AACVPR/ACC/AHA 2007 Performance Measures on Cardiac Rehabilitation for Referral to and Delivery of Cardiac Rehabilitation/Secondary Prevention Services

Endorsed by the American College of Chest Physicians, American College of Sports Medicine, American Physical Therapy Association, Canadian Association of Cardiac Rehabilitation, European Association for Cardiovascular Prevention and Rehabilitation, Inter-American Heart Foundation, National Association of Clinical Nurse Specialists, Preventive Cardiovascular Nurses Association, and the Society of Thoracic Surgeons

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Preamble

Medicine is experiencing an unprecedented focus on quantifying and improving health care quality. The American College of Cardiology (ACC) and the American Heart Association (AHA) have developed a multi-faceted 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 to the care of individual patients, and these guidelines can be generated with varying degrees of confidence based upon 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 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.[1]

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 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 system 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 will 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 quality improvement 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.

While the focus of the performance measures writing committees is to develop measures for internal quality improvement, 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 Appendixes 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 quality improvement (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 will 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,

Table 1. Applying Classification of Recommendations and Level of Evidence†

"Estimate of Certainty (Precision) of Treatment Effect"		"SIZE of TREATMENT EFFECT"			
		Class I *Benefit >>> Risk* Procedure/Treatment SHOULD be performed/administered	**Class IIa** *Benefit >> Risk* **Additional studies with focused objectives needed** IT IS REASONABLE to perform procedure/administer treatment	**Class IIb** *Benefit ≥ Risk* *Additional studies with broad objectives needed; Additional registry data would be helpful* Procedure/Treatment MAY BE CONSIDERED	**Class III** *Risk ≥ Benefit* *No additional studies needed* Procedure/Treatment should NOT be performed/administered SINCE IT IS NOT HELPFUL AND MAY BE HARMFUL
	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	• Recommendation in favor of treatment or procedure being useful/effective • Some conflicting evidence from multiple randomized trials or meta-analyses	• Recommendation's usefulness/efficacy less well established • Greater conflicting evidence from multiple randomized trials or meta-analyses	• Recommendation that procedure or treatment not useful/effective and may be harmful • 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 non-randomized studies	• Recommendation in favor of treatment or procedure being useful/effective • Some conflicting evidence from single randomized trial or non-randomized studies	• Recommendation's usefulness/efficacy less well established • Greater conflicting evidence from single randomized trial or non-randomized studies	• Recommendation that procedure or treatment not useful/effective and may be harmful • Limited evidence from single randomized trial or non-randomized 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	• Recommendation in favor of treatment or procedure being useful/effective • Only diverging expert opinion, case studies, or standard-of-care	• Recommendation's usefulness/efficacy less well established • Only diverging expert opinion, case studies, or standard-of-care	• Recommendation that procedure or treatment not useful/effective and may be harmful • Only expert opinion, case studies, or standard-of-care

*Data 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.

†In 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 will increase readers' comprehension of the guidelines and will allow queries at the individual recommendation level.

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 health care 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 health care 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
Chair, ACC/AHA Task Force on Performance Measures

I. Introduction

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[2–12] and has been promoted by various health care organizations and position statements.[4,12–18] 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 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 in order 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), and heart transplant 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.

A. Rationale for Cardiac Rehabilitation/Secondary Prevention Performance Measures

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 of 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 pre-thrombolytic era.[9,21] Because of this mounting evidence, a number of health care organizations have endorsed the use of CR services in persons with CVD by including provisions for CR in their practice guidelines and practice management position papers.[4,12,13,18,21–23]
- Despite the known benefits of CR and despite the widespread endorsement of its use, CR is vastly underutilized, with less than 30% of eligible patients participating in a CR program after a CVD event.[24–26] Reasons for this gap in CR participation are numerous, but the most critical and potentially most correctable reasons revolve around obstacles in the initial referral of patients to CR programs. These obstacles can be reduced through the systematic adoption of standing orders and other similar tools for CR referral for appropriate hospitalized patients.[27] Furthermore, physician accountability associated with the use of these performance measures may lead to new and novel approaches to improve referral rates and improve the outcome of patients with CVD.
- Standards for CR programs have been previously published,[28] and systems for CR program certification exist, such as the certification process offered through the AACVPR for CR programs that meet their 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%) out of an estimated 2,621 CR programs operating in the United States have AACVPR certification[29] (personal communication, A. Lynn, 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.

B. 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 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.

C. Relationships With Industry

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

D. 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 C. 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.

II. Methodology

A. Definition of Cardiac Rehabilitation/Secondary Prevention

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 programs that have 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.[2,4,12]

Building on this original definition, a number of other complementary definitions of CR have been promulgated by various organizations including the U.S. Public Health Service, the AHA, the AACVPR, and the Canadian Association of Cardiac Rehabilitation.[4,18] These updated definitions emphasize the integral role of CR in the secondary prevention of CVD.

The definition used by the U.S. 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 counselling. 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]

Cardiac rehabilitation/secondary prevention programs are generally divided into 3 main phases:

1. Inpatient CR (also known as Phase 1 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 2 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 3 or Phase 4 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.

