, it is appreciated that other organizations may use these measures for external reporting of provider performance. Therefore, it is within the scope of the writing committee’s task to comment on the strengths and limitations of externally reporting potential performance measures. Specifically, this was done in the “Challenges to implementation” sections in each of the performance measures when appropriate (see Appendices A and B).

All the measures contained in this set have limitations and challenges to implementation that could result in unintended consequences when used for accountability purposes. The implementation of these measures for purposes other than QI require field testing to address issues related to, but not limited to, sample size, reasonable frequency of use for an intervention, comparability, and audit requirements. The way in which these issues are addressed would be highly dependent on the type of accountability system developed, including data collection method, assignment of patients to physicians for measurement purposes, baseline measure setting, incentive system, and public reporting method among others. The ACC/AHA encourages those interested in working on implementation of these measures for purposes beyond QI to work with the ACC/AHA to understand these complex issues in pilot testing projects that can measure the impact of any limitations and provide guidance on possible refinements of the measures that would make them more suitable for additional purposes.

In the process of facilitating the measurement of cardiovascular healthcare quality, the ACC/AHA Performance Measurement Sets can serve as a vehicle for more rapidly translating the strongest clinical evidence into practice. These documents are intended to provide practitioners with “tools” for measuring the quality of care and for identifying opportunities to improve. Because the target audience and unit of analysis for these measures is the practitioner, they were constructed from the provider’s perspective and were not intended to characterize “good” or “bad” practice but to be part of a system with which to assess and improve healthcare quality. It is our hope that an application of these performance measures within a system of QI will provide a mechanism through which the quality of medical care can be measured and improved.

— Robert O. Bonow, MD, FACC, FAHA, FACP, Chair, ACCF/AHA Task Force on Performance Measures

Over the past 4 decades, cardiac rehabilitation/secondary prevention (CR) services have become recognized as a significant component in the continuum of care for persons with cardiovascular disease (CVD). The role of CR services in the comprehensive secondary prevention of CVD events is well documented and has been promoted by various healthcare organizations and position statements. However, performance measures for CR services have not been published to date.

To formalize performance measures for CR services, the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR)/American College of Cardiology (ACC)/American Heart Association (AHA) Cardiac Rehabilitation/Secondary Prevention Performance
### Table 1 • APPLYING CLASSIFICATION OF RECOMMENDATIONS AND LEVEL OF EVIDENCE

<table>
<thead>
<tr>
<th>Size of Treatment Effect</th>
<th>Class I</th>
<th>Class Ia</th>
<th>Class Iib</th>
<th>Class III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefit&gt;&gt;risk</td>
<td>Benefit&gt;&gt;risk</td>
<td>Benefit&gt;&gt;risk</td>
<td>Risk</td>
<td>Risk = benefit</td>
</tr>
<tr>
<td>Procedure/treatment should be performed/administered</td>
<td>It is reasonable to perform procedure/administer treatment</td>
<td>Procedure/treatment may be considered</td>
<td>Procedure/treatment should not be performed/administered since it is not helpful and may be harmful</td>
<td></td>
</tr>
</tbody>
</table>

**Estimate of Certainty (Precision) of Treatment Effect**

**Level A**
- Multiple (3–5) population risk strata evaluated
- General consistency of direction and magnitude of effect
- Recommendation that procedure or treatment is useful/effective
- Sufficient evidence from multiple randomized trials or meta-analyses

**Level B**
- Limited (2–3) population risk strata evaluated
- Recommendation that procedure or treatment is useful/effective
- Limited evidence from single randomized trial or nonrandomized studies

**Level C**
- Very limited (1–2) population risk strata evaluated
- Recommendation that procedure or treatment is useful/effective
- Only expert opinion, case studies, or standard of care

---

*aIn 2003, the ACC/AHA Task Force on Practice Guidelines developed a list of suggested phrases to use when writing recommendations. All guideline recommendations have been written in full sentences that express a complete thought, such that a recommendation, even if separated and presented apart from the rest of the document (including headings above sets of recommendations), would still convey the full intent of the recommendation. It is hoped that this would increase readers’ comprehension of the guidelines and would allow queries at the individual recommendation level.

*bData available from clinical trials or registries about the usefulness/efficacy in different subpopulations, such as gender, age, history of diabetes, history of prior myocardial infarction, history of heart failure, and prior aspirin use. A recommendation with Level of Evidence B or C does not imply that the recommendation is weak. Many important clinical questions addressed in the guidelines do not lend themselves to clinical trials. Even though randomized trials are not available, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.*
Measures Writing Committee was convened in November 2005. The writing committee was given the charge of developing performance measures that cover 2 specific aspects of CR services: (1) referral of eligible patients to a CR program; and (2) delivery of CR services through multidisciplinary CR programs.

The ultimate purpose of these performance measure sets is to help improve the delivery of CR to reduce cardiovascular mortality and morbidity and optimize health in persons with CVD, including acute myocardial infarction (MI) or status post coronary artery bypass graft (CABG) surgery, percutaneous coronary intervention (PCI), stable angina, and heart transplantation or heart valve surgery. Using the previously published methodology of the ACC and the AHA,1,19 performance measures for the referral of eligible patients to a CR program and the delivery of CR services through multidisciplinary CR programs were developed, focusing on processes of care that have been documented to help improve patient outcomes (using the ACC/AHA system for classification of recommendations and level of evidence for guidelines and clinical recommendations shown in Table 1). Both inpatient and outpatient settings of cardiovascular care were considered, resulting in performance measures being created for 3 specific settings: (1) hospitals; (2) office practices; and (3) CR programs.

Rationale for CR Performance Measures/Secondary Prevention

The rationale for developing and implementing performance measure sets for referral to and delivery of CR services is based on several key factors:

- There has been growing scientific evidence over the past 3 decades on the benefits of CR services for persons with CVD.2,17,20 Evidence suggests that the benefits of CR services are as significant in recent years as they were in the prethrombolytic era.9,21 Because of this mounting evidence, a number of healthcare organizations have endorsed the use of CR services in persons with CVD, but to date, no groups have included participation in, and completion of programs in CR. It is anticipated that the implementation of CR performance measure sets will stimulate changes in the clinical practice of preventive and rehabilitative care for persons with CVD.

- Standards for CR programs have been previously published,26 and systems for CR program certification exist, such as the certification process offered through the AACVPR for CR programs that meet its standards of practice. Unfortunately, since such certification is not required for CR program operation or for reimbursement purposes, CR program certification is obtained by a relatively small portion of CR programs in the United States. As of October 2006, only 973 (37%) of an estimated 2,621 CR programs operating in the United States have AACVPR certification29 (A. Lynn, personal communication, October 31, 2006).

- Recommendations for CR referral and participation are included in many practice guidelines and position papers regarding the care of persons with CVD, but to date, no groups have included referral to CR services in their CVD-related performance measure sets. Likewise, there are no currently available performance measure sets that include measures for the delivery of CR services by outpatient CR programs.

Clearly, there is a need and also a prime opportunity to reduce the gap in delivery of CR services to persons with CVD. Such an improvement in CR delivery will require better approaches in the referral to, enrollment in, and completion of programs in CR. It is anticipated that the implementation of CR performance measure sets will stimulate changes in the clinical practice of preventive and rehabilitative care for persons with CVD.

Writing Committee Structure and Members

To formalize performance measures for CR services, the AACVPR/ACC/AHA Cardiac Rehabilitation/Secondary Prevention Performance Measures Writing Committee was convened in November 2005. The writing committee was composed of nominated representatives from the AACVPR, the ACC, and the AHA, including past and current representatives of the ACC Task Force on Performance Measures, past and current presidents of the AACVPR, and clinicians with expertise in general clinical cardiology, heart failure, CVD, and CR. An initial committee meeting was held in Kansas City, Missouri, on January 23 and 24, 2006. Committee meetings were otherwise held by teleconference, generally at weekly intervals.

Relationships With Industry

Committee members volunteered their time to participate in the writing committee and acknowledged any
potential conflicts of interest (Appendix C). The AACVPR, the ACC, and the AHA supported the cost of both the initial committee meeting in January 2006 and conference calls. No commercial support was provided for any aspect of the committee’s work.

Review and Endorsement
A public comment period was held for this document from December 11, 2006, until January 11, 2007. Reviewers were asked to provide comments on the document on the basis of the rating form and guide shown in Appendix D. Reviewer comments were considered and incorporated into a revised version of the document. Review and final approval of the final version of the paper was obtained through the governing bodies from the AACVPR, the ACC, and the AHA. Endorsement of the final paper was sought from key partnering organizations.

METHODOLOGY

Definition of CR
Over the past decade, various CR program delivery paradigms have evolved from the traditional definition where programs operate within a CR center and patients attend sessions in person. Some examples of these programs include those outpatient programs where staff members provide CR services to patients through novel methods such as those that are home-, telephone-, or Internet-based.

The definition for CR in general use today is based on a modification from the original World Health Organization 1964 definition of CR.30 This definition reinforced the observation that CR is an integral component in the overall management of patients with CVD, that the patient plays a significant role in the successful outcome of CR, and that CR is an important source of services aimed at the secondary prevention of CVD events.3,4,12

Building on this original definition, a number of other complementary definitions of CR have been promulgated by various organizations including the US Public Health Service, the AHA, the AACVPR, and the Canadian Association of Cardiac Rehabilitation.4,11

These updated definitions emphasize the integral role of CR in the secondary prevention of CVD.

The definition used by the US Public Health Service and by the Cardiac Rehabilitation/Secondary Prevention Performance Measures Writing Committee is as follows:

Cardiac rehabilitation services are comprehensive, long-term programs involving medical evaluation, prescribed exercise, cardiac risk factor modification, education, and counseling. These programs are designed to limit the physiologic and psychological effects of cardiac illness, reduce the risk for sudden death or re-infarction, control cardiac symptoms, stabilize or reverse the atherosclerotic process, and enhance the psychosocial and vocational status of selected patients.4 CR programs are generally divided into 3 main phases:

1. **Inpatient CR** (also known as phase I CR): A program that delivers preventive and rehabilitative services to hospitalized patients following an index CVD event, such as an MI/acute coronary syndrome.

2. **Early outpatient CR** (also known as phase II CR): A program that delivers preventive and rehabilitative services to patients in the outpatient setting early after a CVD event, generally within the first 3 to 6 months after the event but continuing for as much as 1 year after the event.

