

American College of Cardiology Foundation (ACCF)
American Heart Association (AHA)
Physician Consortium for Performance Improvement® (PCPI®)

Heart Failure
Performance Measurement Set

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Heart Failure

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Executive Summary:

Toward Improving Outcomes for Outpatients and Inpatients with Heart Failure

The American College of Cardiology Foundation (ACCF), American Heart Association (AHA), and Physician Consortium for Performance Improvement® (PCPI) formed a Heart Failure Work Group to identify and define quality measures toward improving outcomes for outpatients and inpatients with heart failure (see diagram at the end of this section). This work represents the formal periodic review and maintenance of existing measure sets.

Reasons for Prioritizing Improvement in Heart Failure

High Impact Topic Area

Heart failure is a chronic condition that poses a major and growing threat to the public's health. Improving the effectiveness of care and optimizing patient outcomes will become increasingly important as the population of the United States ages.

- Currently, approximately 5.7 million Americans are living with heart failure.
- Heart failure incidence approaches 10 per 1000 population after 65 years of age.
- A person aged 40 years or older has a 1 in 5 chance of developing heart failure.
- Hospital discharges for heart failure rose from 877,000 in 1996 to 1,106,000 in 2006.
- 80% percent of men and 70% of women less than 65 years of age who have heart failure will die within 8 years.
- In 2005, 1 in 8 death certificates (292,214 deaths) in the United States mentioned heart failure.
- For 2009, the estimated direct and indirect cost of heart failure in the United States is \$37.2 billion, representing a portion of the estimated \$475.3 billion for all cardiovascular diseases.¹

Demonstrated Opportunity for Improvement

- According to a study analyzing the quality of health care in the United States, on average, patients with heart failure received the recommended quality of care only about 63.9 percent of the time.²
- A study assessing the care delivered to heart failure patients in the outpatient setting found that a median 27% of patients received all heart failure therapies for which they were potentially eligible and use of guideline-recommended therapies by practices varied widely.³
- Another study designed to evaluate heart failure care in the inpatient setting by determining adherence to 4 quality indicators found that median rates of conformity ranged from 24.0% to 86.2%.⁴
- Among patients enrolled in Medicare, the rate of 30-day readmission following hospital discharge with a heart failure diagnosis is 26.9%.⁵

Disparities

- An analysis of AHA's Get With The Guidelines (GWTG)–Heart Failure quality improvement program identified differences in heart failure in Black, White, and Hispanic patients. Black patients were younger, had lower ejection fraction, lower risk of in-patient death and similar length of stay as Whites and Hispanics. While overall quality of care was similar, there were some differences in the quality of care received by Black, White and Hispanic patients.⁶
- The 2009 National Healthcare Disparities Report showed that disparities in care for heart failure exist across populations.⁷

Rigorous Clinical Evidence Base

Evidence-based clinical practice guidelines are available for the management of heart failure. This measurement set is based on guidelines from:

- ACCF/AHA
- European Society of Cardiology
- Heart Failure Society of America (HFSA)

Heart Failure Outcomes

Ideally, a set of measures for patients with heart failure will include both measures of outcomes as well as measures of processes that are known to positively influence desirable outcomes. Desired outcomes for heart failure include:

1. Reduce death
2. Reduce hospitalization
3. Reduce readmission rates
4. Reduce future clinical deterioration
5. Lessen symptoms of heart failure
6. Improve patient’s activity level
7. Improve patient’s ability to manage his/her own illness
8. Improve health status and enhance patient’s overall sense of well being

Several outcome measures with relevance to heart failure have previously been developed and many are endorsed by the National Quality Forum (NQF).

The existing NQF-endorsed[®] outcome measures addressing mortality rate and admission/readmission rate at the institutional or system level were well-developed and incorporate risk-adjustment methodology to account for the often significant differences in patient populations among institutions. These measures are currently implemented nationwide and should continue to be collected and assessed. Together with the proposed measures from the Heart Failure Work Group, these measures can provide a comprehensive view of care quality and hospital or physician performance, as appropriate.

Heart Failure Work Group Recommendations

Outcome measures: The Heart Failure Work Group recognized a significant gap in measures addressing critical patient-centric outcomes for heart failure care - decreasing symptoms and improving function. As a result, the following measure has been recommended:

Measures addressing patient-centered outcomes
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Measure #4: Symptom Management (<i>for quality improvement only</i>)
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Process measures: Several processes of care, demonstrated to improve outcomes for heart failure patients, are recommended:

Measures addressing underuse of effective services (diagnostic and treatment strategies)

Measure #1: Left Ventricular Ejection Fraction (LVEF) Assessment (Outpatient Setting)

Measure #2: Left Ventricular Ejection Fraction (LVEF) Assessment (Inpatient Setting)
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Measure #6: Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction
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Measure #7: Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction

Measure #8: Counseling regarding Implantable Cardioverter-Defibrillator (ICD) Implantation for Patients with Left Ventricular Systolic Dysfunction on Combination Medical Therapy (<i>for quality improvement only</i>)

Measures addressing underuse of patient-centered care strategies

Measure #3: Symptom and Activity Assessment

Measure #5: Patient Self-Care Education (<i>for quality improvement only</i>)

Measures addressing care coordination
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Measure #9: Post-Discharge Appointment for Heart Failure Patients

Paired/Bundled measures: There is one set of paired measures included in the heart failure measurement set. Paired measures are defined by the NQF⁸ as follows: individual measures that should be measured concurrently in the same population; however, the results are not combined into a single score (eg, measuring mortality and readmission and displaying them together—but not calculating a joint score).

Measures addressing underuse of effective services (diagnostic and treatment strategies)

Measure #6: Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction
--

Measure #7: Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction

Please see individual measure documentation for additional information regarding the pairing of these measures.

These clinical performance measures are designed for practitioner and/or system level quality improvement to achieve better outcomes for patients with heart failure. Unless otherwise indicated, the measures are also appropriate for accountability if the appropriate methodological, statistical, and implementation rules are achieved.

Other Potential Measures

The Work Group considered several other potential measures, though ultimately determined that they were not appropriate for inclusion in the measure set.

Measure Harmonization

When existing hospital-level or plan-level measures are available for the same measurement topics, the PCPI attempts to harmonize the measures to the extent feasible.

Technical Specifications

There are several data sources available for collecting performance measures; generally different data sources require different sets of measure specifications, due to the structure of the systems storing the data.

Quality measure technical specifications for administrative data sources are developed with administrative code sets – ICD-9-CM, ICD-10-CM, CPT, for example. A measure intended for administrative data source use or reporting may have significant differences in the specifications due to the nature of the various data sources. In administrative data sources, administrative or billing codes are typically used to identify eligible populations and reported immediately following the provision of care.

Quality measure technical specifications for electronic data sources are developed in alignment with national standards for clinical quality measures. Based on a measure's intended data sources, coding terminology recommendations and tools are used to create specifications to allow for clinical quality measure reporting. In electronic clinical data sources, data can be aggregated over a specific time period and also allow for greater ability to express certain types of data through use of the recommended terminologies for electronic sources.

The Centers for Medicare and Medicaid Services (CMS) developed *A Blueprint for the Measures Management System*, which provides guidance related to the development, implementation, and maintenance of clinical quality measures. Specific to eQMs, this resource includes the recommended vocabularies used to develop

the value sets used in the measures. The Blueprint can be found at the following webpage:

<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/MeasuresManagementSystemBlueprint.html>

When expressing clinical concepts found within a measure, specifically for those electronically specified, the Value Set Authority Center (VSAC) is used as a repository for the value sets. The VSAC serves as a repository for value sets in various stages of development, from draft to published, and allows for maintenance of value sets as updates are made to terminologies. It also allows measure developers to search for value sets currently in the VSAC and stewarded by another organization which could potentially be reused in a measure, as an effort towards harmonization with existing value sets so as not to duplicate value sets already in use with the same or similar clinical concepts. The VSAC can be accessed at the following webpage: <https://vsac.nlm.nih.gov/>

The Quality Data Model (QDM) is a framework used to categorize clinical concepts used in quality measures, as well as the relationships among them for electronic specification. The QDM allows for an Health Quality Measures Format (HQMF) rendering of logic using the Measure Authoring Tool (MAT) to express complex measure logic, and subsequently export measures in several formats, currently including a human-readable document, which can be viewed in a web browser, and the XML.

Links to these tools are found below:

QDM: <https://ecqi.healthit.gov/qdm>

MAT: <https://www.emasuretool.cms.gov/>

CMS and the Office of the National Coordinator for Health IT (ONC) host a website, the Electronic Clinical Quality Information Resource Center (eCQI Resource Center), which is designed to serve as a one-stop shop for all resources related to eQIM development.

The eCQI Resource Center can be accessed at: <https://ecqi.healthit.gov/ecqm>

Testing and Implementation of the Measurement Set

Several of the measures presented here represent updates to existing inpatient and outpatient measures for heart failure. They have therefore been utilized, in their previous specifications, in several national performance measurement projects, including the Centers for Medicare and Medicaid Services (CMS) Physician Group Practice (PGP) Demonstration Project⁹, the Doctor's Office Quality (DOQ) project^{10,11}, the DOQ-Information Technology (IT) project, and the CMS Physician Quality Reporting Initiative (PQRI) project¹². These projects have shown varying levels of feasibility, reliability, and performance, dependent upon the venue and modality of data collection. In addition, specific research projects have been conducted to test the reliability of these measures in various settings. Results of these testing projects have been considered and resulted in modifications to the measures, where appropriate.

Other measures in the set are being made available without any prior testing. The PCPI recognizes the importance of testing all of its measures and encourages testing of the Heart Failure measurement set by organizations or individuals positioned to do so. The *Measure Testing Protocol for PCPI Measures* was approved by the PCPI in 2007 and is available on the PCPI web site (see Position Papers at www.physicianconsortium.org); interested parties are encouraged to review this document and to contact PCPI staff. The PCPI will welcome the opportunity to promote the initial testing of these measures and to ensure that any results available from testing are used to refine the measures before implementation.

Testing of the Measurement Set

The AMA-convened PCPI collaborated on several measure testing projects in 2007, 2009 and 2015 to ensure two Heart Failure measures are reliable and were evaluated for accuracy of the measure denominator, numerator and exception case identification. The testing projects were conducted utilizing EHR and registry data. Parallel forms reliability and signal-to-noise reliability were tested.

