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PERFORMANCE MEASURES

ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure

A Report of the American College of Cardiology Foundation/
American Heart Association Task Force on Performance Measures and the
American Medical Association–Physician Consortium for Performance Improvement

Developed in Collaboration With the American Academy of Family Physicians, American Academy of Hospice and Palliative Medicine, American Nurses Association, American Society of Health-System Pharmacists, Heart Rhythm Society, and Society of Hospital Medicine

Endorsed by the Heart Failure Society of America

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Preamble

Over the last decade, there has been an increasing awareness that the quality of medical care in the United States, which should be effective, timely, safe, equitable, efficient, and patient-centered medical care, has the potential for improvement (1).

Consistent with this focus on healthcare quality, the American College of Cardiology Foundation (ACCF) and the American Heart Association (AHA) work together as a leading force to define "what works in medicine," by developing ACCF/AHA practice guidelines statements and creating performance measures in order to define what should (or should not be done) to ensure that patients with cardiovascular disease receive optimal care (Table 1).

The ACCF/AHA Task Force on Performance Measures is charged with identifying the clinical topics appropriate for the development of performance measures and with assembling writing committees composed of clinical and methodological experts. When appropriate, these committees have included representation from other organizations involved in the care of patients with the condition of focus. Committee members are informed about the methodology of performance measure development (2) and are instructed to construct measures for broad use that meet these criteria. Writing committees are also instructed to strive to create measures that minimize the reporting burden for participants and measures that are aligned with national standards so as to promote harmony among measures.

All selected measures pose potential challenges to implementation that could result in unintended consequences. The manner in which these issues are addressed is dependent on several factors, including the measure design,

Table 1. ACCF/AHA Performance Measure Sets

Topic	Original Publication Date	Partnering Organizations	Status
Heart failure (3)	2005	ACC/AHA—inpatient measures ACC/AHA/AMA-PCPI—outpatient measures	Updated 2011 (4)
Chronic stable coronary artery disease (5)	2005	ACC/AHA/AMA-PCPI	Updated 2011 (6)
Hypertension (7)	2005	ACC/AHA/AMA-PCPI	Updated 2011 (6)
ST-elevation and non–ST-elevation myocardial infarction (8)	2006	ACC/AHA	Updated 2008 (9)
Cardiac rehabilitation (10)	2007	AACVPR/ACC/AHA	Updated 2010 (referral measures only) (11)
Atrial fibrillation (12)	2008	ACC/AHA/AMA-PCPI	
Primary prevention of cardiovascular disease (13)	2009	AHA/ACCF	
Peripheral artery disease (14)	2010	ACCF/AHA/ACR/SCAI/SIR/SVM/SVN/SVS	
Percutaneous coronary intervention	2012*	ACCF/AHA/SCAI/AMA-PCPI/NCQA	
Cardiac imaging	2012*	ACCF/AHA/ACR/AMA-PCPI/NCQA	

AACVPR indicates American Association of Cardiovascular and Pulmonary Rehabilitation; ACC, American College of Cardiology; ACCF, American College of Cardiology Foundation; ACR, American College of Radiology; AHA, American Heart Association; AMA-PCPI, American Medical Association–Physician Consortium for Performance Improvement; NCQA, National Committee for Quality Assurance; SCAI, Society for Cardiac Angiography and Interventions; SIR, Society of Interventional Radiology; SVM, Society for Vascular Medicine; SVN, Society for Vascular Nursing; and SVS, Society for Vascular Surgery.
*Planned publication date.

method of data collection, performance attribution, baseline performance rates, reporting methods used, and incentives linked to these reports. The ACCF/AHA encourages those interested in implementing these measures for purposes beyond quality improvement to work with the ACCF/AHA to consider these complex issues in pilot testing projects, assess limitations and confounding factors, and guide refinements of the measures to enhance their utility for these additional purposes.

The current heart failure (HF) performance measure set is notable for several reasons. First, an earlier group of performance measures was retired when the measures were not found to reflect quality of care delivered when implemented in the community setting, given that there was limited opportunity for further improvement, and/or they were already captured by other performance measure sets. Retirement of measures that no longer serve their intended purpose is an important part of the performance measure life cycle. As a result of its activities, the committee has reduced the documentation burden on clinicians and hospitals in the hope that this will thereby allow them to focus on more critical areas of quality measurement and improvement. The committee has also extended some inpatient measures to the outpatient setting to emphasize the need to measure the quality of care over time, often across providers who care for patients with HF. Finally, the performance measures were extended to assess functional outcomes. This new and modified HF measure set thus spans the spectrum of quality of care and, once implemented, should lead to improved outcomes in patients with HF.

Eric D. Peterson, MD, MPH, FACC, FAHA
Chair, ACCF/AHA Task Force on Performance Measures

1. Introduction

The ACCF/AHA/American Medical Association–Physician Consortium for Performance Improvement (AMA-PCPI) 2011 Performance Measures for Adults With Heart Failure Writing Committee (the writing committee) was charged with the development of performance measures concerning the diagnosis, treatment, and outcomes of patients with HF. The purpose of this effort is to provide measures that can be used to improve care for patients with HF. This updated performance measure document set addresses both in-hospital care and continuing care in the outpatient setting. Many guideline-recommended processes were considered but ultimately not translated into performance measures. Decisions about which measures to include were based on many factors. Common considerations included the complexity of the guideline recommendations (making translation difficult), ability to define patients to be included in the denominator without a large number of exclusions, and feasibility of collecting the required data. This document is intended to supersede the prior publication of HF performance measures (3).

This updated performance measure set presents 9 measures, including 3 new measures and 6 revised measures, of which 3 measures are designated as quality metrics (appropriate for internal quality improvement only). Two measures apply to care in both the inpatient and outpatient setting, 5 measures address care in the outpatient setting only, and 2 measures address care in the inpatient setting only. In addition, 8 earlier measures have been retired. The 3 quality metrics represent test measures that address areas worthy of measurement, but for considerations such as

Table 2. ACCF/AHA/AMA-PCPI 2011 HF Measurement Set

Measure	Description*	Care Setting	Level of Measurement
1. LVEF assessment	Percentage of patients aged ≥18 y with a diagnosis of HF for whom the quantitative or qualitative results of a recent or prior (any time in the past) LVEF assessment is documented within a 12-mo period	Outpatient	Individual practitioner
2. LVEF assessment	Percentage of patients aged ≥18 y with a principal discharge diagnosis of HF with documentation in the hospital record of the results of an LVEF assessment performed either before arrival or during hospitalization, OR documentation in the hospital record that LVEF assessment is planned after discharge	Inpatient	• Individual practitioner • Facility
3. Symptom and activity assessment	Percentage of patient visits for those patients aged ≥18 y with a diagnosis of HF with quantitative results of an evaluation of both current level of activity and clinical symptoms documented	Outpatient	Individual practitioner
4. Symptom management†	Percentage of patient visits for those patients aged ≥18 y with a diagnosis of HF and with quantitative results of an evaluation of both level of activity AND clinical symptoms documented in which patient symptoms have improved or remained consistent with treatment goals since last assessment OR patient symptoms have demonstrated clinically important deterioration since last assessment with a documented plan of care	Outpatient	Individual practitioner
5. Patient self-care education††	Percentage of patients aged ≥18 y with a diagnosis of HF who were provided with self-care education on ≥3 elements of education during ≥1 visit within a 12-mo period	Outpatient	Individual practitioner
6. Beta-blocker therapy for LVSD (outpatient and inpatient setting)	Percentage of patients aged ≥18 y with a diagnosis of HF with a current or prior LVEF of <40% who were prescribed beta-blocker therapy with bisoprolol, carvedilol, or sustained-release metoprolol succinate either within a 12-mo period when seen in the outpatient setting or at hospital discharge	Inpatient and outpatient	• Individual practitioner • Facility
7. ACE inhibitor or ARB therapy for LVSD (outpatient and inpatient setting)	Percentage of patients aged ≥18 y with a diagnosis of HF with a current or prior LVEF of <40% who were prescribed ACE inhibitor or ARB therapy either within a 12-mo period when seen in the outpatient setting or at hospital discharge	Inpatient and outpatient	• Individual practitioner • Facility
8. Counseling about ICD implantation for patients with LVSD receiving combination medical therapy††	Percentage of patients aged ≥18 y with a diagnosis of HF with current LVEF ≤35% despite ACE inhibitor/ARB and beta-blocker therapy for at least 3 mo who were counseled about ICD implantation as a treatment option for the prophylaxis of sudden death	Outpatient	Individual practitioner
9. Postdischarge appointment for HF patients	Percentage of patients, regardless of age, discharged from an inpatient facility to ambulatory care or home health care with a principal discharge diagnosis of HF for whom a follow-up appointment was scheduled and documented, including location, date, and time for a follow-up office visit or home healthcare visit (as specified)	Inpatient	Facility

