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ACC/AHA HEART FAILURE CLINICAL PERFORMANCE MEASURES

ACC/AHA Clinical Performance Measures for Adults With Chronic Heart Failure

A Report of the American College of Cardiology/American Heart Association Task Force on Performance Measures (Writing Committee to Develop Heart Failure Clinical Performance Measures)

Endorsed by the Heart Failure Society of America

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TABLE OF CONTENTS

This document was approved by the American College of Cardiology Board of Trustees in August 2005 and the American Heart Association Science Advisory and Coordinating Committee in August 2005.

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 multifaceted strategy to facilitate the process of improving clinical care. The initial phase of this effort was to create clinical practice guidelines that carefully review and synthesize available evidence to better guide patient care. Such guidelines are written in a spirit of suggesting diagnostic or therapeutic interventions for patients in most circumstances. Accordingly, significant judgment by clinicians is required to adapt these guidelines 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 the performance measurement writing committee is not to perform 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 and ranking of the evidence available for the diagnosis and treatment of specific disease areas. Published guideline recommendations employ the ACC/AHA Classification of Recommendations I, IIa, IIb, and III (Fig. 1).

So as not to duplicate performance measure development efforts, writing committees are also instructed to evaluate existing nationally recognized performance measures using the ACC/AHA "attributes of good performance measures." The measure specifications are 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.

ACC/AHA Performance Measurement Sets are to be applied in either the inpatient and/or outpatient setting depending on the topic. Inpatient measures are usually, but not always, captured by retrospective data collection; outpatient reviews lend themselves to retrospective or prospective collection. The latter 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, respectively. 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 committee 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 inpatient measurement set, where a "Challenges to Implementation" section was included subsequent to the specification, when appropriate (Appendix A).

All the measures contained in this set have limitations and challenges to implementation that might 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, incentive system, and public reporting method, among others. The ACC/AHA encourages those interested in working on implemen-

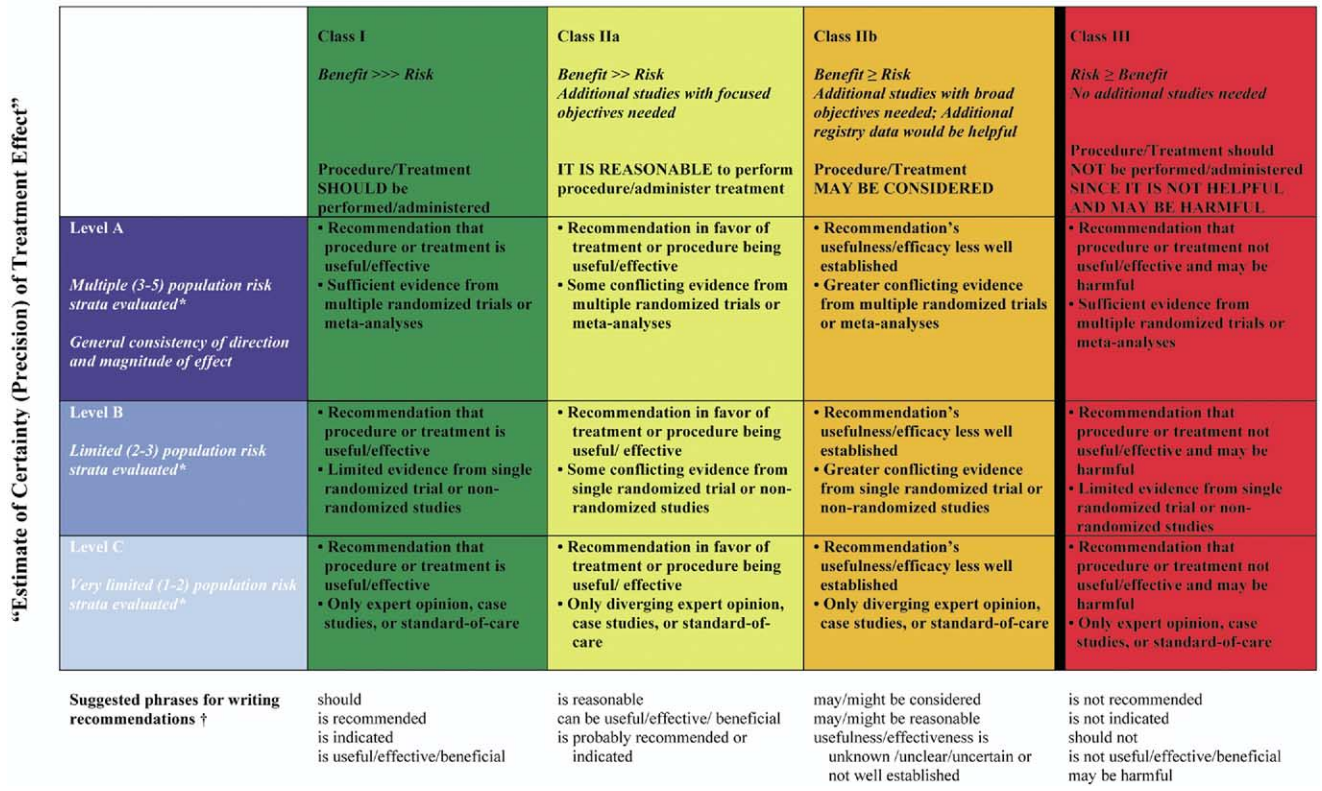

Figure 1. Applying classification of recommendations and level of evidence.

tation 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, ACC/AHA Performance Measurement Sets may 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 QI system 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

The ACC/AHA Heart Failure Performance Measures Writing Committee (hereafter, Writing Committee) was charged with the development of performance measures concerning the diagnosis and treatment of heart failure (HF). These performance measures refer to both hospitalized adult patients (age 18 years or older) with a principal discharge diagnosis of HF and to adults with HF evaluated in the outpatient setting. The Writing Committee independently developed the inpatient performance measures for HF and collaborated with the Physician Consortium for Performance Improvement (Physician Consortium) to develop the outpatient measures. In a concurrent process, the ACC/AHA Task Force on Clinical Data Standards launched the development of the ACC/AHA Key Data Elements and Definitions for Measuring the Clinical Management and Outcomes of Patients With Chronic Heart Failure (2) intended to provide a standardized informational platform for clinical trials, clinical registries, and quality performance measurement for the condition of HF.

A. Scope of the Problem

Heart failure is a major and growing public health problem in the U.S. It affects 4.9 million people, and 550,000 new cases are diagnosed each year (3). Heart failure is primarily a disease of the elderly (4). Thus, the aging of the population and the prolongation of the lives of cardiac patients by modern therapeutic innovations have led to an increasing incidence of HF. The incidence of HF approaches 10 in 1,000 people over the age of 65, and hospital discharges for HF increased by 157% between 1979 and 2002 (3). In the U.S., the disorder is the

underlying reason for 12 to 15 million office visits and 6.5 million hospital days each year (5).

Despite improvements in therapy, the mortality rate in patients with HF has remained high, making implementation of therapies demonstrated to slow the progression of HF imperative. In 2001, 52,800 people died from HF as a primary cause (3). The variability in care documented in the literature demonstrates the opportunity for improvement, which makes performance measurement in cardiovascular disease important.

The costs associated with HF are also large. Heart failure is the most common Medicare diagnosis-related group (DRG), and more Medicare dollars are spent for diagnosis and treatment of HF than for any other diagnosis (6). Medicare reported paying $3.6 billion to beneficiaries for care of HF in 1999, equating to $5,456 per discharge (3). It has been estimated that in 2005, the total direct and indirect cost of HF in the U.S. will be equal to $27.9 billion (3).

B. Writing Committee Structure and Members

Members of the ACC/AHA Heart Failure Performance Measures Writing Committee included a senior clinician, a content expert on HF performance measures, a statistician, various representatives from HF subspecialties, and representatives from the ACC/AHA Heart Failure Guideline Update Writing Committee and ACC/AHA Heart Failure Clinical Data Standards Writing Committee to ensure consistency across the documents. The Writing Committee also included members of the Heart Failure Society of America (HFSA), the American Academy of Family Practitioners (AAFP), the American College of Physicians (ACP), and a nurse scientist from the Nursing Council of the American Heart Association.

