# NATIONAL QUALITY FORUM

**Measure Evaluation 4.1**
**December 2009**

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

**TAP/Workgroup** (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas).*

**Steering Committee:** Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the criteria are met
C = Completely (unquestionably demonstrated to meet the criterion)
P = Partially (demonstrated to partially meet the criterion)
M = Minimally (addressed BUT demonstrated to only minimally meet the criterion)
N = Not at all (NOT addressed; OR incorrectly addressed; OR demonstrated to NOT meet the criterion)
NA = Not applicable (only an option for a few subcriteria as indicated)

| (for NQF staff use) **NQF Review #:** 1530 **NQF Project:** Cardiovascular Endorsement Maintenance 2010 |
|---|
| **MEASURE DESCRIPTIVE INFORMATION** |
| De.1 **Measure Title:** Prophylactic Antibiotics prior to ICD (lead or implant) procedure |
| De.2 **Brief description of measure***:* Proportion of patients that receive an ICD implant or lead procedure that receive antibiotics within 1 hour (if fluoroquinolone or vancomycin, two hours) prior to procedure. |
| 1.1-2 **Type of Measure:** Process<br>De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** N/A |
| De.4 **National Priority Partners Priority Area:** Safety<br>De.5 **IOM Quality Domain**: Effectiveness, Safety, Timeliness<br>De.6 **Consumer Care Need:** Getting better, Staying healthy, Living with illness |

| **CONDITIONS FOR CONSIDERATION BY NQF** | |
|---|---|
| Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards: | **NQF Staff** |
| **A.** The measure is in the public domain or an intellectual property (measure steward agreement) is signed. *Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.*<br>A.1 **Do you attest that the measure steward holds intellectual property rights to the measure and the right to use aspects of the measure owned by another entity (e.g., risk model, code set)?** Yes<br>A.2 **Indicate if Proprietary Measure** (*as defined in measure steward agreement*)**:**<br>A.3 **Measure Steward Agreement:** Agreement will be signed and submitted prior to or at the time of measure submission<br>A.4 **Measure Steward Agreement attached:** NQF - signed-634272262006493898.pdf | **A**<br>**Y**☐<br>**N**☐ |
| **B.** The measure owner/steward verifies there is an identified responsible entity and process to maintain and | **B** |

| | |
|---|---|
| update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. Yes, information provided in contact section | Y☐ N☐ |
| **C.** The intended use of the measure includes both public reporting and quality improvement.<br>►**Purpose:** Public reporting, Internal quality improvement<br>Accountability, Payment incentive, Accreditation | C<br>Y☐<br>N☐ |
| **D.** The requested measure submission information is complete. Generally, measures should be fully developed and tested so that all the evaluation criteria have been addressed and information needed to evaluate the measure is provided. Measures that have not been tested are only potentially eligible for a time-limited endorsement and in that case, measure owners must verify that testing will be completed within 12 months of endorsement.<br>D.1**Testing:** No, testing will be completed within 12 months<br>D.2 **Have NQF-endorsed measures been reviewed to identify if there are similar or related measures?**<br>Yes | D<br>Y☐<br>N☐ |
| (for NQF staff use**) Have all conditions for consideration been met?**<br>**Staff Notes to Steward** (*if submission returned*)**:** | **Met**<br>Y☐<br>N☐ |
| **Staff Notes to Reviewers** (*issues or questions regarding any criteria*)**:** | |
| **Staff Reviewer Name(s):** | |

| | |
|---|---|
| **TAP/Workgroup Reviewer Name:** | |
| **Steering Committee Reviewer Name:** | |
| **1. IMPORTANCE TO MEASURE AND REPORT** | |
| Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in or overall poor performance.<br>*Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria.* (evaluation criteria)<br>**1a. High Impact** | **Eval Rating** |
| (for NQF staff use) **Specific NPP goal**: | |
| 1a.1 **Demonstrated High Impact Aspect of Healthcare:** Affects large numbers, Frequently performed procedure, Leading cause of morbidity/mortality, High resource use, Severity of illness<br>1a.2<br><br>1a.3 **Summary of Evidence of High Impact:** In 2006, 114,000 inpatient defibrillator implantations were performed. The mean hospital charge for ICD procedures was $115,763. While ICDs are very effective in reducing cardiac death, complications including infection may occur during implantation that may lead to morbidity and mortality as well as increased hospital length of stay. The incidence of infection following device implantation is estimated between 0.68 and 3.28%.<br><br>1a.4 **Citations for Evidence of High Impact:** 1. American Heart Association. Heart disease and stroke statistics- 2010 update: A report of the American Heart Association. Available at: http://circ.ahajournals.org/cgi/content/abstract/CIRCULATIONAHA.109.192667v1. Accessed December 3, 2010.<br><br>2. Klug D, Balde M, Pavin D, et al. Risk factors related to infections of implanted pacemakers and cardioverter-defibrillators. Results of a large prospective study. Circulation. 2007;116:1349-1355.<br><br>3. Maytin M, Epstein LM. Proof positive: Efficacy of antibiotic prophylaxis in device implantation. Circ Arrhythmia Electrophysiol. 2009;2:4-5. | **1a**<br>C☐<br>P☐<br>M☐<br>N☐ |

**Comment [KP1]: 1a.** The measure focus addresses:
•a specific national health goal/priority identified by NQF's National Priorities Partners; OR
•a demonstrated high impact aspect of healthcare (e.g., affects large numbers, leading cause of morbidity/mortality, high resource use (current and/or future), severity of illness, and patient/societal consequences of poor quality).

4. de Oliveira JC, Martinelli M, D´Orio Nishioka SA, et al. Efficacy of antibiotic prophylaxis prior to the implantation of pacemakers and cardioverter-defibrillators: Results of a large, prospective, randomized, double-blinded, placebo-controlled trial. Circ Arrhythmia Electrophysiol. 2009;2:29-34.

**1b. Opportunity for Improvement**

**1b.1 Benefits (improvements in quality) envisioned by use of this measure:** Prophylactic antibiotics prior to surgical procedures prevent infection related to the procedure. Several studies have established the efficacy of antibiotics in preventing surgical infection for many surgical procedures. The incidence of infection from ICD implant procedures is estimated at 0.68-3.28%. Hiven the potential complications associated with ICD-associated infections, pre-procedural antibiotic administration is integral to ensuring patient safety following ICD implantation.

**1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:**
Data will be available from the NCDR ICD Registry Version 2 in 2011.

**1b.3 Citations for data on performance gap:**

**1b.4 Summary of Data on disparities by population group:**
Data will be available from the NCDR ICD Registry Version 2 in 2011.

**1b.5 Citations for data on Disparities:**

**1b**
C☐
P☐
M☐
N☐

**1c. Outcome or Evidence to Support Measure Focus**

**1c.1 Relationship to Outcomes** (*For non-outcome measures, briefly describe the relationship to desired outcome. For outcomes, describe why it is relevant to the target population*)**:** Prophylactic antibiotics prior to surgical procedures prevent infection related to the procedure. Several studies have established the efficacy of antibiotics in preventing surgical infection, including for ICD procedures.

**1c.2-3. Type of Evidence:** Evidence-based guideline, Randomized controlled trial, Expert opinion

**1c.4 Summary of Evidence** (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
The Prospective Evaluation of Pacemaker Lead Endocarditis study is a multicenter, prospective survey of the incidence and risk factors of infectious complications after implantation of pacemakers and cardioverter-defibrillators. Among 5866 pacing systems implanted, 3789 included 2 and 117 had >2 leads; among 453 implantable cardioverter-defibrillators, 178 were dual-lead systems. Infections developed over 12 months in 42 patients, representing an incidence of 0.68 per 100 patients (95% CI, 0.47 to 0.89) or 2 per 105 patient-days (1.4 per 105 to 2.6 per 105). The incidence of infection was 0.56 per 100 patients (95% CI, 0.33 to 0.78) and 0.99 per 100 patients (95% CI, 0.54 to 1.45) after de novo implantation and non–de novo implantation, respectively. In this study, an inverse correlation was observed between the development of infections and antibiotic prophylaxis.
A double blinded of 1000 consecutive patients undergoing pacemaker or ICD implantation were randomized to prophylactic antibiotics or placebo. The primary end point was any evidence of infection at the surgical incision (pulse generator pocket), or systemic infection related to be procedure. The trial was discontinued after649 patients were enrolled due to a significant difference in favor of the antibiotic arm (group I: 2 of 314 infected patients—0.63%; group II: 11 of 335 to 3.28%; RR=0.19; P=0.016). The following risk factors were positively correlated with infection by univariate analysis: nonuse of preventive antibiotic (P=0.016); implant procedures (versus generator replacement: P=0.02); presence of postoperative hematoma (P=0.03) and procedure duration (P=0.009). Multivariable analysis identified nonuse of antibiotic (P=0.037) and postoperative hematoma (P=0.023) as independent predictors of infection.

**1c.5 Rating of strength/quality of evidence** (*also provide narrative description of the rating and by whom*)**:**
• Level of Evidence A: Data derived from multiple randomized clinical trials or meta-analyses.

**1c**
C☐
P☐
M☐
N☐

**Comment [KP2]: 1b.** Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating considerable variation, or overall poor performance, in the quality of care across providers and/or population groups (disparities in care).

**Comment [k3]:** 1 Examples of data on opportunity for improvement include, but are not limited to: prior studies, epidemiologic data, measure data from pilot testing or implementation. If data are not available, the measure focus is systematically assessed (e.g., expert panel rating) and judged to be a quality problem.

**Comment [k4]: 1c.** The measure focus is:
•an outcome (e.g., morbidity, mortality, function, health-related quality of life) that is relevant to, or associated with, a national health goal/priority, the condition, population, and/or care being addressed;
OR
•if an intermediate outcome, process, structure, etc., there is **evidence** that supports the specific measure focus as follows:
oIntermediate outcome – evidence that the measured intermediate outcome (e.g., blood pressure, Hba1c) leads to improved health/avoidance of harm or cost/benefit.
oProcess – evidence that the measured clinical or administrative process leads to improved health/avoidance of harm and
if the measure focus is on one step in a multi-step care process, it measures the step that has the greatest effect on improving the specified desired outcome(s).
oStructure – evidence that the measured structure supports the consistent delivery of effective processes or access that lead to improved health/avoidance of harm or cost/benefit.
oPatient experience – evidence that an association exists between the measure ... [1]

**Comment [k5]:** 4 Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multi-step process, the step with the greatest effect on the desired outcome should be selected as the focus of measurement. For example, although assessment of immunization status and recommending immunization are necessary steps, they are not sufficient to achieve the desired impact on health status – patients must be vaccinated to achieve ... [2]

**Comment [k6]:** 3 The strength of the body of evidence for the specific measure focus should be systematically assessed and rated (e.g., USPSTF grading system http://www.ahrq.gov/clinic/uspstf07/methods/benefit.htm). If the USPSTF grading system was not used, the grading system is explained including how it relates to the USPSTF grades or why it does not. However, evidence is not limited to quantitative studies and the best type of evidence depends upon the question being studied (e.g., randomized controlled trials appropriate for studying drug efficacy are not well suited for complex system ... [3]

**1c.6 Method for rating evidence:** The weight of evidence in support of the recommendation is listed as follows:
• 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.

**1c.7 Summary of Controversy/Contradictory Evidence:**

**1c.8 Citations for Evidence (***other than guidelines***):** 1.Klug D, Balde M, Pavin D, et al. Risk factors related to infections of implanted pacemakers and cardioverter-defibrillators. Results of a large prospective study. Circulation. 2007;116:1349-1355.

2. Maytin M, Epstein LM. Proof positive: Efficacy of antibiotic prophylaxis in device implantation. Circ Arrhythmia Electrophysiol. 2009;2:4-5.

3. de Oliveira JC, Martinelli M, D´Orio Nishioka SA, et al. Efficacy of antibiotic prophylaxis prior to the implantation of pacemakers and cardioverter-defibrillators: Results of a large, prospective, randomized, double-blinded, placebo-controlled trial. Circ Arrhythmia Electrophysiol. 2009;2:29-34.

**1c.9 Quote the Specific guideline recommendation (***including guideline number and/or page number***):**
AHA Scientific Statement- Nonvalvular Cardiovascular Device- Related Infections
Primary prophylaxis
•Modeled after that used to prevent surgical site infection.
•Because of the low incidence of infection for many of the devices, evidence-based data have not been collected that prove efficacy.
•Routinely used for placement of electrophysiological cardiac devices, ventricular assist devices, total artificial hearts, ventriculoatrial shunts, cardiac suture line pledgets, vascular grafts, and arterial patches.
Secondary prophylaxis
•Antibiotic prophylaxis is not routinely recommended after device placement for patients who undergo dental, respiratory, gastrointestinal or genitourinary procedures.
•It is recommended for patients with these devices if they undergo incision and drainage of infection at other sites (eg, abscess) or replacement of an infected device.
•It is recommended for patients with residual leak after device placement for attempted closure of the leak associated with patent ductus arteriosus, atrial septal defect, or ventricular septal defect.

Surgical Infection Prevention Guidelines Writers Group Recommendations:
"On the basis of published evidence, the workgroup endorsed the national performance measure that infusion of the first antimicrobial dose should begin within 60 min before incision. However, when a fluoroquinolone or vancomycin is indicated, the infusion should begin within 120 min before incision to prevent antibiotic-associated reactions." (Page 1708)

"Cardiothoracic and vascular surgery. The recommended antimicrobials for cardiothoracic and vascular operations include cefazolin or cefuroxime [10–12, 14, 16]. For patients with serious allergy or adverse reaction to b-lactams, vancomycin is appropriate, and clindamycin may be an acceptable alternative." (Page 1711)

Guidelines for prevention of surgical site infection:
Four principles must be followed to maximize the benefits of AMP (Surgical antimicrobial prophylaxis):
- Use an AMP agent for all operations or classes of operations in which its use has been shown to reduce SSI rates based on evidence from clinical trials or for those operations after which incisional or organ/space SSI would represent a catastrophe.
- Use an AMP agent that is safe, inexpensive, and bactericidal with an in vitro spectrum that covers the most probable intraoperative contaminants for the operation.
- Time the infusion of the initial dose of antimicrobial agent so that a bactericidal concentration of the drug is established in serum and tissues by the time the skin is incised.
- Maintain therapeutic levels of the antimicrobial agent in both serum and tissues throughout the operation and until, at most, a few hours after the incision is closed in the operating room.179,266-268,282,284,286
Because clotted blood is present in all surgical wounds, therapeutic serum levels of AMP agents are logically

important in addition to therapeutic tissue levels. Fibrin-enmeshed bacteria may be resistant to phagocytosis or to contact with antimicrobial agents that diffuse from the wound space.

Table 4 summarizes typical SSI pathogens according to operation type and cites studies that establish AMP efficacy for these operations. A simple way to organize AMP indications is based on using the surgical wound classification scheme shown in Table 7, which employs descriptive case features to postoperatively grade the degree of intraoperative microbial contamination. A surgeon makes the decision to use AMP by anticipating preoperatively the surgical wound class for a given operation.
AMP is indicated for all operations that entail entry into a hollow viscus under controlled conditions.

**1c.10 Clinical Practice Guideline Citation:** 1.Bratzler DW, Houck PM, for the Surgical Infection Prevention Guidelines Writers Group. Antimicrobial prophylaxis for surgery: An advisory statement from the National Surgical Infection Prevention Project. CID. 2004:38(15 June):1706-1715.

2.Mangram AJ, Horan TC, Pearson ML, et al. Guidelines for prevention of surgical site infection, 1999. Infect Control Hosp Epidemiol. 1999;20:247-280.

3.Baddour LM, Bettmann MA, Bolger AF, et al. AHA Scientific Statement: Nonvalvular cardiovascular device-related infections. Circulation. 2003;108:2015-31.
**1c.11 National Guideline Clearinghouse or other URL:** http://www.cardiosource.org/Science-And-Quality/Practice-Guidelines-and-Quality-Standards.aspx

**1c.12 Rating of strength of recommendation (***also provide narrative description of the rating and by whom***):**
N/A

**1c.13 Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF)***:**
N/A

**1c.14 Rationale for using this guideline over others:**

| | |
|---|---|
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Importance to Measure and Report?* | **1** |
| **Steering Committee: Was the threshold criterion,** *Importance to Measure and Report***, met?**<br>**Rationale:** | **1**<br>**Y☐**<br>**N☐** |
| **2. SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES** | |
| Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. (evaluation criteria) | **Eval Rating** |
| **2a. MEASURE SPECIFICATIONS** | |
| **S.1 Do you have a web page where current detailed measure specifications can be obtained?**<br>**S.2 If yes, provide web page URL:**<br><br>**2a. Precisely Specified** | |
| **2a.1 Numerator Statement (***Brief, text description of the numerator - what is being measured about the target population, e.g. target condition, event, or outcome***):**<br>Count of patients that receive antibiotics prior to the ICD implant or leads procedure.<br><br>**2a.2 Numerator Time Window (***The time period in which cases are eligible for inclusion in the numerator***):**<br>1 year | **2a-specs**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |

**Comment [k7]:** USPSTF grading system **http://www.ahrq.gov/clinic/uspstf/grades.htm**: **A -** The USPSTF recommends the service. There is high certainty that the net benefit is substantial. **B -** The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial. **C -** The USPSTF recommends against routinely providing the service. There may be considerations that support providing the service in an individual patient. There is at least moderate certainty that the net benefit is small. Offer or provide this service only if other considerations support the offering or providing the service in an individual patient. **D -** The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits. **I -** The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

**Comment [KP8]: 2a.** The measure is well defined and precisely specified so that it can be implemented consistently within and across organizations and allow for comparability. The required data elements are of high quality as defined by NQF's Health Information Technology Expert Panel (HITEP) .

**2a.3 Numerator Details (***All information required to collect/calculate the numerator, including all codes, logic, and definitions***):**
Prophylactic Antibiotics w/in 1 Hr of Procedure Start Time=yes.

Supporting definitions:
Note(s):
1. An order (written order, verbal order, or standing order/protocol) for prophylactic antibiotics to be given within one hour of procedure start time (two hours if receiving vancomycin or fluoroquinolone).
OR
2. Prophylactic antibiotic administered within one hour (if fluoroquinolone or vancomycin, two hours) prior to procedure start time.
In the event that the procedure is delayed, as long as the patient is redosed (if clinically appropriate) the appropriate selection should be applied.

**2a.4 Denominator Statement (***Brief, text description of the denominator - target population being measured***):**
Count of patients with an ICD implant or lead procedure

**2a.5 Target population gender:** Female, Male
**2a.6 Target population age range:** All Patients

**2a.7 Denominator Time Window (***The time period in which cases are eligible for inclusion in the denominator***):**
1 year

**2a.8 Denominator Details (***All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
Count of patients with arrival/discharge dates from data submissions that pass NCDR data inclusion thresholds

**2a.9 Denominator Exclusions (***Brief text description of exclusions from the target population***):** -Patients with a documented contraindication to receiving prophylactic antibiotics prior to the ICD implant
-Patients receiving continuous antibiotics >24 hours prior to the implant

**2a.10 Denominator Exclusion Details (***All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Prophylactic Antibiotics w/in 1 Hr of Procedure Start Time= No – not given, medical reason documented, including:

-Patients with a documented contraindication to receiving prophylactic antibiotics prior to the ICD implant
-Patients receiving continuous antibiotics >24 hours prior to the implant

**2a.11 Stratification Details/Variables (***All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
N/A

**2a.12-13 Risk Adjustment Type:**

**2a.14 Risk Adjustment Methodology/Variables (***List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
N/A

**2a.15-17 Detailed risk model available Web page URL or attachment:**

**2a.18-19 Type of Score:** Rate/proportion
**2a.20 Interpretation of Score:** Better quality = Higher score
**2a.21 Calculation Algorithm (***Describe the calculation of the measure as a flowchart or series of steps***):**
Denominator Calculation:
1. Count of patients with arrival/discharge dates from data submissions that pass NCDR data inclusion thresholds
3. Exclude patients with Prophylactic Antibiotics w/in 1 Hr of Procedure Start Time= No – not given, medical

**Comment [k9]:** 11 Risk factors that influence outcomes should not be specified as exclusions.
12 Patient preference is not a clinical exception to eligibility and can be influenced by provider interventions.

reason documented

Numerator Calculation:
4. From denominator population, count of patients with Prophylactic Antibiotics w/in 1 Hr of Procedure Start Time=yes.

**2a.22 Describe the method for discriminating performance** *(e.g., significance testing)*:
Hospitals performance for this measure is benchmarked each quarter and annually against hospitals with similar procedural volume, as well as against the ICD Registry aggregate. These benchmarks identify superior performance and encourage poorer performers to improve. The methodology is a data-driven, peer-group performance feedback used to positively affect outcomes.

**2a.23 Sampling (Survey) Methodology** *If measure is based on a sample (or survey), provide instructions for obtaining the sample, conducting the survey and guidance on minimum sample size (response rate)*:
N/A

**2a.24 Data Source (***Check the source(s) for which the measure is specified and tested)*
Registry data

**2a.25 Data source/data collection instrument (***Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.***):**
National Cardiovascular Data Registry (NCDR)® ICD RegistryTM

**2a.26-28 Data source/data collection instrument reference web page URL or attachment:** URL
http://www.ncdr.com/WebNCDR/ICD/ELEMENTS.ASPX

**2a.29-31 Data dictionary/code table web page URL or attachment:** URL
http://www.ncdr.com/WebNCDR/ICD/ELEMENTS.ASPX

**2a.32-35 Level of Measurement/Analysis** (*Check the level(s) for which the measure is specified and tested)*
Facility/Agency

**2a.36-37 Care Settings (***Check the setting(s) for which the measure is specified and tested)*
Hospital, Ambulatory Care: Hospital Outpatient

**2a.38-41 Clinical Services** (*Healthcare services being measured, check all that apply*)
Clinicians: PA/NP/Advanced Practice Nurse, Clinicians: Physicians (MD/DO)

**TESTING/ANALYSIS**

**2b. Reliability testing**

**2b.1 Data/sample** *(description of data/sample and size)*: Data will be available from the NCDR ICD Registry Version 2 in 2011.

**2b.2 Analytic Method** *(type of reliability & rationale, method for testing)*:

**2b.3 Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)*:
The Data Quality Report (DQR) program has been developed to ensure data are valid and complete. The DQR is a process for submitting data files to the NCDR®. Participants use their data collection tool software to create a submission file which is uploaded to the NCDR website. After uploading, the data in the file is automatically checked for errors and completeness. Passing the DQR ensures well-formed data and a statistically significant submission. Types of errors detected by the DQR include:
Schema:Structure doesn't match NCDR requirements
Dates: Inconsistent dates
Selection: Missing or mismatched data; Can be a parent/child errors where a field requests more data.
Outlier: Anomalies or exceptions; Data exceeds the possible limits. For example: 1,000mm length lesion.
Counter: errors deal with Closure Methods, Lesions, and Intracoronary Devices. Each one has a counter, when

**2b**
C☐
P☐
M☐
N☐

**Comment [KP10]: 2b.** Reliability testing demonstrates the measure results are repeatable, producing the same results a high proportion of the time when assessed in the same population in the same time period.

**Comment [k11]:** 8 Examples of reliability testing include, but are not limited to: inter-rater/abstractor or intra-rater/abstractor studies; internal consistency for multi-item scales; test-retest for survey items. Reliability testing may address the data items or final measure score.

more than one is used
List: Missing data in the Medications or either Device lists

**2c. Validity testing**

2c.1 **Data/sample** *(description of data/sample and size)*: Face/content validity: review of relevant evidence and guidelines and expert panel consensus process

2c.2 **Analytic Method** *(type of validity & rationale, method for testing)*:
Face/content validity was established to ensure this measure represented an important aspect of cardiovascular care for which improvement is needed.

2c.3 **Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:
A review of the relevant evidence and guidelines and expert panel consensus process resulted in the conclusion that this is a valid measure of quality of cardiovascular care for patients receiving an ICD.

**2c** C☐ P☐ M☐ N☐

**2d. Exclusions Justified**

2d.1 **Summary of Evidence supporting exclusion(s):**

2d.2 **Citations for Evidence:**

2d.3 **Data/sample** *(description of data/sample and size)*: Data will be available from the NCDR ICD Registry Version 2 in 2011.

2d.4 **Analytic Method** *(type analysis & rationale)*:

2d.5 **Testing Results** *(e.g., frequency, variability, sensitivity analyses)*:

**2d** C☐ P☐ M☐ N☐ NA☐

**2e. Risk Adjustment for Outcomes/ Resource Use Measures**

2e.1 **Data/sample** *(description of data/sample and size)*: N/A

2e.2 **Analytic Method** *(type of risk adjustment, analysis, & rationale)*:
N/A

2e.3 **Testing Results** *(risk model performance metrics)*:
N/A

2e.4 **If outcome or resource use measure is not risk adjusted, provide rationale:** N/A

**2e** C☐ P☐ M☐ N☐ NA☐

**2f. Identification of Meaningful Differences in Performance**

2f.1 **Data/sample from Testing or Current Use** *(description of data/sample and size)*: Data will be available from the NCDR ICD Registry Version 2 in 2011.

2f.2 **Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*:

2f.3 **Provide Measure Scores from Testing or Current Use** *(description of scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance)*:

**2f** C☐ P☐ M☐ N☐

**2g. Comparability of Multiple Data Sources/Methods**

**2g**

**Comment [KP12]: 2c.** Validity testing demonstrates that the measure reflects the quality of care provided, adequately distinguishing good and poor quality. If face validity is the only validity addressed, it is systematically assessed.

**Comment [k13]:** 9 Examples of validity testing include, but are not limited to: determining if measure scores adequately distinguish between providers known to have good or poor quality assessed by another valid method; correlation of measure scores with another valid indicator of quality for the specific topic; ability of measure scores to predict scores on some other related valid measure; content validity for multi-item scales/tests. Face validity is a subjective assessment by experts of whether the measure reflects the quality of care (e.g., whether the proportion of patients with BP < 140/90 is a marker of quality). If face validity is the only validity addressed, it is systematically assessed (e.g., ratings by relevant stakeholders) and the measure is judged to represent quality care for the specific topic and that the measure ... [4]

**Comment [KP14]: 2d.** Clinically necessary measure exclusions are identified and must be:
•supported by evidence of sufficient frequency of occurrence so that results are distorted without the exclusion;
AND ... [5]

**Comment [k15]:** 10 Examples of evidence that an exclusion distorts measure results include, but are not limited to: frequency of occurrence, sensitivity analyses with and without the exclusion, and variability of exclusions across providers.

**Comment [KP16]: 2e.** For outcome measures and other measures (e.g., resource use) when indicated:
•an evidence-based risk-adjustment strategy (e.g., risk models, risk stratification) is specified and is based on patient clinical factors that influence the measured outc ... [6]

**Comment [k17]:** 13 Risk models should not obscure disparities in care for populations by including factors that are associated with differences/inequalities in care such as race, socioeconomic status, gender (e.g., poorer treatment outcomes of African American men with prostate cancer, inequalities in trea ... [7]

**Comment [KP18]: 2f.** Data analysis demonstrates that methods for scoring and analysis of the specified measure allow for identification of statistically significant and practically/clinically meaningful differences in performance.

**Comment [k19]:** 14 With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage ... [8]

**Comment [KP20]: 2g.** If multiple data sources/methods are allowed, there is demonstration they produce comparable results.

| | |
|---|---|
| **2g.1 Data/sample** *(description of data/sample and size)*: N/A<br><br>**2g.2 Analytic Method** *(type of analysis & rationale)*:<br>N/A<br><br>**2g.3 Testing Results** *(e.g., correlation statistics, comparison of rankings)*:<br>N/A | C☐ P☐ M☐ N☐ NA☐ |
| **2h. Disparities in Care**<br><br>**2h.1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*:<br><br>**2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:** | **2h**<br>C☐ P☐ M☐ N☐ NA☐ |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Scientific Acceptability of Measure Properties?* | **2** |
| **Steering Committee: Overall, to what extent was the criterion,** *Scientific Acceptability of Measure Properties*, **met?**<br>**Rationale:** | *2*<br>C☐ P☐ M☐ N☐ |
| **3. USABILITY** | |
| Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making. (evaluation criteria) | **Eval Rating** |
| **3a. Meaningful, Understandable, and Useful Information**<br><br>**3a.1 Current Use:** In use<br><br>**3a.2 Use in a public reporting initiative (disclosure of performance results to the public at large)** (*If used in a public reporting initiative, provide name of initiative(s), locations, Web page URL(s). If not publicly reported, state the plans to achieve public reporting within 3 years*):<br>ACCF plans to begin voluntary public reporting of NCDR measures, including this measure, by 2012. ACCF is currently evaluating public reporting options and finalizing decisions related to location and display of information to be reported as well as communication plans.<br><br>**3a.3 If used in other programs/initiatives (***If used in quality improvement or other programs/initiatives, name of initiative(s), locations, Web page URL(s). If not used for QI, state the plans to achieve use for QI within 3 years*):<br>This measure is used for QI by NCDR ICD Registry participating institutions. As of October 2010, 1582 institutions are enrolled in the ICD Registry. 78% submit data on all patients and 22% submit data on CMS patients only as part of a CMS mandate for submission of primary prevention data for all primary prevention ICD implant procedures.<br><br>Participating institutions receive an institutional outcomes report each quarter with their hospital´s data. Over 1000 metrics are included in version 1 of each hospital´s outcomes report. 10 metrics are highlighted in the all patients report executive summary (16 for version 2 which will be released in early 2011). These metrics are selected by an NCDR panel of experts as presenting the greatest opportunity for care improvement. This measure has been selected as an executive summary metric for the ICD Registry Version 2 Outcomes Report, which will be released in 2011 (data are already being collected and submitted for this measure). Hospitals receive their measure score, as well as the rates for all hospitals in the ICD registry, and all hospitals in the same comparison group (based on volume), and the rate for the 90th and 50th percentiles. A box and whisker plot is displayed for each metric to show hospitals how they compare to all hospitals in the ICD registry. | **3a**<br>C☐ P☐ M☐ N☐ |

**Comment [KP21]: 2h.** If disparities in care have been identified, measure specifications, scoring, and analysis allow for identification of disparities through stratification of results (e.g., by race, ethnicity, socioeconomic status, gender);OR rationale/data justifies why stratification is not necessary or not feasible.

**Comment [KP22]: 3a**. Demonstration that information produced by the measure is meaningful, understandable, and useful to the intended audience(s) for both public reporting (e.g., focus group, cognitive testing) and informing quality improvement (e.g., quality improvement initiatives). An important outcome that may not have an identified improvement strategy still can be useful for informing quality improvement by identifying the need for and stimulating new approaches to improvement.

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| This measure is also provided to Hospital Corporation of America (HCA) for incorporation in their QI program efforts.<br><br>The Centers for Medicare & Medicaid Services (CMS) mandates that all institutions submit data on ICD implant procedures for primary prevention in order to receive reimbursement for these procedures. CMS will use this data for assessment of the efficacy of ICD use for primary prevention.<br><br>**Testing of Interpretability** (*Testing that demonstrates the results are understood by the potential users for public reporting and quality improvement*)<br>3a.4 **Data/sample** *(description of data/sample and size)*: 849 ICD registry participants, fall 2010.<br><br>3a.5 **Methods** *(e.g., focus group, survey, QI project)*:<br>Online survey<br><br>3a.6 **Results** *(qualitative and/or quantitative results and conclusions)*:<br>74% of survey participants answered yes to the question "Will the following metrics provide information that will be valuable for quality improvement at your institution?" | |
| **3b/3c. Relation to other NQF-endorsed measures**<br><br>3b.1 **NQF # and Title of similar or related measures:**<br>#126: Selection of Antibiotic Prophylaxis for Cardiac Surgery Patients, #472:Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision or at the Time of Delivery – Cesarean section., #527: Prophylactic antibiotic received within 1 hour prior to surgical incision SCIP-Inf-1, #528: Prophylactic antibiotic selection for surgical patients | |
| (for NQF staff use) **Notes on similar/related endorsed or submitted measures:** | |
| **3b. Harmonization**<br>If this measure is related to measure(s) already endorsed by NQF (e.g., same topic, but different target population/setting/data source or different topic but same target population):<br>3b.2 **Are the measure specifications harmonized? If not, why?**<br>This measure is harmonized with the SCIP measure in terms of timing and selection of antibiotics. All exclusions in the SCIP measure can be captured under the "medical reason" exclusion for this measure. | **3b**<br>C☐<br>P☐<br>M☐<br>N☐<br>NA<br>☐ |
| **3c. Distinctive or Additive Value**<br>3c.1 **Describe the distinctive, improved, or additive value this measure provides to existing NQF-endorsed measures:**<br>This measure provides additive value to the NQF-endorsed measure set in that it applies to a procedure that is not currently addressed with endorsed measures, and uses a registry as a data source (while endorsed measures use medical record as a data source).<br><br>5.1 **If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), Describe why it is a more valid or efficient way to measure quality:** | **3c**<br>C☐<br>P☐<br>M☐<br>N☐<br>NA<br>☐ |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Usability*? | **3** |
| **Steering Committee: Overall, to what extent was the criterion,** *Usability*, **met?**<br>**Rationale:** | **3**<br>C☐<br>P☐<br>M☐<br>N☐ |
| **4. FEASIBILITY** | |
| Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. (evaluation criteria) | **Eval Ratin g** |
| **4a. Data Generated as a Byproduct of Care Processes** | **4a**<br>C☐ |

**Comment [KP23]: 3b.** The measure specifications are harmonized with other measures, and are applicable to multiple levels and settings.

**Comment [k24]:** 16 Measure harmonization refers to the standardization of specifications for similar measures on the same topic (e.g., *influenza immunization* of patients in hospitals or nursing homes), or related measures for the same target population (e.g., eye exam and HbA1c for *patients with diabetes*), or definitions applicable to many measures (e.g., age designation for children) so that they are uniform or compatible, unless differences are dictated by the evidence. The dimensions of harmonization can include numerator, denominator, exclusions, and data source and collection instructions. The extent of harmonization depends on the relationship of the measures, the evidence for the specific measure focus, and differences in data sources.

**Comment [KP25]: 3c.** Review of existing endorsed measures and measure sets demonstrates that the measure provides a distinctive or additive value to existing NQF-endorsed measures (e.g., provides a more complete picture of quality for a particular condition or aspect of healthcare, is a more valid or efficient way to measure).

**Comment [KP26]: 4a.** For clinical measures, required data elements are routinely generated concurrent with and as a byproduct of care processes during care delivery. (e.g., BP recorded in the electronic record, not abstracted from the record later by other personnel; patient self-assessment tools, e.g., depression scale; lab values, meds, etc.)

**4a.1-2 How are the data elements that are needed to compute measure scores generated?**
Data generated as byproduct of care processes during care delivery (Data are generated and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition), Coding/abstraction performed by someone other than person obtaining original information (E.g., DRG, ICD-9 codes on claims, chart abstraction for quality measure or registry)

P☐ M☐ N☐

**4b. Electronic Sources**

**4b.1 Are all the data elements available electronically?** (*elements that are needed to compute measure scores are in defined, computer-readable fields, e.g., electronic health record, electronic claims*)
Yes

**4b.2 If not, specify the near-term path to achieve electronic capture by most providers.**

**4b**
C☐ P☐ M☐ N☐

**Comment [KP27]: 4b.** The required data elements are available in electronic sources. If the required data are not in existing electronic sources, a credible, near-term path to electronic collection by most providers is specified and clinical data elements are specified for transition to the electronic health record.

**4c. Exclusions**

**4c.1 Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications?**
No

**4c.2 If yes, provide justification.**

**4c**
C☐ P☐ M☐ N☐ NA☐

**Comment [KP28]: 4c. Exclusions** should not require additional data sources beyond what is required for scoring the measure (e.g., numerator and denominator) unless justified as supporting measure validity.

**4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences**

**4d.1 Identify susceptibility to inaccuracies, errors, or unintended consequences of the measure and describe how these potential problems could be audited. If audited, provide results.**
The NCDR program takes a number of steps to minimize any potential for inaccuracies or errors in data used to report on performance back to hospitals. The process begins with support to data abstractors, including webinars, meetings, resource guides on the website, and clinical quality consultants available via e-mail or toll free phone number, to ensure consistent data collection. The NCDR establishes a unified electronic platform for data capture and submission that includes a certification process of the technical data collection tool selected by the hospital (either a commercially available software vendor product, the NCDR´s own web-based data collection tool, or a hospital´s customized electronic medical record system) that must occur prior to any data submissions. The certification process provides edit checks of data elements within the data collection tool to ensure a high quality data submission.

The NCDR data submission process includes a Data Quality Report (DQR) process that checks for validity in submissions based upon predetermined thresholds for element and composite completeness. The NCDR is putting in place a new strategy to systematically review the DQR results.

The NCDR on-site audit program has been developed to assess the reliability of data abstraction. This annual process reviews key elements at a select number of patient reports at a select number of sites and provides feedback scores to the hospitals. Any elements not currently included in the on-site audit process and deemed critical to capture for this measure will be added upon NQF endorsement.

**4d**
C☐ P☐ M☐ N☐

**Comment [KP29]: 4d.** Susceptibility to inaccuracies, errors, or unintended consequences and the ability to audit the data items to detect such problems are identified.

**4e. Data Collection Strategy/Implementation**

**4e.1 Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data/missing data, timing/frequency of data collection, patient confidentiality, time/cost of data collection, other feasibility/ implementation issues:**
Beta testing with a sample of registry participants takes place with each new registry version to identify errors in the data collection tool. In addition, modifications are made to metrics based on feedback during a public comment period.

The Data Quality Report (DQR) program has been developed to ensure data are valid and complete. The DQR is a process for submitting data files to the NCDR. Participants use their data collection tool software to create a submission file which is uploaded to the NCDR website. After uploading, the data in the file are automatically checked for errors and completeness. Passing the DQR ensures well-formed data and a

**4e**
C☐ P☐ M☐ N☐

**Comment [KP30]: 4e.** Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, etc.) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use).

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| statistically significant submission. Types of errors detected by the DQR include:<br><br>Schema: Structure doesn´t match NCDR requirements<br>Dates: Inconsistent dates<br>Selection: Missing or mismatched data; can be parent/child errors where a field requests more data<br>Outlier: Anomalies or exceptions; data exceeds the possible limits.<br><br>4e.2 **Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:**<br>ICD registry participants pay a fee of $3,480/year (as of 2010) to enroll in the registry. Staff resources are needed for data collection and submission at the participating institution. Registry site managers/data collectors undergo (non-mandatory) training offered by the NCDR.<br><br>4e.3 **Evidence for costs:**<br>http://www.ncdr.com/WebNCDR/ncdrdocuments/B08352N%20ICD%20Registry%20Enrollment%20Packet%20Complete.pdf<br><br>4e.4 **Business case documentation:** | |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Feasibility*? | **4** |
| **Steering Committee: Overall, to what extent was the criterion,** *Feasibility***, met?**<br>**Rationale:** | **4**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **RECOMMENDATION** | |
| (for NQF staff use) **Check if measure is untested and only eligible for time-limited endorsement.** | **Time-limited ☐** |
| **Steering Committee: Do you recommend for endorsement?**<br>**Comments:** | **Y☐**<br>**N☐**<br>**A☐** |

| **CONTACT INFORMATION** |
|---|
| Co.1 **Measure Steward (Intellectual Property Owner)**<br>Co.1 **Organization**<br>American College of Cardiology Foundation (ACCF), 2400 N Street NW, Washington, District Of Columbia, 20037<br><br>Co.2 **Point of Contact**<br>Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529- |
| **Measure Developer If different from Measure Steward**<br>Co.3 **Organization**<br>American College of Cardiology Foundation (ACCF), 2400 N Street NW, Washington, District Of Columbia, 20037<br><br>Co.4 **Point of Contact**<br>Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529- |
| Co.5 **Submitter If different from Measure Steward POC**<br>Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529-, American College of Cardiology Foundation (ACCF) |
| Co.6 **Additional organizations that sponsored/participated in measure development** |
| **ADDITIONAL INFORMATION** |
| **Workgroup/Expert Panel involved in measure development**<br>Ad.1 **Provide a list of sponsoring organizations and workgroup/panel members' names and organizations.** |

**Describe the members' role in measure development.**
ICD Registry Steering Committee:
Mark S. Kremers, MD, FACC, FHRS Chair
Stephen C. Hammill, MD, FACC, FHRS Ex-Officio
Sana M. Al-Khatib, MD, FACC
Charles I. Berul, MD, FACC
Jeptha P. Curtis, MD, FACC
Paul A. Heidenreich, MD, FACC
Illeana L. Pina, MD, FACC
Matthew R. Reynolds, MD, FACC
Lynne Warner Stevenson, MD, FACC
Mary Norine Walsh, MD, FACC

Public Reporting Workgroup:
Fred Masoudi, MD, MSPH, FACC, FAHA, FACP
H. Vernon Anderson,MD, FACC, FSCAI
David Malenka, MD, FACC
Matt Roe, MD, FACC
Steve Hammill, MD, FHRS, FACC
Jeptha Curtis, MD, FACC
Paul Heidenreich, MD, MS, FACC
Brahmajee Nallamothu, MD, MPH, FACC
Mark Kremers, MD, FACC
Christopher White MD, FACC
Carl Tommaso, MD, FACC, FAHA, FSCAI
Sunil Rao, MD, FACC, FSCAI
Andrea Russo, MD, FACC, FHRS
Debabrata Mukherjee MD, FACC

**Ad.2 If adapted, provide name of original measure:** N/A
**Ad.3-5 If adapted, provide original specifications URL or attachment**

**Measure Developer/Steward Updates and Ongoing Maintenance**
**Ad.6 Year the measure was first released:** 2006
**Ad.7 Month and Year of most recent revision:** 12, 2010
**Ad.8 What is your frequency for review/update of this measure?** Every 3-4 years or if guideline updates warrant more frequent update, or with new dataset version.
**Ad.9 When is the next scheduled review/update for this measure?** 06, 2011



**Ad.11 -13 Additional Information web page URL or attachment:**

**Date of Submission** (*MM/DD/YY*)**:** 12/14/2010

**Page 3: [1] Comment [k4]** **Karen Pace** **10/5/2009 8:59:00 AM**

**1c.** The measure focus is:

- an outcome (e.g., morbidity, mortality, function, health-related quality of life) that is relevant to, or associated with, a national health goal/priority, the condition, population, and/or care being addressed;

OR

- if an intermediate outcome, process, structure, etc., there is **evidence** that supports the specific measure focus as follows:
  - Intermediate outcome – evidence that the measured intermediate outcome (e.g., blood pressure, Hba1c) leads to improved health/avoidance of harm or cost/benefit.
  - Process – evidence that the measured clinical or administrative process leads to improved health/avoidance of harm and
    if the measure focus is on one step in a multi-step care process, it measures the step that has the greatest effect on improving the specified desired outcome(s).
  - Structure – evidence that the measured structure supports the consistent delivery of effective processes or access that lead to improved health/avoidance of harm or cost/benefit.
  - Patient experience – evidence that an association exists between the measure of patient experience of health care and the outcomes, values and preferences of individuals/ the public.
  - Access – evidence that an association exists between access to a health service and the outcomes of, or experience with, care.
  - Efficiency – demonstration of an association between the measured resource use and level of performance with respect to one or more of the other five IOM aims of quality.

**Page 3: [2] Comment [k5]** **Karen Pace** **10/5/2009 8:59:00 AM**

4 Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multi-step process, the step with the greatest effect on the desired outcome should be selected as the focus of measurement. For example, although assessment of immunization status and recommending immunization are necessary steps, they are not sufficient to achieve the desired impact on health status – patients must be vaccinated to achieve immunity. This does not preclude consideration of measures of preventive screening interventions where there is a strong link with desired outcomes (e.g., mammography) or measures for multiple care processes that affect a single outcome.

**Page 3: [3] Comment [k6]** **Karen Pace** **10/5/2009 8:59:00 AM**

3 The strength of the body of evidence for the specific measure focus should be systematically assessed and rated (e.g., USPSTF grading system http://www.ahrq.gov/clinic/uspstf07/methods/benefit.htm). If the USPSTF grading system was not used, the grading system is explained including how it relates to the USPSTF grades or why it does not. However, evidence is not limited to quantitative studies and the best type of evidence depends upon the question being studied (e.g., randomized controlled trials appropriate for studying drug efficacy are not well suited for complex system changes). When qualitative studies are used, appropriate qualitative research criteria are used to judge the strength of the evidence.

**Page 8: [4] Comment [k13]** **Karen Pace** **10/5/2009 8:59:00 AM**

9 Examples of validity testing include, but are not limited to: determining if measure scores adequately distinguish between providers known to have good or poor quality assessed by another valid method; correlation of measure scores with another valid indicator of quality for the specific topic; ability of measure scores to predict scores on some other related valid measure; content validity for multi-item scales/tests. Face validity is a subjective assessment by experts of whether the measure reflects the quality of care (e.g., whether the proportion of patients with BP < 140/90 is a marker of quality). If face validity is the only validity addressed, it is systematically assessed (e.g., ratings by relevant stakeholders) and the measure is judged to represent quality care for the specific topic and that the measure focus is the most important aspect of quality for the specific topic.

**Page 8: [5] Comment [KP14]** **Karen Pace** **10/5/2009 8:59:00 AM**

**2d.** Clinically necessary measure exclusions are identified and must be:

- supported by evidence of sufficient frequency of occurrence so that results are distorted without the exclusion;

AND

- a clinically appropriate exception (e.g., contraindication) to eligibility for the measure focus;

AND

if patient preference (e.g., informed decision-making) is a basis for exclusion, there must be evidence that it strongly impacts performance on the measure and the measure must be specified so that the information about patient preference and the effect on the measure is transparent (e.g., numerator category computed separately, denominator exclusion category computed separately).

**Page 8: [6] Comment [KP16]** **Karen Pace** **10/5/2009 8:59:00 AM**

**2e.** For outcome measures and other measures (e.g., resource use) when indicated:

- an evidence-based risk-adjustment strategy (e.g., risk models, risk stratification) is specified and is based on patient clinical factors that influence the measured outcome (but not disparities in care) and are present at start of care;**Error! Bookmark not defined.** OR

rationale/data support no risk adjustment.

**Page 8: [7] Comment [k17]** **Karen Pace** **10/5/2009 8:59:00 AM**

13 Risk models should not obscure disparities in care for populations by including factors that are associated with differences/inequalities in care such as race, socioeconomic status, gender (e.g., poorer treatment outcomes of African American men with prostate cancer, inequalities in treatment for CVD risk factors between men and women). It is preferable to stratify measures by race and socioeconomic status rather than adjusting out differences.

**Page 8: [8] Comment [k19]** **Karen Pace** **10/5/2009 8:59:00 AM**

14 With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage of patients who received smoking cessation counseling (e.g., 74% v. 75%) is clinically meaningful; or whether a statistically significant difference of $25 in cost for an episode of care (e.g., $5,000 v. $5,025) is practically meaningful. Measures with overall poor performance may not demonstrate much variability across providers.

# NATIONAL QUALITY FORUM

**Measure Evaluation 4.1**
**December 2009**

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

**TAP/Workgroup** (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas).*

**Steering Committee:** Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the criteria are met
C = Completely (unquestionably demonstrated to meet the criterion)
P = Partially (demonstrated to partially meet the criterion)
M = Minimally (addressed BUT demonstrated to only minimally meet the criterion)
N = Not at all (NOT addressed; OR incorrectly addressed; OR demonstrated to NOT meet the criterion)
NA = Not applicable (only an option for a few subcriteria as indicated)

| (for NQF staff use) **NQF Review #:** 1522 **NQF Project:** Cardiovascular Endorsement Maintenance 2010 |
|---|
| **MEASURE DESCRIPTIVE INFORMATION** |
| De.1 **Measure Title:** ACE/ARB Therapy at Discharge for ICD implant patients with LVSD |
| De.2 **Brief description of measure***:* Proportion of ICD implant patients with a diagnosis of LVSD who are prescribed ACE-I or ARB therapy at discharge. |
| 1.1-2 **Type of Measure:** Process<br>De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** N/A |
| De.4 **National Priority Partners Priority Area:**<br>De.5 **IOM Quality Domain**: Effectiveness, Timeliness<br>De.6 **Consumer Care Need:** Getting better, Living with illness |

| **CONDITIONS FOR CONSIDERATION BY NQF** | |
|---|---|
| Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards: | **NQF Staff** |
| **A.** The measure is in the public domain or an intellectual property (measure steward agreement) is signed. *Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.*<br>A.1 **Do you attest that the measure steward holds intellectual property rights to the measure and the right to use aspects of the measure owned by another entity (e.g., risk model, code set)?** Yes<br>A.2 **Indicate if Proprietary Measure** (*as defined in measure steward agreement*)**:**<br>A.3 **Measure Steward Agreement:** Agreement will be signed and submitted prior to or at the time of measure submission<br>A.4 **Measure Steward Agreement attached:** NQF - signed-634256795457800554.pdf | **A**<br>**Y**☐<br>**N**☐ |
| **B.** The measure owner/steward verifies there is an identified responsible entity and process to maintain and | **B** |

| | |
|---|---|
| update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. Yes, information provided in contact section | Y☐ N☐ |
| **C.** The intended use of the measure includes both public reporting and quality improvement.<br>►**Purpose:** Public reporting, Internal quality improvement<br>Accountability, Payment incentive, Accreditation | C<br>Y☐<br>N☐ |
| **D.** The requested measure submission information is complete. Generally, measures should be fully developed and tested so that all the evaluation criteria have been addressed and information needed to evaluate the measure is provided. Measures that have not been tested are only potentially eligible for a time-limited endorsement and in that case, measure owners must verify that testing will be completed within 12 months of endorsement.<br>D.1**Testing:** Yes, fully developed and tested<br>D.2 **Have NQF-endorsed measures been reviewed to identify if there are similar or related measures?**<br>Yes | D<br>Y☐<br>N☐ |
| (for NQF staff use**) Have all conditions for consideration been met?**<br>**Staff Notes to Steward** (*if submission returned*)**:** | **Met**<br>Y☐<br>N☐ |
| **Staff Notes to Reviewers** (*issues or questions regarding any criteria*)**:** | |
| **Staff Reviewer Name(s):** | |

| | |
|---|---|
| **TAP/Workgroup Reviewer Name:** | |
| **Steering Committee Reviewer Name:** | |
| **1. IMPORTANCE TO MEASURE AND REPORT** | |
| Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in or overall poor performance.<br>*Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria.* (evaluation criteria)<br>**1a. High Impact** | **Eval Ratin g** |
| (for NQF staff use) **Specific NPP goal**: | |
| 1a.1 **Demonstrated High Impact Aspect of Healthcare:** Affects large numbers, Frequently performed procedure, Leading cause of morbidity/mortality, High resource use, Severity of illness<br>1a.2<br><br>1a.3 **Summary of Evidence of High Impact:** Optimal medical therapy is critical to ensure favorable patient outcomes following implantation of an implantable cardiac defibrillator (ICD) to prevent sudden cardiac death (SCD). In 2006, 114,000 inpatient defibrillator implantations were performed. The mean hospital charge for ICD procedures was $115,763.<br><br>Approximately 81 million American adults have 1 or more types of CVD, with 5.8 million having heart failure. Over 30% of all deaths are related to CVD. Over 90% of patients receiving an ICD for primary prevention have ejection fraction under 40%, while 70% of patients receiving an ICD for secondary prevention have an ejection fraction under 40%. Therefore, it is critical that these patients receive discharge medications to treat left ventricular systolic dysfunction to reduce associated morbidity and mortality, as well as repeat hospitalizations and procedures.<br><br>1a.4 **Citations for Evidence of High Impact:** American Heart Association. Heart disease and stroke statistics-2010 update: A report of the American Heart Association. Available at: http://circ.ahajournals.org/cgi/content/abstract/CIRCULATIONAHA.109.192667v1. Accessed December 3, 2010. | **1a**<br>C☐<br>P☐<br>M☐<br>N☐ |

**Comment [KP1]: 1a.** The measure focus addresses:
•a specific national health goal/priority identified by NQF's National Priorities Partners; OR
•a demonstrated high impact aspect of healthcare (e.g., affects large numbers, leading cause of morbidity/mortality, high resource use (current and/or future), severity of illness, and patient/societal consequences of poor quality).

**1b. Opportunity for Improvement**

**1b.1 Benefits (improvements in quality) envisioned by use of this measure:** This measure allows benchmarking against the national aggregate and against hospitals with similar procedural volume, so that hospitals with low performance rates can engage in quality improvement efforts to improve compliance for this measure and subsequently improve patient outcomes related to this measure.

**1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:**
Mean: 0.77
SD: 0.17

Quartile 1: 0.71
Median: 0.79
Quartile 3: 0.87
95%: 1.00

**1b.3 Citations for data on performance gap:**
Unpublished NCDR data

**1b.4 Summary of Data on disparities by population group:**
Mean by hospital SES (proportion white patients):
0-72.7% white:77.2%
72.7-87.7% white:77.1%
87.7-96.12% white:78.9%
96.13-100% white:74.8%

Mean performance by safety net status (defined as government hospitals or non-governmental hospitals with high medicaid caseload using AHA 2008 data):
Not a safety net hospital: 77.0%
Safety net hospital: 77.0%

**1b.5 Citations for data on Disparities:**
Unpublished NCDR data

**1b** C☐ P☐ M☐ N☐

**1c. Outcome or Evidence to Support Measure Focus**

**1c.1 Relationship to Outcomes** (*For non-outcome measures, briefly describe the relationship to desired outcome. For outcomes, describe why it is relevant to the target population*)**:** ACE inhibitors and ARBs improve clinical outcomes among patients with LV dysfunction by interfering with ventricular remodeling and attenuating ventricular dilation over time. Use of ACE inhibitors or ARBs reduces the likelihood for development of heart failure, MI, and death.

**1c.2-3. Type of Evidence:** Evidence-based guideline, Randomized controlled trial, Expert opinion, Systematic synthesis of research, Meta-analysis

**1c.4 Summary of Evidence** (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
Several large randomized clinical trials have demonstrated the efficacy of ACE inhibitor or ARB use in preventing adverse outcomes for patients with left ventricular systolic dysfunction. A systematic review of the evidence supporting use of ACE inhibitors for heart failure assessed ACE inhibitor use for 12,763 patients followed for an average of 35 months. Mortality was found to be lower for all trials reviewed (23.0% vs. 26.8%, odds ratio 0.8), as were readmission rates and rates of MI. Benefits of ACE therapy were independent of age, sex, and baseline use of diuretics, aspirin, and beta blockers.

**1c.5 Rating of strength/quality of evidence** (*also provide narrative description of the rating and by whom*)**:**
Level of Evidence A: Data derived from multiple randomized clinical trials or meta-analyses.

**1c.6 Method for rating evidence:** The weight of evidence in support of the recommendation is listed as

**1c** C☐ P☐ M☐ N☐

**Comment [KP2]: 1b.** Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating considerable variation, or overall poor performance, in the quality of care across providers and/or population groups (disparities in care).

**Comment [k3]:** 1 Examples of data on opportunity for improvement include, but are not limited to: prior studies, epidemiologic data, measure data from pilot testing or implementation. If data are not available, the measure focus is systematically assessed (e.g., expert panel rating) and judged to be a quality problem.

**Comment [k4]: 1c.** The measure focus is:
•an outcome (e.g., morbidity, mortality, function, health-related quality of life) that is relevant to, or associated with, a national health goal/priority, the condition, population, and/or care being addressed;
OR
•if an intermediate outcome, process, structure, etc., there is **evidence** that supports the specific measure focus as follows:
oIntermediate outcome – evidence that the measured intermediate outcome (e.g., blood pressure, Hba1c) leads to improved health/avoidance of harm or cost/benefit.
oProcess – evidence that the measured clinical or administrative process leads to improved health/avoidance of harm and
if the measure focus is on one step in a multi-step care process, it measures the step that has the greatest effect on improving the specified desired outcome(s).
oStructure – evidence that the measured structure supports the consistent delivery of effective processes or access that lead to improved health/avoidance of harm or cost/benefit.
oPatient experience – evidence that an association exists between the measure ... [1]

**Comment [k5]:** 4 Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multi-step process, the step with the greatest effect on the desired outcome should be selected as the focus of measurement. For example, although assessment of immunization status and recommending immunization are necessary steps, they are not sufficient to achieve the desired impact on health status – patients must be vaccinated to achieve ... [2]

**Comment [k6]:** 3 The strength of the body of evidence for the specific measure focus should be systematically assessed and rated (e.g., USPSTF grading system http://www.ahrq.gov/clinic/uspstf07/methods/benefit.htm). If the USPSTF grading system was not used, the grading system is explained including how it relates to the USPSTF grades or why it does not. However, evidence is not limited to quantitative studies and the best type of evidence depends upon the question being studied (e.g., randomized controlled trials appropriate for studying drug efficacy are not well suited for complex system ... [3]

follows:
• 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.

1c.7 **Summary of Controversy/Contradictory Evidence:** N/A

1c.8 **Citations for Evidence (***other than guidelines***):** Flather MD, Yusuf S, Kober L, et al. Long-term ACE-inhibitor therapy in patients with heart failure or left-ventricular dysfunction: a systematic overview of data from individual patients. ACE-Inhibitor Myocardial Infarction Collaborative Group. Lancet. 2000;355:1575-81.

1c.9 **Quote the Specific guideline recommendation (***including guideline number and/or page number***):**
ACC/AHA Secondary Prevention Guidelines:
ACE inhibitors:
• Start and continue indefinitely in all patients with left ventricular ejection fraction </=40% and in those with hypertension, diabetes, or chronic kidney disease, unless contraindicated. I (A)
• Consider for all other patients. I (B)
• Among lower-risk patients with normal left ventricular ejection fraction in whom cardiovascular risk factors are well controlled and revascularization has been performed, use of ACE inhibitors may be considered optional. IIa (B)
Angiotensin receptor blockers:
• Use in patients who are intolerant of ACE inhibitors and have heart failure or have had a myocardial infarction with left ventricular ejection fraction </=40%. I (A)
• Consider in other patients who are ACE inhibitor intolerant. I (B)
• Consider use in combination with ACE inhibitors in systolic-dysfunction heart failure. IIb (B) (Page 2132)

ACC/AHA Heart Failure Guidelines (2005, 2009 Update)
13. In patients with reduced ejection fraction experiencing a symptomatic exacerbation of HF requiring hospitalization during chronic maintenance treatment with oral therapies known to improve outcomes, particularly ACEIs or ARBs and beta-blocker therapy, it is recommended that these therapies be continued in most patients in the absence of hemodynamic instability or contraindications. (Level of Evidence: C) (Page e47)

14. In patients hospitalized with HF with reduced ejection fraction not treated with oral therapies known to improve outcomes, particularly ACEIs or ARBs and beta-blocker therapy, initiation of these therapies is recommended in stable patients prior to hospital discharge. (Level of Evidence: B) (Page e47)

17. Comprehensive written discharge instructions for all patients with a hospitalization for HF and their caregivers is strongly recommended, with special emphasis on the following 6 aspects of care: diet; discharge medications, with a special focus on adherence, persistence, and uptitration to recommended doses of ACEI/ARB and beta-blocker medication; activity level; follow-up appointments; daily weight monitoring; and what to do if HF symptoms worsen. (Level of Evidence: C) (Page e48)

1c.10 **Clinical Practice Guideline Citation:** 1.Smith SC, Jr., Allen J, Blair SN, et al. AHA/ACC guidelines for secondary prevention for patients with coronary and other atherosclerotic vascular disease: 2006 update endorsed by the National Heart, Lung, and Blood Institute. J Am Coll Cardiol. 2006;47:2130-9.

2.Hunt SA, Abraham WT, Chin MH, et al. 2009 Focused update incorporated into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines Developed in Collaboration With the International Society for Heart and Lung Transplantation. J Am Coll Cardiol. 2009;53:e1-e90.
1c.11 **National Guideline Clearinghouse or other URL:** http://www.cardiosource.org/Science-And-Quality/Practice-Guidelines-and-Quality-Standards.aspx

1c.12 **Rating of strength of recommendation (***also provide narrative description of the rating and by whom***):**

**Comment [k7]:** USPSTF grading system **http://www.ahrq.gov/clinic/uspstf/grades.htm**: **A -** The USPSTF recommends the service. There is high certainty that the net benefit is substantial. **B -** The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial. **C -** The USPSTF recommends against routinely providing the service. There may be considerations that support providing the service in an individual patient. There is at least moderate certainty that the net benefit is small. Offer or provide this service only if other considerations support the offering or providing the service in an individual patient. **D -** The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits. **I -** The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

| | |
|---|---|
| Class 1: Conditions for which there is evidence and/or general agreement that a given procedure or treatment is beneficial, useful and effective.<br><br>**1c.13 Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF*)**:**<br>ACC/AHA Taskforce on Practice Guidelines Method:<br><br>Indications are categorized as class I, II, or III on the basis of a multifactorial assessment of risk and expected efficacy viewed in the context of current knowledge and the relative strength of this knowledge. These classes summarize the recommendations for procedures or treatments as follows:<br><br>Class I: Conditions for which there is evidence for and/or general agreement that a given procedure or treatment is beneficial, useful, and effective.<br><br>Class II: Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment.<br><br>Class IIa: Weight of evidence/opinion is in favor of usefulness/efficacy.<br><br>Class IIb: Usefulness/efficacy is less well established by evidence/opinion.<br><br>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.<br><br>**1c.14 Rationale for using this guideline over others:**<br>These guidelines are the most widely recognized professional guidelines in the US for cardiovascular medicine for patients with heart failure. | |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Importance to Measure and Report*? | **1** |
| **Steering Committee: Was the threshold criterion,** *Importance to Measure and Report*, **met?**<br>**Rationale:** | **1**<br>**Y☐**<br>**N☐** |
| **2. SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES** | |
| Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. (evaluation criteria) | **Eval Rating** |
| **2a. MEASURE SPECIFICATIONS** | |
| **S.1 Do you have a web page where current detailed measure specifications can be obtained?**<br>**S.2 If yes, provide web page URL:**<br><br>**2a. Precisely Specified** | |
| **2a.1 Numerator Statement (***Brief, text description of the numerator - what is being measured about the target population, e.g. target condition, event, or outcome***):**<br>Count of patients with ACE-I or ARB therapy prescribed at discharge.<br><br>**2a.2 Numerator Time Window (***The time period in which cases are eligible for inclusion in the numerator***):**<br>1 year<br><br>**2a.3 Numerator Details (***All information required to collect/calculate the numerator, including all codes, logic, and definitions***):**<br>Discharge medications= ACE inhibitor (any)= yes or ARB (any)=yes | **2a-specs**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **2a.4 Denominator Statement (***Brief, text description of the denominator - target population being measured***):** | |

**Comment [KP8]: 2a.** The measure is well defined and precisely specified so that it can be implemented consistently within and across organizations and allow for comparability. The required data elements are of high quality as defined by NQF's Health Information Technology Expert Panel (HITEP) .