B. Definition of Appropriate Patients for Cardiac Rehabilitation/Secondary Prevention

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*
- 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 *), 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 benefit of CR for persons with chronic heart failure or peripheral arterial disease.[35,36] However, formal recommendations by health care 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 (e.g., patient refusal), others that are provider-oriented (e.g., 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 health care system and/or societal barriers (e.g., lack of a CR program, lack of insurance coverage, etc.).[17] Patients with such barriers may be excluded from the number of patients who are considered to be eligible for CR referral (Appendix A, under "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 can benefit from at least some components of a comprehensive, secondary prevention CR program.

C. Overview of Performance Measures Created

Both structure-based 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 health care 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).

D. 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 transplant.[12] Outpatient, medically supervised CR, as described by the U.S. 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 Section II.A.).[4]

Meta-analyses and systematic reviews[2,3,5–11] 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%[2,3,5–11] and a trend towards reduction in nonfatal recurrent MI over a median follow-up of 12 months.[10]

E. 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 39 factors according to guidelines established by the ACC/AHA Task Force on Performance Measures.[1] Those measures that were deemed to be most evidence-based, interpretable, actionable, clinically meaningful, valid, reliable, and feasible were included
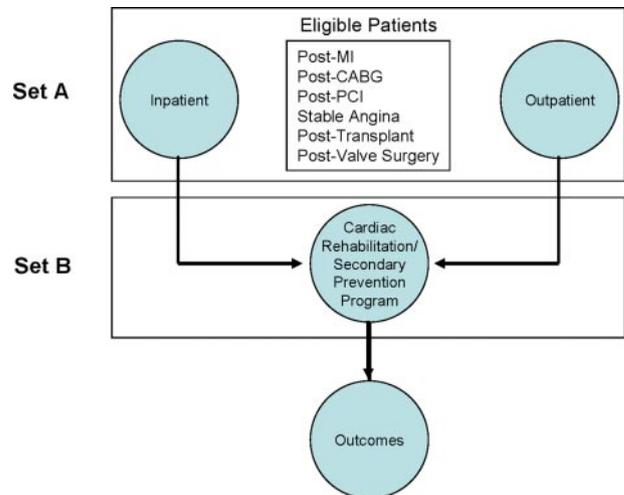
Figure 1. Intended Application of the Cardiac Rehabilitation/ Secondary Prevention Performance Measurement Sets A and B. Diagram shows the relationship between the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Sets A and B and the patient sub-groups for which the Performance Measurement Sets apply. CABG = coronary artery bypass grafting; MI = myocardial infarction; PCI = percutaneous coronary intervention.

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). Figure 1 outlines the overall organization of these 2 types of measures and their intended applications.

III. 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.

A. 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 Section II.B. The CR services are generally most beneficial when delivered soon after the index hospitalization. However, there are often clinical, social, and logistical reasons which 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 health care systems as well as physician practices and other health care settings with primary responsibility for the care of patients after a CVD event.

B. 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 health care provider.

It should be noted that the health care system and its providers who care for patients during and/or after CVD events are accountable for these performance measures. Physicians or other health care 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 exam on a diabetic patient in the year after their 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.

C. 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. In Figure 2, an example is shown of a standardized CR referral tool that health care 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 health care 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. Health care systems and providers are encouraged to develop and implement systematic tools that are most appropriate and most effective for their particular setting and patient population groups.

D. Inclusion in Other Performance Measurement Sets

The Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set A (Appendix A) is designed to be included in (i.e., "plugged into") other related performance measurement sets for which referral to a CR program would be considered an appropriate component of high-quality care (e.g., can be "plugged into" the performance measurement set for management of patients with myocardial infarction).

IV. 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.

A. Populations, Care Period, and Responsible Parties

Patients who are appropriate for entry into a CR program include persons 18 years of age or older who, during the previous year, have had 1 or more of the qualifying diagnoses listed in Section II.B. Patients who are considered ineligible for CR services, by patient-oriented or provider-oriented criteria (see Section II.B.), 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 health care 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.

B. 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 the Committee members.

The measures selected include both structure- and process-based measures that assess for the use of 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 Measures B-2, B-3a to B-3j, 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 health care providers

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   □ Coronary Artery Disease (CAD)
□ Percutaneous Coronary Intervention (PCI)   □ Heart Transplant
□ Myocardial Infarction (MI)   □ Valve Surgery
□ 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 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 KK, Schad SP, Salz KA, et al. Mayo Clinic's Order Set for Provider Referral to Outpatient Cardiac Rehabilitation (Phase II). Mayo Foundation for Medical Education and Research, 2005. Rochester, MN.[37] CR = cardiac rehabilitation/secondary prevention program.

- 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
- Methodology to document program effectiveness and initiate quality improvement strategies

Appendix B provides the detailed specifications for each outpatient performance measure.