C. Relationships With Industry

The work of the Writing Committee was supported exclusively by the ACC and the AHA. Writing Committee members volunteered their time, and there was no commercial support. Meetings of the Writing Committee were confidential and attended only by committee members and staff. All Writing Committee members with relationships with industry relevant to this topic declared these in writing according to standard ACC and AHA reporting requirements; additionally, members verbally acknowledged these relationships to the Writing Committee. Please see Appendix D for relevant Writing Committee relationships with industry. The collaboration with the Physician Consortium to develop the outpatient measures received additional volunteer support from Physician Consortium members and staff support from the American Medical Association. Please see Appendix E for ACC/AHA/Physician Consortium Writing Group relevant relationships with industry. In addition, Appendix F includes relevant relationships with industry information for all peer reviewers of this document.

D. Review and Endorsement

The previously published outpatient ACC/AHA/Physician Consortium Heart Failure Clinical Performance Measures (7) underwent a period of public comment from January 22, 2003 through February 12, 2003, peer review and approval from the respective boards of the ACC and the AHA, and approval by the Physician Consortium. These outpatient measures are being validated through pilot testing as part of the Doctors' Office Quality (DOQ)–Information Technology Project of the Centers for Medicare and Medicaid Services (CMS). Some clarifications, modifications, and additions to the published ACC/AHA/Physician Consortium HF outpatient measures have been made in this document and have been incorporated in their updated ACC/AHA/Physician Consortium Heart Failure Clinical Physician Performance Measurement Set.

During the period February 3, 2005 to March 4, 2005, the complete ACC/AHA HF measurement set, incorporating both inpatient and outpatient measures, underwent a 30-day public comment period during which time ACC and AHA members, as well as other health professionals, had an opportunity to review and comment on the document in advance of its final approval and publication. Over 30 responses were received. The official peer and content review of the document was conducted simultaneously with the 30-day public comment period, with three peer reviewers nominated by the ACC and three reviewers nominated by the AHA. Additional comments were sought from clinical content experts and performance measurement experts.

The ACC/AHA Clinical Performance Measures for the Care of Adults with Chronic Heart Failure was adopted by the respective boards of the ACC and AHA in August 2005. These measures will be reviewed for currency once a year and will be updated as needed. They will be considered valid until they are updated or rescinded by the ACC/AHA Task Force on Performance Measures.

II. METHODOLOGY

The development of performance measures involves identification of a set of measures targeted toward a particular patient population, observed over a particular care period. To achieve this goal, the ACC/AHA Task Force on Performance Measures has outlined and published a methodology of sequential tasks that performance measures writing committees are required to complete (1). The following sections delineate how the Writing Committee applied this methodology to the topic of HF.

A. Definition of HF

The ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (ACC/AHA 2005 HF Guideline Update) (8) classified HF into four stages (Table 1). For the purpose of this document, only the latter two stages, which qualify

Table 1. 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 stuctural heart disease that is stongly 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 stuctural 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).

for the traditional diagnosis of HF (Stages C and D), were considered for inclusion in the measure population. Thus, the inpatient and outpatient performance measurement sets 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 ICD-9-CM (Table 2) should be used to screen and select the inpatient target patient population. These codes correspond to the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and Centers for Medicare and Medicaid Services (CMS) HF cohort selection codes (i.e., the ICD-9-CM codes previously defined by JCAHO and CMS to screen and select cohorts for HF performance measures).

Table 2. ACC/AHA Heart Failure Performance Measures ICD-9-CM Diagnosis Codes

ICD-9-CM Code	Description
402.01	Malignant, hypertensive heart disease with heart failure
402.11	Benign, hypertensive heart disease with heart failure
402.91	Unspecified, hypertensive heart disease with heart failure
404.01	Malignant, hypertensive heart and renal disease with heart failure
404.03	Malignant, hypertensive heart and renal disease with heart failure and renal failure
404.11	Benign, hypertensive heart and renal disease with heart failure
404.13	Benign, hypertensive heart and renal disease with heart failure and renal failure
404.91	Unspecified, hypertensive heart and renal disease with heart failure
404.93	Unspecified, hypertensive heart and renal disease with heart failure and renal failure
428.00	Unspecified, congestive heart failure
428.01	Left heart failure
428.09	Unspecified, heart failure
428.20	Unspecified, systolic heart failure
428.21	Acute systolic heart failure
428.22	Chronic systolic heart failure
428.23	Acute or chronic systolic heart failure
428.30	Unspecified, diastolic heart failure
428.31	Acute diastolic heart failure
428.32	Chronic diastolic heart failure
428.33	Acute or chronic diastolic heart failure
428.40	Unspecified, combined systolic and diastolic heart failure
428.41	Acute combined systolic and diastolic heart failure
428.42	Chronic combined systolic and diastolic heart failure
428.43	Acute or chronic combined systolic and diastolic heart failure

B. Dimensions of Care

Given the multiple domains of providing treatment 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. Classification into dimensions of care facilitated identification of areas where evidence was lacking, as well as prevented duplication of measures within the set. Diagnostics, Patient Education (including prognosis and etiology), Treatment, and Self-Management were selected as the relevant dimensions of care for HF performance measures in both the inpatient and outpatient settings. A fifth dimension, Monitoring of Disease Status, has been addressed for the outpatient setting but will be evaluated in the future for the inpatient setting and might include items such as documentation of follow-up appointments. The Writing Committee exclusively focused on processes and did not consider outcomes since the purpose of the measures is to assist physicians in improving specific clinical care.

C. Literature Review

The Writing Committee reviewed the ACC/AHA 2005 HF Guideline Update (8) as the primary source for deriving the measures. In addition, the Writing Committee reviewed current national performance measures and other relevant literature from organizations developing clinical guidelines and quality standards, including:

- JCAHO/CMS Heart Failure Performance Measures (9);
- Final Report of the Study of Clinically Relevant Indicators for Pharmacologic Therapy (SCRIPT) Project: Congestive Heart Failure (10);
- AHA/ACC Conference Proceedings: Evaluating Quality of Care for Patients With Heart Failure (11);
- Team Management of Patients With Heart Failure: A Statement for Healthcare Professionals From the Car-

Table 3. ACC/AHA Attributes for Satisfactory Performance Measures

ACC/AHA Attributes for Satisfactory Performance Measures
Useful in improving patient outcomes
1. Evidence-based
2. Interpretable
3. Actionable
Measure design
1. Denominator precisely defined
2. Numerator precisely defined
3. Validity
a. Face validity
b. Content validity
c. Construct validity
4. Reliability
Measure implementation
1. Feasibility
a. Reasonable effort
b. Reasonable cost
c. Reasonable time period for collection
Overall assessment

diovascular Nursing Council of the American Heart Association (12);

- Heart Failure Society of America (HFSA) Guidelines for Management of Patients With Heart Failure Caused by Left Ventricular Systolic Dysfunction—Pharmacological Approaches (13); and
- RAND Health: Quality of Care for Cardiopulmonary Conditions: A Review of the Literature and Quality Indicators: Chapter 9, Heart Failure (14).

D. Definition and Selection of Measures

Explicit criteria exist for the development of performance measures so that they accurately reflect the quality of care, including quantification of the numerators and denominators and clearly evaluating the interpretability, applicability, and feasibility of the proposed measures. To determine which measures will be selected for inclusion in the performance measurement set, the committee identified the Class I and Class III recommendations from the ACC/AHA 2005 HF Guideline Update (8) and specific relevant statements from the Team Management of Patients With Heart Failure: A Statement for Healthcare Professionals From the Cardiovascular Nursing Council of the American Heart Association (12).

Once these recommendations were identified, the Writing Committee rated their potential for use as performance measures utilizing the Rating Form and Guide (Appendix C). Writing Committee members rated 27 potential measures on 13 dimensions using 5-point Likert scales (1 = lowest rating; 5 = highest rating) against the ACC/AHA attributes for satisfactory performance measures (Table 3) (15).

The rating results of the final question on the rating form, "Overall Assessment," were used to make the final determination for inclusion of a potential measure in the HF measurement set. Any measure that received a full committee consensus rating of 3 or above in this area ("Overall Assessment") was advanced to the final measure set. Based on the results, 7 inpatient measures and 12 outpatient measures were advanced. These measure sets were then evaluated in light of the ACC/AHA 2005 HF Guideline Update (8) to determine where measures should be revised and clarified. The Discussion section and measurement set specifications (Appendix A and B) detail the rationale for modifications based on the ACC/AHA 2005 HF Guideline Update (8).

III. INPATIENT HF MEASURES

A. Inpatient Population and Care Period

The inpatient target population consists of patients age 18 years or older with a principal discharge diagnosis of HF based on ICD-9-CM (see Table 2). A set of exclusion criteria specific to each inpatient measure was developed. For all the inpatient measures, patients who were under 18 years of age, were transferred to another acute care facility, who left against medical advice, who were discharged to hospice, or who died during the index admission are excluded.