3. **Long-term outpatient CR** (also known as phase III or phase IV CR): A program that provides longer-term delivery of preventive and rehabilitative services for patients in the outpatient setting.

The main focus of this position paper is on the referral to and delivery of early outpatient CR services principally because it is the component of CR that has been most widely documented to help reduce the risk of CVD mortality among its participants.

Definition of Appropriate Patients for CR
Patients who are considered eligible for CR include those who have experienced 1 or more of the following conditions as a primary diagnosis sometime within the previous year:

- MI/acute coronary syndrome
- CABG surgery
- PCI
- Stable angina
- Heart valve surgical repair or replacement
- Heart or heart/lung transplantation

The thrust of this document is focused on the management of persons with coronary artery disease—related conditions (noted in the list above with an asterisk), but CR services are considered appropriate and beneficial for persons (1) after heart valve surgical repair or replacement and (2) after heart or heart/lung transplantation (as previously listed).31–34 Furthermore, growing evidence from published studies supports a CR benefit for persons with chronic heart failure or peripheral arterial disease.35,36 However, formal recommendations by healthcare organizations to approve and/or cover CR services in these patient populations will depend upon policy decision makers and, particularly, in the case of chronic heart failure, the results of ongoing research studies.
Persons who are potentially eligible for CR may, in fact, have barriers that limit their participation in CR. Such barriers include those that are patient-oriented (eg, patient refusal), others that are provider-oriented (eg, provider deems the patient ineligible for CR due to a high-risk medical condition and/or an absolute contraindication to exercise), and still others that are related to the healthcare system and/or societal barriers (eg, lack of a CR program, lack of insurance coverage). Patients with such barriers may be excluded from the number of patients who are considered to be eligible for CR referral (Appendix A, under the “Numerator” criteria for assessing the percentage of eligible patients who have been referred to a CR program). It should be noted, however, that even though some persons may have significant patient- or provider-oriented barriers to CR referral, nearly all patients with CVD could benefit from at least some components of a comprehensive, secondary prevention CR program.

Overview of Performance Measures Created
Both structure- and process-based performance measures are included in the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Sets. While important and related, specific measures focused on clinical outcomes are not included. The performance measures that are included are designed to help healthcare groups identify potentially correctable and actionable “upstream” sources of suboptimal clinical care, such as structure- and process-based gaps in CR services. Details for the dimensions of care included in the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Sets are outlined as follows:

1. **Structure-based measures** quantify the infrastructure from which CR is provided and are based on the provision of appropriate personnel and equipment to satisfy high-quality standards of care for CR services. For example, a structure-based performance measure for a CR program is one that specifies that a CR program has appropriate personnel and equipment to provide rapid care in medical emergencies that may occur during CR program sessions.

2. **Process-based measures** quantify specific aspects of care and are designed to capture all relevant dimensions of CR care. For example, a process-based performance measure for a CR program is one that specifies that all patients in a CR program undergo comprehensive, standardized assessment of their cardiovascular risk factors upon entry to the CR program.

It should also be noted that the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Sets have been designed for 3 different geographical settings of care: (1) the hospital; (2) the physician office; and (3) the CR program settings. Staff members within each of these areas who help provide care to persons with CVD are held accountable for the various aspects of CR services (referral to, enrollment in, and delivery of CR services).

Literature Review and Evidence Base
There is substantial evidence to conclude that CR is reasonable and necessary following MI, CABG surgery, stable angina, heart valve repair or replacement, PCI, and heart or heart/lung transplantation. Outpatient, medically supervised CR, as described by the US Public Health Service, is a comprehensive, long-term intervention including medical evaluation, prescribed exercise, cardiac risk-factor modification, education, and counseling typically initiated 1 to 3 weeks after hospital discharge and typically including electrocardiographic monitoring of patients (see “Definition of CR” section).

Meta-analyses and systematic reviews provide and summarize the extensive evidence that has been generated from published randomized clinical trials demonstrating that exercise-based CR services are beneficial for patients with established CVD. These benefits include improved processes of care and risk-factor profiles that are closely linked to subsequent mortality and morbidity. Pooled data from randomized clinical trials of CR demonstrate a mortality benefit of approximately 20% to 25% and a trend toward reduction in nonfatal recurrent MI over a median follow-up of 12 months.

Definition and Selection of Measures
The Cardiac Rehabilitation/Secondary Prevention Performance Measure Writing Committee initially identified 39 factors from various practice guidelines and other reports that were considered potential performance measures for the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Sets (see Table 1 for standard guidelines that were used to rate the classification of recommendations and level of evidence for assessing these factors). The group evaluated these factors according to guidelines established by the ACC/AHA Task Force on Performance Measures. Those measures that were deemed to be the most evidence-based, interpretable, actionable, clinically meaningful, valid, reliable, and feasible were included in the final performance measurement sets. Once these measures were identified, the writing committee then discussed and refined, over a series of months, the definition, content, and other details of each of the selected measures.

While most performance measures are designed for a specific condition and phase of a particular disease, CR referral is applicable and appropriate for a number of different conditions and phases of CVD. Accordingly, the writing committee created 2 sets of performance
measures, one related to the appropriate referral of patients to a CR program and another set related to optimal performance of a CR program itself. In creating the first set, the writing committee sought to create a measure that would be appropriate for insertion into other performance measurement sets for which CR referral would be appropriate (e.g., performance measurement sets for care of patients following MI, PCI, or CABG surgery). Figure 1 outlines the overall organization of these 2 types of measures and their intended applications.

MEASURES RELATED TO EARLY OUTPATIENT CR REFERRAL

The performance measures that are related to the referral of appropriate patients to an early outpatient CR program are described in the next section.

Populations, Care Period, and Responsible Parties
Patients who are appropriate for referral to an early outpatient CR program include those patients who, in the previous 12 months, have had any of the diagnoses listed in the “Definition of appropriate patients for CR” section. The CR services are generally most beneficial when delivered soon after the index hospitalization. However, there are often clinical, social, and logistical reasons that delay enrollment in CR. For this reason, many third-party payers allow CR services to begin up to 6 to 12 months following a cardiac event. Because patients can be referred to CR at varying times following a CVD event, parties responsible for the referral of patients to CR include hospitals and healthcare systems as well as physician practices and other healthcare settings with primary responsibility for the care of patients after a CVD event.

Brief Summary of the Measures
The Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set A (Appendix A) is based on 2 criteria for the appropriate referral of patients to an early outpatient CR program:

1. all hospitalized patients with a qualifying CVD event are referred to an early outpatient CR program prior to hospital discharge; and
2. all outpatients with a qualifying diagnosis within the past year who have not already participated in an early outpatient CR program are referred to an early outpatient CR program by their healthcare provider.

It should be noted that the healthcare system and its providers who care for patients during and/or after CVD events are accountable for these performance measures. Physicians or other healthcare providers who see patients with CVD but who do not have a primary role in managing their CVD are not accountable for meeting these criteria. For example, an ophthalmologist who is performing an annual retinal examination on a diabetic patient in the year after his or her MI would not be responsible for referring the patient to a CR program. Additional details regarding this performance measurement set are included in Appendix A.
Data Collection Instruments
Examples of tools that may be of help in applying the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set A (Appendix A) into practice are included in Figures 2 and 3. Figure 2 shows an example of a standardized CR referral tool that healthcare systems could potentially use in the inpatient setting, whereas Figure 3 shows an example of a potential CR referral tool for outpatient practice settings. Figure 4 shows an example of a performance measure tracking tool that can be used by healthcare systems following an MI, with the performance measure of CR referral included in the performance measurement tool. These tools are given as examples and not as endorsed instruments. Healthcare systems and providers are encouraged to develop and implement systematic tools that are most appropriate and most

Referral Order to an Early Outpatient Cardiac Rehabilitation/Secondary Prevention Program:
From an Inpatient Setting
(Order applies to patients [18 years of age and older] with cardiovascular disease)

ALERT: This order set does not apply to patients who are deemed ineligible for cardiac rehabilitation/secondary prevention programs, including those in long-term nursing home placement for more than 60 days, homebound patients, or patients with severe dementia.

Intervention requested: □ Order early outpatient cardiac rehabilitation referral (Phase II).

Primary Diagnosis During this Hospitalization: (Select All That Apply)
□ Angina
□ Percutaneous Coronary Intervention (PCI)
□ Myocardial Infarction (MI)
□ Coronary Artery Bypass Graft (CABG) Surgery

□ Coronary Artery Disease (CAD)
□ Heart Transplant
□ Valve
□ Other: ________________

Prescriber’s Signature: ___________________________  Prescriber’s Pager#: __________
Prescriber’s Printed Name: ___________________________ Date: __________ Time: __________

Referral Process:
1. Patient’s primary cardiovascular provider, or designate, to carry out.
2. Impress upon the patient the importance of early outpatient cardiac rehabilitation (see script).
3. Arrange for inpatient cardiac rehabilitation contact prior to dismissal.
4. CR contact to:
   a. Discuss with patient the choices of cardiac rehabilitation programs in his/her home area and have patient select a program.
   b. Provide patient with information about the selected cardiac rehabilitation program
   c. With patient consent, call the receiving cardiac rehabilitation program, chosen by patient, requesting that the program contact the patient at home to arrange the first appointment.
   d. Document the name of the cardiac rehabilitation program in the hospital discharge summary with copies of the appropriate enclosures.
   e. With patient consent, send hospital discharge summary and other appropriate information to the CR program (could include surgical report, angiogram report, electrocardiogram, inpatient CR evaluation, etc.).

Suggested Script for Description of Cardiac Rehabilitation Program:
Cardiac rehabilitation is important for patients like you who are recovering from a heart problem. Health care professionals work in cardiac rehabilitation programs and assist you with getting the treatments you need to get stronger and healthier, like exercise, healthy eating habits, and medications. Cardiac rehabilitation has been shown to help people with heart problems live longer and have better life enjoyment than people who do not go to cardiac rehabilitation. Insurance companies generally cover cardiac rehabilitation, but if you are not sure about your insurance coverage, you should talk with your insurance company or with the cardiac rehabilitation program staff.

Figure 2. Example of a referral tool for an inpatient to an outpatient CR program. Tool to be considered for use with the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set A. Adapted with permission from Zarling et al.37 CR, cardiac rehabilitation/secondary prevention program.

