**National Quality Forum—Evidence (subcriterion 1a)**

**Measure Title**:

Risk-Adjusted Coronary Artery Bypass Graft (CABG) Readmission Rate

**IF the measure is a component in a composite performance measure, provide the title of the Composite Measure here:**

N/A

**Date of Submission**:

2/5/2014

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| **Instructions**  *For composite performance measures:*  *A separate evidence form is required for each component measure unless several components were studied together.*  *If a component measure is submitted as an individual performance measure, attach the evidence form to the individual measure submission.*   * Respond to all questions as instructed with answers immediately following the question. All information needed to demonstrate meeting the evidence subcriterion (1a) must be in this form. An appendix of *supplemental* materials may be submitted, but there is no guarantee it will be reviewed. * If you are unable to check a box, please highlight or shade the box for your response. * Maximum of 10 pages (*incudes questions/instructions*; minimum font size 11 pt; do not change margins). ***Contact NQF staff if more pages are needed.*** * Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](http://www.qualityforum.org/Measuring_Performance/Submitting_Standards.aspx). |

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| **Note: The information provided in this form is intended to aid the Steering Committee and other stakeholders in understanding to what degree the evidence for this measure meets NQF’s evaluation criteria.**  **Subcriterion 1a.** **Evidence to Support the Measure Focus**  The measure focus is a health outcome or is evidence-based, demonstrated as follows:   * Health outcome:**[3](#Note3)** a rationale supports the relationship of the health outcome to processes or structures of care. * Intermediate clinical outcome, Process,**[4](#Note4)** or Structure: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence[**5**](#Note5)that the measure focus leads to a desired health outcome. * Patient experience with care: evidence that the measured aspects of care are those valued by patients and for which the patient is the best and/or only source of information OR that patient experience with care is correlated with desired outcomes. * Efficiency:**[6](#Note6)** evidence for the quality component as noted above.   **Notes**  **3.** Generally, rare event outcomes do not provide adequate information for improvement or discrimination; however, serious reportable events that are compared to zero are appropriate outcomes for public reporting and quality improvement.  **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 multistep process, the step with the strongest evidence for the link to the desired outcome should be selected as the focus of measurement.  **5.** The preferred systems for grading the evidence are the U.S. Preventive Services Task Force (USPSTF) [grading definitions](http://www.uspreventiveservicestaskforce.org/uspstf/grades.htm) and [methods](http://www.uspreventiveservicestaskforce.org/methods.htm), or Grading of Recommendations, Assessment, Development and Evaluation [(GRADE) guidelines](http://www.gradeworkinggroup.org/publications/index.htm).  **6.** Measures of efficiency combine the concepts of resource use and quality (NQF’s [Measurement Framework: Evaluating Efficiency Across Episodes of Care](http://www.qualityforum.org/Publications/2010/01/Measurement_Framework__Evaluating_Efficiency_Across_Patient-Focused_Episodes_of_Care.aspx); [AQA Principles of Efficiency Measures](http://www.aqaalliance.org/files/PrinciplesofEfficiencyMeasurementApril2006.doc)). |

**1a.1.This is a measure of**:

Outcome

Health outcome: readmission

*Health outcome includes patient-reported outcomes (PRO, i.e., HRQoL/functional status, symptom/burden, experience with care, health-related behaviors)*

Intermediate clinical outcome: Click here to name the intermediate outcome

Process: Click here to name the process

Structure: Click here to name the structure

Other: Click here to name what is being measured

**HEALTH OUTCOME PERFORMANCE MEASURE**  *If not a health outcome, skip to* [*1a.3*](#Section1a3)

**1a.2.** **Briefly state or diagram the linkage between the health outcome (or PRO) and the healthcare structures, processes, interventions, or services that influence it.**

General Evidence for Readmission Reduction

There is considerable evidence 1, 2 that care transitions and post-discharge care are often suboptimal, and this suggests an opportunity for improvement that may lead to fewer readmissions. Over the past two decades, numerous studies have demonstrated that systematic interventions may reduce the percentage of patients readmitted, at least in selected environments 3-10. Methods used in effective interventions include enhanced discharge preparation, pre and post-discharge medication counseling, dietary counseling, social service and case management consultation, post-discharge phone calls, educational materials, warning signs, home visits, and early outpatient physician visits.