The general period of assessment is the related inpatient hospitalization. The specific time period of interest for each measure is further defined in Appendix A and ranges from within 30 minutes of the index admission to the hospital discharge.

B. Brief Summary of the Inpatient Measures

Table 4 lists the ACC/AHA Heart Failure Performance Measures Inpatient Measurement Set. The inpatient measurement set includes the dimensions of care referenced in the ACC/AHA Methodology for the Selection and Creation of Performance Measures article (1), with the exception of Monitoring of Disease Status (Table 5). Although no current measure exists for this dimension for the inpatient setting, future measure development efforts will examine how to address this gap in the measurement set.

Appendix A provides detailed specifications for each inpatient performance measure including numerator, denominator, period of assessment, method of reporting, sources of data, rationale, clinical recommendations, and challenges to implementation.

C. Inpatient Data Collection Instruments

To aid in data compilation, a data collection instrument is recommended. A sample instrument is provided in Table 6. This instrument was created to accompany the associated measures; however, individual institutions may need to modify this instrument or develop a different one based on their local practice patterns and standards. The flowsheet is intended for prospective data collection only. It is not designed to meet the reporting requirements of organizations, such as JCAHO or CMS.

Table 4. ACC/AHA Heart Failure Performance Measures: Inpatient Measure Descriptions

Performance Measure Name	Measure Description
1. Evaluation of left ventricular systolic (LVS) function	Heart failure patients with documentation in the hospital record that LVS function was assessed before arrival, during hospitalization, or is planned after discharge.
2. ACE inhibitor (ACEI), or angiotensin receptor blocker (ARB) for LVSD	Heart failure patients with LVSD and without both ACEI and ARB contraindications who are prescribed an ACEI or ARB at hospital discharge.
3. Anticoagulant at discharge for HF patients with atrial fibrillation (AF)	Heart failure patients with chronic/recurrent AF and without warfarin contraindications who are prescribed warfarin at discharge.
4. Discharge instructions	Heart failure patients discharged home with written instructions or educational material given to patient or caregiver at discharge or during the hospital stay addressing *all* of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.
5. Adult smoking cessation advice/counseling	Heart failure patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during hospital stay.

IV. OUTPATIENT HF MEASURES

A. Outpatient Population and Care Period

The target population consists of patients age 18 years or older with at least one primary outpatient visit for HF, documentation of HF in the medical records as the primary reason for their visit, or with a principal diagnosis of HF. In addition, patients with documentation of symptoms consistent with Stage C or Stage D HF (Table 1) should be included. A set of exclusion criteria specific to each outpatient measure was developed to further specify the target population (Appendix B).

For the purpose of this document, the outpatient care period is defined as the care provided in an outpatient setting within the time period under evaluation (reporting year).

B. Brief Summary of the Outpatient Measures

The outpatient performance measurement set for HF (Table 7) was developed, revised, and approved through collaborative efforts among the ACC, AHA, and the Physician Consortium. The ACC/AHA Heart Failure Performance Measures Writing Committee drafted the candidate outpatient measures that were published by the Physician Consortium in 2003 (7) and were reviewed for update in 2005. Although these outpatient measures, have been previously published (7), the outpatient measurement set included in this document reflects some changes to the outpatient measures based on the evidence review from the 2005 ACC/AHA HF Guideline Update (8).

As shown in Table 8, the outpatient measurement set includes measures for each of the dimensions of care referenced in the ACC/AHA Methodology for the Selection and Creation of Performance Measures article (1).

Appendix B provides detailed specification for each outpatient performance measure including numerator, denominator, period of assessment, method of reporting, sources of data, rationale, clinical recommendations, and challenges to implementation. Through ongoing efforts, many of the outpatient measures are under consideration for widespread implementation/endorsement by national healthcare organizations (e.g., National Quality Forum [NQF] and the Ambulatory Care Quality Alliance [AQA]).

C. Outpatient Data Collection Instruments

The outpatient HF performance measures are intended to be used prospectively to enhance the QI process. To aid in data compilation, a data collection instrument is recommended. A sample instrument is provided in Figure 2, which was developed by the Physician Consortium and adapted to correspond to the outpatient measures included

Table 5. ACC/AHA Heart Failure Performance Measurement Set: Dimensions of Care Inpatient Measures Matrix

Performance Measure	Diagnostics	Patient Education	Treatment	Self-Management	Monitoring of Disease Status*
1. Evaluation of left ventricular systolic function (LVS) function	✓				
2. ACE inhibitor (ACEI) or angiotensin receptor blocker (ARB) for LVSD			✓		
3. Anticoagulant at discharge for HF patients with atrial fibrillation (AF)			✓		
4. Discharge instructions		✓		✓	
5. Adult smoking cessation advice/counselling		✓			

*Although no current measure exists for this dimension for the inpatient setting, future measure development efforts will examine how to address this gap in the measurement set.

Table 6. ACC/AHA Heart Failure Performance Measures Inpatient Data Collection Flowsheet

ACC/AHA Heart Failure Performance Measures Inpatient Data Collection Flowsheet			
1. Left ventricular systolic (LVS) function assessment		**YES**	**NO**
LV1.	Was an assessment of left ventricular systolic (LVS) function made in diagnosed HF patients, LVS documented as assessed before arrival, during hospitalization, or planned for after discharge?	○ (go to **LV2**)	○ (go to **4**)
LV2.	☐ Quantitative EF:_____%: _____ Qualitatively assessed as (circle one): Normal Mildly Depressed Moderately Depressed Severely Depressed		
2. ACE inhibitor or ARB therapy for left ventricular systolic dysfunction ("ACE/ARB") at discharge		**YES**	**NO**
ACE/ARB1.	Was ejection fraction <40% or with moderately or severely depressed left ventricular systolic function?	○	○ (go to **3**)
ACE/ARB2.	Was ACE inhibitor prescribed upon discharge?	○ (go to **3**)	○ (go to **ACE/ARB3**)
ACE/ARB3.	Was ARB prescribed upon discharge?	○ (go to **3**)	○ (go to **ACE/ARB4**)
ACE/ARB4.	Reasons documented by physician, nurse practitioner, or physician assistant for not prescribing ACE inhibitor and ARB?	○	○
3. Anticoagulant use for heart failure and atrial fibrillation ("ACU")		**YES**	**NO**
ACU1.	Chronic or recurrent atrial fibrillation documented?	○ (go to **ACU2**)	○ (go to **4**)
ACU2.	If yes, was warfarin prescribed?	○ (go to **4**)	○ (go to **ACU3**)
ACU3.	Reasons documented by physician, nurse practitioner, or physician assistant for not prescribing warfarin?	○	○ (go to **4**)
4. Discharge instructions ("PE")		**YES**	**NO**
PE1.	Patient discharged with complete written discharge instructions, as documented in the medical record?	○	○ (go to **5**)
5. Adult smoking cessation advice/counseling ("SC")		**YES**	**NO**
SC1.	Adult patient who smokes cigarettes given smoking cessation counseling/advice?	○	○

This flowsheet is intended for prospective data collection only. It is not designed to meet the reporting requirements of organizations, such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) or the Centers for Medicare and Medicaid Services (CMS).

Table 7. ACC/AHA/Physician Consortium for Performance Improvement Heart Failure Performance Measurement Set: Outpatient Measure Descriptions

Performance Measure Name	Measure Description
1. Initial laboratory tests	Initial laboratory eveluation of patients with newly diagnosed HF.
2. Left ventricular systolic (LVS) function assessment	Heart failure patients with documentation that LVS has been assessed.
3. Weight measurement	Measurement of patient's weight at each outpatient visit to assess change in volume status.
4. Blood pressure measurement	Measurement of patient's blood pressure at each outpatient visit.
5. Assessment of clinical symptoms of volume overload (excess)	Assessment of clinical *symptoms* of volume overload at each outpatient visit.
6. Assessment of clinical signs of volume overload (excess)	Completion of a physical examination pertaining to volume status assessment in patients diagnosed with HF at each outpatient visit.
7. Assessment of activity level	Evaluation of the impact of HF on activity level at each outpatient visit.
8. Patient education	Percentage of patients who were provided with patient education on disease management and health behavior changes during one or more visits within the period of assessment.
9. Beta-blocker therapy	Prescription of beta-blockers in patients with HF and left ventricular systolic dysfunction (LVSD).
10. ACE inhibitor or angiotensin receptor blocker (ARB) therapy for patients with heart failure who have left ventricular systolic dysfunction (LVSD)	Prescription of ACE inhibitor or ARB for management of outpatient HF patients with LVSD.
11. Warfarin therapy for patients with atrial fibrillation (AF)	Use of warfarin in patients with both HF and AF.

in this document. Individual institutions may need to modify the instrument or develop a different tool, based on their local practice patterns and standards.