Count of patients with an ICD implant with moderate or severe LVSD (LVEF<40%) without contraindication to ACE inhibitors and ARBs.

**2a.5 Target population gender:** Female, Male
**2a.6 Target population age range:** All patients

**2a.7 Denominator Time Window (***The time period in which cases are eligible for inclusion in the denominator***):**
1 year

**2a.8 Denominator Details (***All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
Procedure type= initial generator implant=yes or generator change=yes

Most recent LVEF<40%

**2a.9 Denominator Exclusions (***Brief text description of exclusions from the target population***):** -Patients who expired prior to discharge
-Patients with ACE-I and ARB therapy contraindicated or blinded.

**2a.10 Denominator Exclusion Details (***All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Discharge status=deceased
ACE inhibitor (any)= contraindicated or blinded **AND** ARB (any)=contraindicated or blinded.

Contraindicated supporting definition:
Medication was not prescribed because of a contraindication.
Contraindications must be documented explicitly by the physician, or clearly evidenced within the medical record

Blinded supporting definition:
Patient was in research study or clinical trial and administration of this specific medication is unknown

**2a.11 Stratification Details/Variables (***All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
N/A

**2a.12-13 Risk Adjustment Type:**

**2a.14 Risk Adjustment Methodology/Variables (***List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
N/A

**2a.15-17 Detailed risk model available Web page URL or attachment:**

**2a.18-19 Type of Score:** Rate/proportion
**2a.20 Interpretation of Score:** Better quality = Higher score
**2a.21 Calculation Algorithm (***Describe the calculation of the measure as a flowchart or series of steps***):**
Denominator Calculation:
1. Count of patients with arrival/discharge dates from data submissions that pass NCDR data inclusion thresholds
2. Exclude patients with arrival/discharge dates without initial generator implant or generator change
3. Exclude patients with LVEF>/=40% or LVEF assessed=no
4. Exclude patients with discharge status=deceased
5. Exclude patients with ACE inhibitor (any)= contraindicated or blinded **AND** ARB (any)=contraindicated or blinded.

Numerator Calculation:
6. From denominator population, count of patients with discharge medication of ACE inhibitor (any)=yes or ARB (any)=yes.

**Comment [k9]:** 11 Risk factors that influence outcomes should not be specified as exclusions.
12 Patient preference is not a clinical exception to eligibility and can be influenced by provider interventions.

**2a.22 Describe the method for discriminating performance** *(e.g., significance testing)*:
Hospitals performance for this measure is benchmarked each quarter and annually against hospitals with similar procedural volume, as well as against the ICD Registry aggregate. These benchmarks identify superior performance and encourage poorer performers to improve. The methodology is a data-driven, peer-group performance feedback used to positively affect outcomes.

**2a.23 Sampling (Survey) Methodology** *If measure is based on a sample (or survey), provide instructions for obtaining the sample, conducting the survey and guidance on minimum sample size (response rate)*:
N/A

**2a.24 Data Source (***Check the source(s) for which the measure is specified and tested)*
Registry data

**2a.25 Data source/data collection instrument (***Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.***):**
National Cardiovascular Data Registry (NCDR)® ICD RegistryTM

**2a.26-28 Data source/data collection instrument reference web page URL or attachment:** URL
http://www.ncdr.com/WebNCDR/ICD/ELEMENTS.ASPX

**2a.29-31 Data dictionary/code table web page URL or attachment:** URL
http://www.ncdr.com/WebNCDR/ICD/ELEMENTS.ASPX

**2a.32-35 Level of Measurement/Analysis** (*Check the level(s) for which the measure is specified and tested)*
Facility/Agency

**2a.36-37 Care Settings (***Check the setting(s) for which the measure is specified and tested)*
Hospital, Ambulatory Care: Hospital Outpatient

**2a.38-41 Clinical Services** (*Healthcare services being measured, check all that apply*)
Clinicians: PA/NP/Advanced Practice Nurse, Clinicians: Physicians (MD/DO)

## TESTING/ANALYSIS

**2b. Reliability testing**

**2b.1 Data/sample** *(description of data/sample and size)*: Reliability was established by validating the derivation cohort from 2009 with data from 2008. 131,371 patient records were analyzed from 1283 facilities between January and December 2008.

**2b.2 Analytic Method** *(type of reliability & rationale, method for testing)*:
Reliability was established by validating the derivation cohort from 2009 with data from 2008.

**2b.3 Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)*:
Results were consistent among the derivation cohort and the testing cohort. Specifically, the median for hospitals in the derivation cohort was 79.0% with the lowest decile 58.9% and highest decile 94.0%. This is similar to that observed in the testing cohort (median 79.2%, lowest decile 60.0%, highest decile 94.6%).

The Data Quality Report (DQR) program has been developed to ensure data are valid and complete. The DQR is a process for submitting data files to the NCDR®. Participants use their data collection tool software to create a submission file which is uploaded to the NCDR website. After uploading, the data in the file is automatically checked for errors and completeness. Passing the DQR ensures well-formed data and a statistically significant submission. Types of errors detected by the DQR include:
Schema:Structure doesn't match NCDR requirements
Dates: Inconsistent dates
Selection: Missing or mismatched data; Can be a parent/child errors where a field requests more data.
Outlier: Anomalies or exceptions; Data exceeds the possible limits. For example: 1,000mm length lesion.
Counter: errors deal with Closure Methods, Lesions, and Intracoronary Devices. Each one has a counter, when

**2b**
C☐
P☐
M☐
N☐

**Comment [KP10]: 2b.** Reliability testing demonstrates the measure results are repeatable, producing the same results a high proportion of the time when assessed in the same population in the same time period.

**Comment [k11]:** 8 Examples of reliability testing include, but are not limited to: inter-rater/abstractor or intra-rater/abstractor studies; internal consistency for multi-item scales; test-retest for survey items. Reliability testing may address the data items or final measure score.

more than one is used
List: Missing data in the Medications or either Device lists

**2c. Validity testing**

2c.1 **Data/sample** *(description of data/sample and size)*: Face/content validity: review of relevant evidence and guidelines and expert panel consensus process

2c.2 **Analytic Method** *(type of validity & rationale, method for testing)*:
Face/content validity was established to ensure this measure represented an important aspect of cardiovascular care for which improvement is needed.

2c.3 **Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:
A review of the relevant evidence and guidelines and expert panel consensus process resulted in the conclusion that this is a valid measure of quality of cardiovascular care for patients receiving an ICD.

**2c** C☐ P☐ M☐ N☐

**2d. Exclusions Justified**

2d.1 **Summary of Evidence supporting exclusion(s):**

2d.2 **Citations for Evidence:**

2d.3 **Data/sample** *(description of data/sample and size)*: 144,538 patient records from 1305 hospitals in the ICD registry from January 2009 to December 2009.

2d.4 **Analytic Method** *(type analysis & rationale)*:
Rate of exclusion coding.

2d.5 **Testing Results** *(e.g., frequency, variability, sensitivity analyses)*:
Deceased: 0.32%
ACE inhibitor and ARB contraindicated or blinded: 2.45%

**2d** C☐ P☐ M☐ N☐ NA☐

**2e. Risk Adjustment for Outcomes/ Resource Use Measures**

2e.1 **Data/sample** *(description of data/sample and size)*: N/A

2e.2 **Analytic Method** *(type of risk adjustment, analysis, & rationale)*:
N/A

2e.3 **Testing Results** *(risk model performance metrics)*:
N/A

2e.4 **If outcome or resource use measure is not risk adjusted, provide rationale:** N/A

**2e** C☐ P☐ M☐ N☐ NA☐

**2f. Identification of Meaningful Differences in Performance**

2f.1 **Data/sample from Testing or Current Use** *(description of data/sample and size)*: 144,538 patient records from 1305 hospitals in the ICD registry from January 2009 to December 2009.

2f.2 **Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*:
Distribution of performance by percentile to demonstrate variability across hospitals.

2f.3 **Provide Measure Scores from Testing or Current Use** *(description of scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance)*:
Mean: 0.77

**2f** C☐ P☐ M☐ N☐

**Comment [KP12]: 2c.** Validity testing demonstrates that the measure reflects the quality of care provided, adequately distinguishing good and poor quality. If face validity is the only validity addressed, it is systematically assessed.

**Comment [k13]:** 9 Examples of validity testing include, but are not limited to: determining if measure scores adequately distinguish between providers known to have good or poor quality assessed by another valid method; correlation of measure scores with another valid indicator of quality for the specific topic; ability of measure scores to predict scores on some other related valid measure; content validity for multi-item scales/tests. Face validity is a subjective assessment by experts of whether the measure reflects the quality of care (e.g., whether the proportion of patients with BP < 140/90 is a marker of quality). If face validity is the only validity addressed, it is systematically assessed (e.g., ratings by relevant stakeholders) and the measure is judged to represent quality care for the specific topic and that the measure focus is the most important aspect of quality for the specific topic.

**Comment [KP14]: 2d.** Clinically necessary measure exclusions are identified and must be:
•supported by evidence of sufficient frequency of occurrence so that results are distorted without the exclusion;
AND ... [4]

**Comment [k15]:** 10 Examples of evidence that an exclusion distorts measure results include, but are not limited to: frequency of occurrence, sensitivity analyses with and without the exclusion, and variability of exclusions across providers.

**Comment [KP16]: 2e.** For outcome measures and other measures (e.g., resource use) when indicated:
•an evidence-based risk-adjustment strategy (e.g., risk models, risk stratification) is specified and is based on patient clinical factors that influence the measured outc ... [5]

**Comment [k17]:** 13 Risk models should not obscure disparities in care for populations by including factors that are associated with differences/inequalities in care such as race, socioeconomic status, gender (e.g., poorer treatment outcomes of African American men with prostate cancer, inequalities in treatment for CVD risk factors between men and w ... [6]

**Comment [KP18]: 2f.** Data analysis demonstrates that methods for scoring and analysis of the specified measure allow for identification of statistically significant and practically/clinically meaningful differences in performance.

**Comment [k19]:** 14 With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage of patients who received smoking cessatio ... [7]

SD: 0.17

Quartile 1: 0.71
Median: 0.79
Quartile 3: 0.87
95%: 1.00

**2g. Comparability of Multiple Data Sources/Methods**

2g.1 **Data/sample** *(description of data/sample and size)*: N/A

2g.2 **Analytic Method** *(type of analysis & rationale)*:
N/A

2g.3 **Testing Results** *(e.g., correlation statistics, comparison of rankings)*:
N/A

**2g**
C☐ P☐ M☐ N☐ NA☐

**Comment [KP20]: 2g.** If multiple data sources/methods are allowed, there is demonstration they produce comparable results.

**2h. Disparities in Care**

2h.**1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*:

2h.2 **If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:**
Disparities not reported for this measure.

**2h**
C☐ P☐ M☐ N☐ NA☐

**Comment [KP21]: 2h.** If disparities in care have been identified, measure specifications, scoring, and analysis allow for identification of disparities through stratification of results (e.g., by race, ethnicity, socioeconomic status, gender);OR rationale/data justifies why stratification is not necessary or not feasible.

**TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Scientific Acceptability of Measure Properties?*

**2**

**Steering Committee: Overall, to what extent was the criterion,** *Scientific Acceptability of Measure Properties*, **met?**
**Rationale:**

*2*
C☐ P☐ M☐ N☐

## 3. USABILITY

Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making. (evaluation criteria)

**Eval Rating**

**3a. Meaningful, Understandable, and Useful Information**

3a.1 **Current Use:** In use

3a.2 **Use in a public reporting initiative (disclosure of performance results to the public at large)** (*If used in a public reporting initiative, provide name of initiative(s), locations, Web page URL(s). If not publicly reported, state the plans to achieve public reporting within 3 years*):
ACCF plans to begin voluntary public reporting of NCDR measures, including this measure, by 2012. ACCF is currently evaluating public reporting options and finalizing decisions related to location and display of information to be reported as well as communication plans.

3a.3 **If used in other programs/initiatives (***If used in quality improvement or other programs/initiatives, name of initiative(s), locations, Web page URL(s). If not used for QI, state the plans to achieve use for QI within 3 years*):
This measure is used for QI by NCDR ICD Registry participating institutions. As of October 2010, 1582 institutions are enrolled in the ICD registry. 78% submit data on all patients and 22% submit data on CMS patients only as part of a CMS mandate for submission of primary prevention data for all primary prevention ICD implant procedures.

Participating institutions receive an institutional outcomes report each quarter with their hospital´s data. Over 1000 metrics are included in version 1 of each hospital´s outcomes report. 10 metrics are highlighted in the all patients report executive summary (16 for version 2 which will be released in early 2011). These metrics are selected by an NCDR panel of experts as presenting the greatest opportunity for care

**3a**
C☐ P☐ M☐ N☐

**Comment [KP22]: 3a**. Demonstration that information produced by the measure is meaningful, understandable, and useful to the intended audience(s) for both public reporting (e.g., focus group, cognitive testing) and informing quality improvement (e.g., quality improvement initiatives). An important outcome that may not have an identified improvement strategy still can be useful for informing quality improvement by identifying the need for and stimulating new approaches to improvement.

improvement. Hospitals receive their measure score, as well as the rates for all hospitals in the ICD registry, and all hospitals in the same comparison group (based on volume), and the rate for the 90th and 50th percentiles. A box and whisker plot is displayed for each metric to show hospitals how they compare to all hospitals in the ICD registry.

This measure is also provided to Hospital Corporation of America (HCA) for incorporation in their QI program efforts.

The Centers for Medicare & Medicaid Services (CMS) mandates that all institutions submit data on ICD implant procedures for primary prevention in order to receive reimbursement for these procedures. CMS will use this data for assessment of the efficacy of ICD use for primary prevention.

**Testing of Interpretability** (*Testing that demonstrates the results are understood by the potential users for public reporting and quality improvement*)
3a.4 **Data/sample** *(description of data/sample and size)*: 849 ICD registry participants, fall 2010.

3a.5 **Methods** *(e.g., focus group, survey, QI project)*:
Online survey

3a.6 **Results** *(qualitative and/or quantitative results and conclusions)*:
77% of survey participants answered yes to the question "Will the following metrics provide information that will be valuable for quality improvement at your institution?"

**3b/3c. Relation to other NQF-endorsed measures**

3b.1 **NQF # and Title of similar or related measures:**
#162: HF patients who are prescribed an ACEI or ARB at hospital discharge, #137: ACEI or ARB for left ventricular systolic dysfunction- Acute Myocardial Infarction (AMI) Patients, #162:Heart Failure: Angiotensin converting enzyme inhibitor (ACEI) for left ventricular systolic dysfunction (LVSD)

(for NQF staff use) **Notes on similar/related endorsed or submitted measures:**

**3b. Harmonization**
If this measure is related to measure(s) already endorsed by NQF (e.g., same topic, but different target population/setting/data source or different topic but same target population):
3b.2 **Are the measure specifications harmonized? If not, why?**
This following exclusions for this measure are aligned with the CMS ACE/ARB measures: pt expired, ACE/ARB contraindicated or blinded. The following exclusions in the CMS measures are not in this measure because the registry currently does not collect discharge location: discharged to another hospital, left against medical advice, discharged to home for hospice care. A data element will be added to the ICD registry in the future for discharge location, and the measure will subsequently be updated at that time with these exclusions. This measure also does not have an exclusion for length of stay greater than 120 days, or for patients with comfort only measures, as the CMS measures do.

**3b**
C☐ P☐ M☐ N☐ NA☐

**3c. Distinctive or Additive Value**
3c.1 **Describe the distinctive, improved, or additive value this measure provides to existing NQF-endorsed measures:**
This measure provides additive value to the set of NQF endorsed measure in that it would be the first endorsed measure to include the ICD population with LVSD and to use a registry as a data source.

5.1 **If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), Describe why it is a more valid or efficient way to measure quality:**

**3c**
C☐ P☐ M☐ N☐ NA☐

**TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Usability*?

**3**

**Steering Committee: Overall, to what extent was the criterion,** *Usability*, **met?**
**Rationale:**

**3**
C☐ P☐ M☐ N☐

**Comment [KP23]: 3b.** The measure specifications are harmonized with other measures, and are applicable to multiple levels and settings.

**Comment [k24]:** 16 Measure harmonization refers to the standardization of specifications for similar measures on the same topic (e.g., *influenza immunization* of patients in hospitals or nursing homes), or related measures for the same target population (e.g., eye exam and HbA1c for *patients with diabetes*), or definitions applicable to many measures (e.g., age designation for children) so that they are uniform or compatible, unless differences are dictated by the evidence. The dimensions of harmonization can include numerator, denominator, exclusions, and data source and collection instructions. The extent of harmonization depends on the relationship of the measures, the evidence for the specific measure focus, and differences in data sources.

**Comment [KP25]: 3c.** Review of existing endorsed measures and measure sets demonstrates that the measure provides a distinctive or additive value to existing NQF-endorsed measures (e.g., provides a more complete picture of quality for a particular condition or aspect of healthcare, is a more valid or efficient way to measure).

| 4. FEASIBILITY | |
|---|---|
| Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. (evaluation criteria) | Eval Rating |
| **4a. Data Generated as a Byproduct of Care Processes**<br><br>4a.1-2 **How are the data elements that are needed to compute measure scores generated?**<br>Data generated as byproduct of care processes during care delivery (Data are generated and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition), Coding/abstraction performed by someone other than person obtaining original information (E.g., DRG, ICD-9 codes on claims, chart abstraction for quality measure or registry) | 4a<br>C☐<br>P☐<br>M☐<br>N☐ |
| **4b. Electronic Sources**<br><br>4b.1 **Are all the data elements available electronically?** (*elements that are needed to compute measure scores are in defined, computer-readable fields, e.g., electronic health record, electronic claims*)<br>Yes<br><br>4b.2 **If not, specify the near-term path to achieve electronic capture by most providers.** | 4b<br>C☐<br>P☐<br>M☐<br>N☐ |
| **4c. Exclusions**<br><br>4c.1 **Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications?**<br>No<br><br>4c.2 **If yes, provide justification.** | 4c<br>C☐<br>P☐<br>M☐<br>N☐<br>NA☐ |
| **4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences**<br><br>4d.1 **Identify susceptibility to inaccuracies, errors, or unintended consequences of the measure and describe how these potential problems could be audited. If audited, provide results.**<br>The NCDR program takes a number of steps to minimize any potential for inaccuracies or errors in data used to report on performance back to hospitals. The process begins with support to data abstractors, including webinars, meetings, resource guides on the website, and clinical quality consultants available via e-mail or toll free phone number, to ensure consistent data collection. The NCDR establishes a unified electronic platform for data capture and submission that includes a certification process of the technical data collection tool selected by the hospital (either a commercially available software vendor product, the NCDR´s own web-based data collection tool, or a hospital´s customized electronic medical record system) that must occur prior to any data submissions. The certification process provides edit checks of data elements within the data collection tool to ensure a high quality data submission.<br><br>The NCDR data submission process includes a Data Quality Report (DQR) process that checks for validity in submissions based upon predetermined thresholds for element and composite completeness. The NCDR is putting in place a new strategy to systematically review the DQR results.<br><br>The NCDR on-site audit program has been developed to assess the reliability of data abstraction. This annual process reviews key elements at a select number of patient reports at a select number of sites and provides feedback scores to the hospitals. Any elements not currently included in the on-site audit process and deemed critical to capture for this measure will be added upon NQF endorsement. | 4d<br>C☐<br>P☐<br>M☐<br>N☐ |
| **4e. Data Collection Strategy/Implementation**<br><br>4e.1 **Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data/missing data, timing/frequency of data collection, patient confidentiality, time/cost of data collection, other feasibility/ implementation issues:**<br>Beta testing with a sample of registry participants takes place with each new registry version to identify errors in the data collection tool. In addition, modifications are made to metrics based on feedback during a | 4e<br>C☐<br>P☐<br>M☐<br>N☐ |

**Comment [KP26]: 4a.** For clinical measures, required data elements are routinely generated concurrent with and as a byproduct of care processes during care delivery. (e.g., BP recorded in the electronic record, not abstracted from the record later by other personnel; patient self-assessment tools, e.g., depression scale; lab values, meds, etc.)

**Comment [KP27]: 4b.** The required data elements are available in electronic sources. If the required data are not in existing electronic sources, a credible, near-term path to electronic collection by most providers is specified and clinical data elements are specified for transition to the electronic health record.

**Comment [KP28]: 4c. Exclusions** should not require additional data sources beyond what is required for scoring the measure (e.g., numerator and denominator) unless justified as supporting measure validity.

**Comment [KP29]: 4d.** Susceptibility to inaccuracies, errors, or unintended consequences and the ability to audit the data items to detect such problems are identified.

**Comment [KP30]: 4e.** Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, etc.) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use).

| | |
|---|---|
| public comment period.<br><br>The Data Quality Report (DQR) program has been developed to ensure data are valid and complete. The DQR is a process for submitting data files to the NCDR. Participants use their data collection tool software to create a submission file which is uploaded to the NCDR website. After uploading, the data in the file are automatically checked for errors and completeness. Passing the DQR ensures well-formed data and a statistically significant submission. Types of errors detected by the DQR include:<br><br>Schema: Structure doesn´t match NCDR requirements<br>Dates: Inconsistent dates<br>Selection: Missing or mismatched data; can be parent/child errors where a field requests more data<br>Outlier: Anomalies or exceptions; data exceeds the possible limits.<br><br>4e.2 **Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:** ICD registry participants pay a fee of $3,480/year (as of 2010) to enroll in the registry. Staff resources are needed for data collection and submission at the participating institution. Registry site managers/data collectors undergo (non-mandatory) training offered by the NCDR.<br><br>4e.3 **Evidence for costs:** http://www.ncdr.com/WebNCDR/ncdrdocuments/B08352N%20ICD%20Registry%20Enrollment%20Packet%20Complete.pdf<br><br>4e.4 **Business case documentation:** | |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Feasibility?* | **4** |
| **Steering Committee: Overall, to what extent was the criterion,** *Feasibility***, met?**<br>**Rationale:** | **4**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **RECOMMENDATION** | |
| (for NQF staff use) **Check if measure is untested and only eligible for time-limited endorsement.** | **Time-limited ☐** |
| **Steering Committee: Do you recommend for endorsement?**<br>**Comments:** | **Y☐**<br>**N☐**<br>**A☐** |
| **CONTACT INFORMATION** | |
| Co.1 **Measure Steward (Intellectual Property Owner)**<br>Co.1 **Organization**<br>American College of Cardiology Foundation (ACCF), 2400 N Street NW, Washington, District Of Columbia, 20037<br><br>Co.2 **Point of Contact**<br>Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529- | |
| **Measure Developer If different from Measure Steward**<br>Co.3 **Organization**<br>American College of Cardiology Foundation (ACCF), 2400 N Street NW, Washington, District Of Columbia, 20037<br><br>Co.4 **Point of Contact**<br>Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529- | |
| Co.5 **Submitter If different from Measure Steward POC**<br>Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529-, American College of Cardiology Foundation (ACCF) | |

**Co.6 Additional organizations that sponsored/participated in measure development**

**ADDITIONAL INFORMATION**

**Workgroup/Expert Panel involved in measure development**

**Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.**

ICD Registry Steering Committee:
Mark S. Kremers, MD, FACC, FHRS Chair
Stephen C. Hammill, MD, FACC, FHRS Ex-Officio
Sana M. Al-Khatib, MD, FACC
Charles I. Berul, MD, FACC
Jeptha P. Curtis, MD, FACC
Paul A. Heidenreich, MD, FACC
Illeana L. Pina, MD, FACC
Matthew R. Reynolds, MD, FACC
Lynne Warner Stevenson, MD, FACC
Mary Norine Walsh, MD, FACC

Public Reporting Workgroup:
Fred Masoudi, MD, MSPH, FACC, FAHA, FACP
H. Vernon Anderson,MD, FACC, FSCAI
David Malenka, MD, FACC
Matt Roe, MD, FACC
Steve Hammill, MD, FHRS, FACC
Jeptha Curtis, MD, FACC
Paul Heidenreich, MD, MS, FACC
Brahmajee Nallamothu, MD, MPH, FACC
Mark Kremers, MD, FACC
Christopher White MD, FACC
Carl Tommaso, MD, FACC, FAHA, FSCAI
Sunil Rao, MD, FACC, FSCAI
Andrea Russo, MD, FACC, FHRS
Debabrata Mukherjee MD, FACC

**Ad.2 If adapted, provide name of original measure:** N/A

**Ad.3-5 If adapted, provide original specifications URL or attachment**

**Measure Developer/Steward Updates and Ongoing Maintenance**

**Ad.6 Year the measure was first released:** 2006

**Ad.7 Month and Year of most recent revision:** 12, 2010

**Ad.8 What is your frequency for review/update of this measure?** Every 3-4 years or if guideline updates warrant more frequent update, or with new dataset version.

**Ad.9 When is the next scheduled review/update for this measure?** 06, 2011

**Ad.10 Copyright statement/disclaimers:** 

**Ad.11 -13 Additional Information web page URL or attachment:** Attachment ICDacearbTesting.pdf

**Date of Submission** (*MM/DD/YY*)**:** 12/14/2010

**Page 3: [1] Comment [k4]** **Karen Pace** **10/5/2009 8:59:00 AM**

**1c.** The measure focus is:

- an outcome (e.g., morbidity, mortality, function, health-related quality of life) that is relevant to, or associated with, a national health goal/priority, the condition, population, and/or care being addressed;

OR

- if an intermediate outcome, process, structure, etc., there is **evidence** that supports the specific measure focus as follows:
  - Intermediate outcome – evidence that the measured intermediate outcome (e.g., blood pressure, Hba1c) leads to improved health/avoidance of harm or cost/benefit.
  - Process – evidence that the measured clinical or administrative process leads to improved health/avoidance of harm and
    if the measure focus is on one step in a multi-step care process, it measures the step that has the greatest effect on improving the specified desired outcome(s).
  - Structure – evidence that the measured structure supports the consistent delivery of effective processes or access that lead to improved health/avoidance of harm or cost/benefit.
  - Patient experience – evidence that an association exists between the measure of patient experience of health care and the outcomes, values and preferences of individuals/ the public.
  - Access – evidence that an association exists between access to a health service and the outcomes of, or experience with, care.
  - Efficiency – demonstration of an association between the measured resource use and level of performance with respect to one or more of the other five IOM aims of quality.

**Page 3: [2] Comment [k5]** **Karen Pace** **10/5/2009 8:59:00 AM**

4 Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multi-step process, the step with the greatest effect on the desired outcome should be selected as the focus of measurement. For example, although assessment of immunization status and recommending immunization are necessary steps, they are not sufficient to achieve the desired impact on health status – patients must be vaccinated to achieve immunity. This does not preclude consideration of measures of preventive screening interventions where there is a strong link with desired outcomes (e.g., mammography) or measures for multiple care processes that affect a single outcome.

**Page 3: [3] Comment [k6]** **Karen Pace** **10/5/2009 8:59:00 AM**

3 The strength of the body of evidence for the specific measure focus should be systematically assessed and rated (e.g., USPSTF grading system http://www.ahrq.gov/clinic/uspstf07/methods/benefit.htm). If the USPSTF grading system was not used, the grading system is explained including how it relates to the USPSTF grades or why it does not. However, evidence is not limited to quantitative studies and the best type of evidence depends upon the question being studied (e.g., randomized controlled trials appropriate for studying drug efficacy are not well suited for complex system changes). When qualitative studies are used, appropriate qualitative research criteria are used to judge the strength of the evidence.

**Page 8: [4] Comment [KP14]** **Karen Pace** **10/5/2009 8:59:00 AM**

**2d.** Clinically necessary measure exclusions are identified and must be:

- supported by evidence of sufficient frequency of occurrence so that results are distorted without the exclusion;

AND

- a clinically appropriate exception (e.g., contraindication) to eligibility for the measure focus;

AND

- precisely defined and specified:
  - if there is substantial variability in exclusions across providers, the measure is specified so that exclusions are computable and the effect on the measure is transparent (i.e., impact clearly delineated, such as number of cases excluded, exclusion rates by type of exclusion);

if patient preference (e.g., informed decision-making) is a basis for exclusion, there must be evidence that it strongly impacts performance on the measure and the measure must be specified so that the information about patient preference and the effect on the measure is transparent (e.g., numerator category computed separately, denominator exclusion category computed separately).

**Page 8: [5] Comment [KP16]** **Karen Pace** **10/5/2009 8:59:00 AM**

rationale/data support no risk adjustment.

**Page 8: [6] Comment [k17]** **Karen Pace** **10/5/2009 8:59:00 AM**

13 Risk models should not obscure disparities in care for populations by including factors that are associated with differences/inequalities in care such as race, socioeconomic status, gender (e.g., poorer treatment outcomes of African American men with prostate cancer, inequalities in treatment for CVD risk factors between men and women). It is preferable to stratify measures by race and socioeconomic status rather than adjusting out differences.

**Page 8: [7] Comment [k19]** **Karen Pace** **10/5/2009 8:59:00 AM**

14 With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage of patients who received smoking cessation counseling (e.g., 74% v. 75%) is clinically meaningful; or whether a statistically significant difference of $25 in cost for an episode of care (e.g., $5,000 v. $5,025) is practically meaningful. Measures with overall poor performance may not demonstrate much variability across providers.

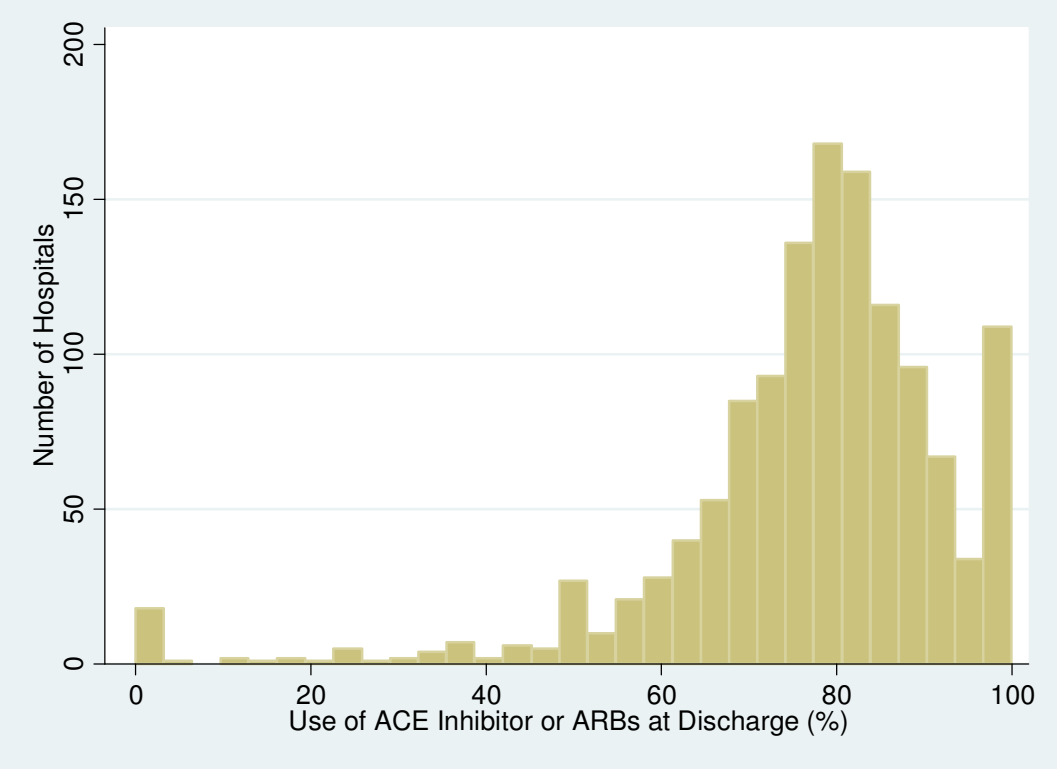
**Table Study Sample (ICD 2009)**

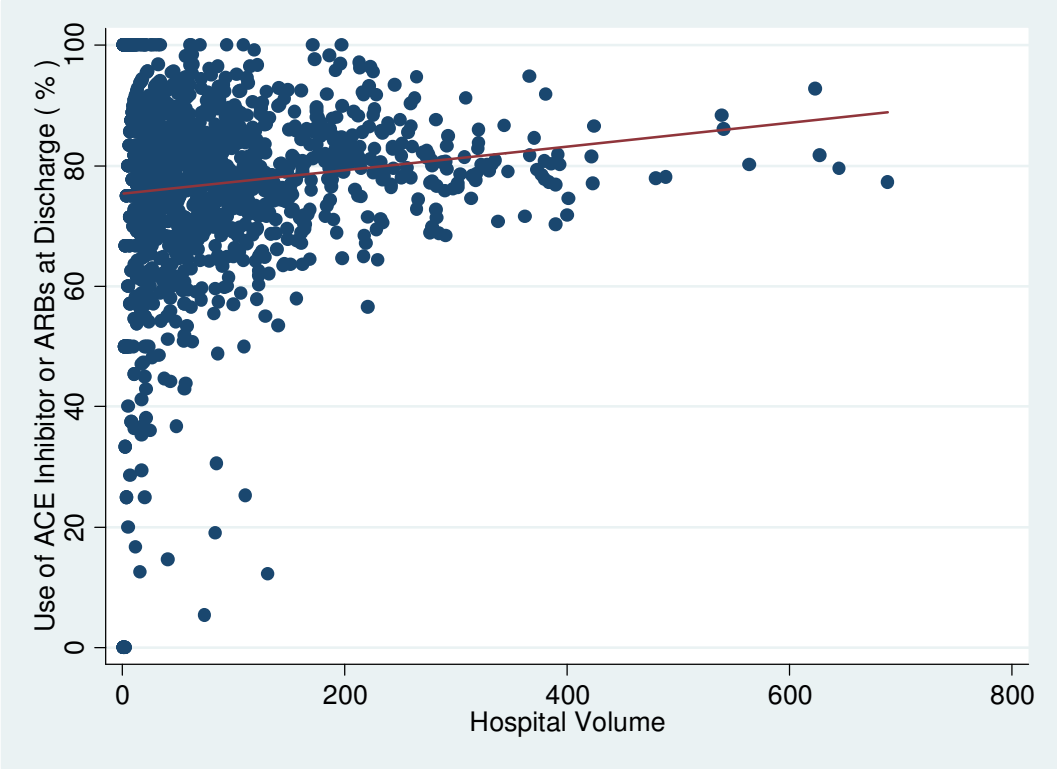
| Exclusions | Hospital stays | | Patients | | Facilities | |
|---|---|---|---|---|---|---|
| | # | % | # | % | # | % |
| **Sample from01/01/2009 to 12/31/2009** | 144538 | 100 | 143653 | 100 | 1305 | 100 |
| excluding deceased patients | 457 | 0.32 | 455 | 0.32 | 0 | 0 |
| **Remaining** | 144081 | 99.68 | 143198 | 99.68 | 1305 | 100 |
| Excluding EF precent>=40% + missing | 30592 | 21.23 | 30357 | 21.20 | 6 | 0.46 |
| **Remaining** | 113489 | 78.77 | 112841 | 78.80 | 1299 | 99.54 |
| Excluding ACE inhibitor and ARB unknown, contraindicated or blinded | 2783 | 2.45 | 2748 | 2.44 | 0 | 0.00 |
| **Study Sample** | 110706 | 97.55 | 110093 | 97.56 | 1299 | 100.00 |
| ACE inhibitor or ARB use at discharge | 87500 | 79.04 | 87065 | 79.08314 | 1281 | 98.61 |

Distribution of ACE inhibitor or ARB use at Discharge

| Description | Hospital volume | % patients received ACEI or ARB at discharge |
|---|---|---|
| N | 1299 | 1299 |
| **Mean** | 85.22 | 0.7702 |
| Std Deviation | 93.73 | 0.1667 |
| | | |
| 100% Max | 689 | 1.0000 |
| 99% | 401 | 1.0000 |
| 95% | 279 | 1.0000 |
| 90% | 213 | 0.9464 |
| 75% Q3 | 117 | 0.8654 |
| **50% Median** | **54** | **0.7917** |
| 25% Q1 | 20 | 0.7105 |
| 10% | 6 | 0.6000 |
| 5% | 3 | 0.5000 |
| 1% | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 |

Among patients with EF<40% , who are eligible for either ACE inhibitors or ARBs

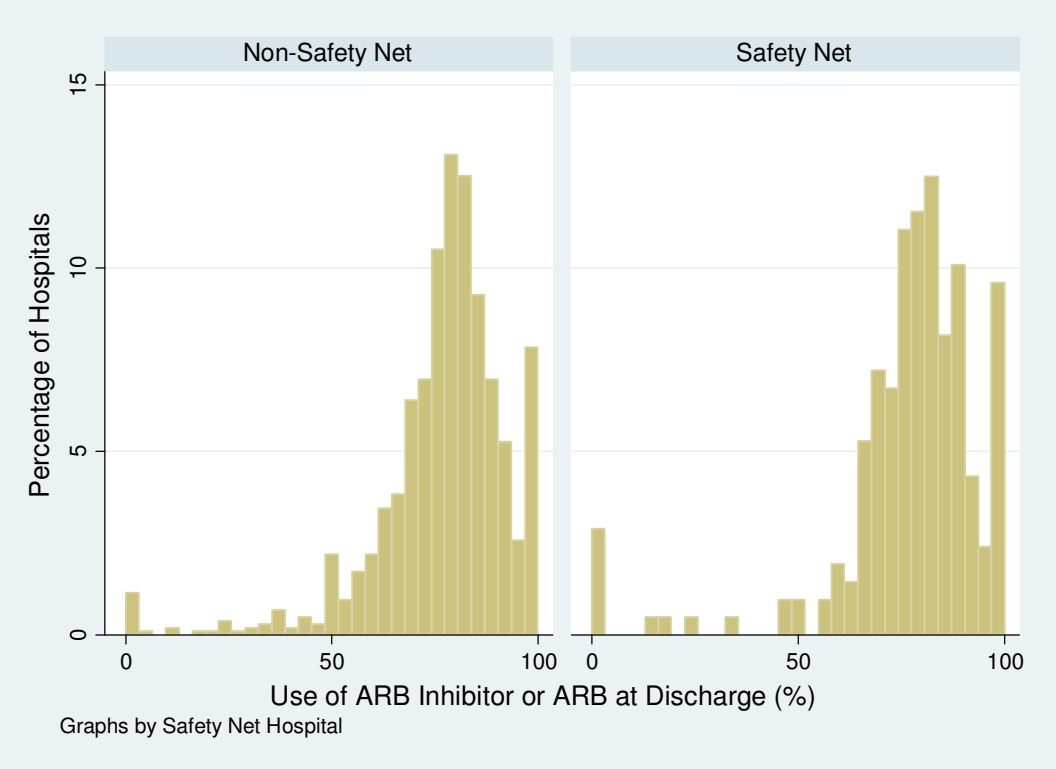


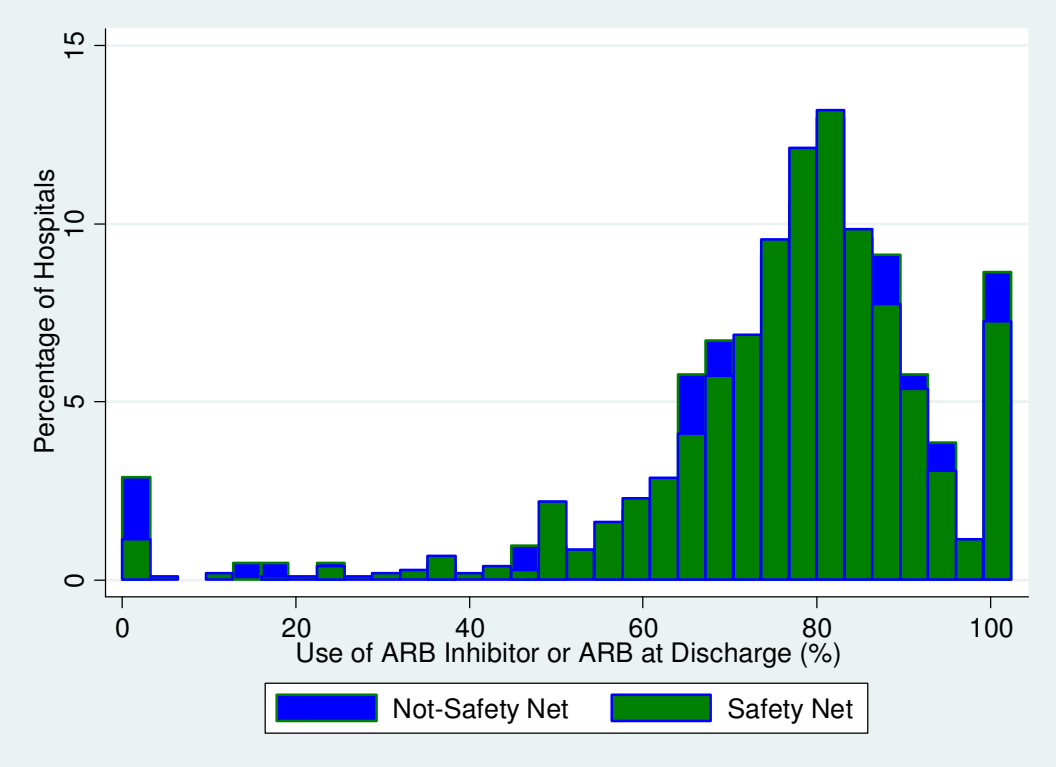

Use of ACE Inhibitor or ARBs at Discharge ( % )
0
20
40
60
80
100
0
200
400
600
800
Hospital Volume

Distribution of AEC inhibitor or ARB use at Discharge Stratified by Safety Net Status

| Description | Safety Net Status* | | | |
|---|---|---|---|---|
| | No | | Yes | |
| | Volume | ACEI or ARB | Volume | ACEI or ARB |
| N | 1046 | 1046 | 208 | 208 |
| Mean | 86.32 | 0.7694 | 81.32 | 0.7699 |
| Std Deviation | 93.67 | 0.1627 | 95.28 | 0.1899 |
| 100% Max | 689 | 1.0000 | 564 | 1.0000 |
| 99% | 400 | 1.0000 | 386 | 1.0000 |
| 95% | 266 | 1.0000 | 291 | 1.0000 |
| 90% | 212 | 0.9400 | 222 | 0.9558 |
| 75% Q3 | 119 | 0.8632 | 113.5 | 0.8750 |
| **50% Median** | **56** | **0.7915** | **44.5** | **0.8000** |
| 25% Q1 | 21 | 0.7097 | 17 | 0.7131 |
| 10% | 7 | 0.5952 | 6 | 0.6250 |
| 5% | 3 | 0.5000 | 3 | 0.4545 |
| 1% | 1 | 0.0000 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |

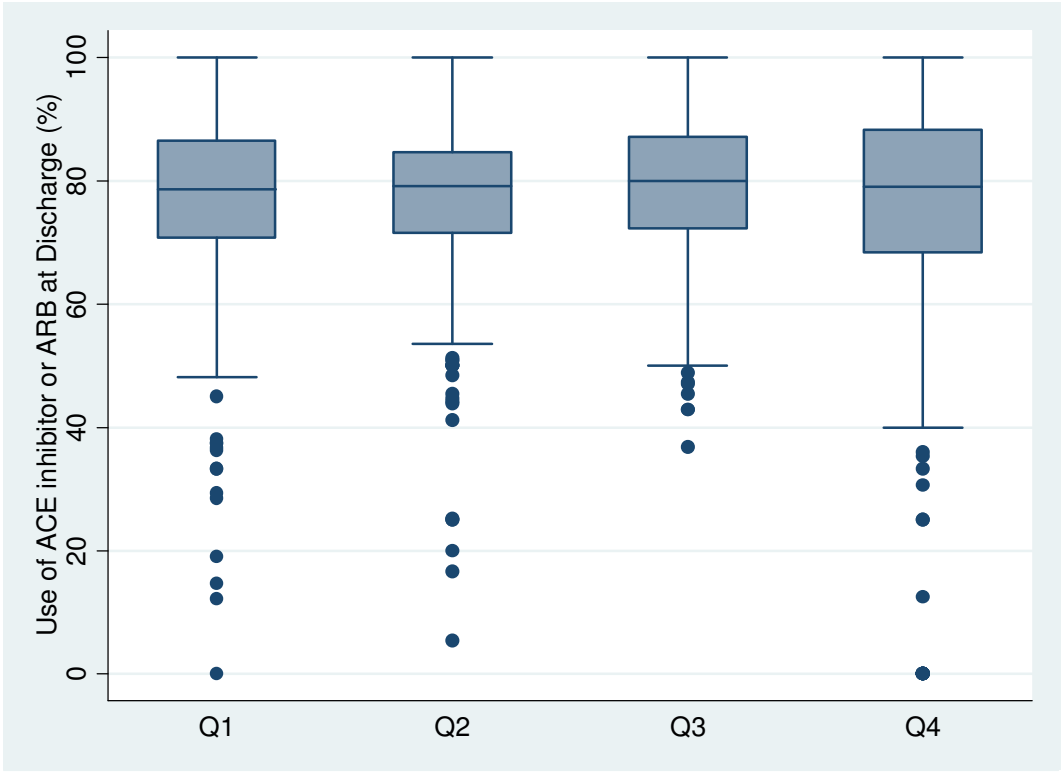
* Defined as government hospitals or non-government hosptials with high medicaid caseload using AHA 2008 Data.


Non-Safety Net
Safety Net
Percentage of Hospitals
0
5
10
15
0
50
100
Use of ARB Inhibitor or ARB at Discharge (%)
Graphs by Safety Net Hospital

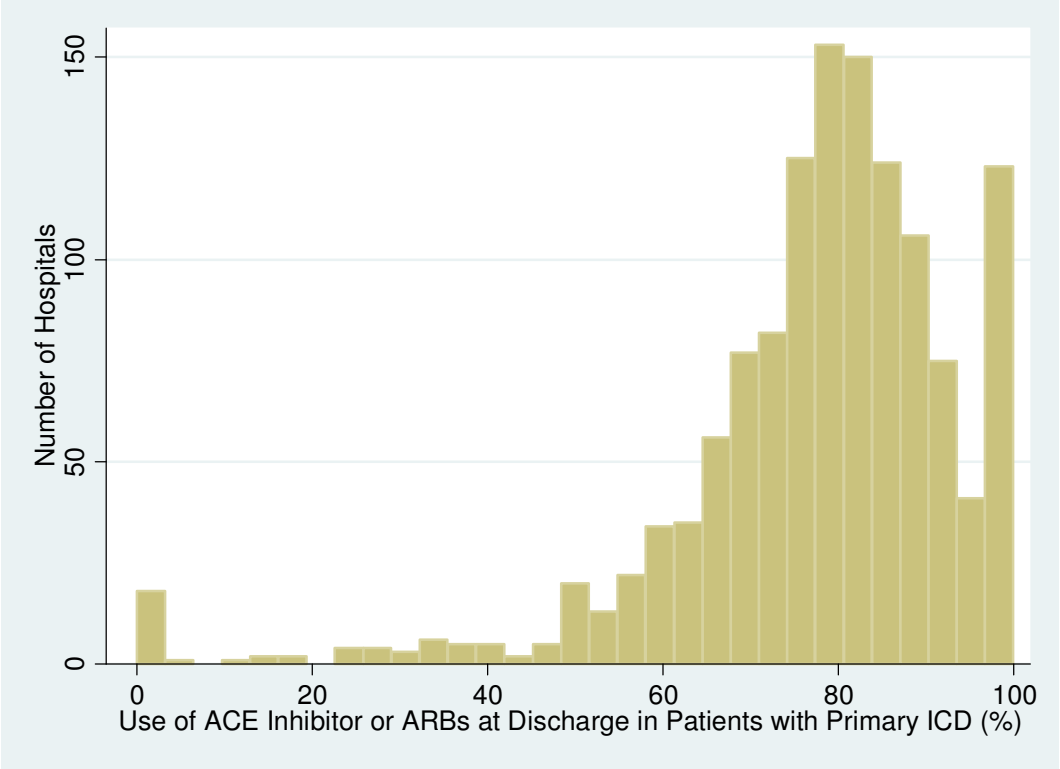

Percentage of Hospitals
0
5
10
15
0
20
40
60
80
100
Use of ARB Inhibitor or ARB at Discharge (%)
Not-Safety Net
Safety Net

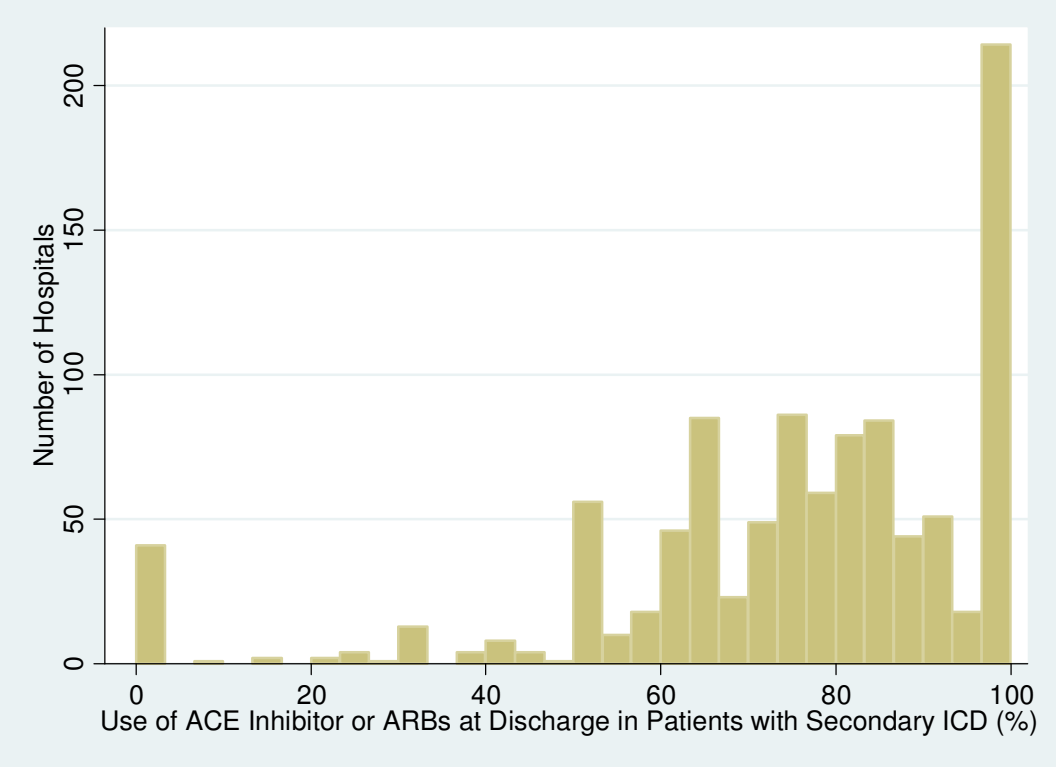
Distribution of AEC inhibitor or ARB use at Discharge Stratified by % White

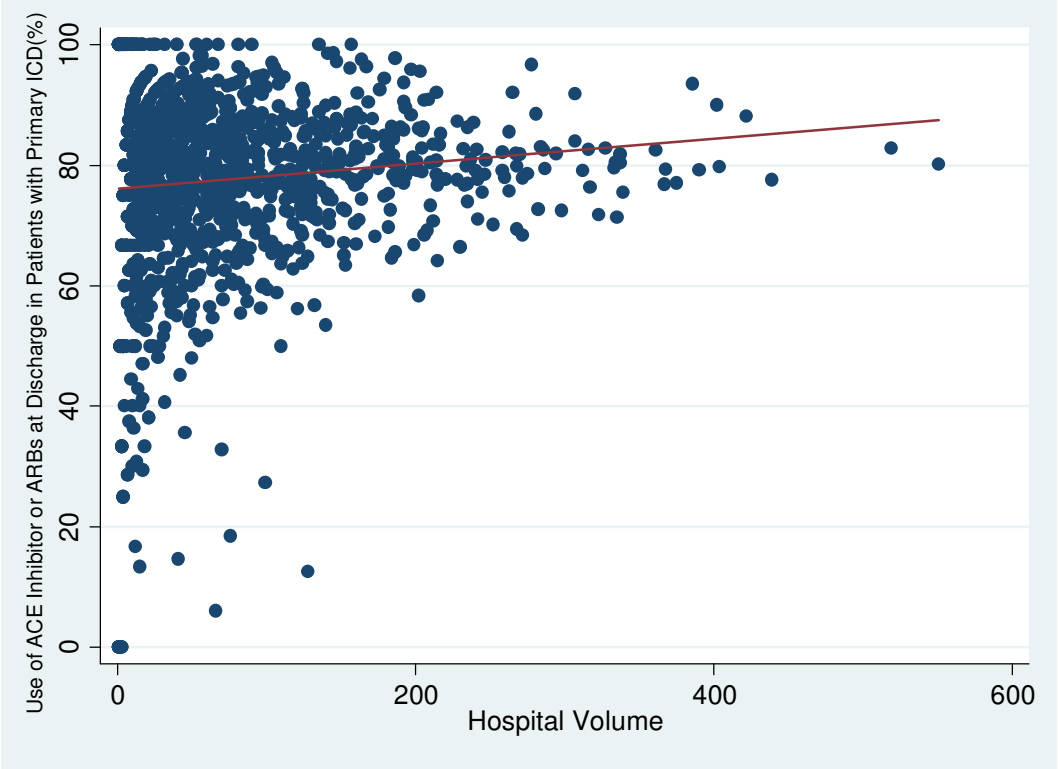
| Description | %White | %White | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Q1 (0.00% to 72.73%) | | Q2 (72.74% to 87.69%) | | Q3 (87.70% to 96.12%) | | Q4 (96.13% to 100.00%) | |
| | | Volume | ACEI or ARB | Volume | ACEI or ARB | Volume | ACEI or ARB | Volume | ACEI or ARB |
| N | 1299 | 323 | 323 | 326 | 326 | 325 | 325 | 325 | 325 |
| Mean | 0.8102 | 81.19 | 0.7724 | 109.32 | 0.7714 | 95.14 | 0.7894 | 55.15 | 0.7477 |
| Std Deviation | 0.2059 | 100.39 | 0.1565 | 106.42 | 0.1405 | 87.38 | 0.1138 | 67.66 | 0.2309 |
| 100% Max | 1.0000 | 627 | 1.0000 | 645 | 1.0000 | 689 | 1.0000 | 489 | 1.0000 |
| 99% | 1.0000 | 424 | 1.0000 | 401 | 1.0000 | 366 | 1.0000 | 282 | 1.0000 |
| 95% | 1.0000 | 290 | 1.0000 | 323 | 1.0000 | 263 | 0.9481 | 192 | 1.0000 |
| 90% | 1.0000 | 215 | 0.9626 | 274 | 0.9231 | 214 | 0.9180 | 138 | 1.0000 |
| 75% Q3 | 0.9612 | 105 | 0.8656 | 150 | 0.8464 | 128 | 0.8715 | 78 | 0.8830 |
| **50% Median** | **0.8769** | **43** | **0.7868** | **78.5** | **0.7915** | **67** | **0.8000** | **31** | **0.7901** |
| 25% Q1 | 0.7273 | 15 | 0.7073 | 30 | 0.7155 | 32 | 0.7222 | 6 | 0.6829 |
| 10% | 0.5238 | 6 | 0.6047 | 11 | 0.6154 | 18 | 0.6437 | 2 | 0.5000 |
| 5% | 0.3750 | 3 | 0.5000 | 7 | 0.5079 | 13 | 0.5796 | 1 | 0.0000 |
| 1% | 0.0000 | 1 | 0.1905 | 4 | 0.2500 | 9 | 0.4546 | 1 | 0.0000 |
| 0% Min | 0.0000 | 1 | 0.0000 | 4 | 0.0541 | 9 | 0.3684 | 1 | 0.0000 |


Use of ACE inhibitor or ARB at Discharge (%)
0
20
40
60
80
100
Q1
Q2
Q3
Q4

| Distribution of AEC inhibitor or ARB use at Discharge Stratified by ICD indication | | | | |
|---|---|---|---|---|
| | ICD Indication | | | |
| **Description** | **Priamry** | | **Secondary** | |
| | **Volume** | **ACEI or ARB** | **Volume** | **ACEI or ARB** |
| N | 1294 | 1294 | 1003 | 1003 |
| Mean | 71.09 | 0.7760 | 18.66 | 0.7521 |
| Std Deviation | 75.91 | 0.1700 | 26.56 | 0.2313 |
| 100% Max | 551 | 1.0000 | 475 | 1.0000 |
| 99% | 339 | 1.0000 | 108 | 1.0000 |
| 95% | 228 | 1.0000 | 61 | 1.0000 |
| 90% | 175 | 0.9619 | 45 | 1.0000 |
| 75% Q3 | 98 | 0.8776 | 25 | 0.9156 |
| 50% Median | 46 | 0.8000 | 10 | 0.7895 |
| 25% Q1 | 16 | 0.7111 | 4 | 0.6667 |
| 10% | 6 | 0.6000 | 1 | 0.5000 |
| 5% | 3 | 0.5000 | 1 | 0.2857 |
| 1% | 1 | 0.0000 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |


Number of Hospitals
0
50
100
150
0
20
40
60
80
100
Use of ACE Inhibitor or ARBs at Discharge in Patients with Primary ICD (%)


Number of Hospitals
0
50
100
150
200
0
20
40
60
80
100
Use of ACE Inhibitor or ARBs at Discharge in Patients with Secondary ICD (%)


Use of ACE Inhibitor or ARBs at Discharge in Patients with Primary ICD(%)
0
20
40
60
80
100
0
200
400
600
Hospital Volume

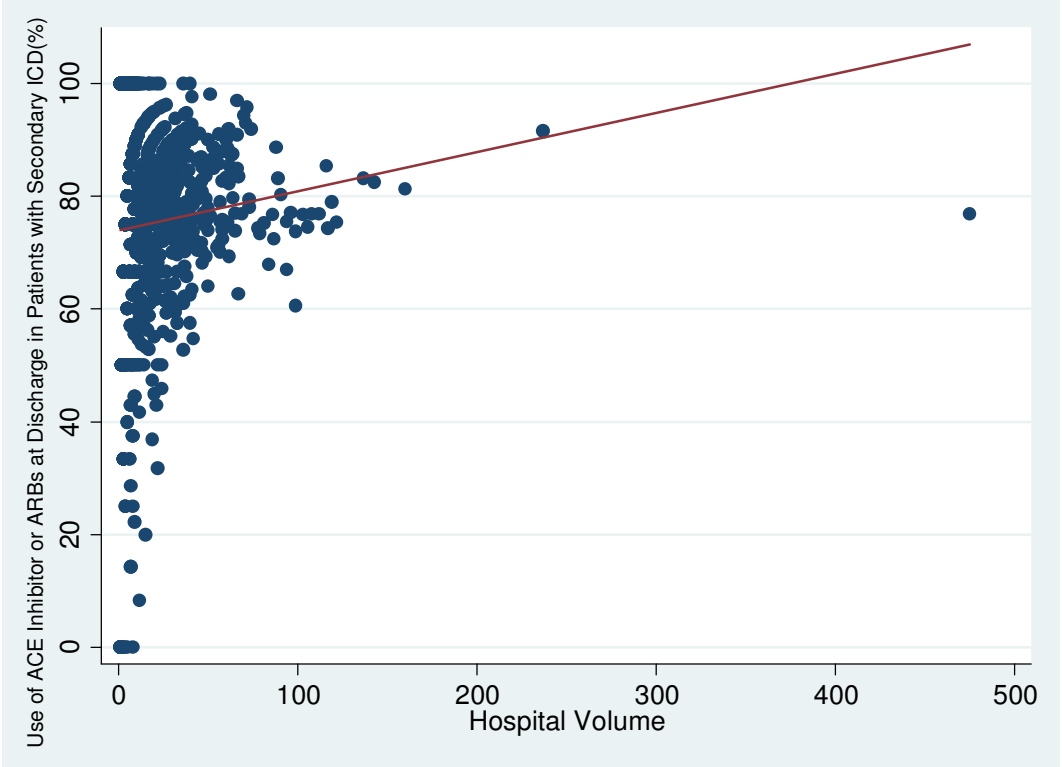
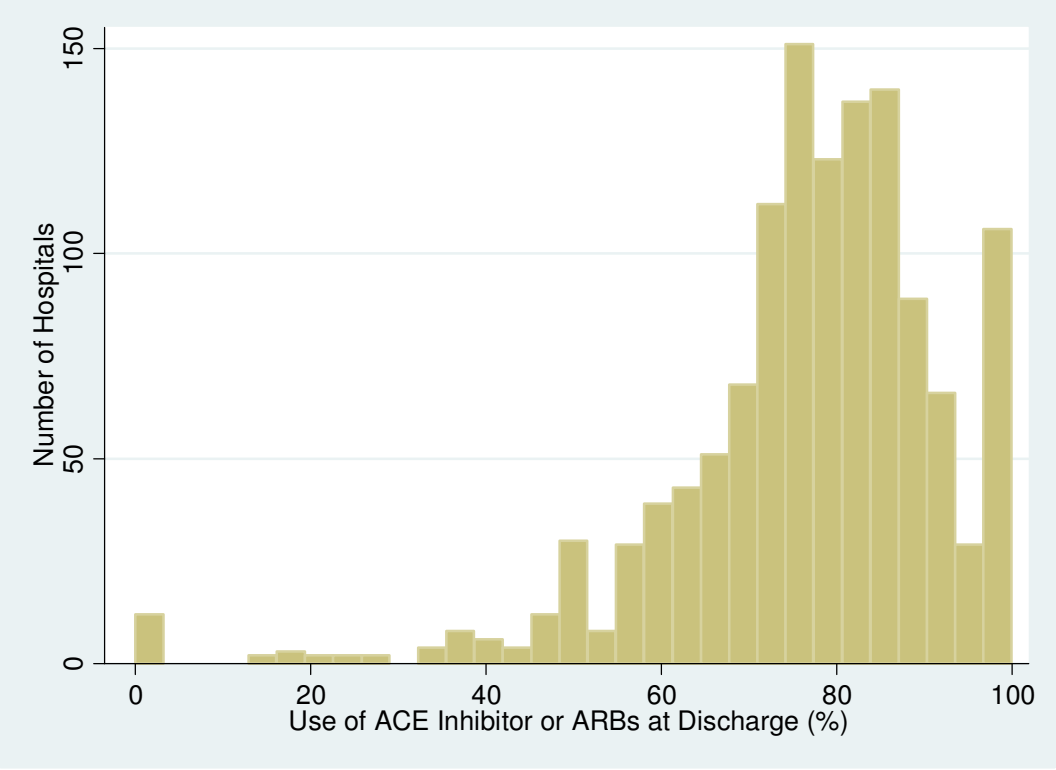