ACCF indicates American College of Cardiology Foundation; ACE, angiotensin-converting enzyme; AHA, American Heart Association; AMA-PCPI, American Medical Association–Physician Consortium for Performance Improvement; ARB, angiotensin II receptor blocker; HF, heart failure; ICD, implantable cardioverter-defibrillator; LVEF, left ventricular ejection fraction; and LVSD, left ventricular systolic dysfunction.

*Please refer to the complete measures for comprehensive information, including measure exceptions.

†Test measure designated for use in internal quality improvement programs only. These measures are not appropriate for any other purpose, for example, pay for performance, physician ranking, or public reporting programs.

†New measure.

strength of evidence and uncertainty regarding feasibility, these are not considered appropriate for use for public accountability at this time. A summary of the new measure set is presented in Table 2.

1.1. Scope of the Problem

HF is a major and growing public health problem in the United States. For a detailed discussion of the scope of the problem and opportunities to improve the quality of care

provided to patients with this condition, see the ACCF/AHA/AMA-PCPI 2011 HF performance measurement set (4).

1.2. Structure and Membership of the Writing Committee

The members of the ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure Writing Committee included clinicians specializing in cardiology, internal medicine, family medicine, preventive medicine, hospital medicine, cardiac electrophysiology, and cardiovascular nursing, as well as people with expertise in performance measure development, implementation, and testing. The writing committee also included patient/consumer representatives, a payer representative, representatives from the ACCF/AHA Heart Failure Guideline Writing Committee, and the ACCF/AHA/AMA-PCPI Coronary Artery Disease/Hypertension Performance Measures Writing Committee to ensure consistency across these clinical documents. The writing committee also included representatives of the American Academy of Family Physicians, the American Academy of Hospice and Palliative Medicine, the American Nurses Association, the American Society of Health-System Pharmacists, the Heart Rhythm Society, and the Society of Hospital Medicine.

1.3. Disclosure of Relationships With Industry and Other Entities

The work of the writing committee was supported exclusively by the ACCF, AHA, and AMA-PCPI without commercial support. Writing committee members volunteered their time to this effort. Meetings of the writing committee were confidential and attended only by committee members and staff from the ACCF, AHA, AMA-PCPI, The Joint Commission, and the National Committee for Quality Assurance to promote harmonization across similar measure sets as described further below. Writing committee members were required to declare in writing all relationships with industry and other entities relevant to this topic. Less than 50% of the writing committee members have relationships with industry and other entities relevant to this topic, in accordance with standard requirements of the ACCF and AHA. Please see Appendix A for relevant relationships of the writing committee and Appendix B for relevant peer reviewer relationships of the peer reviewers.

1.4. Review and Endorsement

Between August 18, 2009, and September 20, 2009, the "ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure" underwent a 30-day public comment period during which time ACCF, AHA, and AMA-PCPI members, as well as other healthcare professionals and members of the general public, had an opportunity to review and comment on the draft document before its final approval and publication. An official peer and content review of the full document was also conducted with 2 peer reviewers nominated by the ACCF and 2 reviewers nominated by the AHA. Additional comments were sought from clinical content experts and performance measurement experts.

Table 3. Stages of HF

Stage	Description
A	Patients at high risk for HF but without structural heart disease or symptoms of HF (e.g., patients with hypertension, atherosclerotic disease, diabetes, obesity, and metabolic syndrome or patients using cardiotoxins or with a family history of cardiomyopathy). Such patients have no identified structural or functional abnormalities of the pericardium, myocardium, or cardiac valves and have never shown signs or symptoms of HF
B	Patients who have developed structural heart disease that is strongly associated with the development of HF (e.g., previous myocardial infarction; LV remodeling, including LVH and low EF; or asymptomatic valvular disease) but without signs or symptoms of HF
C	Patients with structural disease who have current or prior symptoms of HF (e.g., known structural heart disease and shortness of breath and fatigue, reduced exercise tolerance)
D	Patients with refractory HF requiring specialized interventions (e.g., marked symptoms of HF at rest despite maximal medical therapy—those who are recurrently hospitalized or cannot be safely discharged from the hospital without specialized interventions)

EF indicates ejection fraction; HF, heart failure; LV, left ventricular; and LVH, left ventricular hypertrophy.

Adapted from Hunt et al (18,19).

The "ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure" was adopted by the ACCF Board of Trustees and AHA Science Advisory and Coordinating Committee in December 2011 and approved by the AMA-PCPI in December 2011. These measures will be reviewed for currency once annually and updated as needed. They should be considered valid until either updated or rescinded by the ACCF/AHA Task Force on Performance Measures and the AMA-PCPI.

2. Methodology

The development of performance measures involves identification of a set of measures targeted to a particular patient population, observed over a particular time period. To achieve this goal, the ACCF/AHA Task Force on Performance Measures has outlined and published the methodology of sequential tasks required for the development of process-of-care measures, as well as for outcomes measures suitable for public reporting (2,15,16). In addition, the AMA-PCPI has developed a work group charge that outlines the process steps that should be followed by writing committees that develop performance measures (17). The following sections outline how the writing committee applied these methodologies.

2.1. Definition of Heart Failure

The "ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult" (18) classified HF into 4 stages (Table 3). For purposes of this document, only the latter 2 stages, which qualify for the traditional diagnosis of HF (stages C and D), were considered for inclusion in the measure population. Thus, the inpatient and

outpatient performance measures do not apply to patients for whom established risk factors and structural disorders occur without left ventricular systolic dysfunction or symptoms associated with HF (stages A and B). In addition, specific diagnosis codes, based on the *International Classification of Diseases, Ninth Revision, Clinical Modification* (*ICD*-9-CM), which are available on the AMA-PCPI Web site at http://www.ama-assn.org/apps/listserv/x-check/qmeasure.cgi?submit=PCPI, should be used to screen and select the target patient population. The inpatient measures are constructed to include only those patients with a principal discharge diagnosis of HF, which identifies the condition for which, in retrospect, the patient was admitted to the hospital. The writing committee also recognizes that in some cases the principal discharge diagnosis code may identify patients for whom these measures may not be appropriate. In part because of this, all measures are written with exclusions that permit clinicians to document the reasons for not applying particular measures to individual patients. Additional codes have been added to the *ICD*-9-CM codes previously defined by The Joint Commission and the Centers for Medicare & Medicaid Services (CMS) to screen and select cohorts for HF performance measures based on experience gained during testing/implementation of the 2005 measures.

2.2. Identifying Clinically Important Outcomes

To guide the selection of measures to include in the measure set, the writing committee sought to identify outcomes that are meaningful to patients with HF and the structures or processes linked with those outcomes. These outcomes include improving survival rates, decreasing symptoms of HF, and reducing hospitalizations. A complete list of the desirable outcomes identified by the writing committee and how they relate to the proposed process measures is included in the measure specifications (4).