C. 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 quality improvement process. To aid in data compilation, ideally collected prospectively, a data collection

**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 Surgery
☐ 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.
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   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 3. 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 KK, Schad SP, Salz KA, et al. Mayo Clinic's Order Set for Provider Referral to Outpatient Cardiac Rehabilitation (Phase II). Mayo Foundation for Medical Education and Research, 2005. Rochester, MN.[37] CR = cardiac rehabilitation/secondary prevention.

tool or flow sheet is recommended. An example of such a collection tool is shown in Table 2. Health care systems and practices are encouraged to develop and/or use a tool that conforms to local practice patterns and standards.

V. 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 receive CR services and secondary prevention services due, in general, to a number of patient-, provider-, and health care system-related barriers. The Writing Committee designed performance measurement sets that hold health care providers, CR

Insert Patient Information here		Insert hospital Identification/logo here

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: _____

__ Patient left w/o signing

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.

Figure 4. Example of a Tracking Tool for Assessing the Provision of Appropriate Prevention Therapies, Including Referral to a CR Program, for Patients Hospitalized With a CAD Event. Data collection tool to be considered for use with the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set A (adapted from American Heart Association's Get With The Guidelines).[38] ACE = angiotensin-converting enzyme; CAD = coronary artery disease; CR = cardiac rehabilitation/secondary prevention; MI = myocardial infarction; w/o = without.

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)

Patient Name or Code:		Birth Date:		
Gender: ☐M ☐F		Date of event(s):		
Diagnosis: ☐MI ☐CABG ☐Angina ☐Valve repair or replacement ☐PCI ☐Transplantation ☐CHF				
Race/Ethnicity: ☐African American ☐Asian American ☐Native American ☐Non-White Hispanic ☐White ☐Other				
Risk Category ☐Low ☐Moderate ☐High				

	Target Goal	Initial Assessment	Intervention Plan and Communication	Reassessment Prior to Completion of Program	Changes in Intervention Plan and Communication
Date					
Tobacco Use	Complete cessation of tobacco use	☐ Never ☐ Recent (quit less 6 months ago) ☐ Current	*Complete only if current or recent tobacco use* ☐ Individual education and counseling *or* ☐ Referral to a tobacco cessation program *and* ☐ Health care provider notified	☐ Abstaining ☐ Smoking	*Complete only if still smoking* ☐ Individual education and counseling *or* ☐ Referral to a tobacco cessation program *and* ☐ Health care provider notified
Blood Pressure Control	<140/90 mm Hg or <130/80 mm Hg if patient has diabetes or chronic kidney disease	☐ Patient with diagnosis of treated or untreated hypertension ☐ Not hypertensive	*Complete only if patient has a diagnosis of hypertension:* Education completed: ☐ Target BP goal ☐ Medication compliance ☐ Lifestyle modification	☐ Intermittent monitoring of BP during CR	☐ Policy in place concerning communication with health care providers, including thresholds for communication
Lipid Control	For CVD and CVD equivalents: LDL-C <100 mg/dL if triglycerides are >200 mg/dL, non–HDL-C should be <130 mg/dL	☐ Optimal control ☐ Suboptimal control	*Applies to all patients with CVD:* Education completed: ☐ Target lipid goals ☐ Medication compliance ☐ Lifestyle modification	*Complete only if suboptimal control on initial assessment:* ☐ Patient encouraged to contact health care provider about reassessment of lipid control	☐ Policy is in place to communicate with health care providers as needed
Physical Activity Habits	30+ min, minimum 5 d per week	☐ Optimal habits ☐ Suboptimal habits	☐ Education completed concerning optimal physical activity habits *Complete only if habits are suboptimal* ☐ Intervention plan developed with the patient	☐ Optimal habits ☐ Suboptimal habits	*Complete only if habits remain suboptimal* ☐ An intervention plan is developed with the patient ☐ Health care provider notified
Weight Management	Body mass index: 18.5 to 24.9 kg/m² *and* Waist circumference: men <40 inches women <35 inches	☐ At target ☐ Above target	*Applies to all patients* ☐ Education completed concerning target goals, diet, behavior change, regular physical activity *or* ☐ Referral to a weight management program *and* ☐ Health care provider notified if above target	☐ At target ☐ Above target	*Complete only if remains above target* ☐ Additional education completed for target goals, diet, behavior change, exercise *or* ☐ Referral to a weight management program *and* ☐ Health care provider notified