V. DISCUSSION

The ACC/AHA Clinical Performance Measures for Adults with Chronic Heart Failure address many of the same processes of care as earlier measurement sets published by 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 current document incorporates the performance measures developed jointly by CMS and JCAHO for management of patients with HF (9).

The Writing Committee recognizes that not all Class I guideline recommendations lend themselves to becoming excellent performance measures, as many do not easily fit the attributes of performance measures in terms of usefulness, accuracy, feasibility, and measurability. Thus, the

Table 8. ACC/AHA/Physician Consortium for Performance Improvement Heart Failure Performance Measurement Set: Dimensions of Care Outpatient Measures Matrix

Performance Measure Name	Diagnostics	Patient Education	Treatment	Self-Management	Monitoring of Disease Status
1. Initial laboratory tests	✓				
2. Left ventricular systolic function (LVSF) assessment	✓				
3. Weight measurement	✓				
4. Blood pressure measurement	✓				
5. Assessment of clinical *sysmptoms* of volume overload (excess)					✓
6. Assessment of clinical *signs* of volume overload (excess)	✓				
7. Assessment of activity level					✓
8. Patient education		✓		✓	
9. Beta-blocker therapy			✓		
10. ACE inhibitor, or angiotensin receptor blocker (ARB) therapy for patients with HF who have left ventricular systolic dysfunction (LVSD)			✓		
11. Warfarin therapy for patients with atrial fibrillation (AF)			✓		

American College of Cardiology, American Heart Association, and Physician Consortium for Performance Improvement
Heart Failure Core Physician Performance Measurement Set
Prospective Data Collection Flowsheet

Allergies
____
____

Provider No. ________ **Patient Name or Code** ________________________ **Birth Date** ____/____/_____ **(mm / dd / yyyy)** **Gender M ❑ F ❑**

Clinical Assessment

Initial Laboratory Tests Performed: (select all that apply)

❑ CBC	❑ BUN	❑ Blood glucose	❑ Other
❑ Serum electrolytes	❑ Serum creatinine	❑ Thyroid stimulating hormone	
❑ Left ventricular function assessed: ____/____/____		❑ Left ventricular systolic dysfunction (LVEF < 40% or moderately or severely depressed left ventricular systolic function)	

Results:

Clinical Assessment	**Date of Visit** (mm / dd / yyyy)	____/____/____	____/____/____	____/____/____	____/____/____
	Weight (lb/kg)	❑ Unable to weigh	❑ Unable to weigh	❑ Unable to weigh	❑ Unable to weigh
	Heart Rate				
	Blood Pressure	L R sitting supine standing	L R sitting supine standing	L R sitting supine standing	L R sitting supine standing
	Assessment of Clinical *Symptoms* of Volume Overload (Excess)	Dyspnea __ Y __ N Fatigue* __ Y __ N Orthopnea __ Y __ N Standardized scale or assessment tool used[a] __ Y __ N	Dyspnea __ Y __ N Fatigue* __ Y __ N Orthopnea __ Y __ N Standardized scale or assessment tool used[a] __ Y __ N	Dyspnea __ Y __ N Fatigue* __ Y __ N Orthopnea __ Y __ N Standardized scale or assessment tool used[a] __ Y __ N	Dyspnea __ Y __ N Fatigue* __ Y __ N Orthopnea __ Y __ N Standardized scale or assessment tool used[a] __ Y __ N
	Level of Activity	________ ❑ Standardized scale or assessment tool used[a]	________ ❑ Standardized scale or assessment tool used[a]	________ ❑ Standardized scale or assessment tool used[a]	________ ❑ Standardized scale or assessment tool used[a]
	Assessment of Clinical *Signs* of Volume Overload (Excess)	Peripheral edema __Y __N Rales __Y __N Hepatomegaly __Y __N Ascites __Y __N Assessment of jugular venous pressure __Y __N S3 or S4 Gallop __Y __N Other:________	Peripheral edema __Y __N Rales __Y __N Hepatomegaly __Y __N Ascites __Y __N Assessment of jugular venous pressure __Y __N S3 or S4 Gallop __Y __N Other:________	Peripheral edema __Y __N Rales __Y __N Hepatomegaly __Y __N Ascites __Y __N Assessment of jugular venous pressure __Y __N S3 or S4 Gallop __Y __N Other:________	Peripheral edema __Y __N Rales __Y __N Hepatomegaly __Y __N Ascites __Y __N Assessment of jugular venous pressure __Y __N S3 or S4 Gallop __Y __N Other:________
Education	**Patient Education**	❑ Patient education provided[b]	❑ Patient education provided[b]	❑ Patient education provided[b]	❑ Patient education provided[b]

Figure 2. ACC/AHA and Physician Consortium data collection flowsheet. *Continued on next page.*

*Located in flowsheet only for quality improvement. [a]Standardized scale or assessment tools may include the New York Heart Association functional classification of congestive heart failure questionnaire (Guyatt). [b]Patient education should include one or more of the following: weight monitoring; diet (sodium restriction); symptom management; physical activity; smoking cessation; medication instruction; minimizing or avoiding use of NSAIDs; follow-up plans (e.g., next appointment, visiting nurse); referral for specific educational or management programs; or prognosis/end-of-life issues.

This flowsheet is intended for prospective data collection only. It is not designed to meet the reporting requirements of organizations, such as the Joint Commission on Accreditation of Healthcare Organization (JCAHO) or the Centers for Medicare and Medicaid Services (CMS).

American College of Cardiology, American Heart Association, and Physician Consortium for Performance Improvement Heart Failure Core Physician Performance Measurement Set
Prospective Data Collection Flowsheet

Provider No. _____ **Patient Name or Code** _____ **Birth Date** ____ / ____ / _____ **Gender M** ❑ **F** ❑
(mm / dd / yyyy)

Adverse Drug Reactions
_____

Medication Management

Date of Visit (mm / dd / yyyy)	_____/_____/_____	_____/_____/_____	_____/_____/_____	_____/_____/_____
Beta-Blocker Therapy	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)
ACE Inhibitor or ARB Therapy	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)
Warfarin Therapy ❑ Chronic or paroxysmal atrial fibrillation	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)	❑ Not indicated ❑ Prescribed ❑ Not prescribed (medical reasons*) ❑ Not prescribed (patient reasons*)

* Specify medical (e.g., allergy, contraindication) or patient (e.g., economic, social, religious) reasons for not prescribing therapy:

Other Medications

Figure 2 Continued.

Writing Committee selected only those Class I recommendations that were considered to perform well as performance measures in the inpatient or outpatient setting. However, in the case of angiotensin-converting enzyme (ACE) inhibitor/angiotensin receptor blocker (ARB) measures, a Class IIa recommendation was considered and used as the basis for clarifying the measure constructed by the committee. 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 change is made with recognition that although ACE inhibitors are preferred as the first option in HF patients who have left ventricular systolic dysfunction (LVSD), physicians should be given credit for prescribing or continuing ARB therapy.

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 as an effective alternative therapy (16) and is recommended in the ACC/AHA 2005 HF Guideline Update (8) as a reasonable alternative therapy. Thus, the Writing Committee decided to revise both the inpatient and outpatient ACE inhibitor measures to include ARB therapy.

The inpatient and outpatient measures are designed to be implemented in either a retrospective chart abstraction process or used as part of a prospective quality improvement process. The data collection tool suggested for use with the inpatient measures (Table 6) 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 a retrospective chart review, but can be easily implemented using a prospective patient management tool. These inpatient and outpatient measures will require testing in practice to determine their validity and may require modification in the future.

The Writing Committee also felt it was 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.

A. ICD Potential Measure

Although the committee considered a number of additional potential measures that focus on equally important aspects of care, either the evidence base or more significant challenges to measurement of these components of care across all patients undermined the benefits that might be gained. Such is the case for measurement of implantable cardioverter-defibrillator (ICD) implantation for the reduction of sudden death in patients with severe LVSD and biventricular pacing in appropriate candidates. Currently, there is not a sufficient number of qualified cardiac electrophysiologists in every community to implant ICDs and monitor follow-up in these HF patients as well as to ensure that complications are addressed as these patients progress from HF Class III to Class IV.

B. Inpatient Beta-Blocker Potential Measure

The Writing Committee also considered including an inpatient beta-blocker therapy measure. There is no specific guideline recommendation for implementation of beta-blockers in the inpatient setting, although it is recommended that such medications be started when patients are clinically stable. The complexities of establishing the right conditions under which stable HF patients would be included in the measure minus the exclusions would result in so small a denominator that the measure would not be meaningful at this time. The omission of an inpatient beta-blocker measure does not recommend against its initiation in hospitals for appropriate patients.