2.3. Target Population and Care Period

These measures are intended for use by physicians, other eligible healthcare professionals, and healthcare systems to manage the care of patients aged ≥18 years with HF. They may be used to assess performance at the practitioner or system level as specified by each measure. The level of aggregation (clinician versus system) will also depend on the availability of adequate sample sizes to provide stable estimates of performance.

2.4. Dimensions of Care

Given the multiple domains of providing care that can be measured, the writing committee identified and explicitly articulated the relevant dimensions of care that should be evaluated. As part of the methodology, each potential performance measure was categorized into its relevant dimension of care (Tables 4 and 5). Classification into dimensions of care facilitated identification of areas where evidence was lacking and prevented duplication of measures within the set. Diagnostics, patient education (including prognosis and etiology), treatment, self-management, and monitoring of disease status were selected as the relevant dimensions of care for HF performance measures.

In addition, to ensure that the measure set is as comprehensive as possible, the writing committee also compared the potential measures against the Institute of Medicine domains of healthcare quality (safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity) (1). Although focusing primarily on processes of care, the writing committee also considered measures of structures of care and outcomes (e.g., symptom management). The measures proposed in this set are intended to complement existing National Quality Forum–endorsed HF outcome measures, such as the CMS 30-day mortality and readmission measures.

2.5. Literature Review

As the primary sources for updating the 2005 ACC/AHA HF performance measures (3) and deriving new measures as specified in the ACC/AHA methodology for developing process measures (2,16) and the AMA "Physician Consortium for Performance Improvement (PCPI) Position Statement: The Evidence Base Required for Measures Development" (20), the writing committee reviewed the "2009 Focused Update Incorporated Into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults" (19) and the "ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult" (18). One co-chair of this writing committee also participated on the writing committees of both the 2009 HF focused update and the 2005 HF guideline. In addition, the chair of the 2009 HF focused update writing committee was a member of this writing committee. As participants on the guideline writing committees, these individuals were able to offer insights into measurement issues and provide suggestions for clarity and specificity consistent with guideline recommendations. Other sources reviewed

Table 4. ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With HF Set: Dimensions of Care Inpatient Measures Matrix

Measure Name	Diagnostics	Patient Education	Treatment	Self-Management	Monitoring of Disease Status
2. LVEF assessment (inpatient setting)	✓				✓
6. Beta-blocker therapy for LVSD (outpatient and inpatient setting)			✓		
7. ACE inhibitor or ARB therapy for LVSD (outpatient and inpatient setting)			✓		
9. Postdischarge appointment for HF patients					✓

ACCF indicates American College of Cardiology Foundation; ACE, angiotensin-converting enzyme; AHA, American Heart Association; AMA-PCPI, American Medical Association–Physician Consortium for Performance Improvement; ARB, angiotensin II receptor blocker; HF, heart failure; LVEF, left ventricular ejection fraction; and LVSD, left ventricular systolic dysfunction.

Table 5. ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With HF Set: Dimensions of Care Outpatient Measures Matrix

Measure Name	Diagnostics	Patient Education	Treatment	Self-Management	Monitoring of Disease Status
1. LVEF assessment (outpatient setting)	✓				✓
3. Symptom and activity assessment					✓
4. Symptom management*			✓		✓
5. Patient self-care education*		✓		✓	
6. Beta-blocker therapy for LVSD (outpatient and inpatient setting)			✓		
7. ACE inhibitor or ARB therapy for LVSD (outpatient and inpatient setting)			✓		
8. Counseling about ICD implantation for patients with LVSD receiving combination medical therapy*		✓			

ACCF indicates American College of Cardiology Foundation; ACE, angiotensin-converting enzyme; AHA, American Heart Association; AMA-PCPI, American Medical Association—Physician Consortium for Performance Improvement; ARB, angiotensin II receptor blocker; HF, heart failure; ICD, implantable cardioverter-defibrillator; LVEF, left ventricular ejection fraction; and LVSD, left ventricular systolic dysfunction.

*Test measures designated for use in internal quality improvement programs only. These measures are not appropriate for any other use, for example, pay for performance, physician ranking, or public reporting programs.

included the "ACC/AHA/HRS 2008 Guidelines for Device-Based Therapy of Cardiac Rhythm Abnormalities" (21), the "HFSA 2006 Comprehensive Heart Failure Practice Guideline" (22), the "HFSA 2010 Comprehensive Heart Failure Practice Guideline" (23), the American College of Physicians clinical practice guideline "Evidence-Based Interventions to Improve the Palliative Care of Pain, Dyspnea, and Depression at the End of Life" (24), and the "ACCF/ASE/ACEP/ASNC/SCAI/SCCT/SCMR 2007 Appropriateness Criteria for Transthoracic and Transesophageal Echocardiography" (25).

To avoid duplication of efforts and to harmonize with other national measures to the degree possible, the writing committee also reviewed existing HF measures, including outcome measures developed by The Joint Commission and CMS, the Agency for Healthcare Research and Quality, the Institute for Clinical Systems Improvement, CareScience, and PacifiCare and process measures developed by The Joint Commission, CMS, the IMPROVE HF Registry (26), and the RAND Corporation (27). A comparison of the 2005 and 2011 measure sets is provided in Table 6.

2.6. Definition and Selection of Measures

Explicit criteria exist for the development of process performance measures so that they accurately reflect the quality of care. These include evidence of strong scientific validity, specification of numerators and denominators, and certainty that a potential measure is interpretable, applicable, and feasible (2,16). The writing committee sought to identify measures for which there is strong evidence and clear consensus about their importance in the care of HF patients that are linked to improved outcomes. To determine the processes of care with adequate evidence support to be considered for inclusion in the performance measurement set, the writing committee reviewed and prioritized the Class I and Class III recommendations from the 2005 HF guideline (18) and the 2009 HF focused update (19), with particular attention to changes in any guideline recommendations on which the 2005 HF performance measures (3) were based.

In addition to analyzing the updated guideline recommendations, the writing committee reviewed other clinical guidance documents, as detailed below, as well as available information on gaps in care and unexplained variations in care for HF patients. The writing committee also reviewed data on feasibility, reliability, and exception reporting available from implementation of a subset of the 2005 measures (28–30). The writing committee applied a patient-centric approach to identify areas in which new measures or revisions to the 2005 measures might be needed. As part of this process, the writing committee also considered whether any of the 2005 measures should be retired. After extensive discussion and additional review of the literature, consensus was reached on revisions to be made to the measures included in the 2005 inpatient and outpatient measure sets. All measures were designed to assess high-quality care in appropriate patients across a variety of care settings and care teams and to support achievement of the identified desirable outcomes. The measures were also designed to allow for the exclusion of patients with contraindications to the process of care or other valid reasons for not being included in the measure. In defining the measure exclusions, the writing committee was guided by the AMA-PCPI "Specification and Categorization of Measure Exclusions" (31).

The writing committee evaluated the potential new and revised measures against the ACCF/AHA attributes of performance measures (Table 7) to reach consensus on which measures should advance for inclusion in the final measure set and whether to designate any of the measures as test measures (appropriate for internal quality improvement only) in the final set. After the peer review and public comment period, the writing committee reviewed and discussed the comments received and further refinements were made to the measure set.

3. ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure

3.1. Inpatient Target Population and Care Period

The target population for the inpatient measures consists of hospitalized patients aged ≥18 years with a principal dis-

Table 6. Comparison of 2005 and 2011 HF Performance Measures

2011 Measure	2005 Measure	Change	Rationale
Inpatient measures			
2. LVEF assessment (inpatient setting)	Evaluation of left ventricular systolic function	• Added qualitative description of LVEF equivalents. • Simplified exclusions (medical reasons with examples).	Evaluation of LVEF in patients with HF provides important information required to appropriately direct treatment. • Qualitative LVEF equivalents provide additional guidance to measure implementers and allow for easier implementation of treatment-based measures. • The ACCF/AHA/AMA-PCPI standard format for process measure exceptions is to group them into medical, patient, and system reasons with a limited number of frequently occurring examples. This allows patients for whom a test or treatment may not be appropriate to be excluded from the denominator while allowing for patient preferences and clinical judgment in individualizing care.
6. Beta-blocker therapy for LVSD (outpatient and inpatient setting)	Beta-blocker therapy	• Added inpatient setting to 2005 measure 9 (beta-blocker therapy). • Added specific beta blockers (bisoprolol, carvedilol, or sustained-release metoprolol succinate) to numerator.	• Combining measures allows harmonization of specifications across settings. • The 2009 ACCF/AHA guideline update has a Class I recommendation for a beta blocker at discharge (19). • Clinical trials indicate that the benefit of beta-blocker therapy does not represent a class effect, and the 2009 ACCF/AHA guideline update recommends that specific evidence-based beta blockers be prescribed (19). • In patients hospitalized with HF with reduced ejection fraction not treated with oral therapies known to improve outcomes, particularly ACE inhibitors or ARBs and beta-blocker therapy, initiation of these therapies is recommended in stable patients before hospital discharge (19).
7. ACE inhibitor or ARB therapy for LVSD (outpatient and inpatient setting)	ACE inhibitor or ARB therapy for LVSD	• This measure combines inpatient and outpatient measures. • Added definition of "prescribed." • Simplified exclusions (medical reasons with examples, patient reasons with examples, and system reasons with examples).	• Recent national registry data indicate that the use of ACE inhibitors or ARBs in eligible patients without documented contraindications or intolerance remains suboptimal, especially in the outpatient setting. • Combining measures allows harmonization of specifications across settings. • Addition of the definition of "prescribed" clarifies which patients should be counted in the numerator. • ACCF/AHA/AMA-PCPI standard format for process measure exceptions is to group them into medical, patient, and system reasons with a limited number of frequently occurring examples. This allows patients for whom a test or treatment may not be appropriate to be excluded from the denominator while allowing for patient preferences and clinical judgment in individualizing care.
9. Postdischarge appointment for HF patients	No measure for 2005	This is a new measure.	
	Anticoagulant at discharge for HF patients with atrial fibrillation	This measure was retired.	A similar measure has been developed for the broader population of patients with atrial fibrillation and is recommended for adoption in place of the previous narrower version of this measure. The measure "Chronic Anticoagulation Therapy" can be accessed on the AMA-PCPI Web site under the Atrial Fibrillation and Atrial Flutter project at http://www.ama-assn.org/ama1/pub/upload/mm/pcpi/atrial-fib-flutter.pdf.

(*Continued*)

charge diagnosis of HF. The principal diagnosis is the condition established after study to be chiefly responsible for the hospitalization. Detailed specifications, including exception criteria, methods of reporting, and additional background, are available on the AMA-PCPI Web site at http://www.ama-assn.org/apps/listserv/x-check/qmeasure.cgi?submit=PCPI. For all inpatient measures, patients who were transferred to another acute care facility, left against medical

Table 6. Continued

2011 Measure	2005 Measure	Change	Rationale
	Discharge instructions	This measure was retired.	This measure addresses an important component of care for the hospitalized patient, but its implementation in practice seems to have resulted in improved compliance without regard to the quality of discharge instructions provided. Another measure, patient self-care education, which addresses this important transition in care, has been included as part of the current measure set and was developed with the intent of having a greater impact on morbidity and readmission.
	Adult smoking cessation advice/counseling	This measure was retired.	A similar measure is available for a much broader patient population and is recommended for adoption in place of the previous narrower version of this measure. The measure "Tobacco Use: Screening and Cessation Intervention" can be accessed under the Preventive Care and Screening project on the AMA-PCPI Web site at http://www.ama-ssn.org/ama1/pub/upload/mm/370/pcs_final08.pdf.
Outpatient measures			
1. LVEF assessment (outpatient setting)	Left ventricular function assessment	The description has been modified.	Evaluation of LVEF in HF patients provides important information required to direct appropriate treatment.
3. Symptom and activity assessment	• Assessment of activity level • Assessment of clinical symptoms of volume overload	Both original measures were combined into a single measure.	This measure provides a more comprehensive assessment of patient status. It improves on the previous version of the measure(s) in that it requires a quantitative assessment of a patient's level of activity and symptoms.
4. Symptom management*	No measure for 2005	This is a new measure, to be used as a quality metric.	Decreasing symptoms and improving function are 2 of the primary goals of HF treatment. The results of an ongoing assessment of patient symptoms serve as the main basis for monitoring and titrating treatment regimens.
5. Patient self-care education*	Patient education	This measure has changed to a quality metric.	Although there has been research to support certain educational components, the measure was based on expert opinion. In addition, the writing committee was concerned that compliance with the measure can be achieved without regard to the quality of the education provided.
6. Beta-blocker therapy for LVSD (outpatient and inpatient setting)	Beta-blocker therapy	• Added inpatient setting. • Added specific beta blockers (bisoprolol, carvedilol, or sustained-release metoprolol succinate) to numerator.	Clinical trials indicate that the benefit of beta-blocker therapy does not represent a class effect, and the 2009 ACCF/AHA guideline update recommends that specific evidence-based beta blockers be prescribed (19).
7. ACE inhibitor or ARB therapy for LVSD (outpatient and inpatient setting)	ACE inhibitor or ARB therapy		Recent national registry data indicate that the use of ACE inhibitors or ARBs in eligible patients without documented contraindications or intolerance remains suboptimal, especially in the outpatient setting (26).
8. Counseling about ICD implantation for patients with LVSD combination medical therapy*	No measure for 2005	This is a new measure, to be used as a quality metric.	This measure is of value because ICDs have been proved to be highly effective for preventing sudden death due to ventricular tachyarrhythmias in a subset of HF patients. Recent national registry data indicate that almost 50% of eligible patients do not undergo implantation of an ICD or a cardiac resynchronization therapy device with defibrillation capabilities (26).
	Initial laboratory tests	This is a retired measure.	Although recommended as a useful component in the evaluation of HF patients, the measure assesses a process that represents a standard of care. Performance is believed to be high and the measure is not likely to have a significant impact on care/improvement in outcomes.

(*Continued*)

Table 6. Continued

2011 Measure	2005 Measure	Change	Rationale
	Weight measurement	This is a retired measure.	Although recommended as a useful component in the evaluation of HF patients, the supporting evidence is poor (i.e., it is based only on expert opinion, case studies, or standard of care) and does not meet the rigor required for performance measurement. Performance is high and the measure is not likely to have a significant impact on care/improvement in outcomes.
	Blood pressure measurement	This is a retired measure.	Although recommended as a useful component in the evaluation of HF patients, the supporting evidence is poor (i.e., it is based only on expert opinion, case studies, or standard of care) and does not meet the rigor required for performance measurement. Performance is high and the measure is not likely to have a significant impact on care/improvement in outcomes.
	Assessment of clinical signs of volume overload (excess)	This is a retired measure.	Although recommended as a useful component in the evaluation of HF patients, the supporting evidence is poor (i.e., it is based only on expert opinion, case studies, or standard of care) and does not meet the rigor required for performance measurement.
	Warfarin therapy for patients with atrial fibrillation	This is a retired measure.	This measure is of value in improving quality of care for HF patients with comorbid atrial fibrillation. A similar measure has been developed for the broader population of patients with atrial fibrillation and is recommended for adoption in place of the previous narrower version of this measure. The measure "Chronic Anticoagulation Therapy" can be accessed on the AMA-PCPI Web site under the Atrial Fibrillation and Atrial Flutter project at http://www.ama-assn.org/ama1/pub/upload/mm/pcpi/atrial-fib-flutter.pdf.