Referral Order to an Early Outpatient Cardiac Rehabilitation/Secondary Prevention Program: From an Outpatient Setting
(=Order applies to patients [18 years of age and older] with cardiovascular disease)

**Alert:** This order set does not apply to patients who are deemed ineligible for cardiac rehabilitation/secondary prevention programs, including those in long-term nursing home placement for more than 60 days, homebound patients, or patients with severe dementia.

**Intervention requested:** □ Order early outpatient cardiac rehabilitation referral (Phase II).

**Primary Diagnosis During this Hospitalization:** (Select All That Apply)
□ Angina □ Coronary Artery Disease (CAD)
□ Percutaneous Coronary Intervention (PCI) □ Heart Transplant
□ Myocardial Infarction (MI) □ Valve
□ Coronary Artery Bypass Graft (CABG) Surgery □ Other: ________________

Prescriber’s Signature:______________ Prescriber’s Pager#:______________
Prescriber’s Printed Name:______________ Date:__________ Time:__________

**Referral Process:**
1. Patient’s primary cardiovascular provider, or designate, to carry out.
2. Impress upon the patient the importance of early outpatient cardiac rehabilitation (see script).
3. Arrange for inpatient cardiac rehabilitation contact prior to dismissal.
4. CR contact to:
   a. Discuss with patient the choices of cardiac rehabilitation programs in his/her home area and have patient select a program.
   b. Provide patient with information about the selected cardiac rehabilitation program.
   c. With patient consent, call the receiving cardiac rehabilitation program, chosen by patient, requesting that the program contact the patient at home to arrange the first appointment.
   d. Document the name of the cardiac rehabilitation program in the hospital discharge summary with copies of the appropriate enclosures.
   e. With patient consent, send hospital discharge summary and other appropriate information to the CR program (could include surgical report, angiogram report, electrocardiogram, inpatient CR evaluation, etc.).

**Suggested Script for Description of Cardiac Rehabilitation Program:**
Cardiac rehabilitation is important for patients like you who are recovering from a heart problem. Health care professionals work in cardiac rehabilitation programs and assist you with getting the treatments you need to get stronger and healthier, like exercise, healthy eating habits, and medications. Cardiac rehabilitation has been shown to help people with heart problems live longer and have better life enjoyment than people who do not go to cardiac rehabilitation. Insurance companies generally cover cardiac rehabilitation, but if you are not sure about your insurance coverage, you should talk with your insurance company or with the cardiac rehabilitation program staff.

**Figure 1.** Example of referral tool for an outpatient to an outpatient CR program. Sample tool for referring outpatients to an early outpatient/secondary prevention program to be considered for use with the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set A. Adapted with permission from Zarling et al.35 CR, cardiac rehabilitation/secondary prevention.

effective for their particular setting and patient population groups.

**Inclusion in Other Performance Measurement Sets**
The Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set A (Appendix A) is designed to be included in (ie, “plugged into”) other related performance measurement sets for which referral to a CR program would be considered an appropriate component of high-quality care (eg, can be “plugged into” the performance measurement set for management of patients with MI).
Multidisciplinary Cardiac Discharge Checklist/Instructions
To be completed by physician, nurse, or other care provider at patient’s discharge

Admission Date: __________________ Discharge Date: __________________

Diagnosis: ________________________________

Check each therapy prescribed or check contraindication reason.
☐ Aspirin: next dose due (date/time) ________________________________
☐ No aspirin, reason documented in discharge summary.
☐ Clopidogrel: next dose due (date/time) ________________________________
☐ No clopidogrel, reason documented in discharge summary.
☐ Beta blocker: next dose due (date/time) ________________________________
☐ No beta blocker, reason in discharge summary.
☐ ACE inhibitor: next dose due (date/time) ________________________________
☐ No ACE inhibitor, reason documented in discharge summary.
☐ Statin or other lipid-lowering agent (LLA): next dose due (date/time) ________________________________
☐ No statin or other LLA, reason documented in discharge summary.
☐ Cardiac rehabilitation referral made, patient information communicated to program, and program information/appointment communicated to patient
☐ No exercise prescription and/or cardiac rehabilitation referral with reason in discharge summary.
☐ Smoking cessation teaching and pharmacological therapy given (patient is a current smoker or former smoker of less than 1 year) or
☐ Smoking cessation teaching and pharmacological therapy not required (patient is nonsmoker or former smoker of greater than 1 year).
☐ Education on warning signs of MI and what to do if symptoms given.
☐ Education not given, reason documented in discharge summary.
☐ Diet: low-fat, low-cholesterol, no added salt
☐ Follow-up appointment documented in medical record.

Follow-up appointment made? Date: ________________ Time: ________________ OR

Call Dr. ___________________________ for an appointment in ___________ days. Phone # ________________

Call Dr. ___________________________ for an appointment in ___________ days. Phone # ________________

Call ___________________________ Cardiac Rehabilitation Program within ___________ days. Phone # ________________

If condition worsens, new symptoms develop, or questions arise, call your physician.

I hereby acknowledge receiving the explanation of the above instructions:

Patient’s signature: ___________________________ Date: _________________

[It is recommended that a copy of this go to medical records, to the patient, and to the physician. You may want to consider triplicate carbonless copy forms.]
MEASURES TO DEFINE QUALITY

EARLY OUTPATIENT CR PROGRAMS

The second set of performance measures included in the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Sets—Performance Measurement Set B (Appendix B)—relates to the optimal structure and processes of care for CR programs themselves and is described in the next section.

Populations, Care Period, and Responsible Parties

Patients who are appropriate for entry into a CR program include persons 18 years or older who, during the previous year, have had 1 or more of the qualifying diagnoses listed in the “Definition of appropriate patients for CR” section. Patients who are considered ineligible for CR services, by patient-oriented or provider-oriented criteria (see the “Definition of appropriate patients for CR” section), may still be appropriate candidates for enrollment in modified CR programs that adapt their services to a given patient’s limitations, geographic or otherwise. The period of care for early outpatient CR typically begins 1 to 3 weeks after the index CVD event and lasts up to 3 to 6 months.

The unit of analysis for the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set B is the healthcare system’s CR program(s). Therefore, the responsible parties for the performance of early outpatient CR services include members of the CR program staff—the medical director, nurses, exercise specialists, cardiovascular administrators, and other members of the CR team.

Brief Summary of the Outpatient CR Program Measurement Set

The Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set B for the delivery of CR services includes those measures that were considered by the writing committee to have the highest level of evidence and consensus support among its members.

The measures selected include both structure- and process-based measures that are used to assess the following policies and procedures by CR programs:

**Structural Measures (Appendix B: Performance Measure B-1)**
- A physician medical director is responsible for the program
- An emergency response team with appropriate emergency equipment and trained staff is available during patient care hours

**Process Measures (Appendix B: Performance Measure B-2, B-3, and B-4)**
- Assessment and documentation of each patient’s risk for adverse events during exercise
- A process to assess patients for intercurrent changes in symptoms
- Individualized assessment and evaluation of modifiable CVD risk factors
- Development of individualized risk-reduction interventions for identified conditions and coordination of care with other healthcare providers
- Evidence of a plan to monitor response and document program effectiveness through ongoing analysis of aggregate data. This includes:
  - a plan to assess completion of the prescribed course of CR;
  - a standardized plan to reassess patient outcomes at the completion of CR; and
  - methodology to document program effectiveness and initiate quality improvement (QI) strategies. Appendix B provides the detailed specifications for each outpatient performance measure.

Data Collection Instruments

The Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set B is intended to be used prospectively to review a program’s internal procedures with the ultimate goal of enhancing the QI process. To aid in data compilation, ideally collected prospectively, a data collection tool or flow sheet is recommended. An example of such a collection tool is shown in Table 2.

Healthcare systems and practices are encouraged to develop and/or use a tool that conforms to local practice patterns and standards.

DISCUSSION

The aim of the Cardiac Rehabilitation/Secondary Prevention Performance Measures Writing Committee was to address 2 important, persistent gaps in the quality of care for patients with CVD: namely, inadequate referral rates to CR programs and the need for minimum performance standards for such CR programs. Currently, a minority of patients receives CR services and secondary prevention services due, in general, to a number of patient-, provider-, and healthcare system—related barriers. The writing committee designed performance measurement sets that hold healthcare providers, CR program staff members, and leaders of healthcare systems accountable for the ultimate goal of linking eligible patients to the appropriate CR services following a qualifying CVD event.

The writing committee focused its attention on 2 general performance measurement sets: (1) referral of eligible patients to an outpatient CR program; and (2) delivery of appropriate CR services by CR programs. The first performance measure is designed to be used as a plug-in component to other performance measurement sets for which CR referral is deemed appropriate (eg, post-MI,
Table 2 • SAMPLE DATA-COLLECTION TOOL FOR THE CARDIAC REHABILITATION/SECONDARY PREVENTION PERFORMANCE MEASUREMENT SET B*

American Association of Cardiovascular and Pulmonary Rehabilitation, American College of Cardiology, and American Heart Association Cardiac Rehabilitation/Secondary Prevention Program Performance Measurement Set Data Collection Flow Sheet (Ideally collected prospectively)

<table>
<thead>
<tr>
<th>Patient name or code:</th>
<th>Birth date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender: ♂</td>
<td>F</td>
</tr>
<tr>
<td>Diagnosis: MI</td>
<td>CABG</td>
</tr>
<tr>
<td>Race/ethnicity: African American</td>
<td>Asian American</td>
</tr>
</tbody>
</table>

| Risk category | Low | Moderate | High |

<table>
<thead>
<tr>
<th>Target Goal</th>
<th>Initial Assessment</th>
<th>Intervention Plan and Communication</th>
<th>Reassessment Prior to Completion of Program</th>
<th>Changes in Intervention Plan and Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco use</td>
<td>Complete cessation of tobacco use</td>
<td>□ Never</td>
<td>□ Recent (quit less 6 months ago)</td>
<td>□ Current</td>
</tr>
<tr>
<td>Blood pressure control</td>
<td>&lt;140/90 mm Hg or &lt;130/80 mm Hg if patient has diabetes or chronic kidney disease</td>
<td>□ Patient with diagnosis of treated or untreated hypertension</td>
<td>□ Not hypertensive</td>
<td>□ Target BP goal</td>
</tr>
<tr>
<td>Lipid control</td>
<td>For CVD and CVD equivalents: LDL-C &lt;100 mg/dl if triglycerides are &gt;200 mg/dl, non-HDL-C should be &lt;130 mg/dl</td>
<td>□ Optimal control</td>
<td>□ Suboptimal control</td>
<td>Applies to all patients with CVD:</td>
</tr>
<tr>
<td>Physical activity habits</td>
<td>30+ min, minimum 5 d/wk</td>
<td>□ Optimal habits</td>
<td>□ Suboptimal habits</td>
<td>□ Education completed concerning optimal physical activity habits</td>
</tr>
<tr>
<td>Weight management</td>
<td>Body mass index: 18.5 to 24.9 kg/m² and Waist circumference: men &lt;40 in, women &lt;35 in</td>
<td>□ At target</td>
<td>□ Above target</td>
<td>Applies to all patients</td>
</tr>
</tbody>
</table>

Abbreviations: BP, blood pressure; CABG, coronary artery bypass grafting; CHF, congestive heart failure; CR, cardiac rehabilitation/secondary prevention; CVD, cardiovascular disease; DM, diabetes mellitus; HDL-C, high-density lipoprotein cholesterol; IFG, impaired fasting glucose; LDL-C, low-density lipoprotein cholesterol; MI, myocardial infarction; PCI, percutaneous coronary intervention.