Table 2. Continued

	Target Goal	Initial Assessment	Intervention Plan and Communication	Reassessment Prior to Completion of Program	Changes in Intervention Plan and Communication
Presence or Absence of DM or IFG (fasting blood glucose 110–125 mg/dL)	HbA$_{1C}$ <7%	☐ Diagnosis of DM or IFG present ☐ Diagnosis of DM or IFG absent	*Complete only if diabetes mellitus is present:* ☐ Documentation that patient has attended skill training and medical nutrition therapy session or ☐ Referral to skill training and medical nutrition therapy session or ☐ Intervention plan recommended which includes: target goals for HbA$_{1C}$, medical nutrition counseling, and skill training *Complete only if IFG is present:* ☐ Education is completed concerning the importance of weight management and physical activity	*Complete only if diabetes mellitus or IFG is present:* ☐ Attendance at appropriate education or skill training session	☐ A policy is in place concerning communication with appropriate health care professionals including thresholds for notification
Presence or Absence of Depression	Assessment of presence or absence of depression using a valid and reliable screening tool	☐ Patient screened for depression ☐ Patient not screened for depression	*Complete only if screening tool indicates possible depression:* ☐ Results discussed with patient and ☐ Health care provider notified	☐ Patient re-screened for depression ☐ Patient not re-screened for depression	*Complete only if screening tool indicates possible depression:* ☐ Results discussed with patient and ☐ Health care provider notified
Exercise Capacity	Assessment of symptom-limited exercise tolerance and development of an individualized exercise prescription	☐ Assessment and exercise prescription completed ☐ Assessment and exercise prescription not completed	☐ Exercise prescription communicated to the patient and health care provider	☐ Re-assessment and exercise prescription completed ☐ Re-assessment and exercise prescription not completed	☐ Revised exercise prescription communicated to the patient and health care provider
Use of Preventive Medications	Adherence to prescribed preventive medications	☐ Patient has been prescribed preventive medications by his/her health care provider(s)	☐ Individual education and counseling about the importance of adherence to appropriate preventive medications or ☐ Group education and counseling about the importance of adherence to appropriate preventive medications	☐ Individual or group education completed	☐ Patient is encouraged to discuss questions or concerns about prescribed preventive medications with his/her healthcare providers

Target goals are from the 2006 AHA/ACC Secondary Prevention Guidelines.[39] Assessment terms and definitions are from the outcomes registry proposal.

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.

program staff members, and leaders of health care 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 two 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 (e.g., post-MI, post-CABG, post-PCI). The second performance measurement set is designed to clarify structure- and process-based performance measures that serve as a standard for CR programs as they work 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 services, but focused on those groups of patients with the most current scientific evidence and other supporting evidence for benefits from CR. Other patient groups, including 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 will be included in future iterations of the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Sets.

To be effective, the recommendations of the Writing Committee will need to be adapted, adopted, and implemented by health care systems, health care providers, health insurance carriers, chronic disease management organizations, and other groups in the health care field that have responsibility for the delivery of care to persons with CVD. Such strategies should be part of an overall systems-based approach to minimize inappropriate gaps and variation in patient care, optimize delivery of health-promoting services, and improve patient-centered health outcomes.

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Staff

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Appendix A. Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set A

Performance Measure A-1
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 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 health care 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 health care provider or health care 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)
	• Health care 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 health care 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 health care 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 performance measurement sets that involve disease states or other conditions for which CR services have been found to be appropriate and beneficial (e.g., following MI, CABG surgery, etc.). 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 health care team within a health care 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[21]

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. (Level of Evidence: B)

ACC/AHA Guidelines for the Management of Patients with ST-Elevation Myocardial Infarction[40]

Class I
Cardiac rehabilitation/secondary prevention programs, when available, are recommended for patients with ST-elevation myocardial infarction, 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[41]

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[19]

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[42]

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 (LVEF). (Level of Evidence: B)

Evidence-Based Guidelines for Cardiovascular Disease Prevention in Women[22]

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 an LVEF <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.

Appendix A. Continued

Performance Measure A-2
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 myocardial infarction (MI), coronary artery bypass graft (CABG) surgery, a percutaneous coronary intervention (PCI), cardiac valve surgery, or cardiac transplantation, or who have chronic stable angina (CSA) and have not already participated in an early outpatient cardiac rehabilitation/secondary prevention (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 health care 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 health care provider and/or health care 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)
	• Health care system barriers (financial barriers or lack of CR programs near a patient's home, for example)
Denominator	Number of patients in an outpatient clinical practice who have had a qualifying event/diagnosis during the previous 12 months and who do not meet any of the exclusion criteria mentioned in the Numerator section above
Period of Assessment	Twelve months following a qualifying event/diagnosis
Method of Reporting	Proportion of patients in an outpatient practice who have had a qualifying event/diagnosis during the past 12 months and have been referred to a CR program
Sources of Data	Administrative data and/or medical records

Rationale

Cardiac rehabilitation services have been shown to help reduce morbidity and mortality in persons who have experienced a recent coronary artery disease event, but these services are used in less than 30% of eligible patients.[26] A key component to CR utilization is the appropriate and timely referral of patients to an outpatient CR program. While referral takes place generally while the patient is hospitalized for a qualifying event (MI, CSA, CABG, PCI, cardiac valve surgery, or heart transplantation), there are many instances in which a patient can and should be referred from an outpatient clinical practice setting (e.g., when a patient does not receive such a referral while in the hospital, or when the patient fails to follow through with the referral for whatever reason).

This performance measure has been developed to help health care 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 performance measurement sets that involve disease states or other conditions for which CR services have been found to be appropriate and beneficial (e.g., following MI, CABG surgery, etc.). This performance measure is provided in a format that is meant to allow easy and flexible inclusion into such performance measurement sets.