ACCF indicates American College of Cardiology Foundation; ACE, angiotensin-converting enzyme; AHA, American Heart Association; AMA-PCPI, American Medical Association–Physician Consortium for Performance Improvement; ARB, angiotensin II receptor blocker; HF, heart failure; ICD, implantable cardioverter-defibrillator; LVEF, left ventricular ejection fraction; and LVSD, left ventricular systolic dysfunction.

*Test measures designated for use in internal quality improvement programs only. These measures are not appropriate for any other use, for example, pay for performance, physician ranking, or public reporting programs.

advice, were discharged to hospice, or died during the index admission are excluded.

3.2. Outpatient Target Population and Care Period

The target population for the outpatient measures consists of patients aged ≥18 years with a diagnosis of HF. Detailed specifications, including exception criteria, methods of reporting, and additional background, are available on the AMA-PCPI Web site at http://www.ama-assn.org/apps/listserv/x-check/qmeasure.cgi?submit=PCPI. For purposes of this document, the outpatient care period is defined as the care provided in an outpatient setting within the time period under evaluation (12-month reporting period).

3.3. Data Collection

These performance measures are ideally intended for prospective use to enhance the quality improvement process but may also be applied retrospectively. The technical specifications for multiple data sources, including electronic health record data, electronic administrative data (claims), expanded (multiple-source) administrative data, and paper medical record/retrospective data collection flow sheet can be found in Appendix C.

3.4. Measure Exceptions and Challenges to Implementation

The writing committee added exclusion criteria, recognizing that there are justifiable reasons for not meeting the performance measures. Specific documentation of these measure exceptions, which may be due to patient, medical, or system reasons, should be captured to provide data for future research and facilitate in-depth quality improvement in situations where there are apparent outliers with respect to the number of patients with exceptions.

4. Discussion

The "ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure" addresses many of the same processes of care as earlier measurement sets published by the ACCF/AHA, the AMA-PCPI, and other organizations. The writing committee has been cognizant of the previous efforts of other groups and sought to enhance and clarify measures in ways that reflect the advancement of the underlying science, the complexity of care, and the challenges of accurate and complete data collection. In particular, the present document incorporates the performance measures

Table 7. ACCF/AHA Attributes of Performance Measures

Consideration	Attribute
Useful in improving patient outcomes	Evidence-based Interpretable Actionable
Measure design	Denominator precisely defined Numerator precisely defined Validity type • Face* • Content† • Construct† Reliability
Measure implementation	Feasibility • Reasonable effort • Reasonable cost • Reasonable time period for collection
Overall assessment	Overall assessment of measure for inclusion in measurement set

ACCF indicates the American College of Cardiology Foundation; AHA, American Heart Association.

*The measure intuitively seems to capture what it is intended to capture.

†The extent to which the items comprehensively capture the domain the items are intended to measure.

†The extent to which the measures correlate with other methods of quantifying the underlying construct.

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developed jointly by CMS and The Joint Commission for management of patients with HF (33).

The writing committee recognizes that not all Class I guideline recommendations lend themselves to the development of excellent performance measures, because many do not easily fit the attributes of performance measures in terms of usefulness, accuracy, feasibility, and measurability. Thus, the writing committee selected only those Class I recommendations that were considered to perform well as performance measures in the inpatient or outpatient setting. In addition, in the case of the angiotensin-converting enzyme (ACE) inhibitor/angiotensin II receptor blocker (ARB) therapy measure, a Class IIa guideline recommendation for the use of ARBs as first-line therapy was accepted by the committee, and the use of ARB therapy was considered equivalent to ACE inhibitor therapy for this measure, which was also the case in the 2005 HF performance measures (3). Although Class IIa recommendations are not considered for stand-alone measures, in some cases, such as this one, they provide additional information about valid alternative therapies that are considered by the committee for inclusion in a measure set. This exception is made so that physicians receive credit for prescribing or continuing ARB therapy in HF patients who have left ventricular systolic dysfunction.

The support for use of ARBs in patients with HF and reduced left ventricular ejection fraction has evolved significantly in response to published clinical trials that showed ARBs to be an effective alternative therapy (34), and such use is recommended in the 2009 HF focused update (19) as a reasonable alternative therapy. Thus, the writing committee decided to continue the inclusion of ARB therapy in the ACE inhibitor measure for use in both the inpatient and outpatient setting.

The inpatient and outpatient measures are designed to be implemented in either a retrospective chart abstraction process or they can be used as part of a prospective quality improvement process. The data collection tool suggested for use with the inpatient measures (Appendix C) permits prospective data capture as well and promotes the prospective identification of HF patients. For example, documentation of patient education is often difficult to obtain in retrospective chart review but can be easily implemented using a prospective patient management tool. These inpatient and outpatient measures will require additional testing in practice to determine reliability and validity and may require modification in the future.

The writing committee also deemed it important to add exclusion criteria to the measures to recognize that there are justifiable medical and patient reasons for not meeting the performance measures. In the inpatient set, these reasons should be included in the "reasons documented by physician, nurse practitioner, or other healthcare provider for not ...." In the outpatient set, medical and patient reasons for not meeting the measure are listed separately. Documentation of such factors should be encouraged and will provide valuable data for future research and conducting in-depth quality improvement for situations where there seem to be outliers with respect to the number of patients with medical or patient-centered exclusions for the performance measures.

Challenges to implementation of measures are discussed where applicable. In general, inadequate documentation is the initial challenge of any measurement effort. The fact that these challenges are discussed is not intended as an argument against measurement. Rather, they should be considered as cautionary notes that draw attention to areas where additional focus on research and improvement of the measures should be considered.

The 2011 HF performance measures address processes of care. The writing committee did not develop measures of patient outcome in terms of mortality or repeat hospitalization because these outcome measures are already in place and publicly reported by CMS. The new measure of symptom management does address one component of outcome and calls for a plan of action if patient status has not improved or has deteriorated.

4.1. Major Revisions to the 2005 Heart Failure Measures

4.1.1. Retirement of Performance Measures

Eight measures in the 2005 HF performance measures (3) were retired in the present measure set (Table 6). The measure on anticoagulation therapy for patients with HF and atrial fibrillation was retired from the inpatient and outpatient measures because a similar measure has been developed for the broader population of patients with atrial fibrillation (12) and is recommended for adoption in place of the previous narrower version of this measure. The measure on discharge instructions addressed an important component of care for the hospitalized patient, but its implementation in practice seems

to have resulted in improved compliance without regard to the quality of discharge instructions provided. Another measure that addresses the important transition from inpatient to outpatient care has been included as part of the present measure set (9. Postdischarge appointment for HF patients) and was developed with the intent of having a greater impact on morbidity and readmission. The measure on smoking cessation advice/counseling was retired, because a similar measure has been developed for a much broader patient population. The measure "Tobacco Use: Screening and Cessation Intervention" can be accessed under the Preventive Care & Screening project on the AMA-PCPI Web site at http://www.ama-assn.org/ama1/pub/upload/mm/370/pcs_final08.pdf and is recommended for adoption in place of the previous narrower measure. The outpatient measures on initial laboratory testing, weight measurement, and blood pressure measurement were retired because they represent standards of care, performance is believed to be high, and the measures are not likely to have a significant impact on care or improvement in outcomes. Finally, the measure on assessment of signs of volume overload was retired because the supporting evidence is not strong and does not meet the rigorous standard now required for performance measurement.