Hernandez and colleagues 11 studied 30-day all cause readmission among 30,136 heart failure patients at 225 hospitals participating in the OPTIMIZE and Get With the Guidelines heart failure registries between 2003 and 2006. Overall readmission rate was 21.3%. Median percentage of patients receiving early outpatient follow-up was highly variable, with a median of 38.3%. Most follow-up was by internists, with fewer than 10% of patients seen by their cardiologist within 7 days of discharge. Readmission rate for patients treated at hospitals in the second percentage quartile of early outpatient follow-up was lower than that of those in the lowest quartile of early follow-up (20.5% versus 23.3%, risk adjusted HR 0.85), a modest but significant reduction. In a review of 19 studies published between 1991 and 1998, 16 of which were RCTs, Benbassat and Taragin12 found a 12% to 75% reduction in early readmissions or ED visits in 14 of the studies. Similarly, in a meta-analysis conducted for the National Health Service R&D Health Technology Assessment (HTA) Programme by Parker and colleagues 13, 71 studies were analyzed, including 54 randomized trials. These studies investigated the effectiveness of interventions such as discharge planning, comprehensive geriatric assessment, discharge support, and education. Risk of hospital readmission was significantly reduced by interventions (risk ratio 0.851; 95% CI 0.760 - 0.953; p = 0.005; 35 trials). Phillips and colleagues 9 conducted a meta-analysis of studies concerning older patients with heart failure, a high risk group for readmission. In 18 randomized trials from 8 countries, the readmission risk ratio associated with various interventions was 0.75 (95% CI 0.64 – 0.88), a 25% reduction. Interventions included medication review and counseling; dietary counseling; social service consultation; exercise programs; weight and I/O monitoring; symptom monitoring; appropriate diuretic changes; telephone follow-up; early home visits; and the involvement of clinical pharmacists. These results are similar to those of McAlister and colleagues 14, who reviewed 11 randomized trials of disease management programs for heart failure. Not all studies of interventions have shown positive results. For example, Peikes and colleagues 15 studied Medicare FFS patients with heart failure, coronary artery disease or diabetes who participated in one of 15 care coordination programs between 2002 and 2005. Thirteen of the 15 programs showed no significant decrease in hospitalizations for randomly assigned participants versus non-participants. Characteristics of the successful programs included increased in-person contact; targeting of patients that were neither of very low (and thus less likely to require intervention) nor prohibitively high (unlikely to benefit from any intervention) risk; emphasis on correct medication usage; substantial interaction of care coordinators with physicians; and concomitant transitional care planning. Jha and colleagues 16 found no association between hospital readmission rates and chart-based hospital documentation of discharge planning for CHF patients, and very modest association between readmissions and patient-reported discharge process satisfaction for CHF and pneumonia. They conclude that *“…current efforts to collect and publicly report data on discharge planning are unlikely to yield large reductions in unnecessary readmissions.”*

CABG-specific Evidence

As noted under Measure Justification, most CABG readmissions are due to complications, either delayed in onset or recognition. It is hypothesized, though it has not been proven, that efforts to reduce complications and to more effectively deal with certain situation prior to discharge (e.g., arrhythmias, wound problems, heart failure, pleural effusions) may reduce the need for readmission. There are no guidelines or trials to support this, but there are a number of observational studies that support an association between delayed or incompletely treated complications and readmissions 17-32.

Virtually all the CABG-specific studies are observational (one randomized trial by Naylor of enhanced post-discharge follow up) and the potential process-outcomes link is hypothesized but not proven. There are numerous (> 30) RCTs that generally support the general concept that readmissions are significantly decreased by enhanced discharge and post-discharge support.