Referral of appropriate outpatients to a CR program is the responsibility of the health care provider within a health care system that is providing the primary cardiovascular care to the patient in the outpatient setting.

Corresponding Guidelines and Clinical Recommendations

See Clinical Recommendations section from Performance Measure A-1 above.

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

B-1. Structure-Based Measurement Set

The cardiac rehabilitation/secondary prevention (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.[43] 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.[44]

   A. In a hospital setting, physician supervision is presumed to be met when services are performed on hospital premises.[45]

   B. In the setting of a free-standing 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.

   C. In the setting of a physician-directed clinic or practice, a physician-directed emergency response team must be present and immediately available to respond to emergencies.

3. All professional staff have successfully completed the National Cognitive and Skills examination in accordance with the AHA curriculum for basic life support (BLS) with at least one 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.[43,46,47]

4. Functional emergency resuscitation equipment and supplies for handling cardiovascular emergencies are immediately available in the exercise area.[44]

Numerator	The number of CR programs in the health care system that meet these structure-based performance measure criteria
Denominator	All CR programs within a health care 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 health care 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.[48] Medical supervision is the most important day-to-day safety factor in CR.[43] 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.[49] Practice guidelines for management of cardiac arrest include the use of BLS and ACLS strategies, such as early defibrillation.[17,43] Such strategies have been shown to help improve outcomes in persons who experience cardiac arrest.[50]

Some CR programs seek certification of their program by health care organizations, such as 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 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[43]

(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.

AACVPR Guidelines for Cardiac Rehabilitation and Secondary Prevention Programs[51]

(No class of recommendation or level of evidence given)
All professional staff have completed BLS training; at least 1 staff member is present who has successfully completed training in ACLS.

Medical supervision for moderate- to high-risk patients will be provided by a physician, registered nurse, or other appropriately trained staff member who has successfully completed AHA curriculum for ACLS and has met state and hospital or facility medico-legal requirements for defibrillation and other related practices.

Exercise Standards for Testing and Training: A Statement for Health Professionals From the American Heart Association. AHA Scientific Statement[52]

(No class of recommendation or level of evidence given)
An emergency response team is immediately available to respond to medical emergencies.

CMS National Coverage Determination for Cardiac Rehabilitation Programs[45]

(No class of recommendation or level of evidence given)
Functional emergency resuscitation equipment and supplies for handling cardiovascular emergencies are immediately available in the exercise area.

Challenges to Implementation

Adherence to this measure requires the engagement of a physician-director who is accountable for policy development and implementation.

Appendix B. Continued

Performance Measure B-2

B-2. Assessment of Risk for Adverse Cardiovascular Events

The cardiac rehabilitation/secondary prevention (CR) program has the following processes in place:

1. Documentation, at program entry, that each patient undergoes an assessment of clinical status (e.g., 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 health care provider according to thresholds for communication included in the policies developed for Performance Measure B-3j.

Numerator	Number of CR programs in the health care system that meet the performance measure for assessment of risk for adverse cardiovascular events
Denominator	Number of CR programs in the health care 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.[17]

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 cardiovascular disease (CVD). In 1 study from Olmsted County, Minnesota, nearly half of patients discharged from the hospital following a myocardial infarction (MI) had a recurrent adverse cardiovascular event in the 3 years following their MI.[53]

However, adverse events are rare during CR early after a CVD event, occurring approximately once in every 100,000 patient-hours.[49] 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.[17,50] 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.[54] However, 1 study found that a combination of the AACVPR criteria with a comorbidity index helped improve the accuracy of risk stratification, particularly among female patients.[55] A significant limitation to these studies is the fact that patients identified as 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[51]

(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 Health Care Professionals From the American Heart Association[52]

(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.

Appendix B. Continued

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Performance Measure B-3

B-3. Individualized Assessment and Evaluation of Modifiable Cardiovascular Risk Factors, Development of Individualized Interventions, and Communication With Other Health Care Providers

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This performance measure includes 10 individual sub-measures for the evaluation of modifiable cardiovascular risk factors, development of individualized interventions, and communication with other health care 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 cardiac rehabilitation/secondary prevention (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 health care provider.)

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Performance Measure B-3a—Individualized Assessment of Tobacco Use

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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 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 health care system's CR program(s) who meet the performance measure for tobacco use
Denominator	Number of patients in the health care 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

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Rationale

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Cessation of tobacco use is most successful when health care 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]

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Corresponding Guidelines and Clinical Recommendations

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AHA/ACC Guidelines for Secondary Prevention for Patients with Coronary and Other Atherosclerotic Vascular Disease: 2006 Update[39]

Class I
Goal: Complete cessation. (Level of Evidence: B)

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update[57]

(No class of recommendation or level of evidence given)
Goals:
Short-term: 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: 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)
Goal: Avoid use of (and exposure to) tobacco products.

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Related Performance Measurement Sets

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Clinical Performance Measures: Chronic Stable Coronary Artery Disease. Tools Developed by Physicians for Physicians. Physician Consortium for Performance Improvement[59]

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.