4.1.2. Expansion of Beta-Blocker Measure to Inpatient Setting

Beta-blocker therapy for patients with HF and left ventricular systolic dysfunction was an outpatient measure in the 2005 HF performance measures (3). Although a measure for inpatient treatment with beta blockers was considered at that time, no inpatient measure was developed because there was no specific guideline recommendation for the use of beta blockers in the inpatient setting in 2005. In response to the new Class I recommendation for beta-blocker therapy at discharge in the 2009 HF focused update (19), the beta-blocker measure has been expanded in the current performance measures to include both outpatient and inpatient settings. In addition, clinical trial data indicate that the benefit of beta-blocker therapy does not appear to represent a class effect, and the 2009 HF focused update recommends that specific beta blockers be prescribed (19). Thus, the revised measure specifies 1 of 3 evidence-based beta blockers (bisoprolol, carvedilol, or sustained-release metoprolol succinate) in the numerator.

It should be emphasized that in-hospital initiation of beta blockers is recommended only in stable patients before hospital discharge (19). Regardless of the severity of symptoms, patients should not be hospitalized in an intensive care unit, should have no or minimal evidence of fluid overload or volume depletion, and should not have required recent treatment with an intravenous positive inotropic agent.

4.1.3. New Performance Measure: Symptom Management

Symptom assessment remains an important component of every encounter with a patient with HF. However, symptom assessment alone is insufficient in patients whose symptoms are progressive or poorly controlled. Hence, the writing committee developed a new measure on symptom *management* that can be paired with the measure on symptom assessment. The symptom management measure includes documentation of a care plan to attempt to alleviate ongoing symptoms by changing medication doses, adding new medications, considering device therapy, or referring patients to specialty HF teams for advanced care.

4.1.4. Changed to Quality Metric: Patient Education

Patient education about lifestyle, physical activity, diet, and medications is an important component of providing quality care for patients with HF. However, whether documentation of patient education in the medical record improves outcomes is uncertain. Compliance with a measure of patient education is relatively easy to achieve without regard to the quality of actual education provided. For this reason, the patient education measure was changed from a performance measure recommended for public reporting to a quality metric for internal quality improvement.

4.1.5. New Quality Metric: Counseling About Implantable Cardioverter-Defibrillators

The writing committee considered a measure for implantation of an implantable cardioverter-defibrillator for the reduction of occurrence of sudden death in patients with severe left ventricular systolic dysfunction. Such a measure was not developed because of concerns related to the large number of exceptions due to patient factors (age, comorbidities, patient preference) and physician factors. Rather, the writing committee developed a measure to address counseling about the potential benefits of implantable cardioverter-defibrillators in appropriately selected patients instead of the actual implantation itself.

4.2. Potential Measures Considered But Not Included in This Set

The writing committee considered including a composite measure of the prescription of both ACE inhibitor and beta-blocker therapy. The complexities of developing and implementing such an "all or none" optimal medical therapy measure (35) became clear during the public comment and peer review processes and led the writing committee to develop separate ACE inhibitor and beta-blocker measures that could be used as paired measures instead of a single composite measure.

Two other measures were developed by the writing committee but ultimately removed from the HF performance measure set after the peer review and public comment periods. These were the "Overuse of Echocardiography" measure from the outpatient set and "End-of-Life Care Plan" measure from the inpatient set. These measures, although potentially of value for improving patterns of care, were not felt to have been tested in clinical situations to ensure their reliability and validity. The writing committee notes 2 broader measures that address the provision of palliative care and end-of-life care and are intended for use in eligible patients with HF. One measure jointly developed by the AMA-PCPI and the National Committee for Quality Assurance, "Advance Care Planning," can be accessed under the Palliative Care project on the AMA-PCPI Web site at http://www.ama-assn.org/ama1/pub/upload/mm/pcpi/palliative-care.pdf.

The other measure developed by the AMA-PCPI, American Geriatrics Society, and National Committee for Quality Assurance that has been targeted to a broader patient population, "Advance Care Plan," can be accessed under the Geriatrics project on the AMA-PCPI Web site at http://www.ama-assn.org/ama1/pub/upload/mm/pcpi/geriatrics-ws.pdf.

The writing committee considered a number of additional potential measures that focus on equally important aspects of care, but after extensive discussion, the committee declined to develop these measures either because of an anticipated large number of exclusions in the denominator or because of challenges in implementation. Such is the case for cardiac resynchronization therapy, in which methods to predict which patients will derive improved outcomes remain imperfect and the identification of all patients with prolonged QRS complexes, who would constitute the denominator, would be a feasibility challenge. Another measure related to treatment with aldosterone receptor antagonists was considered but not developed because of the large number of patients excluded from the denominator because of renal insufficiency or hyperkalemia before or during treatment with these agents. In addition, the development of serious renal failure or hyperkalemia in large numbers of patients might be an unintended consequence of the broad implementation of such a measure. Finally, treatment with combined hydralazine and nitrate therapy for black patients with HF was also considered but not developed. Although this therapy has been shown to be efficacious in blacks, defining the denominator would be difficult or impossible for most practices. If future methods to collect information on race/ethnicity are determined to be reliable, this barrier to measurement may be overcome.

5. Conclusions

The "2005 ACC/AHA Heart Failure Performance Measures" (3) were well aligned with the HF measures of the CMS and The Joint Commission. The ACCF, AHA, and AMA-PCPI will continue to work with the CMS, The Joint Commission, and the National Quality Forum to harmonize measures for care of patients with HF.

To be successful as quality improvement tools, these 9 measures in the current HF performance measure set need to be adopted, implemented, and integrated as routine components of patient care across various care settings. These measurement sets should contribute to the evolution of reporting systems that allow physicians and other healthcare providers to improve care for a critical patient population. Quality improvement is a continuous process, and this document reflects the lessons the practicing community has learned to date in using existing measures and knowledge gained about how these measures might be improved. The clinical care team should collect data and review adherence to these measures on a routine basis, look for changes, and adjust practice patterns as needed to improve performance.

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Key Words: ACCF/AHA Performance Measures ■ ambulatory-level quality ■ health policy and outcome research ■ heart failure ■ hospital level quality ■ quality indicators.

Appendix A. Author Relationships With Industry and Other Entities—ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure

Name	Employment	Consultant	Speaker's Bureau	Ownership/ Partnership/ Principal	Personal Research	Institutional, Organizational, or Other Financial Benefit	Expert Witness
Robert O. Bonow, Co-Chair	Northwestern University Feinberg School of Medicine—Goldberg Distinguished Professor of Cardiology	None	None	None	None	None	None
Theodore G. Ganiats, Co-Chair	UCSD School of Medicine—Professor and Interim Chair, Department of Family and Preventive Medicine	None	None	None	None	None	None
Craig T. Beam	Medical Development Specialists—Senior Vice President	None	None	None	None	None	None
Kathleen Blake	Center for Medical Technology Policy—Senior Research Director; New Mexico Heart Institute—Physician	None	None	None	None	None	None
Donald E. Casey, Jr	Atlantic Health—Vice President of Quality and Chief Medical Officer	None	None	None	None	None	None
Sarah J. Goodlin	Portland VAMC, Portland, Oregon—Chief, Geriatrics and Patient-Centered Education and Research—President	None	None	None	• Boston Scientific Corporation*	None	None
Kathleen L. Grady	Northwestern University Feinberg School of Medicine—Associate Professor of Surgery and Northwestern University Center for Heart Failure Bluhm Cardiovascular Institute—Administrative Director, Division of Cardiac Surgery	None	None	None	None	None	None
Randal F. Hundley	Arkansas Health Group—Medical Director	None	None	None	None	None	None
Mariell Jessup	University of Pennsylvania—Professor of Medicine	• Boston Scientific • Medtronic, Inc. • Scios Inc.†	None	None	None	None	None
Thomas E. Lynn	Ingenix—Senior Medical Director, Clinical Informatics*	None	None	None	None	• Ingenix*	None
Frederick A. Masoudi	University of Colorado, Denver—Associate Professor of Medicine, Division of Cardiology	• Amgen Inc.†	None	None	None	None	None
David Nilasena	Centers for Medicare and Medicaid Services—Chief Medical Officer, Region VI	None	None	None	None	• Roche Diagnostics Corporation (spouse)*	None
Ileana L. Piña	Albert Einstein College of Medicine—Professor of Medicine and Epidemiology and Population Health; Associate Chief for Academic Affairs, Division of Cardiology	• Astra Zeneca LP • Merck & Co., Inc. • Novartis Pharmaceuticals Corporation • sanofi-aventis US, Inc. • Solvay	None	None	None	None	None
Paul D. Rockswold	US Navy—Captain, Medical Corps; Uniformed Services University of the Health Sciences—Adjunct Assistant Professor, Preventive Medicine and Biometrics†	None	None	None	None	None	None
Lawrence B. Sadwin	Torbot Group, Inc.	None	None	None	None	None	None
Joanna D. Sikkema	University of Miami School of Nursing and Health Studies—Director of Acute Care Nurse Practitioner Program	None	None	None	None	None	None