One site participated in the parallel forms testing of the measures. The site was an academic, general internal medicine clinic.

Signal-to-noise reliability was assessed using 2013 data acquired from the Centers for Medicare & Medicaid Services Physician Quality Reporting System Group Practice Reporting Option (GPRO) database.

Measures Tested

Heart Failure – Beta Blocker Therapy for LVSD

Heart Failure – Angiotensin-Converting Enzyme Inhibitor or ARB Therapy for LVSD

Reliability Testing

The purpose of reliability testing was to evaluate whether the measure definitions and specifications, as prepared by the PCPI, yield stable, consistent measures. Data abstracted from electronic health records were used to calculate parallel forms reliability and data acquired from the GPRO database were used to perform signal-to-noise reliability testing for the measures.

Heart Failure – Beta Blocker Therapy for LVSD

Parallel Forms Reliability Testing

There were 254 observations from Site A included as part of the analysis. Of the 254 patients sampled, automated EHR review detected 219 (86.2%) with an active electronic prescription for a Beta Blocker. Of the remaining 35 patients, 13(37.1%) met one or more of the exclusion criteria. Performance was 90.9% by automated EHR review. The automated quality assessment had a sensitivity of 100.0% for identifying patients with heart failure, taking a Beta Blocker. The automated quality assessment captured 12 of 18 patients with valid exclusion criteria (sensitivity, 66.7%), and 1 of 13 patients who met exclusion criteria were judged not to have a true exclusion.

GPRO EHR Web-Interface

The reliability at the minimum level of quality reporting events (10) was 0.44. The average number of quality reporting events for physicians included is 90.1. The reliability at the average number of quality reporting events was 0.87. This measure has moderate reliability when evaluated at the minimum level of quality reporting events and high reliability at the average number of quality events.

GPRO Registry

The reliability at the minimum level of quality reporting events (10) was 0.86. The average number of quality reporting events for physicians included is 33.9. The reliability at the average number of quality reporting events was 0.96. This measure has high reliability when evaluated at the minimum level of quality reporting events and high reliability at the average number of quality events.

Heart Failure – ACE Inhibitor or ARB Therapy for LVSD

Parallel Forms Reliability Testing

Of the 254 patients sampled, automated EHR review detected 217 (85.4%) with an active electronic prescription for an ACE inhibitor or ARB. Of the remaining 37 patients, 23(62.2%) met one or more of the exclusion criteria. Performance on the ACE inhibitor and ARB quality measure was 93.9% by using automated

EHR review. The automated quality assessment had a sensitivity of 97.7% for identifying patients with heart failure taking an ACE inhibitor or ARB. The automated quality assessment captured 21 of 29 patients with valid exclusion criteria (sensitivity, 72.4%), and 2 of 23 patients who met exclusion criteria were judged not to have a true exclusion.

Signal-to-Noise Reliability Testing

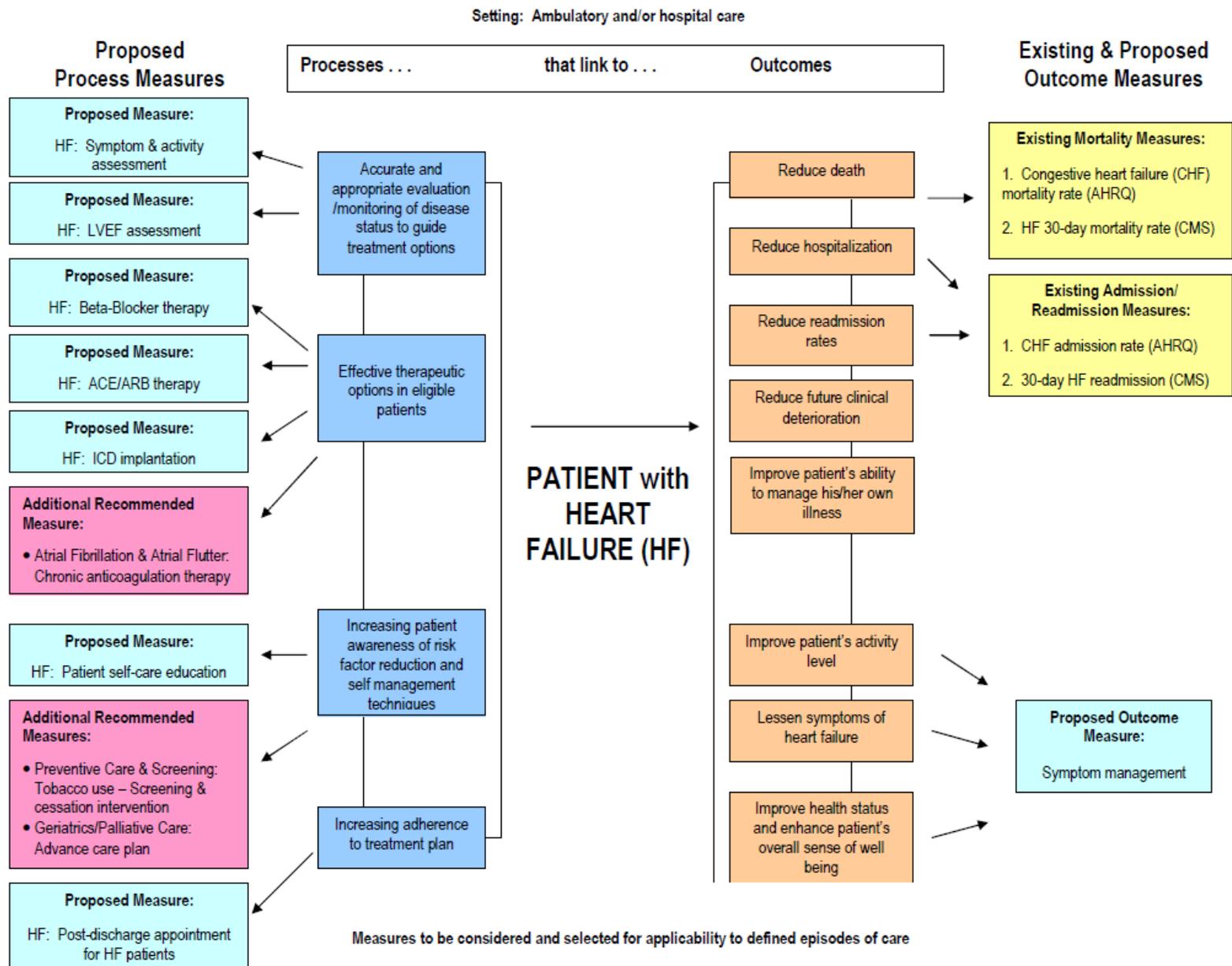
GPRO Registry

The reliability at the minimum level of quality reporting events (10) was 0.83. The average number of quality reporting events for physicians included is 31.5. The reliability at the average number of quality reporting events was 0.94. This measure has high reliability when evaluated at the minimum level of quality reporting events and high reliability at the average number of quality events.

Executive Summary: Toward Improving Outcomes for Outpatients and Inpatients with Heart Failure

Link to Outcomes:

The proposed measures focus on accurate and appropriate evaluation and monitoring of disease status to guide treatment, effective therapeutic options in eligible patients, increasing patient awareness of risk factor reduction and self-management techniques, and increasing adherence to treatment plan. The proposed measures are intended to be complementary to existing outcomes measures for mortality and admission/readmission rates.



Purpose of Measurement Set:

The American College of Cardiology Foundation (ACCF), American Heart Association (AHA), and Physician Consortium for Performance Improvement® (PCPI) formed a Heart Failure Work Group to identify and define quality measures toward improving outcomes for outpatients and inpatients with heart failure. The Work Group aimed to develop a comprehensive set of measures that support the efficient delivery of high quality health care in each of the Institute of Medicine's (IOM) six aims for quality improvement (safe, effective, patient centered, timely, efficient, and equitable).

This work represents the formal periodic review and maintenance of an existing measure set. The PCPI stipulates a regular review of measures (every 3-4 years) or when there is a major change in scientific evidence, results from testing or other issues noted that materially affect the integrity of the measure. In 2003, the ACCF, AHA, and PCPI developed a set of measures for patients with heart failure receiving care in the outpatient setting. These measures were later updated in 2005 to incorporate new scientific evidence included in a guideline update regarding the appropriate pharmacologic therapies for a patient with heart failure. Also, in 2005, the ACCF and AHA independently developed measures for inpatients with heart failure. Many of the outpatient and inpatient measures received endorsement from the National Quality Forum (NQF), have been tested in a variety of implementation and demonstration projects, and are in use at the national level.

The 2011 measure development project aimed to review and update these existing outpatient and inpatient heart failure measures to ensure they reflect the latest guideline recommendations, address areas most in need of performance improvement, and incorporate results from testing projects. The Work Group also looked to the development of new measures with particular attention to exploring the development of outcome, group or system-level, overuse measures, and composite or bundled measures.

Importance of Topic

Prevalence and Incidence

- 5.7 million Americans are living with heart failure - 2.6% of men and 2.1% of women.
- Heart failure was the most common cardiac condition for adults 85 years and older in 1997–2006.¹³
- Over 670,000 patients are diagnosed with heart failure for the first time each year.
- Heart failure incidence approaches 10 per 1000 population after 65 years of age.
- At 40 years of age, the lifetime risk of developing heart failure for both men and women is 1 in 5. At 80 years of age, remaining lifetime risk for development of new heart failure remains at 20% for men and women, even in the face of a much shorter life expectancy.
- Data has indicated an increase in the incidence of heart failure and improved survival rate among the elderly, with both of these effects being greater in men.

Mortality

- In 2005, 1 in 8 death certificates (292,214 deaths) in the United States mentioned heart failure. Heart failure was selected as the “underlying cause” in 58,933 of those deaths.

- 80% of men and 70% of women less than 65 years of age who have heart failure will die within 8 years.
- The 30-day, 1-year, and 5-year case fatality rates after hospitalization for heart failure were 10.4%, 22%, and 42.3%, respectively.
- After heart failure is diagnosed, the survival rate is lower in men than in women, but less than 15% of women survive more than 8 to 12 years. The 1-year mortality rate is high, with 1 in 5 dying.
- In people diagnosed with heart failure, sudden cardiac death occurs at 6 to 9 times the rate of the general population.