Use of ACE Inhibitor or ARBs at Discharge in Patients with Secondary ICD(%)
0
20
40
60
80
100
0
100
200
300
400
500
Hospital Volume

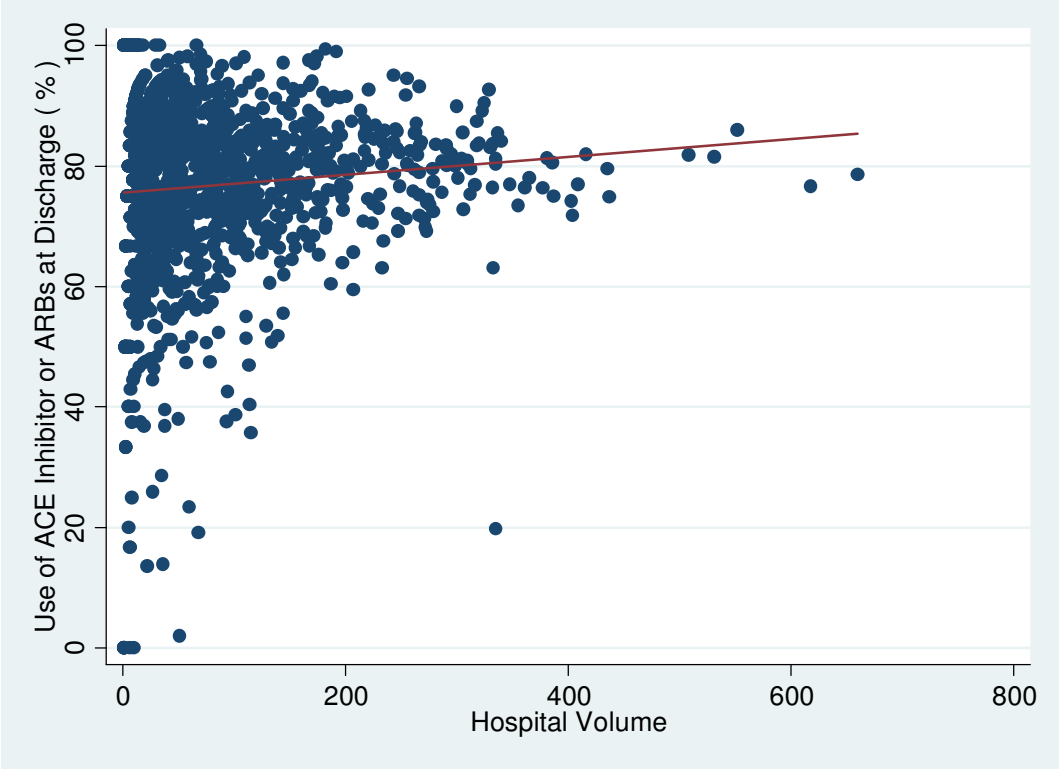
**Table Study Sample (ICD 2008)**

| Exclusions | Hospital stays | | Patients | | Facilities | |
|---|---|---|---|---|---|---|
| | # | % | # | % | # | % |
| **Sample from01/01/2008 to 12/31/2008** | 131371 | 100 | 130593 | 100 | 1283 | 100 |
| excluding deceased patients | 500 | 0.38 | 494 | 0.38 | 0 | 0 |
| **Remaining** | 130871 | 99.62 | 130099 | 99.62 | 1283 | 100 |
| Excluding EF precent>=40% + missing | 25185 | 19.24 | 25004 | 19.22 | 5 | 0.39 |
| **Remaining** | 105686 | 80.76 | 105095 | 80.78 | 1278 | 99.61 |
| Excluding unknown, contraindicated or blinded | 1847 | 1.75 | 1824 | 1.74 | 0 | 0.00 |
| **Study Sample** | 103839 | 98.25 | 103271 | 98.26 | 1278 | 100.00 |
| ACE inhibitor or ARB use at discharge | 81208 | 78.21 | 80833 | 78.27 | 1267 | 99.14 |

Distribution of ACE inhibitor or ARB use at Discharge

| Description | Hospital volume | % patients prescribed ACEI or ARB at discharge |
|---|---|---|
| N | 1278 | 1278 |
| **Mean** | 81.25 | 0.7681 |
| Std Deviation | 87.50 | 0.1598 |
| | | |
| 100% Max | 660 | 1.0000 |
| 99% | 386 | 1.0000 |
| 95% | 267 | 1.0000 |
| 90% | 196 | 0.9394 |
| 75% Q3 | 112 | 0.8629 |
| **50% Median** | 51 | 0.7895 |
| 25% Q1 | 19 | 0.7059 |
| 10% | 6 | 0.5890 |
| 5% | 3 | 0.5000 |
| 1% | 1 | 0.1364 |
| 0% Min | 1 | 0.0000 |

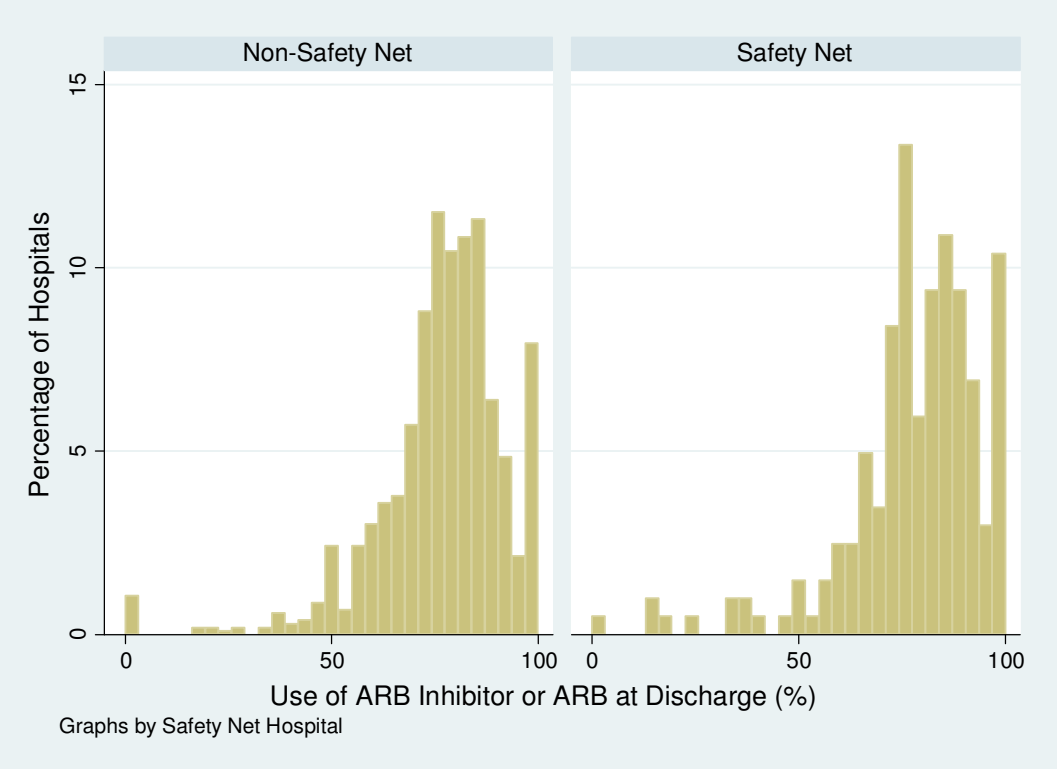


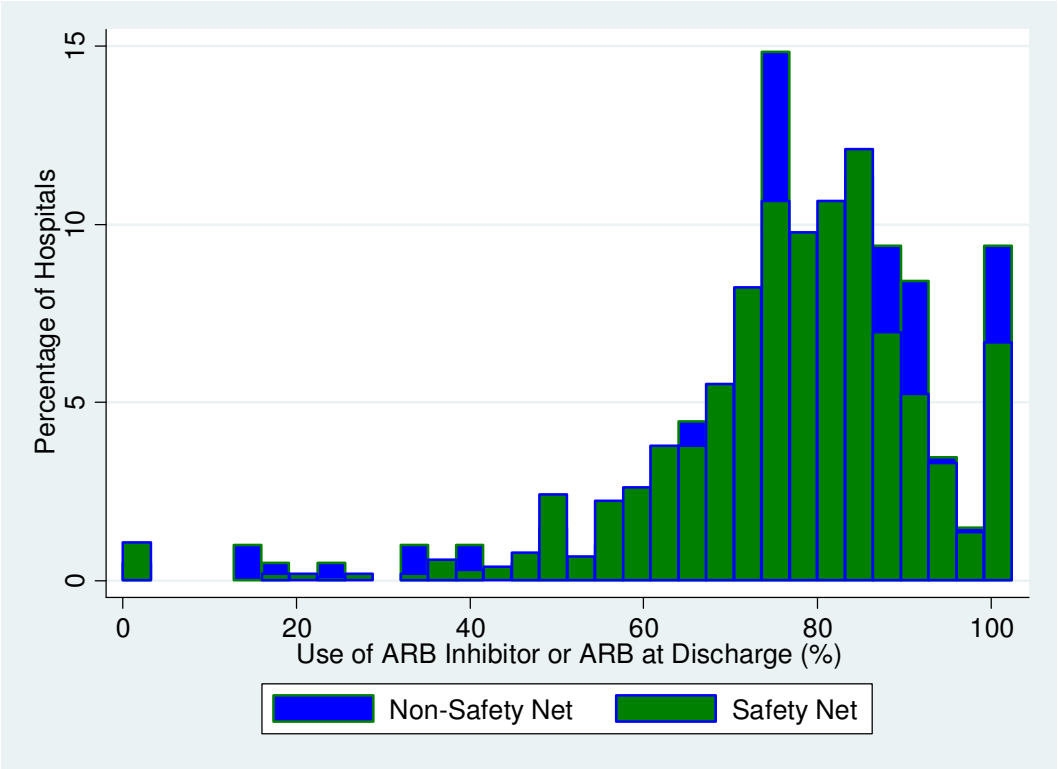

Use of ACE Inhibitor or ARBs at Discharge ( % )
0
20
40
60
80
100
0
200
400
600
800
Hospital Volume

Distribution of AEC inhibitor or ARB use at Discharge Stratified by Safety Net Status

| Description | Safety Net Status* | | | |
|---|---|---|---|---|
| | No | | Yes | |
| | Volume | ACEI or ARB | Volume | ACEI or ARB |
| N | 1032 | 1032 | 202 | 202 |
| Mean | 82.94 | 0.7668 | 74.34 | 0.7803 |
| Std Deviation | 88.84 | 0.1577 | 81.75 | 0.1705 |
| 100% Max | 660 | 1.0000 | 387 | 1.0000 |
| 99% | 386 | 1.0000 | 318 | 1.0000 |
| 95% | 268 | 1.0000 | 254 | 1.0000 |
| 90% | 196 | 0.9362 | 197 | 0.9722 |
| 75% Q3 | 113.5 | 0.8593 | 109 | 0.8846 |
| **50% Median** | 53 | 0.7882 | 44 | 0.8070 |
| 25% Q1 | 20 | 0.7039 | 14 | 0.7288 |
| 10% | 6 | 0.5909 | 4 | 0.6000 |
| 5% | 3 | 0.5000 | 3 | 0.4690 |
| 1% | 1 | 0.0196 | 1 | 0.1389 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |

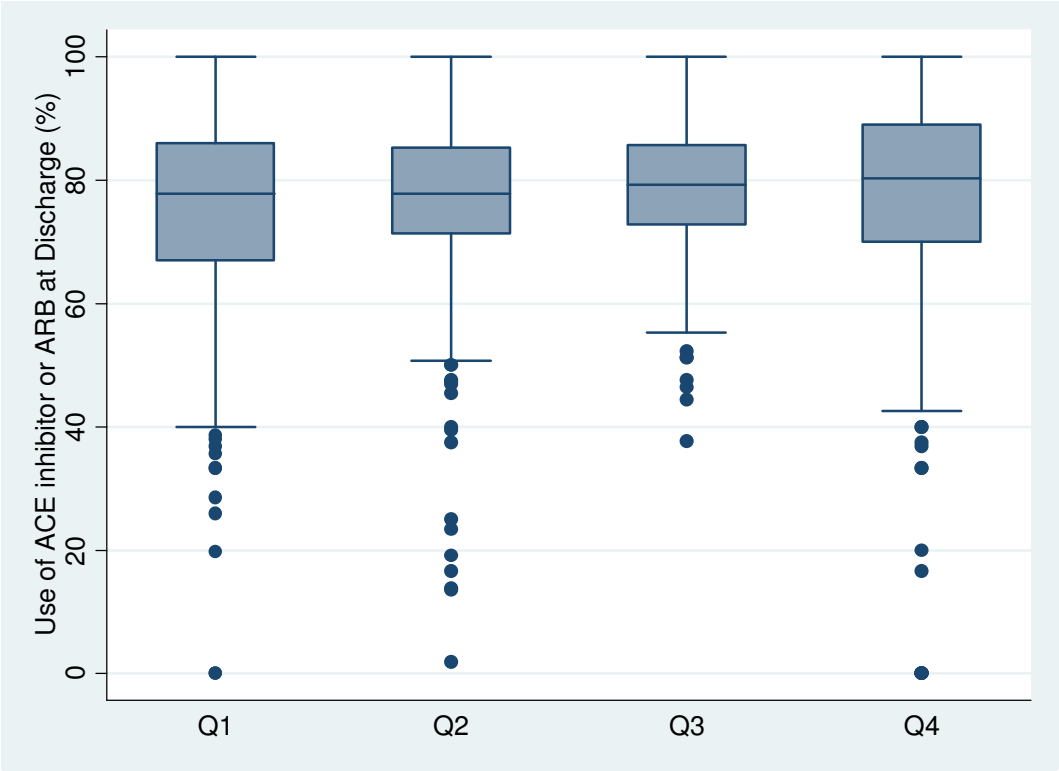
* Defined as government hospitals or non-government hosptials with high medicaid caseload using AHA 2008 Data.



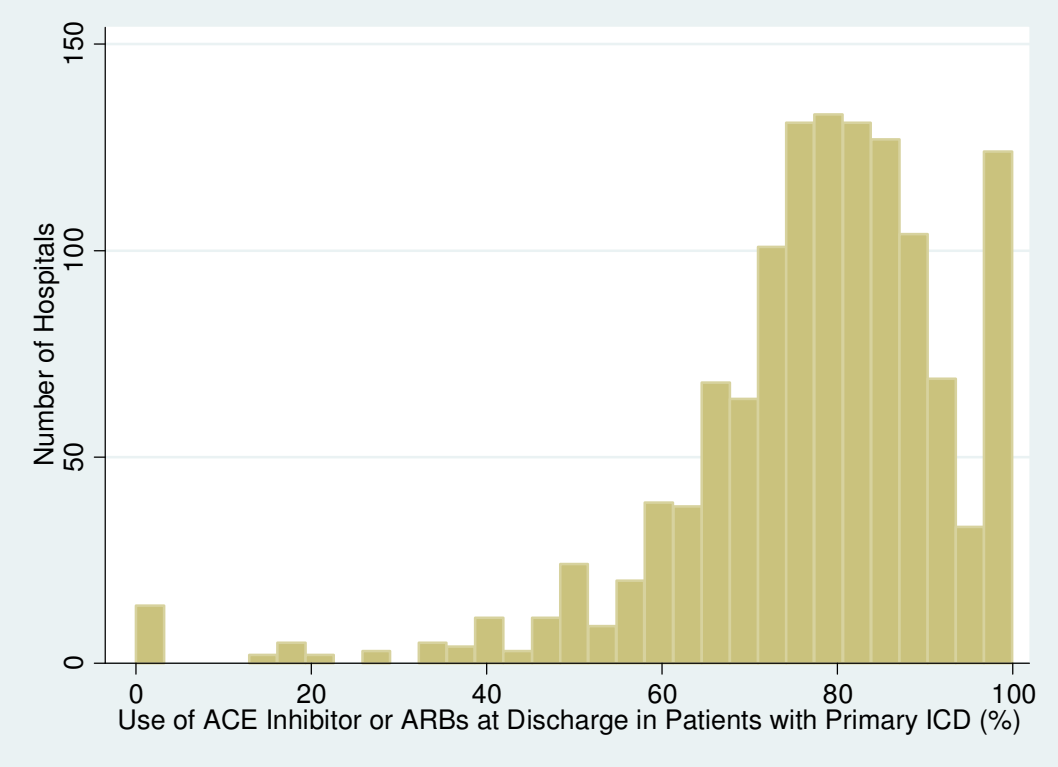

Percentage of Hospitals
0
5
10
15
0
20
40
60
80
100
Use of ARB Inhibitor or ARB at Discharge (%)
Non-Safety Net
Safety Net

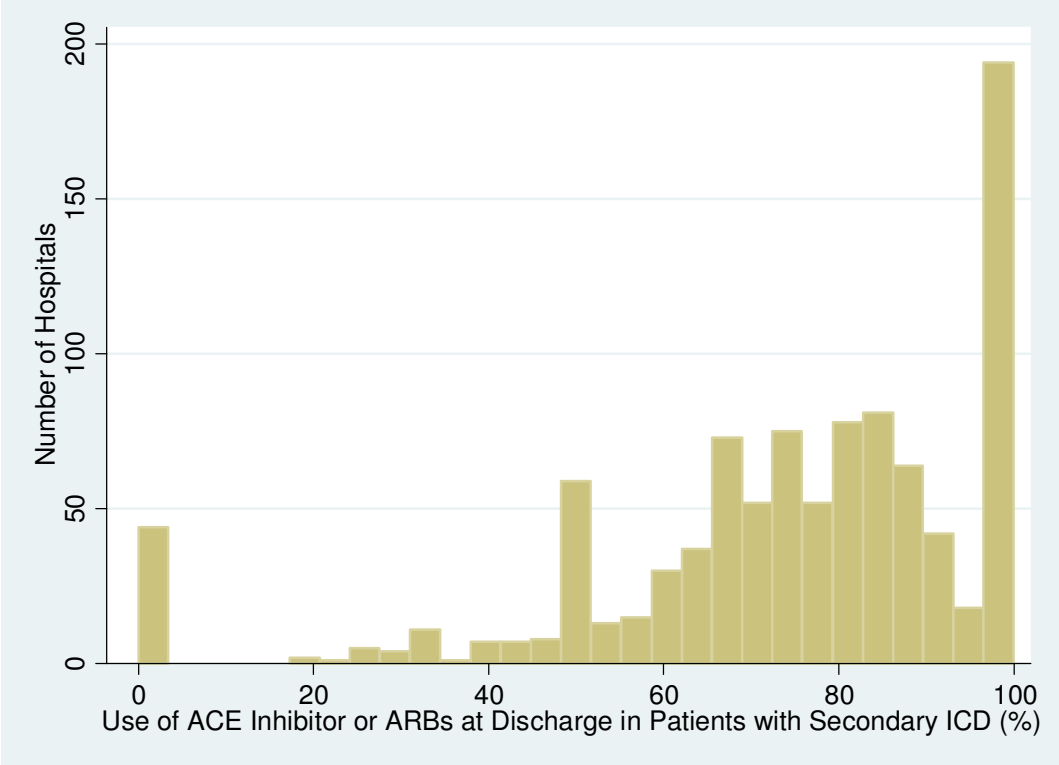
Distribution of AEC inhibitor or ARB use at Discharge Stratified by % White

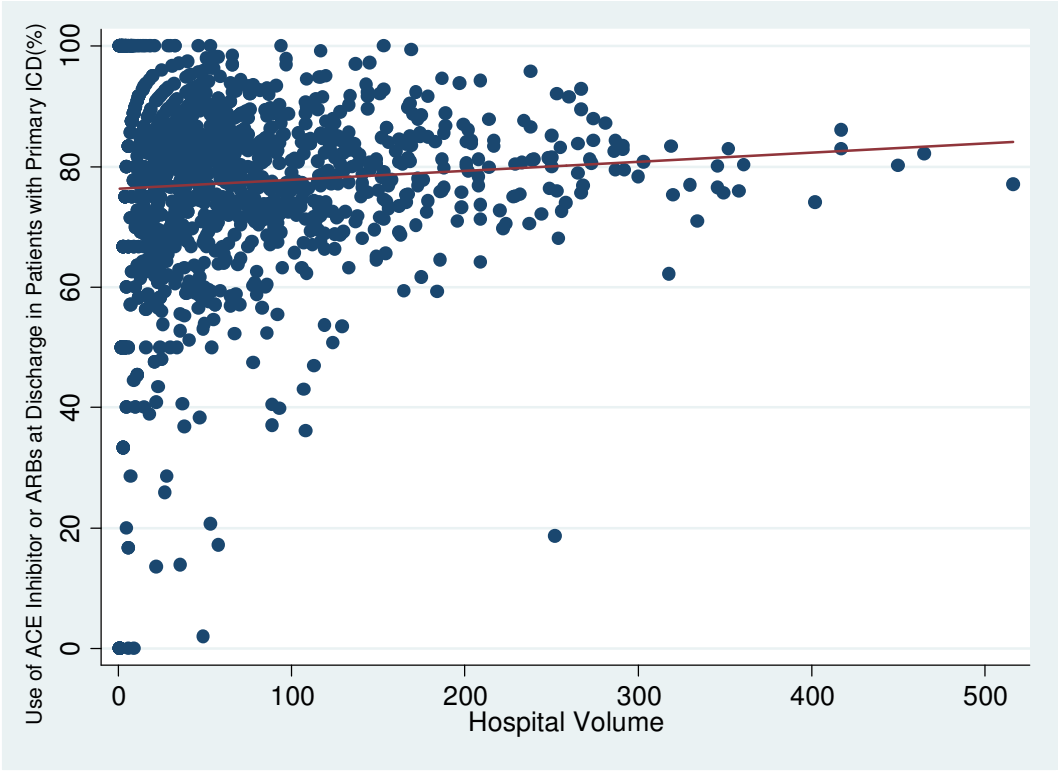
| Description | %White | %White | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Q1 (0.00% to 72.73%) | | Q2 (72.74% to 87.69%) | | Q3 (87.70% to 96.12%) | | Q4 (96.13% to 100.00%) | |
| | | Volume | ACEI or ARB | Volume | ACEI or ARB | Volume | ACEI or ARB | Volume | ACEI or ARB |
| N | 1278 | 321 | 321 | 321 | 321 | 316 | 316 | 320 | 320 |
| Mean | 0.8138 | 78.21 | 0.7593 | 98.24 | 0.7614 | 96.15 | 0.7851 | 52.55 | 0.7670 |
| Std Deviation | 0.2007 | 94.53 | 0.1649 | 95.01 | 0.1473 | 84.07 | 0.1064 | 65.59 | 0.2039 |
| 100% Max | 1.0000 | 660 | 1.0000 | 618 | 1.0000 | 552 | 1.0000 | 348 | 1.0000 |
| 99% | 1.0000 | 409 | 1.0000 | 403 | 1.0000 | 340 | 1.0000 | 320 | 1.0000 |
| 95% | 1.0000 | 272 | 1.0000 | 281 | 0.9451 | 287 | 0.9429 | 184.5 | 1.0000 |
| 90% | 1.0000 | 206 | 0.9571 | 245 | 0.9167 | 202 | 0.9167 | 137.5 | 1.0000 |
| 75% Q3 | 0.9613 | 106 | 0.8603 | 133 | 0.8529 | 131 | 0.8564 | 75.5 | 0.8904 |
| **50% Median** | 0.8750 | 43 | 0.7778 | 71 | 0.7778 | 68 | 0.7928 | 29 | 0.8035 |
| 25% Q1 | 0.7333 | 15 | 0.6707 | 29 | 0.7143 | 35.5 | 0.7273 | 6 | 0.7000 |
| 10% | 0.5306 | 5 | 0.5556 | 9 | 0.6000 | 20 | 0.6400 | 2 | 0.5000 |
| 5% | 0.3810 | 3 | 0.4737 | 6 | 0.5075 | 17 | 0.5918 | 1 | 0.4000 |
| 1% | 0.0909 | 1 | 0.2593 | 4 | 0.1667 | 11 | 0.4762 | 1 | 0.0000 |
| 0% Min | 0.0000 | 1 | 0.0000 | 4 | 0.0196 | 9 | 0.3763 | 1 | 0.0000 |

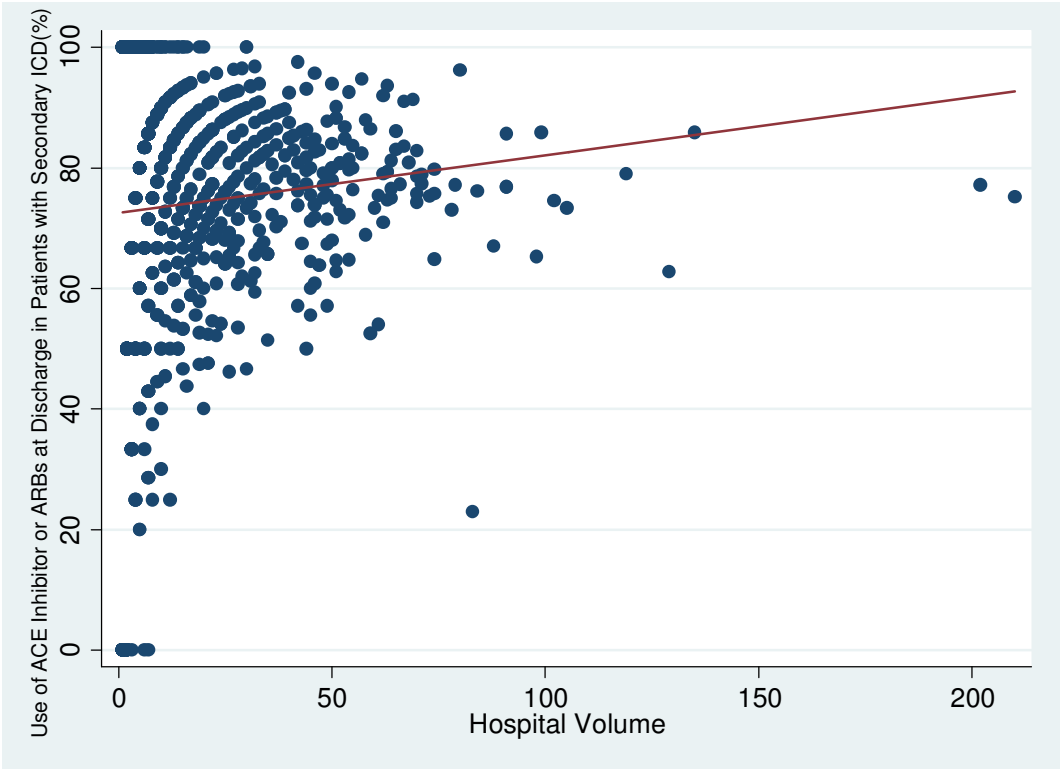

Use of ACE inhibitor or ARB at Discharge (%)
0
20
40
60
80
100
Q1
Q2
Q3
Q4

| Distribution of AEC inhibitor or ARB use at Discharge Stratified by ICD indication | | | | |
|---|---|---|---|---|
| | ICD Indication | | | |
| **Description** | **Priamry** | | **Secondary** | |
| | **Volume** | **ACEI or ARB** | **Volume** | **ACEI or ARB** |
| N | 1275 | 1275 | 973 | 973 |
| Mean | 67.85 | 0.7734 | 17.81 | 0.7421 |
| Std Deviation | 72.76 | 0.1652 | 21.26 | 0.2366 |
| 100% Max | 516 | 1.0000 | 210 | 1.0000 |
| 99% | 334 | 1.0000 | 91 | 1.0000 |
| 95% | 222 | 1.0000 | 59 | 1.0000 |
| 90% | 166 | 0.9600 | 46 | 1.0000 |
| 75% Q3 | 92 | 0.8750 | 24 | 0.9020 |
| 50% Median | 44 | 0.7979 | 10 | 0.7857 |
| 25% Q1 | 16 | 0.7089 | 4 | 0.6539 |
| 10% | 5 | 0.5924 | 1 | 0.5000 |
| 5% | 3 | 0.5000 | 1 | 0.2500 |
| 1% | 1 | 0.0000 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |


Number of Hospitals
0
50
100
150
0
20
40
60
80
100
Use of ACE Inhibitor or ARBs at Discharge in Patients with Primary ICD (%)


Number of Hospitals
0
50
100
150
200
0
20
40
60
80
100
Use of ACE Inhibitor or ARBs at Discharge in Patients with Secondary ICD (%)


Use of ACE Inhibitor or ARBs at Discharge in Patients with Primary ICD(%)
0
20
40
60
80
100
0
100
200
300
400
500
Hospital Volume


Use of ACE Inhibitor or ARBs at Discharge in Patients with Secondary ICD(%)
0
20
40
60
80
100
0
50
100
150
200
Hospital Volume

# NATIONAL QUALITY FORUM

**Measure Evaluation 4.1**
**December 2009**

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

**TAP/Workgroup** (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas).*

**Steering Committee:** Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the criteria are met
C = Completely (unquestionably demonstrated to meet the criterion)
P = Partially (demonstrated to partially meet the criterion)
M = Minimally (addressed BUT demonstrated to only minimally meet the criterion)
N = Not at all (NOT addressed; OR incorrectly addressed; OR demonstrated to NOT meet the criterion)
NA = Not applicable (only an option for a few subcriteria as indicated)

| (for NQF staff use) **NQF Review #:** 1528 **NQF Project:** Cardiovascular Endorsement Maintenance 2010 |
|---|
| **MEASURE DESCRIPTIVE INFORMATION** |
| De.1 **Measure Title:** Beta Blocker at Discharge for ICD implant patients with a previous MI |
| De.2 **Brief description of measure***:* Proportion of ICD implant patients with a diagnosis of previous MI who are prescribed a Beta Blocker at discharge. |
| 1.1-2 **Type of Measure:** Process<br>De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** N/A |
| De.4 **National Priority Partners Priority Area:**<br>De.5 **IOM Quality Domain**: Effectiveness, Timeliness<br>De.6 **Consumer Care Need:** Getting better, Living with illness |

| **CONDITIONS FOR CONSIDERATION BY NQF** | |
|---|---|
| Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards: | **NQF Staff** |
| **A.** The measure is in the public domain or an intellectual property (measure steward agreement) is signed. *Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.*<br>A.1 **Do you attest that the measure steward holds intellectual property rights to the measure and the right to use aspects of the measure owned by another entity (e.g., risk model, code set)?** Yes<br>A.2 **Indicate if Proprietary Measure** (*as defined in measure steward agreement*)**:**<br>A.3 **Measure Steward Agreement:** Agreement will be signed and submitted prior to or at the time of measure submission<br>A.4 **Measure Steward Agreement attached:** NQF - signed-634272258470379690.pdf | **A**<br>**Y**☐<br>**N**☐ |
| **B.** The measure owner/steward verifies there is an identified responsible entity and process to maintain and | **B** |

| | |
|---|---|
| update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. Yes, information provided in contact section | Y☐ N☐ |
| **C.** The intended use of the measure includes both public reporting and quality improvement.<br>►**Purpose:** Public reporting, Internal quality improvement<br>Accountability, Payment incentive, Accreditation | C<br>Y☐<br>N☐ |
| **D.** The requested measure submission information is complete. Generally, measures should be fully developed and tested so that all the evaluation criteria have been addressed and information needed to evaluate the measure is provided. Measures that have not been tested are only potentially eligible for a time-limited endorsement and in that case, measure owners must verify that testing will be completed within 12 months of endorsement.<br>D.1**Testing:** Yes, fully developed and tested<br>D.2 **Have NQF-endorsed measures been reviewed to identify if there are similar or related measures?**<br>Yes | D<br>Y☐<br>N☐ |
| (for NQF staff use**)** **Have all conditions for consideration been met?**<br>**Staff Notes to Steward** (*if submission returned*)**:** | **Met**<br>Y☐<br>N☐ |
| **Staff Notes to Reviewers** (*issues or questions regarding any criteria*)**:** | |
| **Staff Reviewer Name(s):** | |

| | |
|---|---|
| **TAP/Workgroup Reviewer Name:** | |
| **Steering Committee Reviewer Name:** | |
| **1. IMPORTANCE TO MEASURE AND REPORT** | |
| Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in or overall poor performance.<br>*Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria.* (evaluation criteria)<br>**1a. High Impact** | **Eval Rating** |
| (for NQF staff use) **Specific NPP goal**: | |
| 1a.1 **Demonstrated High Impact Aspect of Healthcare:** Affects large numbers, Frequently performed procedure, Leading cause of morbidity/mortality, High resource use, Severity of illness<br>1a.2<br><br>1a.3 **Summary of Evidence of High Impact:** Optimal medical therapy is critical to ensure favorable patient outcomes following implantation of an implantable cardiac defibrillator (ICD) to prevent sudden cardiac death (SCD). In 2006, 114,000 inpatient defibrillator implantations were performed. The mean hospital charge for ICD procedures was $115,763.<br><br>Coronary heart disease caused approximately 1 of every 6 deaths in the US in 2006. Coronary heart disease mortality in 2006 was 425,425. In 2010, an estimated 785,000 Americans will have a new coronary attack, and approximately 470,000 will have a recurrent attack. Over half of ICD implant patients have a previous myocardial infarction (MI). Therefore, it is critical that these patients be prescribed or continued on guideline-based medical therapy for a previous MI. Optimal medical therapy for these patients improves rates of mortality and morbidity, as well as associated hospitalizations and repeat interventional procedures.<br><br>1a.4 **Citations for Evidence of High Impact:** American Heart Association. Heart disease and stroke statistics-2010 update: A report of the American Heart Association. Available at: http://circ.ahajournals.org/cgi/content/abstract/CIRCULATIONAHA.109.192667v1. Accessed December 3, 2010. | **1a**<br>C☐<br>P☐<br>M☐<br>N☐ |

**Comment [KP1]: 1a.** The measure focus addresses:
•a specific national health goal/priority identified by NQF's National Priorities Partners; OR
•a demonstrated high impact aspect of healthcare (e.g., affects large numbers, leading cause of morbidity/mortality, high resource use (current and/or future), severity of illness, and patient/societal consequences of poor quality).

**1b. Opportunity for Improvement**

**1b.1 Benefits (improvements in quality) envisioned by use of this measure:** This measure allows benchmarking against the national aggregate and against hospitals with similar procedural volume, so that hospitals with low performance rates can engage in quality improvement efforts to improve compliance for this measure and subsequently improve patient outcomes related to this measure.

**1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:**
Mean: 0.874
SD: 0.137

Quartile 1: 0.833
Median: 0.903
Quartile 3: 0.955
95%: 1.00

**1b.3 Citations for data on performance gap:**
Unpublished NCDR data

**1b.4 Summary of Data on disparities by population group:**
Mean by hospital SES (proportion white patients):
0-80.6% white:86.9%
80.6-91.9% white:87.5%
91.9-98.8% white:89.2
98.8-100% white:86.0

Mean performance by safety net status (defined as government hospitals or non-governmental hospitals with high medicaid caseload using AHA 2008 data):
Not a safety net hospital: 87.3%
Safety net hospital: 87.9%

**1b.5 Citations for data on Disparities:**
Unpublished NCDR data

**1b**
C☐
P☐
M☐
N☐

**1c. Outcome or Evidence to Support Measure Focus**

**1c.1 Relationship to Outcomes** (*For non-outcome measures, briefly describe the relationship to desired outcome. For outcomes, describe why it is relevant to the target population*)**:** The benefits of beta blocker therapy in patients without contraindications have been demonstrated with or without reperfusion, initiated early or later in the clinical course, and for all age groups. The greatest mortality benefit is seen in patients with the greatest baseline risk: those with impaired ventricular function or ventricular arrhythmias and those who do not undergo reperfusion. The benefits of beta-blocker therapy for secondary prevention are well established.

**1c.2-3. Type of Evidence:** Observational study, Evidence-based guideline, Randomized controlled trial, Expert opinion, Systematic synthesis of research

**1c.4 Summary of Evidence** (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
Many large studies have demonstrated the benefit of beta blocker therapy for coronary artery disease. Meta analyses of randomized trials and observational studies have shown a substantial reduction in mortality as a result of beta blocker therapy. These studies have shown that beta blockers reduce mortality by approximately 23% in prospective trials and up to 40% in observational studies.

**1c.5 Rating of strength/quality of evidence** (*also provide narrative description of the rating and by whom*)**:**
Level of Evidence A: Data derived from multiple randomized clinical trials or meta-analyses.

**1c.6 Method for rating evidence:** The weight of evidence in support of the recommendation is listed as

**1c**
C☐
P☐
M☐
N☐

**Comment [KP2]: 1b.** Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating considerable variation, or overall poor performance, in the quality of care across providers and/or population groups (disparities in care).

**Comment [k3]:** 1 Examples of data on opportunity for improvement include, but are not limited to: prior studies, epidemiologic data, measure data from pilot testing or implementation. If data are not available, the measure focus is systematically assessed (e.g., expert panel rating) and judged to be a quality problem.

**Comment [k4]: 1c.** The measure focus is:
•an outcome (e.g., morbidity, mortality, function, health-related quality of life) that is relevant to, or associated with, a national health goal/priority, the condition, population, and/or care being addressed;
OR
•if an intermediate outcome, process, structure, etc., there is **evidence** that supports the specific measure focus as follows:
oIntermediate outcome – evidence that the measured intermediate outcome (e.g., blood pressure, Hba1c) leads to improved health/avoidance of harm or cost/benefit.
oProcess – evidence that the measured clinical or administrative process leads to improved health/avoidance of harm and
if the measure focus is on one step in a multi-step care process, it measures the step that has the greatest effect on improving the specified desired outcome(s).
oStructure – evidence that the measured structure supports the consistent delivery of effective processes or access that lead to improved health/avoidance of harm or cost/benefit.
oPatient experience – evidence that an association exists between the measure ... [1]

**Comment [k5]:** 4 Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multi-step process, the step with the greatest effect on the desired outcome should be selected as the focus of measurement. For example, although assessment of immunization status and recommending immunization are necessary steps, they are not sufficient to achieve the desired impact on health status – patients must be vaccinated to achieve ... [2]

**Comment [k6]:** 3 The strength of the body of evidence for the specific measure focus should be systematically assessed and rated (e.g., USPSTF grading system http://www.ahrq.gov/clinic/uspstf07/methods/benefit.htm). If the USPSTF grading system was not used, the grading system is explained including how it relates to the USPSTF grades or why it does not. However, evidence is not limited to quantitative studies and the best type of evidence depends upon the question being studied (e.g., randomized controlled trials appropriate for studying drug efficacy are not well suited for complex system ... [3]

follows:
• 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.

**1c.7 Summary of Controversy/Contradictory Evidence:** N/A

**1c.8 Citations for Evidence (***other than guidelines***):** Yusuf S, Peto R, Lewis J, et al. Beta blockade during and after myocardial infarction: an overview of the randomized trials. Prog Cardiovasc Dis. 1985;27:335-71. Gottlieb SS, McCarter RJ, Vogel RA. Effect of beta-blockade on mortality among high-risk and low-risk patients after myocardial infarction. N Engl J Med. 1998;339:489-97.

**1c.9 Quote the Specific guideline recommendation (***including guideline number and/or page number***):**
ACC/AHA STEMI Guidelines (2004)
Class I
1. All patients after STEMI except those at low risk (normal or near-normal ventricular function, successful reperfusion, absence of significant ventricular arrhythmias) and those with contraindications should receive beta-blocker therapy. Treatment should begin within a few days of the event, if not initiated acutely, and continue indefinitely. (Level of Evidence: A)

2. Patients with moderate or severe LV failure should receive beta-blocker therapy with a gradual titration scheme. (Level of Evidence: B)

Class IIa
It is reasonable to prescribe beta-blockers to low-risk patients after STEMI who have no contraindications to that class of medications. (Level of Evidence: A)
(Page e147)

ACC/AHA NSTEMI Guidelines (2007)
CLASS I
1. Beta blockers are indicated for all patients recovering from UA/
NSTEMI unless contraindicated. (For those at low risk, see Class IIa recommendation below). Treatment should begin within a few days of the event, if not initiated acutely, and should be continued indefinitely. (Level of Evidence: B)
2. Patients recovering from UA/NSTEMI with moderate or severe LV failure should receive beta-blocker therapy with a gradual titration scheme. (Level of Evidence: B)
CLASS IIa
It is reasonable to prescribe beta blockers to low-risk patients (i.e.,
normal LV function, revascularized, no high-risk features) recovering from UA/NSTEMI in the absence of absolute contraindications. (Level
of Evidence: B)
(Page e91)

ACC/AHA Secondary Prevention Guidelines (2006), Beta Blockers:
Start and continue indefinitely in all patients who have had myocardial infarction, acute coronary syndrome, or left ventricular dysfunction with or without heart failure symptoms, unless contraindicated. I (A)
Consider chronic therapy for all other patients with coronary or other vascular disease or diabetes unless contraindicated. IIa (C) (Page 2132)

**1c.10 Clinical Practice Guideline Citation:** 1. Antman EM, Anbe DT, Armstrong PW, et al. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1999 Guidelines for the Management of Patients with Acute Myocardial Infarction). Circulation. 2004;110:e82-292.

2. Smith SC, Jr., Allen J, Blair SN, et al. AHA/ACC guidelines for secondary prevention for patients with coronary and other atherosclerotic vascular disease: 2006 update endorsed by the National Heart, Lung, and Blood Institute. J Am Coll Cardiol. 2006;47:2130-9.

3. Anderson JL, Adams CD, Antman EM, et al. ACC/AHA 2007 guidelines for the management of patients with unstable angina/non-ST-Elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction) developed in collaboration with the American College of Emergency Physicians, the Society for Cardiovascular Angiography and Interventions, and the Society of Thoracic Surgeons endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation and the Society for Academic Emergency Medicine. J Am Coll Cardiol. 2007;50:e1-e157.

**1c.11 National Guideline Clearinghouse or other URL:** http://www.cardiosource.org/Science-And-Quality/Practice-Guidelines-and-Quality-Standards.aspx

**1c.12 Rating of strength of recommendation (***also provide narrative description of the rating and by whom***):**
Class I: Conditions for which there is evidence for and/or general agreement that a given procedure or treatment is beneficial, useful, and effective.

**1c.13 Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF)***:**
ACC/AHA Taskforce on Practice Guidelines Method:

Indications are categorized as class I, II, or III on the basis of a multifactorial assessment of risk and expected efficacy viewed in the context of current knowledge and the relative strength of this knowledge. These classes summarize the recommendations for procedures or treatments as follows:

Class I: Conditions for which there is evidence for 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.

**1c.14 Rationale for using this guideline over others:**
These guidelines is the most widely recognized professional guideline in the US for cardiovascular medicine for patients with coronary artery disease.

**Comment [k7]:** USPSTF grading system **http://www.ahrq.gov/clinic/uspstf/grades.htm**: **A -** The USPSTF recommends the service. There is high certainty that the net benefit is substantial. **B -** The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial. **C -** The USPSTF recommends against routinely providing the service. There may be considerations that support providing the service in an individual patient. There is at least moderate certainty that the net benefit is small. Offer or provide this service only if other considerations support the offering or providing the service in an individual patient. **D -** The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits. **I -** The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

| | |
|---|---|
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Importance to Measure and Report?* | **1** |
| **Steering Committee: Was the threshold criterion,** *Importance to Measure and Report***, met?**<br>**Rationale:** | **1**<br>**Y☐**<br>**N☐** |
| **2. SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES** | |
| Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. (evaluation criteria) | **Eval Rating** |
| **2a. MEASURE SPECIFICATIONS** | |

**S.1 Do you have a web page where current detailed measure specifications can be obtained?**
**S.2 If yes, provide web page URL:**

**2a. Precisely Specified**

**2a.1 Numerator Statement (***Brief, text description of the numerator - what is being measured about the target population, e.g. target condition, event, or outcome***):**
Count of patients discharged on beta-blocker therapy.

**2a.2 Numerator Time Window (***The time period in which cases are eligible for inclusion in the numerator***):**
1 year

**2a.3 Numerator Details (***All information required to collect/calculate the numerator, including all codes, logic, and definitions***):**
discharge medication of beta blocker (any)= yes

**2a.4 Denominator Statement (***Brief, text description of the denominator - target population being measured***):**
Count of patients with an ICD implant without contraindication to beta-blockers

**2a.5 Target population gender:** Female, Male
**2a.6 Target population age range:** All Patients

**2a.7 Denominator Time Window (***The time period in which cases are eligible for inclusion in the denominator***):**
1 year

**2a.8 Denominator Details (***All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
Procedure type= initial generator implant=yes or generator change=yes
Previous MI= yes

**2a.9 Denominator Exclusions (***Brief text description of exclusions from the target population***):** -Patients who expired
-Beta-blocker therapy contraindicated or blinded.

Contraindicated supporting definition:
Medication was not prescribed because of a contraindication.
Contraindications must be documented explicitly by the physician, or clearly evidenced within the medical record

Blinded supporting definition:
Patient was in research study or clinical trial and administration of this specific medication is unknown

**2a.10 Denominator Exclusion Details (***All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Discharge status=deceased
Beta blocker (any)= contraindicated or blinded

**2a.11 Stratification Details/Variables (***All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
N/A

**2a.12-13 Risk Adjustment Type:**

**2a.14 Risk Adjustment Methodology/Variables (***List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
N/A

**2a.15-17 Detailed risk model available Web page URL or attachment:**

**2a-specs**
**C**☐
**P**☐
**M**☐
**N**☐

**Comment [KP8]: 2a.** The measure is well defined and precisely specified so that it can be implemented consistently within and across organizations and allow for comparability. The required data elements are of high quality as defined by NQF's Health Information Technology Expert Panel (HITEP) .

**Comment [k9]:** 11 Risk factors that influence outcomes should not be specified as exclusions.
12 Patient preference is not a clinical exception to eligibility and can be influenced by provider interventions.

**2a.18-19 Type of Score:** Rate/proportion
**2a.20 Interpretation of Score:** Better quality = Higher score
**2a.21 Calculation Algorithm (***Describe the calculation of the measure as a flowchart or series of steps***):**
Denominator Calculation:
1. Count of patients with arrival/discharge dates from data submissions that pass NCDR data inclusion thresholds
2. Exclude patients with arrival/discharge dates without initial generator implant or generator change
3. Exclude patients with prior MI=no
4. Exclude patients with discharge status=deceased
5. Exclude patients with Beta blocker (any)= contraindicated or blinded

Numerator Calculation:
6. From denominator population, count of patients with discharge medication of Beta Blocker (any)=yes.

**2a.22 Describe the method for discriminating performance** *(e.g., significance testing)***:**
Hospital performance for this measure is benchmarked each quarter and annually against hospitals with similar procedural volume, as well as against the ICD Registry aggregate. These benchmarks identify superior performance and encourage poorer performers to improve. The methodology is a data-driven, peer-group performance feedback used to positively affect outcomes.

**2a.23 Sampling (Survey) Methodology** *If measure is based on a sample (or survey), provide instructions for obtaining the sample, conducting the survey and guidance on minimum sample size (response rate)*:

**2a.24 Data Source (***Check the source(s) for which the measure is specified and tested)*
Registry data

**2a.25 Data source/data collection instrument (***Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.***):**
National Cardiovascular Data Registry (NCDR)® ICD RegistryTM

**2a.26-28 Data source/data collection instrument reference web page URL or attachment:** URL
http://www.ncdr.com/WebNCDR/ICD/ELEMENTS.ASPX

**2a.29-31 Data dictionary/code table web page URL or attachment:** URL
http://www.ncdr.com/WebNCDR/ICD/ELEMENTS.ASPX

**2a.32-35 Level of Measurement/Analysis** (*Check the level(s) for which the measure is specified and tested)*
Facility/Agency

**2a.36-37 Care Settings (***Check the setting(s) for which the measure is specified and tested)*
Hospital, Ambulatory Care: Hospital Outpatient

**2a.38-41 Clinical Services** (*Healthcare services being measured, check all that apply*)
Clinicians: PA/NP/Advanced Practice Nurse, Clinicians: Physicians (MD/DO)

## TESTING/ANALYSIS

**2b. Reliability testing**

**2b.1 Data/sample** *(description of data/sample and size)***:** Reliability was established by validating the derivation cohort from 2009 with data from 2008. 131,371 patient records were analyzed from 1283 facilities between January and December 2008.

**2b.2 Analytic Method** *(type of reliability & rationale, method for testing)***:**
Reliability was established by validating the derivation cohort from 2009 with data from 2008.

**2b.3 Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:**
Results were consistent among the derivation cohort and the testing cohort. Specifically, the median for

**2b**
C☐
P☐
M☐
N☐

**Comment [KP10]: 2b.** Reliability testing demonstrates the measure results are repeatable, producing the same results a high proportion of the time when assessed in the same population in the same time period.

**Comment [k11]:** 8 Examples of reliability testing include, but are not limited to: inter-rater/abstractor or intra-rater/abstractor studies; internal consistency for multi-item scales; test-retest for survey items. Reliability testing may address the data items or final measure score.

hospitals in the derivation cohort was 89.2% with the lowest decile 70.6% and highest decile 100%. This is similar to that observed in the testing cohort (median 91.7%, lowest decile 66.7%, highest decile 100%).

The Data Quality Report (DQR) program has been developed to ensure data are valid and complete. The DQR is a process for submitting data files to the NCDR®. Participants use their data collection tool software to create a submission file which is uploaded to the NCDR website. After uploading, the data in the file is automatically checked for errors and completeness. Passing the DQR ensures well-formed data and a statistically significant submission. Types of errors detected by the DQR include:
Schema:Structure doesn't match NCDR requirements
Dates: Inconsistent dates
Selection: Missing or mismatched data; Can be a parent/child errors where a field requests more data.
Outlier: Anomalies or exceptions; Data exceeds the possible limits. For example: 1,000mm length lesion.
Counter: errors deal with Closure Methods, Lesions, and Intracoronary Devices. Each one has a counter, when more than one is used
List: Missing data in the Medications or either Device lists1

**2c. Validity testing**

2c.1 **Data/sample** *(description of data/sample and size)*: Face/content validity: review of relevant evidence and guidelines and expert panel consensus process

2c.2 **Analytic Method** *(type of validity & rationale, method for testing)*:
Face/content validity was established to ensure this measure represented an important aspect of cardiovascular care for which improvement is needed.

2c.3 **Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:
A review of the relevant evidence and guidelines and expert panel consensus process resulted in the conclusion that this is a valid measure of quality of cardiovascular care for patients receiving an ICD.

**2c** C☐ P☐ M☐ N☐

**2d. Exclusions Justified**

2d.1 **Summary of Evidence supporting exclusion(s):**

2d.2 **Citations for Evidence:**

2d.3 **Data/sample** *(description of data/sample and size)*: 144,538 patient records from 1305 hospitals in the ICD registry from January 2009 to December 2009.

2d.4 **Analytic Method** *(type analysis & rationale)*:
Rate of exclusion coding.

2d.5 **Testing Results** *(e.g., frequency, variability, sensitivity analyses)*:
Deceased: 0.32%
Beta blocker contraindicated or blinded: 1.25%

**2d** C☐ P☐ M☐ N☐ NA☐

**2e. Risk Adjustment for Outcomes/ Resource Use Measures**

2e.1 **Data/sample** *(description of data/sample and size)*: N/A

2e.2 **Analytic Method** *(type of risk adjustment, analysis, & rationale)*:
N/A

2e.3 **Testing Results** *(risk model performance metrics)*:
N/A

2e.4 **If outcome or resource use measure is not risk adjusted, provide rationale:** N/A

**2e** C☐ P☐ M☐ N☐ NA☐

**Comment [KP12]: 2c.** Validity testing demonstrates that the measure reflects the quality of care provided, adequately distinguishing good and poor quality. If face validity is the only validity addressed, it is systematically assessed.

**Comment [k13]:** 9 Examples of validity testing include, but are not limited to: determining if measure scores adequately distinguish between providers known to have good or poor quality assessed by another valid method; correlation of measure scores with another valid indicator of quality for the specific topic; ability of measure scores to predict scores on some other related valid measure; content validity for multi-item scales/tests. Face validity is a subjective assessment by experts of whether the measure reflects the quality of care (e.g., whether the proportion of patients with BP < 140/90 is a marker of quality). If face validity is the only validity addressed, it is systematically assessed (e.g., ratings by relevant stakeholders) and the measure is judged to represent quality care for the specific topic and that the measure focus is the most important aspect of quality for the specific topic.

**Comment [KP14]: 2d.** Clinically necessary measure exclusions are identified and must be:
•supported by evidence of sufficient frequency of occurrence so that results are distorted without the exclusion;
AND
•a clinically appropriate exception (e.g., contraindication) to eligibility for the measure focus;
AND
•precisely defined and specified:
–if there is substantial variability in exclusions across providers, the measure is specified so that exclusions are computable and the effect on the measure is transparent (i.e., impact clearly delineated, such as number of ca ... [4]

**Comment [k15]:** 10 Examples of evidence that an exclusion distorts measure results include, but are not limited to: frequency of occurrence, sensitivity analyses with and without the exclusion, and variability of exclusions across providers.

**Comment [KP16]: 2e.** For outcome measures and other measures (e.g., resource use) when indicated:
•an evidence-based risk-adjustment strategy (e.g., risk models, risk stratification) is specified and is based on patient clinical factors that influence the measured outcome (but not disparities in care) and are present at start of care;[Error! Bookmark not defined.] OR
rationale/data support no risk adjustment.

**Comment [k17]:** 13 Risk models should not obscure disparities in care for populations by including factors that are associated with differences/inequalities in care such as race, socioeconomic status, gender (e.g., poorer treatment outcomes of African American men with prostate cancer, inequalities in treatment for CVD risk factors between men and women). It is preferable to stratify measures by race and socioeconomic status rather than adjusting out differences.

**2f. Identification of Meaningful Differences in Performance**

2f.1 **Data/sample from Testing or Current Use** *(description of data/sample and size)*: 144,538 patient records from 1305 hospitals in the ICD registry from January 2009 to December 2009.

2f.2 **Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*:
Distribution of performance by percentile to demonstrate variability across hospitals.

2f.3 **Provide Measure Scores from Testing or Current Use** *(description of scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance)*:
Mean: 0.874
SD: 0.137

Quartile 1: 0.833
Median: 0.903
Quartile 3: 0.955
95%: 1.00

**2f**
C☐
P☐
M☐
N☐

**Comment [KP18]: 2f.** Data analysis demonstrates that methods for scoring and analysis of the specified measure allow for identification of statistically significant and practically/clinically meaningful differences in performance.

**Comment [k19]:** 14 With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage of patients who received smoking cessation counseling (e.g., 74% v. 75%) is clinically meaningful; or whether a statistically significant difference of $25 in cost for an episode of care (e.g., $5,000 v. $5,025) is practically meaningful. Measures with overall poor performance may not demonstrate much variability across providers.

**2g. Comparability of Multiple Data Sources/Methods**

2g.1 **Data/sample** *(description of data/sample and size)*: N/A

2g.2 **Analytic Method** *(type of analysis & rationale)*:
N/A

2g.3 **Testing Results** *(e.g., correlation statistics, comparison of rankings)*:
N/A

**2g**
C☐
P☐
M☐
N☐
NA☐

**Comment [KP20]: 2g.** If multiple data sources/methods are allowed, there is demonstration they produce comparable results.

**2h. Disparities in Care**

2h.**1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*:

2h.2 **If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:**
No disparities have been reported for this measure.

**2h**
C☐
P☐
M☐
N☐
NA☐

**Comment [KP21]: 2h.** If disparities in care have been identified, measure specifications, scoring, and analysis allow for identification of disparities through stratification of results (e.g., by race, ethnicity, socioeconomic status, gender);OR rationale/data justifies why stratification is not necessary or not feasible.

**TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Scientific Acceptability of Measure Properties?*

**2**

**Steering Committee: Overall, to what extent was the criterion,** *Scientific Acceptability of Measure Properties*, **met?**
**Rationale:**

*2*
C☐
P☐
M☐
N☐

## 3. USABILITY

Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making. (evaluation criteria)

**Eval Rating**

**3a. Meaningful, Understandable, and Useful Information**

3a.1 **Current Use:** In use

3a.2 **Use in a public reporting initiative (disclosure of performance results to the public at large)** *(If used in a public reporting initiative, provide name of initiative(s), locations, Web page URL(s). If not publicly reported, state the plans to achieve public reporting within 3 years)*:
ACCF plans to begin voluntary public reporting of NCDR measures, including this measure, by 2012. ACCF is currently evaluating public reporting options and finalizing decisions related to location and display of information to be reported as well as communication plans.

**3a**
C☐
P☐
M☐
N☐

**Comment [KP22]: 3a**. Demonstration that information produced by the measure is meaningful, understandable, and useful to the intended audience(s) for both public reporting (e.g., focus group, cognitive testing) and informing quality improvement (e.g., quality improvement initiatives). An important outcome that may not have an identified improvement strategy still can be useful for informing quality improvement by identifying the need for and stimulating new approaches to improvement.

**3a.3 If used in other programs/initiatives (***If used in quality improvement or other programs/initiatives, name of initiative(s), locations, Web page URL(s). If not used for QI, state the plans to achieve use for QI within 3 years***):**
This measure is used for QI by NCDR ICD Registry participating institutions. As of October 2010, 1582 institutions are enrolled in the ICD registry. 78% submit data on all patients and 22% submit data on CMS patients only as part of a CMS mandate for submission of primary prevention data for all primary prevention ICD implant procedures.

Participating institutions receive an institutional outcomes report each quarter with their hospital´s data. Over 1000 metrics are included in version 1 of each hospital´s outcomes report. 10 metrics are highlighted in the all patients report executive summary (16 for version 2 which will be released in early 2011). These metrics are selected by an NCDR panel of experts as presenting the greatest opportunity for care improvement. Hospitals receive their measure score, as well as the rates for all hospitals in the ICD registry, and all hospitals in the same comparison group (based on volume), and the rate for the 90th and 50th percentiles. A box and whisker plot is displayed for each metric to show hospitals how they compare to all hospitals in the ICD registry.

This measure is also provided to Hospital Corporation of America (HCA) for incorporation in their QI program efforts.

The Centers for Medicare & Medicaid Services (CMS) mandates that all institutions submit data on ICD implant procedures for primary prevention in order to receive reimbursement for these procedures. CMS will use this data for assessment of the efficacy of ICD use for primary prevention.

**Testing of Interpretability** (*Testing that demonstrates the results are understood by the potential users for public reporting and quality improvement*)
**3a.4 Data/sample** *(description of data/sample and size)***:** 849 ICD registry participants, fall 2010.

**3a.5 Methods** *(e.g., focus group, survey, QI project)***:**
Online survey

**3a.6 Results** *(qualitative and/or quantitative results and conclusions)***:**
75% of survey participants answered yes to the question "Will the following metrics provide information that will be valuable for quality improvement at your institution?"

**3b/3c. Relation to other NQF-endorsed measures**

**3b.1 NQF # and Title of similar or related measures:**
#117: Beta Blockade at Discharge, #160 Beta blocker prescribed at discharge for AMI, #238 Beta blocker on discharge

(for NQF staff use) **Notes on similar/related endorsed or submitted measures:**

**3b. Harmonization**
If this measure is related to measure(s) already endorsed by NQF (e.g., same topic, but different target population/setting/data source or different topic but same target population):
**3b.2 Are the measure specifications harmonized? If not, why?**
This measure is aligned with the CMS measure #160, except that it does not include exclusions for discharge to hospice, against medical advice, or patients with comfort care measures only. A data element will be added to the ICD registry in the future for discharge location, and the measure will subsequently be updated at that time with these exclusions

**3b**
C☐ P☐ M☐ N☐ NA☐

**3c. Distinctive or Additive Value**
**3c.1 Describe the distinctive, improved, or additive value this measure provides to existing NQF-endorsed measures:**
This measure provides additive value to existing NQF-endorsed measures. #117 and #238 apply to CABG patients, while #160 applies to AMI patients. There is currently not an endorsed measure for beta blocker prescribed at discharge for ICD patients with a previous MI. This measure uses a different data source (registry) than the CMS measure (medical record).