*Target goals are from the 2006 AHA/ACC Secondary Prevention Guidelines.19 Assessment terms and definitions are from the outcomes registry proposal.
ing those patients who have undergone heart valve surgery or who have received heart or heart/lung transplantation, are also appropriate for CR referral. In addition, there is growing evidence for the benefits of CR in persons with other cardiovascular conditions, including heart failure and peripheral vascular disease. As more evidence becomes available for the benefits of CR in these patient groups, they may be included in future iterations of the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Sets.

To be effective, the recommendations of the writing committee would need to be adapted, adopted, and put into practice. The second performance measurement set is designed to clarify structure- and process-based performance measures that serve as a guide to continually improve the quality of care provided to their patients with CVD and thereby optimize their patients' health-related outcomes.

The writing committee did not include performance measures for all patient groups that may benefit from CR, but focused on those groups with the most current scientific evidence and other supporting evidence. To improve the quality of care provided to their patients with CVD and thereby optimize their patients' health-related outcomes, the writing committee did not include performance measures for all patient groups that may benefit from CR, but focused on those groups with the most current scientific evidence and other supporting evidence. To improve the quality of care provided to their patients with CVD and thereby optimize their patients' health-related outcomes, the writing committee did not include performance measures for all patient groups that may benefit from CR, but focused on those groups with the most current scientific evidence and other supporting evidence.
sessions or may include other options such as home-based approaches. If alternative CR approaches are used, they should be designed to meet appropriate safety standards.

A referral is defined as an official communication between the healthcare provider and the patient to recommend and carry out a referral order to an early outpatient CR program. This includes the provision of all necessary information to the patient that will allow the patient to enroll in an early outpatient CR program. This also includes a communication between the healthcare provider or healthcare system and the CR program that includes the patient’s referral information for the program. A hospital discharge summary or office note may potentially be formatted to include the necessary patient information to communicate to the CR program (the patient’s cardiovascular history, testing, and treatments, for instance). All communications must maintain appropriate confidentiality as outlined by the 1996 Health Insurance Portability and Accountability Act (HIPAA).

Exclusion Criteria:

- Patient-oriented barriers (patient refusal, for example)
- Provider-oriented criteria (patient deemed to have a high-risk condition or a contraindication to exercise, for example)
- Healthcare system barriers (financial barriers or lack of CR programs near a patient’s home, for example)

Denominator: Number of hospitalized patients in the reporting period hospitalized with a qualifying event/diagnosis who do not meet any of the exclusion criteria mentioned above.

Period of Assessment: Inpatient hospitalization.

Method of Reporting: Proportion of healthcare system’s patients with a qualifying event/diagnosis who had documentation of their referral to an outpatient CR program.

Sources of Data: Administrative data and/or medical records.

Rationale

A key component to outpatient CR program utilization is the appropriate and timely referral of patients. Generally, the most important time for this referral to take place is while the patient is hospitalized for a qualifying event/diagnosis (MI, CSA, CABG, PCI, cardiac valve surgery, or cardiac transplantation).

This performance measure has been developed to help healthcare systems implement effective steps in their systems of care that will optimize the appropriate referral of a patient to an outpatient CR program. This measure is designed to serve as a stand-alone measure or, preferably, to be included within other

---

Appendix A

Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set A

PERFORMANCE MEASURE A-1

Cardiac Rehabilitation Patient Referral From an Inpatient Setting

All patients hospitalized with a primary diagnosis of an acute myocardial infarction (MI) or chronic stable angina (CSA), or who during hospitalization have undergone coronary artery bypass graft (CABG) surgery, a percutaneous coronary intervention (PCI), cardiac valve surgery, or cardiac transplantation are to be referred to an early outpatient cardiac rehabilitation/secondary prevention (CR) program.

Numerator: Number of eligible patients with a qualifying event/diagnosis who have been referred to an outpatient CR program prior to hospital discharge or have a documented medical or patient-centered reason why such a referral was not made.

(Note: The program may include a traditional CR program based on face-to-face interactions and training
performance measurement sets that involve disease states or other conditions for which CR services have been found to be appropriate and beneficial (eg, following MI, CABG surgery). This performance measure is provided in a format that is meant to allow easy and flexible inclusion into such performance measurement sets.

Effective referral of appropriate inpatients to an outpatient CR program is the responsibility of the healthcare team within a healthcare system that is primarily responsible for providing cardiovascular care to the patient during the hospitalization.

Corresponding Guidelines and Clinical Recommendations

ACC/AHA 2004 Guideline Update for Coronary Artery Bypass Graft Surgery

Class I (for the description of the class of recommendations and level of evidence used in this document, see Table 1): Cardiac rehabilitation should be offered to all eligible patients after CABG surgery (level of evidence: B).

ACC/AHA Guidelines for the Management of Patients with ST-Elevation Myocardial Infarction

Class I: CR programs, when available, are recommended for patients with ST-elevation MI, particularly those with multiple modifiable risk factors and/or those with moderate- to high-risk patients in whom supervised exercise training is warranted (level of evidence: C).

ACC/AHA 2002 Guideline Update for the Management of Patients with Unstable Angina and Non-ST-Segment Elevation Myocardial Infarction

Class I: Consider the referral of patients who are smokers to a smoking cessation program or clinic and/or an outpatient CR program (level of evidence: B).

ACC/AHA 2002 Guideline Update for the Management of Patients with Chronic Stable Angina

Class I: Comprehensive CR program (including exercise) (level of evidence: B).

ACC/AHA Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult: Executive Summary

Class I: Exercise training is beneficial as an adjunctive approach to improve clinical status in ambulatory patients with current or prior symptoms of heart failure and reduced left ventricular ejection fraction (level of evidence: B).

Evidence-Based Guidelines for Cardiovascular Disease Prevention in Women

Class I: A comprehensive risk-reduction regimen, such as cardiovascular or stroke rehabilitation or a physician-guided home- or community-based exercise training program, should be recommended to women with a recent acute coronary syndrome or coronary intervention, new-onset or chronic angina, recent cerebrovascular event, peripheral arterial disease (level of evidence: A), or current/prior symptoms of heart failure and a left ventricular ejection fraction of less than 40% (level of evidence: B).

Challenges to Implementation

Identification of all eligible patients in an inpatient setting will require that a timely, accurate, and effective system be in place. Communication of referral information by the inpatient hospital service team to the outpatient CR program represents a potential challenge to the implementation of this performance measure. However, this task is generally performed by an inpatient cardiovascular care team member, such as an inpatient CR team member or a hospital discharge planning team member.

PERFORMANCE MEASURE A-2

Cardiac Rehabilitation Patient Referral From an Outpatient Setting

All patients evaluated in an outpatient setting who within the past 12 months have experienced an acute MI, CABG surgery, a PCI, cardiac valve surgery, or cardiac transplantation, or who have CSA and have not already participated in an early outpatient CR program for the qualifying event/diagnosis are to be referred to such a program.

Numerator: Number of patients in an outpatient clinical practice who have had a qualifying event/diagnosis during the previous 12 months, who have been referred to an outpatient CR program.

(Note: The program may include a traditional CR program based on face-to-face interactions and training sessions or other options that include home-based approaches. If alternative CR approaches are used, they should be designed to meet appropriate safety standards.

A referral is defined as an official communication between the healthcare provider and the patient to recommend and carry out a referral order to an outpatient CR program. This includes the provision of all necessary information to the patient that will allow the patient to enroll in an outpatient CR program. This also includes a communication from the healthcare provider and/or healthcare system to the CR program that includes necessary information for the patient’s referral information for the program. A hospital discharge summary or office note may potentially be formatted to include the necessary patient information to communicate to the CR program [the patient’s cardiovascular history, testing, and treatments, for instance]. All communications must maintain an appropriate level of confidentiality as outlined by the 1996 Health Insurance Portability and Accountability Act [HIPAA].)

Exclusion Criteria:

- Patient-oriented barriers (patient refusal, for example)
- Provider-oriented criteria (patient deemed to have a high-risk condition or a contraindication to exercise, for example)
Challenges to Implementation

Identification of all eligible patients in an outpatient clinical practice will require that a timely, accurate, and effective system be in place. Communication of referral information by the outpatient clinical practice team to the outpatient CR program represents a potential challenge to the implementation of this performance measure.

Appendix B

Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set B

PERFORMANCE MEASURE B-1

Structure-Based Measurement Set

The CR program has policies in place to demonstrate that:

1. A physician-director is responsible for the oversight of CR program policies and procedures and ensures that policies and procedures are consistent with evidence-based guidelines, safety standards, and regulatory standards. This includes appropriate policies and procedures for the provision of alternative CR program services, such as home-based CR.

2. An emergency response team is immediately available to respond to medical emergencies. In a hospital setting, physician supervision is presumed to be met when services are performed on hospital premises. In the setting of a freestanding outpatient CR program (owned/operated by a hospital, but not located on the main campus), a physician-directed emergency response team must be present and immediately available to respond to emergencies.