Office Visits and Hospital Stays

- 2006 data found that the number of ambulatory care visits for heart failure was 3,390,000.
- Hospital discharges for heart failure rose from 877,000 in 1996 to 1,106,000 in 2006.
- In 2006, heart failure (534,000 stays for males and 565,000 for females) occurred equally often in hospitalizations for males and females.
- Fonarow and colleagues assessed length of stay and in-hospital mortality rates and the variation among hospitals. The “median inpatient length of stay [was found to be] 4.0 days (range, 2.3-9.5 days), with an approximately 2-day difference between hospitals at the 10th (3.1 days) and 90th (5.0 days) percentiles. Median in-hospital mortality was 3.5%, with substantial variation between hospitals. There was a 2-fold difference in mortality between the 25th and 75th percentiles (2.4% vs 4.8%) and a 4.4-fold difference in mortality between the 10th and 90th percentiles (1.4% vs 6.1%).”
- Within 1 year of hospitalization for heart failure, more than 1 in 3 Medicare beneficiaries died, and two-thirds were readmitted to the hospital. Nearly 40% of patients were admitted at least twice.
- Among patients enrolled in Medicare, the rate of 30-day readmission following hospital discharge with a heart failure diagnosis is 26.9%.

Cost

- For 2009, the estimated direct and indirect cost of heart failure in the United States is \$37.2 billion.
- U.S. hospital costs for treating patients with heart failure increased from \$6.6 billion in 1997 to \$11.2 billion in 2006 (a 6.1 percent annual increase).
- More Medicare dollars are spent for the diagnosis and treatment of heart failure than for any other diagnosis.¹⁴

Opportunity for Improvement

- According to a study analyzing the quality of health care in the US, on average, patients with heart failure received the recommended quality of care only about 63.9 percent of the time. Quality of care was assessed by analysis of clinician performance on thirty six heart failure quality indicators. Quality of care varied significantly by indicator with average rates of adherence ranging from 16.12% for the provision of

dietary counseling within one month of the start of medical treatment to 100% for blood pressure assessment at the time of presentation.¹⁵

- Using baseline data from the Registry to Improve the Use of Evidence-Based Heart Failure Therapies in the Outpatient Setting (IMPROVE HF), Fonarow and colleagues assessed contemporary care patterns for heart failure in the outpatient setting among 167 outpatient cardiology practices in the United States. The authors found that a median 27% of patients received all heart failure therapies for which they were potentially eligible and use of guideline-recommended therapies by practices varied widely. To quantify use of therapies, 7 individual metrics were assessed.
- In another study, Fonarow and colleagues analyzed data from 81,142 admissions occurring between July 2002, and December 2003, at 223 hospitals in the United States to determine rates of conformity with the 4 Joint Commission core heart failure (HF) performance measures. Across all hospitals, median rates of conformity with HF-1 (discharge instructions), HF-2 (assessment of left ventricular function), HF-3 [use of angiotensin converting enzyme (ACE) inhibitors in patients with left ventricular systolic dysfunction (LVSD)], and HF-4 (smoking cessation counseling) were 24.0%, 86.2%, 72.0%, and 43.2%, respectively. Rates of conformity at individual hospitals varied from 0% to 100%.
- More recent national data available for the aforementioned core performance measures from the Joint Commission’s Quality Check Web site indicates higher rates of adherence. From October 2007 through September 2008, performance was as follows:¹⁶

Joint Commission Core Heart Failure Performance Measures	Mean
HF-1 Discharge instructions	82.03%
HF-2 Assessment of left ventricular function	96.62%
HF-3 Use of ACE inhibitors in patients with LVSD	92.28%
HF-4 Smoking cessation counseling	97.25%

Geographic Variations in Care

The 2008 Dartmouth Atlas of Health Care identified geographic differences in the care of patients with chronic illness.

- Among the 306 hospital referral regions, the frequency of hospitalizations for heart failure varied by a factor of more than four.
- Patients with heart failure saw a physician 99.3 times in the last six months of life at the highest ranked hospital and 15.2 times at the lowest ranked (rankings based on U.S. News and World Report 2001).¹⁷

Disparities

The 2009 National Healthcare Disparities Report showed that disparities in care for heart failure exist across populations. Although the quality of hospital care for heart failure has improved overall, “care for Whites continues to improve at a higher rate than for minority populations. Thus, quality improvement has not necessarily translated to disparities reduction, which is critical for high-quality care.” Recommended hospital care for heart failure was characterized by evaluation of the patient’s left ventricular ejection fraction and patient’s receipt of an ACE inhibitor for left ventricular systolic dysfunction. Separately, to analyze patient centered care, a measure was included to identify adult hospital patients with heart failure who were given complete written discharge instructions.

- In 2006, the proportion of Medicare patients with heart failure who received recommended hospital care was higher for Blacks than for Whites (91.4% compared with 90%).¹⁸

- In 2006, the proportion of Medicare patients with heart failure who received recommended hospital care was lower for American Indians (AI) or Alaska Natives (AN) (86.3%) and Hispanics (89.3%) compared with Whites (90%).
- From 2005 to 2007, disparities in hospital care for heart failure for AI/ANs have been worsening at a rate of 12.4% per year.
- In all years (2005 to 2007), Hispanics and AI/ANs were less likely than Whites to receive complete written discharge instructions.
- Rates of ICD therapy in eligible patients hospitalized for heart failure are lower among eligible women and black patients than among white men.^{19,20}
- Both patient age and sex are associated with reduced rates of some heart failure therapies: ICDs, anticoagulation for atrial fibrillation, and the provision of heart failure education.²¹
- An analysis of AHA's Get With The Guidelines (GWTG)–Heart Failure quality improvement program identified differences in heart failure in Black, White, and Hispanic patients. Black patients were younger, had lower ejection fraction, lower risk of in-patient death and similar length of stay as Whites and Hispanics. While overall quality of care was similar, there were some differences in the quality of care received by Black, White and Hispanic patients. Performance on all performance measures under study were either similar or higher in Black heart failure patients compared to White and Hispanic patients.

The PCPI believes that performance measure data should be stratified by race, ethnicity, and primary written and spoken language to assess disparities and initiate subsequent quality improvement activities addressing identified disparities. These categories are consistent with recent national efforts to standardize the collection of race and ethnicity data. A 2008 NQF report endorsed 45 practices including stratification by the aforementioned variables.²² A 2009 IOM report “recommends collection of the existing Office of Management and Budget (OMB) race and Hispanic ethnicity categories as well as more fine-grained categories of ethnicity (referred to as granular ethnicity and based on one’s ancestry) and language need (a rating of spoken English language proficiency of less than very well and one’s preferred language for health-related encounters).”²³

Clinical Evidence Base

Clinical practice guidelines serve as the foundation for the development of performance measures. Updated ACCF and AHA guidelines for the diagnosis and management of heart failure in adults, published in 2013, were reviewed during the measure development and maintenance process.²⁴ Additional guidelines from the Heart Failure Society of America (HFSA) and other groups that focused on specific dimensions in the care of patients with heart failure were also considered.

Relevant guidelines met all of the required elements and many, if not all, of the preferred elements outlined in a PCPI position statement establishing a framework for consistent and objective selection of clinical practice guidelines from which PCPI Work Groups may derive clinical performance measures.

Performance measures, however, are not clinical practice guidelines and cannot capture the full spectrum of care for all patients with heart failure. The guideline principles with the strongest recommendations and often the highest level of evidence (well-designed randomized-controlled trials) served as the basis for measures in this set.

Heart Failure Outcomes

Ideally, a set of measures for patients with heart failure will include both measures of outcomes as well as measures of processes that are known to positively influence desirable outcomes. Desired outcomes for heart failure include:

1. Reduce death
2. Reduce hospitalization
3. Reduce readmission rates
4. Reduce future clinical deterioration
5. Lessen symptoms of heart failure
6. Improve patient's activity level
7. Improve patient's ability to manage his/her own illness
8. Improve health status and enhance patient's overall sense of well being

Setting Targets for Success and Tracking Progress with Outcomes Measures

At the national level, Healthy People 2010 offers a number of health objectives and goals to improve cardiovascular health and quality of life. One of these objectives aims to reduce hospitalizations of older adults with heart failure as the principal diagnosis by approximately 50% from 1997 to 2010. Since few national targets have been established, individual provider groups and collaboratives have established their own targets. In order to track progress toward outcomes, outcomes measures should be implemented and tracked.

Several outcome measures with relevance to heart failure have previously been developed and endorsed by the NQF, including:

Measure	Developer
Congestive heart failure mortality rate (NQF-endorsed [®])	Agency for Health Research and Quality (AHRQ)
Heart failure 30-day mortality rate (NQF-endorsed [®])	Centers for Medicare and Medicaid Services (CMS)
Congestive heart failure admission rate (NQF-endorsed [®])	AHRQ
Heart failure 30-day risk-standardized heart failure readmission rate (NQF-endorsed [®])	CMS
Percentage of adult patients with a primary diagnosis of heart failure who are readmitted for heart failure within 30 days of discharge	Institute for Clinical Systems Improvement
Risk-adjusted average length of inpatient hospital stay (NQF-endorsed [®])	Premier, Inc.
Overall inpatient hospital average length of stay (LOS) & average LOS by diagnosis-related group (DRG) service category (NQF-endorsed [®])	UnitedHealth Group

Intended Audience, Care Setting, and Patient Population

The PCPI encourages use of these measures by physicians, other health care professionals, and healthcare systems, where appropriate, to manage the care for patients aged 18 years and older with heart failure.

Heart Failure Work Group Recommendations

The measurement set includes measures that focus on accurate and appropriate evaluation and monitoring of disease status to guide treatment, effective therapeutic options in eligible patients, increasing patient awareness of risk factor reduction and self-management techniques, and increasing adherence to the treatment plan.

The Heart Failure Work Group identified several desired outcomes for patients with heart failure (see “Link to Outcomes” diagram in preceding section). Current quality gaps in heart failure care emphasize the need to improve the use of therapies and interventions that have been demonstrated to improve heart failure outcomes. As a result, many of the measures in the heart failure set focus on the provision of effective care. The measure set also includes a set of measures assessing important patient-centered outcomes – decreasing symptoms and improving activity/functional status.