**3c**
C☐ P☐ M☐ N☐ NA☐

**Comment [KP23]: 3b.** The measure specifications are harmonized with other measures, and are applicable to multiple levels and settings.

**Comment [k24]:** 16 Measure harmonization refers to the standardization of specifications for similar measures on the same topic (e.g., *influenza immunization* of patients in hospitals or nursing homes), or related measures for the same target population (e.g., eye exam and HbA1c for *patients with diabetes*), or definitions applicable to many measures (e.g., age designation for children) so that they are uniform or compatible, unless differences are dictated by the evidence. The dimensions of harmonization can include numerator, denominator, exclusions, and data source and collection instructions. The extent of harmonization depends on the relationship of the measures, the evidence for the specific measure focus, and differences in data sources.

**Comment [KP25]: 3c.** Review of existing endorsed measures and measure sets demonstrates that the measure provides a distinctive or additive value to existing NQF-endorsed measures (e.g., provides a more complete picture of quality for a particular condition or aspect of healthcare, is a more valid or efficient way to measure).

| | |
|---|---|
| **5.1 If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), Describe why it is a more valid or efficient way to measure quality:** | |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Usability*?** | **3** |
| **Steering Committee: Overall, to what extent was the criterion, *Usability*, met?**<br>**Rationale:** | **3**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **4. FEASIBILITY** | |
| Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. (evaluation criteria) | **Eval Rating** |
| **4a. Data Generated as a Byproduct of Care Processes**<br><br>**4a.1-2 How are the data elements that are needed to compute measure scores generated?**<br>Data generated as byproduct of care processes during care delivery (Data are generated and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition), Coding/abstraction performed by someone other than person obtaining original information (E.g., DRG, ICD-9 codes on claims, chart abstraction for quality measure or registry) | **4a**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **4b. Electronic Sources**<br><br>**4b.1 Are all the data elements available electronically?** (*elements that are needed to compute measure scores are in defined, computer-readable fields, e.g., electronic health record, electronic claims*)<br>Yes<br><br>**4b.2 If not, specify the near-term path to achieve electronic capture by most providers.** | **4b**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **4c. Exclusions**<br><br>**4c.1 Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications?**<br>No<br><br>**4c.2 If yes, provide justification.** | **4c**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐**<br>**NA☐** |
| **4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences**<br><br>**4d.1 Identify susceptibility to inaccuracies, errors, or unintended consequences of the measure and describe how these potential problems could be audited. If audited, provide results.**<br>The NCDR program takes a number of steps to minimize any potential for inaccuracies or errors in data used to report on performance back to hospitals. The process begins with support to data abstractors, including webinars, meetings, resource guides on the website, and clinical quality consultants available via e-mail or toll free phone number, to ensure consistent data collection. The NCDR establishes a unified electronic platform for data capture and submission that includes a certification process of the technical data collection tool selected by the hospital (either a commercially available software vendor product, the NCDR´s own web-based data collection tool, or a hospital´s customized electronic medical record system) that must occur prior to any data submissions. The certification process provides edit checks of data elements within the data collection tool to ensure a high quality data submission.<br><br>The NCDR data submission process includes a Data Quality Report (DQR) process that checks for validity in submissions based upon predetermined thresholds for element and composite completeness. The NCDR is putting in place a new strategy to systematically review the DQR results. | **4d**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |

**Comment [KP26]: 4a.** For clinical measures, required data elements are routinely generated concurrent with and as a byproduct of care processes during care delivery. (e.g., BP recorded in the electronic record, not abstracted from the record later by other personnel; patient self-assessment tools, e.g., depression scale; lab values, meds, etc.)

**Comment [KP27]: 4b.** The required data elements are available in electronic sources. If the required data are not in existing electronic sources, a credible, near-term path to electronic collection by most providers is specified and clinical data elements are specified for transition to the electronic health record.

**Comment [KP28]: 4c. Exclusions** should not require additional data sources beyond what is required for scoring the measure (e.g., numerator and denominator) unless justified as supporting measure validity.

**Comment [KP29]: 4d.** Susceptibility to inaccuracies, errors, or unintended consequences and the ability to audit the data items to detect such problems are identified.

The NCDR on-site audit program has been developed to assess the reliability of data abstraction. This annual process reviews key elements at a select number of patient reports at a select number of sites and provides feedback scores to the hospitals. Any elements not currently included in the on-site audit process and deemed critical to capture for this measure will be added upon NQF endorsement.

**4e. Data Collection Strategy/Implementation**

Comment [KP30]: **4e.** Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, etc.) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use).

4e.1 **Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data/missing data, timing/frequency of data collection, patient confidentiality, time/cost of data collection, other feasibility/ implementation issues:**
Beta testing with a sample of registry participants takes place with each new registry version to identify errors in the data collection tool. In addition, modifications are made to metrics based on feedback during a public comment period.

The Data Quality Report (DQR) program has been developed to ensure data are valid and complete. The DQR is a process for submitting data files to the NCDR. Participants use their data collection tool software to create a submission file which is uploaded to the NCDR website. After uploading, the data in the file are automatically checked for errors and completeness. Passing the DQR ensures well-formed data and a statistically significant submission. Types of errors detected by the DQR include:

Schema: Structure doesn´t match NCDR requirements
Dates: Inconsistent dates
Selection: Missing or mismatched data; can be parent/child errors where a field requests more data
Outlier: Anomalies or exceptions; data exceeds the possible limits.

4e.2 **Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:**
ICD registry participants pay a fee of $3,480/year (as of 2010) to enroll in the registry. Staff resources are needed for data collection and submission at the participating institution. Registry site managers/data collectors undergo (non-mandatory) training offered by the NCDR.

4e.3 **Evidence for costs:**
http://www.ncdr.com/WebNCDR/ncdrdocuments/B08352N%20ICD%20Registry%20Enrollment%20Packet%20Complete.pdf

4e.4 **Business case documentation:**

**4e**
C☐ P☐ M☐ N☐

**TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Feasibility*?

**4**

**Steering Committee: Overall, to what extent was the criterion,** *Feasibility*, **met?**
**Rationale:**

**4**
C☐ P☐ M☐ N☐

**RECOMMENDATION**

(for NQF staff use) **Check if measure is untested and only eligible for time-limited endorsement.**

**Time-limited** ☐

**Steering Committee: Do you recommend for endorsement?**
**Comments:**

Y☐ N☐ A☐

**CONTACT INFORMATION**

Co.1 **Measure Steward (Intellectual Property Owner)**
Co.1 **Organization**
American College of Cardiology Foundation (ACCF), 2400 N Street NW, Washington, District Of Columbia, 20037

Co.2 **Point of Contact**
Kristyne, McGuinn, kmcguinn@acc.org, 202-375-6529-

**Measure Developer If different from Measure Steward**
Co.3 **Organization**
American College of Cardiology Foundation (ACCF), 2400 N Street NW, Washington, District Of Columbia, 20037

Co.4 **Point of Contact**
Kristyne, McGuinn, kmcguinn@acc.org, 202-375-6529-

Co.5 **Submitter If different from Measure Steward POC**
Kristyne, McGuinn, kmcguinn@acc.org, 202-375-6529-, American College of Cardiology Foundation (ACCF)

Co.6 **Additional organizations that sponsored/participated in measure development**

## ADDITIONAL INFORMATION

**Workgroup/Expert Panel involved in measure development**
Ad.1 **Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.**
ICD Registry Steering Committee:
Mark S. Kremers, MD, FACC, FHRS Chair
Stephen C. Hammill, MD, FACC, FHRS Ex-Officio
Sana M. Al-Khatib, MD, FACC
Charles I. Berul, MD, FACC
Jeptha P. Curtis, MD, FACC
Paul A. Heidenreich, MD, FACC
Illeana L. Pina, MD, FACC
Matthew R. Reynolds, MD, FACC
Lynne Warner Stevenson, MD, FACC
Mary Norine Walsh, MD, FACC

Public Reporting Workgroup:
Fred Masoudi, MD, MSPH, FACC, FAHA, FACP
H. Vernon Anderson,MD, FACC, FSCAI
David Malenka, MD, FACC
Matt Roe, MD, FACC
Steve Hammill, MD, FHRS, FACC
Jeptha Curtis, MD, FACC
Paul Heidenreich, MD, MS, FACC
Brahmajee Nallamothu, MD, MPH, FACC
Mark Kremers, MD, FACC
Christopher White MD, FACC
Carl Tommaso, MD, FACC, FAHA, FSCAI
Sunil Rao, MD, FACC, FSCAI
Andrea Russo, MD, FACC, FHRS
Debabrata Mukherjee MD, FACC

Ad.2 **If adapted, provide name of original measure:** N/A
Ad.3-5 **If adapted, provide original specifications URL or attachment**

**Measure Developer/Steward Updates and Ongoing Maintenance**
Ad.6 **Year the measure was first released:** 2006
Ad.7 **Month and Year of most recent revision:** 12, 2010
Ad.8 **What is your frequency for review/update of this measure?** Every 3-4 years or if guideline updates warrant more frequent update, or with new dataset version.
Ad.9 **When is the next scheduled review/update for this measure?** 06, 2011

Ad.10 **Copyright statement/disclaimers:** 

| |
|---|
| **Ad.11 -13 Additional Information web page URL or attachment:** Attachment ICDbetablockerMITesting.pdf |
| **Date of Submission** (*MM/DD/YY*)**:** 12/14/2010 |

**Page 3: [1] Comment [k4]** **Karen Pace** **10/5/2009 8:59:00 AM**

**1c.** The measure focus is:

- an outcome (e.g., morbidity, mortality, function, health-related quality of life) that is relevant to, or associated with, a national health goal/priority, the condition, population, and/or care being addressed;

OR

- if an intermediate outcome, process, structure, etc., there is **evidence** that supports the specific measure focus as follows:
  - Intermediate outcome – evidence that the measured intermediate outcome (e.g., blood pressure, Hba1c) leads to improved health/avoidance of harm or cost/benefit.
  - Process – evidence that the measured clinical or administrative process leads to improved health/avoidance of harm and
    if the measure focus is on one step in a multi-step care process, it measures the step that has the greatest effect on improving the specified desired outcome(s).
  - Structure – evidence that the measured structure supports the consistent delivery of effective processes or access that lead to improved health/avoidance of harm or cost/benefit.
  - Patient experience – evidence that an association exists between the measure of patient experience of health care and the outcomes, values and preferences of individuals/ the public.
  - Access – evidence that an association exists between access to a health service and the outcomes of, or experience with, care.
  - Efficiency – demonstration of an association between the measured resource use and level of performance with respect to one or more of the other five IOM aims of quality.

**Page 3: [2] Comment [k5]** **Karen Pace** **10/5/2009 8:59:00 AM**

4 Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multi-step process, the step with the greatest effect on the desired outcome should be selected as the focus of measurement. For example, although assessment of immunization status and recommending immunization are necessary steps, they are not sufficient to achieve the desired impact on health status – patients must be vaccinated to achieve immunity. This does not preclude consideration of measures of preventive screening interventions where there is a strong link with desired outcomes (e.g., mammography) or measures for multiple care processes that affect a single outcome.

**Page 3: [3] Comment [k6]** **Karen Pace** **10/5/2009 8:59:00 AM**

3 The strength of the body of evidence for the specific measure focus should be systematically assessed and rated (e.g., USPSTF grading system http://www.ahrq.gov/clinic/uspstf07/methods/benefit.htm). If the USPSTF grading system was not used, the grading system is explained including how it relates to the USPSTF grades or why it does not. However, evidence is not limited to quantitative studies and the best type of evidence depends upon the question being studied (e.g., randomized controlled trials appropriate for studying drug efficacy are not well suited for complex system changes). When qualitative studies are used, appropriate qualitative research criteria are used to judge the strength of the evidence.

**Page 8: [4] Comment [KP14]** **Karen Pace** **10/5/2009 8:59:00 AM**

**2d.** Clinically necessary measure exclusions are identified and must be:

- supported by evidence of sufficient frequency of occurrence so that results are distorted without the exclusion;

AND

- a clinically appropriate exception (e.g., contraindication) to eligibility for the measure focus;

AND

- precisely defined and specified:
  - if there is substantial variability in exclusions across providers, the measure is specified so that exclusions are computable and the effect on the measure is transparent (i.e., impact clearly delineated, such as number of cases excluded, exclusion rates by type of exclusion);

if patient preference (e.g., informed decision-making) is a basis for exclusion, there must be evidence that it strongly impacts performance on the measure and the measure must be specified so that the information about patient preference and the effect on the measure is transparent (e.g., numerator category computed separately, denominator exclusion category computed separately).

## Beta Blocker at Discharge, MI patients: Testing Results

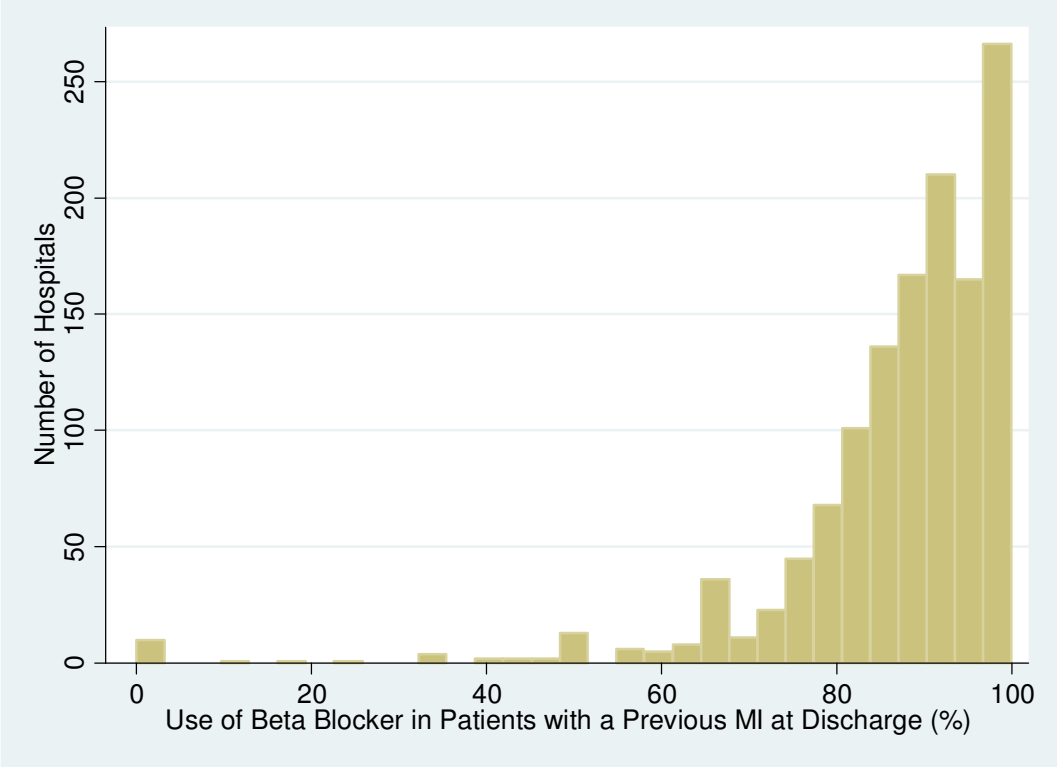
### Table Study Sample (ICD 2009)

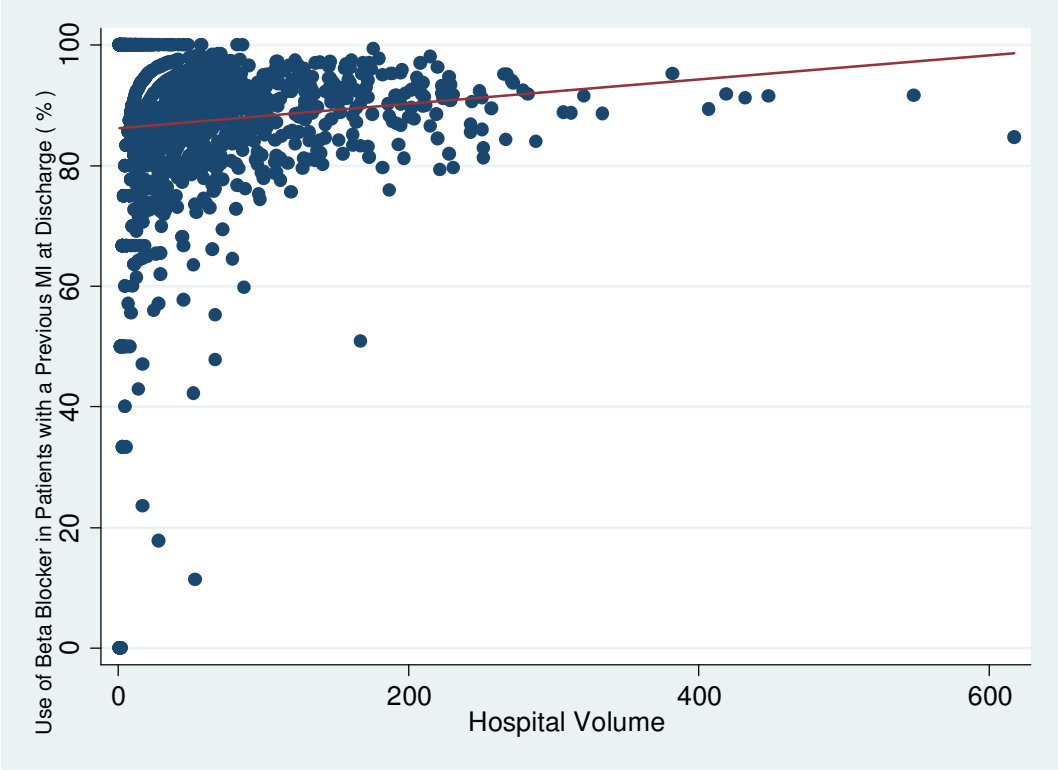
| Exclusions | Hospitals | | Patients | | Facilities | |
|---|---|---|---|---|---|---|
| | # | % | # | % | # | % |
| **Sample from01/01/2009 to 12/31/2009** | 144538 | 100 | 143653 | 100 | 1305 | 100 |
| excluding deceased patients | 457 | 0.32 | 455 | 0.32 | 0 | 0 |
| **Remaining** | 144081 | 99.68 | 143198 | 99.68 | 1305 | 100 |
| Excluding no history of previous MI+missing | 69984 | 48.57 | 69476 | 48.52 | 22 | 1.69 |
| **Remaining** | 74097 | 51.43 | 73722 | 51.48 | 1283 | 98.31 |
| contraindicated or blinded | 923 | 1.25 | 914 | 1.24 | 0 | 100.00 |
| **Study Sample** | 73174 | 98.75 | 72808 | 98.76 | 1283 | 100.00 |
| beta blocker use at discharge | 65088 | 88.95 | 64780 | 88.97 | 1273 | 99.22 |

Distribution of Beta blocker use in patients with a previous MI at Discharge

| Description | Hospital volume | % patients received beta blocker at discharge |
|---|---|---|
| N | 1283 | 1283 |
| **Mean** | 57.03 | 0.8741 |
| Std Deviation | 66.10 | 0.1367 |
| | | |
| 100% Max | 617 | 1.0000 |
| 99% | 282 | 1.0000 |
| 95% | 192 | 1.0000 |
| 90% | 141 | 1.0000 |
| 75% Q3 | 76 | 0.9546 |
| **50% Median** | **34** | **0.9032** |
| 25% Q1 | 12 | 0.8333 |
| 10% | 4 | 0.7500 |
| 5% | 2 | 0.6667 |
| 1% | 1 | 0.2353 |
| 0% Min | 1 | 0.0000 |

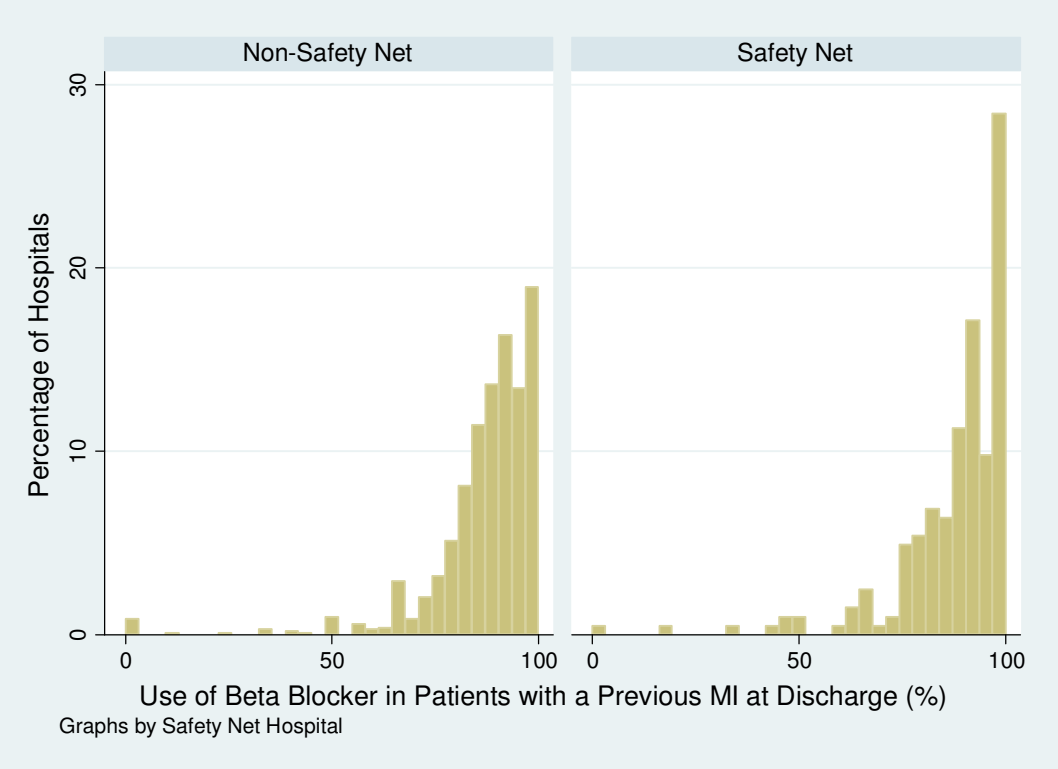
Among patients with previous MI , who are eligible for beta blockers

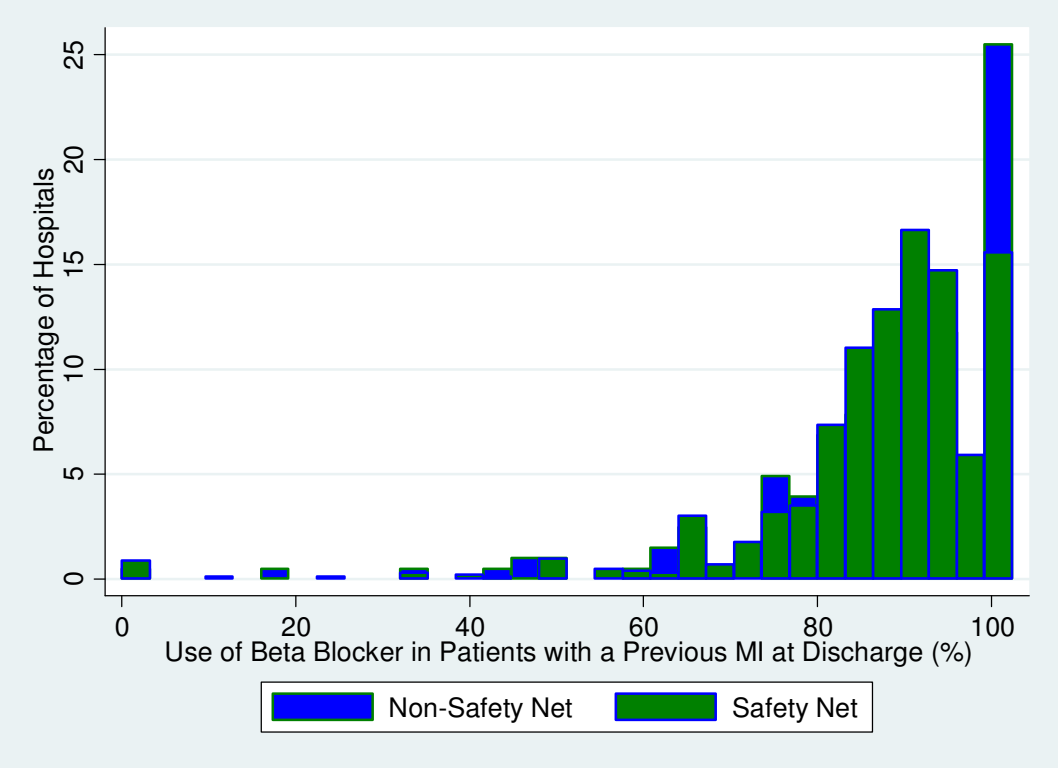

Number of Hospitals
0
50
100
150
200
250
0
20
40
60
80
100
Use of Beta Blocker in Patients with a Previous MI at Discharge (%)


Use of Beta Blocker in Patients with a Previous MI at Discharge ( % )
0
20
40
60
80
100
0
200
400
600
Hospital Volume

| Distribution of Beta blocker use in Patients with a previous MI at Discharge Stratified by Safety Net Status | | | | |
|---|---|---|---|---|
| **Description** | **Safety Net Status*** | | | |
| | **No** | | **Yes** | |
| | **Volume** | **beta blocker** | **Volume** | **beta blocker** |
| N | 1033 | 1033 | 204 | 204 |
| Mean | 58.63 | 0.8731 | 49.79 | 0.8786 |
| Std Deviation | 66.83 | 0.1360 | 60.18 | 0.1442 |
| 100% Max | 617 | 1.0000 | 321 | 1.0000 |
| 99% | 282 | 1.0000 | 251 | 1.0000 |
| 95% | 192 | 1.0000 | 195 | 1.0000 |
| 90% | 145 | 1.0000 | 135 | 1.0000 |
| 75% Q3 | 80 | 0.9512 | 66.5 | 0.9972 |
| **50% Median** | **36** | **0.9000** | **26.5** | **0.9143** |
| 25% Q1 | 13 | 0.8333 | 9 | 0.8333 |
| 10% | 4 | 0.7500 | 3 | 0.7458 |
| 5% | 2 | 0.6667 | 2 | 0.6364 |
| 1% | 1 | 0.2353 | 1 | 0.3333 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |

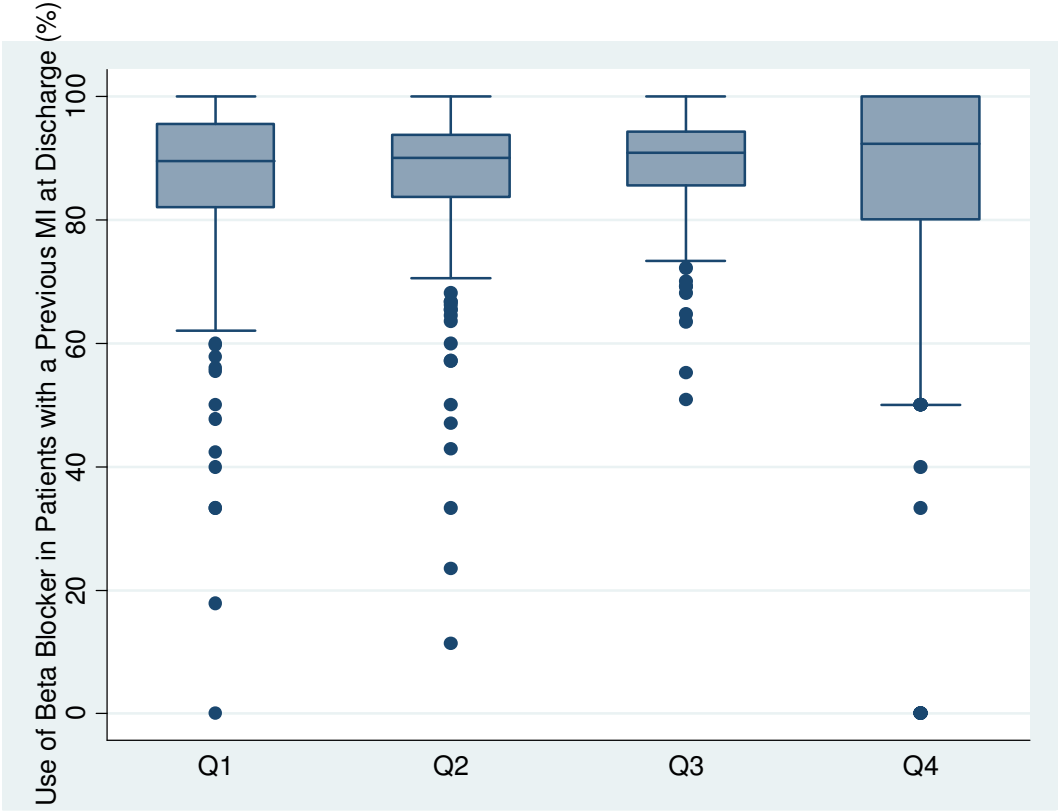
* Defined as government hospitals or non-government hosptials with high medicaid caseload using AHA 2008 Data.


Non-Safety Net
Safety Net
Percentage of Hospitals
0
10
20
30
0
50
100
Use of Beta Blocker in Patients with a Previous MI at Discharge (%)
Graphs by Safety Net Hospital

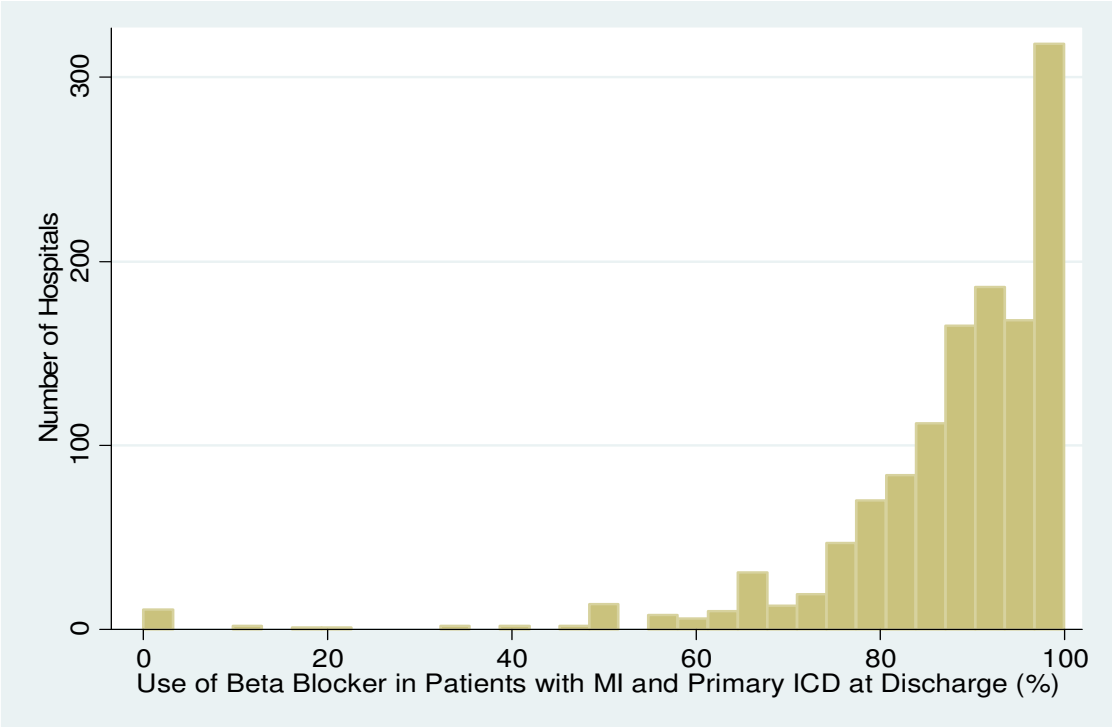

Percentage of Hospitals
0
5
10
15
20
25
0
20
40
60
80
100
Use of Beta Blocker in Patients with a Previous MI at Discharge (%)
Non-Safety Net
Safety Net

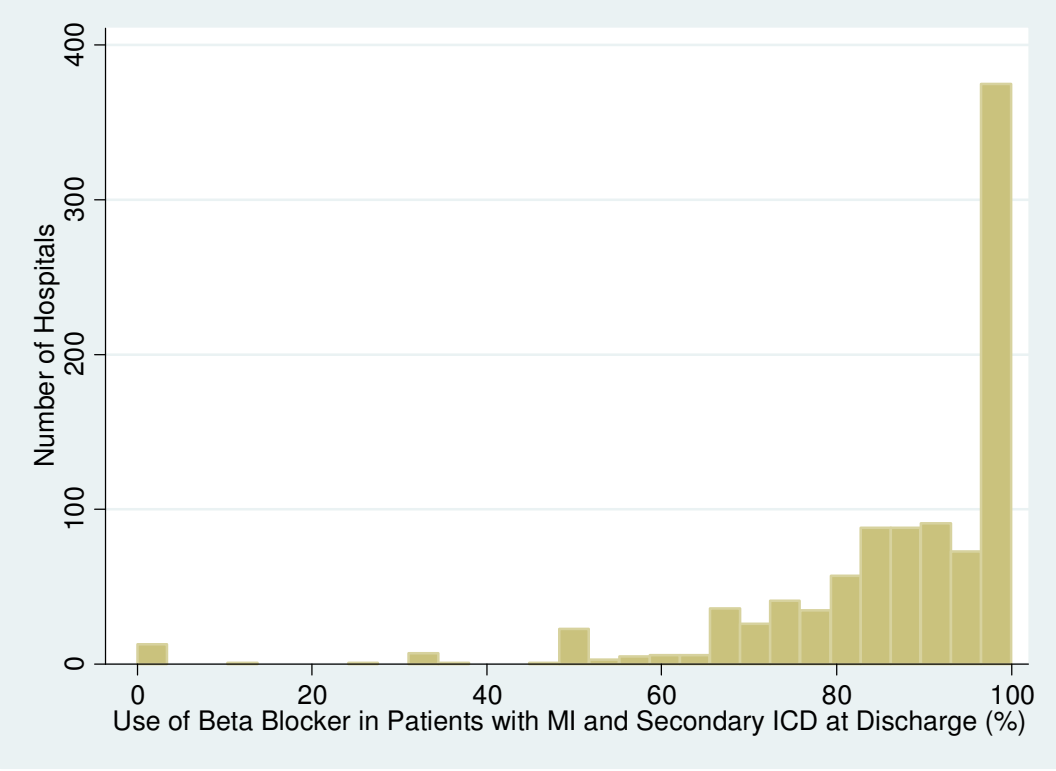
Distribution of Beta blocker use in Patients with a previous MI at Discharge Stratified by % White

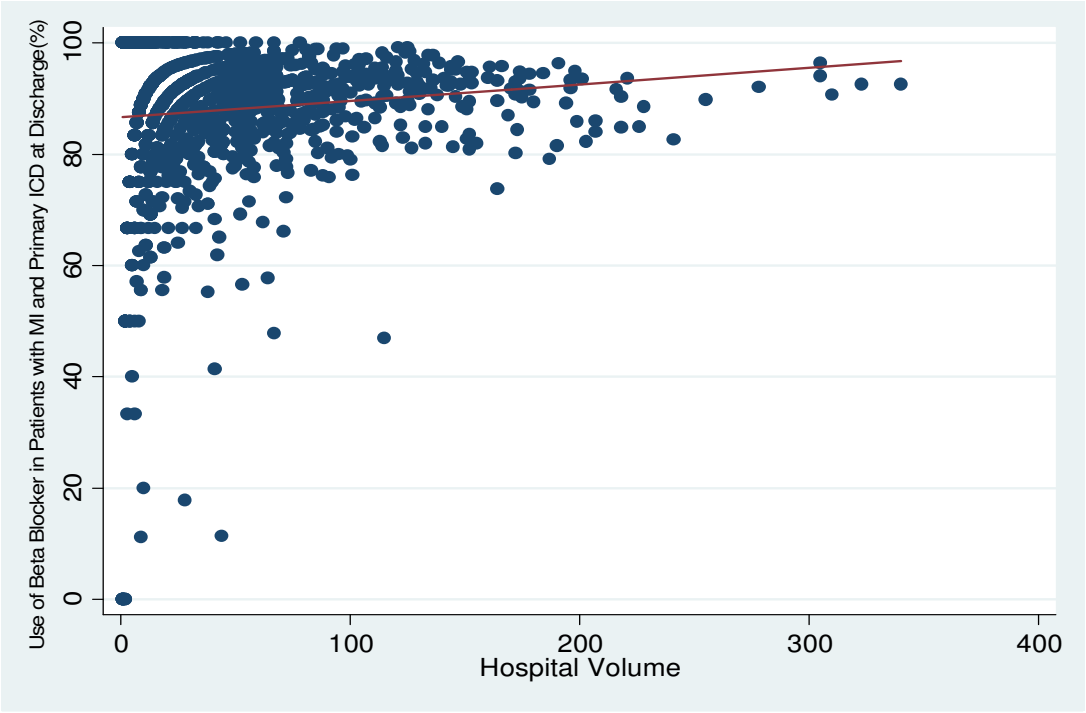
| Description | %White | %White | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Q1 (0.00% to 80.56%) | | Q2 80.57% to 91.92%) | | Q3 (91.93% to 98.80%) | | Q4 (98.81% to 100.00%) | |
| | | Volume | beta blocker | Volume | beta blocker | Volume | beta blocker | Volume | beta blocker |
| N | 1283 | 320 | 320 | 321 | 321 | 321 | 321 | 321 | 321 |
| Mean | 0.8530 | 47.54 | 0.8686 | 74.16 | 0.8751 | 82.93 | 0.8923 | 23.48 | 0.8603 |
| Std Deviation | 0.1930 | 64.02 | 0.1336 | 71.91 | 0.1105 | 70.00 | 0.0742 | 34.12 | 0.1971 |
| 100% Max | 1.0000 | 548 | 1.0000 | 448 | 1.0000 | 617 | 1.0000 | 215 | 1.0000 |
| 99% | 1.0000 | 282 | 1.0000 | 321 | 1.0000 | 271 | 1.0000 | 164 | 1.0000 |
| 95% | 1.0000 | 179 | 1.0000 | 212 | 1.0000 | 220 | 1.0000 | 99 | 1.0000 |
| 90% | 1.0000 | 123 | 1.0000 | 170 | 0.9740 | 173 | 0.9711 | 63 | 1.0000 |
| 75% Q3 | 0.9880 | 60.5 | 0.9555 | 97 | 0.9381 | 103 | 0.9434 | 26 | 1.0000 |
| **50% Median** | **0.9192** | **25** | **0.8947** | **53** | **0.9000** | **64** | **0.9082** | **11** | **0.9231** |
| 25% Q1 | 0.8056 | 8.5 | 0.8210 | 23 | 0.8361 | 35 | 0.8560 | 4 | 0.8000 |
| 10% | 0.6191 | 3 | 0.7123 | 10 | 0.7683 | 23 | 0.7959 | 1 | 0.6667 |
| 5% | 0.4831 | 2 | 0.6603 | 7 | 0.6818 | 17 | 0.7692 | 1 | 0.5000 |
| 1% | 0.0000 | 1 | 0.3333 | 6 | 0.4286 | 13 | 0.6471 | 1 | 0.0000 |
| 0% Min | 0.0000 | 1 | 0.0000 | 6 | 0.1132 | 13 | 0.5090 | 1 | 0.0000 |


Use of Beta Blocker in Patients with a Previous MI at Discharge (%)
0
20
40
60
80
100
Q1
Q2
Q3
Q4

| Distribution of Beta Blocker use in Patients with a previous MI at Discharge Stratified | | | | |
|---|---|---|---|---|
| | ICD Indication | | | |
| Description | Priamry | | Secondary | |
| | Volume | Beta Blocker | Volume | Beta Blocker |
| N | 1272 | 1272 | 977 | 977 |
| Mean | 43.69 | 0.8789 | 18.01 | 0.8721 |
| Std Deviation | 47.97 | 0.1415 | 26.93 | 0.1699 |
| 100% Max | 340 | 1.0000 | 515 | 1.0000 |
| 99% | 218 | 1.0000 | 100 | 1.0000 |
| 95% | 144 | 1.0000 | 57 | 1.0000 |
| 90% | 106 | 1.0000 | 41 | 1.0000 |
| 75% Q3 | 59.5 | 0.9680 | 23 | 1.0000 |
| 50% Median | 28 | 0.9091 | 10 | 0.9167 |
| 25% Q1 | 10 | 0.8360 | 4 | 0.8125 |
| 10% | 4 | 0.7500 | 1 | 0.6667 |
| 5% | 2 | 0.6667 | 1 | 0.5417 |
| 1% | 1 | 0.1136 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |


Number of Hospitals
0
100
200
300
0
20
40
60
80
100
Use of Beta Blocker in Patients with MI and Primary ICD at Discharge (%)


Number of Hospitals
0
100
200
300
400
0
20
40
60
80
100
Use of Beta Blocker in Patients with MI and Secondary ICD at Discharge (%)


Use of Beta Blocker in Patients with MI and Primary ICD at Discharge(%)
0
20
40
60
80
100
0
100
200
300
400
Hospital Volume

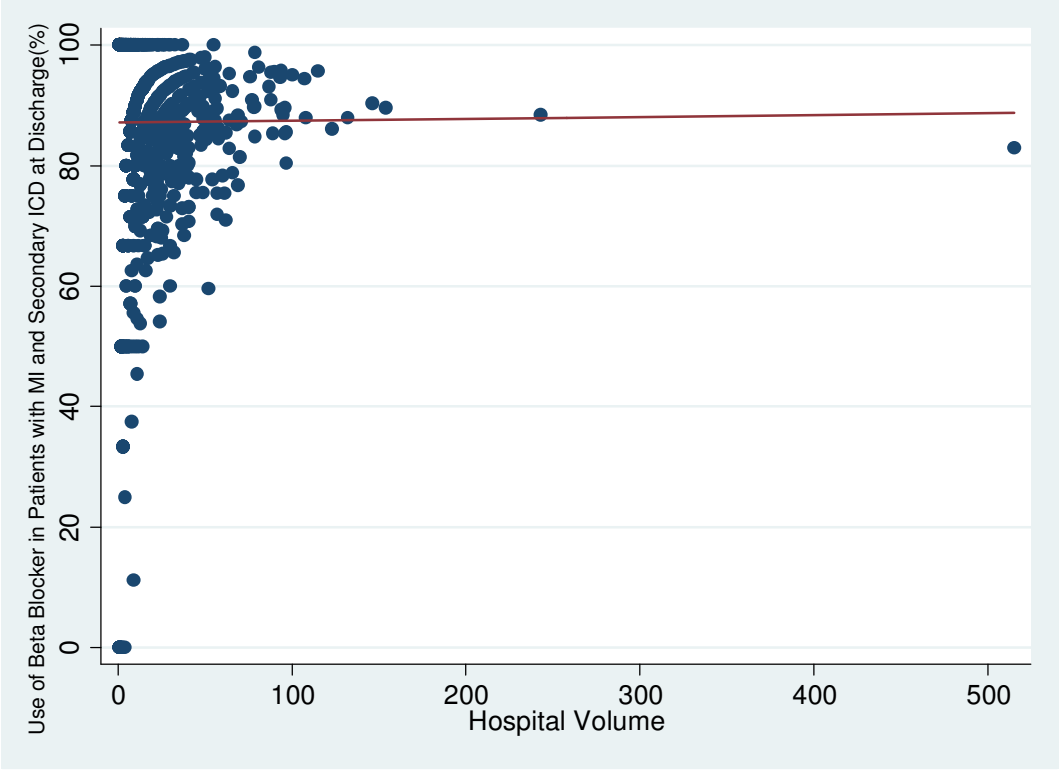

Use of Beta Blocker in Patients with MI and Secondary ICD at Discharge(%)
0
20
40
60
80
100
0
100
200
300
400
500
Hospital Volume

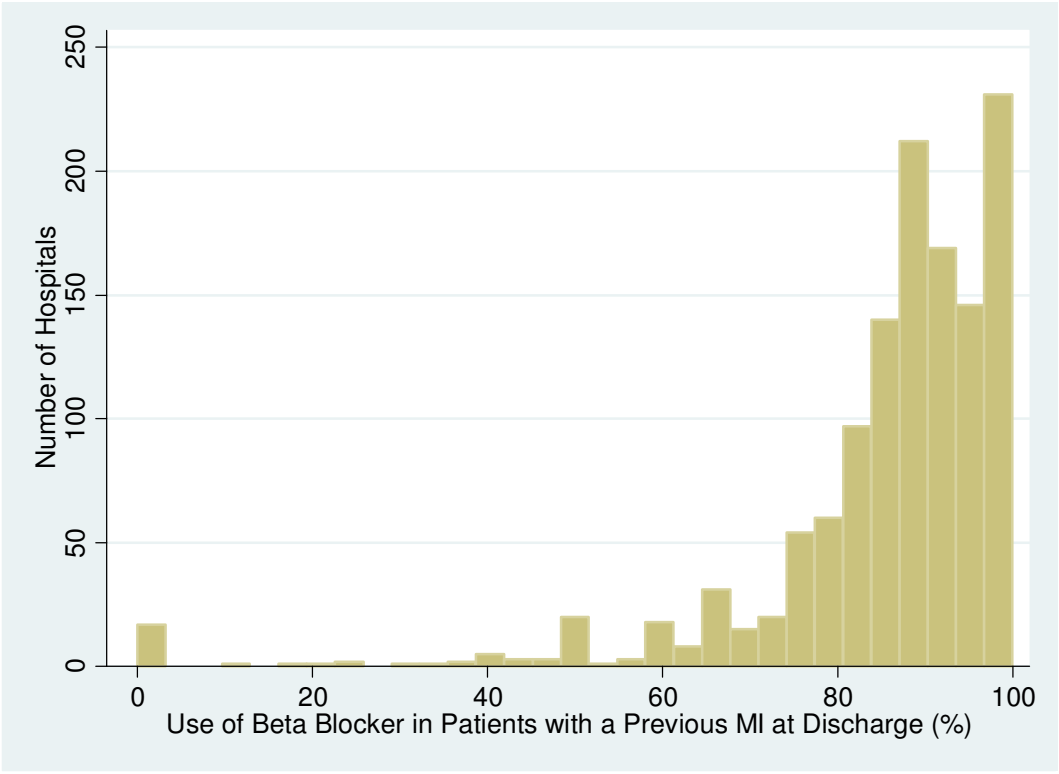
**Table Study Sample (ICD 2008)**

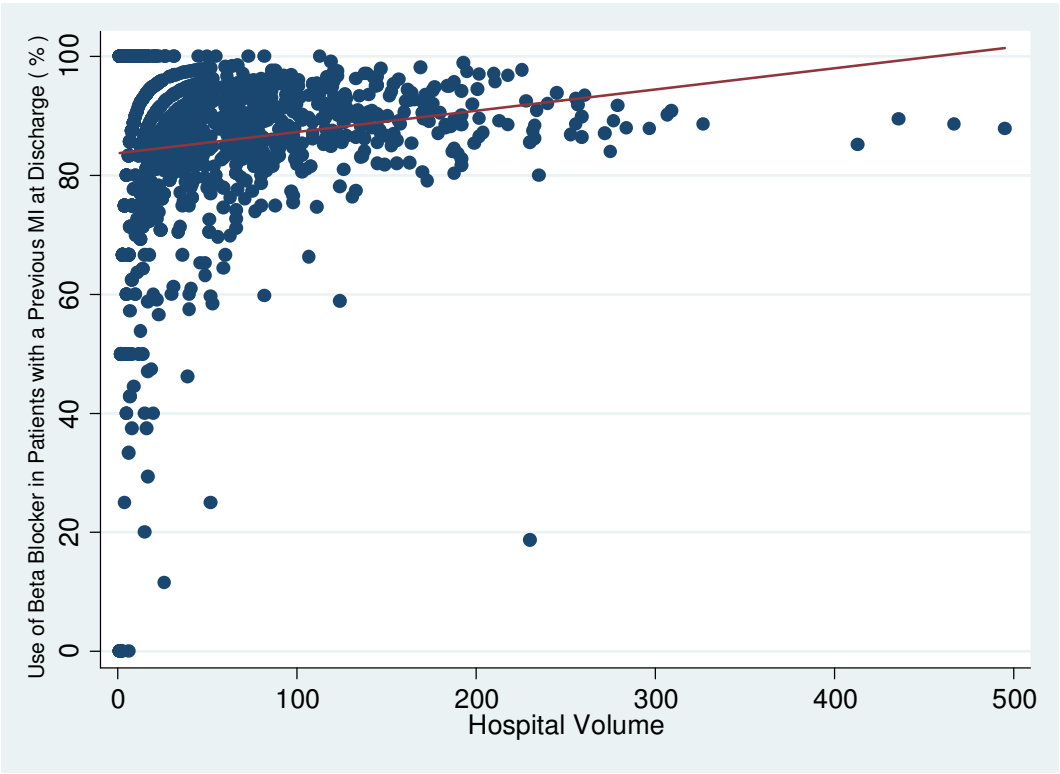
| Exclusions | Hospital stays | | Patients | | Facilities | |
|---|---|---|---|---|---|---|
| | # | % | # | % | # | % |
| **Sample from01/01/2008 to 12/31/2008** | 131371 | 100 | 130593 | 100 | 1283 | 100 |
| excluding deceased patients | 500 | 0.38 | 494 | 0.38 | 0 | 0 |
| **Remaining** | 130871 | 99.62 | 130099 | 99.62 | 1283 | 100 |
| Excluding no history of previous MI+missing | 61556 | 47.04 | 61134 | 46.99 | 21 | 1.64 |
| **Remaining** | 69315 | 52.96 | 68965 | 53.01 | 1262 | 98.36 |
| contraindicated or blinded | 829 | 1.20 | 817 | 1.18 | 0 | 100.00 |
| **Study Sample** | 68486 | 98.80 | 68148 | 98.82 | 1262 | 100.00 |
| beta blocker use at discharge | 60350 | 88.12 | 60072 | 88.15 | 1245 | 98.65 |

## Distribution of Beta blocker use in patients with a previous MI at Discharge

| Description | Hospital volume | % patients received beta blocker at discharge |
|---|---|---|
| N | 1262 | 1262 |
| **Mean** | 54.27 | 0.8569 |
| Std Deviation | 60.89 | 0.1584 |
| | | |
| 100% Max | 495 | 1.0000 |
| 99% | 272 | 1.0000 |
| 95% | 180 | 1.0000 |
| 90% | 135 | 1.0000 |
| 75% Q3 | 76 | 0.9487 |
| 50% Median | 34 | 0.8918 |
| 25% Q1 | 13 | 0.8276 |
| 10% | 4 | 0.7059 |
| 5% | 2 | 0.5887 |
| 1% | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 |

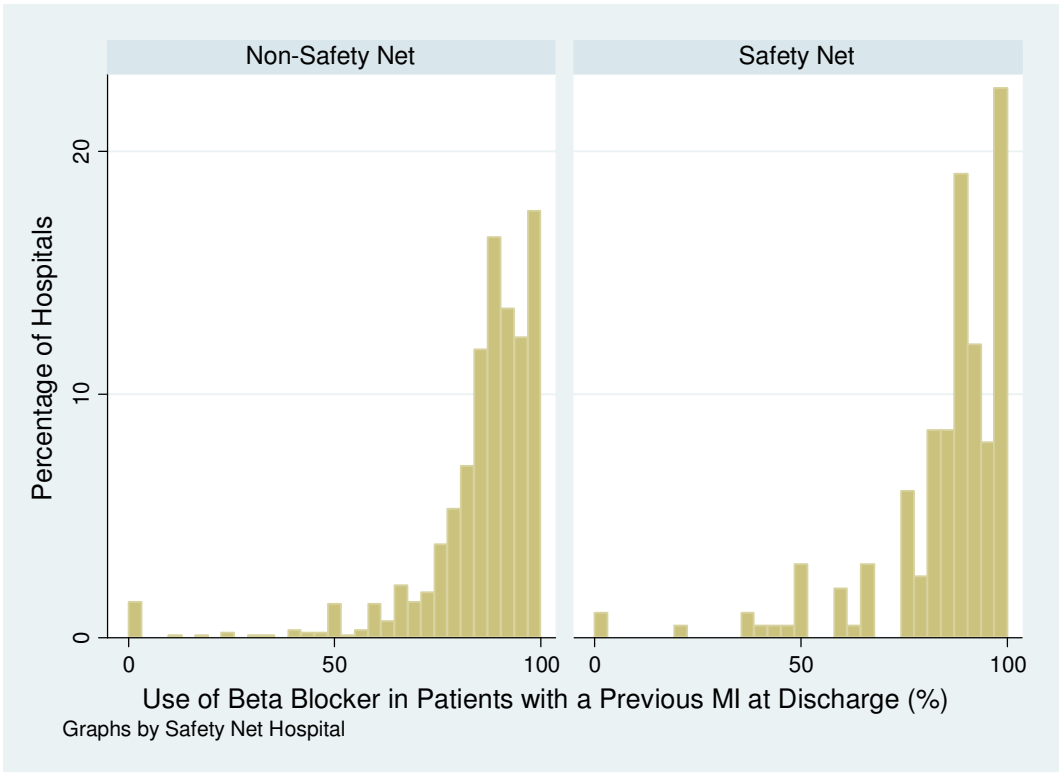
Among patients with previous MI , who are eligible for beta blockers

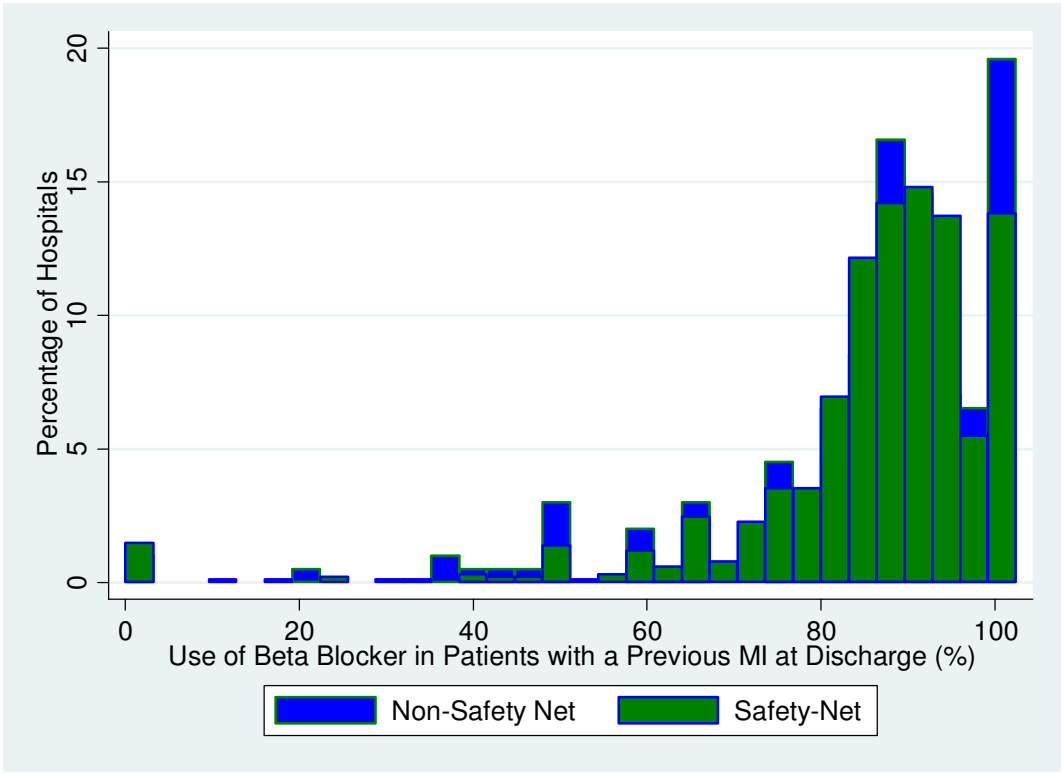

Number of Hospitals
0
50
100
150
200
250
0
20
40
60
80
100
Use of Beta Blocker in Patients with a Previous MI at Discharge (%)


Use of Beta Blocker in Patients with a Previous MI at Discharge ( % )
0
20
40
60
80
100
0
100
200
300
400
500
Hospital Volume

| Distribution of Beta blocker use in Patients with a previous MI at Discharge Stratified by Safety Net Status | | | | |
|---|---|---|---|---|
| **Description** | **Safety Net Status*** | | | |
| | **No** | | **Yes** | |
| | **Volume** | **beta blocker** | **Volume** | **beta blocker** |
| N | 1020 | 1020 | 199 | 199 |
| Mean | 56.28 | 0.8574 | 44.94 | 0.8530 |
| Std Deviation | 62.44 | 0.1582 | 51.81 | 0.1676 |
| 100% Max | 495 | 1.0000 | 261 | 1.0000 |
| 99% | 275 | 1.0000 | 226 | 1.0000 |
| 95% | 184.5 | 1.0000 | 171 | 1.0000 |
| 90% | 138 | 1.0000 | 122 | 1.0000 |
| 75% Q3 | 79 | 0.9474 | 63 | 0.9608 |
| 50% Median | 36 | 0.8920 | 25 | 0.8920 |
| 25% Q1 | 13 | 0.8282 | 8 | 0.8182 |
| 10% | 4 | 0.7083 | 2 | 0.6667 |
| 5% | 2 | 0.6000 | 2 | 0.5000 |
| 1% | 1 | 0.0000 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |

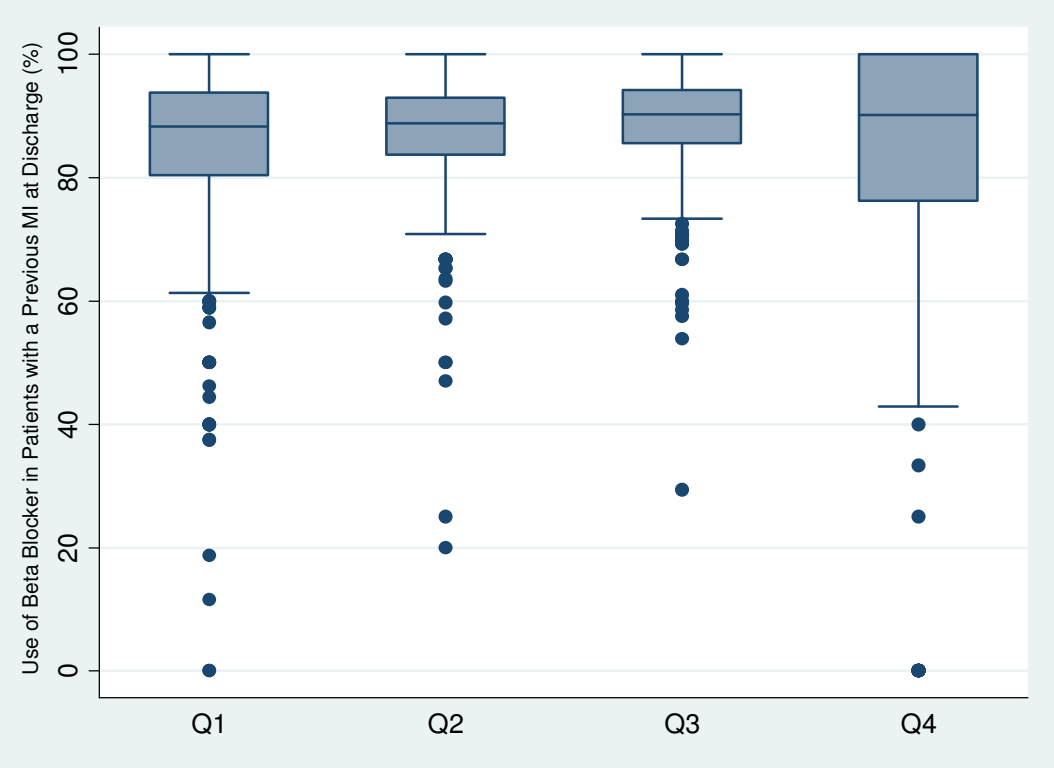
* Defined as government hospitals or non-government hosptials with high medicaid caseload using AHA 2008 Data.