3. All professional staff members have successfully completed the National Cognitive and Skills examination in accordance with the AHA curriculum for basic life support (BLS) with at least 1 staff member present who has completed the National Cognitive and Skills examination in accordance with the AHA curriculum for advanced cardiac life support (ACLS) and has met state and hospital or facility medico-legal requirements for defibrillation and other related practices.

4. Functional emergency resuscitation equipment and supplies for handling cardiovascular emergencies are immediately available in the exercise area.

Numerator: The number of CR programs in the healthcare system that meet these structure-based performance measure criteria.

Appendix B

Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set B

PERFORMANCE MEASURE B-1

Structure-Based Measurement Set

The CR program has policies in place to demonstrate that:

1. A physician-director is responsible for the oversight of CR program policies and procedures and ensures that policies and procedures are consistent with evidence-based guidelines, safety standards, and regulatory standards. This includes appropriate policies and procedures for the provision of alternative CR program services, such as home-based CR.

2. An emergency response team is immediately available to respond to medical emergencies. In a hospital setting, physician supervision is presumed to be met when services are performed on hospital premises. In the setting of a freestanding outpatient CR program (owned/operated by a hospital, but not located on the main campus), a physician-directed emergency response team must be present and immediately available to respond to emergencies.

3. All professional staff members have successfully completed the National Cognitive and Skills examination in accordance with the AHA curriculum for basic life support (BLS) with at least 1 staff member present who has completed the National Cognitive and Skills examination in accordance with the AHA curriculum for advanced cardiac life support (ACLS) and has met state and hospital or facility medico-legal requirements for defibrillation and other related practices.

4. Functional emergency resuscitation equipment and supplies for handling cardiovascular emergencies are immediately available in the exercise area.

Numerator: The number of CR programs in the healthcare system that meet these structure-based performance measure criteria.
Denominator: All CR programs within a healthcare system.

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Written program policies

Rationale
The delivery of CR services is physician directed and provided by a multidisciplinary staff of healthcare professionals. A system for communication between a physician-director with expertise in CVD management and a referring or primary physician enhances the program's success in helping that patient achieve individualized target goals. It is the responsibility of the physician-director to assure that the information and instruction given to patients in CR is consistent with the most current clinical practice guidelines.

There is a growing trend among patients referred to and completing early outpatient CR to be older, at higher risk, and have more chronic comorbidities. Medical supervision is the most important day-to-day safety factor in CR. Personnel and equipment for ACLS are essential to the adequate delivery of emergency care for patients who experience cardiac arrest or other life-threatening events during CR sessions.

Although rare, cardiovascular emergencies can occur during exercise training in CR programs. Studies suggest that the incidence of cardiac arrest requiring defibrillation is approximately 1 arrest every 100,000 patient-hours. Practice guidelines for management of cardiac arrest include the use of BLS and ACLS strategies, such as early defibrillation. Such strategies have been shown to help improve outcomes in persons who experience cardiac arrest.

Some CR programs seek certification of their program by healthcare organizations, such as the AACVPR, in order to show that they meet certain standards for the delivery of CR services. Such a certification process, while outside the scope of this document, may result in documentation of a program’s ability to meet this (B-1) and other CR performance measures mentioned in this document. Currently, for instance, CR program certification through the AACVPR requires that all of the above policies (items 1 to 4 above) are in place and operational.

Corresponding Guidelines and Clinical Recommendations
Medical Director Responsibilities for Outpatient Cardiac Rehabilitation/Secondary Prevention Programs (no class of recommendation or level of evidence given)

There is a physician-director responsible for program oversight and to ensure that policies and procedures are consistent with evidence-based guidelines, safety standards, and regulatory standards.

Performance Measure B-2
Assessment of Risk for Adverse Cardiovascular Events
The CR program has the following processes in place:

1. Documentation, at program entry, that each patient undergoes an assessment of clinical status (eg, symptoms, medical history) in order to identify high-risk conditions for adverse cardiovascular events.

2. A policy to provide recurrent assessments for each patient during the time of participation in the CR program in order to identify any changes in clinical status that increase the patient’s risk of adverse cardiovascular events. If such findings are noted, the CR staff contacts the program’s physician director and/or the patient’s primary healthcare provider according to thresholds for communication included in the policies developed for Performance Measure B-3j.

Numerator: Number of CR programs in the healthcare system that meet the performance measure for assessment of risk for adverse cardiovascular events

Denominator: Number of CR programs in the healthcare system

Period of Assessment: Per reporting year
Method of Reporting: Inclusive data collection tracking sheet
Sources of Data: Written program policies

Rationale
A standardized assessment should be performed to identify patients with unstable symptoms and other factors that place the patient at increased risk for adverse cardiovascular events. When high-risk findings are noted, a patient should be considered for prompt evaluation and treatment, and rehabilitation recommendations should be adjusted accordingly.

Recurrent adverse cardiovascular events are relatively common in persons with CVD. In one study from Olmsted County, Minnesota, nearly half of patients discharged from the hospital following an MI had a recurrent adverse cardiovascular event in the 3 years following their MI.

However, adverse events are rare during CR early after a CVD event, occurring approximately once in every 100,000 patient-hours. This safety record is likely due in part to standard procedures that exist in CR programs to frequently screen patients for signs and symptoms that increase their risk for adverse cardiovascular events. If a CR participant develops abnormal cardiovascular signs (significant arrhythmias or blood pressure abnormalities, for example) or symptoms (exertional chest pain, for instance), they typically receive prompt evaluation and care.

Published reports suggest limited accuracy of the risk stratification methods from the AACVPR, ACC/AHA, and the American College of Physicians in identifying patients at risk for adverse events during CR sessions. However, one study found that a combination of the AACVPR criteria with a comorbidity index helped improve the accuracy of risk stratification, particularly among female patients. A significant limitation to these studies is the fact that patients identified at high risk undergo additional evaluation and treatment to lower their risk, thereby dampening the ability of such screening measures to accurately identify individuals at increased risk of adverse cardiovascular events.

This performance measure does not cover the assessment of modifiable risk factors, such as blood pressure, cholesterol, and diabetes. Assessment of modifiable risk factors related to CVD progression and recurrent CVD events is covered in Performance Measure B-3.

Corresponding Guidelines and Clinical Recommendations
AACVPR Guidelines for Cardiac Rehabilitation and Secondary Prevention Programs (no class of recommendation or level of evidence given)

All cardiac patients entering exercise rehabilitation should be stratified according to the risk for the occurrence of cardiac events during exercise.

Exercise Standards for Testing and Training: A statement for healthcare professionals from the American Heart Association (no class of recommendation or level of evidence given)

Screening procedures can be used that identify an individual who is at risk for an exercise-related cardiac event, which may be helpful in reducing these occurrences.

After the medical evaluation is complete, subjects can be classified by risk on the basis of their characteristics. This classification is used to determine the need for subsequent supervision and the level of monitoring required.

PERFORMANCE MEASURE B-3
Individualized Assessment and Evaluation of Modifiable Cardiovascular Risk Factors, Development of Individualized Interventions, and Communication With Other Healthcare Providers

This performance measure includes 10 individual submeasures for the evaluation of modifiable cardiovascular risk factors, development of individualized interventions, and communication with other healthcare providers concerning these risk factors and interventions.

The rationale for including both recognition and intervention for satisfactory fulfillment of these measures is predicated upon the belief that high-quality cardiovascular care requires both the identification and treatment of known cardiovascular risk factors.

An important component of this performance measure is the expectation that the CR staff communicates with appropriate primary care providers and treating physicians in order to help coordinate risk factor management and to promote life-long adherence to lifestyle and pharmacological therapies. (See Performance Measure B-3j for more specific coverage of communication with the patient's primary healthcare provider.)

PERFORMANCE MEASURE B-3A: INDIVIDUALIZED ASSESSMENT OF TOBACCO USE

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. An assessment is made of current and past tobacco use.
2. If current tobacco use is identified, an intervention plan is recommended to the patient and communicated to

AACVPR/ACC/AHA 2007 Performance Measures / 277
the primary care provider and/or cardiologist. This plan may include individual education, counseling, and/or referral to a tobacco cessation program.

3. Prior to completion of the CR program, the patient’s tobacco use status and tobacco avoidance treatment plan are reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

**Numerator:** Number of patients in the healthcare system’s CR program(s) who meet the performance measure for tobacco use

**Denominator:** Number of patients in the healthcare system’s CR program(s)

**Period of Assessment:** Per reporting year

**Method of Reporting:** Inclusive data collection tracking sheet

**Sources of Data:** Electronic or paper-based prospective flow sheet (preferred) or retrospective medical record review

**Rationale**

Cessation of tobacco use is most successful when healthcare providers work together with patients to identify and implement effective treatment strategies. Persons with CVD who stop smoking reduce their cardiovascular risk by approximately 35%.56,57

**Corresponding Guidelines and Clinical Recommendations**

AHA/ACC Guidelines for Secondary Prevention for Patients with Coronary and Other Atherosclerotic Vascular Disease: 2006 Update39

Class I

**Goal:** Complete cessation (level of evidence: B).

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update57 (no class of recommendation or level of evidence given)

Class I

**Short-term Goal:** Patient will demonstrate readiness to change by initially expressing decision to quit and selecting a quit date. Subsequently, patient will quit smoking and all tobacco use, adhere to pharmacological therapy (if prescribed), and practice relapse prevention strategies; patient will resume cessation plan as quickly as possible when temporary relapse occurs.

**Long-term Goal:** Complete abstinence from smoking and use of all tobacco products for at least 12 months (maintenance) from quit date.

**AHA Scientific Statement: Diet and Lifestyle Recommendations Revision 2006**58 (no class of recommendation or level of evidence given)

**Long-term Goal:** Avoid use of (and exposure to) tobacco products from quit date.

**Related Performance Measurement Sets**


- Percentage of patients queried 1 or more times during the reporting year about cigarette smoking.
- Percentage of patients identified as cigarette smokers who received smoking cessation intervention during the reporting year.

**Challenges to Implementation**

This measure relies on patient self-report.