(Continued)

Appendix A. Continued

Name	Employment	Consultant	Speaker's Bureau	Ownership/ Partnership/ Principal	Personal Research	Institutional, Organizational, or Other Financial Benefit	Expert Witness
Carrie A. Sincak	Midwestern University Chicago College of Pharmacy—Associate Professor and Vice Chair of Acute Care, Department of Pharmacy Practice	None	None	None	None	None	None
John Spertus	Saint Luke's Hospital of Kansas City—Clinical Director, Outcomes Research	• Amgen Inc. • Novartis Pharmaceuticals Corporation • St. Jude Medical • UnitedHealth	None	• Kansas City Cardiomyopathy Questionnaire* • Peripheral Artery Questionnaire* • Seattle Angina Questionnaire*	• Amgen Inc.* • Bristol-Myers Squibb/Sanofi Pharmaceuticals Partnership* • Eli Lilly and Company* • Johnson & Johnson* • Roche Diagnostics Corporation*	None	None
Patrick J. Torcson	St. Tammany Parish Hospital—Director of Hospital Medicine	None	None	None	None	None	None
Elizabeth Torres	Practicing physician	None	None	None	None	None	None
Mark V. Williams	Northwestern University Feinberg School of Medicine—Professor and Chief, Division of Hospital Medicine	None	None	None	None	None	None
John B. Wong	Tufts Medical Center—Chief, Division of Clinical Decision Making	None	None	None	None	None	None

This table represents all relationships of committee members with industry and other entities that were reported by authors, including those not deemed to be relevant to this document, at the time this document was under development. A person is deemed to have a *significant* interest in a business if the interest represents ownership of 5% or more of the voting stock or share of the business entity, or ownership of $10,000 or more of the fair market value of the business entity; or if funds received by the person from the business entity exceed 5% of the person's gross income for the previous year. A relationship is considered to be *modest* if it is less than significant under the preceding definition. Relationships that exist with no financial benefit are also included for the purposes of transparency. Relationships in this table are modest unless otherwise noted.

*Significant relationship.

†No financial relationship.

†The findings and conclusions of this report are those of the author(s) and do not necessarily represent the official positions of the US Navy or USUHS.

UCSD indicates University of California, San Diego; USUHS, Uniformed Services University of the Health Sciences; and VAMC, US Department of Veterans Affairs–Medical Center.

Appendix B. Reviewer Relationships With Industry and Other Entities—ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure

Peer Reviewer	Representation	Consultant	Speaker's Bureau	Ownership/ Partnership/ Principal	Personal Research	Institutional, Organizational, or Other Financial Benefit	Expert Witness
Kathleen A. Dracup	Official Reviewer—AHA	None	None	None	None	None	None
Gregg C. Fonarow	Official Reviewer—AHA	• Abbott Laboratories† • AstraZeneca LP • Bristol-Myers Squibb/Sanofi Pharmaceuticals Partnership† • GlaxoSmithKline† • Medtronic, Inc.† • Merck/Schering-Plough† • Novartis Pharmaceuticals Corporation† • Pfizer, Inc. • Scios Inc.	None	None	• GlaxoSmithKline† • Medtronic, Inc.†	None	None
Robert Hobbs	Official Reviewer—ACCF Board of Governors	• Hospira	• Scios Inc.	None	None	None	None
Eric D. Peterson	Official Reviewer—ACCF/AHA Task Force on Performance Measures Lead Reviewer	• Eli Lilly and Company	None	None	• Bristol-Myers Squibb/Sanofi Pharmaceuticals Partnership†	None	None
James E. Udelson	Official Reviewer—ACCF Board of Trustees	• Acusphere • Boehringer-Ingelheim Corporation • Cytori Therapeutics • GE Healthcare • King Pharmaceuticals, Inc.	None	None	• Baxter • GlaxoSmithKline† • Medtronic, Inc.	None	None
Jeffrey L. Anderson	Content Reviewer—ACCF/AHA Task Force on Practice Guidelines	• Bristol Myers Squibb/Sanofi Pharmaceuticals Partnership • Daiichi-Sankyo, Inc. • Eli Lilly and Company • sanofi-aventis	• Merck & Co., Inc. • Schering-Plough Corporation	None	• AstraZeneca LP	None	• Defendant, COX-2, 2008
Craig Clark	Content Reviewer—ACCF Board of Governors	• Forest Pharmaceuticals	None	None	None	None	None
Bibiana Cujec	Content Reviewer—ACCF Board of Governors	None	None	None	None	None	None
Lee A. Green	Content Reviewer—ACCF/AHA Task Force on Performance Measures	None	None	None	None	None	None
Judith S. Hochman	Content Reviewer—ACCF/AHA Task Force on Practice Guidelines	• Eli Lilly and Company • Millennium Pharmaceuticals, Inc. • Schering Plough Research Institute	None	None	None	• GlaxoSmithKline	None
David E. Lanfear	Content Reviewer—ACCF Heart Failure and Transplantation Committee	None	• Thoratec	None	• Merck & Co., Inc.* • Johnson & Johnson* • sanofi-aventis*	None	None
Ann Loth	Content Reviewer—ACCF/AHA Task Force on Performance Measures	None	None	None	None	None	None
Barry M. Massie	Content Reviewer—ACCF Heart Failure and Transplantation Committee	• Bristol-Myers Squibb Company† • Cytokinetics • GlaxoSmithKline • Merck & Co., Inc. • Novartis Pharmaceuticals Corporation	None	None	None	None	None

(Continued)

Appendix B. Continued

Peer Reviewer	Representation	Consultant	Speaker's Bureau	Ownership/ Partnership/ Principal	Personal Research	Institutional, Organizational, or Other Financial Benefit	Expert Witness
Wayne L. Miller	Content Reviewer—ACCF Heart Failure and Transplantation Committee	None	None	None	None	None	None
Pasala Ravichandran	Content Reviewer—ACCF Heart Failure and Transplantation Committee	None	None	None	None	None	None
Michael W. Rich	Content Reviewer—Individual	None	None	None	None	None	None
Lynne Warner Stevenson	Content Reviewer—ACCF/AHA Heart Failure Guideline Writing Committee	None	None	None	• CardioMEMS • Medtronic, Inc.	None	• CardioMEMS • Medtronic, Inc.
William G. Stevenson	Content Reviewer—ACCF/AHA Task Force on Practice Guidelines	• Biosense Webster • Boston Scientific Corporation • Medtronic, Inc. • St. Jude Medical, Inc.	None	None	None	None	None

This table represents the relevant relationships with industry and other entities that were disclosed at the time of peer review. It does not necessarily reflect relationships with industry at the time of publication. A person is deemed to have a significant interest in a business if the interest represents ownership of 5% or more of the voting stock or share of the business entity, or ownership of $10,000 or more of the fair market value of the business entity, or if funds received by the person from the business entity exceed 5% of the person's gross income for the previous year. A relationship is considered to be modest if it is less than significant under the preceding definition. Relationships that exist with no financial benefit are also included for the purposes of transparency. Relationships in this table are modest unless otherwise noted.