Non-Safety Net
Safety Net
Percentage of Hospitals
0
10
20
0
50
100
Use of Beta Blocker in Patients with a Previous MI at Discharge (%)
Graphs by Safety Net Hospital

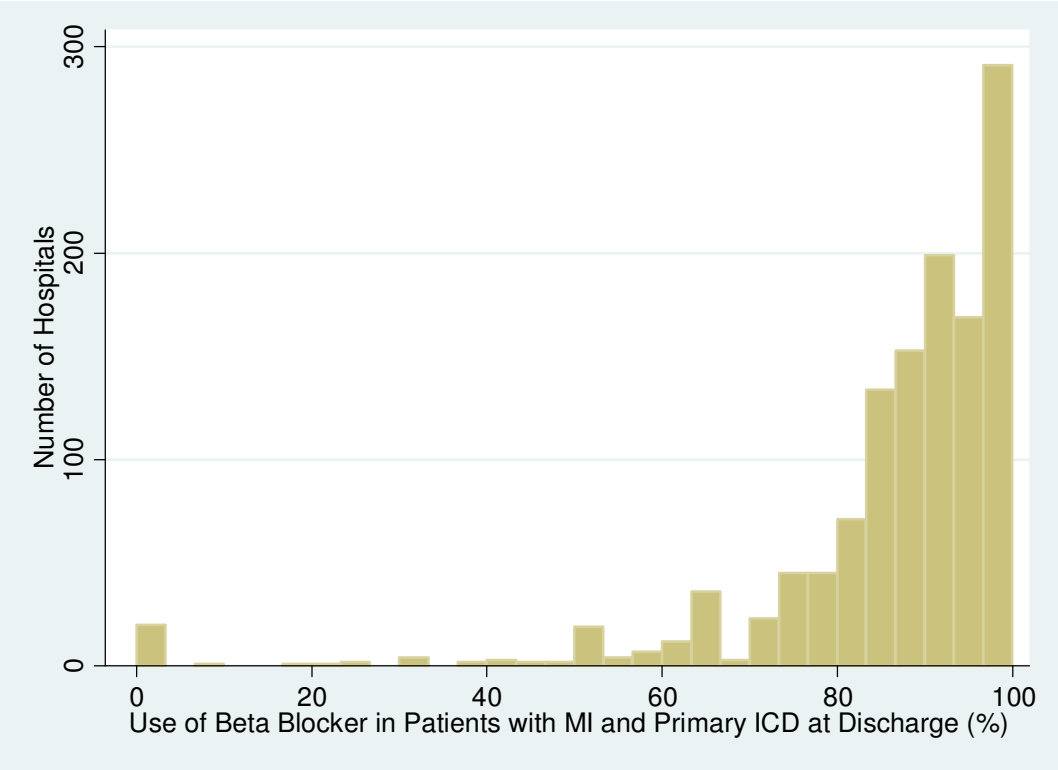

Percentage of Hospitals
0
5
10
15
20
0
20
40
60
80
100
Use of Beta Blocker in Patients with a Previous MI at Discharge (%)
Non-Safety Net
Safety-Net

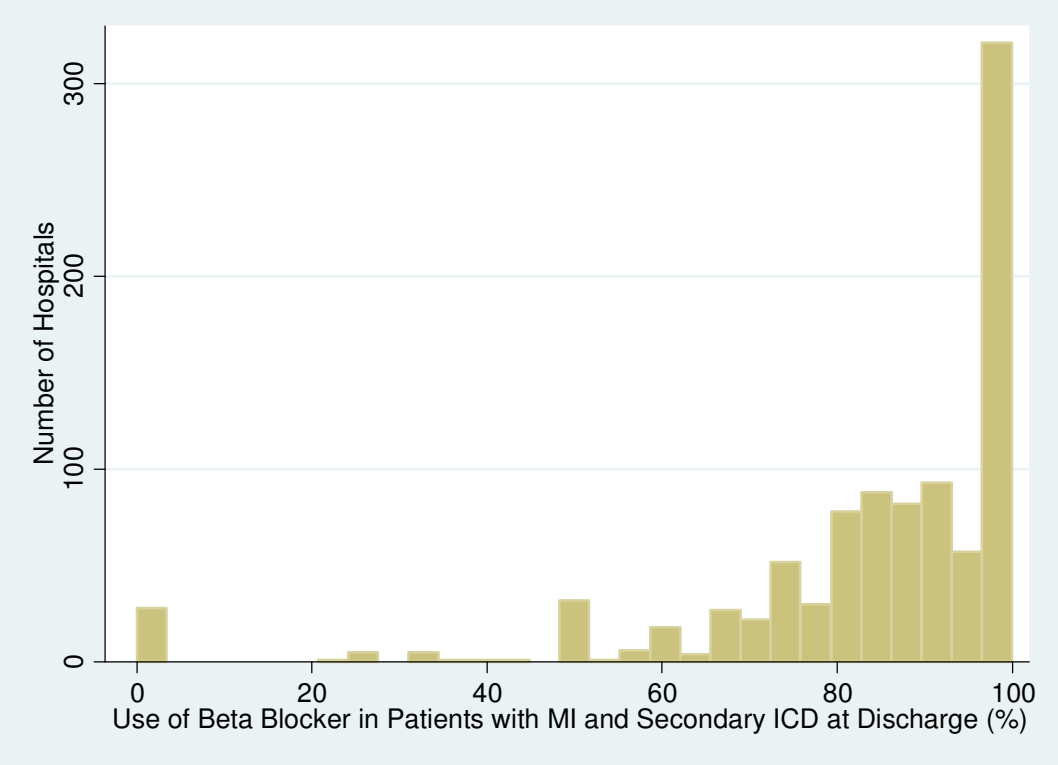
Distribution of Beta blocker use in Patients with a previous MI at Discharge Stratified by % White

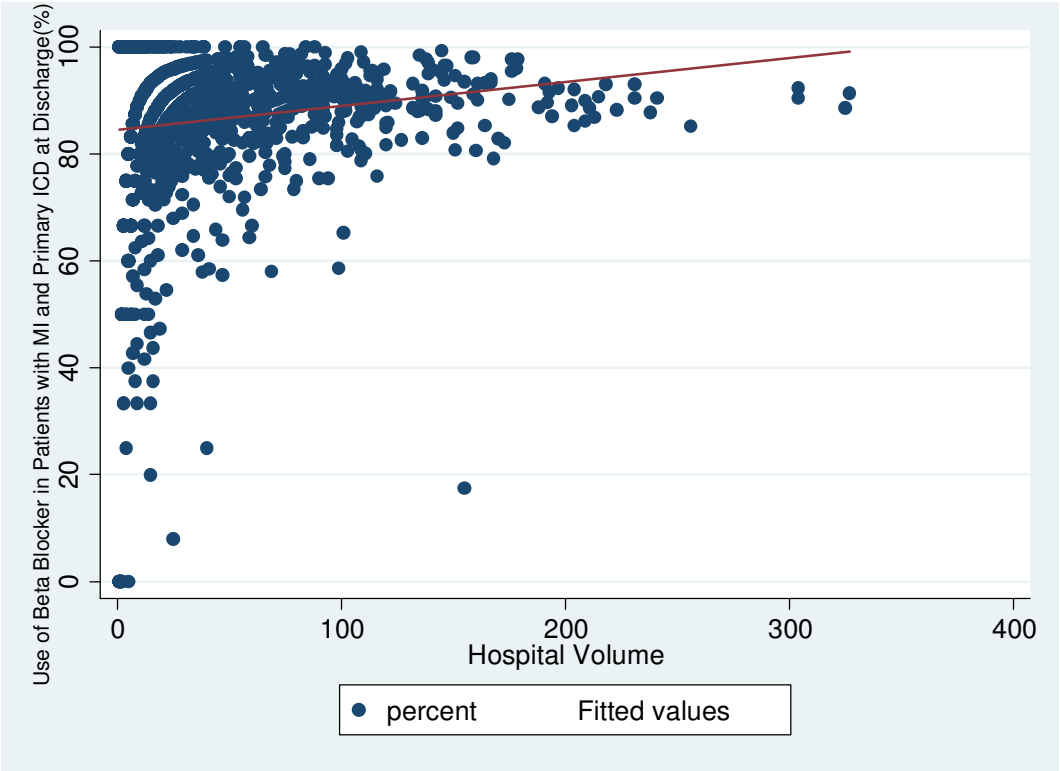
| Description | %White | %White | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Q1 (0.00% to 80.56%) | | Q2 80.57% to 91.92%) | | Q3 (91.93% to 98.80%) | | Q4 (98.81% to 100.00%) | |
| | | Volume | beta blocker | Volume | beta blocker | Volume | beta blocker | Volume | beta blocker |
| N | 1262 | 315 | 315 | 316 | 316 | 316 | 316 | 315 | 315 |
| Mean | 0.8581 | 48.92 | 0.8457 | 70.79 | 0.8712 | 74.37 | 0.8833 | 22.87 | 0.8270 |
| Std Deviation | 0.1849 | 62.19 | 0.1590 | 65.99 | 0.0998 | 60.74 | 0.0879 | 35.39 | 0.2363 |
| 100% Max | 1.0000 | 495 | 1.0000 | 436 | 1.0000 | 467 | 1.0000 | 218 | 1.0000 |
| 99% | 1.0000 | 272 | 1.0000 | 297 | 1.0000 | 275 | 1.0000 | 170 | 1.0000 |
| 95% | 1.0000 | 173 | 1.0000 | 193 | 1.0000 | 192 | 0.9779 | 95 | 1.0000 |
| 90% | 1.0000 | 125 | 1.0000 | 164 | 0.9655 | 152 | 0.9672 | 66 | 1.0000 |
| 75% Q3 | 0.9860 | 66 | 0.9381 | 96 | 0.9291 | 97 | 0.9421 | 27 | 1.0000 |
| 50% Median | 0.9224 | 26 | 0.8824 | 50 | 0.8881 | 55.5 | 0.9021 | 8 | 0.9010 |
| 25% Q1 | 0.8101 | 9 | 0.8030 | 23 | 0.8358 | 32.5 | 0.8557 | 3 | 0.7619 |
| 10% | 0.6364 | 3 | 0.6636 | 11 | 0.7778 | 19 | 0.7744 | 1 | 0.5000 |
| 5% | 0.5000 | 2 | 0.5000 | 8 | 0.6667 | 15 | 0.7059 | 1 | 0.2500 |
| 1% | 0.0000 | 1 | 0.1870 | 6 | 0.5000 | 13 | 0.5849 | 1 | 0.0000 |
| 0% Min | 0.0000 | 1 | 0.0000 | 6 | 0.2000 | 13 | 0.2941 | 1 | 0.0000 |

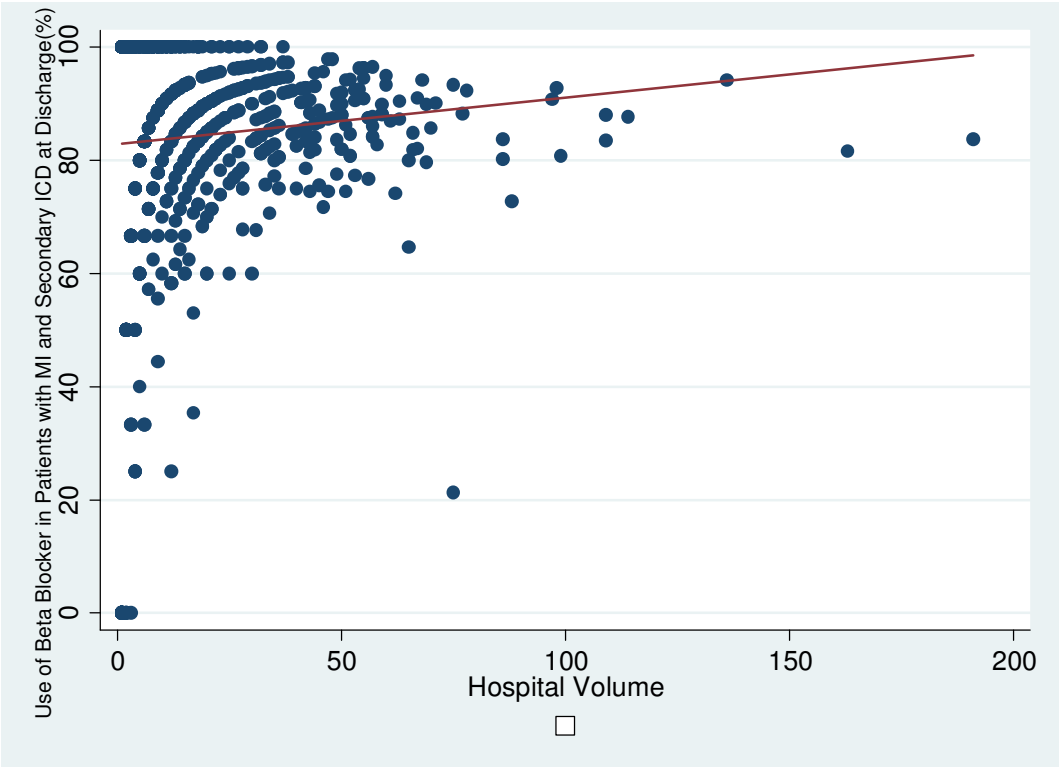

Use of Beta Blocker in Patients with a Previous MI at Discharge (%)
0
20
40
60
80
100
Q1
Q2
Q3
Q4

| Distribution of Beta Blocker use in Patients with a previous MI at Discharge Stratified by ICD indication | | | | |
|---|---|---|---|---|
| | ICD Indication | | | |
| Description | Priamry | | Secondary | |
| | Volume | Beta Blocker | Volume | Beta Blocker |
| N | 1249 | 1249 | 953 | 953 |
| Mean | 42.00 | 0.8643 | 16.82 | 0.8421 |
| Std Deviation | 46.47 | 0.1661 | 19.73 | 0.2060 |
| 100% Max | 327 | 1.0000 | 191 | 1.0000 |
| 99% | 213 | 1.0000 | 88 | 1.0000 |
| 95% | 139 | 1.0000 | 55 | 1.0000 |
| 90% | 102 | 1.0000 | 42 | 1.0000 |
| 75% Q3 | 57 | 0.9630 | 22 | 1.0000 |
| 50% Median | 27 | 0.9032 | 10 | 0.8889 |
| 25% Q1 | 9 | 0.8333 | 4 | 0.8000 |
| 10% | 3 | 0.7143 | 1 | 0.6000 |
| 5% | 2 | 0.5745 | 1 | 0.5000 |
| 1% | 1 | 0.0000 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |


Number of Hospitals
0
100
200
300
0
20
40
60
80
100
Use of Beta Blocker in Patients with MI and Primary ICD at Discharge (%)


Number of Hospitals
0
100
200
300
0
20
40
60
80
100
Use of Beta Blocker in Patients with MI and Secondary ICD at Discharge (%)


Use of Beta Blocker in Patients with MI and Primary ICD at Discharge(%)
0
20
40
60
80
100
0
100
200
300
400
Hospital Volume
percent
Fitted values


Use of Beta Blocker in Patients with MI and Secondary ICD at Discharge(%)
0
20
40
60
80
100
0
50
100
150
200
Hospital Volume

# NATIONAL QUALITY FORUM

**Measure Evaluation 4.1**
**December 2009**

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

**TAP/Workgroup** (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas).*

**Steering Committee:** Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the criteria are met
C = Completely (unquestionably demonstrated to meet the criterion)
P = Partially (demonstrated to partially meet the criterion)
M = Minimally (addressed BUT demonstrated to only minimally meet the criterion)
N = Not at all (NOT addressed; OR incorrectly addressed; OR demonstrated to NOT meet the criterion)
NA = Not applicable (only an option for a few subcriteria as indicated)

| (for NQF staff use) **NQF Review #:** 1529 **NQF Project:** Cardiovascular Endorsement Maintenance 2010 |
|---|
| **MEASURE DESCRIPTIVE INFORMATION** |
| De.1 **Measure Title:** Beta Blocker at Discharge for ICD implant patients with LVSD |
| De.2 **Brief description of measure***:* Proportion of ICD implant patients with a diagnosis of LVSD who are prescribed beta-blocker therapy on discharge. |
| 1.1-2 **Type of Measure:** Process<br>De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** N/A |
| De.4 **National Priority Partners Priority Area:**<br>De.5 **IOM Quality Domain**: Effectiveness, Timeliness<br>De.6 **Consumer Care Need:** Getting better, Living with illness |

| **CONDITIONS FOR CONSIDERATION BY NQF** | |
|---|---|
| Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards: | **NQF Staff** |
| **A.** The measure is in the public domain or an intellectual property (measure steward agreement) is signed. *Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.*<br>A.1 **Do you attest that the measure steward holds intellectual property rights to the measure and the right to use aspects of the measure owned by another entity (e.g., risk model, code set)?** Yes<br>A.2 **Indicate if Proprietary Measure** (*as defined in measure steward agreement*)**:**<br>A.3 **Measure Steward Agreement:** Agreement will be signed and submitted prior to or at the time of measure submission<br>A.4 **Measure Steward Agreement attached:** NQF - signed-634272261673694178.pdf | **A**<br>**Y**☐<br>**N**☐ |
| **B.** The measure owner/steward verifies there is an identified responsible entity and process to maintain and | **B** |

| | |
|---|---|
| update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. Yes, information provided in contact section | Y☐ N☐ |
| **C.** The intended use of the measure includes both public reporting and quality improvement.<br>►**Purpose:** Public reporting, Internal quality improvement<br>Accountability | C<br>Y☐<br>N☐ |
| **D.** The requested measure submission information is complete. Generally, measures should be fully developed and tested so that all the evaluation criteria have been addressed and information needed to evaluate the measure is provided. Measures that have not been tested are only potentially eligible for a time-limited endorsement and in that case, measure owners must verify that testing will be completed within 12 months of endorsement.<br>D.1**Testing:** Yes, fully developed and tested<br>D.2 **Have NQF-endorsed measures been reviewed to identify if there are similar or related measures?**<br>Yes | D<br>Y☐<br>N☐ |
| (for NQF staff use**) Have all conditions for consideration been met?**<br>**Staff Notes to Steward** (*if submission returned*)**:** | **Met**<br>Y☐<br>N☐ |
| **Staff Notes to Reviewers** (*issues or questions regarding any criteria*)**:** | |
| **Staff Reviewer Name(s):** | |

| | |
|---|---|
| **TAP/Workgroup Reviewer Name:** | |
| **Steering Committee Reviewer Name:** | |
| **1. IMPORTANCE TO MEASURE AND REPORT** | |
| Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in or overall poor performance.<br>*Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria.* (evaluation criteria)<br>**1a. High Impact** | **Eval Rating** |
| (for NQF staff use) **Specific NPP goal**: | |
| 1a.1 **Demonstrated High Impact Aspect of Healthcare:** Affects large numbers, Frequently performed procedure, Leading cause of morbidity/mortality, High resource use, Severity of illness<br>1a.2<br><br>1a.3 **Summary of Evidence of High Impact:** Optimal medical therapy is critical to ensure favorable patient outcomes following implantation of an implantable cardiac defibrillator (ICD) to prevent sudden cardiac death (SCD). In 2006, 114,000 inpatient defibrillator implantations were performed. The mean hospital charge for ICD procedures was $115,763.<br><br>Approximately 81 million American adults have 1 or more types of CVD, with 5.8 million having heart failure. Over 30% of all deaths are related to CVD. Over 90% of patients receiving an ICD for primary prevention have ejection fraction under 40%, while 70% of patients receiving an ICD for secondary prevention have an ejection fraction under 40%. Therefore, it is critical that these patients receive discharge medications to treat left ventricular systolic dysfunction to reduce associated morbidity and mortality, as well as repeat hospitalizations and procedures.<br><br>1a.4 **Citations for Evidence of High Impact:** American Heart Association. Heart disease and stroke statistics-2010 update: A report of the American Heart Association. Available at: http://circ.ahajournals.org/cgi/content/abstract/CIRCULATIONAHA.109.192667v1. Accessed December 3, 2010. | **1a**<br>C☐<br>P☐<br>M☐<br>N☐ |

**Comment [KP1]: 1a.** The measure focus addresses:
•a specific national health goal/priority identified by NQF's National Priorities Partners; OR
•a demonstrated high impact aspect of healthcare (e.g., affects large numbers, leading cause of morbidity/mortality, high resource use (current and/or future), severity of illness, and patient/societal consequences of poor quality).

**1b. Opportunity for Improvement**

**1b.1 Benefits (improvements in quality) envisioned by use of this measure:** This measure allows benchmarking against the national aggregate and against hospitals with similar procedural volume, so that hospitals with low performance rates can engage in quality improvement efforts to improve compliance for this measure and subsequently improve patient outcomes related to this measure.

**1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:**
Mean: 0.88
SD: 0.13

Quartile 1: 0.85
Median: 0.91
Quartile 3: 0.95
95%: 1.00

**1b.3 Citations for data on performance gap:**
Unpublished NCDR data

**1b.4 Summary of Data on disparities by population group:**
Mean by hospital SES (proportion white patients):
0-72.41% white: 87.7%
72.4-87.7% white: 87.9%
87.7-96.0% white: 89.4%
96.0-100% white: 86.6%

Mean performance by safety net status (defined as government hospitals or non-governmental hospitals with high medicaid caseload using AHA 2008 data):
Not a safety net hospital: 87.8%
Safety net hospital: 87.7%

**1b.5 Citations for data on Disparities:**
Unpublished NCDR data

**1b**
C☐
P☐
M☐
N☐

**1c. Outcome or Evidence to Support Measure Focus**

**1c.1 Relationship to Outcomes** (*For non-outcome measures, briefly describe the relationship to desired outcome. For outcomes, describe why it is relevant to the target population*)**:** Long term beta blocker therapy for patients with left systolic ventricular dysfunction (LVSD) can improve symptoms of heart failure, improve patient clinical status, and reduce hospitalizations and mortality.

**1c.2-3. Type of Evidence:** Evidence-based guideline, Randomized controlled trial, Expert opinion, Systematic synthesis of research, Meta-analysis

**1c.4 Summary of Evidence** (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
There has been substantial research to support the use of beta blockers in patients with chronic heart failure. Many studies have consistently shown a substantial reduction in the rate of mortality and morbidity, as well as improvement in symptoms with the use of beta-blocker therapy. Meta-analyses have shown beta blockers to be beneficial in the regardless of age in men or women, in diabetics, and in nondiabetics.

**1c.5 Rating of strength/quality of evidence (***also provide narrative description of the rating and by whom***):**
Level of Evidence A: Data derived from multiple randomized clinical trials or meta-analyses.

**1c.6 Method for rating evidence:** The weight of evidence in support of the recommendation is listed as follows:
• 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.

**1c**
C☐
P☐
M☐
N☐

Rating: C=Completely; P=Partially; M=Minimally; N=Not at all; NA=Not applicable



**Comment [KP2]: 1b.** Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating considerable variation, or overall poor performance, in the quality of care across providers and/or population groups (disparities in care).

**Comment [k3]:** 1 Examples of data on opportunity for improvement include, but are not limited to: prior studies, epidemiologic data, measure data from pilot testing or implementation. If data are not available, the measure focus is systematically assessed (e.g., expert panel rating) and judged to be a quality problem.

**Comment [k4]: 1c.** The measure focus is:
•an outcome (e.g., morbidity, mortality, function, health-related quality of life) that is relevant to, or associated with, a national health goal/priority, the condition, population, and/or care being addressed;
OR
•if an intermediate outcome, process, structure, etc., there is **evidence** that supports the specific measure focus as follows:
oIntermediate outcome – evidence that the measured intermediate outcome (e.g., blood pressure, Hba1c) leads to improved health/avoidance of harm or cost/benefit.
oProcess – evidence that the measured clinical or administrative process leads to improved health/avoidance of harm and
if the measure focus is on one step in a multi-step care process, it measures the step that has the greatest effect on improving the specified desired outcome(s).
oStructure – evidence that the measured structure supports the consistent delivery of effective processes or access that lead to improved health/avoidance of harm or cost/benefit.
oPatient experience – evidence that an association exists between the measure ... [1]

**Comment [k5]:** 4 Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multi-step process, the step with the greatest effect on the desired outcome should be selected as the focus of measurement. For example, although assessment of immunization status and recommending immunization are necessary steps, they are not sufficient to achieve the desired impact on health status – patients must be vaccinated to achieve ... [2]

**Comment [k6]:** 3 The strength of the body of evidence for the specific measure focus should be systematically assessed and rated (e.g., USPSTF grading system http://www.ahrq.gov/clinic/uspstf07/methods/benefit.htm). If the USPSTF grading system was not used, the grading system is explained including how it relates to the USPSTF grades or why it does not. However, evidence is not limited to quantitative studies and the best type of evidence depends upon the question being studied (e.g., randomized controlled trials appropriate for studying drug efficacy are not well suited for complex system ... [3]

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

1c.7 **Summary of Controversy/Contradictory Evidence:**

1c.8 **Citations for Evidence (***other than guidelines***):** Packer M, Fowler MB, Roecker EB, et al. Effect of carvedilol on the morbidity of patients with severe chronic heart failure: results of the carvedilol prospective randomized cumulative survival (COPERNICUS) study. Circulation. 2002;106:2194-9.
Effect of metoprolol CR/XL in chronic heart failure: Metoprolol CR/XL Randomised Intervention Trial in Congestive Heart Failure (MERIT-HF). Lancet. 1999;353:2001-7.
The Cardiac Insufficiency Bisoprolol Study II (CIBIS-II): a randomised trial. Lancet. 1999;353:9-13.
Dulin BR, Haas SJ, Abraham WT, et al. Do elderly systolic heart failure patients benefit from beta blockers to the same extent as the non-elderly? Meta-analysis of >12,000 patients in large-scale clinical trials. Am J Cardiol. 2005;95:896-8.

1c.9 **Quote the Specific guideline recommendation (***including guideline number and/or page number***):**
ACC/AHA Secondary Prevention Guidelines (2006), Beta Blockers:
-Start and continue indefinitely in all patients who have had myocardial infarction, acute coronary syndrome, or left ventricular dysfunction with or without heart failure symptoms, unless contraindicated. I (A)
-Consider chronic therapy for all other patients with coronary or other vascular disease or diabetes unless contraindicated. IIa (C) (Page 2132)

ACC/AHA Heart Failure Guidelines (2005, 2009 Update)
13. In patients with reduced ejection fraction experiencing a symptomatic exacerbation of HF requiring hospitalization during chronic maintenance treatment with oral therapies known to improve outcomes, particularly ACEIs or ARBs and beta-blocker therapy, it is recommended that these therapies be continued in most patients in the absence of hemodynamic instability or contraindications. (Level of Evidence: C) (Page e47)

14. In patients hospitalized with HF with reduced ejection fraction not treated with oral therapies known to improve outcomes, particularly ACEIs or ARBs and beta-blocker therapy, initiation of these therapies is recommended in stable patients prior to hospital discharge (569,570). (Level of Evidence: B) (Page e47)

15. 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. Particular caution should be used when initiating beta blockers in patients who have required inotropes during their hospital course (569,570). (Level of Evidence: B) (Page e47)

17. Comprehensive written discharge instructions for all patients with a hospitalization for HF and their caregivers is strongly recommended, with special emphasis on the following 6 aspects of care: diet; discharge medications, with a special focus on adherence, persistence, and uptitration to recommended doses of ACEI/ARB and beta-blocker medication; activity level; follow-up appointments; daily weight monitoring; and what to do if HF symptoms worsen. (Level of Evidence: C) (Page e48)

1c.10 **Clinical Practice Guideline Citation:** 1. Smith SC, Jr., Allen J, Blair SN, et al. AHA/ACC guidelines for secondary prevention for patients with coronary and other atherosclerotic vascular disease: 2006 update endorsed by the National Heart, Lung, and Blood Institute. J Am Coll Cardiol. 2006;47:2130-9.

2. Hunt SA, Abraham WT, Chin MH, et al. 2009 Focused update incorporated into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines Developed in Collaboration With the International Society for Heart and Lung Transplantation. J Am Coll Cardiol. 2009;53:e1-e90.

1c.11 **National Guideline Clearinghouse or other URL:** http://www.cardiosource.org/Science-And-Quality/Practice-Guidelines-and-Quality-Standards.aspx

1c.12 **Rating of strength of recommendation (***also provide narrative description of the rating and by whom***):**

**Comment [k7]:** USPSTF grading system **http://www.ahrq.gov/clinic/uspstf/grades.htm**: **A -** The USPSTF recommends the service. There is high certainty that the net benefit is substantial. **B -** The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial. **C -** The USPSTF recommends against routinely providing the service. There may be considerations that support providing the service in an individual patient. There is at least moderate certainty that the net benefit is small. Offer or provide this service only if other considerations support the offering or providing the service in an individual patient. **D -** The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits. **I -** The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

| | |
|---|---|
| Class I: Conditions for which there is evidence for and/or general agreement that a given procedure or treatment is beneficial, useful, and effective<br><br>**1c.13 Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF*)**:**<br>ACC/AHA Taskforce on Practice Guidelines Method:<br><br>Indications are categorized as class I, II, or III on the basis of a multifactorial assessment of risk and expected efficacy viewed in the context of current knowledge and the relative strength of this knowledge. These classes summarize the recommendations for procedures or treatments as follows:<br><br>Class I: Conditions for which there is evidence for and/or general agreement that a given procedure or treatment is beneficial, useful, and effective.<br><br>Class II: Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment.<br><br>Class IIa: Weight of evidence/opinion is in favor of usefulness/efficacy.<br><br>Class IIb: Usefulness/efficacy is less well established by evidence/opinion.<br><br>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.<br><br>**1c.14 Rationale for using this guideline over others:**<br>These guidelines are the most widely recognized professional guidelines in the US for cardiovascular medicine for patients with heart failure. | |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Importance to Measure and Report*? | **1** |
| **Steering Committee: Was the threshold criterion,** *Importance to Measure and Report*, **met?**<br>**Rationale:** | **1**<br>**Y☐**<br>**N☐** |
| **2. SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES** | |
| Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. (evaluation criteria) | **Eval Rating** |
| **2a. MEASURE SPECIFICATIONS** | |
| **S.1 Do you have a web page where current detailed measure specifications can be obtained?**<br>**S.2 If yes, provide web page URL:**<br><br>**2a. Precisely Specified** | |
| **2a.1 Numerator Statement (***Brief, text description of the numerator - what is being measured about the target population, e.g. target condition, event, or outcome***):**<br>Count of patients with beta blocker therapy prescribed on discharge.<br><br>**2a.2 Numerator Time Window (***The time period in which cases are eligible for inclusion in the numerator***):**<br>1 year<br><br>**2a.3 Numerator Details (***All information required to collect/calculate the numerator, including all codes, logic, and definitions***):**<br>discharge medication of beta blocker (any)= yes | **2a-specs**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **2a.4 Denominator Statement (***Brief, text description of the denominator - target population being measured***):** | |

**Comment [KP8]: 2a.** The measure is well defined and precisely specified so that it can be implemented consistently within and across organizations and allow for comparability. The required data elements are of high quality as defined by NQF's Health Information Technology Expert Panel (HITEP) .

Count of patients with an ICD implant with LVSD without contraindication to beta blockers

**2a.5 Target population gender:** Female, Male
**2a.6 Target population age range:** All Patients

**2a.7 Denominator Time Window (***The time period in which cases are eligible for inclusion in the denominator***):**
1 year

**2a.8 Denominator Details (***All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):**
Procedure type= initial generator implant=yes or generator change=yes

Most recent LVEF<40%

**2a.9 Denominator Exclusions (***Brief text description of exclusions from the target population***):** -Patients who expired
-Beta blocker therapy contraindicated or blinded.

**2a.10 Denominator Exclusion Details (***All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
Discharge status=deceased
Beta blocker (any)= contraindicated or blinded

Contraindicated supporting definition:
Medication was not prescribed because of a contraindication.
Contraindications must be documented explicitly by the physician, or clearly evidenced within the medical record

Blinded supporting definition:
Patient was in research study or clinical trial and administration of this specific medication is unknown

**2a.11 Stratification Details/Variables (***All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
N/A

**2a.12-13 Risk Adjustment Type:**

**2a.14 Risk Adjustment Methodology/Variables (***List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
N/A

**2a.15-17 Detailed risk model available Web page URL or attachment:**

**2a.18-19 Type of Score:** Rate/proportion
**2a.20 Interpretation of Score:** Better quality = Higher score
**2a.21 Calculation Algorithm (***Describe the calculation of the measure as a flowchart or series of steps***):**
Denominator Calculation:
1. Count of patients with arrival/discharge dates from data submissions that pass NCDR data inclusion thresholds
2. Exclude patients with arrival/discharge dates without initial generator implant or generator change
3. Exclude patients with LVEF>/=40% or LVEF assessed=no
4. Exclude patients with discharge status=deceased
5. Exclude patients with Beta blocker (any)= contraindicated or blinded

Numerator Calculation:
6. From denominator population, count of patients with discharge medication of Beta Blocker (any)=yes.

**2a.22 Describe the method for discriminating performance** *(e.g., significance testing)***:**
Hospitals performance for this measure is benchmarked each quarter and annually against hospitals with similar procedural volume, as well as against the ICD Registry aggregate. These benchmarks identify superior

**Comment [k9]:** 11 Risk factors that influence outcomes should not be specified as exclusions.
12 Patient preference is not a clinical exception to eligibility and can be influenced by provider interventions.

performance and encourage poorer performers to improve. The methodology is a data-driven, peer-group performance feedback used to positively affect outcomes.

**2a.23 Sampling (Survey) Methodology** *If measure is based on a sample (or survey), provide instructions for obtaining the sample, conducting the survey and guidance on minimum sample size (response rate)*:
N/A

**2a.24 Data Source (***Check the source(s) for which the measure is specified and tested)*
Registry data

**2a.25 Data source/data collection instrument (***Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.***):**
National Cardiovascular Data Registry (NCDR)® ICD RegistryTM

**2a.26-28 Data source/data collection instrument reference web page URL or attachment:** URL
http://www.ncdr.com/WebNCDR/ICD/ELEMENTS.ASPX

**2a.29-31 Data dictionary/code table web page URL or attachment:** URL
http://www.ncdr.com/WebNCDR/ICD/ELEMENTS.ASPX

**2a.32-35 Level of Measurement/Analysis** (*Check the level(s) for which the measure is specified and tested)*
Facility/Agency

**2a.36-37 Care Settings (***Check the setting(s) for which the measure is specified and tested)*
Hospital, Ambulatory Care: Hospital Outpatient

**2a.38-41 Clinical Services** (*Healthcare services being measured, check all that apply*)
Clinicians: PA/NP/Advanced Practice Nurse, Clinicians: Physicians (MD/DO)

## TESTING/ANALYSIS

**2b. Reliability testing**

**2b.1 Data/sample** *(description of data/sample and size)***:** Reliability was established by validating the derivation cohort from 2009 with data from 2008. 131,371 patient records were analyzed from 1283 facilities between January and December 2008.

**2b.2 Analytic Method** *(type of reliability & rationale, method for testing)***:**
Reliability was established by validating the derivation cohort from 2009 with data from 2008.

**2b.3 Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:**
Results were consistent among the derivation cohort and the testing cohort. Specifically, the median for hospitals in the derivation cohort was 89.8% with the lowest decile 75.0% and highest decile 100%. This is similar to that observed in the testing cohort (median 90.1%, lowest decile 75.0%, highest decile 100%).

The Data Quality Report (DQR) program has been developed to ensure data are valid and complete. The DQR is a process for submitting data files to the NCDR®. Participants use their data collection tool software to create a submission file which is uploaded to the NCDR website. After uploading, the data in the file is automatically checked for errors and completeness. Passing the DQR ensures well-formed data and a statistically significant submission. Types of errors detected by the DQR include:
Schema:Structure doesn't match NCDR requirements
Dates: Inconsistent dates
Selection: Missing or mismatched data; Can be a parent/child errors where a field requests more data.
Outlier: Anomalies or exceptions; Data exceeds the possible limits. For example: 1,000mm length lesion.
Counter: errors deal with Closure Methods, Lesions, and Intracoronary Devices. Each one has a counter, when more than one is used
List: Missing data in the Medications or either Device lists

**2b** C☐ P☐ M☐ N☐

**2c. Validity testing** — **2c**

**Comment [KP10]: 2b.** Reliability testing demonstrates the measure results are repeatable, producing the same results a high proportion of the time when assessed in the same population in the same time period.

**Comment [k11]:** 8 Examples of reliability testing include, but are not limited to: inter-rater/abstractor or intra-rater/abstractor studies; internal consistency for multi-item scales; test-retest for survey items. Reliability testing may address the data items or final measure score.

**Comment [KP12]: 2c.** Validity testing demonstrates that the measure reflects the quality of care provided, adequately distinguishing good and poor quality. If face validity is the only validity addressed, it is systematically assessed.

**2c.1 Data/sample** *(description of data/sample and size)*: Face/content validity: review of relevant evidence and guidelines and expert panel consensus process

**2c.2 Analytic Method** *(type of validity & rationale, method for testing)*:
Face/content validity was established to ensure this measure represented an important aspect of cardiovascular care for which improvement is needed.

**2c.3 Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:
A review of the relevant evidence and guidelines and expert panel consensus process resulted in the conclusion that this is a valid measure of quality of cardiovascular care for patients receiving an ICD.

C☐ P☐ M☐ N☐

**2d. Exclusions Justified**

**2d.1 Summary of Evidence supporting exclusion(s):**

**2d.2 Citations for Evidence:**

**2d.3 Data/sample** *(description of data/sample and size)*: 144,538 patient records from 1305 hospitals in the ICD registry from January 2009 to December 2009.

**2d.4 Analytic Method** *(type analysis & rationale)*:
Rate of exclusion coding.

**2d.5 Testing Results** *(e.g., frequency, variability, sensitivity analyses)*:
Deceased: 0.32%
Beta blocker contraindicated or blinded: 1.24%

2d C☐ P☐ M☐ N☐ NA☐

**2e. Risk Adjustment for Outcomes/ Resource Use Measures**

**2e.1 Data/sample** *(description of data/sample and size)*: N/A

**2e.2 Analytic Method** *(type of risk adjustment, analysis, & rationale)*:
N/A

**2e.3 Testing Results** *(risk model performance metrics)*:
N/A

**2e.4 If outcome or resource use measure is not risk adjusted, provide rationale:** N/A

2e C☐ P☐ M☐ N☐ NA☐

**2f. Identification of Meaningful Differences in Performance**

**2f.1 Data/sample from Testing or Current Use** *(description of data/sample and size)*: 15,483 patient records from 1305 hospitals in the CARE registry

**2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*:
Distribution of performance by percentile to demonstrate variability across hospitals.

**2f.3 Provide Measure Scores from Testing or Current Use** *(description of scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance)*:
Mean: 0.88
SD: 0.13
Q1: 0.85
Median: 0.91
Q3: 0.95

2f C☐ P☐ M☐ N☐

**Comment [k13]:** 9 Examples of validity testing include, but are not limited to: determining if measure scores adequately distinguish between providers known to have good or poor quality assessed by another valid method; correlation of measure scores with another valid indicator of quality for the specific topic; ability of measure scores to predict scores on some other related valid measure; content validity for multi-item scales/tests. Face validity is a subjective assessment by experts of whether the measure reflects the quality of care (e.g., whether the proportion of patients with BP < 140/90 is a marker of quality). If face validity is the only validity addressed, it is systematically assessed (e.g., ratings by relevant stakeholders) and the measure is judged to represent quality care for the specific topic and that the measure focus is the most important aspect of quality for the specific topic.

**Comment [KP14]: 2d.** Clinically necessary measure exclusions are identified and must be:
•supported by evidence of sufficient frequency of occurrence so that results are distorted without the exclusion;
AND
•a clinically appropriate exception (e.g., contraindication) to eligibility for the measure focus;
AND ... [4]

**Comment [k15]:** 10 Examples of evidence that an exclusion distorts measure results include, but are not limited to: frequency of occurrence, sensitivity analyses with and without the exclusion, and variability of exclusions across providers.

**Comment [KP16]: 2e.** For outcome measures and other measures (e.g., resource use) when indicated:
•an evidence-based risk-adjustment strategy (e.g., risk models, risk stratification) is specified and is based on patient clinical factors that influence the measured outcome (but not disparities in care) and are present at start of care;Error! Bookmark not defined. OR ... [5]

**Comment [k17]:** 13 Risk models should not obscure disparities in care for populations by including factors that are associated with differences/inequalities in care such as race, socioeconomic status, gender (e.g., poorer treatment outcomes of African American men with prostate cancer, inequalities in treatment for CVD risk factors between men and women). It is preferable to stratify measures by ra ... [6]

**Comment [KP18]: 2f.** Data analysis demonstrates that methods for scoring and analysis of the specified measure allow for identification of statistically significant and practically/clinically meaningful differences in performance.

**Comment [k19]:** 14 With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage of patients who received smoking cessation counseling (e.g., 74% v. 75%) is clinically ... [7]

95%: 1.00

**2g. Comparability of Multiple Data Sources/Methods**

**2g.1 Data/sample** *(description of data/sample and size)*: N/A

**2g.2 Analytic Method** *(type of analysis & rationale)*:
N/A

**2g.3 Testing Results** *(e.g., correlation statistics, comparison of rankings)*:
N/A

**2g** C☐ P☐ M☐ N☐ NA☐

**Comment [KP20]: 2g.** If multiple data sources/methods are allowed, there is demonstration they produce comparable results.

**2h. Disparities in Care**

**2h.1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*:

**2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:**

**2h** C☐ P☐ M☐ N☐ NA☐

**Comment [KP21]: 2h.** If disparities in care have been identified, measure specifications, scoring, and analysis allow for identification of disparities through stratification of results (e.g., by race, ethnicity, socioeconomic status, gender);OR rationale/data justifies why stratification is not necessary or not feasible.

**TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Scientific Acceptability of Measure Properties?*

**2**

**Steering Committee: Overall, to what extent was the criterion,** *Scientific Acceptability of Measure Properties*, **met?**
**Rationale:**

*2* C☐ P☐ M☐ N☐

## 3. USABILITY

Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making. (evaluation criteria)

**Eval Rating**

**3a. Meaningful, Understandable, and Useful Information**

**3a.1 Current Use:** In use

**3a.2 Use in a public reporting initiative (disclosure of performance results to the public at large)** (*If used in a public reporting initiative, provide name of initiative(s), locations, Web page URL(s). If not publicly reported, state the plans to achieve public reporting within 3 years*):
ACCF plans to begin voluntary public reporting of NCDR measures, including this measure, by 2012. ACCF is currently evaluating public reporting options and finalizing decisions related to location and display of information to be reported as well as communication plans.

**3a.3 If used in other programs/initiatives (***If used in quality improvement or other programs/initiatives, name of initiative(s), locations, Web page URL(s). If not used for QI, state the plans to achieve use for QI within 3 years***):**
This measure is used for QI by NCDR ICD Registry participating institutions. As of October 2010, 1582 institutions are enrolled in the ICD registry. 78% submit data on all patients and 22% submit data on CMS patients only as part of a CMS mandate for submission of primary prevention data for all primary prevention ICD implant procedures.

Participating institutions receive an institutional outcomes report each quarter with their hospital´s data. Over 1000 metrics are included in version 1 of each hospital´s outcomes report. 10 metrics are highlighted in the all patients report executive summary (16 for version 2 which will be released in early 2011). These metrics are selected by an NCDR panel of experts as presenting the greatest opportunity for care improvement. Hospitals receive their measure score, as well as the rates for all hospitals in the ICD registry, and all hospitals in the same comparison group (based on volume), and the rate for the 90th and 50th percentiles. A box and whisker plot is displayed for each metric to show hospitals how they compare to all hospitals in the ICD registry.

**3a** C☐ P☐ M☐ N☐

**Comment [KP22]: 3a**. Demonstration that information produced by the measure is meaningful, understandable, and useful to the intended audience(s) for both public reporting (e.g., focus group, cognitive testing) and informing quality improvement (e.g., quality improvement initiatives). An important outcome that may not have an identified improvement strategy still can be useful for informing quality improvement by identifying the need for and stimulating new approaches to improvement.

This measure is also provided to Hospital Corporation of America (HCA) for incorporation in their QI program efforts.

The Centers for Medicare & Medicaid Services (CMS) mandates that all institutions submit data on ICD implant procedures for primary prevention in order to receive reimbursement for these procedures. CMS will use this data for assessment of the efficacy of ICD use for primary prevention.

**Testing of Interpretability** (*Testing that demonstrates the results are understood by the potential users for public reporting and quality improvement*)
3a.4 **Data/sample** *(description of data/sample and size)*: 849 ICD registry participants, fall 2010.

3a.5 **Methods** *(e.g., focus group, survey, QI project)*:
Online survey

3a.6 **Results** *(qualitative and/or quantitative results and conclusions)*:
76% of survey participants answered yes to the question "Will the following metrics provide information that will be valuable for quality improvement at your institution?"

**3b/3c. Relation to other NQF-endorsed measures**

3b.1 **NQF # and Title of similar or related measures:**
#117: Beta Blockade at Discharge, #160 Beta blocker prescribed at discharge for AMI, #238 Beta blocker on discharge

(for NQF staff use) **Notes on similar/related endorsed or submitted measures:**

**3b. Harmonization**
If this measure is related to measure(s) already endorsed by NQF (e.g., same topic, but different target population/setting/data source or different topic but same target population):
3b.2 **Are the measure specifications harmonized? If not, why?**
This measure is aligned with the CMS measure #160, except that it does not include exclusions for discharge to hospice, against medical advice, or patients with comfort care measures only. A data element will be added to the ICD registry in the future for discharge location, and the measure will subsequently be updated at that time with these exclusions

3b C☐ P☐ M☐ N☐ NA ☐

**3c. Distinctive or Additive Value**
3c.1 **Describe the distinctive, improved, or additive value this measure provides to existing NQF-endorsed measures:**
This measure provides additive value to existing NQF-endorsed measures. #117 and #238 apply to CABG patients, while #160 applies to AMI patients. There is currently not an endorsed measure for beta blocker prescribed at discharge for ICD patients with LVSD.This measure also uses a different data source (registry) than the CMS measure (medical record).

5.1 **If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), Describe why it is a more valid or efficient way to measure quality:**

3c C☐ P☐ M☐ N☐ NA ☐

**TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Usability*?

3

**Steering Committee: Overall, to what extent was the criterion,** *Usability*, **met?**
**Rationale:**

3 C☐ P☐ M☐ N☐

## 4. FEASIBILITY

Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. (evaluation criteria)

Eval Rating

**4a. Data Generated as a Byproduct of Care Processes**

4a C☐

**Comment [KP23]: 3b.** The measure specifications are harmonized with other measures, and are applicable to multiple levels and settings.

**Comment [k24]:** 16 Measure harmonization refers to the standardization of specifications for similar measures on the same topic (e.g., *influenza immunization* of patients in hospitals or nursing homes), or related measures for the same target population (e.g., eye exam and HbA1c for *patients with diabetes*), or definitions applicable to many measures (e.g., age designation for children) so that they are uniform or compatible, unless differences are dictated by the evidence. The dimensions of harmonization can include numerator, denominator, exclusions, and data source and collection instructions. The extent of harmonization depends on the relationship of the measures, the evidence for the specific measure focus, and differences in data sources.

**Comment [KP25]: 3c.** Review of existing endorsed measures and measure sets demonstrates that the measure provides a distinctive or additive value to existing NQF-endorsed measures (e.g., provides a more complete picture of quality for a particular condition or aspect of healthcare, is a more valid or efficient way to measure).

**Comment [KP26]: 4a.** For clinical measures, required data elements are routinely generated concurrent with and as a byproduct of care processes during care delivery. (e.g., BP recorded in the electronic record, not abstracted from the record later by other personnel; patient self-assessment tools, e.g., depression scale; lab values, meds, etc.)

**4a.1-2 How are the data elements that are needed to compute measure scores generated?**
Data generated as byproduct of care processes during care delivery (Data are generated and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition), Coding/abstraction performed by someone other than person obtaining original information (E.g., DRG, ICD-9 codes on claims, chart abstraction for quality measure or registry)

P☐ M☐ N☐

**4b. Electronic Sources**

**4b.1 Are all the data elements available electronically?** (*elements that are needed to compute measure scores are in defined, computer-readable fields, e.g., electronic health record, electronic claims*)
Yes

**4b.2 If not, specify the near-term path to achieve electronic capture by most providers.**

**4b**
C☐ P☐ M☐ N☐

**Comment [KP27]: 4b.** The required data elements are available in electronic sources. If the required data are not in existing electronic sources, a credible, near-term path to electronic collection by most providers is specified and clinical data elements are specified for transition to the electronic health record.

**4c. Exclusions**

**4c.1 Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications?**
No

**4c.2 If yes, provide justification.**

**4c**
C☐ P☐ M☐ N☐ NA☐

**Comment [KP28]: 4c. Exclusions** should not require additional data sources beyond what is required for scoring the measure (e.g., numerator and denominator) unless justified as supporting measure validity.

**4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences**

**4d.1 Identify susceptibility to inaccuracies, errors, or unintended consequences of the measure and describe how these potential problems could be audited. If audited, provide results.**
The NCDR program takes a number of steps to minimize any potential for inaccuracies or errors in data used to report on performance back to hospitals. The process begins with support to data abstractors, including webinars, meetings, resource guides on the website, and clinical quality consultants available via e-mail or toll free phone number, to ensure consistent data collection. The NCDR establishes a unified electronic platform for data capture and submission that includes a certification process of the technical data collection tool selected by the hospital (either a commercially available software vendor product, the NCDR´s own web-based data collection tool, or a hospital´s customized electronic medical record system) that must occur prior to any data submissions. The certification process provides edit checks of data elements within the data collection tool to ensure a high quality data submission.

The NCDR data submission process includes a Data Quality Report (DQR) process that checks for validity in submissions based upon predetermined thresholds for element and composite completeness. The NCDR is putting in place a new strategy to systematically review the DQR results.

The NCDR on-site audit program has been developed to assess the reliability of data abstraction. This annual process reviews key elements at a select number of patient reports at a select number of sites and provides feedback scores to the hospitals. Any elements not currently included in the on-site audit process and deemed critical to capture for this measure will be added upon NQF endorsement.

**4d**
C☐ P☐ M☐ N☐

**Comment [KP29]: 4d.** Susceptibility to inaccuracies, errors, or unintended consequences and the ability to audit the data items to detect such problems are identified.

**4e. Data Collection Strategy/Implementation**

**4e.1 Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data/missing data, timing/frequency of data collection, patient confidentiality, time/cost of data collection, other feasibility/ implementation issues:**
Beta testing with a sample of registry participants takes place with each new registry version to identify errors in the data collection tool. In addition, modifications are made to metrics based on feedback during a public comment period.

The Data Quality Report (DQR) program has been developed to ensure data are valid and complete. The DQR is a process for submitting data files to the NCDR. Participants use their data collection tool software to create a submission file which is uploaded to the NCDR website. After uploading, the data in the file are automatically checked for errors and completeness. Passing the DQR ensures well-formed data and a

**4e**
C☐ P☐ M☐ N☐

**Comment [KP30]: 4e.** Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, etc.) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use).

| | |
|---|---|
| statistically significant submission. Types of errors detected by the DQR include:<br><br>Schema: Structure doesn´t match NCDR requirements<br>Dates: Inconsistent dates<br>Selection: Missing or mismatched data; can be parent/child errors where a field requests more data<br>Outlier: Anomalies or exceptions; data exceeds the possible limits.<br><br>4e.2 **Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:**<br>ICD registry participants pay a fee of $3,480/year (as of 2010) to enroll in the registry. Staff resources are needed for data collection and submission at the participating institution. Registry site managers/data collectors undergo (non-mandatory) training offered by the NCDR.<br><br>4e.3 **Evidence for costs:**<br>http://www.ncdr.com/WebNCDR/ncdrdocuments/B08352N%20ICD%20Registry%20Enrollment%20Packet%20Complete.pdf<br><br>4e.4 **Business case documentation:** | |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Feasibility*? | **4** |
| **Steering Committee: Overall, to what extent was the criterion,** *Feasibility***, met?**<br>**Rationale:** | **4**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |
| **RECOMMENDATION** | |
| (for NQF staff use) **Check if measure is untested and only eligible for time-limited endorsement.** | **Time-limited ☐** |
| **Steering Committee: Do you recommend for endorsement?**<br>**Comments:** | **Y☐**<br>**N☐**<br>**A☐** |
| **CONTACT INFORMATION** | |
| Co.1 **Measure Steward (Intellectual Property Owner)**<br>Co.1 **Organization**<br>American College of Cardiology Foundation, 2400 N Street NW, Washington, District Of Columbia, 20037<br><br>Co.2 **Point of Contact**<br>Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529- | |
| **Measure Developer If different from Measure Steward**<br>Co.3 **Organization**<br>American College of Cardiology Foundation, 2400 N Street NW, Washington, District Of Columbia, 20037<br><br>Co.4 **Point of Contact**<br>Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529- | |
| Co.5 **Submitter If different from Measure Steward POC**<br>Kristyne, McGuinn, MHS, kmcguinn@acc.org, 202-375-6529-, American College of Cardiology Foundation | |
| Co.6 **Additional organizations that sponsored/participated in measure development** | |
| **ADDITIONAL INFORMATION** | |
| **Workgroup/Expert Panel involved in measure development**<br>Ad.1 **Provide a list of sponsoring organizations and workgroup/panel members' names and organizations.** | |

**Describe the members' role in measure development.**
ICD Registry Steering Committee:
Mark S. Kremers, MD, FACC, FHRS Chair
Stephen C. Hammill, MD, FACC, FHRS Ex-Officio
Sana M. Al-Khatib, MD, FACC
Charles I. Berul, MD, FACC
Jeptha P. Curtis, MD, FACC
Paul A. Heidenreich, MD, FACC
Illeana L. Pina, MD, FACC
Matthew R. Reynolds, MD, FACC
Lynne Warner Stevenson, MD, FACC
Mary Norine Walsh, MD, FACC

Public Reporting Workgroup:
Fred Masoudi, MD, MSPH, FACC, FAHA, FACP
H. Vernon Anderson,MD, FACC, FSCAI
David Malenka, MD, FACC
Matt Roe, MD, FACC
Steve Hammill, MD, FHRS, FACC
Jeptha Curtis, MD, FACC
Paul Heidenreich, MD, MS, FACC
Brahmajee Nallamothu, MD, MPH, FACC
Mark Kremers, MD, FACC
Christopher White MD, FACC
Carl Tommaso, MD, FACC, FAHA, FSCAI
Sunil Rao, MD, FACC, FSCAI
Andrea Russo, MD, FACC, FHRS
Debabrata Mukherjee MD, FACC

**Ad.2 If adapted, provide name of original measure:** N/A
**Ad.3-5 If adapted, provide original specifications URL or attachment**

**Measure Developer/Steward Updates and Ongoing Maintenance**
**Ad.6 Year the measure was first released:** 2006
**Ad.7 Month and Year of most recent revision:** 12, 2010
**Ad.8 What is your frequency for review/update of this measure?** Every 3-4 years or if guideline updates warrant more frequent update, or with new dataset version.
**Ad.9 When is the next scheduled review/update for this measure?** 06, 2011



**Ad.11 -13 Additional Information web page URL or attachment:** Attachment ICDbetablockerLVSDTesting.pdf

**Date of Submission** (*MM/DD/YY*)**:** 12/14/2010

**Page 3: [1] Comment [k4]** **Karen Pace** **10/5/2009 8:59:00 AM**

**1c.** The measure focus is:

- an outcome (e.g., morbidity, mortality, function, health-related quality of life) that is relevant to, or associated with, a national health goal/priority, the condition, population, and/or care being addressed;

OR

- if an intermediate outcome, process, structure, etc., there is **evidence** that supports the specific measure focus as follows:
  - Intermediate outcome – evidence that the measured intermediate outcome (e.g., blood pressure, Hba1c) leads to improved health/avoidance of harm or cost/benefit.
  - Process – evidence that the measured clinical or administrative process leads to improved health/avoidance of harm and
    if the measure focus is on one step in a multi-step care process, it measures the step that has the greatest effect on improving the specified desired outcome(s).
  - Structure – evidence that the measured structure supports the consistent delivery of effective processes or access that lead to improved health/avoidance of harm or cost/benefit.
  - Patient experience – evidence that an association exists between the measure of patient experience of health care and the outcomes, values and preferences of individuals/ the public.
  - Access – evidence that an association exists between access to a health service and the outcomes of, or experience with, care.
  - Efficiency – demonstration of an association between the measured resource use and level of performance with respect to one or more of the other five IOM aims of quality.

**Page 3: [2] Comment [k5]** **Karen Pace** **10/5/2009 8:59:00 AM**

4 Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multi-step process, the step with the greatest effect on the desired outcome should be selected as the focus of measurement. For example, although assessment of immunization status and recommending immunization are necessary steps, they are not sufficient to achieve the desired impact on health status – patients must be vaccinated to achieve immunity. This does not preclude consideration of measures of preventive screening interventions where there is a strong link with desired outcomes (e.g., mammography) or measures for multiple care processes that affect a single outcome.

**Page 3: [3] Comment [k6]** **Karen Pace** **10/5/2009 8:59:00 AM**

3 The strength of the body of evidence for the specific measure focus should be systematically assessed and rated (e.g., USPSTF grading system http://www.ahrq.gov/clinic/uspstf07/methods/benefit.htm). If the USPSTF grading system was not used, the grading system is explained including how it relates to the USPSTF grades or why it does not. However, evidence is not limited to quantitative studies and the best type of evidence depends upon the question being studied (e.g., randomized controlled trials appropriate for studying drug efficacy are not well suited for complex system changes). When qualitative studies are used, appropriate qualitative research criteria are used to judge the strength of the evidence.

**Page 8: [4] Comment [KP14]** **Karen Pace** **10/5/2009 8:59:00 AM**

**2d.** Clinically necessary measure exclusions are identified and must be:

- supported by evidence of sufficient frequency of occurrence so that results are distorted without the exclusion;

AND

- a clinically appropriate exception (e.g., contraindication) to eligibility for the measure focus;

AND

- precisely defined and specified:
  - if there is substantial variability in exclusions across providers, the measure is specified so that exclusions are computable and the effect on the measure is transparent (i.e., impact clearly delineated, such as number of cases excluded, exclusion rates by type of exclusion);

if patient preference (e.g., informed decision-making) is a basis for exclusion, there must be evidence that it strongly impacts performance on the measure and the measure must be specified so that the information about patient preference and the effect on the measure is transparent (e.g., numerator category computed separately, denominator exclusion category computed separately).

**Page 8: [5] Comment [KP16]** **Karen Pace** **10/5/2009 8:59:00 AM**

rationale/data support no risk adjustment.

**Page 8: [6] Comment [k17]** **Karen Pace** **10/5/2009 8:59:00 AM**

13 Risk models should not obscure disparities in care for populations by including factors that are associated with differences/inequalities in care such as race, socioeconomic status, gender (e.g., poorer treatment outcomes of African American men with prostate cancer, inequalities in treatment for CVD risk factors between men and women). It is preferable to stratify measures by race and socioeconomic status rather than adjusting out differences.

**Page 8: [7] Comment [k19]** **Karen Pace** **10/5/2009 8:59:00 AM**

14 With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage of patients who received smoking cessation counseling (e.g., 74% v. 75%) is clinically meaningful; or whether a statistically significant difference of $25 in cost for an episode of care (e.g., $5,000 v. $5,025) is practically meaningful. Measures with overall poor performance may not demonstrate much variability across providers.

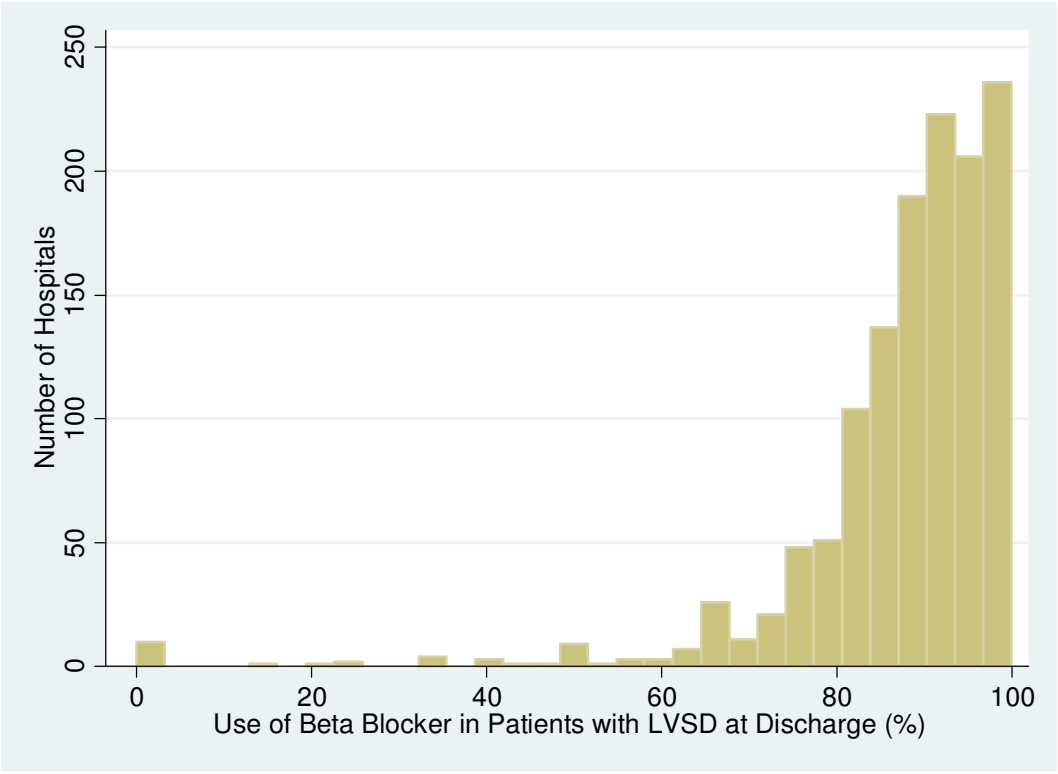
## Table Study Sample (ICD 2009)

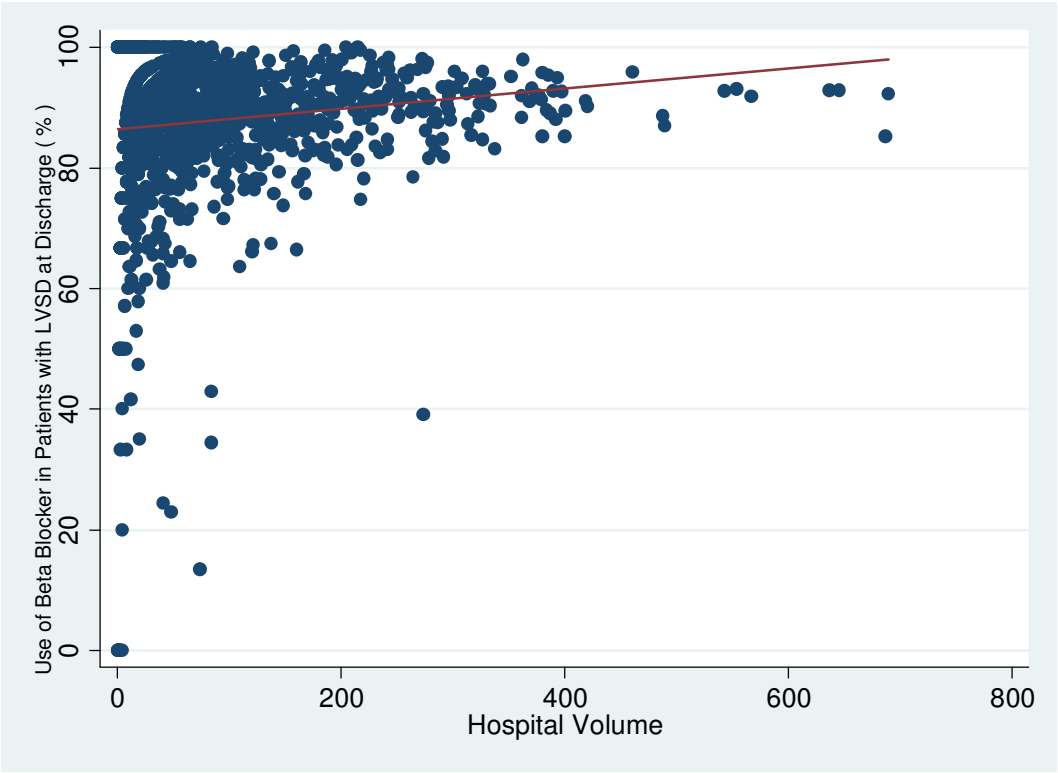
| Exclusions | Hospital stays | | Patients | | Facilities | |
|---|---|---|---|---|---|---|
| | # | % | # | % | # | % |
| **Sample from01/01/2009 to 12/31/2009** | 144538 | 100 | 143653 | 100 | 1305 | 100 |
| excluding deceased patients | 457 | 0.32 | 455 | 0.32 | 0 | 0 |
| **Remaining** | 144081 | 99.68 | 143198 | 99.68 | 1305 | 100 |
| Excluding EF>=40%+missing | 30592 | 21.23 | 30357 | 21.20 | 6 | 0.46 |
| **Remaining** | 113489 | 78.77 | 112841 | 78.80 | 1299 | 99.54 |
| unknown, contraindicated or blinded | 1412 | 1.24 | 1396 | 1.24 | 0 | 100.00 |
| **Study Sample** | 112077 | 98.76 | 111445 | 98.76 | 1299 | 100.00 |
| beta blocker use at discharge | 100489 | 89.66 | 99958 | 89.69 | 1289 | 99.23 |

Distribution of Beta blocker use in patients with LVSD at Discharge

| Description | Hospital volume | % patients received beta blocker at discharge |
|---|---|---|
| N | 1299 | 1299 |
| **Mean** | 86.28 | 0.8790 |
| Std Deviation | 95.19 | 0.1315 |
| | | |
| 100% Max | 690 | 1.0000 |
| 99% | 401 | 1.0000 |
| 95% | 280 | 1.0000 |
| 90% | 216 | 1.0000 |
| 75% Q3 | 119 | 0.9524 |
| **50% Median** | **54** | **0.9063** |
| 25% Q1 | 19 | 0.8462 |
| 10% | 6 | 0.7500 |
| 5% | 3 | 0.6667 |
| 1% | 1 | 0.2292 |
| 0% Min | 1 | 0.0000 |

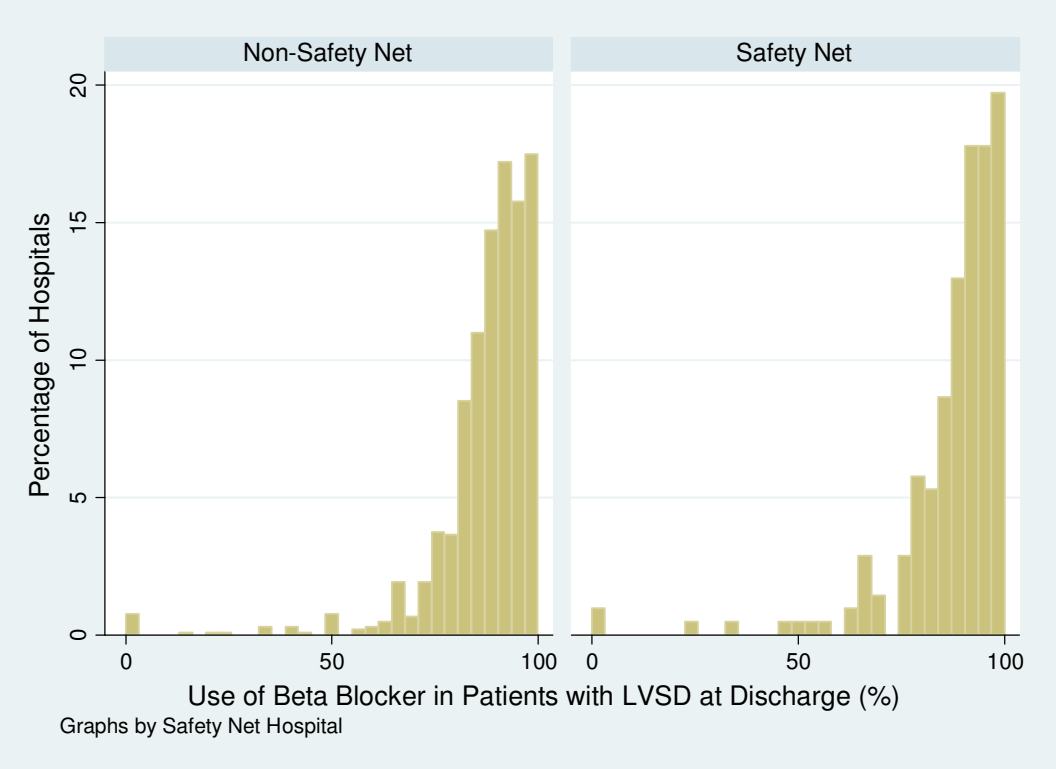
Among patients with previous MI , who are eligible for beta blockers

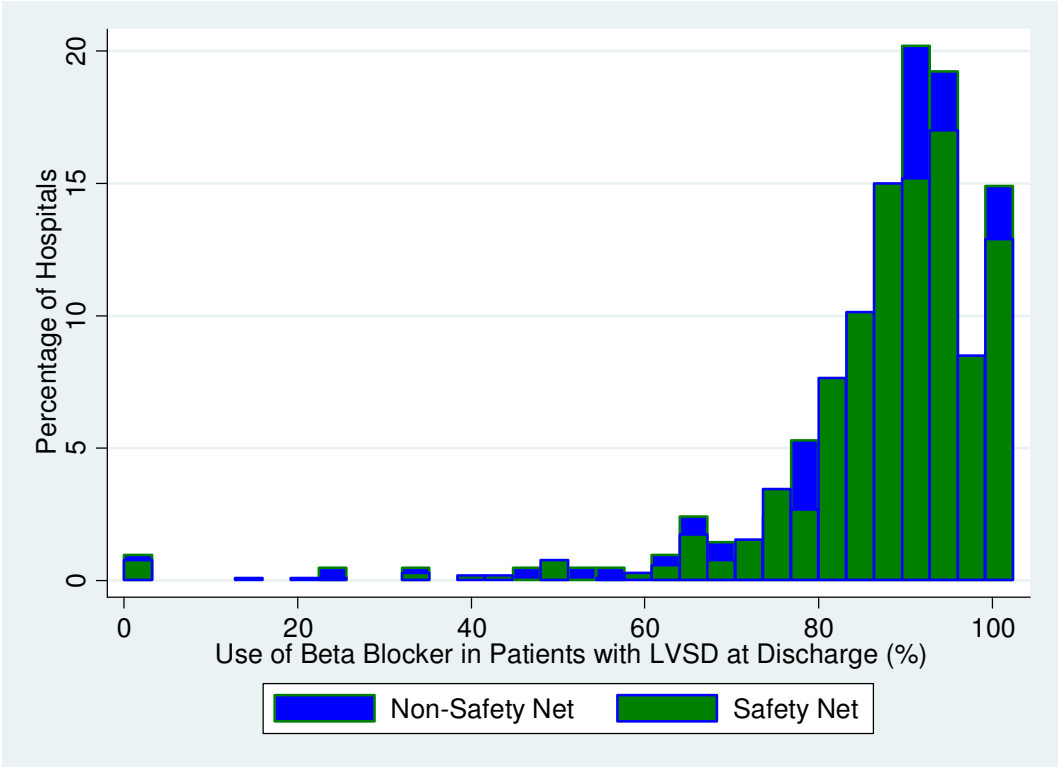

Number of Hospitals
0
50
100
150
200
250
0
20
40
60
80
100
Use of Beta Blocker in Patients with LVSD at Discharge (%)


Use of Beta Blocker in Patients with LVSD at Discharge (%)
0
20
40
60
80
100
0
200
400
600
800
Hospital Volume

| Distribution of Beta blocker use in Patients with LVSD at Discharge Stratified by Safety Net Status | | | | |
|---|---|---|---|---|
| **Description** | **Safety Net Status*** | | | |
| | **No** | | **Yes** | |
| | **Volume** | **beta blocker** | **Volume** | **beta blocker** |
| N | 1046 | 1046 | 208 | 208 |
| Mean | 87.41 | 0.8785 | 82.03 | 0.8770 |
| Std Deviation | 95.16 | 0.1305 | 95.95 | 0.1439 |
| 100% Max | 690 | 1.0000 | 567 | 1.0000 |
| 99% | 400 | 1.0000 | 386 | 1.0000 |
| 95% | 274 | 1.0000 | 296 | 1.0000 |
| 90% | 215 | 1.0000 | 230 | 1.0000 |
| 75% Q3 | 120 | 0.9524 | 114.5 | 0.9497 |
| **50% Median** | **56** | **0.9051** | **44** | **0.9134** |
| 25% Q1 | 21 | 0.8462 | 18 | 0.8451 |
| 10% | 7 | 0.7586 | 6 | 0.7500 |
| 5% | 3 | 0.6667 | 2 | 0.6612 |
| 1% | 1 | 0.2292 | 1 | 0.2439 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |

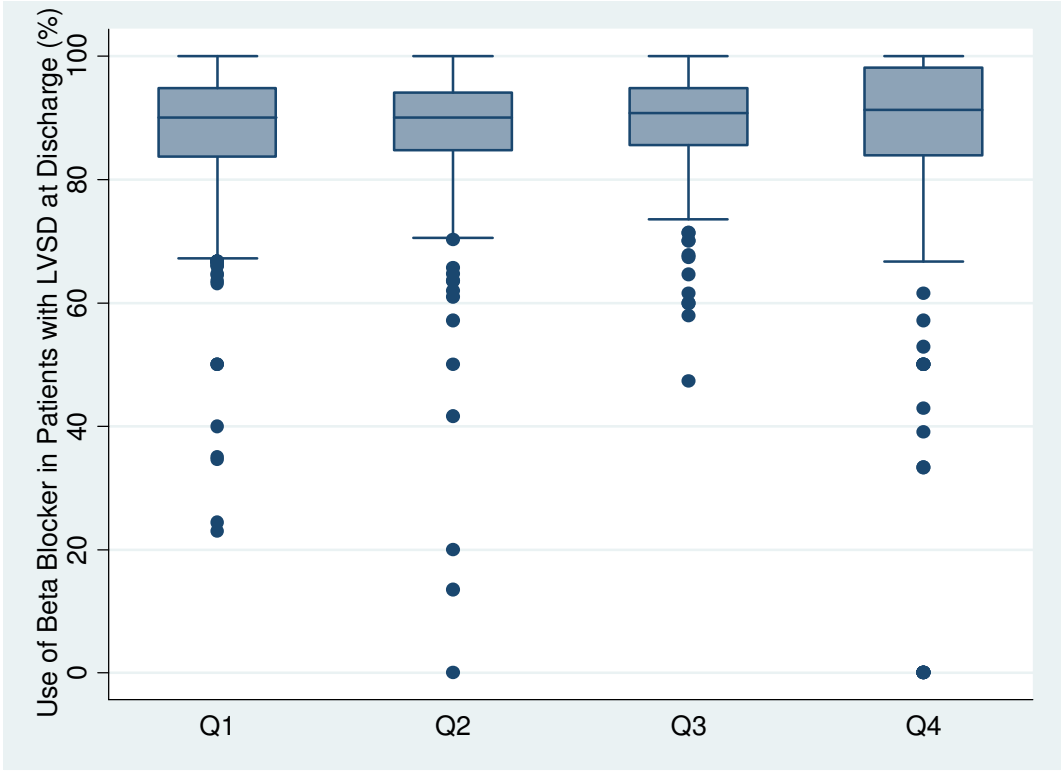
* Defined as government hospitals or non-government hosptials with high medicaid caseload using AHA 2008 Data.


Non-Safety Net
Safety Net
Percentage of Hospitals
0
5
10
15
20
0
50
100
Use of Beta Blocker in Patients with LVSD at Discharge (%)
Graphs by Safety Net Hospital

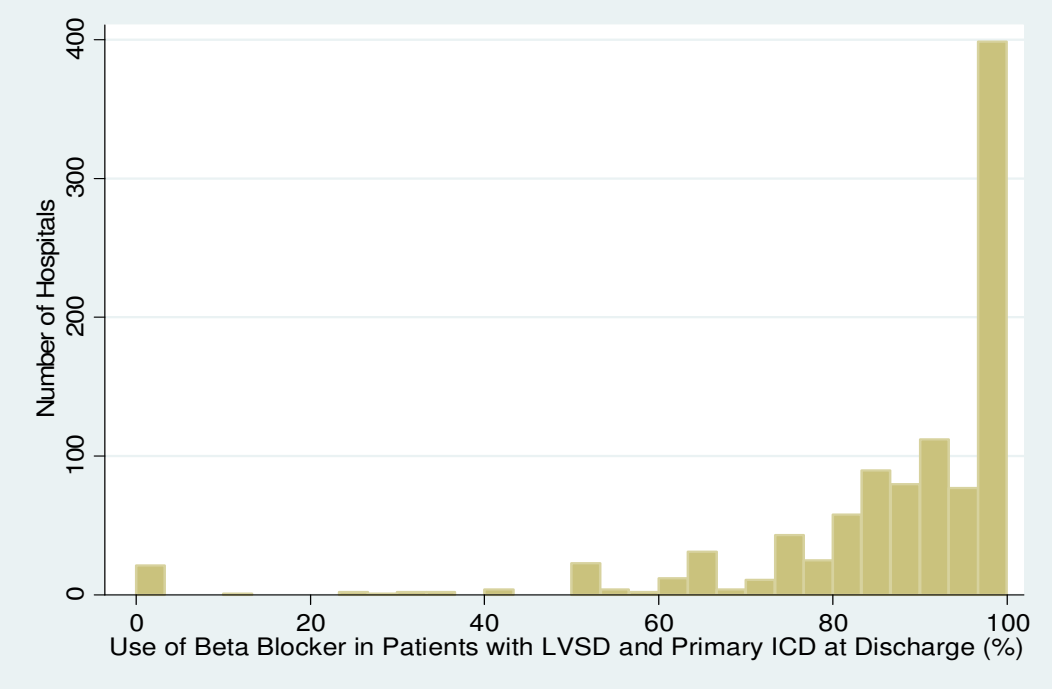

Percentage of Hospitals
0
5
10
15
20
0
20
40
60
80
100
Use of Beta Blocker in Patients with LVSD at Discharge (%)
Non-Safety Net
Safety Net

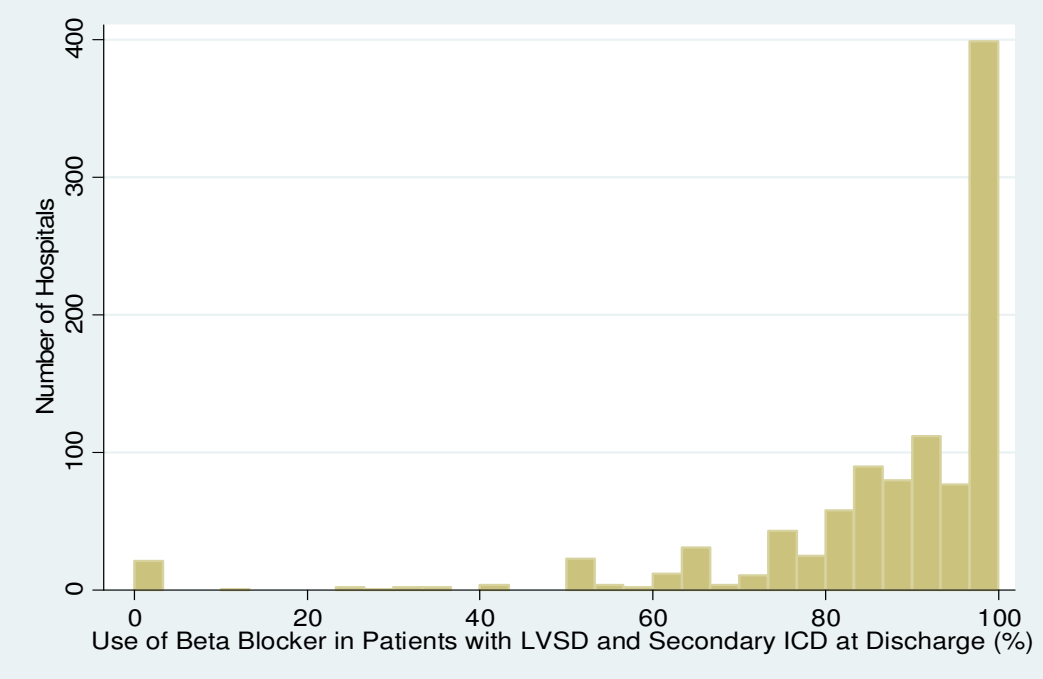
Distribution of Beta blocker use in Patients with LVSD at Discharge Stratified by % White

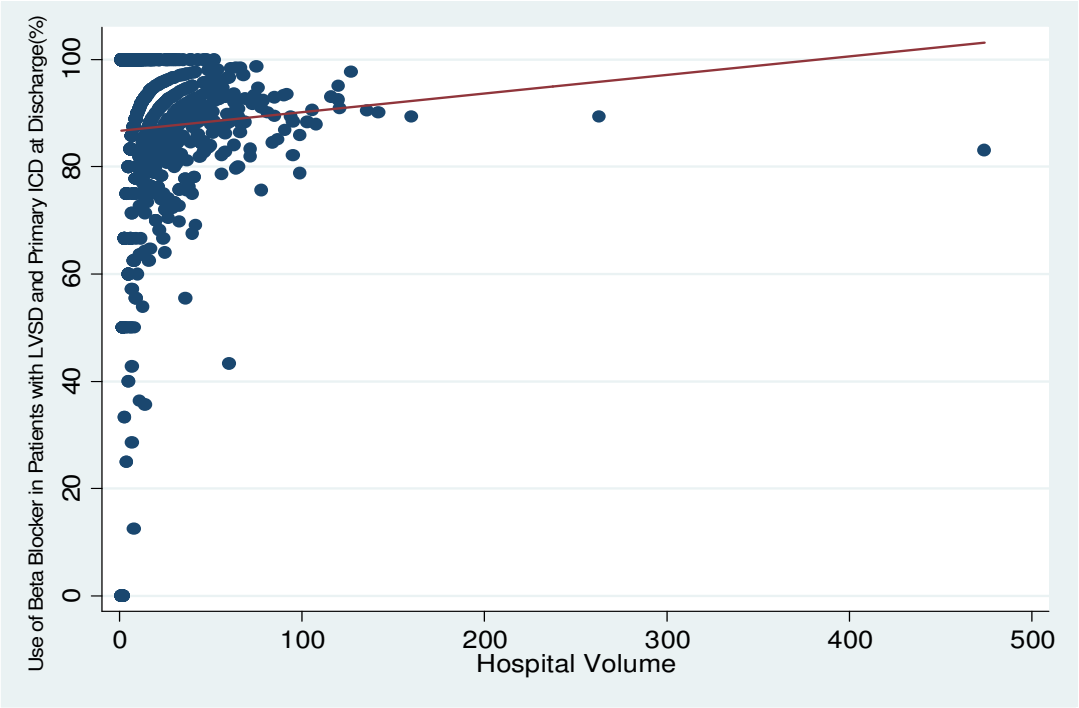
| Description | %White | %White | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Q1 (0.00% to 72.41%) | | Q2 (72.42% to 87.71%) | | Q3 (87.72% to 96.00%) | | Q4 (96.01% to 100.00%) | |
| | | Volume | beta blocker | Volume | beta blocker | Volume | beta blocker | Volume | beta blocker |
| N | 1299 | 324 | 324 | 325 | 325 | 325 | 325 | 325 | 325 |
| Mean | 0.8094 | 82.02 | 0.8770 | 111.55 | 0.8789 | 96.05 | 0.8936 | 55.49 | 0.8663 |
| Std Deviation | 0.2062 | 102.82 | 0.1202 | 107.72 | 0.1129 | 88.50 | 0.0800 | 67.98 | 0.1878 |
| 100% Max | 1.0000 | 690 | 1.0000 | 646 | 1.0000 | 687 | 1.0000 | 488 | 1.0000 |
| 99% | 1.0000 | 461 | 1.0000 | 401 | 1.0000 | 371 | 1.0000 | 274 | 1.0000 |
| 95% | 1.0000 | 291 | 1.0000 | 328 | 1.0000 | 275 | 1.0000 | 199 | 1.0000 |
| 90% | 1.0000 | 221 | 1.0000 | 278 | 0.9767 | 216 | 0.9778 | 141 | 1.0000 |
| 75% Q3 | 0.9600 | 105 | 0.9485 | 151 | 0.9412 | 127 | 0.9481 | 78 | 0.9811 |
| **50% Median** | **0.8771** | **44** | **0.9005** | **79** | **0.9000** | **68** | **0.9079** | **29** | **0.9130** |
| 25% Q1 | 0.7241 | 15.5 | 0.8362 | 31 | 0.8462 | 32 | 0.8558 | 6 | 0.8387 |
| 10% | 0.5174 | 6 | 0.7273 | 12 | 0.7727 | 18 | 0.7910 | 2 | 0.7313 |
| 5% | 0.3810 | 3 | 0.6667 | 8 | 0.7273 | 13 | 0.7477 | 1 | 0.5000 |
| 1% | 0.0000 | 1 | 0.3500 | 4 | 0.4167 | 9 | 0.6000 | 1 | 0.0000 |
| 0% Min | 0.0000 | 1 | 0.2292 | 4 | 0.0000 | 9 | 0.4737 | 1 | 0.0000 |


Use of Beta Blocker in Patients with LVSD at Discharge (%)
0
20
40
60
80
100
Q1
Q2
Q3
Q4

| Distribution of Beta Blocker use in Patients with LVSD at Discharge Stratified by ICD indication | | | | |
|---|---|---|---|---|
| | ICD Indication | | | |
| Description | Priamry | | Secondary | |
| | Volume | Beta Blocker | Volume | Beta Blocker |
| N | 1294 | 1294 | 1004 | 1004 |
| Mean | 71.93 | 0.8814 | 18.93 | 0.8735 |
| Std Deviation | 76.99 | 0.1352 | 27.02 | 0.1846 |
| 100% Max | 551 | 1.0000 | 474 | 1.0000 |
| 99% | 338 | 1.0000 | 108 | 1.0000 |
| 95% | 231 | 1.0000 | 63 | 1.0000 |
| 90% | 177 | 1.0000 | 46 | 1.0000 |
| 75% Q3 | 99 | 0.9583 | 25 | 1.0000 |
| 50% Median | 46 | 0.9106 | 10 | 0.9231 |
| 25% Q1 | 16 | 0.8462 | 4 | 0.8333 |
| 10% | 6 | 0.7566 | 1 | 0.6667 |
| 5% | 3 | 0.6667 | 1 | 0.5000 |
| 1% | 1 | 0.1892 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |


Number of Hospitals
0
100
200
300
400
0
20
40
60
80
100
Use of Beta Blocker in Patients with LVSD and Primary ICD at Discharge (%)


Number of Hospitals
0
100
200
300
400
0
20
40
60
80
100
Use of Beta Blocker in Patients with LVSD and Secondary ICD at Discharge (%)


Use of Beta Blocker in Patients with LVSD and Primary ICD at Discharge(%)
0
20
40
60
80
100
0
100
200
300
400
500
Hospital Volume

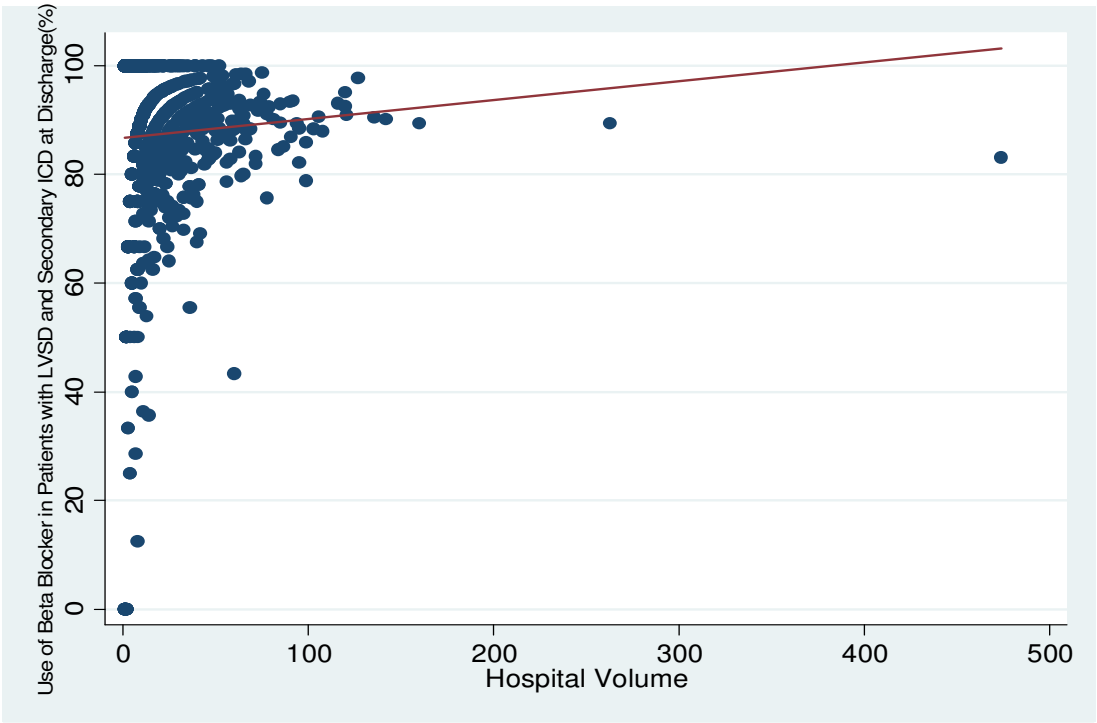

Use of Beta Blocker in Patients with LVSD and Secondary ICD at Discharge(%)
0
20
40
60
80
100
0
100
200
300
400
500
Hospital Volume

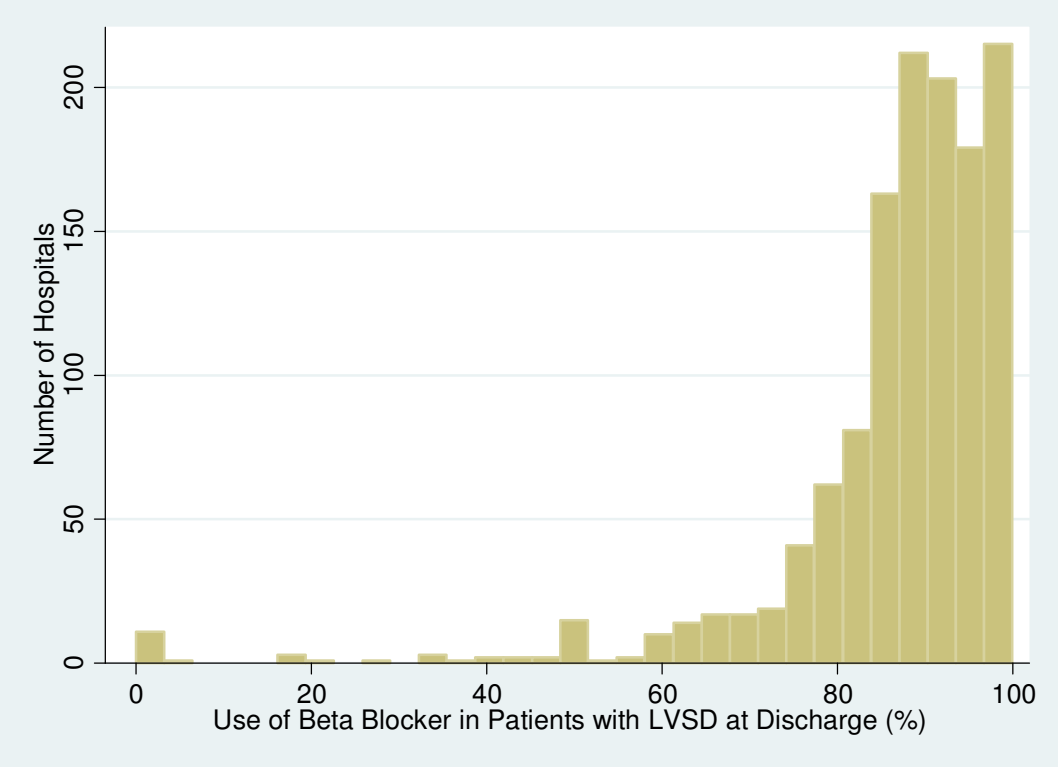
**Table Study Sample (ICD 2008)**

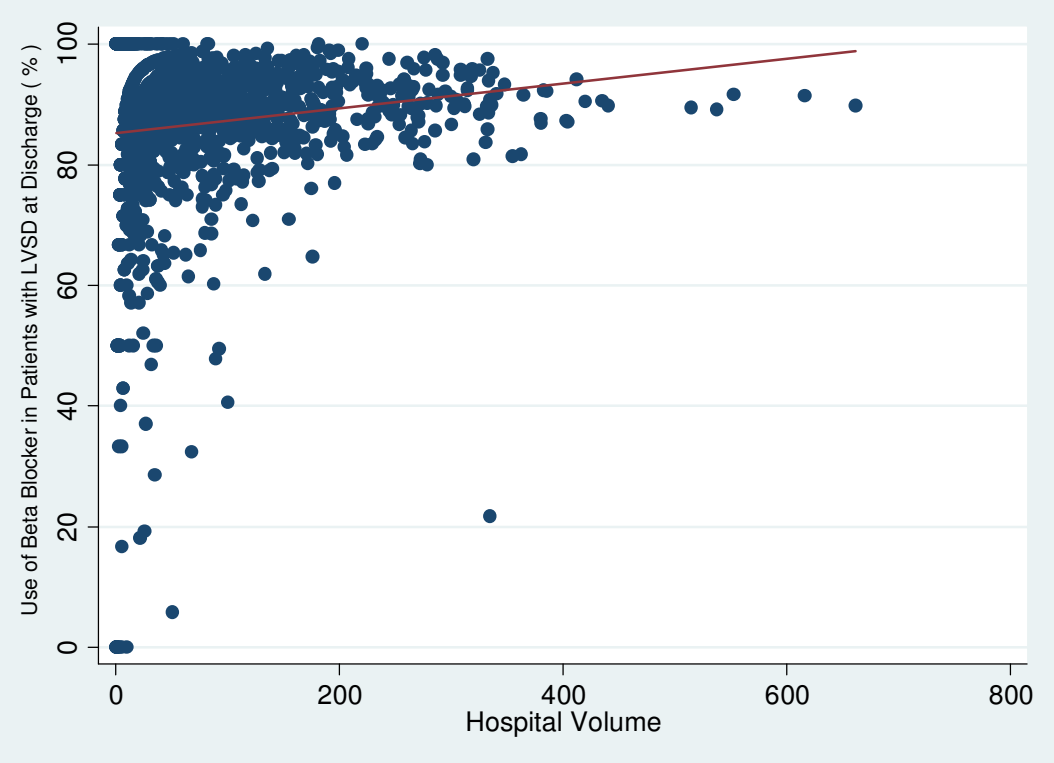
| Exclusions | Hospital stays | | Patients | | Facilities | |
|---|---|---|---|---|---|---|
| | # | % | # | % | # | % |
| **Sample from01/01/2008 to 12/31/2008** | 131371 | 100 | 130593 | 100 | 1283 | 100 |
| excluding deceased patients | 500 | 0.38 | 494 | 0.38 | 0 | 0 |
| **Remaining** | 130871 | 99.62 | 130099 | 99.62 | 1283 | 100 |
| Excluding EF>=40%+missing | 25185 | 19.24 | 25004 | 19.22 | 5 | 0.39 |
| **Remaining** | 105686 | 80.76 | 105095 | 80.78 | 1278 | 99.61 |
| unknown, contraindicated or blinded | 1191 | 1.13 | 1176 | 1.12 | 0 | 100.00 |
| **Study Sample** | 104495 | 98.87 | 103919 | 98.88 | 1278 | 100.00 |
| beta blocker use at discharge | 92903 | 88.91 | 92426 | 88.94 | 1267 | 99.14 |

Distribution of Beta blocker use in patients with LVSD at Discharge

| Description | Hospital volume | % patients received beta blocker at discharge |
|---|---|---|
| N | 1278 | 1278 |
| Mean | 81.76 | 0.8696 |
| Std Deviation | 88.10 | 0.1406 |
| | | |
| 100% Max | 662 | 1.0000 |
| 99% | 383 | 1.0000 |
| 95% | 271 | 1.0000 |
| 90% | 197 | 1.0000 |
| 75% Q3 | 114 | 0.9478 |
| 50% Median | 52 | 0.8982 |
| 25% Q1 | 19 | 0.8421 |
| 10% | 6 | 0.7500 |
| 5% | 3 | 0.6316 |
| 1% | 1 | 0.1667 |
| 0% Min | 1 | 0.0000 |

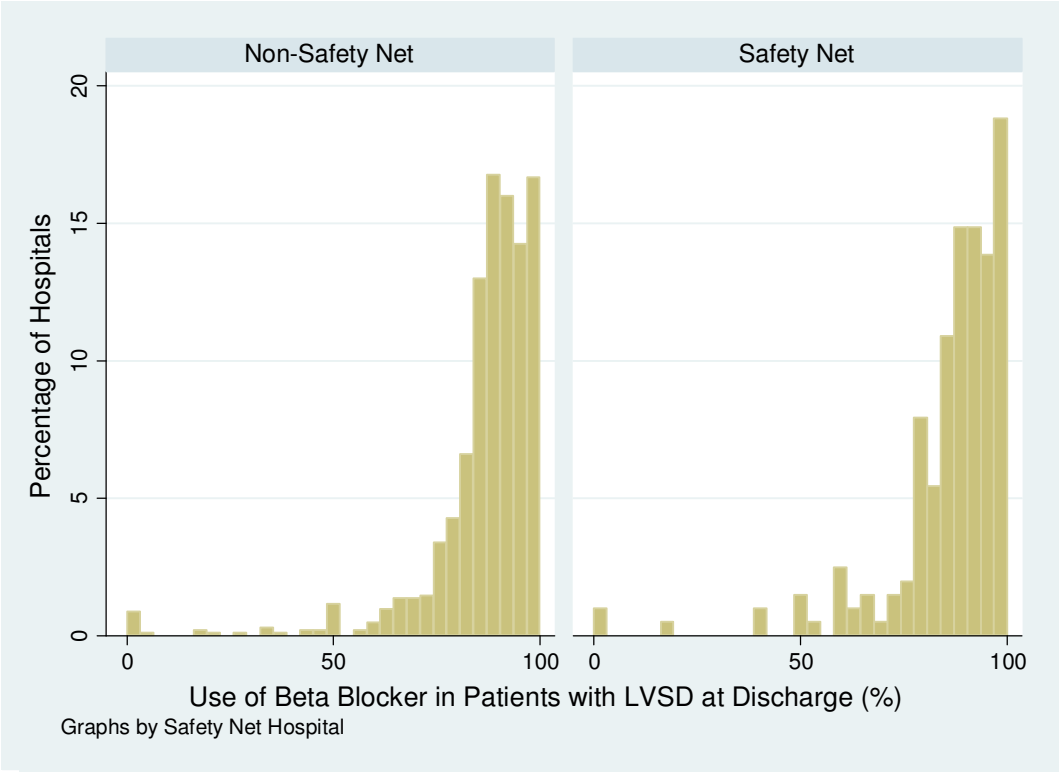
Among patients with previous MI , who are eligible for beta blockers

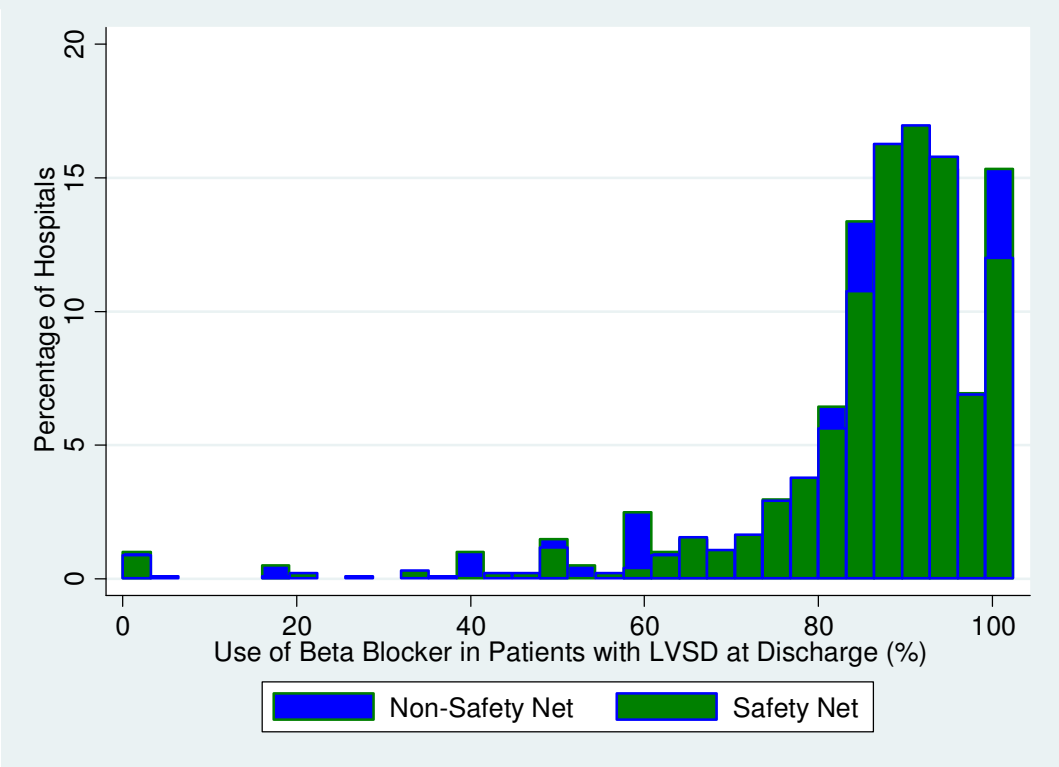

Number of Hospitals
0
50
100
150
200
0
20
40
60
80
100
Use of Beta Blocker in Patients with LVSD at Discharge (%)


Use of Beta Blocker in Patients with LVSD at Discharge ( % )
0
20
40
60
80
100
0
200
400
600
800
Hospital Volume

| Distribution of Beta blocker use in Patients with LVSD at Discharge Stratified by Safety Net Status | | | | |
|---|---|---|---|---|
| **Description** | **Safety Net Status*** | | | |
| | **No** | | **Yes** | |
| | **Volume** | **beta blocker** | **Volume** | **beta blocker** |
| N | 1032 | 1032 | 202 | 202 |
| Mean | 83.54 | 0.8707 | 74.44 | 0.8641 |
| Std Deviation | 89.44 | 0.1399 | 82.08 | 0.1532 |
| 100% Max | 662 | 1.0000 | 383 | 1.0000 |
| 99% | 386 | 1.0000 | 326 | 1.0000 |
| 95% | 271 | 1.0000 | 258 | 1.0000 |
| 90% | 198 | 1.0000 | 195 | 1.0000 |
| 75% Q3 | 115.5 | 0.9481 | 109 | 0.9497 |
| **50% Median** | 53.5 | 0.8990 | 43.5 | 0.8982 |
| 25% Q1 | 20 | 0.8438 | 14 | 0.8333 |
| 10% | 6 | 0.7500 | 4 | 0.7345 |
| 5% | 3 | 0.6508 | 3 | 0.5862 |
| 1% | 1 | 0.1667 | 1 | 0.1818 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |

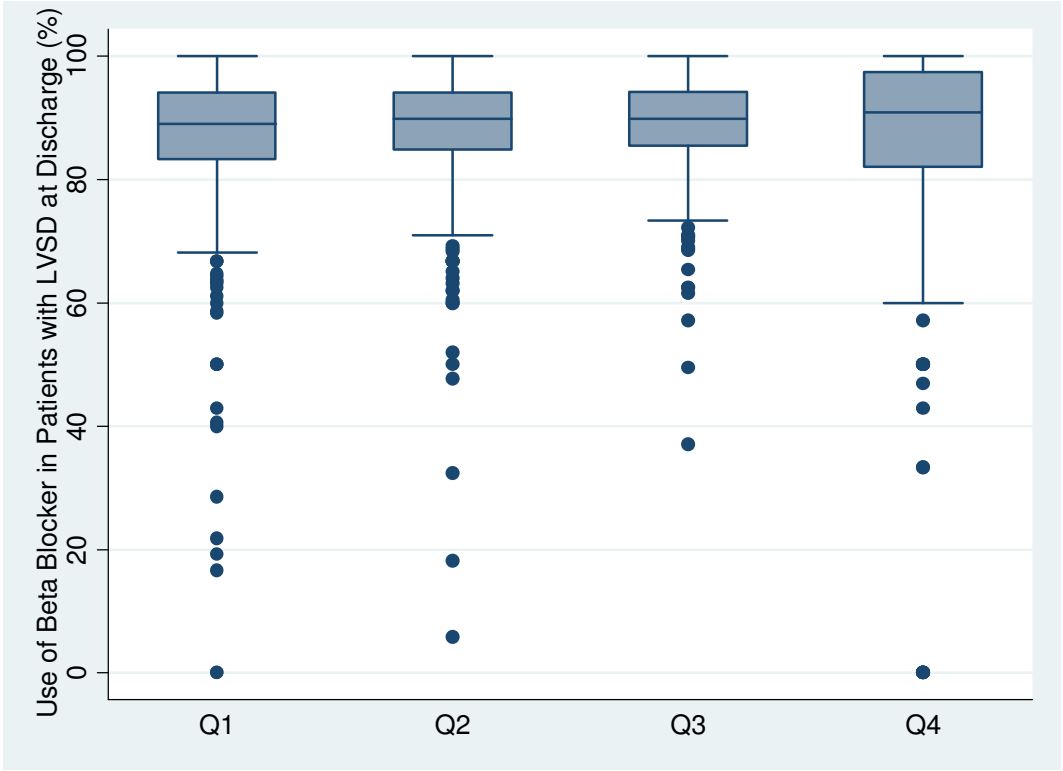
* Defined as government hospitals or non-government hosptials with high medicaid caseload using AHA 2008 Data.


Non-Safety Net
Safety Net
Percentage of Hospitals
0
5
10
15
20
0
50
100
Use of Beta Blocker in Patients with LVSD at Discharge (%)
Graphs by Safety Net Hospital

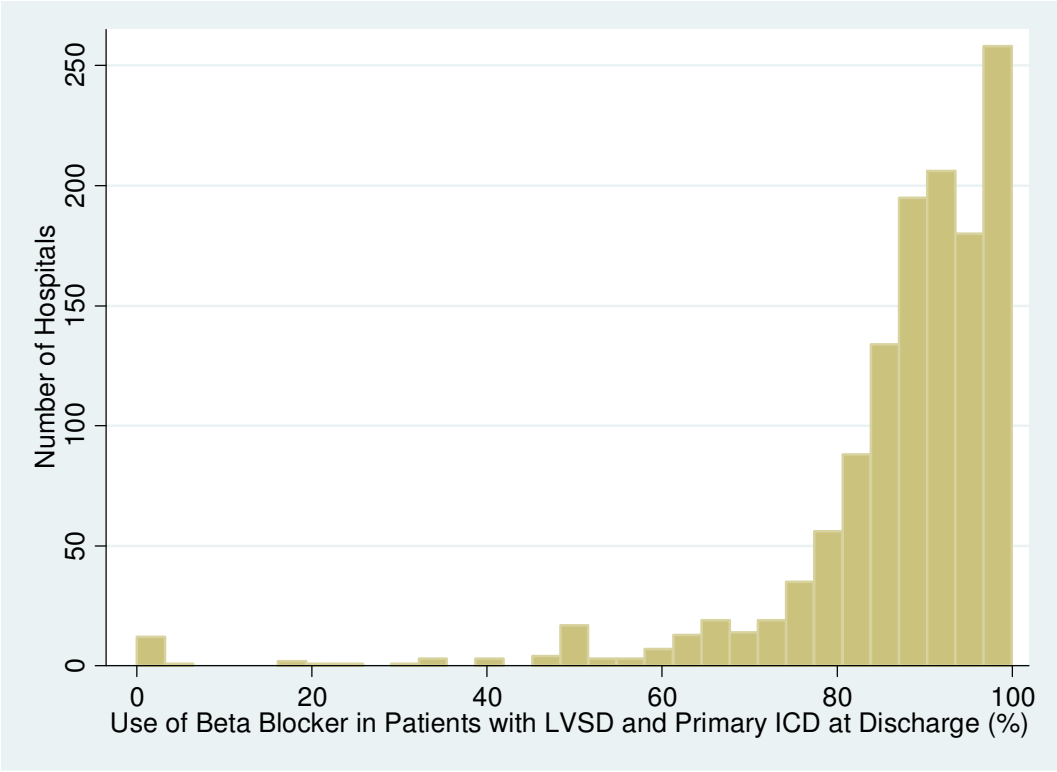

Percentage of Hospitals
0
5
10
15
20
0
20
40
60
80
100
Use of Beta Blocker in Patients with LVSD at Discharge (%)
Non-Safety Net
Safety Net

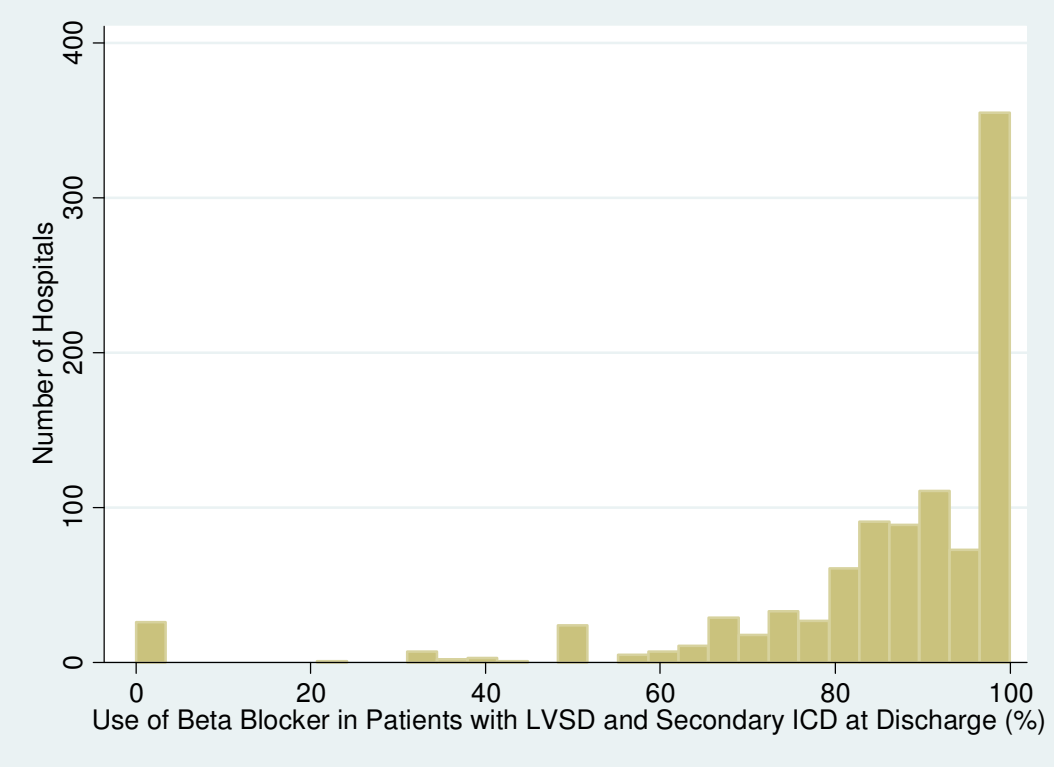
Distribution of Beta blocker use in Patients with LVSD at Discharge Stratified by % White

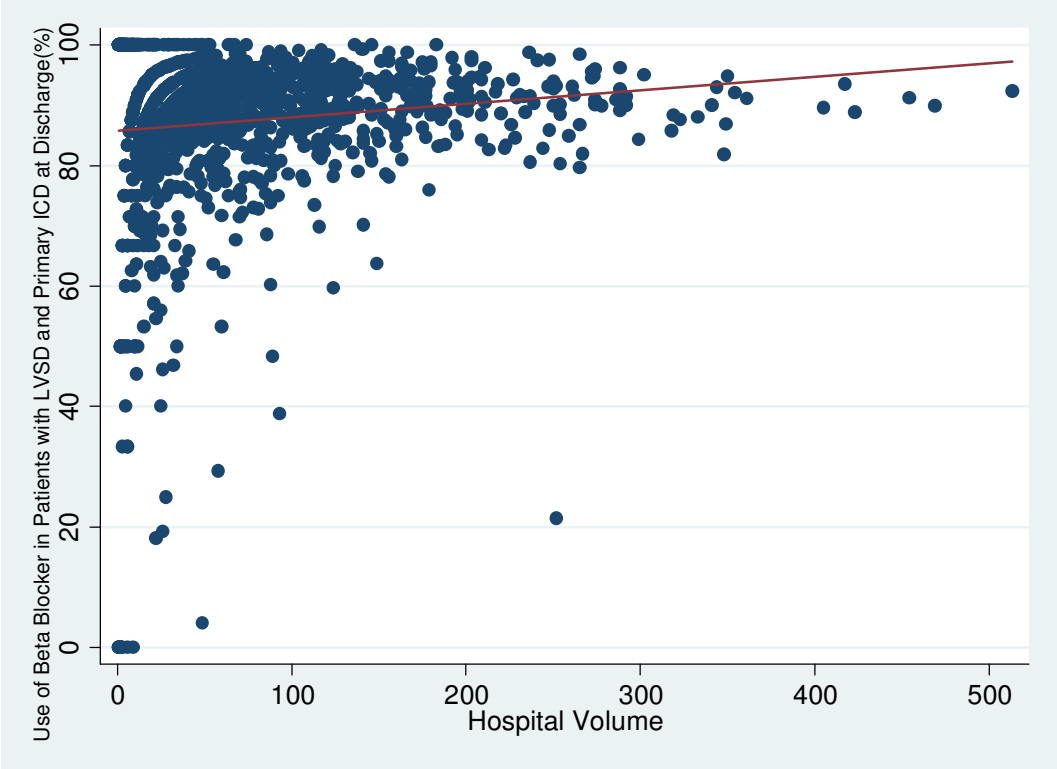
| Description | %White | %White | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Q1 (0.00% to 72.41%) | | Q2 (72.42% to 87.71%) | | Q3 (87.72% to 96.00%) | | Q4 (96.01% to 100.00%) | |
| | | Volume | beta blocker | Volume | beta blocker | Volume | beta blocker | Volume | beta blocker |
| N | 1278 | 319 | 319 | 318 | 318 | 322 | 322 | 319 | 319 |
| Mean | 0.8137 | 79.15 | 0.8608 | 100.11 | 0.8752 | 94.48 | 0.8856 | 53.254 | 0.8566 |
| Std Deviation | 0.2005 | 95.40 | 0.1466 | 96.57 | 0.1133 | 83.91 | 0.0819 | 65.865 | 0.1945 |
| 100% Max | 1.0000 | 662 | 1.0000 | 616 | 1.0000 | 553 | 1.0000 | 348 | 1.0000 |
| 99% | 1.0000 | 412 | 1.0000 | 403 | 1.0000 | 341 | 1.0000 | 320 | 1.0000 |
| 95% | 1.0000 | 272 | 1.0000 | 288 | 1.0000 | 273 | 0.9815 | 184 | 1.0000 |
| 90% | 1.0000 | 210 | 1.0000 | 254 | 0.9822 | 198 | 0.9677 | 138 | 1.0000 |
| 75% Q3 | 0.9613 | 107 | 0.9412 | 134 | 0.9409 | 129 | 0.9423 | 77 | 0.9741 |
| **50% Median** | 0.8750 | 44 | 0.8904 | 73 | 0.8988 | 66.5 | 0.8986 | 30 | 0.9091 |
| 25% Q1 | 0.7368 | 15 | 0.8333 | 30 | 0.8478 | 32 | 0.8553 | 6 | 0.8201 |
| 10% | 0.5278 | 5 | 0.7143 | 9 | 0.7627 | 18 | 0.7895 | 2 | 0.6585 |
| 5% | 0.3816 | 3 | 0.6111 | 5 | 0.6667 | 15 | 0.7407 | 1 | 0.5000 |
| 1% | 0.0909 | 1 | 0.1923 | 4 | 0.4778 | 8 | 0.6154 | 1 | 0.0000 |
| 0% Min | 0.0000 | 1 | 0.0000 | 4 | 0.0588 | 8 | 0.3704 | 1 | 0.0000 |

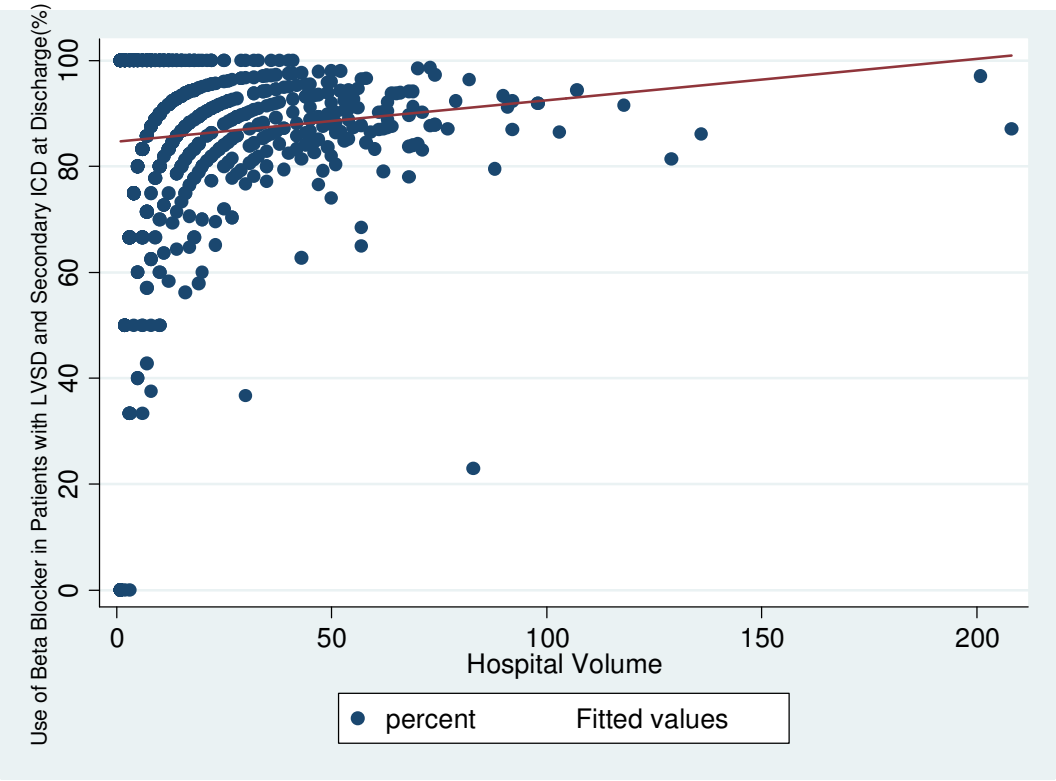

Use of Beta Blocker in Patients with LVSD at Discharge (%)
0
20
40
60
80
100
Q1
Q2
Q3
Q4

| Distribution of Beta Blocker use in Patients with LVSD at Discharge Stratified by ICD indication | | | | |
|---|---|---|---|---|
| | ICD Indication | | | |
| Description | Priamry | | Secondary | |
| | Volume | Beta Blocker | Volume | Beta Blocker |
| N | 1275 | 1275 | 974 | 974 |
| Mean | 68.27 | 0.8733 | 17.92 | 0.8602 |
| Std Deviation | 73.29 | 0.1447 | 21.33 | 0.1961 |
| 100% Max | 513 | 1.0000 | 208 | 1.0000 |
| 99% | 341 | 1.0000 | 92 | 1.0000 |
| 95% | 226 | 1.0000 | 59 | 1.0000 |
| 90% | 166 | 1.0000 | 46 | 1.0000 |
| 75% Q3 | 93 | 0.9545 | 24 | 1.0000 |
| 50% Median | 44 | 0.9048 | 10 | 0.9099 |
| 25% Q1 | 16 | 0.8421 | 4 | 0.8182 |
| 10% | 5 | 0.7500 | 1 | 0.6667 |
| 5% | 3 | 0.6296 | 1 | 0.5000 |
| 1% | 1 | 0.0408 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |


Number of Hospitals
0
50
100
150
200
250
0
20
40
60
80
100
Use of Beta Blocker in Patients with LVSD and Primary ICD at Discharge (%)


Number of Hospitals
0
100
200
300
400
0
20
40
60
80
100
Use of Beta Blocker in Patients with LVSD and Secondary ICD at Discharge (%)


Use of Beta Blocker in Patients with LVSD and Primary ICD at Discharge(%)
0
20
40
60
80
100
0
100
200
300
400
500
Hospital Volume


Use of Beta Blocker in Patients with LVSD and Secondary ICD at Discharge(%)
0
20
40
60
80
100
0
50
100
150
200
Hospital Volume
percent
Fitted values

NQF Review #:

# THE NATIONAL QUALITY FORUM

## COMPOSITE MEASURE SUBMISSION FORM
Version 4.1 January 2010

This form will be used by stewards to submit **composite** measures and by reviewers to evaluate the measures.

**Measure Stewards:** Check with NQF staff before using this form. Complete all non-shaded areas of the form. All requested information should be entered directly into this form. The information requested is directly related to NQF's composite measure evaluation criteria and will be used by reviewers to determine if the evaluation criteria have been met. The specific relevant subcriteria language is provided in a Word comment within the form and will appear if your cursor is over the highlighted area (or in balloons).

The measure steward has the opportunity to identify and present the information that demonstrates the measure meets the criteria. Additional materials will only be considered supplemental. Do not rely solely on materials provided at URLs or in attached documents to provide measure specifications or to demonstrate meeting the criteria. If supplemental materials are provided, be sure to indicate specific page numbers/ web page locations for the relevant information (web page links preferred).

For questions about completing this form, contact the project director at 202-783-1300. Please email this form to the appropriate contact listed in the corresponding call for measures.