**PERFORMANCE MEASURE B-3B: INDIVIDUALIZED ASSESSMENT OF BLOOD PRESSURE CONTROL**

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. An assessment is made of blood pressure (BP) control, with target goals defined by the AHA/ACC secondary prevention guidelines.
2. For patients with a diagnosis of hypertension, an intervention plan is developed. This should include education about target BP goals, medication compliance, lifestyle modification for optimal dietary and physical activity habits, and weight control.
3. During the CR program, BP control is reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

**Numerator:** Number of patients in the healthcare system’s CR program(s) who meet the performance measure for BP control

**Denominator:** Number of patients in the healthcare system’s CR program(s)

**Period of Assessment:** Per reporting year

**Method of Reporting:** Inclusive data collection tracking sheet

**Sources of Data:** Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review
Rationale
The BP levels represent a strong, consistent, continuous, independent, and etiologically relevant risk factor for cardiovascular and renal disease. Optimal control of BP has a beneficial impact on lowering cardiovascular risk.39,57

Corresponding Guidelines and Clinical Recommendations
AHA/ACC Guidelines for Secondary Prevention for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2006 Update39

Class I:
Goal: <140/90 mm Hg or <130/80 mm Hg if patient has diabetes or chronic kidney disease (level of evidence: B, for lifestyle modification; A, for pharmacological treatment).

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update58 (no class of recommendation or level of evidence given)

Goal: Continued assessment and modification of intervention until normalization of BP.

AHA Scientific Statement: Diet and Lifestyle Recommendations Revision 200658 (no class of recommendation or level of evidence given).

Goal: Aim for a normal BP.

Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. National High Blood Pressure Education Program59 (no class of recommendation or level of evidence given)

Treating systolic BP and diastolic BP to targets that are lower than 140/90 mm Hg is associated with a decrease in CVD complications. In patients with hypertension with diabetes or renal disease, the BP goal is lower than 130/80 mm Hg.

Related Performance Measurement Sets
Clinical Performance Measures: Chronic Stable Coronary Artery Disease. Tools Developed by Physicians for Physicians. Physician Consortium for Performance Improvement58

Percentage of patients who had a BP measurement during the last office visit.

PERFORMANCE MEASURE B-3C: INDIVIDUALIZED ASSESSMENT OF OPTIMAL LIPID CONTROL

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. An assessment of blood lipid control and use of lipid-lowering medications, with target goals defined by the AHA/ACC secondary prevention guidelines.
2. For patients with a diagnosis of hyperlipidemia, an intervention plan has been recommended to the patient. This should include education about target lipid goals, importance of medication compliance, lifestyle modification for optimal dietary and regular physical activity habits, and weight control.
3. Prior to completion of the CR program, lipid control and the lipid management plan, including lifestyle modification, are reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

Numerator: Number of patients in the healthcare system’s CR program(s) who meet the performance measure for lipid control

Denominator: Number of patients in the healthcare system’s CR program(s)

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review

Rationale
Multiple clinical trials have shown the benefit of lipid-lowering agents and lifestyle modification for patients with documented CVD.39 A more aggressive low-density lipoprotein target goal of <70 mg/dL should be considered for persons with multiple cardiovascular risk factors, particularly when they are under suboptimal control (e.g., a patient with coronary artery disease who continues to smoke).
Period of Assessment: Per reporting year

Method of Reporting: A standardized method for assessing physical activity is to be used, with results entered into an inclusive data collection tracking sheet.

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review.

Rationale:
Adherence to regular physical activity has been associated with a 20% to 30% reduction in all-causes mortality in patients with CVD.

Corresponding Guidelines and Clinical Recommendations:
AHA/ACC Guidelines for Secondary Prevention for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2006 Update

Class I:
- **Goal:** 30 minute, 7 days per week (minimum 5 days per week) (level of evidence: B).

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update (no class of recommendation or level of evidence given)

- **Goal:** 30 to 60 minute per day of moderate-intensity physical activity on 5 or more (preferably most) days of the week.

Exercise and Physical Activity in the Prevention and Treatment of Atherosclerotic Cardiovascular Disease: A statement from the Council on Clinical Cardiology (Subcommittee on Exercise, Rehabilitation, and Prevention) and the Council on Nutrition, Physical Activity, and Metabolism (Subcommittee on Physical Activity) (no class of recommendation or level of evidence given)

- **Goal:** Aim for recommended levels of low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, and triglycerides.

Challenges to Implementation:
Community-based exercise may not utilize modalities designed for elderly patients and those with neurological and musculoskeletal disease, making continued regular physical activity a challenge for some patients.

PERFORMANCE MEASURE B-3D: INDIVIDUALIZED ASSESSMENT OF PHYSICAL ACTIVITY HABITS

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. An assessment of current physical activity habits.
2. If physical activity habits at time of program entry do not meet suggested guidelines as defined by the AHA/ACC secondary prevention guidelines, then recommendations to improve physical activity habits are given to the patient.
3. Prior to completion of the CR program, physical activity habits and the physical activity intervention plan are reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

**Numerator:** Number of patients in the healthcare system’s CR program(s) who meet the performance measure for physical activity habits.

**Denominator:** Number of patients in the healthcare system’s CR program(s)

PERFORMANCE MEASURE B-3E: INDIVIDUALIZED ASSESSMENT OF WEIGHT MANAGEMENT

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. An assessment of current weight management habits.
2. If weight management habits at time of program entry do not meet suggested guidelines as defined by the AHA/ACC secondary prevention guidelines, then recommendations to improve weight management habits are given to the patient.
3. If patients are not at goal weight, they are encouraged to achieve and maintain a healthy weight.

**Numerator:** Number of patients in the healthcare system’s CR program(s) who meet the performance measure for weight management habits.

**Denominator:** Number of patients in the healthcare system’s CR program(s)
been met:

1. An assessment of body weight/composition, including the measurement of either body mass index or waist circumference, with targets as defined by the AHA/ACC secondary prevention guidelines.

2. If the body weight/composition measure(s) is (are) above recommended goal(s), then an intervention plan is recommended to the patient. This should include education about target goals and lifestyle modification including a healthy diet, behavior change, and regular physical activity and/or referral to a weight management program.

3. Prior to completion of the CR program, body weight/composition and the intervention plan are reassessed and communicated to the patient as well as the primary care provider and/or cardiologist.

Numerator: Number of patients in the healthcare system's CR program(s) who meet the performance measure for assessment of weight management

Denominator: Number of patients in the healthcare system's CR program(s)

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review

Rationale

Obesity is an independent risk factor for CVD and adversely affects CVD risk factors. By adhering to diet and lifestyle recommendations, patients can substantially reduce their risk of CVD.

Corresponding Guidelines and Clinical Recommendations

AHA/ACC Guidelines for Secondary Prevention for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2006 Update

Goal: Body mass index: 18.5–24.9 kg/m²; waist circumference: men <40 in.; women <35 in. (level of evidence: B).

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update (no class of recommendation or level of evidence given)

Short-term Goal: Continued assessment and modification of interventions until progressive weight loss is achieved. Provide referral to specialized, validated nutrition weight loss programs if weight goals are not achieved.

Long-term Goal: Adherence to diet and physical activity/exercise program aimed toward attainment of established weight goal.

AHA Scientific Statement: Diet and Lifestyle Recommendations Revision 2006 (no class of recommendation or level of evidence given)

Goal: Aim for a healthy body weight.

(No class of recommendation or level of evidence given)

Goals: Balance energy intake and physical activity to achieve and maintain a healthy body weight; consume a diet rich in vegetables and fruits; choose whole-grain, high-fiber foods; consume fish, especially oily fish, at least twice a week; limit intake of saturated fat to less than 7% of energy, trans fat to less than 1% of energy, and cholesterol to less than 300 mg/d by choosing lean meats and vegetable alternatives, fat-free (skim) or low-fat (1% fat) dairy products and minimize intake of partially hydrogenated fats; minimize intake of beverages and foods with added sugars; choose and prepare foods with little or no salt; if you consume alcohol, do so in moderation; and when you eat food prepared outside of the home, follow these diet and lifestyle recommendations.

Challenges to Implementation

Weight management relies on patient compliance with diet and lifestyle recommendations.

PERFORMANCE MEASURE B-3F: INDIVIDUALIZED ASSESSMENT OF THE DIAGNOSIS OF DIABETES MELLITUS OR IMPAIRED FASTING GLUCOSE

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. Assessment of the diagnosis of impaired fasting glucose (IFG) and diabetes mellitus (DM), with definitions as described in the most recent American Diabetes Association (ADA) Standards of Medical Care in Diabetes Position Statement.

2. If the patient has a diagnosis of IFG or DM, then an intervention plan is recommended to the patient for glycemic monitoring during exercise, for glycemic goals, and for recommendations concerning medical nutrition therapy (MNT) and/or skill training sessions (if not previously attended).

3. Prior to completion of the CR program, DM/IFG status and the DM/IFG intervention plan are reassessed and
People with DM should receive DM self-management education according to national standards when their DM is diagnosed and as needed thereafter (level of evidence: B, see above).

AHA/ACC Guidelines for Secondary Prevention for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2006 Update

Class I

Initiate lifestyle and pharmacotherapy to achieve near-normal HbA1c (level of evidence: B). Begin vigorous modification of other risk factors (level of evidence: B). Coordinate diabetic care with patient's primary care physician or endocrinologist (level of evidence: C).

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update (no class of recommendation or level of evidence given)

Educate patient and staff to be alert for signs/symptoms of hypoglycemia or hyperglycemia and provide appropriate assessment and interventions.

Teach and practice self-monitoring skills for use during unsupervised exercise. Refer to registered dietitian for MNT. Consider referral to certified diabetic educator for skill training, medication instruction, and support groups.

Challenges to Implementation

Patients may not be aware that they have IFG or DM. In addition, it may be difficult for CR staff to obtain medical records to verify or refute the diagnosis. Given the latter, either patient self-report or medical records, if available, may be used to meet these criteria.

PERFORMANCE MEASURE B-3G:
INDIVIDUALIZED ASSESSMENT OF THE PRESENCE OR ABSENCE OF DEPRESSION

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. Assessment of the presence or absence of depression, using a valid and reliable screening tool.
2. If clinical depression is suspected as a result of screening, this has been discussed with the patient.
3. If clinical depression is suspected as a result of screening, the primary care provider and/or mental healthcare provider have been notified.