C. Measures Removed From the Measurement Set

Three measures were removed from the measurement sets (inpatient and outpatient) post-peer review/public comment, i.e., the "Volume Status and Clinical Assessment on Admission" and "Initial Evaluation of Left Ventricular Systolic Function for Newly Diagnosed HF Patients" measures from the inpatient set, and the "Examination of the Heart" measure from the outpatient set. These measures, although potentially of value for improving patterns of care, were not believed to have been tested in clinical situations to assure their reliability and validity.

To be successful as quality improvement tools, these measures need to be adopted, implemented, and integrated into the patient care. These measurement sets should contribute to the evolution of reporting systems that allow physicians and other health care providers to improve treatment 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 they 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 necessary to improve performance.

APPENDIX A. Inpatient Measurement Set Specifications

1. Evaluation of Left Ventricular Systolic (LVS) Function

Heart failure patients with documentation in the hospital record that LVS function was assessed before arrival, during hospitalization, or is planned for after discharge

Numerator	Heart failure patients with documentation in the hospital record that LVS function was assessed before arrival, during hospitalization, or is planned for after discharge. Description of left ventricular systolic function may be quantitative (ejection fraction) or qualitative (for example, "moderately depressed" or visually estimated ejection fraction).
Denominator	Heart failure patients. **Included populations:** Discharges with an ICD-9-CM Principal Diagnosis Code for heart failure as defined in Table 3. **Excluded populations:** • Patients less than 18 years of age; • Patients transferred to another acute care hospital or federal hospital; • Patients who expired; • Patients who left against medical advice; • Patients discharged to hospice; • Patients with reason(s) documented by a physician, nurse practitioner, or physician assistant for no LVS function assessment.
Period of assessment	Inpatient admission.
Sources of data	Administrative data and medical records.

Rationale

Evaluation of patients with heart failure should include a measurement of left ventricular systolic function. Patients with LVEF less than 40% or with moderately or severely depressed left ventricular systolic function are generally considered to warrant consideration of specific therapy. LVS function assessed at the time of heart failure diagnosis can be considered valid unless the patient has had a change in clinical status, experienced or recovered from a clinical event, or received treatment that might have a significant effect on cardiac function.

The single most useful diagnostic test in the evaluation of patients with HF is the comprehensive two-dimensional echocardiogram coupled with Doppler flow studies to determine whether the primary abnormality is pericardial, myocardial, or valvular. A comprehensive echocardiographinc evaluation is important, since it is common for patient to have more than on cardiac abnormality that contributes to the development of HF. Furthermore, the study serves as a baseline for comparison to assess long-term effects of therapeutic interventions or changes associated with significant clinical events.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

Two-dimensional echocardiography with Doppler should be performed during initial evaluation of patients presenting with HF to assess LVEF, LV size, wall thickness, and valve function. Radionuclide ventriculography can be performed to assess LVEF and volumes (Level of Evidence: C).

Method of Reporting

Aggregate rate (standard error) generated from count data reported as a proportion.

Challenges to Implementation

Confirming results of LVS function assessment if conducted before arrival or planned after discharge.

2. ACE Inhibitor (ACEI) or Angiotensin Receptor Blocker (ARB) for Left Ventricular Systolic Dysfunction (LVSD)

Heart failure patients with LVSD and without both ACEI and ARB contraindications who are prescribed an ACEI or ARB at hospital discharge

[For purposes of this measure, LVSD is defined as chart documentation of LVEF less than 40% or a narrative description of left ventricular systolic (LVS) function consistent with moderate or severe systolic dysfunction.]

Numerator	Heart failure patients who are prescribed an ACEI or ARB at hospital discharge.
Denominator	Heart failure patients with LVSD and without both ACEI and ARB contraindications **Included populations:** • Discharges with an ICD-9-CM Principal Diagnosis Code for heart failure as defined in Table 3, AND • Chart documentation of a LVEF less than 40% or a narrative description of LVS function consistent with moderate or severe systolic dysfunction. **Excluded populations:** • Patients less than 18 years of age; • Patients transferred to another acute care hospital or federal hospital; • Patients who expired; • Patients who left against medical advice; • Patients discharged to hospice; • Patients with BOTH a potential contraindication/reason for not prescribing an ACEI at discharge AND a potential contraindication/reason for not prescribing an ARB at discharge, as evidenced by one or more of the following: – ACEI allergy AND ARB allergy, – Moderate or severe aortic stenosis, – Physician, nurse practitioner, or physician assistant documentation of BOTH a reason for not prescribing an ACEI at discharge AND a reason for not prescribing an ARB at discharge, – Reason documented by physician, nurse, or other healthcare provider for not prescribing an ARB at discharge AND an ACEI allergy, – Reason documented by physician, nurse practitioner, or physician assistant for not prescribing an ACEI at discharge AND an ARB allergy.
Period of assessment	Hospital discharge.
Sources of data	Administrative data and medical records.

Rationale

ACE inhibitors have been shown to decrease morbidity, mortality, and hospitalizations for patients with heart failure and left ventricular systolic dysfunction. The efficacy of ARB therapy has been strengthened by several large-scale prospective randomized clinical trials demonstrating reduction in mortality and hospitalization for heart failure among patients with heart failure and LVSD. ACE inhibitors should be prescribed to all patients with HF due to LV systolic dysfunction unless they have a contraindication to their use or have been shown to be unable to tolerate treatment with these drugs. ACE inhibitors remain the first choice for inhibition of the renin-angiotensin system in chronic HF, but ARBs can now be considered a reasonable alternative (13,16,17). Even if the patient has responded favorably to the diuretic, treatment with ACE inhibitor or ARBs should be initiated and maintained in patients who can tolerate them, because they have been shown to favorably influence the long-term prognosis of HF.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

Angiotensin converting enzyme inhibitors are recommended for all patients with current or prior symptoms of HF and reduced LVEF, unless contraindicated (Level of Evidence: A).

Class IIa

An ARB should be administered to post-MI patients without HF who are intolerant of ACEIs and have a low LVEF (Level of Evidence: B).

Referenced Recommendation(s)

CMS/JCAHO Core Measure: Heart Failure, HF-3: ACEI or ARB for LVSD (9).

Method of Reporting

Aggregate rate (standard error) generated from count data reported as a proportion.

Challenges to Implementation

- Determination of who has LVEF <0.40 is a potential challenge to implementation, as well as how this can be reasonably, consistently, reliably located in the patient record. Also, future updates may consider whether the determination of ACEI or ARB use is made only at discharge (discharge medication list) or whether additional credit should be provided for in-hospital initiation and titration.
- Ambiguity regarding what constitutes contraindication and difficulty identifying the contraindications in the medical record.
- Quality improvement efforts also should consider whether prescription of only specific agent or specific dose-ranges (based on clinical trial evidence) should be encouraged.

3. Anticoagulant at Discharge for HF Patients With Atrial Fibrillation (AF)*

Heart failure patients with chronic/recurrent AF and without warfarin contraindications who are prescribed warfarin at discharge

Numerator	Heart failure patients in the denominator for whom warfarin is prescribed at discharge
Denominator	Heart failure patients discharged with chronic or recurrent atrial fibrillation. **Included populations:** • Discharges with an ICD-9-CM Principal Diagnosis Code for heart failure as defined in Table 3, AND • Chart documentation of chronic or recurrent atrial fibrillation. **Excluded populations:** • Patients less than 18 years of age; • Patients transferred to another acute care hospital or federal hospital; • Patients who expired; • Patients who left against medical advice; • Patients discharged to hospice; • Contraindication to warfarin which include: – Allergy, – Pregnancy, – Risk of bleeding (such as active peptic ulcer disease); hemorrhagic stroke; other hemorrhage; hepatic failure; bleeding disorder; metastatic cancer; recent or planned surgery or biopsy procedure; other physician-documented bleeding risk, – Risk of fall documented by physician, – Psychosocial concerns (such as active psychosis; terminal illness/comfort care only; alcoholism or drug abuse), or – Other potential contraindication (seizure disorder; malignant hypertension; intracranial aneurysm, repaired or unrepaired, and others); or • Documentation of reason(s) by a physician, nurse practitioner, or physician assistant for not prescribing warfarin.
Period of assessment	Hospital discharge.
Sources of data	Administrative data and medical records.