**TAP/Workgroup** (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas).*

**Steering Committee:** Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the criteria are met
C = Completely (unquestionably demonstrated to meet the criterion)
P = Partially (demonstrated to partially meet the criterion)
M = Minimally (addressed BUT demonstrated to only minimally meet the criterion)
N = Not at all (NOT addressed; OR incorrectly addressed; OR demonstrated to NOT meet the criterion)
NA = Not applicable (only an option for a few subcriteria as indicated)

| |
|---|
| (for NQF staff use) **NQF Review #:** 0965 **NQF Project:** |
| De.1 **Title of Measure:** Patients with an ICD implant who receive prescriptions for all medications (ACE/ARB and beta blockers) for which they are eligible for at discharge |
| De.2 **Brief description of measure** (*including type of score, measure focus, target population, time, e.g., Percentage of adult patients aged 18-75 years receiving one or more HbA1c tests per year*):<br>Proportion of patients with an ICD implant who receive prescriptions for all medications (ACE/ARB and beta blockers) for which they are eligible for at discharge (all-or-none composite measure of two medication classes). |
| De.3 **Type of Measure:**<br>☒ Composite with component measures combined at patient-level (e.g., all-or-none)<br>☐ Composite with component measures combined at aggregate-level |
| **Select the most relevant priority area(s), quality domain(s), and consumer need(s).**<br><br>De.4 **National Priority Partners Priority Area** ☐ patient and family engagement ☐ population health ☐ safety<br>☐ care coordination ☐ palliative and end of life care ☐ overuse |

**De.5 IOM Quality Domain** ☒ effectiveness ☐ efficiency ☐ equity ☐ patient-centered ☐ safety ☒ timeliness

**De.6 Consumer Care Need** ☒ Getting Better ☒ Living With Illness ☐ Staying Healthy

| CONDITIONS FOR CONSIDERATION BY NQF | |
|---|---|
| Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards: | **NQF Staff** |
| **A.** The measure is in the public domain or an intellectual property agreement (measure steward agreement) is signed. *Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.*<br><br>**A.1 Do you attest that the measure steward holds intellectual property rights to the measure and the right to use any aspects of the measure owned by another entity (e.g., component measures, risk model, code set)?** ☒ Yes<br><br>**A.2 Measure Steward Agreement**<br>☒ Signed and Submitted **OR** ☐ Government entity–public domain<br>(If measure steward agreement not signed for non-government entities, do not submit)<br><br>**A.3 Please check if either of the following apply:**<br>☐ Proprietary Measure ☐ Proprietary Complex Measure w/fees | **A**<br>Y☐<br>N☐ |
| **B.** The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. **B.1** ☒ Yes (If no, do not submit) | **B**<br>Y☐<br>N☐ |
| **C.** The intended use of the measure includes both public reporting and quality improvement.<br>**C.1 Purpose:** ☒ Public reporting ☒ Internal quality improvement<br>**C.2** ☐ Accountability ☐ Accreditation ☐ Payment incentive ☐ Other, describe:<br>(If not intended for both public reporting and quality improvement, do not submit) | **C**<br>Y☐<br>N☐ |
| **D.** The requested measure submission information is complete. Composite measures should be fully developed and tested so that all the evaluation criteria have been addressed and information needed to evaluate the measure is provided.<br><br>**D.1 Testing:** ☒ Fully developed and tested (If composite measure not tested, do not submit)<br><br>**D.2 Have NQF-endorsed measures been reviewed to identify if there are similar or related measures?**<br>☒ Yes (If no, do not submit) *If there are similar or related measures, be sure to address items 3b and 3c with specific information.*<br>►**Is all requested information entered into this form?** ☒ Yes (If no, do not submit) | **D**<br>Y☐<br>N☐ |
| **De.7** If component measures of the composite **are aggregate-level measures, all** must be either NQF-endorsed or submitted for consideration for NQF endorsement (*check one*)<br>☐ All component measures are NQF-endorsed measures<br>☒ Some or all component measures are not NQF-endorsed and have been submitted using the online measure submission tool (If not, do not submit) | Y☐<br>N☐ |
| (for NQF staff use) **Have all conditions for consideration been met?**<br>Staff Notes to Steward (if submission returned): | **Met**<br>Y☐<br>N☐ |
| **Staff Notes to Reviewers (issues or questions regarding any criteria):** | |
| **Staff Reviewer Name(s):** | |

**TAP/Workgroup Reviewer Name:**

**Comment [KP1]:** The individual measures included in the composite or subcomposite measures must be either:
NQF-endorsed;
OR
assessed to have met the individual measure evaluation criteria as the first step in evaluating the composite measure.
(This does not apply to subscales of a scale/instrument that cannot be used independently of the total scale.)

NQF Review #:

**Steering Committee Reviewer Name:**

## 1. IMPORTANCE TO MEASURE AND REPORT

Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in or overall poor performance. *Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria.* (composite measure evaluation criteria)

**Eval**

(for NQF staff use) **Specific NPP goal**:

**1d. Purpose/objective of the Composite**

**1d.1 Describe the purpose/objective of the composite measure:** This measure is intended to assess the extent to which eligible patients receive evidence-based medications that are indicated at hosptial discharge following ICD placement.

**1d.2 Describe the quality construct used in developing the composite:** This measure focuses on processes of care that are supported by guidelines for optimal care for patients undergoing ICD placement.

**Comment [KP2]: 1d.** The purpose/objective of the composite measure and the construct for quality are clearly described.

C☐ P☐ M☐ N☐

**1e. Components and conceptual construct for quality**

**1e.1 Describe how the component measures/items are consistent with and representative of the quality construct:** Each of the components of this measure address appropriate medication prescribing at discharge for ICD patients.

**Comment [KP3]: 1e.** The component items/measures (e.g., types, focus) that are included in the composite are consistent with and representative of the conceptual construct for quality represented by the composite measure. Whether the composite measure development begins with a conceptual construct or a set of measures, the measures included must be conceptually coherent and consistent with the purpose.

If the component measures are combined at the patient level, complete 1a, 1b, and 1c.

If the component measures are combined at the aggregate level, skip to criterion 2, *Scientific Acceptability of Measure Properties* (individual measures are either NQF-endorsed or submitted individually).

**1a. High Impact**

**1a.1 Demonstrated high impact aspect of healthcare** (*Select the most relevant*)

☒ affects large numbers ☒ frequently performed procedure ☒ leading cause of morbidity/mortality ☒ high resource use ☒ severity of illness ☐ patient/societal consequences of poor quality ☐ other, describe: **1a.2**

**1a.3 Summary of Evidence of High Impact:** Optimal medical therapy is critical to ensure favorable patient outcomes following implantation of an implantable cardiac defibrillator (ICD) to prevent sudden cardiac death (SCD). In 2006, 114,000 inpatient defibrillator implantations were performed. The mean hospital charge for ICD procedures was $115,763. Approximately 81 million American adults have 1 or more types of CVD, with 5.8 million having heart failure. Over 30% of all deaths are related to CVD. Over 90% of patients receiving an ICD for primary prevention have ejection fraction under 40%, while 70% of patients receiving an ICD for secondary prevention have an ejection fraction under 40%. Therefore, it is critical that these patients receive discharge medications to treat left ventricular systolic dysfunction to reduce associated morbidity and mortality, as well as repeat hospitalizations and procedures.

**1a.4 Citations for Evidence of High Impact:** American Heart Association. Heart disease and stroke statistics- 2010 update: A report of the American Heart Association.
Available at: http://circ.ahajournals.org/cgi/content/abstract/CIRCULATIONAHA.109.192667v1. Accessed December 3, 2010.

**Comment [KP4]: 1a.** The measure focus addresses:
- a specific national health goal/priority identified by NQF's National Priorities Partners; OR
- a demonstrated high impact aspect of healthcare (e.g., affects large numbers, leading cause of morbidity/mortality, high resource use (current and/or future), severity of illness, and patient/societal consequences of poor quality).

**1a** H☐ M☐ L☐ N☐

**1b. Opportunity for Improvement**

**1b.1 Briefly explain benefits (improvements in quality) envisioned by use of this measure:** This measure is intended to improve rates of evidence-based medication prescribing for patients following ICD implantation to improve outcomes associated with cardiovascular disease.

**1b.2 Summary of data demonstrating performance gap** (*variation or overall poor performance across providers*)**:** Data from 518,695 patients from 1475 facilities in 2009 ranged from 40.0% at he 5th percentile, to 100.00% at the 95th percentile. The median was 73.3%.

**1b.3 Citations for data on performance gap:** Unpublished NCDR data, see supplemental documentation.

**1b.4 Summary of Data on disparities by population group:** Data from the ICD registry were stratified by safety net

**Comment [KP5]: 1b.** Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating considerable variation, or overall poor performance, in the quality of care across providers and/or population groups (disparities in care).

**1b** H☐ M☐ L☐ N☐

status, age, gender, and race. No significant disparities were found. Please see results in 2h in this form, as well as supplemental documentation provided.

**1b.5 Citations for data on Disparities:** Unpublished NCDR data.

**1c. Evidence-based**

**1c.1 Relationship to Outcomes** (*For non-outcome measures, briefly describe the relationship to desired outcome. For outcomes, describe why it is relevant to the target population.)* This measure is intended to improve rates of evidence-based medication prescribing for patients following ICD placement to improve outcomes associated with cardiovascular disease.

**1c.2 Type of Evidence** *(Check all that apply)*
☐ Cohort study ☒ Evidence-based guideline ☐ Expert opinion ☐ Meta-analysis
☐ Observational study ☐ Randomized controlled trial ☐ Systematic synthesis of research
☐ Other (*Please describe*): **1c.3**

**1c.4 Summary of Evidence** *as described above for type of measure; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:** Several large randomized clinical trials have demonstrated the efficacy of ACE inhibitor or ARB use in preventing adverse outcomes for patients with left ventricular systolic dysfunction. A systematic review of the evidence supporting use of ACE inhibitors for heart failure assessed ACE inhibitor use for 12,763 patients followed for an average of 35 months. Mortality was found to be lower for all trials reviewed (23.0% vs. 26.8%, odds ratio 0.8), as were readmission rates and rates of MI. Benefits of ACE therapy were independent of age, sex, and baseline use of diuretics, aspirin, and beta blockers.

There has been substantial research to support the use of beta blockers in patients with chronic heart failure. Many studies have consistently shown a substantial reduction in the rate of mortality and morbidity, as well as improvement in symptoms with the use of beta-blocker therapy. Meta-analyses have shown beta blockers to be beneficial in the regardless of age in men or women, in diabetics, and in nondiabetics. Meta analyses of randomized trials and observational studies have shown a substantial reduction in mortality as a result of beta blocker therapy. These studies have shown that beta blockers reduce mortality by approximately 23% in prospective trials and up to 40% in observational studies.

**1c.5 Rating of strength/quality of evidence** (*also provide narrative description of the rating and by whom*) Level of Evidence A: Data derived from multiple randomized clinical trials or meta-analyses.
**1c.6 Method for rating evidence:** The weight of evidence in support of the recommendation is listed as follows:
• 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

**1c.7 Summary of Controversy/Contradictory Evidence:** N/A

**1c.8 Citations for Evidence** (*other than guidelines*) Flather MD, Yusuf S, Kober L, et al. Long-term ACE-inhibitor therapy in patients with heart failure or left-ventricular dysfunction: a systematic overview of data from individual patients. ACE-Inhibitor Myocardial Infarction Collaborative Group. Lancet.2000;355:1575-81.

Packer M, Fowler MB, Roecker EB, et al. Effect of carvedilol on the morbidity of patients with severe chronic heart failure: results of the carvedilol prospective randomized cumulative survival (COPERNICUS) study. Circulation. 2002;106:2194-9. Effect of metoprolol CR/XL in chronic heart failure: Metoprolol CR/XL Randomised Intervention Trial in Congestive Heart Failure (MERIT-HF). Lancet. 1999;353:2001-7.

The Cardiac Insufficiency Bisoprolol Study II (CIBIS-II): a randomised trial. Lancet. 1999;353:9-13. Dulin BR, Haas SJ, Abraham WT, et al. Do elderly systolic heart failure patients benefit from beta blockers to the same extent as the non-elderly? Meta-analysis of >12,000 patients in large-scale clinical trials. Am J Cardiol. 2005;95:896-8.

**1c.9 Quote the Specific guideline recommendation** (*including guideline number and/or page number*)
ACC/AHA Secondary Prevention Guidelines:
ACE inhibitors:
• Start and continue indefinitely in all patients with left ventricular ejection fraction </=40% and in those with hypertension, diabetes, or chronic kidney disease, unless contraindicated. I (A)

**1c**
**H**☐
**M**☐
**L**☐
**N**☐

**Comment [KP6]: 1c.** The measure focus is:
•an outcome (e.g., morbidity, mortality, function, health-related quality of life) that is relevant to, or associated with, a national health goal/priority, the condition, population, and/or care being addressed;
OR
•if an intermediate outcome, process, structure, etc., there is **evidence** that supports the specific measure focus as follows:
oIntermediate outcome – evidence that the measured intermediate outcome (e.g., blood pressure, Hba1c) leads to improved health/avoidance of harm or cost/benefit.
oProcess – evidence that the measured clinical or administrative process leads to improved health/avoidance of harm and
if the measure focus is on one step in a multi-step care process, it measures the step that has the greatest effect on improving the specified desired outcome(s).
oStructure – evidence that the measured structure supports the consistent delivery of effective processes or access that lead to improved health/avoidance of harm or cost/benefit.
oPatient experience – evidence that an association exists between the measure of patient experience of health care and the outcomes, values and preferences of individuals/ the public.
oAccess – evidence that an association exists between access to a health service and the outcomes of, or experience with, care.
Efficiency – demonstration of an association between the measured resource use and level of performance with respect to one or more of the other five IOM aims of quality.

• Consider for all other patients. I (B)
• Among lower-risk patients with normal left ventricular ejection fraction in whom cardiovascular risk factors are well controlled and revascularization has been performed, use of ACE inhibitors may be considered optional. IIa (B)
Angiotensin receptor blockers:
• Use in patients who are intolerant of ACE inhibitors and have heart failure or have had a myocardial infarction with left ventricular ejection fraction </=40%. I (A)
• Consider in other patients who are ACE inhibitor intolerant. I (B)
• Consider use in combination with ACE inhibitors in systolic-dysfunction heart failure. IIb (B) (Page 2132)
ACC/AHA Heart Failure Guidelines (2005, 2009 Update)
13. In patients with reduced ejection fraction experiencing a symptomatic exacerbation of HF requiring hospitalization during chronic maintenance treatment with oral therapies known to improve outcomes, particularly ACEIs or ARBs and betablocker therapy, it is recommended that these therapies be continued in most patients in the absence of hemodynamic instability or contraindications. (Level of Evidence: C) (Page e47)

14. In patients hospitalized with HF with reduced ejection fraction not treated with oral therapies known to improve outcomes, particularly ACEIs or ARBs and beta-blocker therapy, initiation of these therapies is recommended in stable patients prior to hospital discharge. (Level of Evidence: B) (Page e47)
17. Comprehensive written discharge instructions for all patients with a hospitalization for HF and their caregivers is strongly recommended, with special emphasis on the following 6 aspects of care: diet; discharge medications, with a special focus on adherence, persistence, and uptitration to recommended doses of ACEI/ARB and beta-blocker medication; activity level; follow-up appointments; daily weight monitoring; and what to do if HF symptoms worsen. (Level of Evidence: C) (Page e48)

ACC/AHA Secondary Prevention Guidelines (2006), Beta Blockers:
-Start and continue indefinitely in all patients who have had myocardial infarction, acute coronary syndrome, or left ventricular dysfunction with or without heart failure symptoms, unless contraindicated. I (A)
-Consider chronic therapy for all other patients with coronary or other vascular disease or diabetes unless contraindicated. IIa (C) (Page 2132) ACC/AHA Heart Failure Guidelines (2005, 2009 Update)
13. In patients with reduced ejection fraction experiencing a symptomatic exacerbation of HF requiring hospitalization during chronic maintenance treatment with oral therapies known to improve outcomes, particularly ACEIs or ARBs and beta-blocker therapy, it is recommended that these therapies be continued in most patients in the absence of hemodynamic instability or contraindications. (Level of Evidence: C) (Page e47)
14. In patients hospitalized with HF with reduced ejection fraction not treated with oral therapies known to improve outcomes, particularly ACEIs or ARBs and beta-blocker therapy, initiation of these therapies is recommended in stable patients prior to hospital discharge (569,570). (Level of Evidence: B) (Page e47)

15. 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. Particular caution should be used when initiating beta blockers in patients who have required inotropes during their hospital course (569,570). (Level of Evidence: B) (Page e47)
17. Comprehensive written discharge instructions for all patients with a hospitalization for HF and their caregivers is strongly recommended, with special emphasis on the following 6 aspects of care: diet; discharge medications, with a special focus on adherence, persistence, and uptitration to recommended doses of ACEI/ARB and beta-blocker medication; activity level; follow-up appointments; daily weight monitoring; and what to do if HF symptoms worsen. (Level of Evidence: C) (Page e48)

**1c.10 Clinical Practice Guideline Citation:** 1.Smith SC, Jr., Allen J, Blair SN, et al. AHA/ACC guidelines for secondary prevention for patients with coronary and other atherosclerotic vascular disease: 2006 update endorsed by the National Heart, Lung, and Blood Institute. J Am Coll Cardiol. 2006;47:2130-9.
2.Hunt SA, Abraham WT, Chin MH, et al. 2009 Focused update incorporated into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines Developed in Collaboration With the International Society for Heart and Lung Transplantation. J Am Coll Cardiol. 2009;53:e1-e90.
**1c.11 National Guideline Clearinghouse or other URL:** Http://www.cardiosource.org/Science-And-Quality/Practice-Guidelines-and-Quality-Standards.aspx

**1c.12 Rating of strength of recommendation** (*also provide narrative description of the rating and by whom*) Class 1: Conditions for which there is evidence and/or general agreement that a given procedure or treatment is beneficial, useful and effective.

| | |
|---|---|
| **1c.13 Method for rating strength of recommendation** (*If different from USPSTF system, also describe rating and how it relates to USPSTF*)**:** ACC/AHA Taskforce on Practice Guidelines Method:<br>Indications are categorized as class I, II, or III on the basis of a multifactorial assessment of risk and expected efficacy viewed in the context of current knowledge and the relative strength of this knowledge. These classes summarize the recommendations for procedures or treatments as follows:<br>Class I: Conditions for which there is evidence for and/or general agreement that a given procedure or treatment is beneficial, useful, and effective.<br>Class II: Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of a procedure or treatment.<br>Class IIa: Weight of evidence/opinion is in favor of usefulness/efficacy.<br>Class IIb: Usefulness/efficacy is less well established by evidence/opinion.<br>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.<br><br>**1c.14 Rationale for using this guideline over others:** These guidelines are the most widely recognized professional guidelines in the US for cardiovascular medicine for patients with cardiovascular disease. | |
| **TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Importance to Measure and Report?* | **1** |
| **Steering Committee: Was the threshold criterion,** *Importance to Measure and Report***, met?**<br>**Rationale:** | **1**<br>**Y☐**<br>**N☐** |
| **2. SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES** | |
| Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. (composite measure evaluation criteria) | **Eval** |
| 2a. COMPOSITE MEASURE SPECIFICATIONS | |
| *In the future, NQF will require measure stewards to provide a URL link to a web page where current detailed specifications can be obtained?*<br>**S.1** Do you have a web page where current detailed measure specifications can be obtained? no, not at this time.<br>**S.2** If yes, provide web page URL:<br><br>2a. Precisely Specified<br><br>**2a.0.1 Components of the Composite** (*List the components, i.e., domains/sub-composites, individual measures. If component measures are NQF-endorsed, include NQF measure number*; if not NQF-endorsed, provide date of submission to NQF)<br>1.ACE/ARB prescribed at discharge for patients with left ventricular systolic dysfunction (LV ejection fraction <40%) without contraindications to ACE and ARB therapy.<br><br>2. Beta blockers prescribed at discharge for patients with left ventricular systolic dysrfunction (ejection fraction <40%) without contraindications to beta blocker therapy<br><br>3. Beta blockers prescribed at discharge for patients with a previous myocardial infarction without contraindications to beta blocker therapy. | |
| *If the composite measure cannot be specified with a numerator and denominator, please consult with NQF staff.*<br><br>*If the component measures are combined at the aggregate level, do not include the individual measure specifications below.* | |
| **2a.1 Composite Numerator Statement:**<br>Patients who receive all medications for which they are eligible.<br><br>1. ACE/ARB prescribed at discharge (if eligible for ACE/ARB as described in denominator)<br><br>AND<br><br>2. Beta blockers prescribed at discharge (if eligible for beta blockers as described in denominator) | **2a-specs**<br>**C☐**<br>**P☐**<br>**M☐**<br>**N☐** |

**Comment [KP7]: 2a.** The composite measure is well defined and precisely specified so that it can be implemented consistently within and across organizations and allow for comparability. Composite specifications include methods for standardizing scales across component scores, scoring rules (i.e., how the component scores are combined or aggregated), weighting rules (i.e., whether all component scores are given equal or differential weighting when combined into the composite), handling of missing data, and required sample sizes.

**2a.2 Numerator Time Window:** 1 year

**2a.3 Numerator Details:** Numerator: Count of ICD implant patients with

[(ACE/ARB=yes) AND [(EF<40) AND (ACE/ARB not contraindicated or blinded)]] AND

[[(Beta blocker=yes) AND [(EF<40) AND/OR (previous MI)]] AND (beta blockers not contraindicated or blinded)]

AND

[(Discharge status=alive) AND (Discharged Against Medical Advice=No)]

**2a.4 Composite Denominator Statement:**
All patients with an ICD implant surviving hospitalization who are eligible to receive any one of the two medication classes:

1) Eligiblility for ACE/ARB: Patients who have an ejection fraction (EF) of <40% AND do not have a documented contraindication to ACE/ARB documented

OR

2) Eligibility for beta blockers: Patients who do not have a documented contraindication to beta blocker therapy and have either:
a. EF of <40% OR
b. a previous myocardial infarction (MI)

**2a.5 Target Population Gender** ☒ Female ☒ Male
**2a.6 Target Population Age range** 18 years of age and older

**2a.7 Denominator Time Window:** 1 year

**2a.8 Denominator Details**: Denominator: Count of ICD implant patients with

[(EF<40) AND (ACE/ARB not contraindicated or blinded)] OR
[(EF<40) AND/OR (previous MI)] AND (beta blockers not contraindicated or blinded)]]

AND

[(Discharge status=alive) AND (Discharged against Medical Advice=No)]

Numerator: Count of ICD implant patients with

[(ACE/ARB=yes) AND [(EF<40) AND (ACE/ARB not contraindicated or blinded)]] AND

[[(Beta blocker=yes) AND [(EF<40) AND/OR (previous MI)]] AND (beta blockers not contraindicated or blinded)]

**2a.9 Composite Denominator Exclusions:** Discharge status of expired; not eligible for either ACE/ARB or beta blockers

**2a.10 Denominator Exclusion Details:** Medication prescribed at discharge coded as "contraindicated" or "blinded" for beta blocker or ACE/ARB. Discharge status=deceased.

**2a.11 Stratification Details/Variables (***All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
N/A

**2a.18 Type of Score:** Non-weighted score/composite/scale **2a.19** If "Other", please describe:

**2a.20 Interpretation of Score** (*Classifies interpretation of score according to whether better quality is associated with a higher score, a lower score, a score falling within a defined interval, or a passing score*)
Better quality = Higher score

**2a.42 Method of Scoring/Aggregation:** all/any-or-none **2a.43 If "other" scoring method, describe:**

**2a.44 Missing Component Scores** (*Indicate how missing component scores are handled*): Patients who are eligible for a medication included in the measure but have missing values for the medication are excluded from eligibility for that measure in the same way that patients who are contraindicated or blinded are excluded.

**2a.45 Weighting:** ☒ **Equal** ☐ **Differential** **2a.46 If differential weighting, describe:**

**2a.21 Calculation Algorithm** (*Describe the calculation of the measure as a flowchart or series of steps*)**:**
Denominator: Count of ICD implant patients with

[[(EF<40) AND (ACE/ARB not contraindicated or blinded)] OR
[[(EF<40) AND/OR (previous MI)] AND (beta blockers not contraindicated or blinded)]]

AND

[(Discharge status=alive) AND (Discharged against Medical Advice=No)]

Numerator: Count of ICD implant patients with

[(ACE/ARB=yes) AND [(EF<40) AND (ACE/ARB not contraindicated or blinded)]] AND

[[(Beta blocker=yes) AND [(EF<40) AND/OR (previous MI)]] AND (beta blockers not contraindicated or blinded)]

AND

[(Discharge status=alive) AND (Discharged Against Medical Advice=No)]

**2a.22 Describe the method for discriminating performance** (*e.g., significance testing*)**:**
Hospital performance for this measure will be benchmarked each quarter and annually against hospitals with similar procedural volume, as well as against the ICD Registry aggregate. These benchmarks identify superior performance and encourage poorer performers to improve. The methodology is a data-driven, peer-group performance feedback used to positively affect outcomes.

**2a.23 Sampling (Survey) Methodology** *If measure is based on a sample (or survey), provide instructions for obtaining the sample (or conducting the survey) and guidance on minimum sample size (response rate)*:
N/A

**2a.24 Data Source** *Check all the source(s) used in the component measures.*

- ☐ Documentation of original self-assessment *(e.g., SF-36)*
- ☐ Electronic administrative data/ claims
- ☐ Electronic Clinical Data *(e.g., MDS)*
- ☐ Electronic Health/Medical Record
- ☐ External audit
- ☐ Lab data
- ☐ **M**anagement data
- ☐ Organizational policies and procedures
- ☐ Paper Medical Record/flowsheet
- ☐ Pharmacy data
- ☐ Public health data/vital statistics
- ☒ Registry data
- ☐ Survey-patient *(e.g., CAHPS)*
- ☐ Survey-provider
- ☐ Special or unique data, specify:

**2a.25 Data source or collection instrument** (*Identify the specific data source or data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.*): National Cardiovascular Data Registry (NCDR) ICD Registry

**2a.26 Data source/data collection instrument attached** ☐ **OR 2a.27 at web page URL:**
http://www.ncdr.com/WebNCDR/ICD/ELEMENTS.ASPX

**2a.29 Data dictionary/code table attached** ☐ **OR 2a.30 at web page URL:**
http://www.ncdr.com/WebNCDR/ICD/ELEMENTS.ASPX

**2a.32 Level of Measurement/Analysis** (*Check the level for which the measure is specified and tested*)

**Clinicians:** ☐ Individual ☐ Group ☐ Other
☒ Facility/Agency (e.g., hospital, nursing home)
☐ Health plan
☐ Integrated delivery system
☐ **M**ulti-site/corporate chain
**Population:** ☐ National ☐ Regional/network
☐ State ☐ Counties/Cities

☐ Prescription drug plan

**Program:** ☐ Disease management ☐ QIO
☐ Other

☐ Measured at all levels
☐ Other (*Please describe*):

**2a.26 Care Settings (***Check the settings for which the measure is specified and tested; check all that apply*)
**Ambulatory Care:** ☐ Amb Surgery Center ☐ Office ☐ Clinic ☐ Emergency Dept ☒ Hospital Outpatient

☐ Assisted Living
☐ Behavioral health/psychiatric unit
☐ Dialysis Facility
☐ Emergency medical services/ambulance
☐ Group Home
☐ Home
☐ Hospice

☒ Hospital
☐ Long term acute care hospital
☐ Nursing home/ Skilled Nursing Facility (SNF)
☐ Rehabilitation Facility
☐ All settings
☐ Unspecified or "not applicable"
☐ Other (*Please describe*):

**2a.38 Clinical Services** (*Healthcare services being measured; all that apply.*)

**Behavioral Health:**
- ☐ Mental health
- ☐ Substance use treatment
- ☐ Other

**Clinicians:**
- ☐ Audiologist
- ☐ Chiropractor
- ☐ Dentist/Oral surgeon
- ☐ Dietician/Nutritional professional
- ☐ Nurses
- ☐ Optometrist
- ☒ PA/NP/Advanced Practice Nurse
- ☐ Pharmacist
- ☒ Physicians (MD/DO)
- ☐ Podiatrist
- ☐ Psychologist/LCSW
- ☐ PT/OT/Speech
- ☐ Respiratory Therapy
- ☐ Other

☐ Dialysis
☐ Home health
☐ Hospice/Palliative care
☐ Imaging services
☐ Laboratory
☐ Other

If the component measures are combined at the patient level and include outcomes, complete the following

**2a.12 Risk Adjustment Type:** ☒ No risk adjustment necessary ☐ analysis by subgroup ☐ case-mix adjustment ☐ paired data at patient level ☐ risk-adjustment devised specifically for this measure/condition ☐ risk adjustment method widely or commercially available
☐ Other (specify) **2a.13**

**2a.14 Risk Adjustment Methodology/Variables (***List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**

**2a.15 Detailed risk model attached** ☐ **OR 2a.16 at web page URL:**

## TESTING/ANALYSIS

**2i. Component item/measure analysis to justify inclusion in composite**

**2i.1 Data/sample:**

**2i.2 Analytic Method:**

**2i.3 Results:** This is an all-or-none approach to assessing whether patients receive all medications at discharge that they are eligible for following ICD placement. Correlation analyses are not needed to support this approach.

**Comment [KP8]: 2i.** Component item/measure analysis (e.g., various correlation analyses such as internal consistency reliability), demonstrates that the included component items/measures fit the conceptual construct;
OR
justification and results for alternative analyses are provided.

**2j. Component item/measure analysis of contribution to variability in composite score**

**2j.1 Data/sample:** 144,538 patient records from 1305 hospitals in the ICD registry from January 2009 to December 2009.

**2j.2 Analytic Method:** Distribution of performance by percentile to demonstrate variability across hospitals.

**Comment [KP9]: 2j.** Component item/measure analysis demonstrates that the included components contribute to the variation in the overall composite score;
OR
if not, justification for inclusion is provided.

2f.3. Measure Scores from Testing or Current Use (Description of scores, e.

**2j.3 Results:**
Beta blocker, LVSD:
Mean: 0.88
SD: 0.13
Quartile 1: 0.85
Median: 0.91
Quartile 3: 0.95
95%: 1.00

Beta blocker, Prior MI:
Mean: 0.874
SD: 0.137
Quartile 1: 0.833
Median: 0.903
Quartile 3: 0.955
95%: 1.00

ACE/ARB:
Mean: 0.77
SD: 0.17
Quartile 1: 0.71
Median: 0.79
Quartile 3: 0.87
95%: 1.00

**2k. Analysis to support differential weighting of component scores**

**2k.1 Data/sample:** N/A

**2k.2 Analytic Method:** N/A

**2k.3 Results:** N/A

**2k.4 Describe how the method of scoring/aggregation achieves the stated purpose and represents the quality construct:**

**2k.5 Indicate if any alternative scoring/aggregation methods were tested and why not chosen:**

**2k**
C☐
P☐
M☐
N☐

**Comment [KP10]: 2k.** The scoring/aggregation and weighting rules are consistent with the conceptual construct. (Simple, equal weighting is often preferred unless differential weighting is justified. Differential weights are determined by empirical analyses or a systematic assessment of expert opinion or values-based priorities.)

**2l. Analysis of missing component scores**

**2l.1 Data/sample:**

**2l.2 Analytic Method:**

**2l.3 Results:** Patients who are eligible for a medication included in the measure but have missing values for the medication are excluded from eligibility for that measure in the same way that patients who are contraindicated or blinded are excluded.

**2l**
C☐
P☐
M☐
N☐

**Comment [KP11]: 2l.** Analysis of missing component scores supports the specifications for scoring/aggregation and handling of missing component scores.

**2b. Reliability testing of composite score**

**2b.1 Data/sample** *(description of data/sample and size)***:** Reliability was established by validating the derivation cohort from 2009 data with a testing cohort from 2008 data. 130,593 patient records were analyzed from 1283 facilities.

**2b.2 Analytic Method** *(type of reliability & rationale, method for testing)***:** Reliability was established by validating the derivation cohort from 2009 data with a testing cohort from 2008 data.

**2b.3 Testing Results** *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:** Results were consistent among the derivation cohort and the testing cohort. Specifically, the median for hospitals in

**2b**
C☐
P☐
M☐
N☐

**Comment [KP12]: 2b.** Reliability testing of the composite measure demonstrates the results are repeatable, producing the same results a high proportion of the time when assessed in the same population in the same time period.

the derivation cohort was 73.3% with the lowest decile 63.6% and highest decile 90.0%. This is similar to that observed in the testing cohort (median 72.2%, lowest decile 50.0%, highest decile 88.7%).

**2c. Validity testing of composite score**

**2c.1 Data/sample** *(description of data/sample and size)*: Face/content validity: review of relevant evidence and guidelines and expert panel consensus process.

**2c.2 Analytic Method** *(type of validity & rationale, method for testing)*: Face/content validity was established to ensure this measure represented an important aspect of cardiovascular care for which improvement is needed.

**2c.3 Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted)*: A review of the relevant evidence and guidelines and expert panel consensus process resulted in the conclusion that this is a valid measure of quality of cardiovascular care for patients with ICD placement where variation in practice exists.

**Comment [KP13]: 2c.** Validity testing of the composite measure demonstrates that the measure reflects the quality of care provided, adequately distinguishing good and poor quality. If face validity is the only validity addressed, it is systematically assessed.

**2c**
C☐
P☐
M☐
N☐

**2f. Identification of Meaningful Differences in Performance Across Entities**

**2f.1 Data/sample from Testing or Current Use** *(description of data/sample and size)*: 1475 facilities, 518,695 patients, 2009

**2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance** *(type of analysis & rationale)*: Distribution by quartile, mean, median, SD.

**2f.3 Provide Measure Scores from Testing or Current Use** *(description of scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance)* :

| | |
|---|---|
| Mean | 71.09% |
| Std Deviation | 17.81% |
| 100% | 100.00% |
| 99% | 100.00% |
| 95% | 100.00% |
| 90% | 90.00% |
| 75% Q3 | 81.36% |
| 50% | 73.33% |
| 25% Q1 | 63.64% |
| 10% | 50.00% |
| 5% | 40.00% |
| 1% | 0.00% |
| 0% Min | 0.00% |

**Comment [KP14]: 2f.** Methods for scoring and analysis of the composite measure allow for identification of statistically significant and practically/ clinically meaningful differences in performance.

**2f**
C☐
P☐
M☐
N☐

**2h. Disparities in Care**

**2h.1 If measure is stratified, provide stratified results** *(scores by stratified categories/cohorts)*:

| | Non-Safety Net | Safety Net |
|---|---|---|
| Mean | 70.93% | 71.25% |
| SD | 17.45% | 19.66% |
| 100% | 100.00% | 100.00% |
| 99% | 100.00% | 100.00% |
| 95% | 98.41% | 100.00% |
| 90% | 89.66% | 90.44% |
| 75% Q3 | 80.91% | 84.21% |
| 50% | 73.33% | 73.33% |
| 25% Q1 | 63.44% | 64.19% |
| 10% | 50.00% | 52.53% |
| 5% | 40.00% | 27.27% |
| 1% | 0.00% | 0.00% |
| 0% Min | 0.00% | 0.00% |

**Comment [KP15]: 2h.** If disparities in care have been identified, measure specifications, scoring, and analysis allow for identification of disparities through stratification of results (e.g., by race, ethnicity, socioeconomic status, gender);
OR
rationale/data justifies why stratification is not necessary or not feasible.

**2h**
C☐
P☐
M☐
N☐
NA☐

%White

| | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|
| N | 325 | 325 | 326 | 325 |
| Mean | 71.0% | 71.0% | 73.3% | 69.0% |
| SD | 17.3% | 15.4% | 13.0% | 23.7% |
| 100% | 100.0% | 100.0% | 100.0% | 100.0% |
| 99% | 100.0% | 100.0% | 100.0% | 100.0% |
| 95% | 100.0% | 94.0% | 91.0% | 100.0% |
| 90% | 90.4% | 87.4% | 88.9% | 98.6% |
| 75% Q3 | 80.3% | 79.8% | 82.7% | 83.3% |
| 50% | 72.9% | 72.2% | 74.5% | 74.2% |
| 25% Q1 | 63.2% | 63.9% | 65.7% | 60.5% |
| 10% | 51.1% | 53.8% | 55.6% | 40.0% |
| 5% | 37.3% | 42.9% | 49.5% | 0.0% |
| 1% | 14.5% | 20.0% | 40.3% | 0.0% |
| 0% Min | 0.0% | 0.0% | 26.9% | 0.0% |

| | Female | Male |
|---|---|---|
| N | 1247 | 1293 |
| Mean | 71.4% | 71.1% |
| SD | 21.7% | 18.7% |
| 100% | 100.0% | 100.0% |
| 99% | 100.0% | 100.0% |
| 95% | 100.0% | 100.0% |
| 90% | 100.0% | 91.0% |
| 75% Q3 | 85.7% | 82.4% |
| 50% | 74.5% | 73.5% |
| 25% Q1 | 61.5% | 63.6% |
| 10% | 47.6% | 50.0% |
| 5% | 29.2% | 36.1% |
| 1% | 0.0% | 0.0% |
| 0% Min | 0.0% | 0.0% |

**2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:**

If the component measures are combined at the patient level, complete 2d.

**2d. Exclusions Justified**

**2d.1 Summary of Evidence supporting exclusion(s):** Exclusions are based on expert consensus for appropriate contraindications for these medications.

**2d.2 Citations for Evidence:**

**2d.3 Data/sample** *(description of data/sample and size)*: 1475 facilities
518695 patients, 2009

**2d.4 Analytic Method** *(type analysis & rationale)*: Rate of exclusion coding.

**2d.5 Testing Results** *(e.g., frequency, variability, sensitivity analyses)*: Deceased 0.3%

If the component measures are combined at the patient level and include outcomes, complete 2e.

**2e. Risk Adjustment**

**Comment [KP16]: 2d.** Clinically necessary measure exclusions are identified and must be:
•supported by evidence of sufficient frequency of occurrence so that results are distorted without the exclusion;
AND
•a clinically appropriate exception (e.g., contraindication) to eligibility for the measure focus;
AND
•precisely defined and specified:
–if there is substantial variability in exclusions across providers, the measure is specified so that exclusions are computable and the effect on the measure is transparent (i.e., impact clearly delineated, such as number of cases excluded, exclusion rates by type of exclusion);
if patient preference (e.g., informed decision-making) is a basis for exclusion, there must be evidence that it strongly impacts performance on the measure and the measure must be specified so that the information about patient preference and the effect on the measure is transparent (e.g., numerator category computed separately, denominator exclusion category computed separately).

**Comment [KP17]: 2e.** For outcome measures and other measures (e.g., resource use) when indicated:
•an evidence-based risk-adjustment strategy (e.g., risk models, risk stratification) is specified and is based on patient clinical factors that influence the measured outcome (but not disparities in care) and are present at start of care; OR
rationale/data support no risk adjustment.

2e.1 **Data/sample** *(description of data/sample and size)*: N/A

2e.2 **Analytic Method** *(type of risk adjustment, analysis, & rationale)*:

2e.3 **Testing Results** *(risk model performance metrics)*:

2e.4 **If outcome or resource use measure is not risk adjusted, provide rationale:**

L☐ N☐ NA☐

**TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Scientific Acceptability of Measure Properties?*

**2**

**Steering Committee: Overall, to what extent was the criterion,** *Scientific Acceptability of Measure Properties*, **met?**
**Rationale:**

*2*
C☐ P☐ M☐ N☐

## 3. USABILITY

**Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making.** (composite measure evaluation criteria)

**Eval**

**3a. Meaningful, Understandable, and Useful Information**

3a.1 **Current Use:** ☐ In use ☒ Not in use

3a.2 **Use in a public reporting initiative (disclosure of performance results to the public at large)** (*If used in a public reporting initiative, provide name of initiative(s), locations, Web page URL(s). If not publicly reported, state the plans to achieve public reporting within 3 years*):
ACCF plans to begin voluntary public reporting of NCDR measures, including this measure, by 2012. ACCF is currently evaluating public reporting options and finalizing decisions related to location and display of information to be reported as well as communication plans.

3a.3 **If used in other programs/initiatives (***If used in quality improvement or other programs/initiatives, name of initiative(s), locations, Web page URL(s). If not used for QI, state the plans to achieve use for QI within 3 years***):**
This measure will be used in the ICD Registry for hospital benchmarking for quality improvement efforts within the next year.

**Testing of Interpretability** (*Testing that demonstrates the results are understood by the potential users for public reporting and quality improvement*)

3a.4 **Data/sample** *(description of data/sample and size)*: No data available.

3a.5 **Methods** *(methods, e.g., focus group, survey, QI project)*:

3a.6 **Results** *(qualitative and/or quantitative results and conclusions)*:

**3a**
C☐ P☐ M☐ N☐

**3b/3c. Relation to other NQF-endorsed measures**
*Identify similar or related NQF-endorsed measures to components and/or composite*

3b.1 **NQF # and Title of similar or related measures:**

(for NQF staff use) **Notes on similar/related endorsed or submitted measures:**

**3b. Harmonization**

3b.2 **Are the component measure specifications harmonized, or if not, why?**
Yes, the component measures are harmonized with similar endorsed measures where possible.

**3c. Distinctive or Additive Value**

**Comment [KP18]: 3a**. Demonstration that information produced by the composite measure is meaningful, understandable, and useful to the intended audience(s) for both public reporting (e.g., focus group, cognitive testing) and informing quality improvement (e.g., quality improvement initiatives).

**Comment [KP19]: 3b.** The component measure specifications are harmonized.

**Comment [KP20]: 3c.** Review of existing endorsed measures and measure sets demonstrates that the composite measure provides a distinctive or additive value to existing NQF-endorsed measures (e.g., provides a more complete picture of quality for a particular condition or aspect of healthcare).

**3c.1 Describe the distinctive, improved, or additive value this measure provides to existing NQF-endorsed measures:**
There is currently not an endorsed composite measure for medication prescribing at discharge following ICD implant.

**5.1 Competing Measures If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), describe why it is a more valid or efficient way to measure quality:**

C☐ P☐ M☐ N☐

Comment [k21]: 5. Demonstration that the measure is superior to competing measures – new submissions and/or endorsed measures (e.g., is a more valid or efficient way to measure).

**3d. Decomposition of Composite**
**3d.1 Describe the information that is available from decomposing the composite into its components:**
Please see calculation algorithm.

Comment [KP22]: 3d. Data detail is maintained such that the composite measure can be decomposed into its components to facilitate transparency and understanding.

**3e. Achieved stated purpose**
**3e.1 Describe how the scores from testing or use reported in 2f demonstrate that the composite achieves the stated purpose:** Current testing results of this measure demonstrate that there is a gap in performance for this measure.

Comment [KP23]: 3e. Demonstration (through pilot testing or operational data) that the composite measure achieves the stated purpose/objective.

C☐ P☐ M☐ N☐

**TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Usability*?** **3**

**Steering Committee: Overall, to what extent was the criterion, *Usability*, met?** **3**
**Rationale:**

C☐ P☐ M☐ N☐

## 4. FEASIBILITY

**Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement.** (composite measure evaluation criteria) **Eval**

**4a. Data Generated as a Byproduct of Care Processes**
**4a.1 How are all the data elements that are needed to compute measure scores generated?** (*Check all that apply*)
☒ Data are generated as a byproduct of care processes during care delivery (*Data are generated and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition*)
☒ Coding/abstraction performed by someone other than person obtaining original information *(e.g., DRG, ICD-9 codes on claims; chart abstraction for quality measure, registry)*
☐ Survey
☐ Other *(e.g., patient experience of care surveys, provider surveys, observation)*, *Please describe*:

Comment [KP24]: 4a. For clinical composite measures, overall the required data elements are routinely generated concurrent with and as a byproduct of care processes during care delivery.

C☐ P☐ M☐ N☐

**4b. Electronic Sources**
**4b.1 Are all the data elements available electronically?** (*elements that are needed to compute measure scores are in defined, computer-readable fields, e.g., electronic health record, electronic claims*)
☒ Yes ☐ No
**4b.2 If no, specify the near-term path to achieve electronic capture by most providers.**

*Note: Measure stewards will be asked to specify the data elements for electronic health records at a later date*

Comment [KP25]: 4b. The required data elements for the composite overall are available in electronic sources.

4b
C☐ P☐ M☐ N☐

**4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences**
**4d.1 Identify susceptibility to inaccuracies, errors, or unintended consequences of the measure and describe how these potential problems could be audited. If audited, provide results.**
Inaccuracies may occur if certified vendors export data incorrectly, in transmission of data from medical record to a paper form and then to the online data collection tool. Some sites may overcode medication exclusions.

A vendor certification process has been established to ensure high quality data collection and submission.
The NCDR audit program is in place to assess reliability of data abstraction. All elements required to capture this measure will be added upon NQF endorsement.

Comment [KP26]: 4d. Susceptibility to inaccuracies, errors, or unintended consequences and the ability to audit the data items to detect such problems are identified.

4d
C☐ P☐ M☐ N☐

**4e. Data Collection Strategy/Implementation**
**4e.1 Describe what you have learned/modified as a result of testing and/or operational use of the composite/component measures regarding data collection, availability of data/missing data, timing/frequency of**

Comment [KP27]: 4e. Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, etc.) for obtaining all component measures can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use).

**data collection, patient confidentiality, time/cost of data collection, other feasibility/ implementation issues:** M☐ N☐

Beta testing with a set of registry participants takes place with each new registry version to identify errors in the data collection tool.

The Data Quality Report (DQR) program has been developed to ensure data are valid and complete. The DQR is a process for submitting data files to the NCDR®. Participants use their data collection tool software to create a submission file which is uploaded to the NCDR website. After uploading, the data in the file is automatically checked for errors and completeness. Passing the DQR ensures well-formed data and a statistically significant submission. Types of errors detected by the DQR include:

Schema:Structure doesn't match NCDR requirements Dates: Inconsistent dates

Selection: Missing or mismatched data; Can be a parent/child errors where a field requests more data.

Outlier: Anomalies or exceptions; Data exceeds the possible limits. For example: 1,000mm length lesion.

Counter: errors deal with Closure Methods, Lesions, and Intracoronary Devices. Each one has a counter, when more than one is used

List: Missing data in the Medications or either Device lists.

4.2 **Costs to implement the measure** (*costs of data collection, fees associated with proprietary measures*)**:**

ICD registry participants pay a fee of $3,480/year (as of 2010) to enroll in the registry. Staff resources are needed for data collection and submission at the participating institution. Registry site managers/data collectors undergo (non-mandatory) training offered by the NCDR.

4e.3 **Evidence for costs:**

http://www.ncdr.com/WebNCDR/ncdrdocuments/B08352N%20ICD%20Registry%20Enrollment%20Packet%20Complete.pdf

4e.4 **Business case documentation:**

---

If the component measures are combined at the patient level, complete 4c.

**4c**
H☐
M
L
N
N

**4c. Exclusions**

4c.1 **Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications?** ☒ No ☐ Yes ►**If yes, provide justification**

**Comment [KP28]: 4c. Exclusions** should not require additional data sources beyond what is required for scoring the measure (e.g., numerator and denominator) unless justified as supporting measure validity.

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**TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for** *Feasibility*? **4**

---

**Steering Committee: Overall, to what extent was the criterion,** *Feasibility*, **met?** **4**
**Rationale:**
C☐
P☐
M☐
N☐

## RECOMMENDATION

**Steering Committee: Do you recommend for endorsement?**
**Comments:**
Y☐
N☐
A☐

## CONTACT INFORMATION

Co.1 **Measure Steward (Intellectual Property Owner)**
**Organization:** American College of Cardiology Foundation (ACCF)
**Street Address:** 2400 N St NW **City:** Washington **State:** DC **ZIP:** 20037

Co.2 **Point of Contact: First Name:** Kristyne **Last Name:** McGuinn **Credentials (MD, MPH, etc.):** MHS
**Email:** kmcguinn@acc.org **Telephone:** 202-375-6529 ext:

Co.3 **Measure Developer If different from Measure Steward**
**Organization:**
**Street Address:** **City:** **State:** **ZIP:**

Co.4 **Point of Contact: First Name:** **Last Name:** **Credentials (MD, MPH, etc.):**
**Email:** **Telephone:** ext:

Co.5 **Submitter**
**Organization:** ☒ Measure Steward ☐ Measure Developer

**First Name:** Kristyne **Last Name:** McGuinn **Credentials (MD, MPH, etc.):** MHS
**Email:** kmcguinn@acc.org **Telephone:** 202-375-6529 ext:

**Co.6 List any additional organizations that sponsored/participated in measure development:**

## ADDITIONAL INFORMATION

**Ad.1 Workgroup/Expert Panel involved in measure development**
*Provide a list of workgroup/panel member names and organizations. Describe the group's role in measure development.*

ICD Registry Steering Committee:
Mark S. Kremers, MD, FACC, FHRS Chair
Stephen C. Hammill, MD, FACC, FHRS Ex-Officio
Sana M. Al-Khatib, MD, FACC
Charles I. Berul, MD, FACC
Jeptha P. Curtis, MD, FACC
Paul A. Heidenreich, MD, FACC
Illeana L. Pina, MD, FACC
Matthew R. Reynolds, MD, FACC
Lynne Warner Stevenson, MD, FACC
Mary Norine Walsh, MD, FACC
Public Reporting Workgroup:
Fred Masoudi, MD, MSPH, FACC, FAHA, FACP
H. Vernon Anderson,MD, FACC, FSCAI
David Malenka, MD, FACC
Matt Roe, MD, FACC
Steve Hammill, MD, FHRS, FACC
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Christopher White MD, FACC
Carl Tommaso, MD, FACC, FAHA, FSCAI
Sunil Rao, MD, FACC, FSCAI
Andrea Russo, MD, FACC, FHRS
Debabrata Mukherjee MD, FAC

**Ad.2 If adapted, name of original measure:**
**Ad.3 If adapted, original specifications ☐ attachment or Ad.4 web page URL:**

**Measure Developer/Steward Updates and Ongoing Maintenance**
**Ad.6** Year the measure was first released: 2011
**Ad.7** Month and Year of most recent revision: March, 2011
**Ad.8** What is the frequency for review/update of this measure? Annually
**Ad.9** When is the next scheduled review/update for this measure? 2012

**Ad.10 Copyright statement/disclaimers:** 

**Ad.11 Additional Information ☒ attachment or web page URL:**

**I have checked that the submission is complete and all the information needed to evaluate the measure is provided in the form; any blank fields indicate that no information is provided.** ☒

**Date of Submission** (*MM/DD/YY*)**:** 3/30/2011

## Therapy with ACE/ARB and beta blocker at discharge following ICD implantation in eligible patients- Testing Sample

| Exclusions | Patient Stays | | Patients | | Facilities | |
|---|---|---|---|---|---|---|
| **Total** | **533188** | **100.0** | **518695** | **100.0** | **1475** | **100.0** |
| Discharge not in 2009 | 388650 | 72.9 | 375042 | 72.3 | 170 | 11.5 |
| **Remaining** | **144538** | **27.1** | **143653** | **27.7** | **1305** | **88.5** |
| Died during hospital | 457 | 0.3 | 455 | 0.3 | 0 | 0.0 |
| **Remaining** | **144081** | **99.7** | **143198** | **99.7** | **1305** | **100.0** |
| Not eligible to the composite measure | 18336 | 12.7 | 18188 | 12.7 | 4 | 0.3 |
| **Study Cohort** | **125745** | **87.3** | **125010** | **87.3** | **1301** | **99.7** |
| The composite measure at discharge | 92961 | 73.93 | 92502 | 74.00 | 1279 | 98.31 |

## ICD Composite Measure Testing Results (ACC)

| | DEFINITION | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ACE | ARB | EF <40 | B Blocker | Prev MI | Measure Eligibility (denominator) | Composite (numerator) | ACEARB | BB |
| 1 | y | y | y | y | y | Yes | Yes | Yes | Yes |
| 2 | y | y | y | y | n | Yes | Yes | Yes | Yes |
| 3 | y | y | n | y | y | Yes | Yes | N/A | Yes |
| 4 | y | y | n | y | n | No | | N/A | N/A |
| 5 | y | y | y | n | y | Yes | No | Yes | No |
| 6 | y | y | y | n | n | Yes | No | Yes | No |
| 7 | y | y | n | n | y | Yes | No | N/A | No |
| 8 | y | y | n | n | n | No | | N/A | N/A |
| 9 | y | y | y | o | y | Yes | Yes | Yes | Other |
| 10 | y | y | y | o | n | Yes | Yes | Yes | Other |
| 11 | y | y | n | o | y | No | | N/A | Other |
| 12 | y | y | n | o | n | No | | N/A | N/A |
| 13 | y | n | y | y | y | Yes | Yes | Yes | Yes |
| 14 | y | n | y | y | n | Yes | Yes | Yes | Yes |
| 15 | y | n | n | y | y | Yes | Yes | N/A | Yes |
| 16 | y | n | n | y | n | No | | N/A | N/A |
| 17 | y | n | y | n | y | Yes | No | Yes | No |
| 18 | y | n | y | n | n | Yes | No | Yes | No |
| 19 | y | n | n | n | y | Yes | No | N/A | No |
| 20 | y | n | n | n | n | No | | N/A | N/A |
| 21 | y | n | y | o | y | Yes | Yes | Yes | Other |
| 22 | y | n | y | o | n | Yes | Yes | Yes | Other |
| 23 | y | n | n | o | y | No | | N/A | Other |
| 24 | y | n | n | o | n | No | | N/A | N/A |
| 25 | y | o | y | y | y | Yes | Yes | Yes | Yes |
| 26 | y | o | y | y | n | Yes | Yes | Yes | Yes |
| 27 | y | o | n | y | y | Yes | Yes | N/A | Yes |
| 28 | y | o | n | y | n | No | | N/A | N/A |
| 29 | y | o | y | n | y | Yes | No | Yes | No |
| 30 | y | o | y | n | n | Yes | No | Yes | No |
| 31 | y | o | n | n | y | Yes | No | N/A | No |
| 32 | y | o | n | n | n | No | | N/A | N/A |
| 33 | y | o | y | o | y | Yes | Yes | Yes | Other |
| 34 | y | o | y | o | n | Yes | Yes | Yes | Other |
| 35 | y | o | n | o | y | No | | N/A | Other |
| 36 | y | o | n | o | n | No | | N/A | N/A |
| 37 | n | y | y | y | y | Yes | Yes | Yes | Yes |
| 38 | n | y | y | y | n | Yes | Yes | Yes | Yes |
| 39 | n | y | n | y | y | Yes | Yes | N/A | Yes |
| 40 | n | y | n | y | n | No | | N/A | N/A |
| 41 | n | y | y | n | y | Yes | No | Yes | No |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 42 | n | y | y | n | n | | Yes | | No | Yes | No |
| 43 | n | y | n | n | y | | Yes | | No | N/A | No |
| 44 | n | y | n | n | n | | No | | | N/A | N/A |
| 45 | n | y | y | o | y | | Yes | | Yes | Yes | Other |
| 46 | n | y | y | o | n | | Yes | | Yes | Yes | Other |
| 47 | n | y | n | o | y | | No | | | N/A | Other |
| 48 | n | y | n | o | n | | No | | | N/A | N/A |
| 49 | n | n | y | y | y | | Yes | | No | No | Yes |
| 50 | n | n | y | y | n | | Yes | | No | No | Yes |
| 51 | n | n | n | y | y | | Yes | | Yes | N/A | Yes |
| 52 | n | n | n | y | n | | No | | | N/A | N/A |
| 53 | n | n | y | n | y | | Yes | | No | No | No |
| 54 | n | n | y | n | n | | Yes | | No | No | No |
| 55 | n | n | n | n | y | | Yes | | No | N/A | No |
| 56 | n | n | n | n | n | | No | | | N/A | N/A |
| 57 | n | n | y | o | y | | Yes | | No | No | Other |
| 58 | n | n | y | o | n | | Yes | | No | No | Other |
| 59 | n | n | n | o | y | | No | | | N/A | Other |
| 60 | n | n | n | o | n | | No | | | N/A | N/A |
| 61 | n | o | y | y | y | | Yes | | No | No | Yes |
| 62 | n | o | y | y | n | | Yes | | No | No | Yes |
| 63 | n | o | n | y | y | | Yes | | Yes | N/A | Yes |
| 64 | n | o | n | y | n | | No | | | N/A | N/A |
| 65 | n | o | y | n | y | | Yes | | No | No | No |
| 66 | n | o | y | n | n | | Yes | | No | No | No |
| 67 | n | o | n | n | y | | Yes | | No | N/A | No |
| 68 | n | o | n | n | n | | No | | | N/A | N/A |
| 69 | n | o | y | o | y | | Yes | | No | No | Other |
| 70 | n | o | y | o | n | | Yes | | No | No | Other |
| 71 | n | o | n | o | y | | No | | | N/A | Other |
| 72 | n | o | n | o | n | | No | | | N/A | N/A |
| 73 | o | y | y | y | y | | Yes | | Yes | Yes | Yes |
| 74 | o | y | y | y | n | | Yes | | Yes | Yes | Yes |
| 75 | o | y | n | y | y | | Yes | | Yes | N/A | Yes |
| 76 | o | y | n | y | n | | No | | | N/A | N/A |
| 77 | o | y | y | n | y | | Yes | | No | Yes | No |
| 78 | o | y | y | n | n | | Yes | | No | Yes | No |
| 79 | o | y | n | n | y | | Yes | | No | N/A | No |
| 80 | o | y | n | n | n | | No | | | N/A | N/A |
| 81 | o | y | y | o | y | | Yes | | Yes | Yes | Other |
| 82 | o | y | y | o | n | | Yes | | Yes | Yes | Other |
| 83 | o | y | n | o | y | | No | | | N/A | Other |
| 84 | o | y | n | o | n | | No | | | N/A | N/A |
| 85 | o | n | y | y | y | | Yes | | No | No | Yes |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 86 | o | n | y | y | n | | Yes | | No | No | Yes |
| 87 | o | n | n | y | y | | Yes | | Yes | N/A | Yes |
| 88 | o | n | n | y | n | | No | | | N/A | N/A |
| 89 | o | n | y | n | y | | Yes | | No | No | No |
| 90 | o | n | y | n | n | | Yes | | No | No | No |
| 91 | o | n | n | n | y | | Yes | | No | N/A | No |
| 92 | o | n | n | n | n | | No | | | N/A | N/A |
| 93 | o | n | y | o | y | | Yes | | No | No | Other |
| 94 | o | n | y | o | n | | Yes | | No | No | Other |
| 95 | o | n | n | o | y | | No | | | N/A | Other |
| 96 | o | n | n | o | n | | No | | | N/A | N/A |
| 97 | o | o | y | y | y | | Yes | | Yes | Other | Yes |
| 98 | o | o | y | y | n | | Yes | | Yes | Other | Yes |
| 99 | o | o | n | y | y | | Yes | | Yes | N/A | Yes |
| 100 | o | o | n | y | n | | No | | | N/A | N/A |
| 101 | o | o | y | n | y | | Yes | | No | Other | No |
| 102 | o | o | y | n | n | | Yes | | No | Other | No |
| 103 | o | o | n | n | y | | Yes | | No | N/A | No |
| 104 | o | o | n | n | n | | No | | | N/A | N/A |
| 105 | o | o | y | o | y | | No | | | Other | Other |
| 106 | o | o | y | o | n | | No | | | Other | Other |
| 107 | o | o | n | o | y | | No | | | N/A | Other |
| 108 | o | o | n | o | n | | No | | | N/A | N/A |

## Reference 1. ACEIARB

| LVEFLT40 | ACEI | ARB | ACEIARB | # | % |
|---|---|---|---|---|---|
| No | No | No | N/A | 3739 | 2.97 |
| No | No | Yes | N/A | 1692 | 1.35 |
| No | No | Other | N/A | 4 | 0.00 |
| No | Yes | No | N/A | 6408 | 5.10 |
| No | Yes | Yes | N/A | 283 | 0.23 |
| No | Yes | Other | N/A | 27 | 0.02 |
| No | Other | No | N/A | 149 | 0.12 |
| No | Other | Yes | N/A | 85 | 0.07 |
| No | Other | Other | N/A | 155 | 0.12 |
| No | No/Yes/Other | No/Yes/Other | N/A | 12542 | 9.97 |
| Yes | No | No | No | 21345 | 16.97 |
| Yes | No | Yes | Yes | 15320 | 12.18 |
| Yes | No | Other | No | 91 | 0.07 |
| Yes | Yes | No | Yes | 67942 | 54.03 |
| Yes | Yes | Yes | Yes | 2676 | 2.13 |
| Yes | Yes | Other | Yes | 413 | 0.33 |
| Yes | Other | No | No | 1770 | 1.41 |
| Yes | Other | Yes | Yes | 1149 | 0.91 |
| Yes | Other | Other | Other | 2497 | 1.99 |

* Other includes missing, conindicated, blinded.

## Reference 2. BB

| LVEFLT40 | PREVMI | BB | # | % |
|---|---|---|---|---|
| No | Yes | No | 1977 | 1.57 |
| No | Yes | Yes | 10565 | 8.40 |
| Yes | No | No | 5479 | 4.36 |
| Yes | No | Yes | 45966 | 36.55 |
| Yes | No | Other | 501 | 0.40 |
| Yes | Yes | No | 6109 | 4.86 |
| Yes | Yes | Yes | 54523 | 43.36 |
| Yes | Yes | Other | 625 | 0.50 |

* Other includes missing, conindicated, blinded.

## Reference 2. Composite Measure (CM)

| ACEIARB | BB | CM | # | % |
|---|---|---|---|---|
| No | No | No | 3987 | 3.17 |
| No | Yes | No | 18917 | 15.04 |
| No | Other | No | 302 | 0.24 |
| Yes | No | No | 7421 | 5.90 |
| Yes | Yes | Yes | 79255 | 63.03 |
| Yes | Other | Yes | 824 | 0.66 |
| Other | No | No | 180 | 0.14 |
| Other | Yes | Yes | 2317 | 1.84 |
| N/A | No | No | 1977 | 1.57 |
| N/A | Yes | Yes | 10565 | 8.40 |

* Other includes missing, conindicated, blinded.