Numerator: Number of patients in the healthcare system's CR program(s) who meet the performance measure for depression
Denominator: Number of patients in the healthcare system's CR program(s)

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review

Rationale
Depression is highly prevalent among patients following acute cardiac events, with 20% to 45% of patients suffering significant levels of depressive symptoms after an acute MI. Depression has been shown to be a powerful, independent risk factor for cardiac mortality after an acute MI or unstable angina. Several studies suggest that depressed patients with CVD benefit from CR programs by improving coping skills and self-image, reducing biological risk factors such as social isolation and smoking, providing emotional support, and improving quality-of-life scores.

Corresponding Guidelines and Clinical Recommendations
Depression Screening in Cardiac Rehabilitation: AACVPR Task Force Report (no class of recommendation or level of evidence given)

The AACVPR recommends that appropriately trained healthcare professionals in the CR setting assess for depression using a valid and reliable screening tool and ask specific questions about depression as a part of the intake assessment and/or clinical interview. They also recommend that cardiac rehabilitation professionals communicate findings indicating possible clinical depression to referring physicians, facilitate referral of patients for appropriate treatment, and periodically reassess therapeutic progress.

Challenges to Implementation
Depression screening includes patient self-report, but validated self-report tools are available to help facilitate screening for depression.

PERFORMANCE MEASURE B-3H:
INDIVIDUALIZED ASSESSMENT OF EXERCISE CAPACITY

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. Assessment of maximal or submaximal exercise capacity, using at least 1 of several possible assessment methods that have standard end points as defined by groups such as the American College of Sports Medicine and ACC/AHA practice guidelines and scientific statements.

2. An individualized exercise prescription, based on the assessment of exercise capacity, is recommended to the patient and communicated to the primary care provider and/or cardiologist.

3. Prior to completion of the CR program, change in exercise capacity is reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

Numerator: Number of patients in the healthcare system's CR program(s) who meet the performance measure for assessment of exercise capacity

Denominator: Number of patients in the healthcare system's CR program(s)

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review

Rationale
Meta-analyses and systematic reviews have concluded that comprehensive, exercise-based CR reduces mortality rates in patients with CVD.

Corresponding Guidelines and Clinical Recommendations
Depression Screening in Cardiac Rehabilitation: AACVPR Task Force Report (no class of recommendation or level of evidence given)

The AACVPR recommends that appropriately trained healthcare professionals in the CR setting assess for depression using a valid and reliable screening tool and ask specific questions about depression as a part of the intake assessment and/or clinical interview. They also recommend that cardiac rehabilitation professionals communicate findings indicating possible clinical depression to referring physicians, facilitate referral of patients for appropriate treatment, and periodically reassess therapeutic progress.

Challenges to Implementation
Depression screening includes patient self-report, but validated self-report tools are available to help facilitate screening for depression.

PERFORMANCE MEASURE B-3H:
INDIVIDUALIZED ASSESSMENT OF EXERCISE CAPACITY

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. Assessment of maximal or submaximal exercise capacity, using at least 1 of several possible assessment methods that have standard end points as defined by groups such as the American College of Sports Medicine and ACC/AHA practice guidelines and scientific statements.

2. An individualized exercise prescription, based on the assessment of exercise capacity, is recommended to the patient and communicated to the primary care provider and/or cardiologist.

3. Prior to completion of the CR program, change in exercise capacity is reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

Numerator: Number of patients in the healthcare system's CR program(s) who meet the performance measure for assessment of exercise capacity

Denominator: Number of patients in the healthcare system's CR program(s)

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review

Rationale
Meta-analyses and systematic reviews have concluded that comprehensive, exercise-based CR reduces mortality rates in patients with CVD.

Corresponding Guidelines and Clinical Recommendations
Depression Screening in Cardiac Rehabilitation: AACVPR Task Force Report (no class of recommendation or level of evidence given)

The AACVPR recommends that appropriately trained healthcare professionals in the CR setting assess for depression using a valid and reliable screening tool and ask specific questions about depression as a part of the intake assessment and/or clinical interview. They also recommend that cardiac rehabilitation professionals communicate findings indicating possible clinical depression to referring physicians, facilitate referral of patients for appropriate treatment, and periodically reassess therapeutic progress.

Challenges to Implementation
Depression screening includes patient self-report, but validated self-report tools are available to help facilitate screening for depression.

PERFORMANCE MEASURE B-3H:
INDIVIDUALIZED ASSESSMENT OF EXERCISE CAPACITY

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. Assessment of maximal or submaximal exercise capacity, using at least 1 of several possible assessment methods that have standard end points as defined by groups such as the American College of Sports Medicine and ACC/AHA practice guidelines and scientific statements.

2. An individualized exercise prescription, based on the assessment of exercise capacity, is recommended to the patient and communicated to the primary care provider and/or cardiologist.

3. Prior to completion of the CR program, change in exercise capacity is reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

Numerator: Number of patients in the healthcare system's CR program(s) who meet the performance measure for assessment of exercise capacity

Denominator: Number of patients in the healthcare system's CR program(s)

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review

Rationale
Meta-analyses and systematic reviews have concluded that comprehensive, exercise-based CR reduces mortality rates in patients with CVD.

Corresponding Guidelines and Clinical Recommendations
Depression Screening in Cardiac Rehabilitation: AACVPR Task Force Report (no class of recommendation or level of evidence given)

The AACVPR recommends that appropriately trained healthcare professionals in the CR setting assess for depression using a valid and reliable screening tool and ask specific questions about depression as a part of the intake assessment and/or clinical interview. They also recommend that cardiac rehabilitation professionals communicate findings indicating possible clinical depression to referring physicians, facilitate referral of patients for appropriate treatment, and periodically reassess therapeutic progress.

Challenges to Implementation
Depression screening includes patient self-report, but validated self-report tools are available to help facilitate screening for depression.

PERFORMANCE MEASURE B-3H:
INDIVIDUALIZED ASSESSMENT OF EXERCISE CAPACITY

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. Assessment of maximal or submaximal exercise capacity, using at least 1 of several possible assessment methods that have standard end points as defined by groups such as the American College of Sports Medicine and ACC/AHA practice guidelines and scientific statements.

2. An individualized exercise prescription, based on the assessment of exercise capacity, is recommended to the patient and communicated to the primary care provider and/or cardiologist.

3. Prior to completion of the CR program, change in exercise capacity is reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

Numerator: Number of patients in the healthcare system's CR program(s) who meet the performance measure for assessment of exercise capacity

Denominator: Number of patients in the healthcare system's CR program(s)

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review

Rationale
Meta-analyses and systematic reviews have concluded that comprehensive, exercise-based CR reduces mortality rates in patients with CVD.

Corresponding Guidelines and Clinical Recommendations
Depression Screening in Cardiac Rehabilitation: AACVPR Task Force Report (no class of recommendation or level of evidence given)

The AACVPR recommends that appropriately trained healthcare professionals in the CR setting assess for depression using a valid and reliable screening tool and ask specific questions about depression as a part of the intake assessment and/or clinical interview. They also recommend that cardiac rehabilitation professionals communicate findings indicating possible clinical depression to referring physicians, facilitate referral of patients for appropriate treatment, and periodically reassess therapeutic progress.

Challenges to Implementation
Depression screening includes patient self-report, but validated self-report tools are available to help facilitate screening for depression.

PERFORMANCE MEASURE B-3H:
INDIVIDUALIZED ASSESSMENT OF EXERCISE CAPACITY

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. Assessment of maximal or submaximal exercise capacity, using at least 1 of several possible assessment methods that have standard end points as defined by groups such as the American College of Sports Medicine and ACC/AHA practice guidelines and scientific statements.

2. An individualized exercise prescription, based on the assessment of exercise capacity, is recommended to the patient and communicated to the primary care provider and/or cardiologist.

3. Prior to completion of the CR program, change in exercise capacity is reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

Numerator: Number of patients in the healthcare system's CR program(s) who meet the performance measure for assessment of exercise capacity

Denominator: Number of patients in the healthcare system's CR program(s)

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review

Rationale
Meta-analyses and systematic reviews have concluded that comprehensive, exercise-based CR reduces mortality rates in patients with CVD.

Corresponding Guidelines and Clinical Recommendations
Depression Screening in Cardiac Rehabilitation: AACVPR Task Force Report (no class of recommendation or level of evidence given)

The AACVPR recommends that appropriately trained healthcare professionals in the CR setting assess for depression using a valid and reliable screening tool and ask specific questions about depression as a part of the intake assessment and/or clinical interview. They also recommend that cardiac rehabilitation professionals communicate findings indicating possible clinical depression to referring physicians, facilitate referral of patients for appropriate treatment, and periodically reassess therapeutic progress.

Challenges to Implementation
Depression screening includes patient self-report, but validated self-report tools are available to help facilitate screening for depression.

PERFORMANCE MEASURE B-3H:
INDIVIDUALIZED ASSESSMENT OF EXERCISE CAPACITY

For each eligible patient enrolled in the CR program, there is documentation that the following criteria have been met:

1. Assessment of maximal or submaximal exercise capacity, using at least 1 of several possible assessment methods that have standard end points as defined by groups such as the American College of Sports Medicine and ACC/AHA practice guidelines and scientific statements.

2. An individualized exercise prescription, based on the assessment of exercise capacity, is recommended to the patient and communicated to the primary care provider and/or cardiologist.

3. Prior to completion of the CR program, change in exercise capacity is reassessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

Numerator: Number of patients in the healthcare system's CR program(s) who meet the performance measure for assessment of exercise capacity

Denominator: Number of patients in the healthcare system's CR program(s)

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review

Rationale
Meta-analyses and systematic reviews have concluded that comprehensive, exercise-based CR reduces mortality rates in patients with CVD.

Corresponding Guidelines and Clinical Recommendations
Depression Screening in Cardiac Rehabilitation: AACVPR Task Force Report (no class of recommendation or level of evidence given)

The AACVPR recommends that appropriately trained healthcare professionals in the CR setting assess for depression using a valid and reliable screening tool and ask specific questions about depression as a part of the intake assessment and/or clinical interview. They also recommend that cardiac rehabilitation professionals communicate findings indicating possible clinical depression to referring physicians, facilitate referral of patients for appropriate treatment, and periodically reassess therapeutic progress.

Challenges to Implementation
Depression screening includes patient self-report, but validated self-report tools are available to help facilitate screening for depression.
Challenges to Implementation
In some cases, results of recent stress tests are available to assess exercise capacity, but this is not universal. The CR program may use an alternative assessment of exercise capacity, such as submaximal treadmill testing or a 6-minute walk.