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Challenges to Implementation

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This measure relies on patient self-report.

Appendix B. Continued

Performance Measure B-3b—Individualized Assessment of Blood Pressure (BP) Control

For each eligible patient enrolled in the cardiac rehabilitation/secondary prevention (CR) program, there is documentation that the following criteria have been met:

1. An assessment is made of 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 health care system's CR program(s) who meet the performance measure for BP control
Denominator	Number of patients in the health care 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 Update[39]

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 Update[58]

(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 2006[58]

(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 Program[60]

(No class of recommendation or level of evidence given)
Treating systolic BP and diastolic BP to targets that are less 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 less 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 Improvement[58]

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

Appendix B. Continued

Performance Measure B-3c—Individualized Assessment of Optimal Lipid Control

For each eligible patient enrolled in the cardiac rehabilitation/secondary prevention (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 health care system's CR program(s) who meet the performance measure for lipid control
Denominator	Number of patients in the health care 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 cardiovascular disease.[39] A more aggressive low-density lipoprotein (LDL) 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).

Corresponding Guidelines and Clinical Recommendations

AHA/ACC Guidelines for Secondary Prevention for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2006 Update[39]

Class I
Goal: Low-density lipoprotein-cholesterol (LDL-C) <100 mg/dL; If triglycerides are >200 mg/dL, non–high-density lipoprotein cholesterol (HDL-C) should be <130 mg/dL. (Level of Evidence: B, for lifestyle modification; A, for pharmacological treatment)

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update[57]

(No class of recommendation or level of evidence given)
Goals:
Short-term: Continued assessment and modification of intervention until LDL <100 mg/dL (further reduction to a goal <70 mg/dL is considered reasonable).
Long-term: LDL <100 mg/dL (further reduction to a goal <70 mg/dL is considered reasonable). Secondary goal: non–HDL-C <130 mg/dL (further reduction to a goal of <100 mg/dL is considered reasonable).

AHA Scientific Statement: Diet and Lifestyle Recommendations Revision 2006[58]

(No class of recommendation or level of evidence given)
Goal: Aim for recommended levels of LDL-C, HDL-C, and triglycerides.

Related Performance Measurement Sets

Clinical Performance Measures. Chronic Stable Coronary Artery Disease. Tools Developed by Physicians for Physicians. Physician Consortium for Performance Improvement[59]

Percentage of patients receiving at least one lipid profile during the reporting year. Percentage of patients who are receiving a statin (based on current ACC/AHA guidelines).

Appendix B. Continued

Performance Measure B-3d—Individualized Assessment of Physical Activity Habits

For each eligible patient enrolled in the cardiac rehabilitation/secondary prevention (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 health care system's CR program(s) who meet the performance measure for physical activity habits
Denominator	Number of patients in the health care system's CR program(s)
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 cardiovascular disease (CVD) patients.[9]

Corresponding Guidelines and Clinical Recommendations

AHA/ACC Guidelines for Secondary Prevention for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2006 Update[39]

Class I
Goal: 30 min, 7 d per week (minimum 5 d per week). (Level of Evidence: B)

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update[56]

(No class of recommendation or level of evidence given)
Goal: 30 to 60 min per d 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)[61]

(No class of recommendation or level of evidence given)
Health professionals should prescribe physical activity programs commensurate with those recommended by the Centers for Disease Control and Prevention and the American College of Sports Medicine, that is, 30 min or more of moderate-intensity physical activity such as brisk walking on most, and preferably all, days of the week.

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.

Appendix B. Continued

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Performance Measure B-3e—Individualized Assessment of Weight Management
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For each eligible patient enrolled in the cardiac rehabilitation/secondary prevention (CR) program, there is documentation that the following criteria have been met:

1. An assessment of body weight/composition, including the measurement of either body mass index (BMI) or waist circumference with targets as defined by the AHA/ACC secondary prevention guidelines.[39]

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 health care system's CR program(s) who meet the performance measure for assessment of weight management
Denominator	Number of patients in the health care 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

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Rationale
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Obesity is an independent risk factor for cardiovascular disease (CVD) and adversely affects CVD risk factors. By adhering to diet and lifestyle recommendations, patients can substantially reduce their risk of cardiovascular disease.[58]

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Corresponding Guidelines and Clinical Recommendations
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AHA/ACC Guidelines for Secondary Prevention for Patients With Coronary and Other Atherosclerotic Vascular Disease: 2006 Update[39]

Class I
Goal: BMI, 18.5 to 24.9 kg/m^2; waist circumference, men <40 inches, women <35 inches. (Level of Evidence: B)

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update[57]

(No class of recommendation or level of evidence given)
Goals:
<u>Short-term:</u> 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.
<u>Long-term:</u> Adherence to diet and physical activity/exercise program aimed toward attainment of established weight goal.

AHA Scientific Statement: Diet and Lifestyle Recommendations: Revision 2006[58]

(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 caloric 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 <7% of energy, trans fat to <1% of energy, and cholesterol to <300 mg/day 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.