These clinical performance measures are designed for practitioner and/or system level quality improvement to achieve better outcomes for patients with heart failure. Unless otherwise indicated, the measures are also appropriate for accountability if the appropriate methodological, statistical, and implementation rules are achieved.

The measures listed below may be used for quality improvement and accountability. Measures that are new to the 2010 heart failure measure set are identified with an asterisk:

Measures addressing underuse of effective services (diagnostic and treatment strategies)
Measure #1: Left Ventricular Ejection Fraction (LVEF) Assessment (Outpatient Setting)
Measure #2: Left Ventricular Ejection Fraction (LVEF) Assessment (Inpatient Setting)
Measure #6: Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction
Measure #7: Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction
Measures addressing underuse of patient-centered care strategies
Measure #3: Symptom and Activity Assessment
Measures addressing care coordination
Measure #9: Post-Discharge Appointment for Heart Failure Patients*

The following measures are appropriate for quality improvement only. Measures that are new to the 2010 heart failure measure set are identified with an asterisk:

Measures addressing patient-centered outcomes
Measure #4: Symptom Management*
Measures addressing underuse of patient-centered care strategies
Measure #5: Patient Self-Care Education
Measures addressing underuse of effective services (diagnostic and treatment strategies)
Measure #8: Counseling regarding Implantable Cardioverter-Defibrillator (ICD) Implantation for Patients with Left Ventricular Systolic Dysfunction on Combination Medical Therapy*

These measures support the efficient delivery of high quality health care in nearly each of the Institute of Medicine’s (IOM) six aims for quality improvement as described in the following table:

IOM Domains of Health Care Quality	Safe	Effective		Patient-centered	Timely	Efficient	Equitable
		Underuse	Overuse				
Measures							
1	Left Ventricular Ejection Fraction	√					√

	(LVEF) Assessment (Outpatient Setting)							
2	Left Ventricular Ejection Fraction (LVEF) Assessment (Inpatient Setting)		√					√
3	Symptom and Activity Assessment		√		√			√
4	Symptom Management		√		√			√
5	Patient Self-Care Education		√		√			√
6	Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction		√					√
7	Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction		√					√
8	Counseling regarding Implantable Cardioverter-Defibrillator (ICD) Implantation for Patients with Left Ventricular Systolic Dysfunction on Combination Medical Therapy		√					√
9	Post-Discharge Appointment for Heart Failure Patients	√	√		√	√		√

Retired Measures

During the Work Group’s review of existing outpatient and inpatient measures, several measures were recommended for retirement. The retirement of these measures does not imply that the processes themselves are not important for heart failure patients, but rather that these aspects of care no longer meet the attributes of performance measurement. The Work Group chose to place a greater emphasis on measures that have a closer relationship to improved clinical outcomes and that represent an opportunity for improvement. The retired measures include practices (eg, weight and blood pressure measurement) that remain fundamental to the management of patients with heart failure. A number of circumstances might warrant the retirement of a measure from a measure set including, but not limited to, that the measure no longer remains clinically relevant/appropriate as determined by current guidelines and scientific evidence, high clinician performance implying that the measure no longer represents an opportunity for quality improvement, testing results demonstrating poor feasibility of data collection or weak correlation with improved health outcomes, and identification of significant unintended consequences of measurement. The rationale for retiring individual measures from the previous heart failure measure sets is provided below.

Retired ACCF/AHA/AMA PCPI Outpatient Measures	Rationale
Weight Measurement	While recommended as a useful component in the evaluation of patients with heart failure, the measure assesses a process that represents a standard of care. Performance is high and the measure is not likely to have a significant impact on care/improvement in outcomes.
Blood Pressure Measurement	While recommended as a useful component in the evaluation of patients with heart failure, the measure assesses a process that represents a standard of care. Performance is high and the measure is not likely to have a significant impact on care/improvement in outcomes.

Assessment of Clinical Signs of Volume Overload (Excess)	While recommended as a useful component in the evaluation of patients with heart failure, the measure assesses a process that represents a standard of care
Warfarin Therapy for Patients with Atrial Fibrillation	This measure is of value in improving quality of care for heart failure patients with comorbid atrial fibrillation. A similar measure has been developed for the broader population of patients with atrial fibrillation and is recommended for adoption in place of the previous narrower version of this measure. The measure, "Chronic Anticoagulation Therapy," can be accessed at: http://www.ama-assn.org/ama1/pub/upload/mm/pcpi/atrial-fib-flutter.pdf
Laboratory Tests	While recommended as a useful component in the evaluation of patients with heart failure, the measure assesses a process that represents a standard of care.
Retired ACCF/AHA Inpatient measures	Rationale
Anticoagulant at Discharge for Heart Failure Patients With Atrial Fibrillation (AF)	This measure is of value in improving quality of care for heart failure patients with comorbid atrial fibrillation. A similar measure has been developed for the broader population of patients with atrial fibrillation and is recommended for adoption in place of the previous narrower version of this measure. The measure, "Chronic Anticoagulation Therapy," can be accessed at: http://www.ama-assn.org/ama1/pub/upload/mm/pcpi/atrial-fib-flutter.pdf
Discharge Instructions	While this measure addresses an important component of care for the hospitalized patient, implementation of this measure in practice seems to have resulted in improved adherence without regard to the quality of discharge instructions provided. Another measure that addresses this important transition in care has been included as part of this measure set and was developed with the intent of having a greater impact on morbidity and readmission.
Adult Smoking Cessation Advice/Counseling	This measure is of value in improving quality of care for heart failure patients. A similar measure is available for a much broader patient population and is recommended for adoption in place of the previous narrower version of this measure. The measure, "Tobacco Use: Screening and Cessation Intervention," can be accessed at: http://www.ama-assn.org/ama1/pub/upload/mm/370/pcs_final08.pdf .

Other Potential Measures

The Work Group considered several other potential measures, though ultimately determined that they were not appropriate for inclusion in the measure set.

Additional measures were considered that addressed the provision of therapies that have been shown to have a significant impact on outcomes and that are strongly recommended by existing ACCF/AHA guidelines. Although clinical trial data indicate that aldosterone antagonists are effective in reducing death and re-hospitalization, they are recommended for use in a select group of patients who can be carefully monitored for adverse effects including hyperkalemia and renal dysfunction. Such a measure would be susceptible to a high rate of exceptions as well as unintended consequences related to potential for harm and life-threatening complications without careful monitoring. As a result of these considerations, the Work Group did not feel that use of these agents was appropriate for inclusion as a performance measure at this time. Over time and with additional information regarding their effectiveness, the prescription of aldosterone antagonists may be

worthy of measurement with the inclusion of a complementary measure that would call for safe monitoring practices to minimize complications.

Cardiac resynchronization therapy (CRT) has resulted in improved outcomes for heart failure patients with persistently symptomatic heart failure undergoing optimal medical therapy who have cardiac dyssynchrony. Additional research is needed to more clearly identify the select group of patients who are likely to benefit versus those who will not. As a result, it seemed premature to develop a performance measure for CRT.

Another measure that was considered related to the combined use of hydralazine and nitrates in addition to standard therapy with beta-blockers and ACE inhibitors or ARBs for African American patients with heart failure and left ventricular systolic dysfunction. The additional use of this pharmacotherapy has demonstrated reductions in the rate of death from any cause, reduction in the rate of first hospitalization for heart failure, and an improvement in the patient's quality of life. At the same time, the limited trial data supporting its efficacy was specific to a fixed-dose combination of isosorbide dinitrate and hydralazine and there is no evidence to suggest that alternative doses of each pharmacologic agent individually are equally effective. This is further complicated by the fact that the fixed-dose combination is not often covered by health insurance companies and the company that originally developed the drug has since been acquired by another company resulting in an unclear status as to the continued production of this particular drug. In light of these challenges and concerns related to the practicality and feasibility of the measure, the Work Group felt that it would be premature to move forward with the development of this type of measure.

One measure, Combination Medical Therapy, was included in the document submitted for public comment and subsequently removed from the measure set. The draft measure intended to identify patients that have been prescribed combination medical therapy (ie, both a beta-blocker and an ACE inhibitor/ARB), while also allowing for the individual measures to assess the prescription of each therapy individually. After further consideration, the Work Group agreed that pairing the ACE inhibitor/ARB and beta-blocker measures would allow users access to these data while still preserving the individual measures and allowing for the capture of exceptions specific to each therapeutic agent. In their Composite Evaluation Framework, the NQF defines paired measures as "individual measures that should be measured concurrently in the same population, however the results are not combined into a single score (e.g., measuring mortality and readmission and displaying them together – but not calculating some joint score)." In other words, each measure in a pair remains an individual measure that can provide actionable information upon which to focus quality improvement efforts, and is recommended to be measured concurrently with its counterpart.

While each performance measure is intended to support quality improvement in one or more of the IOM domains (safe, effective, patient centered, timely, efficient, and equitable), the development of measures specifically designed to eliminate *overuse* of ineffective care and promote efficiency proved more challenging. The Work Group identified a few areas of potential overuse and considered one measure in particular to address the perceived overuse of echocardiography in heart failure patients. The draft measure intended to assess the number of patients who received 3 or more echocardiograms within a 12 month period. Although Medicare data indicates that utilization and spending for cardiovascular imaging has grown significantly in recent years, an analysis of the 5% standard analytic file of physician claims (5% sample of Medicare beneficiaries) found little evidence supporting overuse of echocardiography in the outpatient setting (see Appendix 1). Data indicated that only 2.5% of patients receiving echocardiograms in the outpatient setting had 3 or more echocardiograms; hence, at the aggregated patient level, the draft measure was met for 97.5% of patients. Upon review of this data, the Work Group determined that the measure was not appropriate for inclusion in the set given the minimal opportunity for improvement.

Other areas of overuse include the use of aggressive treatment at the end of life and ICD implantation in patients who are not likely to benefit. Given the complexity of these issues and the relevant guideline recommendations, there is no generalizable way to identify patients who may be subject to this overuse. As a result, the direct assessment of these care processes was not feasible within the constructs of performance measurement. Nevertheless, several of the measures in this set may indirectly address these significant concerns in the care of patients with heart failure.