Citations

1. Jencks SF, Williams MV, Coleman EA. Rehospitalizations among patients in the Medicare fee-for-service program. N Engl J Med 2009; 360(14):1418-1428.
2. Bodenheimer T. Coordinating care--a perilous journey through the health care system. N Engl J Med 2008; 358(10):1064-1071.
3. Coleman EA, Parry C, Chalmers S, Min SJ. The care transitions intervention: results of a randomized controlled trial. Arch Intern Med 2006; 166(17):1822-1828.
4. Naylor M, Brooten D, Jones R, Lavizzo-Mourey R, Mezey M, Pauly M. Comprehensive discharge planning for the hospitalized elderly. A randomized clinical trial. Ann Intern Med 1994; 120(12):999-1006.
5. Naylor MD, Brooten DA, Campbell RL, Maislin G, McCauley KM, Schwartz JS. Transitional care of older adults hospitalized with heart failure: a randomized, controlled trial. J Am Geriatr Soc 2004; 52(5):675-684.
6. Rich MW, Beckham V, Wittenberg C, Leven CL, Freedland KE, Carney RM. A multidisciplinary intervention to prevent the readmission of elderly patients with congestive heart failure. N Engl J Med 1995; 333(18):1190-1195.
7. Naylor MD, Brooten D, Campbell R et al. Comprehensive discharge planning and home follow-up of hospitalized elders: a randomized clinical trial. Jama 1999; 281(7):613-620.
8. Jack BW, Chetty VK, Anthony D et al. A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. Ann Intern Med 2009; 150(3):178-187.
9. Phillips CO, Wright SM, Kern DE, Singa RM, Shepperd S, Rubin HR. Comprehensive discharge planning with postdischarge support for older patients with congestive heart failure: a meta-analysis. Jama 2004; 291(11):1358-1367.
10. Gohler A, Januzzi JL, Worrell SS et al. A systematic meta-analysis of the efficacy and heterogeneity of disease management programs in congestive heart failure. J Card Fail 2006; 12(7):554-567.
11. Hernandez AF, Greiner MA, Fonarow GC et al. Relationship between early physician follow-up and 30-day readmission among Medicare beneficiaries hospitalized for heart failure. JAMA 2010; 303(17):1716-1722.
12. Benbassat J, Taragin M. Hospital readmissions as a measure of quality of health care: advantages and limitations. Arch Intern Med 2000; 160(8):1074-1081.
13. Parker SG, Peet SM, McPherson A et al. A systematic review of discharge arrangements for older people. Health Technol Assess 2002; 6(4):1-183.
14. McAlister FA, Lawson FM, Teo KK, Armstrong PW. A systematic review of randomized trials of disease management programs in heart failure. Am J Med 2001; 110(5):378-384.
15. Peikes D, Chen A, Schore J, Brown R. Effects of care coordination on hospitalization, quality of care, and health care expenditures among Medicare beneficiaries: 15 randomized trials. Jama 2009; 301(6):603-618.
16. Jha AK, Orav EJ, Epstein AM. Public reporting of discharge planning and rates of readmissions. N Engl J Med 2009; 361(27):2637-2645.
17. Beggs VL, Birkemeyer NJ, Nugent WC, Dacey LJ, O'Connor GT. Factors related to rehospitalization within thirty days of discharge after coronary artery bypass grafting. Best Pract Benchmarking Healthc 1996; 1(4):180-186.
18. D'Agostino RS, Jacobson J, Clarkson M, Svensson LG, Williamson C, Shahian DM. Readmission after cardiac operations: prevalence, patterns, and predisposing factors. J Thorac Cardiovasc Surg 1999; 118(5):823-832.
19. Ferraris VA, Ferraris SP, Harmon RC, Evans BD. Risk factors for early hospital readmission after cardiac operations. J Thorac Cardiovasc Surg 2001; 122(2):278-286.
20. Lahey SJ, Campos CT, Jennings B, Pawlow P, Stokes T, Levitsky S. Hospital readmission after cardiac surgery. Does "fast track" cardiac surgery result in cost saving or cost shifting? Circulation 1998; 98(19 Suppl):II35-II40.
21. Hannan EL, Racz MJ, Walford G et al. Predictors of readmission for complications of coronary artery bypass graft surgery. Jama 2003; 290(6):773-780.
22. Allen LA, Hernandez AF, Peterson ED et al. Discharge to a skilled nursing facility and subsequent clinical outcomes among older patients hospitalized for heart failure. Circ Heart Fail 2011; 4(3):293-300.
23. Stewart RD, Campos CT, