



NCDR®
NATIONAL CARDIOVASCULAR DATA REGISTRY



AMERICAN
COLLEGE of
CARDIOLOGY

NCDR® Public Reporting Companion Guide

Implantable Cardioverter Defibrillator (ICD) Measures

The mission of the NCDR voluntary hospital public reporting program, as defined by the American College of Cardiology (ACC) along with its partner's the Heart Rhythm Society (HRS) and The Society for Cardiovascular Angiography and Interventions (SCAI), is to:

- Monitor the quality of cardiovascular patient care being provided in a transparent manner.
- Ensure reporting is based on data that is of high quality, is administered with minimal collection burden as cost-effectively as reasonable, and employs clinically valid and methodologically sound measures.
- Provide measures that are actionable and consistent with the Triple Aim of better outcomes, better care and lower costs without causing unintended consequences in access to care for any population.
- Focus on measures that include aspects of care where the patient can be engaged as part of the solution OR where there is clear evidence that individual patient risk factors have an effect on the care being provided, so should be understood to the patient.
- Foster relationships of trust through collaboration between patients and their cardiovascular care team by presenting information that is credible, understandable, and actionable.
- Empower broader discussions at the community level in improving not only the overall care being provided to individual patients but the health and wellbeing of populations.
- Enable patients and cardiovascular professionals to advocate for policies at the federal and state level that support achieving the Triple Aim.

This mission in providing open access to information on quality of care is championed by cardiovascular physicians and the members of the care team, including nurses, nurse practitioners, and physicians assistants, as an ethical responsibility of the profession.

Companion Guide to
NCDR® Public Reporting
Implantable Cardioverter Defibrillator (ICD) Measures

Purpose: This document is a Companion guide for the American College of Cardiology (ACC) National Cardiovascular Data Registry (NCDR®) - Implantable Cardioverter Defibrillator (ICD) Measures. It contains an explanation of how to read and interpret measure scores as well as the details of individual metric calculation.

Document Version and Change History

Version	Effective Date	Notes/Changes
1.0	November 2, 2015	Initial Deployment Version
1.1	February 2, 2019	Section 1 Reporting Time Period dates updated

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Interpretation of Public Reporting Scoring

Hospital Score		State Score	
P score	75.00%	P score	62.15%
Star Rating	☆☆☆☆	Star Rating	☆☆☆☆
95% Interval Estimate	(52.15% , 86.25%)	95% Interval Estimate	(22.15% , 76.25%)

Metric Scoring: All metrics are scored using statistical models developed from the most recent calendar year data. Quality performance is represented as a percentage ranging between 0 and 100% (called a “P score”) and can be thought of as the percentage of time the metric guideline is followed. For each hospital two P scores are displayed.

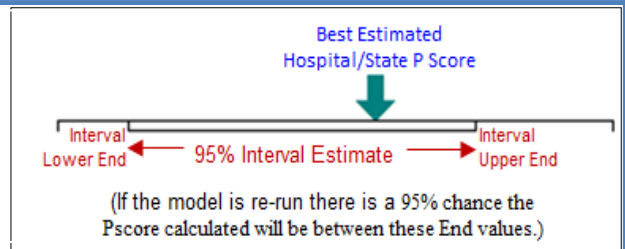
- Hospital P Score:**
 - Each hospital receives its own quality performance (P) score.
 - This score can be used to assess individual hospital performance.
 - A Higher Hospital P Score means better individual hospital quality performance.**
- State P Score:**
 - Each US state receives a quality performance (P) score.
 - This score can be used to assess performance of all the ACC hospitals within a state.
 - All hospitals within the same state will receive the same State P Score.
 - A higher State P Score means better quality performance for all hospitals across the state.**

Star Rating	P Value Range
☆☆☆☆	>0.00% - 74.99%
☆☆☆☆	75.00% - 89.99%
☆☆☆☆	90.00% - 94.99%
☆☆☆☆	95.00% - <100.00%

Star Ratings: To more easily interpret the quality performance score, hospitals and states are grouped into four (4) star categories. These star categories are set based on the recommended performance (P score) that all hospitals should achieve in their care of patients. Star cutoff values are the same for all metrics.

Example: A hospital receiving a P score of 79.00% will receive a 2 star rating as its score falls in the 2 star range of 75.00% – 84.99%.

Interval Estimate: The P score for a metric is based on the data available and therefore the scoring model accuracy depends on the amount of data for a hospital/state. There will always be some degree of uncertainty in the single P score given. The uncertainty in the P score is highest when a hospital/state has few data points and increases as more data becomes available.



The degree of belief that can be placed in an individual P score can be shown using a figure called an ‘interval estimate’. The interval is displayed as a box drawn between a Lower End value and an Upper End value. If the model were to be re-run, there is a 95% chance the P score calculated would fall in the interval between the two End values.

A smaller confidence interval box, or distance between the Lower End and Upper End values, indicates a greater confidence in the single P score given to the hospital/state. **The best estimate of the true value is the P score assigned and shown with the green arrow.**

Minimum Data: To partially account for uncertainty when less data is available, a minimum number of cases has been established in order for the model to assign a P score. By requiring a minimum amount of data we ensure a reasonable degree of confidence that any score given is truly representative of the quality of performance at that site.

The minimum number of cases per year to receive a P score for a ICD Metrics is: 11 cases

Public Reporting Measure Details

This section provides details regarding the calculation process, guidelines and relevant citations for each public reporting measure. All measures approved for Public Reporting with the ACC have been endorsed by the National Quality Forum (NQF). Details for the approval of these measures by NQF can be found on the NQF website <http://www.qualityforum.org/QPS/QPSTool.aspx> by searching for the NQF# listed in the metric table provided.