The provision of palliative or supportive care concurrent with evidence-based interventions comprises comprehensive care for heart failure patients at the end of life. Despite its importance, the Work Group agreed that there is a lack of evidence to define patients for whom end of life planning is appropriate and to identify elements that should be included in a plan for end of life care. As a result, the draft End of Life Care Plan measure has been removed from the set following the public comment period. Two related PCPI/NCQA measures are available and partly address the concepts included in the end of life care plan measure. These measures focus on documentation of an advance care plan or surrogate decision maker in the medical record. The measure from the palliative care set is aimed at patients that are at the end of life which is identified through use of a CPT II code or an ICD-9 code indicative of a significant comorbidity (the heart failure diagnosis codes are included in this measure). An even broader measure from our geriatrics measure set exists for all patients over the age of 65. Considering these end of life issues for patients with heart failure remains integral to proper management. To promote a comprehensive approach to performance improvement, the Work Group advocates the use of either of these advance care plan measures when measuring clinical quality in the care of eligible patients.

Finally, the Work Group reviewed all measures in the set to determine if a composite measure for heart failure could be developed. As articulated in a recent position paper from the ACCF/AHA, any composite measure (and its component measures) needs to undergo empirical testing for validity and reliability before being put forward for implementation.²⁵ Given that testing data is currently unavailable for any preliminary composite measure and subsequently for some of the new measures of which it may be comprised, it seemed premature to think about developing a heart failure composite measure for accountability. Furthermore, any composite measure should add value beyond the individual measures of which it is comprised. Further research would be needed to determine the performance of any proposed composite measure and its value in improving the quality of care for heart failure patients. Of note, the pairing of the ACE inhibitor/ARB and beta-blocker measures represents a first step toward the development of a bundled/composite measure for heart failure and will provide vital data regarding the patients who are receiving optimal medical therapy.

Measure Harmonization

When existing hospital-level or plan-level measures are available for the same measurement topics, the PCPI attempts to harmonize the measures to the extent feasible. A few measures in the heart failure measure set are similar to the core measures developed by the Joint Commission and the Centers for Medicare and Medicaid Services for use at the hospital level.

Please see individual measure documentation for additional information regarding measure harmonization.

Technical Specifications: Overview

There are several data sources available for collecting performance measures; generally different data sources require different sets of measure specifications, due to the structure of the systems storing the data.

Quality measure technical specifications for administrative data sources are developed with administrative code sets – ICD-9-CM, ICD-10-CM, CPT, for example. A measure intended for administrative data source use or reporting may have significant differences in the specifications due to the nature of the various data sources. In administrative data sources, administrative or billing codes are typically used to identify eligible populations and reported immediately following the provision of care.

Quality measure technical specifications for electronic data sources are developed in alignment with national standards for clinical quality measures. Based on a measure’s intended data sources, coding terminology recommendations and tools are used to create specifications to allow for clinical quality measure reporting. In electronic clinical data sources, data can be aggregated over a specific time period and also allow for greater ability to express certain types of data through use of the recommended terminologies for electronic sources.

The Centers for Medicare and Medicaid Services (CMS) developed *A Blueprint for the Measures Management System*, which provides guidance related to the development, implementation, and maintenance of clinical quality measures. Specific to eCQMs, this resource includes the recommended vocabularies used to develop the value sets used in the measures. The Blueprint can be found at the following webpage:

<https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/MeasuresManagementSystemBlueprint.html>

When expressing clinical concepts found within a measure, specifically for those electronically specified, the Value Set Authority Center (VSAC) is used as a repository for the value sets. The VSAC serves as a repository for value sets in various stages of development, from draft to published, and allows for maintenance of value sets as updates are made to terminologies. It also allows measure developers to search for value sets currently in the VSAC and stewarded by another organization which could potentially be reused in a measure, as an effort towards harmonization with existing value sets so as not to duplicate value sets already in use with the same or similar clinical concepts. The VSAC can be accessed at the following webpage:

<https://vsac.nlm.nih.gov/>

The Quality Data Model (QDM) is a framework used to categorize clinical concepts used in quality measures, as well as the relationships among them for electronic specification. The QDM allows for an Health Quality Measures Format (HQMF) rendering of logic using the Measure Authoring Tool (MAT) to express complex measure logic, and subsequently export measures in several formats, currently including a human-readable document, which can be viewed in a web browser, and the XML.

Links to these tools are found below:

QDM: <https://ecqi.healthit.gov/qdm>

MAT: <https://www.emasuretool.cms.gov/>

CMS and the Office of the National Coordinator for Health IT (ONC) host a website, the Electronic Clinical Quality Information Resource Center (eCQI Resource Center), which is designed to serve as a one-stop shop for all resources related to eCQM development.

The eCQI Resource Center can be accessed at: <https://ecqi.healthit.gov/ecqm>

Measure Exceptions

Measure Exclusions

The PCPI distinguishes between measure exceptions and measure exclusions. Exclusions arise when the intervention required by the numerator is not appropriate for a group of patients who are otherwise included

in the initial patient or eligible population of a measure (ie, the denominator). Exclusions are absolute and are to be removed from the denominator of a measure and therefore clinical judgment does not enter the decision.

Measure Exceptions

Exceptions are used to remove a patient from the denominator of a performance measure when the patient does not receive a therapy or service AND that therapy or service would not be appropriate due to patient-specific reasons. The patient would otherwise meet the denominator criteria. Exceptions are not absolute, and are based on clinical judgment, individual patient characteristics, or patient preferences.

For ***process measures***, the PCPI provides three categories of exception reasons for which a patient may be removed from the denominator of an individual measure.

- **Medical reasons**
Includes:
 - not indicated (absence of organ/limb, already received/performed, other)
 - contraindicated (patient allergic history, potential adverse drug interaction, other)
- **Patient reasons**
Includes:
 - patient declined
 - social or religious reasons
 - other patient reasons
- **System reasons**
Includes:
 - resources to perform the services not available
 - insurance coverage/payer-related limitations
 - other reasons attributable to health care delivery system

These measure exception categories are not available uniformly across all measures; for each measure, there must be a clear rationale to permit an exception for a medical, patient, or system reason. For some measures, examples have been provided in the measure exception language of instances that would constitute an exception. Examples are intended to guide clinicians and are not all-inclusive lists of all possible reasons why a patient could be excluded from a measure. There are different approaches for reporting measure exceptions, depending on whether the measure is being reported from an electronic clinical data source or an administrative data source.

Electronic Clinical Data Sources:

Value sets are included in the electronic clinical data source specifications for Medical Reason, Patient Reason and System Reason. These have been specified in SNOMED-CT and include a broad list of reasons that pertain to each type of exception and cover various situations. The contents of these value sets are broad, and facilitate re-use of the Medical, Patient, and System Reason value sets across measurement sets.

Administrative Data Sources

Exceptions reported from administrative data sources can be reported using a Quality Data Code (QDC), which may be a CPT Category II code or a G-code.

Where CPT Category II codes are used, the exception of a patient may be reported by appending the appropriate modifier to the CPT Category II code designated for the measure:

- **Medical reasons:** modifier 1P
- **Patient reasons:** modifier 2P
- **System reasons:** modifier 3P

Although this methodology does not require the external reporting of more detailed exception data, the PCPI recommends that physicians document the *specific* reasons for exception in patients' medical records for purposes of optimal patient management and audit-readiness. The PCPI also advocates the systematic review and analysis of each physician's exceptions data to identify practice patterns and opportunities for quality improvement. For example, it is possible for implementers to calculate the percentage of patients that physicians have identified as meeting the criteria for exception.

Please refer to documentation for each individual measure for information on the acceptable exception categories and the codes and modifiers to be used for reporting.

Testing and Implementation of the Measurement Set

Several of the measures presented here represent updates to existing inpatient and outpatient measures for heart failure. They have therefore been utilized, in their previous specifications, in several national performance measurement projects, including the CMS Physician Group Practice (PGP) Demonstration Project, the Doctor's Office Quality (DOQ) project^{10, 11}, the DOQ-Information Technology (IT) project¹⁰, and the CMS Physician Quality Reporting Initiative (PQRI) project¹². These projects have shown varying levels of feasibility, reliability, and performance, dependent upon the venue and modality of data collection. In addition, specific research projects have been conducted to test the reliability of these measures in various settings.

Other measures in the set are being made available without any prior testing. The PCPI recognizes the importance of testing all of its measures and encourages testing of the Heart Failure measurement set for feasibility and reliability by organizations or individuals positioned to do so. The *Measure Testing Protocol for PCPI Measures* was approved by the PCPI in 2007 and is available on the PCPI web site (see Position Papers at www.physicianconsortium.org); interested parties are encouraged to review this document and to contact PCPI staff. The PCPI will welcome the opportunity to promote the initial testing of these measures and to ensure that any results available from testing are used to refine the measures before implementation.

Feasibility Testing

The CMS Doctors' Office Quality (DOQ)^{10, 11} Project revealed that 4 of the 7 measures studied from the heart failure set are feasible to collect, as previously specified. As part of the DOQ project, reviewers assessed the feasibility of use of the ACCF/AHA/PCPI measures in offices by performing retrospective audits of paper medical records and electronic health records. A study by Baker et. al.²⁶ utilizing an EHR system found that all four measures studied were feasible to collect, though automated review was found to be less accurate than manual review. Implementation in the PQRI program¹² allowed for tracking of denominator mismatch rates. It is important to note that physicians participating in PQRI for Heart Failure measures in 2007 represented a small proportion of the eligible physicians (4.77-4.88%) and therefore the measure performance rates may not accurately reflect the ability of the general physician population to attain quality performance.

Reliability Testing

The DOQ¹⁰⁻¹¹ project tested inter-rater reliability twice during the project. The agreement rate for the Heart Failure measures was 92.9%.

An observational study by Baker et. al. compared automated review of EHR data with automated review followed by manual review of electronic notes for patients with apparent quality deficits (hybrid review). Performance based on automated review of EHR data was similar to that based on hybrid review for 3 of the 4 measures studied, though performance was better in the hybrid review for all cases. Overall, failure to recognize contraindications to medications documented only in provider notes caused performance on medication-based quality measures to be underestimated.

The Cardio-HIT study is in progress²⁷, testing heart failure measures in 6 physician offices with 5 different EHRs, in use for at least 5 years at time of project. As part of the project, the integrated measure specifications were translated to data fields within the practice EHR. Records for 46,737 eligible patients were reviewed. Final results from this project are expected to be available soon. The results regarding exception rate reporting will be analyzed to determine if any changes to the measures are required.