*Significant relationship.

†No financial relationship.

ACCF indicates American College of Cardiology Foundation; AHA, American Heart Association; CV, cardiovascular; and GE, General Electric.

Appendix C. American College of Cardiology Foundation, American Heart Association, and Physician Consortium for Performance Improvement Heart Failure Outpatient Performance Measurement Set Sample Prospective Data Collection Flow Sheet

Allergies, Adverse Drug Reactions
____
____
____
____

Provider No. _______________ Patient Name or Code ______________________________________ Birth Date ____/____/____ Sex □ M □ F
(mm/dd/yyyy)

Clinical Assessment and Evaluation	***Left Ventricular Ejection Fraction (LVEF) Results*** Date of Assessment: ____/____/_____ *Instructions: Must include documentation of the quantitative or qualitative results of an LVEF assessment, regardless of when the evaluation of ejection fraction was performed (ie, recent or prior [any time in the past]).*				
	DATE OF VISIT (mm/dd/yyyy)	______/______/_____	______/______/_____	______/______/_____	______/______/_____
	Assessment of symptoms and activity by New York Heart Association (NYHA) classification or patient-reported questionnaire[1]	NYHA: I / II / III / IV KCCQ: ________ (score) MLHFQ: _______ (score) CHFQ: ________ (score) Other: ________ (score) ___Not assessed (medical reasons*)	NYHA: I / II / III / IV KCCQ: ________ (score) MLHFQ: _______ (score) CHFQ: ________ (score) Other: ________ (score) ___Not assessed (medical reasons*)	NYHA: I / II / III / IV KCCQ: ________ (score) MLHFQ: _______ (score) CHFQ: ________ (score) Other: ________ (score) ___Not assessed (medical reasons*)	NYHA: I / II / III / IV KCCQ: ________ (score) MLHFQ: _______ (score) CHFQ: ________ (score) Other: ________ (score) ___Not assessed (medical reasons*)
Symptom Management	***Symptom management*** *(Quality improvement only)*	___Symptoms improved since last visit or remained consistent with treatment goals	___Symptoms improved since last visit or remained consistent with treatment goals	___Symptoms improved since last visit or remained consistent with treatment goals	___Symptoms improved since last visit or remained consistent with treatment goals
		___Symptoms worsened[2] since last visit Plan of care to address symptom worsening[3] ____________________ ____________________ ____________________ ____________________ ____________________ ____________________ ____________________ ____________________	___Symptoms worsened[2] since last visit Plan of care to address symptom worsening[3] ____________________ ____________________ ____________________ ____________________ ____________________ ____________________ ____________________ ____________________	___Symptoms worsened[2] since last visit Plan of care to address symptom worsening[3] ____________________ ____________________ ____________________ ____________________ ____________________ ____________________ ____________________ ____________________	___Symptoms worsened[2] since last visit Plan of care to address symptom worsening[3] ____________________ ____________________ ____________________ ____________________ ____________________ ____________________ ____________________ ____________________
Medication Management for Patients With LVSD	**DATE OF VISIT** (mm/dd/yyyy)	______/______/_____	______/______/_____	______/______/_____	______/______/_____
	Beta-blocker therapy for left ventricular systolic dysfunction (LVSD) (ie, bisoprolol, carvedilol, or sustained-release metoprolol succinate)	___**Prescribed** ___Not prescribed (medical reasons*) ___Not prescribed (patient reasons*) ___Not prescribed (system reasons*)	___**Prescribed** ___Not prescribed (medical reasons*) ___Not prescribed (patient reasons*) ___Not prescribed (system reasons*)	___**Prescribed** ___Not prescribed (medical reasons*) ___Not prescribed (patient reasons*) ___Not prescribed (system reasons*)	___**Prescribed** ___Not prescribed (medical reasons*) ___Not prescribed (patient reasons*) ___Not prescribed (system reasons*)
	ACE inhibitor or ARB therapy for LVSD	___**Prescribed** ___Not prescribed (medical reasons*) ___Not prescribed (patient reasons*) ___Not prescribed (system reasons*)	___**Prescribed** ___Not prescribed (medical reasons*) ___Not prescribed (patient reasons*) ___Not prescribed (system reasons*)	___**Prescribed** ___Not prescribed (medical reasons*) ___Not prescribed (patient reasons*) ___Not prescribed (system reasons*)	___**Prescribed** ___Not prescribed (medical reasons*) ___Not prescribed (patient reasons*) ___Not prescribed (system reasons*)
	Counseling about implantable cardioverter-defibrillator (ICD) implantation *(Quality improvement only)* □ LVEF ≤ 35% □ Angiotensin-converting enzyme (ACE) inhibitor/angiotensin II receptor blocker (ARB) and beta-blocker therapy for at least 3 mo	___Counseling provided[4] ___Not provided (medical reasons*)	___Counseling provided[4] ___Not provided (medical reasons*)	___Counseling provided[4] ___Not provided (medical reasons*)	___Counseling provided[4] ___Not provided (medical reasons*)

Appendix C. Continued

Education	***Patient self-care education*** *(Quality improvement only)*	___Patient education provided[5]	___Patient education provided[5]	___Patient education provided[5]	___Patient education provided[5]
	***Specify medical reasons (eg, not indicated, contraindicated), patient reasons (eg, patient declined, social, religious), system reasons (eg, resources to perform services not available, insurance coverage/payer-related limitations) for not performing any of the above:**				

[1]NYHA functional classification categories are as follows: *Class I*: patients with cardiac disease but without resulting limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea, or anginal pain; *Class II*: patients with cardiac disease resulting in slight limitation of physical activity. Patients are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea, or anginal pain; *Class III*: patients with marked limitation of physical activity. Patients are comfortable at rest. Less than ordinary activity causes fatigue, palpitation, dyspnea, or anginal pain; *Class IV*: patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of heart failure or anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort is increased. Valid, reliable, disease-specific patient-reported questionnaires include the Kansas City Cardiomyopathy Questionnaire (KCCQ); Minnesota Living with Heart Failure Questionnaire (MLHFQ); and Chronic Heart Failure Questionnaire (CHFQ).

[2]Patient symptoms have demonstrated clinically important deterioration since last assessment.

[3]A documented plan of care may include $\geq$1 of the following: reevaluation of medical therapy, including uptitration of doses, consideration of electrical device therapy, recommended lifestyle modifications (e.g., salt restriction, exercise training), initiation of palliative care, referral for more advanced therapies (e.g., transplant, ventricular assist device), or referral to disease management programs.

[4]Counseling should be specific to each individual patient and include documentation of a discussion regarding the risk of sudden and nonsudden death AND the efficacy, safety, and risks of an ICD. This will allow patients to be informed of the risks and benefits of ICD implantation and to be better able to make decisions based on the valuation of sudden cardiac death vs other risks.

[5]Must include $\geq$3 of the following elements: definition of heart failure (linking disease, symptoms, and treatment) and cause of patient's heart failure; recognition of escalating symptoms and concrete plan for response to particular symptoms; indications and use of each medication; modify risk for heart failure progression; specific diet recommendations; individualized low-sodium diet; recommendation for alcohol intake; specific activity/exercise recommendations; importance of treatment adherence and behavioral strategies to promote treatment adherence.