Rationale

In patients with symptomatic HF, the prevalence of AF ranges from 10 to 30 percent, with the highest incidence among those with the most severe HF. These patients are at risk of systematic embolization and stroke. Anticoagulation with warfarin is most justified in patients with HF who have experienced a previous embolic event or who have paroxysmal or chronic atrial fibrillation.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I
Physicians should prescribe anticoagulants in patients with HF who have paroxysmal or persistent atrial fibrillation or a previous thromboembolic event (Level of Evidence: A).

Method of Reporting

Aggregate rate (standard error) generated from count data reported as a proportion.

*This is a test measure.

4. Discharge Instructions

Heart failure patients discharged home with written instructions or educational material given to the patient or care giver at discharge or during the hospital stay addressing *all* of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen

Numerator	Heart failure patients with documentation that they or their caregivers were given written discharge instructions or other educational material addressing *all* of the following: 1. Activity level 2. Diet 3. Discharge medications 4. Follow-up appointment 5. Weight monitoring 6. What to do if symptoms worsen
Denominator	Heart failure patients discharged home. **Included populations:** • Discharges with an ICD-9-CM Principal Diagnosis Code for heart failure as defined in Table 3. • A discharge to home or home care. **Excluded populations:** • Patients less than 18 years of age
Period of assessment	Hospital discharge.
Sources of data	Administrative data and medical records.

Rationale

Education of heart failure patients and their families is critical. Failure of these patients to comply with physician's and other healthcare providers' instructions is sometimes a cause of HF exacerbation. A significant cause of patient's failure to comply is lack of understanding. It is, therefore, incumbent on health care professionals to be certain that patients and their families have an understanding of the causes of heart failure, prognosis, therapy, dietary restrictions, activity, importance of compliance, and the signs and symptoms of recurrent heart failure. Thorough discharge planning is associated with improved patient outcomes (11).

Reference Recommendation(s)

CMS/JCAHO Core Measure: Heart Failure, HF-1: Discharge Instructions (9).

Method of Reporting

Aggregate rate (standard error) generated from count data reported as a proportion.

5. Adult Smoking Cessation Advice/Counseling

Heart failure patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during hospital stay

[For purposes of this measure, a smoker is defined as someone who has smoked cigarettes anytime during the year prior to hospital arrival.]*

Numerator	Heart failure patients (cigarette smokers) who receive smoking cessation advice or counseling during the hospital stay.
Denominator	Heart failure patients with a history of smoking cigarettes anytime during the year prior to hospital arrival. **Included populations:** • Discharges with an ICD-9-CM Principal Diagnosis Code for heart failure as defined in Table 3, AND • A history of smoking cigarettes anytime during the year prior to hospital arrival. **Excluded populations:** • Patients less than 18 years of age; • Patients transferred to another acute care hospital or federal hospital; • Patients who expired; • Patients who left against medical advice; • Patients discharged to hospice.
Period of assessment	Hospital discharge.
Sources of data	Administrative data and medical records.

Rationale

Smoking is correlated with increased risk of coronary artery disease and heart failure. Heart failure patients who are smokers should be given smoking cessation advice or counseling during the hospital stay. In addition, resources to assist in quitting smoking should be supplied, such as nicotine replacement therapy, referral to a smoking cessation counselor or support group, and smoking cessation pharmacotherapy.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I
Patients at high risk for developing HF should be counseled to avoid behaviors that may increase the risk of HF (e.g., smoking, excessive alcohol consumption, and illicit drug use) (Level of Evidence: C).

Reference Recommendation(s)

CMS/JCAHO Core Measure: Heart Failure, HF-4: Adult Smoking Cessation Advice/Counseling (9).

Method of Reporting

Aggregate rate (standard error) generated from count data reported as a proportion.

*There is interest in expanding this definition beyond cigarette smoking that would include cigars and pipes. At this time, efforts are being made to keep the measures aligned with the referenced recommendations.

APPENDIX B. Outpatient Measurement Set Specifications

1. Initial Laboratory Tests*

Initial laboratory evaluation of patients with newly diagnosed HF

Numerator	Patients for whom initial laboratory testing was performed. Laboratory testing should include the following: • Complete blood count, • Urinalysis, • Serum electrolytes (including calcium and magnesium), • Blood urea nitrogen, • Serum creatinine, • Blood glucose, • Liver function test, and • Thyroid-stimulating hormone.
Denominator	All patients, 18 years of age and older, with newly diagnosed HF during the reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet

Rationale

Laboratory testing may reveal important heart failure etiologies, the presence of disorders or conditions that can lead to or exacerbate HF. Laboratory testing could also reveal important modulators of therapy. The initial evaluation of patients with heart failure should include all of the testing indicated in the guideline recommendation.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

Initial laboratory evaluation of patients presenting with HF should include complete blood count, urinalysis, serum electrolytes (including calcium and magnesium), blood urea nitrogen, serum creatinine, fasting blood glucose (glycohemoglobin), lipid profile, liver function tests, and thyroid-stimulating hormone (Level of Evidence: C).

Method of Reporting

Per patient

• Whether or not initial laboratory testing was performed.

Per patient population

• Percentage of all patients for whom initial laboratory testing was performed.

*This measure has been designated strictly as a quality improvement measure and requires prospective data collection.

2. Left Ventricular Systolic (LVS) Function Assessment

Heart failure patients with documentation that LVS function has been assessed

Numerator	Patients in whom quantitative or qualitative results of a recent or prior (any time in the past) assessment of LVS function is documented.
Denominator	All patients, 18 years of age and older, with HF.
Period of assessment	Per reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet.

Rationale

Measurement of left ventricular function is a crucial step in the evaluation and management of heart failure patients. Evaluation of patients with heart failure should include a measurement of left ventricular systolic function. Patients with a left ventricular ejection fraction less than 40% or with moderately or severely depressed left ventricular systolic function are generally considered to have depressed systolic function warranting consideration of specific therapy.

The single most useful diagnostic test in the evaluation of patients with HF and left ventricular systolic function is the comprehensive two-dimensional echocardiogram coupled with Doppler flow studies to determine whether the primary abnormality is pericardial, myocardial or valvular. A comprehensive echocardiographic evaluation is important, since it is common for patient to have more than one cardiac abnormality that contributes to the development of HF. Furthermore, the study serves as a baseline for comparison to assess long-term effects of therapeutic interventions or changes associated with significant clinical events.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

Two-dimensional echocardiography with Doppler should be performed during initial evaluation of patients presenting with HF to assess LVEF, LV size, wall thickness, and valve function. Radionuclide ventriculography can be performed to assess LVEF and volumes (Level of Evidence: C).

Method of Reporting

Per patient:

- Quantitative or qualitative results of LVS function assessment.

Per patient population:

- Percentage of patients with quantitative or qualitative results of LVS function assessment recorded.

Challenges to Implementation

In the stable heart failure patient, the LVS function assessment carries over from year to year. Since older measurements are still valid if the patient has not experienced a change in clinical status, the use of a patient flow sheet or data collection tool that includes notation of most recent LVS function assessment results is suggested.

3. Weight Measurement

Measurement of patient's weight at each outpatient visit to assess change in volume status

Numerator	Patient visits with weight measurement recorded.
Denominator	All patient visit for patients 18 years of age and older with HF. **Excluded Populations:** • Patient visits in which physician was unable to weight patient.
Period of assessment	Per reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet.

Rationale

Weight and fluid monitoring is essential for heart failure patients. Significant changes in weight are often indications that the patient is in fluid overload. A thorough physical examination is recommended to identify cardiac and non-cardiac disorders that may accelerate the progression of HF. A careful history of heart failure patients focused on volume status plays a pivotal role in determining the need for or adjustment of diuretic therapy and in detecting sodium excesses or deficiencies that may limit efficacy and decrease the tolerability of drugs used to treat HF. Short-term changes in fluid status are best assessed by measuring changes in body weight. However, changes in body weight may be less reliable during long periods of follow-up, because many patients lose skeletal muscle mass and body fat as the disease progresses due to the development of cardiac cachexia.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

Initial examination of patients presenting with HF should include assessment of the patient's volume status, orthostatic blood pressure changes, measurement of weight and height, and calculation of body mass index (Level of Evidence: C).

Assessment should be made at each visit of the volume status and weight of a patient with HF. (Level of Evidence: C).

Method of Reporting

Per patient:

• Number of visits with weight measurement recorded/number of visits.

Per patient population:

• Percentage of patient visits with weight measurement recorded.

4. Blood Pressure Measurement

Measurement of patient's blood pressure at each outpatient visit

Numerator	Patient visits with blood pressure measurement recorded.
Denominator	All patient visits for patients 18 years of age and older with HF.
Period of assessment	Per reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet.