Heart Failure Measures

Measures #1-5 have been removed from this document

Measure #1: Left Ventricular Ejection Fraction (LVEF) Assessment (Outpatient Setting)

This measure is no longer stewarded by the AMA-PCPI. It has been removed from this document.

Measure #2: Left Ventricular Ejection Fraction (LVEF) Assessment (Inpatient Setting)

This measure is no longer stewarded by the AMA-PCPI. It has been removed from this document.

Measure #3: Symptom and Activity Assessment (Outpatient Setting)

This measure is no longer stewarded by the AMA-PCPI. It has been removed from this document.

Measure #4: Symptom Management (Outpatient Setting)

This measure is no longer stewarded by the AMA-PCPI. It has been removed from this document.

Measure #5: Patient Self-Care Education (Outpatient Setting)

This measure is no longer stewarded by the AMA-PCPI. It has been removed from this document.

Measure #6: Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction (LVSD)
(Outpatient and Inpatient Setting)
Heart Failure

This measure is paired with Measure #7 – Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction (LVSD)
Implementers of this measure should not use Measure #6 without Measure #7.

Measure Description

Percentage of patients aged 18 years and older with a diagnosis of heart failure with a current or prior LVEF < 40% who were prescribed beta-blocker therapy either within a 12 month period when seen in the outpatient setting or at each hospital discharge

Measure Components

Numerator Statement	<p>Patients who were prescribed* beta-blocker therapy** either within a 12 month period when seen in the outpatient setting or at hospital discharge</p> <p>*Prescribed may include: Outpatient setting: prescription given to the patient for beta-blocker therapy at one or more visits in the measurement period OR patient already taking beta-blocker therapy as documented in current medication list Inpatient setting: prescription given to the patient for beta-blocker therapy at discharge OR beta-blocker therapy to be continued after discharge as documented in the discharge medication list</p> <p>**Beta-blocker therapy should include bisoprolol, carvedilol, or sustained release metoprolol succinate. (see technical specifications for additional information on medications)</p>
Denominator Statement	<p>All patients aged 18 years and older with a diagnosis of heart failure with a current or prior LVEF < 40%</p> <p><i>LVEF < 40% corresponds to qualitative documentation of moderate dysfunction or severe dysfunction</i></p>
Denominator Exceptions	<p>Documentation of medical reason(s) for not prescribing beta-blocker therapy (eg, low blood pressure, fluid overload, asthma, patients recently treated with an intravenous positive inotropic agent, allergy, intolerance, other medical reasons) Documentation of patient reason(s) for not prescribing beta-blocker therapy (eg, patient declined, other patient reasons) Documentation of system reason(s) for not prescribing beta-blocker therapy (eg, other reasons attributable to the healthcare system)</p>
Supporting Guideline & Other References	<p>The following evidence statements are quoted <u>verbatim</u> from the referenced clinical guidelines.</p> <p><u><i>7.3.2.4. Beta Blockers: Recommendation</i></u></p>

Class I

1. Use of 1 of the 3 beta blockers proven to reduce mortality (eg, bisoprolol, carvedilol, and sustained release metoprolol succinate) is recommended for all patients with current or prior symptoms of HFrEF, unless contraindicated, to reduce morbidity and mortality. (Level of Evidence: A) (ACCF/AHA, 2013).²⁴

7.3.2.4.2. Beta Blockers: Initiation and Maintenance. Treatment with a beta blocker should be initiated at very low doses [see excerpt from guideline table below], followed by gradual increments in dose if lower doses have been well tolerated. ... Clinicians should make every effort to achieve the target doses of the beta blockers shown to be effective in major clinical trials.

Beta Blockers Commonly Used for the Treatment of Patients with [Heart Failure] with Low Ejection Fraction

Drug	Initial Daily Dose(s)	Maximum Doses(s)
Beta Blockers		
Bisoprolol	1.25 mg once	10 mg once
Carvedilol	3.125 mg twice	25 mg twice 50 mg twice for patients >85 kg
Carvedilol CR	10 mg once	80 mg once
Metoprolol succinate extended release (metoprolol CR/XL)	12.5 to 25 mg once	200 mg once

For the hospitalized patient:

Class I

- In patients with HFrEF experiencing a symptomatic exacerbation of HF requiring hospitalization during chronic maintenance treatment with GDMT, it is recommended that GDMT be continued in the absence of hemodynamic instability or contraindications. (Level of Evidence: B) (ACCF/AHA, 2013)²⁴
- Initiation of beta-blocker therapy is recommended after optimization of volume status and successful discontinuation of intravenous diuretics, vasodilators, and inotropic agents. Beta-blocker therapy should be initiated at a low dose and only in stable patients. Caution should be used when initiating beta blockers in patients who have required inotropes during their hospital course. (Level of Evidence: B) (ACCF/AHA, 2013)²⁴

Measure Importance

Relationship to desired outcome

Beta-blockers are recommended for all patients with stable heart failure and left ventricular systolic dysfunction, unless contraindicated. Treatment should be initiated as soon as a patient is diagnosed with left ventricular systolic dysfunction and does not have low blood pressure, fluid overload, or recent treatment with an intravenous positive inotropic agent. Beta-blockers have been shown to lessen the symptoms of heart failure, improve the clinical status of patients, reduce future clinical deterioration, and decrease the risk of mortality and the combined risk of mortality and

hospitalization.²⁴

Opportunity for Improvement

Registry data from IMPROVE HF indicates that beta-blockers were prescribed to 86% of eligible outpatients without documented contraindications or intolerance. More importantly, use of beta-blockers varied widely with practices reporting rates of adherence as low as 8.6% and as high as 100%.

From March 1, 2003, through December 31, 2004, Fonarow and colleagues analyzed data from the 259 U.S. hospitals (48,612 patients) participating in the Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients With Heart Failure (OPTIMIZE-HF) to determine the effect of a quality improvement initiative. Baseline data indicated that 78% of eligible patients were prescribed a beta-blocker at discharge. Use of any of the three recommended, evidence-based beta blockers (bisoprolol fumarate, carvedilol, metoprolol succinate) was significantly lower with 56% of eligible patients.²⁸

IOM Domains of Health Care Quality Addressed

- Effective
- Equitable

Exception Justification

The Heart Failure Work Group agreed to include a medical reason exception so that clinicians can exclude patients for whom the prescription of beta-blocker therapy may not be indicated or contraindicated (eg, low blood pressure, fluid overload). A patient reason exception has been included for patients who might decline this particular pharmacologic treatment. Additionally, a system reason exception has been included to account for potential financial constraints that would inhibit use/prescription of a beta-blocker.

Harmonization with Existing Measures

This measure reflects an update to a previously developed ACCF/AHA/PCPI measure – Beta-Blocker Therapy.

Measure Designation

Measure purpose

- Quality improvement
- Accountability

Type of measure

- Process

Level of Measurement

- Individual practitioner
- Facility

Care setting

- Ambulatory care
- Inpatient

Data source

- Electronic health record (EHR) data
- Administrative Data/Claims (inpatient or outpatient claims)
- Administrative Data/Claims Expanded (multiple-source)
- Paper medical record

Additional Information

Measures #6 and #7 (Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction) address related aspects of care for effective treatment for patients with heart failure and should be measured concurrently. Both ACE inhibitors and beta-blockers have been shown to reduce mortality and hospitalizations and improve a patient's clinical status. ARBs can be considered a reasonable alternative for ACE inhibitors. Combined treatment with these agents produces additive benefits and is required for optimal management of heart failure. It is not recommended that either of these measures be used independently. The pairing of these measures is not intended to suggest the use of any particular scoring methodology (ie, a composite score), nor does it imply either equality of or difference in the relative "weights" of the two measures. **A performance score for each measure should be reported individually** to provide actionable information upon which to focus quality improvement efforts.

The NQF provides definitions of paired and composite measures:

- Paired measures are individual measures that should be measured concurrently in the same population; however, the results are not combined into a single score (eg, measuring mortality and readmission and displaying them together—but not calculating a joint score)
- A composite measure is a combination of two or more individual measures in a single measure that results in a single score.

**Measure #7: Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction (LVSD)
(Outpatient and Inpatient Setting)**

This measure is paired with Measure #6 – Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction (LVSD)

Implementers of this measure should not use Measure #7 without Measure #6.

Measure Description

Percentage of patients aged 18 years and older with a diagnosis of heart failure with a current or prior LVEF < 40% who were prescribed ACE inhibitor or ARB therapy either within a 12 month period when seen in the outpatient setting or at each hospital discharge

Measure Components

Numerator Statement	<p>Patients who were prescribed* ACE inhibitor or ARB therapy either within a 12 month period when seen in the outpatient setting or at hospital discharge</p> <p>*Prescribed may include: Outpatient setting: prescription given to the patient for ACE inhibitor or ARB therapy at one or more visits in the measurement period OR patient already taking ACE inhibitor or ARB therapy as documented in current medication list Inpatient setting: prescription given to the patient for ACE inhibitor or ARB therapy at discharge OR ACE inhibitor or ARB therapy to be continued after discharge as documented in the discharge medication list</p>
Denominator Statement	<p>All patients aged 18 years and older with a diagnosis of heart failure with a current or prior LVEF < 40%</p> <p><i>LVEF < 40% corresponds to qualitative documentation of moderate dysfunction or severe dysfunction</i></p>
Denominator Exceptions	<p>Documentation of medical reason(s) for not prescribing ACE inhibitor or ARB therapy (eg, hypotensive patients who are at immediate risk of cardiogenic shock, hospitalized patients who have experienced marked azotemia, allergy, intolerance, other medical reasons)</p> <p>Documentation of patient reason(s) for not prescribing ACE inhibitor or ARB therapy (eg, patient declined, other patient reasons)</p> <p>Documentation of system reason(s) for not prescribing ACE inhibitor or ARB therapy (eg, other system reasons)</p>
Supporting Guideline & Other References	<p>The following evidence statements are quoted <u>verbatim</u> from the referenced clinical guidelines.</p> <p><i>7.3.2.2. ACE Inhibitors: Recommendation Class I</i></p>

ACE inhibitors are recommended in patients with HFrEF and current or prior symptoms, unless contraindicated, to reduce morbidity and mortality. (Level of Evidence: A) (ACCF/AHA, 2013)²⁴.