PERFORMANCE MEASURE B-3J: INDIVIDUALIZED ADHERENCE TO PREVENTIVE MEDICATIONS

For each eligible patient with coronary artery disease enrolled in the CR program, there is documentation that the following criterion has been met:

The patient has received individual or group education concerning the importance of adherence to preventive medications that are described in the AHA/ACC secondary prevention guidelines. (Note: Patients should be encouraged to discuss questions or concerns about prescribed preventive medications with their healthcare providers.)

Numerator: Number of patients in the healthcare system’s CR program(s) who meet the performance measure for adherence to preventive medications

Denominator: Number of patients in the healthcare system’s CR program(s)

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Electronic- or paper-based prospective flow sheet (preferred) or retrospective medical record review

Rationale
The use of preventive medications that may or may not be tied to a specific risk factor (aspirin, omega-3 fatty acids, β-blockers, and angiotensin-converting enzyme inhibitor/angiotensin-receptor blocker agents, for instance) are also critically important in reducing recurrent cardiovascular events in patients enrolled in a CR program. A gap in their usage is common, but can be corrected with the help of systematic programs, such as CR programs, that can promote the appropriate use of preventive medications and thereby improve patient outcomes.26

Corresponding Guidelines and Clinical Recommendations
AHA/ACC Guidelines for Secondary Prevention for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2006 Update29

Class I: Use of antiplatelet agents, renin-angiotensin-aldosterone system blockers, and β-blockers (level of evidence: B).

Related Performance Measurement Sets

Percentage of patients receiving antiplatelet therapy, drug therapy for lowering cholesterol, or β-blocker therapy post-MI.

ACC/AHA STEMI/NSTEMI Clinical Performance Measures72

Patients with acute MI without contraindications who are prescribed the following drug at discharge: (1) aspirin, (2) β-blocker, (3) lipid-lowering therapy, or (4) angiotensin-converting enzyme inhibitor or angiotensin-receptor blocker for left ventricular systolic dysfunction.

Challenges to Implementation
Rehabilitation teams need to understand how current clinical practice guidelines relate to individual patients in order to optimize education.

PERFORMANCE MEASURE B-3J: COMMUNICATION WITH HEALTHCARE PROVIDERS

There is a policy in place to ensure communication with healthcare providers, including individual patient status related to each modifiable risk factor at entrance to and completion of the CR program, as well as when thresholds are met for more frequent or urgent communication concerning suboptimal risk factor control.

Numerator: The number of CR programs in the healthcare system that meet the performance measure for communication with healthcare providers

Denominator: The number of CR programs in the healthcare system

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

Sources of Data: Written program policies

Rationale
Optimal communication between the CR team and appropriate healthcare providers will promote timely adjustments in a patient’s medical regimen, leading to improved risk factor modification.
Sources of Data: Written program policies

Rationale
Continuous QI relies on collecting information about individual response to therapy as well as analysis of aggregate data to assess program effectiveness. The recommendation is that each CR program provides evidence of a standardized method to document individual patient outcomes on completion of the course of CR as defined on intake to the CR program which, in aggregate, will permit documentation of program effectiveness and QI initiative success.

Outcome assessment and evaluation provides evidence of effectiveness of therapeutic interventions. According to a recent report of the National Heart, Lung, and Blood Institute, this enhances the migration of best practice to clinical practice, improves decision making and the quality of care provided, and supports the optimal allocation of healthcare resources for all patients.73

The 2004 AACVPR consensus statement document suggests that “no single form [or] assessment protocol… will fit the needs of all programs.”74 The document gives examples of outcome measures for evaluating program effectiveness and communicating with other healthcare professionals, providing the basis for a flexible “structural framework… that will guide programs in the development of standardized assessment protocols that fit their specific needs.”74

Initiation and completion of the prescribed course of CR, as defined on admission assessment, are keys to promoting both life-long behavior change as well as physiological adaptations from regular exercise. Comprehensive CR programs include core components designed to address secondary prevention issues that can improve patient self-management. Reassessment of outcome measures after completion of CR can help programs assess their performance in each of these core components. It is anticipated that programs would assess different core components outcomes over time, using aggregate results to assess issues such as overall program performance, alternative approaches to programming, and programming in underserved populations such as minorities, women, and the elderly.

Corresponding Guidelines and Clinical Recommendations
AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update77 (no class of recommendation or level of evidence given)

Medical Director Responsibilities for Outpatient Cardiac Rehabilitation/Secondary Prevention Programs73 (no class of recommendation or level of evidence given)

By working closely with referring physicians, the cardiac rehabilitation team can assist the patient in reaching target goals more effectively.

Challenges to Implementation
CR programs may not have access to all data related to risk factor control, such as most recent lipid profile, HbA_1c, or patient-specific contraindications to preventive medications.

PERFORMANCE MEASURE B-4

Monitor Response to Therapy and Document Program Effectiveness

For each CR program in a healthcare system, a written policy is in place to:

1. Document the percentage of patients for whom the CR program has received a formal referral request who actually enroll in the program.
2. Document for each patient a standardized plan to assess completion of the prescribed course of CR as defined on entrance to the program.
3. Document for each patient a standardized plan to assess outcome measurements at the initiation and again at the completion of CR, including at least 1 outcome measure for the core program components as outlined in the Cardiac Rehabilitation/Secondary Prevention Performance Measure Set B, Performance Measure 3.
4. Describe the program’s methodology to document program effectiveness and initiate QI strategies.

Numerator: Number of CR programs in the healthcare system that meet this performance measure for monitoring response to therapy and documenting program effectiveness

Denominator: Number of CR programs in the healthcare system

Period of Assessment: Per reporting year

Method of Reporting: Inclusive data collection tracking sheet

www.jcrjournal.com
Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update (no class of recommendation or level of evidence given)

The assessment and evaluation of at least 1 of the expected outcome measures is recommended for each of the core cardiac rehabilitation components.

Appendix C

Sample Rating Form and Rating Form Guide

Sample Rating Form

Name of Measure: 
Clinical Rationale: 
Numerator: 
Denominator: 
Measure: 
Rate this measure on the following criteria:

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Moderate Agreement</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Useful in Improving Patient Outcomes

1. Evidence-based: The scientific basis of the measure is well established
   1 2 3 4 5

2. Interpretable: The results of the measure are interpretable by practitioners
   1 2 3 4 5

3. Actionable: The measure addresses an area that is under the practitioner's control
   1 2 3 4 5

Measure Design

1. Denominator: The patient group to whom this measure applies (denominator) is clinically meaningful
   1 2 3 4 5

2. Numerator: The definition of conformance for this measure is clinically meaningful
   1 2 3 4 5

3. Validity:
   a. The measure appears to measure what it is intended to (face validity)
      1 2 3 4 5
   b. The measure captures most meaningful aspects of care (content validity)
      1 2 3 4 5
   c. The measure correlates well with other measures of the same aspect of care (construct validity)
      1 2 3 4 5

4. Reliability: The measure is likely to be reproducible across organizations and delivery settings.
   1 2 3 4 5

Measure Implementation

1. Feasibility
   a. The data required for the measure are likely to be obtained with reasonable effort
      1 2 3 4 5
   b. The data required for the measure are likely to be obtained at reasonable cost
      1 2 3 4 5
   c. The data required for the measure are likely to be obtained within the period allowed for data collection
      1 2 3 4 5

Overall Assessment

Considering your assessment of this measure on all dimensions above, rate this measure overall for inclusion into the performance measurement set

<table>
<thead>
<tr>
<th>Do Not Include</th>
<th>Could Include</th>
<th>Must Include</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rating Form Guide

Attribute of Performance

Useful in Improving Patient Outcomes

1. Evidence-based: The scientific basis of the measure is well established.
   This can be confirmed by explicit reference to a published clinical practice guideline.

2. Interpretable: The results of the measure are interpretable by practitioners.
   This is your assessment of the degree with which a provider can clearly understand what the results mean and can take action if necessary.

3. **Actionable**: The measure addresses an area that is under the practitioner's control.

**Measure Design**

1. **Denominator**: The patient group to whom this measure applies (denominator) is clinically meaningful.

2. **Numerator**: The definition of conformance for this measure is clinically meaningful.

3. **Validity**:  
   a. The measure appears to measure what it is intended to (face validity).
   b. The measure captures most meaningful aspects of care (content validity).
   c. The measure correlates well with other measures of the same aspect of care (construct validity).

4. **Reliability**: The measure is likely to be reproducible across organizations and delivery settings.

**Measure Implementation**

1. **Feasibility**:  
   a. The data required for the measure are likely to be obtained with reasonable effort.
   b. The data required for the measure are likely to be obtained at reasonable cost.
   c. The data required for the measure are likely to be obtained within the period allowed for data collection.

**Overall Assessment**

Considering your assessment of this measure on all dimensions above, rate this measure for overall inclusion in the performance measurement set.

---

**Appendix D**

**Author Relationships With Industry: AACVPR/ACC/AHA Cardiac Rehabilitation/Secondary Prevention Performance Measures**

<table>
<thead>
<tr>
<th>Writing Committee Member</th>
<th>Research Grant</th>
<th>Speakers’ Bureau/ Honoraria/Expert Witness</th>
<th>Stock Ownership</th>
<th>Consultant/Advisory Board/Steering Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randal J. Thomas, MD, MS, FAHA</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Marjorie King, MD, FAACVPR, FACC</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Healthways</td>
</tr>
<tr>
<td>Karen Lui, RN, MS, FAACVPR</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Neil Oldridge, PhD, FAACVPR</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Ileana L. Piña, MD, FACC</td>
<td>Novartis, NIH</td>
<td>AstraZeneca, Novartis</td>
<td>None</td>
<td>FDA</td>
</tr>
<tr>
<td>John Spertus, MD, MPH, FACC</td>
<td>Amgen, Atherotech, Roche Diagnostics</td>
<td>Health Outcomes Services</td>
<td>Amgen, United Healthcare, Outcomes Instruments</td>
<td></td>
</tr>
</tbody>
</table>

References


37. Zafing K, Schad SP, Salz KA, et al. Mayo Clinic’s Order Set for Provider Referral to Outpatient Cardiac Rehabilitation (Phase II). Rochester, Minn: Mayo Foundation for Medical Education and Research; 2005.


AACVPR/AHA 2007 Performance Measures / 289