## ICD Composite Measure Testing Results (ACC)

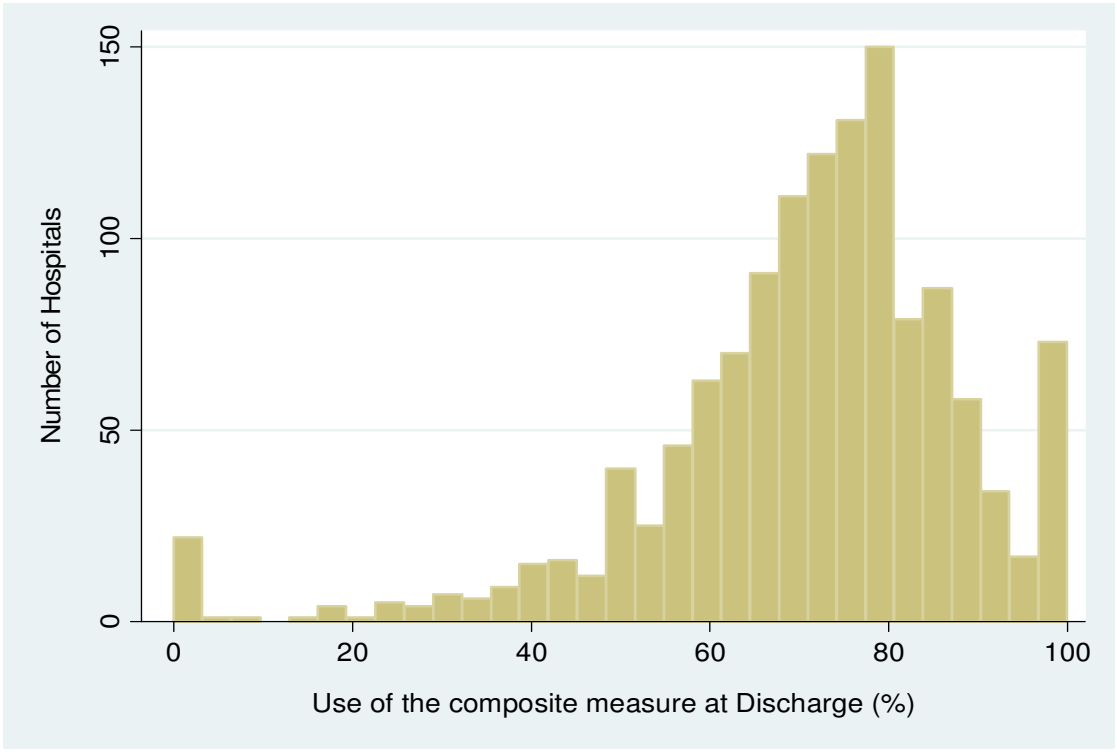
| ROW | DACEI | DARB | LVEFLT40 | DBB | PREVMI | DCM | DACEIARB | COUNT | PERCENT |
|---|---|---|---|---|---|---|---|---|---|
| 55 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 832 | 0.66 |
| 51 | 0 | 0 | 0 | 1 | 1 | 1 | 3 | 2907 | 2.31 |
| 54 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1870 | 1.49 |
| 53 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1998 | 1.59 |
| 50 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 7685 | 6.11 |
| 49 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 9694 | 7.71 |
| 58 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 36 | 0.03 |
| 57 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 62 | 0.05 |
| 43 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 241 | 0.19 |
| 39 | 0 | 1 | 0 | 1 | 1 | 1 | 3 | 1451 | 1.15 |
| 42 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 744 | 0.59 |
| 41 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 848 | 0.67 |
| 38 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 6565 | 5.22 |
| 37 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 7001 | 5.57 |
| 46 | 0 | 1 | 1 | 2 | 0 | 1 | 1 | 77 | 0.06 |
| 45 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 85 | 0.07 |
| 67 | 0 | 2 | 0 | 0 | 1 | 0 | 3 | 2 | 0.00 |
| 63 | 0 | 2 | 0 | 1 | 1 | 1 | 3 | 2 | 0.00 |
| 66 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 6 | 0.00 |
| 65 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 4 | 0.00 |
| 62 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 34 | 0.03 |
| 61 | 0 | 2 | 1 | 1 | 1 | 0 | 0 | 33 | 0.03 |
| 70 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 7 | 0.01 |
| 69 | 0 | 2 | 1 | 2 | 1 | 0 | 0 | 7 | 0.01 |
| 19 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 807 | 0.64 |
| 15 | 1 | 0 | 0 | 1 | 1 | 1 | 3 | 5601 | 4.45 |
| 18 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2480 | 1.97 |
| 17 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 2784 | 2.21 |
| 14 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 28532 | 22.69 |
| 13 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 33586 | 26.71 |
| 22 | 1 | 0 | 1 | 2 | 0 | 1 | 1 | 237 | 0.19 |
| 21 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 323 | 0.26 |
| 7 | 1 | 1 | 0 | 0 | 1 | 0 | 3 | 57 | 0.05 |
| 3 | 1 | 1 | 0 | 1 | 1 | 1 | 3 | 226 | 0.18 |
| 6 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 228 | 0.18 |
| 5 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 262 | 0.21 |
| 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1019 | 0.81 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1147 | 0.91 |
| 10 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 12 | 0.01 |
| 9 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 8 | 0.01 |
| 27 | 1 | 2 | 0 | 1 | 1 | 1 | 3 | 27 | 0.02 |
| 30 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 4 | 0.00 |
| 29 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 13 | 0.01 |
| 26 | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 172 | 0.14 |
| 25 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 208 | 0.17 |
| 34 | 1 | 2 | 1 | 2 | 0 | 1 | 1 | 8 | 0.01 |
| 33 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 8 | 0.01 |
| 91 | 2 | 0 | 0 | 0 | 1 | 0 | 3 | 12 | 0.01 |
| 87 | 2 | 0 | 0 | 1 | 1 | 1 | 3 | 137 | 0.11 |
| 90 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 43 | 0.03 |
| 89 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 66 | 0.05 |
| 86 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 615 | 0.49 |
| 85 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 856 | 0.68 |
| 94 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 89 | 0.07 |

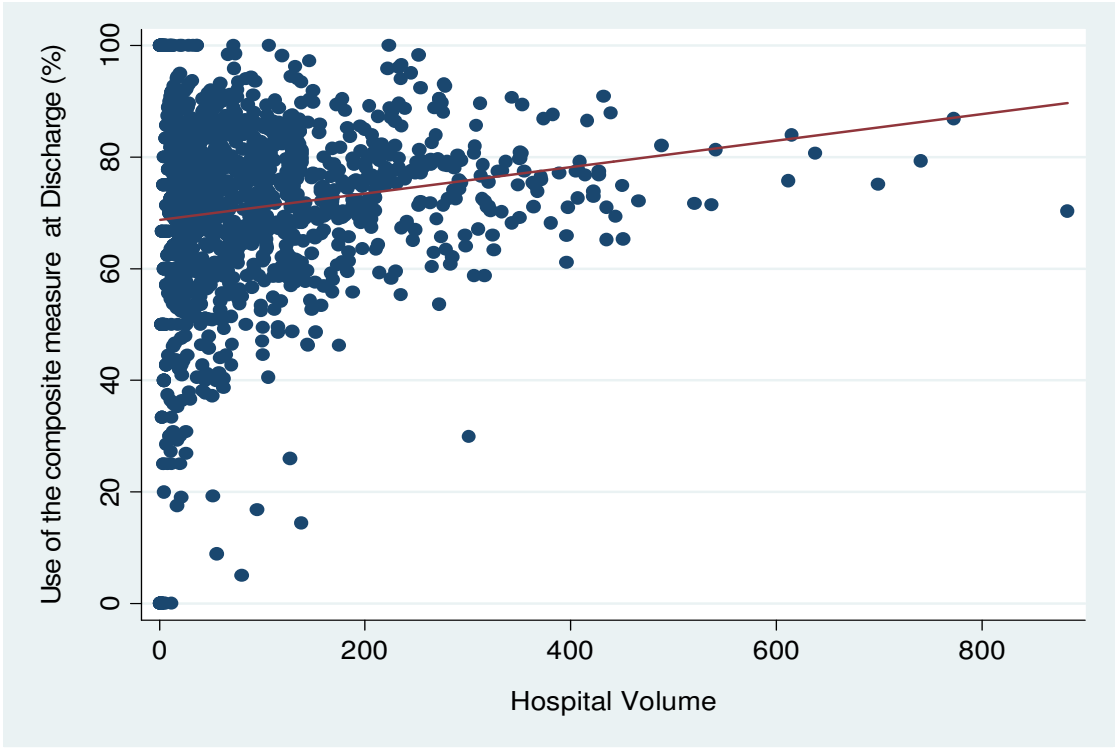
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 93 | 2 | 0 | 1 | 2 | 1 | 0 | 0 | 101 | 0.08 |
| 79 | 2 | 1 | 0 | 0 | 1 | 0 | 3 | 10 | 0.01 |
| 75 | 2 | 1 | 0 | 1 | 1 | 1 | 3 | 75 | 0.06 |
| 78 | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 27 | 0.02 |
| 77 | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 31 | 0.02 |
| 74 | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 456 | 0.36 |
| 73 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 569 | 0.45 |
| 82 | 2 | 1 | 1 | 2 | 0 | 1 | 1 | 35 | 0.03 |
| 81 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 31 | 0.02 |
| 103 | 2 | 2 | 0 | 0 | 1 | 0 | 3 | 16 | 0.01 |
| 99 | 2 | 2 | 0 | 1 | 1 | 1 | 3 | 139 | 0.11 |
| 102 | 2 | 2 | 1 | 0 | 0 | 0 | 2 | 77 | 0.06 |
| 101 | 2 | 2 | 1 | 0 | 1 | 0 | 2 | 103 | 0.08 |
| 98 | 2 | 2 | 1 | 1 | 0 | 1 | 2 | 888 | 0.71 |
| 97 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1429 | 1.14 |

**Distribution of ICD Composite Measure at Discharge**

| Description | **Volume** | **DCM** |
|---|---|---|
| N | 1301 | 1301 |
| Mean | 96.65 | 0.7109 |
| Std Deviation | 107.55 | 0.1781 |
| | | |
| 100% Max | 883 | 1.0000 |
| 99% | 450 | 1.0000 |
| 95% | 314 | 1.0000 |
| 90% | 241 | 0.9000 |
| 75% Q3 | 131 | 0.8136 |
| 50% Median | 60 | 0.7333 |
| 25% Q1 | 21 | 0.6364 |
| 10% | 7 | 0.5000 |
| 5% | 3 | 0.4000 |
| 1% | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 |

**ICD Composite Measure Testing Results (ACC)**



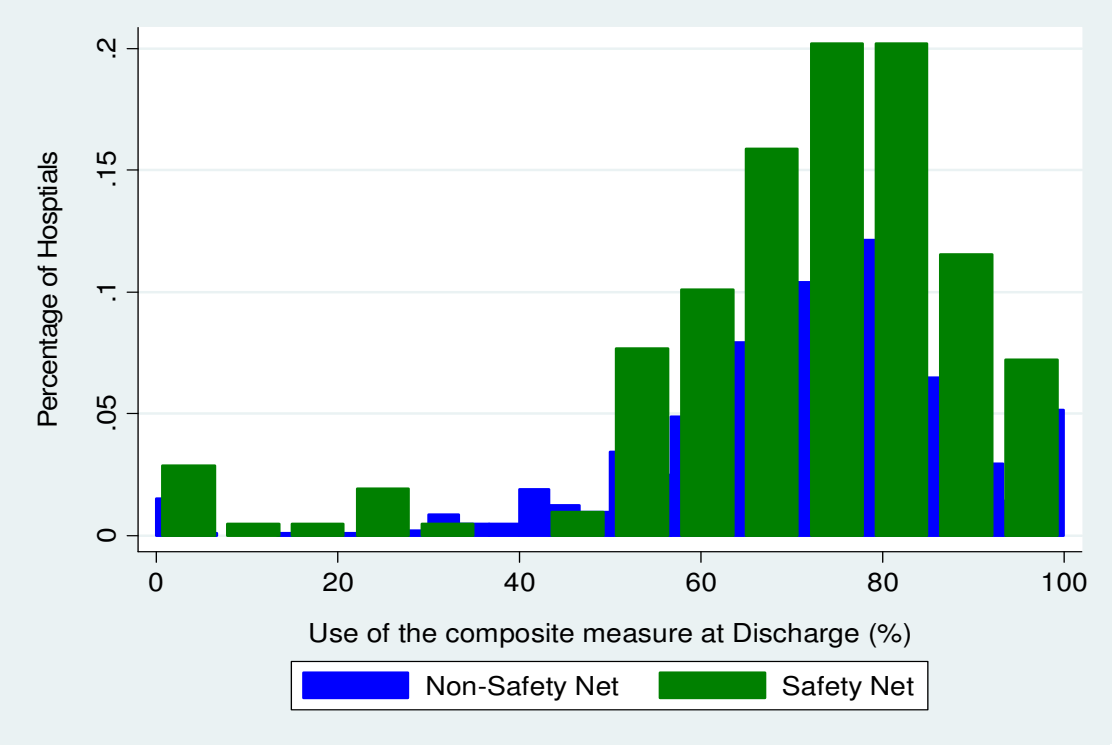



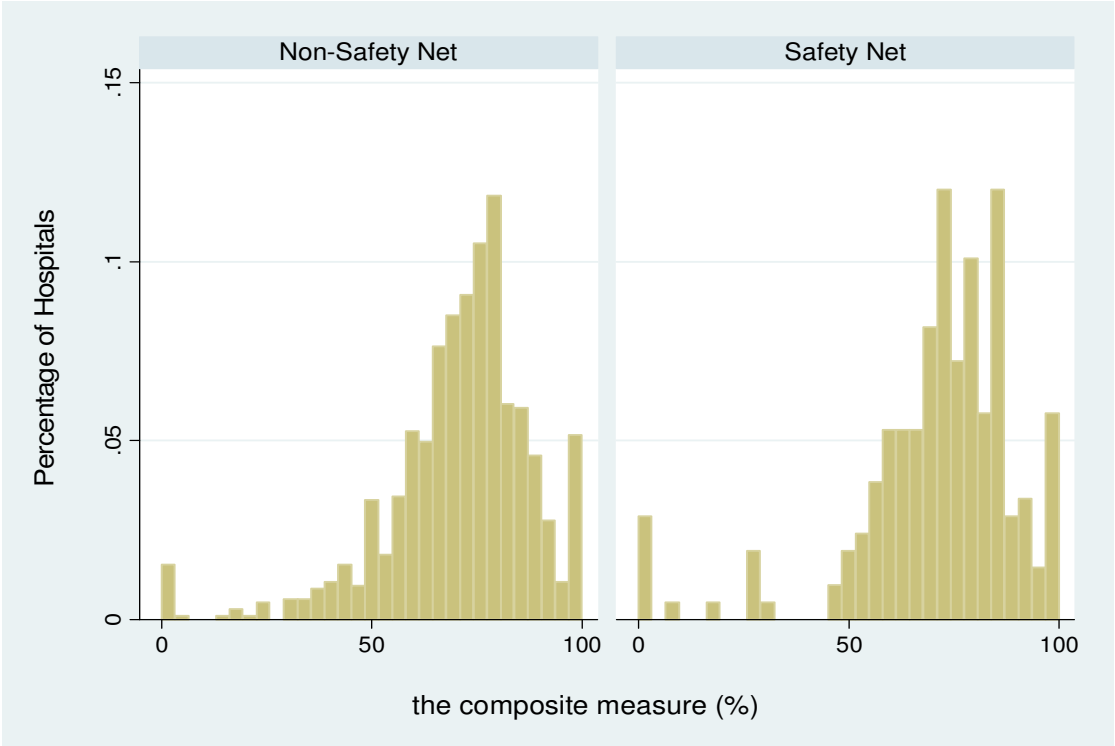
## Distribution of ICD Composite Measure at Discharge Stratified by Safety Net Status

| Description | Safety Net Status* | | | |
|---|---|---|---|---|
| | No | | Yes | |
| | Volume | DCM | Volume | DCM |
| N | 1047 | 1047 | 208 | 208 |
| Mean | 98.25 | 0.7093 | 90.38 | 0.7125 |
| Std Deviation | 107.95 | 0.1745 | 105.65 | 0.1966 |
| 100% Max | 883 | 1.0000 | 612 | 1.0000 |
| 99% | 450 | 1.0000 | 408 | 1.0000 |
| 95% | 307 | 0.9841 | 319 | 1.0000 |
| 90% | 241 | 0.8966 | 268 | 0.9044 |
| 75% Q3 | 134 | 0.8091 | 126 | 0.8421 |
| 50% Median | 62 | 0.7333 | 48.5 | 0.7333 |
| 25% Q1 | 23 | 0.6344 | 19 | 0.6419 |
| 10% | 7 | 0.5000 | 6 | 0.5253 |
| 5% | 3 | 0.4000 | 3 | 0.2727 |
| 1% | 1 | 0.0000 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |

* Defined as government hospitals or non-government hosptials with high medicaid caseload using AHA 2008 Data.

**ICD Composite Measure Testing Results (ACC)**

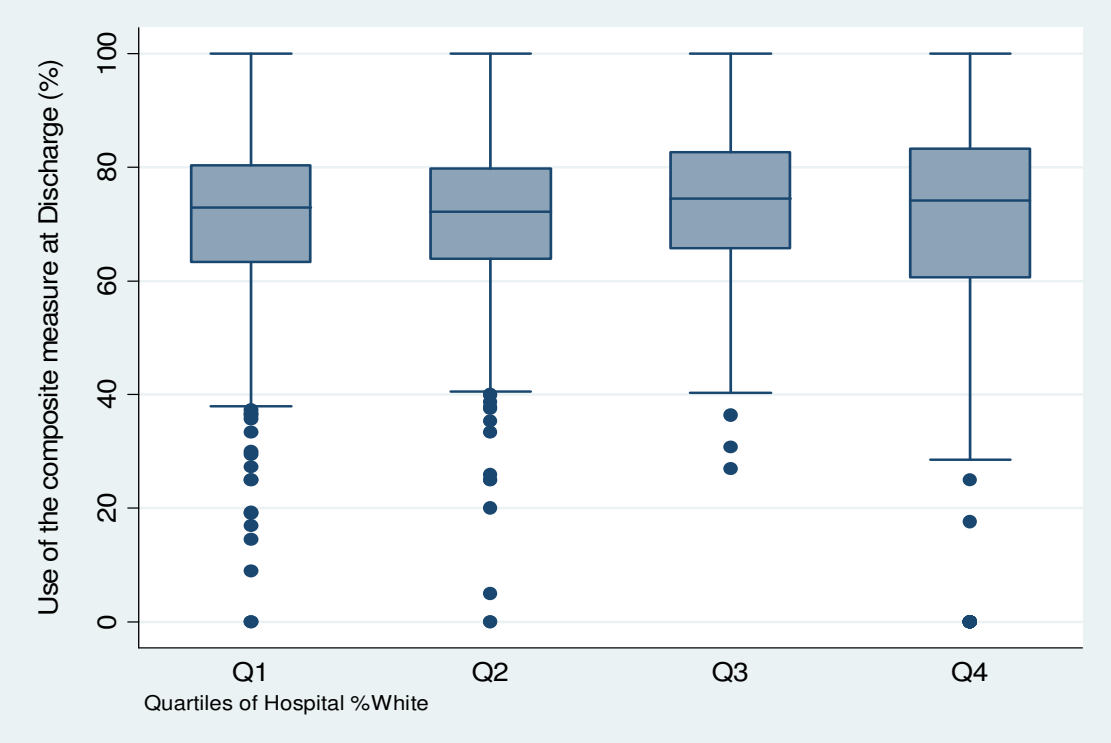


## Distribution of The Composite Measure at Discharge Stratified by Hospital %White

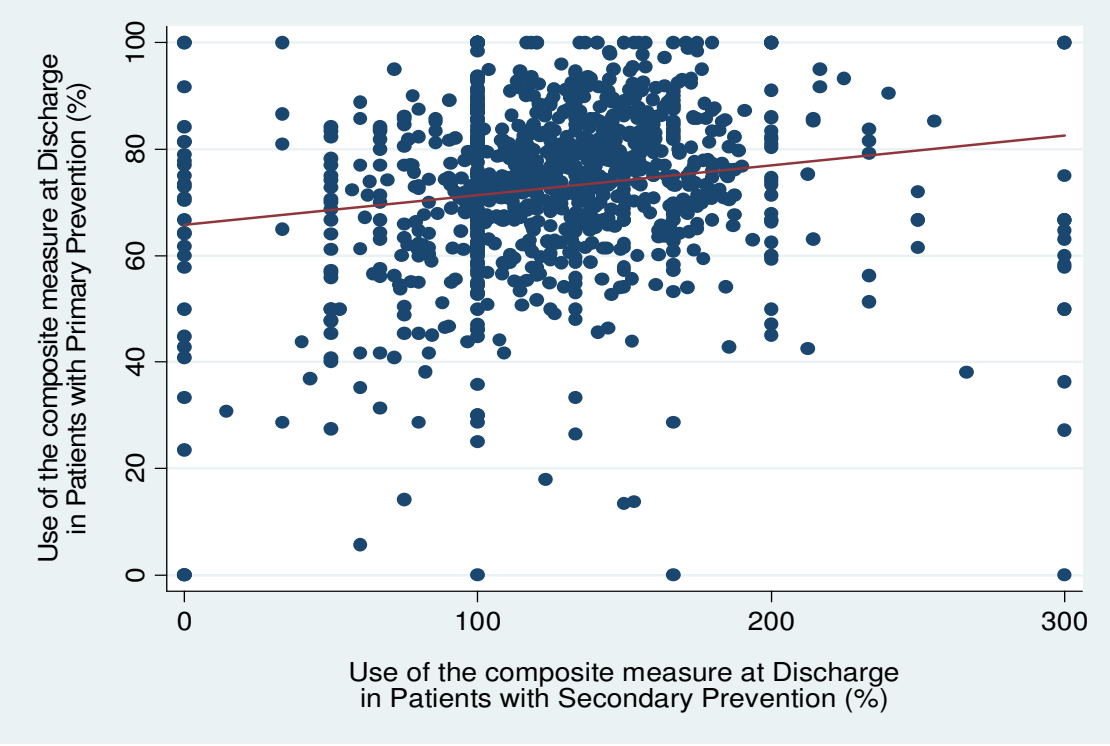
| Description | %White | %White Q1 | | Q2 | | Q3 | | Q4 | |
|---|---|---|---|---|---|---|---|---|---|
| | | Volume | DCM | Volume | DCM | Volume | DCM | Volume | DCM |
| N | 1301 | 325 | 325 | 325 | 325 | 326 | 326 | 325 | 325 |
| Mean | 0.8162 | 91.09 | 0.7103 | 124.50 | 0.7105 | 107.72 | 0.7332 | 63.26 | 0.6897 |
| SD | 0.2013 | 114.56 | 0.1725 | 120.70 | 0.1540 | 103.23 | 0.1295 | 77.33 | 0.2365 |
| 100% Max | 1.0000 | 773 | 1.0000 | 699 | 1.0000 | 883 | 1.0000 | 520 | 1.0000 |
| 99% | 1.0000 | 537 | 1.0000 | 451 | 1.0000 | 427 | 1.0000 | 312 | 1.0000 |
| 95% | 1.0000 | 316 | 1.0000 | 368 | 0.9403 | 306 | 0.9097 | 230 | 1.0000 |
| 90% | 1.0000 | 239 | 0.9045 | 310 | 0.8740 | 241 | 0.8889 | 166 | 0.9865 |
| 75% Q3 | 0.9608 | 123 | 0.8034 | 169 | 0.7977 | 149 | 0.8268 | 94 | 0.8333 |
| 50% Median | 0.8837 | 50 | 0.7290 | 92 | 0.7215 | 73.5 | 0.7452 | 33 | 0.7419 |
| 25% Q1 | 0.7403 | 17 | 0.6324 | 34 | 0.6389 | 38 | 0.6569 | 7 | 0.6050 |
| 10% | 0.5370 | 7 | 0.5106 | 12 | 0.5385 | 19 | 0.5556 | 2 | 0.4000 |
| 5% | 0.3897 | 4 | 0.3725 | 8 | 0.4286 | 14 | 0.4950 | 1 | 0.0000 |
| 1% | 0.0000 | 1 | 0.1449 | 4 | 0.2000 | 10 | 0.4032 | 1 | 0.0000 |
| 0% Min | 0.0000 | 1 | 0.0000 | 4 | 0.0000 | 9 | 0.2692 | 1 | 0.0000 |

**ICD Composite Measure Testing Results (ACC)**

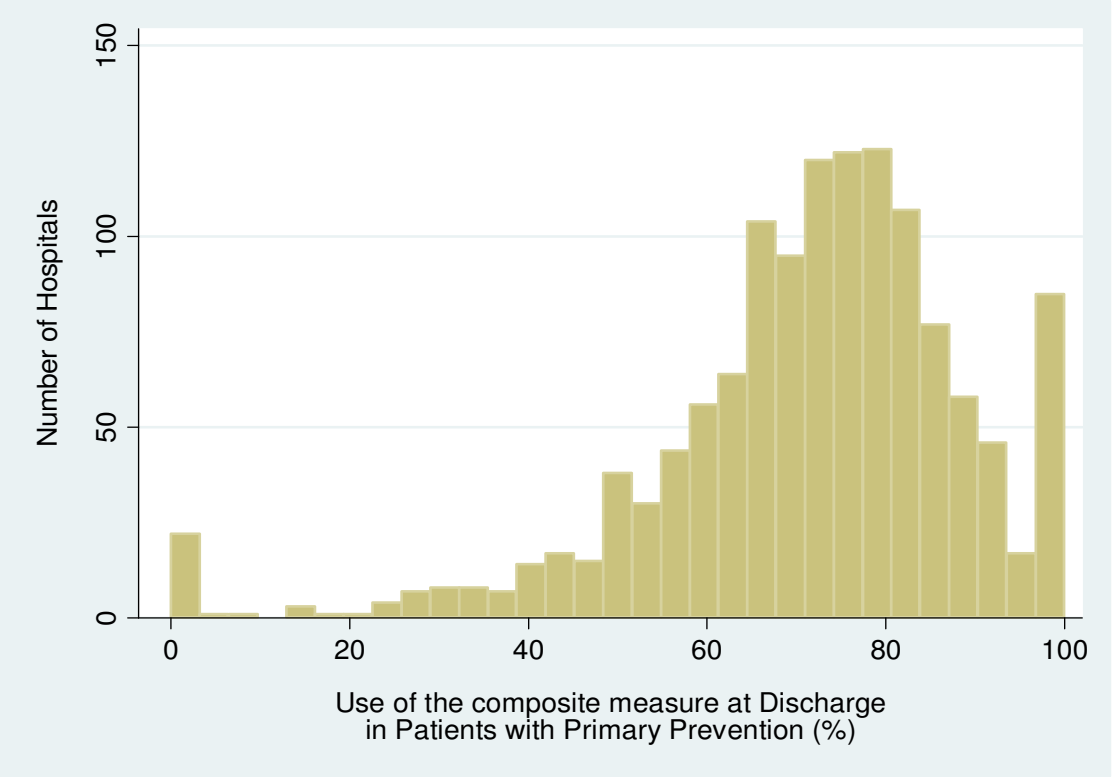


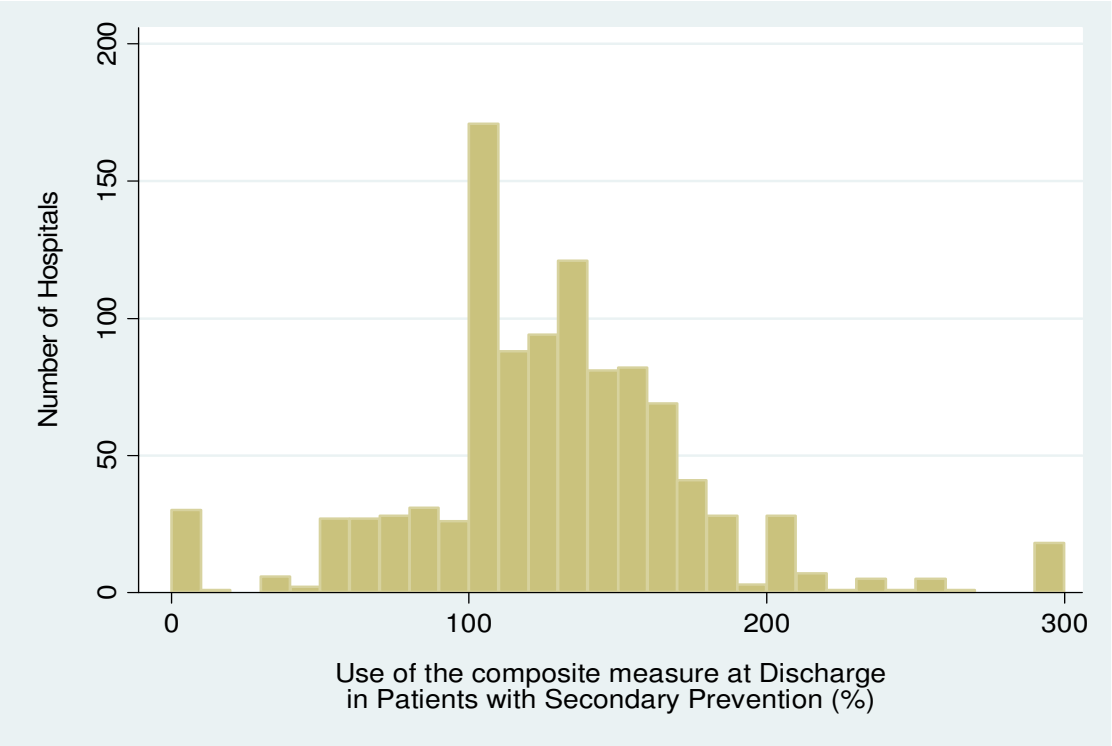
## Distribution of The Composite Measure at Discharge Stratified by ICD Indication

| Description | ICD Indication | | | |
|---|---|---|---|---|
| | Primary Prevention | | Secondary Prevention | |
| | Volume | DCM | Volume | DCM |
| N | 1295 | 1295 | 1022 | 1022 |
| Mean | 77.72 | 0.7146 | 24.56 | 1.2728 |
| Std Deviation | 83.39 | 0.1827 | 35.55 | 0.4867 |
| 100% Max | 591 | 1.0000 | 661 | 3.0000 |
| 99% | 370 | 1.0000 | 142 | 3.0000 |
| 95% | 251 | 1.0000 | 82 | 2.0000 |
| 90% | 190 | 0.9149 | 59 | 1.7778 |
| 75% Q3 | 110 | 0.8258 | 32 | 1.5165 |
| 50% Median | 50 | 0.7394 | 14 | 1.2706 |
| 25% Q1 | 18 | 0.6329 | 5 | 1.0000 |
| 10% | 6 | 0.5000 | 2 | 0.7500 |
| 5% | 3 | 0.4000 | 1 | 0.5000 |
| 1% | 1 | 0.0000 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |



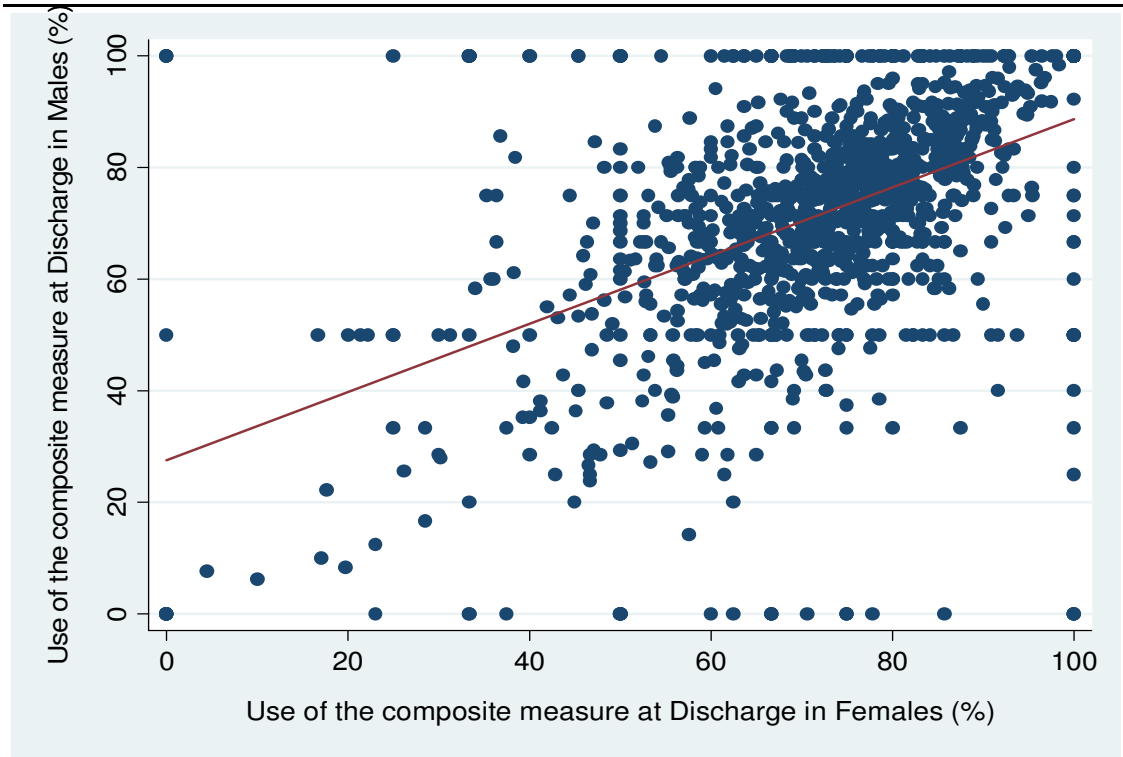
**ICD Composite Measure Testing Results (ACC)**



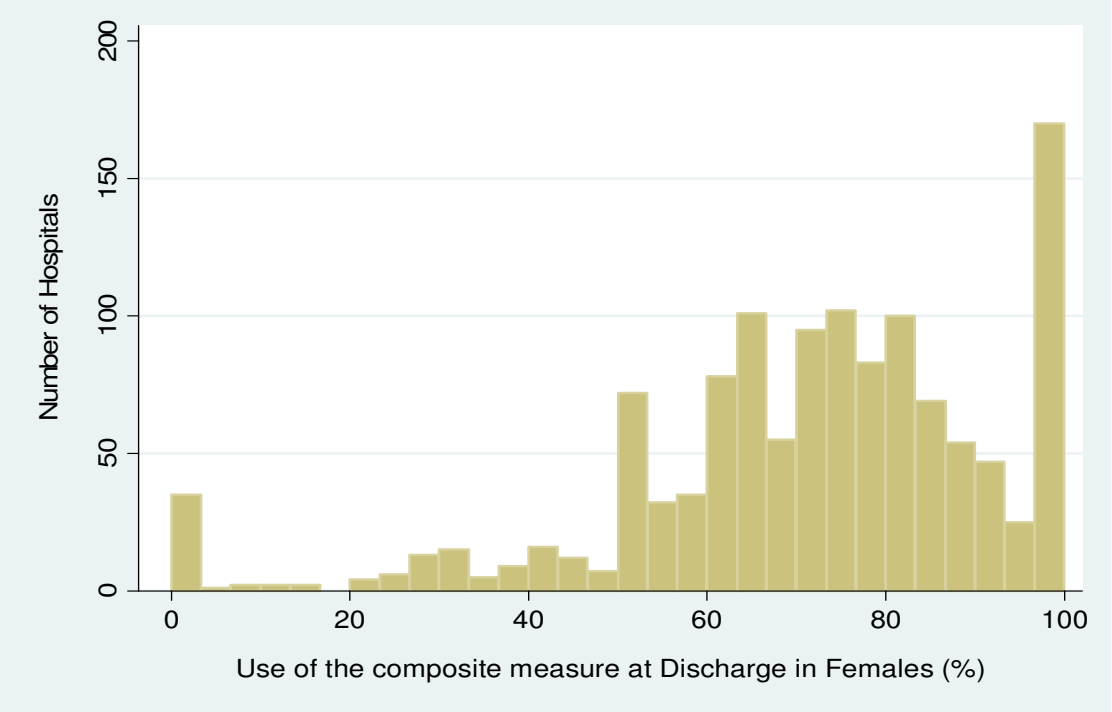



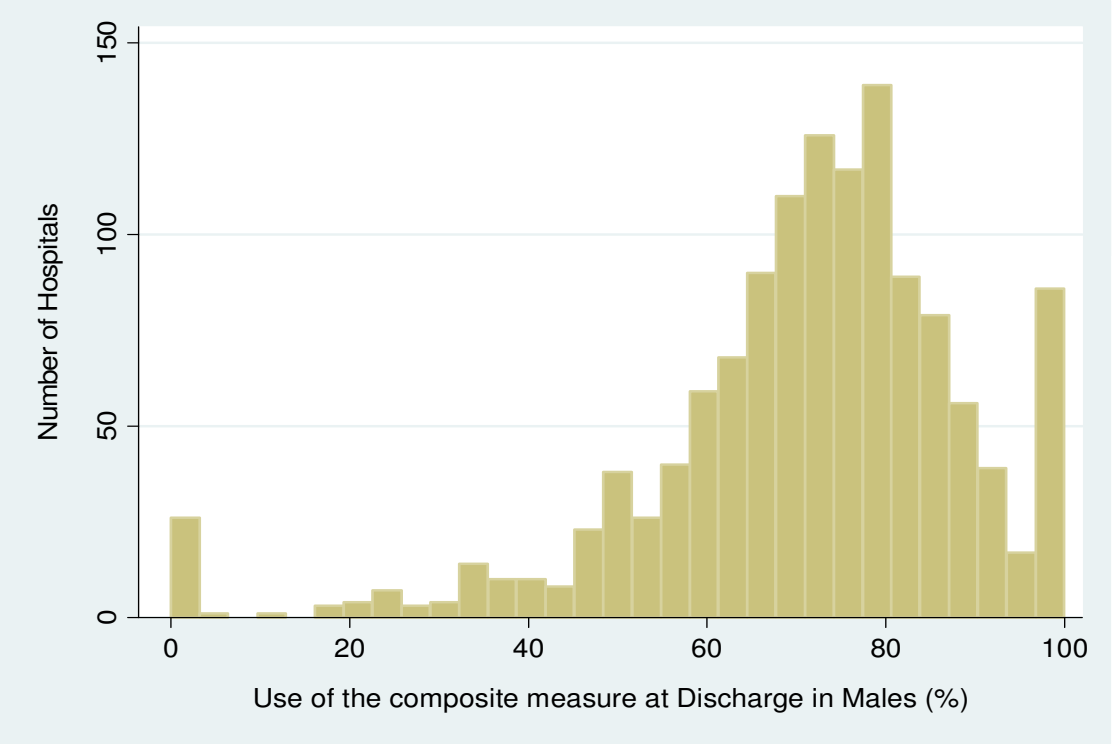
## Distribution of The Composite Measure at Discharge

| Description | Female | | | |
|---|---|---|---|---|
| | Yes | | No | |
| | Volume | DCM | Volume | DCM |
| N | 1247 | 1247 | 1293 | 1293 |
| Mean | 25.34 | 0.7142 | 72.81 | 0.7112 |
| Std Deviation | 27.17 | 0.2172 | 81.40 | 0.1867 |
| 100% Max | 194 | 1.0000 | 701 | 1.0000 |
| 99% | 123 | 1.0000 | 355 | 1.0000 |
| 95% | 80 | 1.0000 | 235 | 1.0000 |
| 90% | 61 | 1.0000 | 183 | 0.9098 |
| 75% Q3 | 35 | 0.8571 | 99 | 0.8235 |
| 50% Median | 16 | 0.7452 | 45 | 0.7353 |
| 25% Q1 | 6 | 0.6154 | 16 | 0.6364 |
| 10% | 2 | 0.4762 | 6 | 0.5000 |
| 5% | 1 | 0.2917 | 2 | 0.3611 |
| 1% | 1 | 0.0000 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 |



**ICD Composite Measure Testing Results (ACC)**



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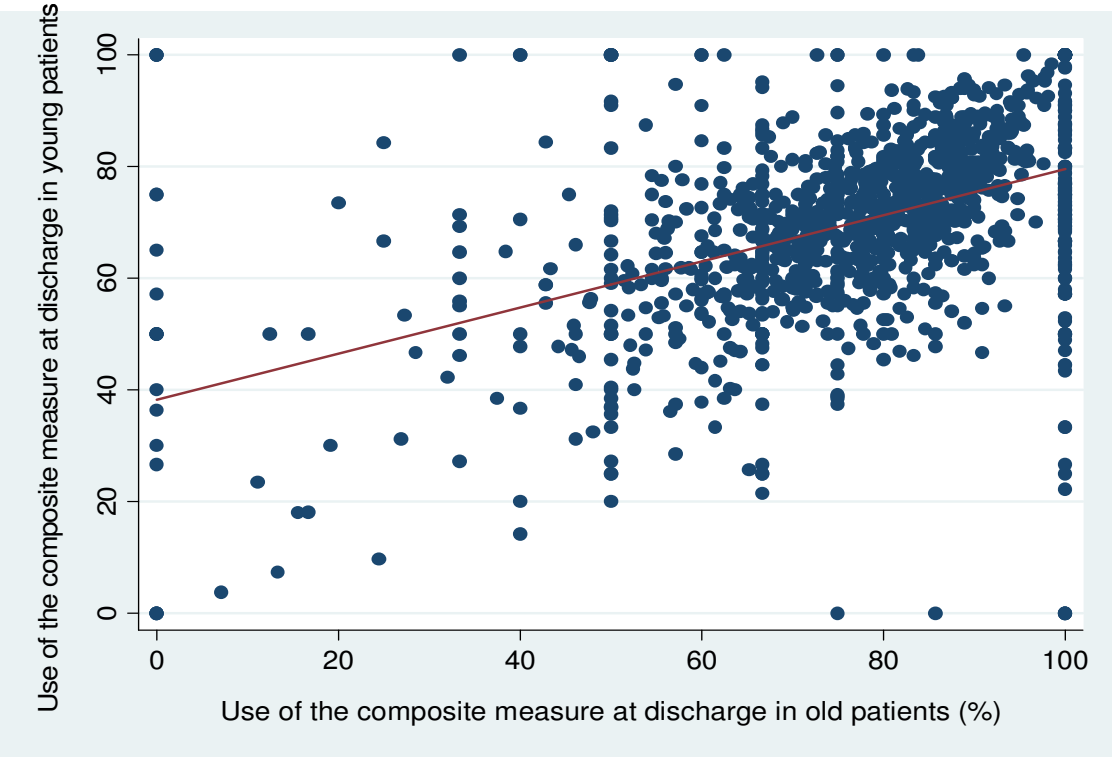
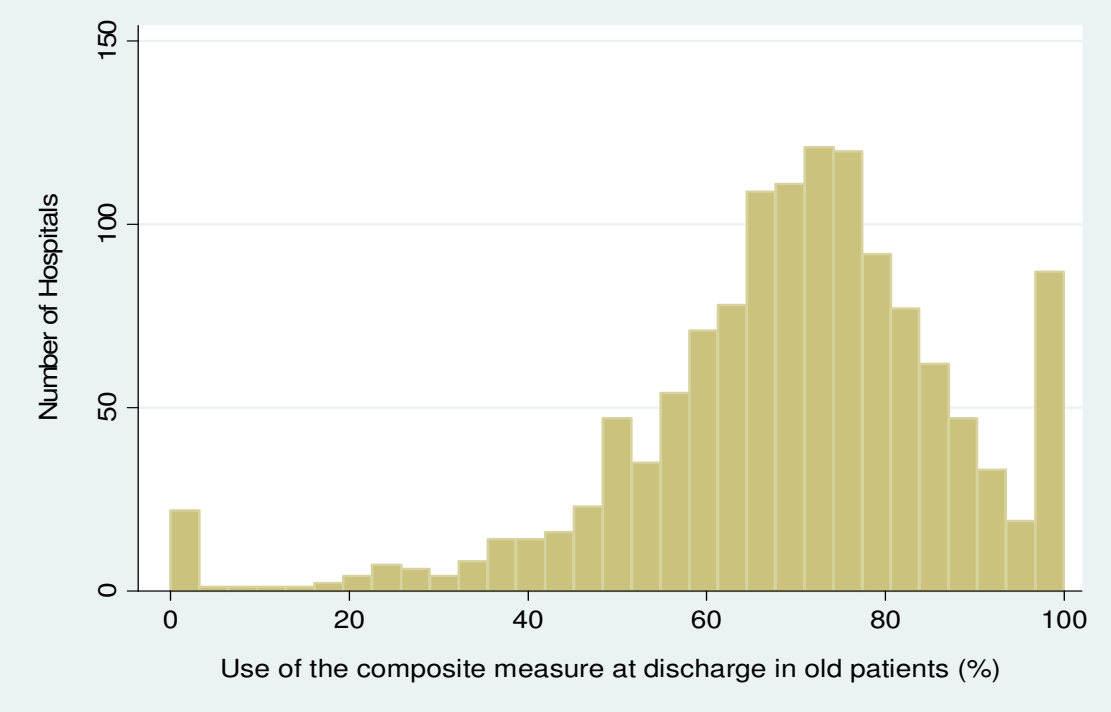
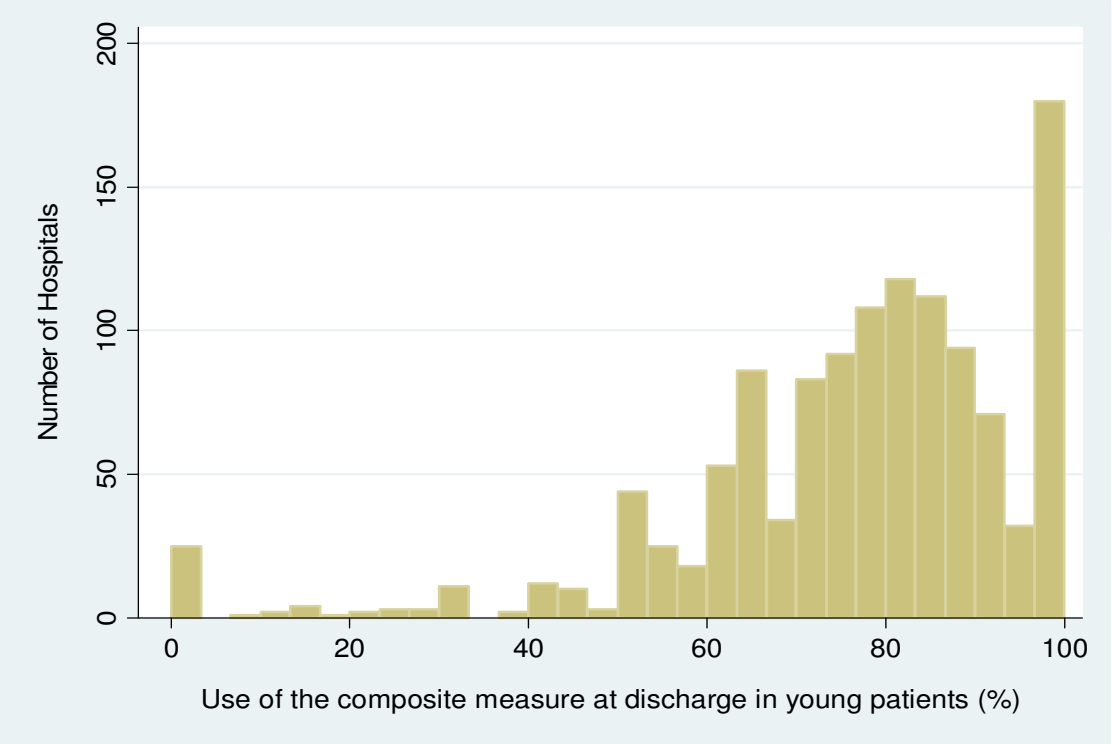
## Distribution of The Composite Measure at Discharge

| Description | Age >= 65 | | | |
|---|---|---|---|---|
| | Yes | | No | |
| | Volume | DCM | Volume | DCM |
| N | 1287 | 1287 | 1229 | 1229 |
| Mean | 65.25 | 0.69558 | 33.99 | 0.76377 |
| Std Deviation | 71.26 | 0.18546 | 39.96 | 0.19630 |
| 100% Max | 647 | 1.00000 | 286 | 1.00000 |
| 99% | 316 | 1.00000 | 184 | 1.00000 |
| 95% | 208 | 1.00000 | 118 | 1.00000 |
| 90% | 157 | 0.91089 | 85 | 1.00000 |
| 75% Q3 | 90 | 0.80769 | 45 | 0.88889 |
| 50% Median | 42 | 0.71429 | 20 | 0.79433 |
| 25% Q1 | 14 | 0.60448 | 7 | 0.67442 |
| 10% | 5 | 0.50000 | 3 | 0.52632 |
| 5% | 2 | 0.37500 | 1 | 0.40000 |
| 1% | 1 | 0.00000 | 1 | 0.00000 |
| 0% Min | 1 | 0.00000 | 1 | 0.00000 |



**ICD Composite Measure Testing Results (ACC)**

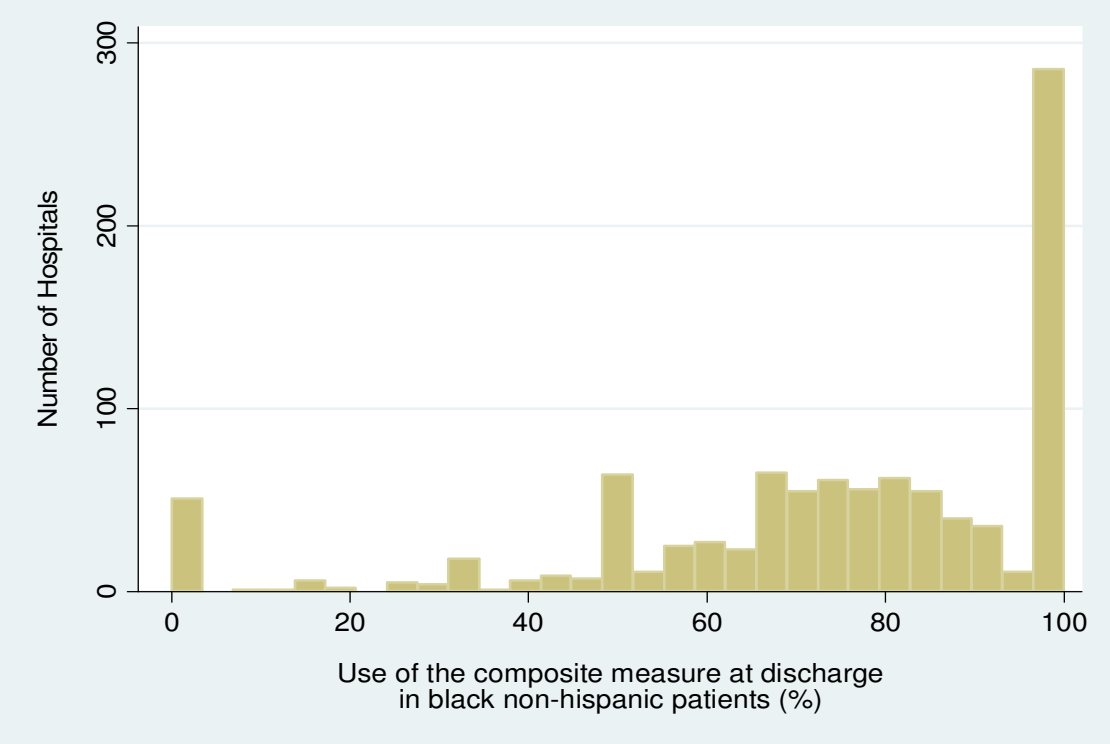


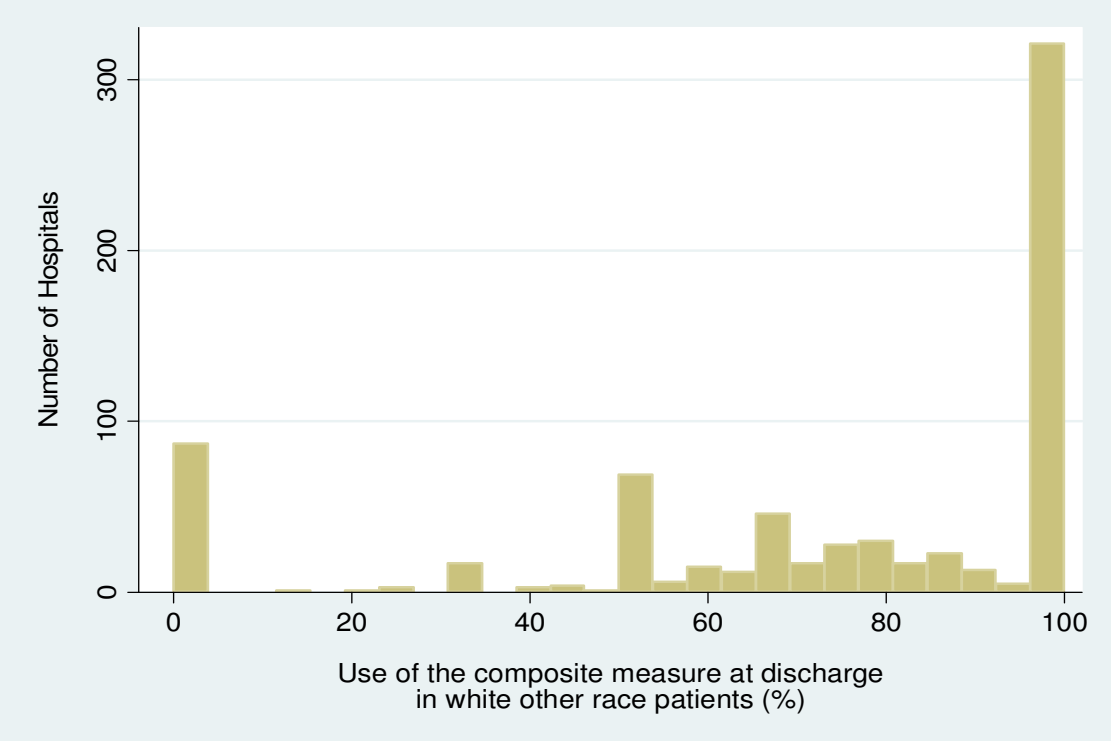



## Distribution of The Composite Measure at Discharge Stratified by Race

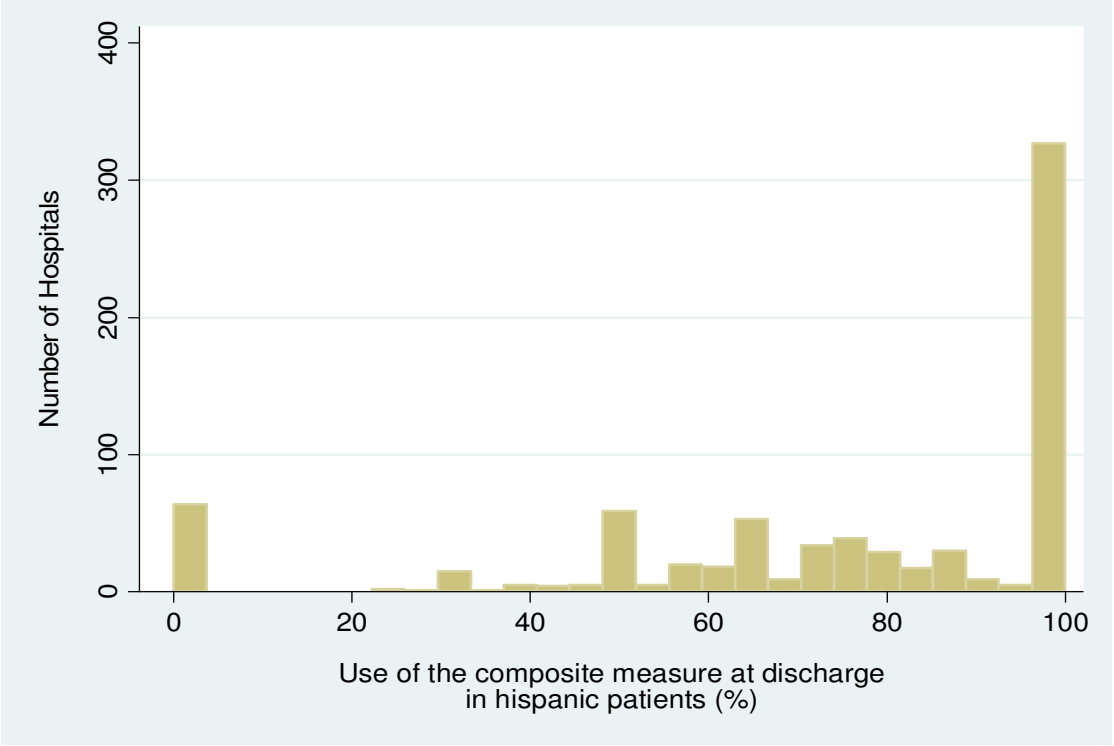
| Description | Race | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Hispanic | | White non-hispani | | Black non-Hispanic | | Other | |
| | Volume | DCM | Volume | DCM | Volume | DCM | Volume | DCM |
| N | 751 | 751 | 1284 | 1284 | 988 | 988 | 719 | 719 |
| Mean | 8.42 | 0.7521 | 77.51 | 0.7035 | 15.92 | 0.7436 | 5.80 | 0.7282 |
| SD | 15.14 | 0.3007 | 88.83 | 0.1921 | 25.04 | 0.2608 | 11.12 | 0.3342 |
| 100% Max | 155 | 1.0000 | 778 | 1.0000 | 208 | 1.0000 | 135 | 1.0000 |
| 99% | 87 | 1.0000 | 368 | 1.0000 | 128 | 1.0000 | 66 | 1.0000 |
| 95% | 30 | 1.0000 | 263 | 1.0000 | 65 | 1.0000 | 20 | 1.0000 |
| 90% | 20 | 1.0000 | 197 | 0.9091 | 42 | 1.0000 | 13 | 1.0000 |
| 75% Q3 | 9 | 1.0000 | 106 | 0.8153 | 18 | 1.0000 | 6 | 1.0000 |
| 50% Mediar | 3 | 0.8333 | 45 | 0.7275 | 7 | 0.7876 | 2 | 0.8571 |
| 25% Q1 | 1 | 0.6000 | 16 | 0.6250 | 2 | 0.6348 | 1 | 0.5000 |
| 10% | 1 | 0.3333 | 5 | 0.4915 | 1 | 0.4286 | 1 | 0.0000 |
| 5% | 1 | 0.0000 | 2 | 0.3333 | 1 | 0.0000 | 1 | 0.0000 |
| 1% | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 |

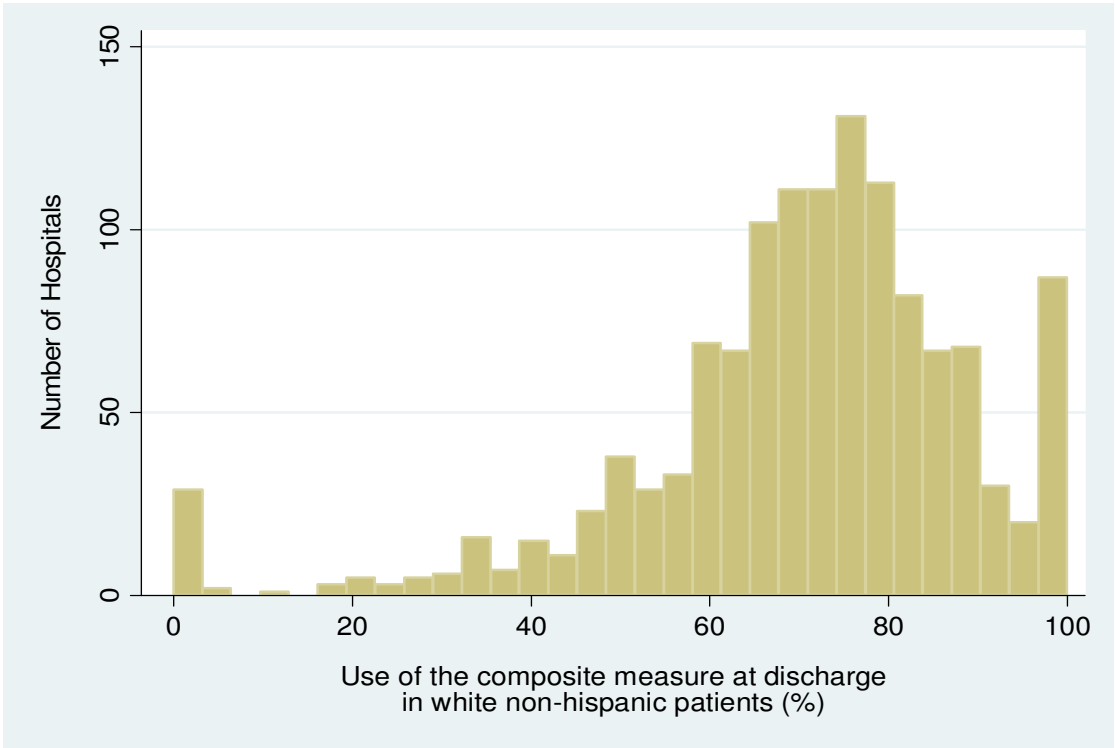
**ICD Composite Measure Testing Results (ACC)**



**ICD Composite Measure Testing Results (ACC)**



# Study Cohort

| Exclusions | Patient Stays | | Patients | | Facilities | |
|---|---|---|---|---|---|---|
| **Total** | **533188** | **100.0** | **518695** | **100.0** | **1475** | **100.0** |
| Discharge not in 2008 | 401817 | 75.4 | 388102 | 74.8 | 192 | 13.0 |
| **Remaining** | **131371** | **24.6** | **130593** | **25.2** | **1283** | **87.0** |
| Died during hospital | 500 | 0.4 | 494 | 0.4 | 0 | 0.0 |
| **Remaining** | **130871** | **99.6** | **130099** | **99.6** | **1283** | **100.0** |
| Not eligible to the composite measure | 14702 | 11.2 | 14589 | 11.2 | 2 | 0.2 |
| **Study Cohort** | **116169** | **88.8** | **115510** | **88.8** | **1281** | **99.8** |
| The composite measure at discharge | 84267 | 72.54 | 83882 | 72.62 | 1262 | 98.52 |

0

**The Composite Measure at Discharge- Validation Sample**

| Description | Volume | DCM |
|---|---|---|
| N | 1281 | 1281 |
| Mean | 90.69 | 0.6991 |
| Std Deviation | 98.39 | 0.1766 |
| | | |
| 100% Max | 732 | 1.0000 |
| 99% | 426 | 1.0000 |
| 95% | 298 | 0.9524 |
| 90% | 221 | 0.8871 |
| 75% Q3 | 126 | 0.8065 |
| 50% Median | 57 | 0.7222 |
| 25% Q1 | 21 | 0.6250 |
| 10% | 6 | 0.5000 |
| 5% | 4 | 0.3962 |
| 1% | 1 | 0.0000 |
| 0% Min | 1 | 0.0000 |

## ICD Composite Measure Testing Results (ACC)