Section I: Reporting Time Period

For the measures presented data results were calculated base on patients discharge from the reported hospital during the following time period:

- ICD Public Reporting Measures: Jan 1 2016 – Dec 31 2016

Section II: ICD Public Reporting Measures

All metrics in this section pertain to hospitals treating patients receiving an implantable cardioverter defibrillator (ICD).

Measure: Use of a medicine in the ACE or ARB class after ICD implant in patients with less than normal heart function.

Description: Patients with less than normal heart function should be prescribed an ACE or ARB medication after receiving an ICD implant-unless there is a reason not to use the medicine (such as an allergy). Use of this medication may reduce the risk of death and hospital re-admission after this procedure.

This score shows how well this facility is following this guideline - higher is better. Patients who cannot take an ACE or ARB are excluded.

ICD Registry#	4
NQF#	1522
Numerator	Count of ICD implant patients with a diagnosis of heart failure and left ventricular systolic dysfunction with ACE-I or ARB therapy prescribed at discharge.
Denominator	Count of patients with a diagnosis left ventricular systolic dysfunction
Inclusion criteria	-ICD implant patients
Exclusion criteria	-Both ACE-I or ARB therapy contraindicated or blinded. Contraindications must be documented explicitly by the physician, or clearly evidenced within the medical record.

Clinical Rationale/Guideline Recommendation

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

This measure is endorsed by the National Quality Forum (NQF), endorsed measure #1522.

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult:

Class I

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

Class IIa

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

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

Relevant Citation(s): Bonow RO, Bennett S, Casey DE, Jr., et al. ACC/AHA clinical performance measures for adults with chronic heart failure: a report of the American College of Cardiology/American Heart Association Task Force on Performance Measures (Writing Committee to Develop Heart Failure Clinical Performance Measures) endorsed by the Heart Failure Society of America. J Am Coll Cardiol. 2005;46:1144-78.

Measure: Use of a Beta-blocker medication after ICD implant in patients with a previous heart attack.

Description: Patients who have suffered a previous heart attack should be prescribed a Beta-blocker medication after receiving an ICD implant- unless there is a reason not to use these medicines (such as an allergy). Use of this medication may reduce the risk of death and hospital re-admission after this procedure.

This score shows how well this facility is following this guideline - higher is better. Patients who cannot take beta-blocker medicines are excluded.

ICD Registry#	5
NQF#	1528
Numerator	Count of ICD implant patients with prior MI and discharged on beta-blocker therapy.
Denominator	ICD patients with a prior MI
Inclusion criteria	-ICD implant patients
Exclusion criteria	-Beta-blocker therapy contraindicated or blinded. Contraindications must be documented explicitly by the physician, or clearly evidenced within the medical record.

Clinical Rationale/Guideline Recommendation

The benefits of beta blocker therapy in patients with prior myocardial infarction without contraindications have been established for a wide range of patient 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.

This measure is endorsed by the National Quality Forum (NQF), endorsed measure #1528.

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)

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)

ACC/AHA Secondary Prevention Guidelines (2006)

Class I

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. (Level of Evidence: A)

CLASS IIa

Consider chronic therapy for all other patients with coronary or other vascular disease or diabetes unless contraindicated. (Level of Evidence: C)

Relevant Citation(s):

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.

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.

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

Measure: Use of a Beta-blocker medication after ICD implant in patients with less than normal heart function.

Description: Patients with less than normal heart function should be prescribed a Beta-blocker medication after receiving an ICD implant- unless there is a reason not to use the medicine (such as an allergy). Use of this medication may reduce the risk of death and hospital re-admission after this procedure.

This score shows how well this facility is following this guideline - higher is better. Patients who cannot take beta-blocker medicines are excluded.

ICD Registry#	6
NQF#	1529
Numerator	Count of ICD implant patients with a diagnosis of left ventricular systolic dysfunction (LVSD) prescribed beta blocker therapy on discharge.
Denominator	Count of ICD implant patients left ventricular systolic dysfunction (LVSD).
Inclusion criteria	-Implant patients with a diagnosis of LVSD
Exclusion criteria	-Beta blocker therapy contraindicated or blinded. Contraindications must be documented explicitly by the physician, or clearly evidenced within the medical record

Clinical Rationale/Guideline Recommendation

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.

This measure is endorsed by the National Quality Forum (NQF), endorsed measure #1529.

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)

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)
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)
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. (Level of Evidence: B)
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).

Relevant Citation(s):

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.

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.

Measure: Use of all recommended medications (ACE or ARB and Beta-blocker) after ICD implant.

Description: Patients should be prescribed an ACE or ARB medication and a Beta-blocker after receiving an ICD implant- unless there is a reason not to use these medicines (such as an allergy). Use of these medications may reduce the risk of death and hospital re-admission after this procedure.

This score shows how well this facility is following this guideline - higher is better. Patients who cannot take all of the recommended medicines are excluded.

ICD Registry#	14
NQF#	0965
Numerator	<p>Patients who receive all medications for which they are eligible:</p> <ol style="list-style-type: none"> 1. ACE/ARB prescribed at discharge (if eligible for ACE/ARB as described in denominator) -AND- 2. Beta blockers prescribed at discharge (if eligible for beta blockers as described in denominator)
Denominator	<p>All patients with an ICD implant surviving hospitalization who are eligible to receive any one of the two medication classes:</p> <ol style="list-style-type: none"> 1) Eligibility 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: <ol style="list-style-type: none"> a. EF of <40% OR b. a previous myocardial infarction (MI)
Inclusion criteria	-ICD implant patients eligible for beta blocker or ACE/ARB
Exclusion criteria	-Eligible for neither medication

Clinical Rationale/Guideline Recommendation

See individual measures above for clinical rationale/guideline recommendation

This measure is endorsed by the National Quality Forum (NQF), endorsed measure #965.