Treatment with an ACE inhibitor should be initiated at low doses [see excerpt from guideline table below], followed by gradual dose increments if lower doses have been well tolerated... Clinicians should attempt to use doses that have been shown to reduce the risk of cardiovascular events in clinical trials. If these target doses of an ACE inhibitor cannot be used or are poorly tolerated, intermediate doses should be used with the expectation that there are likely to be only small differences in efficacy between low and high doses. Abrupt withdrawal of treatment with an ACE inhibitor can lead to clinical deterioration and should be avoided. (ACCF/AHA, 2013)²⁴.

Inhibitors of the Renin-Angiotensin-Aldosterone System...Commonly Used for the Treatment of Patients with [Heart Failure] with Low Ejection Fraction

Drug	Initial Daily Dose(s)	Maximum Doses(s)
ACE Inhibitors		
Captopril	6.25 mg 3 times	50 mg 3 times
Enalapril	2.5 mg twice	10 to 20 mg twice
Fosinopril	5 to 10 mg once	40 mg once
Lisinopril	2.5 to 5 mg once	20 to 40 mg once
Perindopril	2 mg once	8 to 16 mg once
Quinapril	5 mg twice	20 mg twice
Ramipril	1.25 to 2.5 mg once	10 mg once
Trandolapril	1 mg once	4 mg once
Angiotensin Receptor Blockers		
Candesartan	4 to 8 mg once	32 mg once
Losartan**	25 to 50 mg once	50 to 150 mg once
Valsartan	20 to 40 mg twice	160 mg twice

**[Note: Among ARBs, Losartan has the weakest evidence supporting its value in heart failure patients. Additionally, while the 2009 guidelines recommended a maximum dosage of 100mg, the maximum dosage recommendation for Losartan has been increased to 150mg based on the HEAAL trial.²⁹]

7.3.2.3. ARBs: Recommendations

Class I

1. ARBs are recommended in patients with HFrEF with current or prior symptoms who are ACE inhibitor intolerant, unless contraindicated, to reduce morbidity and mortality (Level of Evidence: A) (ACCF/AHA, 2013)²⁴.

Class IIa

1. ARBs are reasonable to reduce morbidity and mortality as alternatives to ACE inhibitors as first-line therapy for patients with HFrEF, especially for patients already taking ARBs for other indications, unless contraindicated (Level of Evidence: A) (ACCF/AHA, 2013)²⁴.

	<p>Class IIb</p> <p>1. Addition of an ARB may be considered in persistently symptomatic patients with HF_rEF who are already being treated with an ACE inhibitor and a beta blocker in whom an aldosterone antagonist is not indicated or tolerated (Level of Evidence: A) (ACCF/AHA, 2013)²⁴.</p> <p>Class III: Harm</p> <p>1. Routine <i>combined</i> use of an ACE inhibitor, ARB, and aldosterone antagonist is potentially harmful for patients with HF_rEF (Level of Evidence: C) (ACCF/AHA, 2013)²⁴.</p> <p><u>For the hospitalized patient:</u></p> <p><u>Class I</u></p> <ul style="list-style-type: none"> ▪ In patients with HF_rEF experiencing a symptomatic exacerbation of HF requiring hospitalization during chronic maintenance treatment with GDMT, it is recommended that GDMT be continued in the absence of hemodynamic instability or contraindications. (Level of Evidence: B) (ACCF/AHA, 2013)²⁴
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Measure Importance

Relationship to desired outcome	In the absence of contraindications, ACE inhibitors or ARBs are recommended for all patients with symptoms of heart failure and reduced left ventricular systolic function. ACE inhibitors remain the first choice for inhibition of the renin-angiotensin system in chronic heart failure, but ARBs can now be considered a reasonable alternative. Both pharmacologic agents have been shown to decrease the risk of death and hospitalization. Additional benefits of ACE inhibitors include the alleviation of symptoms and the improvement of clinical status and overall sense of well-being of patients with heart failure. ²⁴
Opportunity for Improvement	<p>Registry data from the outpatient setting has indicated that the use of ACE inhibitors or ARBs in eligible patients without documented contraindications or intolerance remains suboptimal with an average of 80% of patients receiving the recommended treatment. This use varied widely among participating practices with rates of adherence ranging from 5.9% to 96.3%.</p> <p>For patients hospitalized with heart failure, registry data indicates a higher rate of adherence with 84% of patients receiving an ACE inhibitor or ARB at discharge. More recent data from October 2007 through September 2008 indicates an even higher rate of adherence with a national average of 92.28% of patients with left ventricular systolic dysfunction being prescribed ACE inhibitor/ARB therapy.</p>
IOM Domains of Health Care Quality Addressed	<ul style="list-style-type: none"> • Effective • Equitable
Exception Justification	The Heart Failure Work Group agreed to include a medical reason exception so that clinicians can exclude patients for whom the prescription of ACE inhibitors or ARB therapy may not be indicated or contraindicated (eg, hypotensive patients who are at

immediate risk of cardiogenic shock, hospitalized patients who have experienced marked azotemia). A patient reason exception has been included for patients who might decline this particular pharmacologic treatment. Additionally, a system reason exception has been included to account for potential financial constraints that would inhibit use/prescription of ACE inhibitors or ARB therapy.

Harmonization with Existing Measures	This measure reflects an update to a previously developed ACCF/AHA/PCPI measure – ACE inhibitor or ARB for Patients with Heart Failure Who Have Left Ventricular Systolic Dysfunction. This measure was harmonized to the extent feasible with The Joint Commission’s ACE inhibitor or ARB for Left Ventricular Systolic Dysfunction measure.
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Measure Designation

Measure purpose	<ul style="list-style-type: none"> • Quality improvement • Accountability
Type of measure	<ul style="list-style-type: none"> • Process
Level of Measurement	<ul style="list-style-type: none"> • Individual practitioner • Facility
Care setting	<ul style="list-style-type: none"> • Ambulatory care • Inpatient
Data source	<ul style="list-style-type: none"> • Electronic health record (EHR) data • Administrative Data/Claims (inpatient or outpatient claims) • Administrative Data/Claims Expanded (multiple-source) • Paper medical record

Additional Information

Measures #6 (Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction) and #7 address related aspects of care for effective treatment for patients with heart failure and should be measured concurrently. Both ACE inhibitors and beta-blockers have been shown to reduce mortality and hospitalizations and improve a patient's clinical status. ARBs can be considered a reasonable alternative for ACE inhibitors. Combined treatment with these agents produces additive benefits and is required for optimal management of heart failure. It is not recommended that either of these measures be used independently. The pairing of these measures is not intended to suggest the use of any particular scoring methodology (ie, a composite score), nor does it imply either equality of or difference in the relative "weights" of the two measures. **A performance score for each measure should be reported individually** to provide actionable information upon which to focus quality improvement efforts.

The NQF provides definitions of paired and composite measures:

- Paired measures are individual measures that should be measured concurrently in the same population; however, the results are not combined into a single score (eg, measuring mortality and readmission and displaying them together—but not calculating a joint score)
- A composite measure is a combination of two or more individual measures in a single measure that results in a single score.

Measures #8-9 have been removed from this document

Measure #8: Counseling regarding Implantable Cardioverter-Defibrillator (ICD) Implantation for Patients with Left Ventricular Systolic Dysfunction on Combination Medical Therapy (Outpatient Setting)

This measure is no longer stewarded by the AMA-PCPI. It has been removed from this document.

Measure #9: Post-Discharge Appointment for Heart Failure Patients (Inpatient Setting)

This measure is no longer stewarded by the AMA-PCPI. It has been removed from this document.

Guideline Evidence Classification and Rating Schemes

Heart Failure

ACCF/AHA Guidelines for the Diagnosis and Management of Heart Failure in Adults

Classification of Recommendations

Class I: Conditions for which there is evidence and/or general agreement that a given procedure or treatment is beneficial, useful, and effective.

Class II: Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment.

Class IIa: Weight of evidence/opinion is in favor of usefulness/efficacy.

Class IIb: Usefulness/efficacy is less well established by evidence/opinion.

Class III: Conditions for which there is evidence and/or general agreement that a procedure/treatment is not useful/effective and in some cases may be harmful.

Level of Evidence

Level of Evidence A: Data derived from multiple randomized clinical trials or meta-analyses.

Level of Evidence B: Data derived from a single randomized trial, or nonrandomized studies.

Level of Evidence C: Only consensus opinion of experts, case studies, or standard-of-care.

HFSA Comprehensive Heart Failure Practice Guideline

Level A : Randomized, Controlled, Clinical Trials

May be assigned based on results of a single Trials

Level B: Cohort and Case-Control Studies

Post hoc, subgroup analysis, and meta-analysis

Prospective observational studies or registries

Level C: Expert Opinion

Observational studies-epidemiologic findings

Safety Reporting from large-scale use in practice

ACCF/ASE/ACEP/ASNC/SCAI/SCCT/SCMR Appropriateness Criteria for Transthoracic and Transesophageal

Echocardiography

Median score 7 to 9: Appropriate test for that specific indication (test *is* generally acceptable and *is* a reasonable approach for the indication).

Median score 4 to 6: Uncertain or possibly appropriate test for that specific indication (test *may* be generally acceptable and *may* be a reasonable approach for the indication). Uncertainty also implies that more research and/or patient information is needed to classify definitively the indication as appropriate and to update the criteria.

Median score 1 to 3: Inappropriate test for that indication (test is *not* generally acceptable and is *not* a reasonable approach for the indication).

The American College of Physicians' Guideline: Evidence-based interventions to improve the palliative care of pain, dyspnea, and depression at the end of life

Quality of Evidence	Strength of Recommendation	
	Benefits Clearly Outweigh Risks and Burden OR Risks and Burden Clearly Outweigh Benefits	Benefits Finely Balanced with Risks and Burden
High	Strong	Weak
Moderate	Strong	Weak
Low	Strong	Weak
Insufficient evidence to	I - recommendation	

Appendix 1: Analysis of 2006 Medicare Beneficiary Data to Inform Draft Overuse of Echocardiography Measure

To assist the Heart Failure Work Group in evaluating the draft Heart Failure Overuse of Echocardiography measure, AMA and AMA-PCPI staff analyzed the 5% standard analytic file of physician claims (5% sample of Medicare beneficiaries) for frequency of use of echocardiography services in outpatient settings for 2006.