Rationale

Systematic hypertension is a major risk factor for heart failure increasing its development by two- to four-fold. A complete history and physical examination are the first steps in evaluating the structural abnormality or cause responsible for the development of HF. Direct inquiry may reveal prior or current evidence of MI, valvular disease, or congenital heart disease, whereas examination of the heart may suggest the presence of cardiac enlargement, murmurs, or a third heart sound.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

A thorough history and physical examination should be obtained/performed in patients presenting with HF to identify cardiac and noncardiac disorders or habits that might cause or accelerate the development of HF or accelerate the progression of HF (Level of Evidence: C).

Method of Reporting

Per patient:

- Number of visits with blood pressure measurement recorded/number of visits.
- Most recent systolic and diastolic blood pressure values.

Per patient population:

- Percentage of patient visits with a blood pressure measurement recorded.
- Distribution of systolic and diastolic blood pressure values.

5. Assessment of Clinical Symptoms of Volume Overload (Excess)

Assessment of patient's clinical *symptoms* of volume overload at each outpatient visit (standardized scale or assessment tool may be used)

Numerator	Patient visits with assessment of clinical symptoms of volume overload (excess). Assessment for presence or absence of symptoms of volume overload must include: • Dyspnea, or • Orthopnea, or • Documentation of standardized scale or completion of assessment tool.
Denominator	All patients visits for patients, 18 years of age and older, with HF.
Period of assessment	Per reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet.

Rationale

A careful history of heart failure patients focused on volume status plays a pivotal role in determining the need for or adjustment of diuretic therapy and in detecting sodium excesses or deficiencies that may limit efficacy and decrease the tolerability of drugs used to treat HF. Volume overload is a common reason for repeat hospitalization for patients with heart failure. The finding of clear lung fields on physical examination of a patient with chronic heart failure should not suggest that fluid retention has been adequately treated.

Once the nature and cause of the structural abnormalities leading to the development of HF have been defined, physicians should focus on the clinical assessment of patients, both during the initial presentation and during subsequent visits. This ongoing review of the patient's clinical status is critical to the appropriate selection and monitoring of treatments.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

A thorough history and physical examination should be obtained/performed in patients presenting with HF to identify cardiac and noncardiac disorders or behaviors that might cause or accelerate the development or progression of HF (Level of Evidence: C).

Initial examination of patients presenting with HF should include assessment of the patient's volume status, orthostatic blood pressure changes, measurement of weight and height, and calculation of body mass index (Level of Evidence: C).

Assessment should be made at each visit of the volume status and weight of a patient with HF (Level of Evidence: C).

Method of Reporting

Per patient:

• Number of visits with assessment of clinical *symptoms* of volume overload (excess)/number of visits.

Per patient population:

• Percentage of patient visits with assessment of clinical *symptoms* of volume overload (excess).

Challenges to Implementation

Completion of history focused on volume status.

6. Assessment of Clinical Signs of Volume Overload (Excess)

Completion of a physical examination pertaining to volume status assessment in patients diagnosed with HF at each outpatient visit (standardized scale or assessment tool may be used)

Numerator	Patient visits with assessment of clinical signs of volume overload (excess). Assessment for presence or absence of signs of volume overload must include: • Peripheral edema, or • Rales, or • Hepatomegaly, or • Ascites, or • Assessment of jugular venous pressure, or • S_3 gallop, or • S_4 gallop.
Denominator	All patient visits for patients, 18 years of age and older, with HF.
Period of assessment	Per reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet.

Rationale

A careful history of heart failure patients focused on volume status plays a pivotal role in determining the need for or adjustment of diuretic therapy and in detecting sodium excesses or deficiencies that may limit efficacy and decrease the tolerability of drugs used to treat HF. Volume overload is a common reason for repeat hospitalization for patients with heart failure. The finding of clear lung fields on physical examination of a patient with chronic heart failure should not suggest that fluid retention has been adequately treated.

Once the nature and cause of the structural abnormalities leading to the development of HF have been defined, physicians should focus on the clinical assessment of patients, both during the initial presentation and during subsequent visits. This ongoing review of the patient's clinical status is critical to the appropriate selection and monitoring of treatments.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

A thorough history and physical examination should be obtained/performed in patients presenting with HF to identify cardiac and noncardiac disorders or behaviors that might cause or accelerate the development or progression of HF (Level of Evidence: C).

Initial examination of patients presenting with HF should include assessment of the patient's volume status, orthostatic blood pressure changes, measurement of weight and height, and calculation of body mass index (Level of Evidence: C).

Assessment should be made at each visit of the volume status and weight of a patient with HF (Level of Evidence: C).

Method of Reporting

Per patient:

• Number of visits with assessment of clinical *signs* of volume overload (excess)/number of visits.

Per patient population:

• Percentage of patient visits with assessment of clinical *signs* of volume overload (excess).

Challenges to Implementation

Completion of physical examination focused on volume status.

7. Assessment of Activity Level

Evaluation of the impact of HF on activity level at each outpatient visit (standardized scale or assessment tool may be used)

Numerator	Patient visits with assessment of current level of activity OR documentation of standardized scale or completion of assessment tool.*
Denominator	All patient visits for patients aged ≥18 years with HF.
Period of assessment	Per reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet.

Rationale

Evaluation of function longitudinally is necessary to track improvement or worsening as a basis for treatment decisions. A thorough history is recommended to identify cardiac and non-cardiac disorders that may accelerate the progression of HF. Inquiry about the patient's activity level is important in the assessment of the patient's functional capacity and plays a role in the general management of patients with HF.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

In patients presenting with HF, initial assessment should be made of a patient's ability to perform routine and desired activities of daily living (Level of Evidence: C).

Method of Reporting

Per patient:

- Number of visits with assessment of activity level/number of visits.

Per patient population:

- Percentage of patient visits with assessment of activity level.

*Standardized scale or assessment tools may include the New York Heart Association functional classification of congestive heart failure (level of activity only); Kansas City Cardiomyopathy Questionnaire; Minnesota Living with Heart Failure Questionnaire; or Chronic Heart Failure Questionnaire (Guyatt).

8. Patient Education

Percentage of patients who were provided with patient education on disease management and health behavior changes during one or more visits within the period of assessment

Numerator	Patients who were provided with written and/or verbal education at one or more visit(s). Patient education should include one or more of the following: • Weight monitoring; • Diet (sodium restriction); • Symptom management; • Physical activity; • Smoking cessation; • Medication instruction; • Minimizing or avoiding use of NSAIDs; • Referral for visiting nurse or specific educational or management programs; or • Prognosis/end-of-life issues.
Denominator	All patients 18 years of age and older, with HF and with one or more visit(s).
Period of assessment	Per reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet.

Rationale

Patient education and close supervision is recommended for patients with HF to reduce the likelihood of noncompliance and lead to the detection of changes in body weight or clinical status early enough for effective treatment to be instituted.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

Patients at high risk for developing HF should be counseled to avoid behaviors that may increase the risk of HF (e.g., smoking, excessive alcohol consumption, and illicit drug use) (Level of Evidence: C).

Method of Reporting

Per patient:

• Whether or not patient education was provided.

Per patient population:

• Percentage of patients who were provided with patient education on disease management and health behavior changes during one or more visits.

Challenges to Implementation

• Lack of chart documentation of education activities and patient counseling.
• Use of patient's education measure for accountability purposes.

9. Beta-Blocker Therapy

Prescription of beta-blockers in patients with HF and left ventricular systolic dysfunction (LVSD)

Numerator	Patients who were prescribed beta-blocker therapy.
Denominator	All HF patients, 18 years of age and older, with LVSD, defined as LVEF <40% or with moderately or severely depressed left ventricular systolic function. **Included populations:** • Patients with HF and LVSD, defined as LVEF <40% or with moderately or severely depressed left ventricular systolic function. **Excluded populations:** • Documentation of medical reason(s) by a physician, nurse practitioner, or physician assistant for not prescribing beta-blocker; or • Documentation of patient reason(s) (e.g., economic, social, and/or religious) for not prescribing beta-blocker therapy.
Period of assessment	Per reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet.

Rationale

Beta-blockers should be prescribed to all patients with stable HF due to LVSD unless they have a contraindication to their use or have been shown to be unable to tolerate treatment with these drugs. Treatment should be initiated in the outpatient setting as soon as the LV dysfunction is diagnosed, even when symptoms are mild. Long-term treatment with beta-blockers can lessen the symptoms of HF, improve the clinical status of patients, reduce the risk of death, and reduce the combined risk of death or hospitalization. These benefits of beta-blockers were seen in patients with or without coronary artery disease and in patients with or without diabetes.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

Beta-blockers (using 1 of the 3 proven to reduce mortality, i.e., bisoprolol, carvedilol, and sustained release metoprolol succinate) are recommended for all stable patients with current or prior symptoms of HF and reduced LVEF, unless contraindicated (Level of Evidence: A).