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

Appendix B. Continued

Performance Measure B-3f—Individualized Assessment of the Diagnosis of Diabetes Mellitus (DM) or Impaired Fasting Glucose (IFG)

For each eligible patient enrolled in the cardiac rehabilitation/secondary prevention (CR) program, there is documentation that the following criteria have been met:

1. Assessment of the diagnosis of IFG and DM, with definitions as described in the most recent American Diabetes Association Standards of Medical Care in Diabetes Position Statement.[62]

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 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 communicated to the patient as well as to the primary care provider and/or cardiologist.

Numerator	Number of patients in the health care system's CR program(s) who meet the performance measure for DM/IFG
Denominator	Number of patients in the health care 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 presence of DM or IFG has been linked to unfavorable long-term cardiovascular outcomes. Because improved glycemic control has been shown to favorably affect cardiovascular morbidity and mortality,[61] the CR program setting is an ideal environment to educate patients about the implications of DM or IFG and to initiate the behavior patterns that foster improved glycemic control.[56]

Corresponding Guidelines and Clinical Recommendations

Physical Activity/Exercise and Type 2 Diabetes: A Consensus Statement from the American Diabetes Association[63]

(No class of recommendation given)
Those who take insulin or secretagogues should check capillary blood glucose before, after, and several hours after completing a session of physical activity, at least until they know their usual glycemic responses to such activity. (Level of Evidence E, from the American Diabetes Association [ADA] classification system, in which Level of Evidence E is based on expert consensus or clinical experience)

American Diabetes Association Standards of Medical Care in Diabetes-2006[62]

(No class of recommendation given)
Lowering HbA$_{1C}$ has been associated with a reduction of microvascular and neuropathic complications of diabetes. (Level of Evidence A, from the ADA classification system, in which Level A is based on clear evidence from well-conducted, generalizable, randomized controlled trials that are adequately powered.)

People with DM should receive individualized medical nutrition therapy (MNT) as needed to achieve treatment goals, preferably provided by a registered dietitian familiar with the components of diabetes MNT. (Level of Evidence: B, from the ADA classification system, in which Level B is based on supportive evidence from well-conducted cohort studies.)

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[39]

Class I
Initiate lifestyle and pharmacotherapy to achieve near-normal HbA$_{1C}$. (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[57]

(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 medical nutrition therapy. 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.

Appendix B. Continued

Performance Measure B-3g—Individualized Assessment of the Presence or Absence of Depression

For each eligible patient enrolled in the cardiac rehabilitation/secondary prevention (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 health care provider have been notified.

Numerator	Number of patients in the health care system's CR program(s) who meet the performance measure for depression
Denominator	Number of patients in the health care 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 myocardial infarction (MI).[64,65] Depression has been shown to be a powerful, independent risk factor for cardiac mortality after an acute MI or unstable angina.[66,67] 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.[68]

Corresponding Guidelines and Clinical Recommendations

Depression Screening in Cardiac Rehabilitation: AACVPR Task Force Report[69]

(No class of recommendation or level of evidence given)
The AACVPR recommends that appropriately trained health care 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.

Appendix B. Continued

Performance Measure B-3h—Individualized Assessment of Exercise Capacity

For each eligible patient enrolled in the cardiac rehabilitation/secondary prevention (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 has standard end points as defined by groups such as the American College of Sports Medicine and ACC/AHA practice guidelines and scientific statements[52,70]

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 re-assessed and communicated to the patient as well as to the primary care provider and/or cardiologist.

Numerator	Number of patients in the health care system's CR program(s) who meet the performance measure for assessment of exercise capacity
Denominator	Number of patients in the health care 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 cardiovascular disease (CVD).[2,3,5–7,9–11]

Corresponding Guidelines and Clinical Recommendations

ACC/AHA 2002 Guidelines Update for Exercise Testing: Summary Article[71]

Class I
Assessment of symptom-limited exercise tolerance for activity prescription.

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update[57]

(No class of recommendation or level of evidence given)
Develop a documented individualized exercise prescription for aerobic and resistance training that is based on evaluation findings, risk stratification, patient and program goals, and resources. Exercise prescription should specify frequency, intensity, duration, and modalities.

Working Group on Cardiac Rehabilitation and Exercise Physiology of the European Society of Cardiology Position Paper[15]

(No class of recommendation or level of evidence given)
Moderate- to high-risk cardiac patients must undergo an individualized exercise program and receive an exercise prescription within the limits imposed by their disease.

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-min walk.

Appendix B. Continued

Performance Measure B-3i—Individualized Adherence to Preventive Medications

For each eligible patient with coronary artery disease enrolled in the cardiac rehabilitation/secondary prevention (CR) program, there is documentation that the following criterion has been met:

1. 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 health care providers.)