Results from the analysis indicate the following:

- 41,379,253 total claims in the data file
- 1,703,765 unique beneficiary IDs, which would translate to just over 34 million Medicare Fee-for-Service beneficiaries with claims in 2006
- 1,196,162 claims with any diagnosis of heart failure (ICD-9 codes per measure specification)
- 208,344 unique beneficiary IDs with a diagnosis of heart failure (12% of all beneficiaries with claims)
- 10,268,924 claims for those 208,344 beneficiaries with any diagnosis of heart failure (which account for a disproportionate share of claims)
- Of those 208,344 beneficiaries with any diagnosis of heart failure, 114,584 (55%) received at least one echocardiogram in 2006, and 65,127 (31%) had at least one echocardiogram in an outpatient setting
- Only 1,627, or 2.5% of patients receiving echocardiograms in the outpatient setting had 3 or more echocardiograms; hence, at the aggregated patient level, the Overuse of Echocardiography measure was met for 97.5% of patients

Total Patient Counts and Allowed Charges

The total number of patients (beneficiaries) diagnosed with heart failure receiving echocardiography services in an outpatient setting, and total allowed charges for echocardiography for those patients are presented in table 1. Total patients counts, and counts in each category of the number of echocardiograms received are derived by multiplying the corresponding patient counts from the 5% sample data by 20. Likewise, total allowed charges are based on the allowed charges for the patients in the 5% sample multiplied by 20.

It is estimated that 32,540 Medicare beneficiaries had 3 or more echocardiograms during 2006, and that total allowed charges for those patients were \$15.9 million (in 2006 dollars). An estimate of the potential savings from having 100% of patients meet the measure can be derived from calculating the change in total allowed charges that would result from reducing the number of echocardiograms to 2, for the patients receiving 3 or more echocardiograms. Potential cost savings from meeting the measure for those patients is estimated to be only \$6.3 million (in 2006 dollars).

Table 1. Percent and Total Number of Patients, and Allowed Charges and Potential Savings from Meeting the Overuse Measure, by Number of Echocardiography Services

Number of	Percent of Patients	Total Patients (5% sample count X 20)	Total Allowed Charges, 3 Echocardiograms or More	Potential Savings From Meeting the Measure
1	85.2%	1,109,940		
2	12.3%	160,060		
3	1.9%	24,800	\$ 11,119,322	\$ 3,706,441
4	0.4%	5,360	\$ 3,010,981	\$ 1,505,491
5	0.1%	1,660	\$ 1,153,463	\$ 692,078
6	0.0%	340	\$ 292,139	\$ 194,759
7	0.0%	160	\$ 110,051	\$ 78,608
8	0.0%	80	\$ 54,314	\$ 40,736
9	0.0%	40	\$ 51,962	\$ 40,415
11	0.0%	40	\$ 55,249	\$ 45,204
12	0.0%	20	\$ 7,963	\$ 6,636
13	0.0%	40	\$ 21,734	\$ 18,390
Patients with 3 or More Echocardiograms	2.5%	32,540	\$ 15,877,179	\$ 6,328,757

Conclusion

These data provide little evidence of overuse of echocardiography in the outpatient setting, for Medicare patients with a diagnosis of heart failure. The measure is met for 97.5% of patients, and hence the overuse of echocardiography is limited.

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**American College of Cardiology Foundation (ACCF)
American Heart Association (AHA)
Physician Consortium for Performance Improvement® (PCPI®)**

APPENDIX A
Heart Failure Performance Measurement Specifications

Specifications Reviewed and Updated: April, 2016

Physician Performance Measures (Measures) and related data specifications have been developed by the American Medical Association (AMA)-convened Physician Consortium for Performance Improvement® (PCPI®). These Measures are not clinical guidelines and do not establish a standard of medical care, and have not been tested for all potential applications.

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Heart Failure

Measure #6: Heart Failure (HF): Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction (LVSD)

A. Specifications for Administrative Data Sources

Denominator (Eligible Population)	<p>All patients aged 18 years and older with a diagnosis of heart failure with a current or prior LVEF < 40%</p> <p><u>Denominator Note:</u> <i>LVEF < 40% corresponds to qualitative documentation of moderate dysfunction or severe dysfunction</i></p> <p>Age >= 18 years AND Diagnosis for heart failure (ICD-9-CM) [reportable through 9/30/2015]: 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9 Diagnosis for heart failure (ICD-10-CM) [reportable beginning 10/1/2015]: I11.0, I13.0, I13.2, I50.1, I50.20, I50.21, I50.22, I50.23, I50.30, I50.31, I50.32, I50.33, I50.40, I50.41, I50.42, I50.43, I50.9 AND CPT® Code for Encounter: 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99241, 99242, 99243, 99244, 99245, 99238, 99239, 99304, 99305, 99306, 99307, 99308, 99309, 99310, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350 AND Report Quality Data Code: G8923: Left ventricular ejection fraction (LVEF) < 40% or documentation of moderately or severely depressed left ventricular systolic function</p>
Denominator Exclusions	<p>None</p>
Numerator	<p>Patients who were prescribed beta-blocker therapy either within a 12 month period when seen in the outpatient setting or at each hospital discharge</p> <p><u>Numerator Definitions:</u> Prescribed - Outpatient Setting: prescription given to the patient for beta blocker therapy at one or more visits in the measurement period OR patient already taking beta-blocker therapy as documented in current medication list Prescribed - Inpatient Setting: prescription given to the patient for beta-blocker therapy at discharge OR beta-blocker therapy to be continued after discharge as documented in the discharge medication list Beta-blocker Therapy – For patients with prior LVEF < 40%, beta-blocker therapy</p>

	<p>should include bisoprolol, carvedilol, or sustained release metoprolol succinate</p> <p>Report Quality Data Code: G8450: Beta-blocker therapy prescribed</p>
<p>Denominator Exceptions</p>	<p>Documentation of medical reason(s) for not prescribing beta-blocker therapy (eg, low blood pressure, fluid overload, asthma, patients recently treated with an intravenous positive inotropic agent, allergy, intolerance, other medical reasons)</p> <p>Documentation of patient reason(s) for not prescribing beta-blocker therapy (eg, patient declined, other patient reasons)</p> <p>Documentation of system reason(s) for not prescribing beta-blocker therapy (eg, other reasons attributable to the healthcare system)</p> <p>To report a medical, patient or system reason exception, report quality data code: G8451: Beta-Blocker Therapy for LVEF < 40% not prescribed for reasons documented by the clinician (e.g., low blood pressure, fluid overload, asthma, patients recently treated with an intravenous positive inotropic agent, allergy, intolerance, other medical reasons, patient declined, other patient reasons, or other reasons attributable to the healthcare system)</p>

B. Specifications for Electronic Clinical Data Sources

As of the date of the posting of this document, this measure is currently in use in CMS' EHR Incentive Program (Meaningful Use). The specifications are updated on a regular basis and published on the CMS website. To download the electronic specifications for this measure, visit CMS' eCQM Library and view the most recent publishing:

http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/eCQM_Library.html

Additional resources for eCQM implementation can also be found at the eCQI Resource Center webpage: <https://ecqi.healthit.gov/>

Accompanying value sets are available in the Value Set Authority Center (VSAC) found at the following webpage: <https://vsac.nlm.nih.gov/>

Heart Failure

Measure #7: Heart Failure (HF): Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction (LVSD)

A. Specifications for Administrative Data Sources

Denominator (Eligible Population)	<p>All patients aged 18 years and older with a diagnosis of heart failure with a current or prior LVEF < 40%</p> <p><u>Denominator Note:</u> <i>LVEF < 40% corresponds to qualitative documentation of moderate dysfunction or severe dysfunction</i></p> <p>Age >= 18 years AND Diagnosis for heart failure (ICD-9-CM) [reportable through 9/30/2015]: 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9 Diagnosis for heart failure (ICD-10-CM) [reportable beginning 10/1/2015]: I11.0, I13.0, I13.2, I50.1, I50.20, I50.21, I50.22, I50.23, I50.30, I50.31, I50.32, I50.33, I50.40, I50.41, I50.42, I50.43, I50.9 AND CPT® Code for Encounter: 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99241, 99242, 99243, 99244, 99245, 99238, 99239, 99304, 99305, 99306, 99307, 99308, 99309, 99310, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350 AND Report CPT Category II code: 3021F: Left ventricular ejection fraction (LVEF) < 40% or documentation of moderately or severely depressed left ventricular systolic function</p>
Denominator Exclusions	None
Numerator	<p>Patients who were prescribed ACE inhibitor or ARB therapy either within a 12 month period when seen in the outpatient setting or at each hospital discharge</p> <p><u>Numerator Definitions:</u> Prescribed - Outpatient Setting: prescription given to the patient for ACE inhibitor or ARB therapy at one or more visits in the measurement period OR patient already taking ACE inhibitor or ARB therapy as documented in current medication list Prescribed - Inpatient Setting: prescription given to the patient for ACE inhibitor or ARB therapy at discharge OR ACE inhibitor or ARB therapy to be continued</p>

	<p>after discharge as documented in the discharge medication list</p> <p>Report CPT Category II code: 4010F: Angiotensin Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) therapy prescribed or currently being taken</p>
<p>Denominator Exceptions</p>	<p>Documentation of medical reason(s) for not prescribing ACE inhibitor or ARB therapy (eg, hypotensive patients who are at immediate risk of cardiogenic shock, hospitalized patients who have experienced marked azotemia, allergy, intolerance, other medical reasons) Append modifier to CPT Category II code: 4010F with 1P</p> <p>Documentation of patient reason(s) for not prescribing ACE inhibitor or ARB therapy (eg, patient declined, other patient reasons) Append modifier to CPT Category II code: 4010F with 2P</p> <p>Documentation of system reason(s) for not prescribing ACE inhibitor or ARB therapy (eg, other system reasons) Append modifier to CPT Category II code: 4010F with 3P</p>

B. Specifications for Electronic Clinical Data Sources

As of the date of the posting of this document, this measure is currently in use in CMS' EHR Incentive Program (Meaningful Use). The specifications are updated on a regular basis and published on the CMS website. To download the electronic specifications for this measure, visit CMS' eCQM Library and view the most recent publishing:

http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/eCQM_Library.html

Additional resources for eCQM implementation can also be found at the eCQI Resource Center webpage: <https://ecqi.healthit.gov/>

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