Method of Reporting

Per patient:

• Whether or not patient with LVSD was prescribed beta-blocker therapy.

Per patient population:

• Percentage of all HF patients with LVSD who were prescribed beta-blocker therapy.
• Percentage of patients with LVSD who were prescribed beta-blocker therapy, with all denominator exclusions applied.

Challenges to Implementation

Identification of contraindications in medical records.

10. ACE Inhibitor or Angiotensin Receptor Blocker (ARB) for Patients with Heart Failure Who Have Left Ventricular Systolic Dysfunction (LVSD)

Prescription of ACE inhibitor or ARB for management of outpatient HF patients with LVSD

Numerator	Patients who were prescribed ACE inhibitor or ARB therapy.
Denominator	All HF patients, 18 years of age and older, with LVSD, defined as LVEF <40% or with moderately or severely depressed left ventricular systolic function. **Included populations:** • Patients with HF and LVSD, defined as LVEF <40% or with moderately or severely depressed left ventricular systolic function. **Excluded populations:** • Documentation of medical reason(s) by a physician, nurse practitioner, or physician assistant for not prescribing ACE inhibitor and for not prescribing ARB therapy. • Documentation of patient reason(s) (e.g. economic, social, and/or religious) for not prescribing ACE inhibitor and for not prescribing ARB therapy.
Period of assessment	Per reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet.

Rationale

ACE inhibitors have been shown to decrease morbidity, mortality, and hospitalizations for patients with heart failure and left ventricular systolic dysfunction. The efficacy of ARB therapy has been strengthened by several large-scale prospective randomized clinical trials demonstrating reduction in mortality and hospitalization for heart failure among patients with heart failure and LVSD. ACEIs should be prescribed to all patients with HF due to LV systolic dysfunction unless they have a contraindication to their use or have been shown to be unable to tolerate treatment with these drugs. ACEIs remain the first choice for inhibition of the renin-angiotensin system in chronic HF, but ARBs can now be considered a reasonable alternative (13). Even if the patient has responded favorably to the diuretic, treatment with ACEI should be initiated and maintained in patients who can tolerate them, because they have been shown to favorably influence the long-term prognosis of HF.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

Angiotensin converting enzyme inhibitors are recommended for all patients with current or prior symptoms of HF and reduced LVEF, unless contraindicated (Level of Evidence: A).

An ARB should be administered to post-MI patients without HF who are intolerant of ACEIs and have a low LVEF (Level of Evidence: B).

Class IIa

Angiotensin II receptor blockers are reasonable to use as alternatives to ACEIs as first-line therapy for patients with mild to moderate HF and reduced LVEF, especially for patients already taking ARBs for other indications (Level of Evidence: A).

Method of Reporting

Per patient:

• Whether or not patient with LVSD was prescribed ACE inhibitor or ARB therapy.

Per patient population:

• Percentage of all patients with LVSD who were prescribed ACE inhibitor or ARB therapy.
• Percentage of patients with LVSD who were prescribed ACE inhibitor or ARB therapy, with all denominator exclusions applied.

Challenges to Implementation

• Difficulty locating information regarding LVSD.
• Ambiguity regarding what constitutes contraindication.
• Difficulty sorting through the chart to find the contraindications.

11. Warfarin Therapy for Patients with Atrial Fibrillation (AF)

Use of warfarin in patients with both HF and AF

Numerator	Patients who were prescribed warfarin therapy within the specified period of assessment.
Denominator	All HF patients, 18 years of age and older, with paroxysmal or chronic atrial fibrillation **Included populations:** • Patients with HF and paroxysmal or chronic atrial fibrillation **Excluded populations:** • Documentation of medical reason(s) by a physician, nurse practitioner, or physician assistant for not prescribing warfarin, or • Documentation of patient reason(s) for not prescribing warfarin.
Period of assessment	Per reporting year.
Source of data	EHRS, retrospective paper medical records, prospective flowsheet.

Rationale

In patients with symptomatic HF, the prevalence of AF ranges from 10 to 30 percent, with the highest incidence among those with the most severe HF. These patients are at risk of systematic embolization and stroke. Anticoagulation with warfarin is most justified in patients with HF who have experiences a previous embolic event or who have paroxysmal or chronic atrial fibrillation.

Clinical Recommendation(s)

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult (8).

Class I

Physicians should prescribe anticoagulants in patients with HF who have paroxysmal or persistent atrial fibrillation or a previous thromboembolic event (Level of Evidence: A).

Method of Reporting

Per patient:

• Whether or not patient with paroxysmal or chronic atrial fibrillation was prescribed warfarin therapy.

Per patient population:

• Percentage of all patients with paroxysmal or chronic atrial fibrillation who were prescribed warfarin therapy.
• Percentage of patients with paroxysmal or chronic atrial fibrillation who were prescribed warfarin therapy, with all denominator exclusions applied.

Challenges to Implementation

• Tracking medical record for the relevant data.
• Interfacing with laboratory information systems.

APPENDIX C. Sample Rating Form and Rating Form Guide

Name of Measure:
Clinical Rationale:
Numerator:
Denominator:
Measure:

	Disagree	Moderate Agreement			Agree
Rate this measure on the following criteria.	**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 is likely to be obtained with reasonable effort.	**1**	**2**	**3**	**4**	**5**
b. The data required for the measure is likely to be obtained at reasonable cost.	**1**	**2**	**3**	**4**	**5**
c. The data required for the measure is 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**
Considering your assessment of this measure on all dimensions above, rate this measure overall for inclusion into the ACC/AHA Heart Failure Performance Measurement Set.	**1**	**2**	**3**	**4**	**5**

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. These 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. These 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.
Measure Implementation	
1. Feasibility: a. The data required for the measure is likely to be obtained with reasonable effort. b. The data required for the measure is likely to be obtained at reasonable cost. c. The data required for the measure is likely to be obtained within the period allowed for data collection.	From your perspective, the required data can be typically abstracted from patient charts or there are national registries, 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.
Overall Assessment	
Considering your assessment of this measure on all dimensions above, rate this measure inclusion in the ACC/AHA Heart Failure Performance Measurement Set.	Consider a balance in the continuum of care. Consider overall purpose of the measurement set and the intended user.

APPENDIX D. ACC/AHA Heart Failure Performance Measures Writing Committee—Relationships With Industry

Committee Member	Research Grant	Speakers Bureau/ Honoraria/ Expert Witness	Stock Ownership	Board of Directors	Consultant/ Advisory Member
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Dr. Lynne Warner Stevenson	• Medtronic	None	None	None	• Medtronic • Novacardia • Scios

APPENDIX E. ACC/AHA/Physician Consortium Writing Group—Relationships With Industry (Outpatient Measures Only)

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Dr. Joel V. Brill	None	None	None	None	• Value Options • CORF Services • Kimberly-Clark
Dr. Charles Cefalu	None	• Novartis • Pfizer • Proctor and Gamble • Wyeth-Ayerst	None	None	• Novartis • Proctor and Gamble • Wyeth-Ayerst
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Dr. A. Todd Davis	None	None	None	None	None
Dr. Joseph P. Drozda	None	None	• Centene Corp.	None	None
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Continued on next page

APPENDIX E Continued

Committee Member	Research Grant	Speakers Bureau/ Honoraria/ Expert Witness	Stock Ownership	Board of Directors	Consultant/ Advisory Member
Dr. Josie R. Williams	AHRQ Grants: • Partnership Grant 3/4th years; Health Information Technology Grant 1/3 years • Texas Health and Human Services–Texas Medicaid Diabetic Eye Screen Technology Grant	Speakers Bureau: • Texas Medical Association • Physician Consortium for Performance Improvement • AMA Health Literacy Group • National Patient Safety Foundation	None	• Texas Medical Association • Physician Consortium for Performance Improvement–Co Chair • National Patient Safety Foundation • AHRQ National Performance Measures Clearing House Advisory Committee	• Physician Advisory for Quality Evaluation–BCBS Texas

APPENDIX F. Peer Reviewers—Relationships With Industry

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Dr. Edward K. Kasper	• ACCF Board of Governors	None	None	None	None	None
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Dr. Joseph P. Ornato	• ACC/AHA TF GL	None	None	None	None	None
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