Numerator	Number of patients in the health care system's CR program(s) who meet the performance measure for adherence to preventive medications
Denominator	Number of patients in the health care 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, beta blockers, and angiotensin-converting enzyme inhibitors (ACEI)/angiotensin-receptor blockers (ARB) 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 Update[39]

Class I
Use of antiplatelet agents, renin-angiotensin-aldosterone system blockers, and beta blockers. (Level of Evidence: B)

Related Performance Measurement Sets

Clinical Performance Measures: Chronic Stable Coronary Artery Disease. Tools Developed by Physicians for Physicians. Physician Consortium for Performance Improvement[59]

Percentage of patients receiving: antiplatelet therapy, drug therapy for lowering cholesterol, or beta-blocker therapy post-myocardial infarction.

ACC/AHA STEMI/NSTEMI Clinical Performance Measures[72]

Acute myocardial infarction patients without contraindications who are prescribed the following drug at discharge: 1) aspirin, 2) beta blocker, 3) lipid-lowering therapy, or 4) ACEI or ARB 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.

Appendix B. Continued

Performance Measure B-3j—Communication With Health Care Providers

There is a policy in place to ensure communication with health care providers, including individual patient status related to each modifiable risk factor at entrance to and completion of the cardiac rehabilitation/secondary prevention (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 health care system that meet the performance measure for communication with health care providers
Denominator	The number of CR programs in the health care 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 health care providers will promote timely adjustments in a patient's medical regimen, leading to improved risk factor modification.

Corresponding Guidelines and Clinical Recommendations

AHA/AACVPR Scientific Statement: Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update[57]

(No class of recommendation or level of evidence given)
It is essential to the success of any program that each of these interventions is performed in concert with the patient's primary care provider and/or cardiologist, who will subsequently supervise and refine these interventions over the long term.

Medical Director Responsibilities for Outpatient Cardiac Rehabilitation/Secondary Prevention Programs[43]

(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.

Appendix B. Continued

Performance Measure B-4
B-4. Monitor Response to Therapy and Document Program Effectiveness

For each cardiac rehabilitation/secondary prevention (CR) program in a health care 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 quality improvement strategies.

Numerator	Number of CR programs in the health system that meet this performance measure for monitoring response to therapy and documenting program effectiveness
Denominator	Number of CR programs in the health care system
Period of Assessment	Per reporting year
Method of Reporting	Inclusive data collection tracking sheet
Sources of Data	Written program policies

Rationale

Continuous quality improvement 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 quality improvement 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 health care 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 health care 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 physiologic adaptations from regular exercise. Comprehensive CR programs include core components designed to address secondary prevention issues which can improve with 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

AACVPR Consensus Statement. Outcomes Evaluation in Cardiac Rehabilitation/Secondary Prevention Programs: Improving Patient Care and Program Effectiveness[74]

(No class of recommendation or level of evidence given)
Cardiac rehabilitation programs need to establish a standardized method of data collection and maintain effective communication with other health care providers who also provide care for the referred patient.

Core Components of Cardiac Rehabilitation/Secondary Prevention Programs: 2007 Update[57]

(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

Name of Measure:

Clinical Rationale:

Numerator:

Denominator:

Measure:

Rate this measure on the following criteria.	Disagree	Moderate Agreement			Agree
	1	2	3	4	5

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

	Do Not Include		Could Include		Must Include
	1	2	3	4	5
Considering your assessment of this measure on all dimensions above, rate this measure overall for inclusion into the performance measurement set.					

Rating Form Guide

Attribute of Performance	Considerations
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.	This is your assessment of the degree with which a provider is empowered and can influence the activities of the health care system toward improvement.
Measure Design	
1. Denominator: The patient group to whom this measure applies (denominator) is clinically meaningful.	Depending upon intended use of the measure, the data source, any inclusion or exclusion criteria, and sampling frames are explicit. The criteria used must be clinically meaningful. An algorithm for determining the denominator may be present.
2. Numerator: The definition of conformance for this measure is clinically meaningful.	The numerator may be specified using either explicit or implicit criteria. The criteria used must be clinically meaningful. An algorithm for determining the numerator may be present.
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).	This can be confirmed by your judgment of the clarity and comprehensiveness of the measure. For those measures that have been actually tested for validity, you may see indications of specific testing such as comparisons with the results of other methods, criterion or gold standard validity testing, and criterion validity testing. There may also be documentation that the health care construct underlying the measure is associated with important health care processes/outcomes.
4. Reliability: The measure is likely to be reproducible across organizations and delivery settings.	This can be confirmed by specific tests undertaken by the measure developers. For those measures that have been actually tested for reliability, you may see indications of types of reliability testing such as test–retest reliability, inter-rater reliability, data accuracy checks, and internal consistency analyses. If the measure has not been used in practice, indicate the degree of likelihood that it is reproducible.

Appendix C. Continued

Rating Form Guide	
Attribute of Performance	**Considerations**
Measure Implementation	
1. Feasibility:	From your perspective, the required data can be typically abstracted from patient charts, or there are national registries and databases readily available. For those measures actually being used, there is information on the data collection approach and the system required to support the measure.
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.	Consider a balance in the continuum of care. Consider overall purpose of the measurement set and the intended user.

Appendix D. Author Relationships With Industry—AACVPR/ACC/AHA Cardiac Rehabilitation/Secondary Prevention Performance Measures

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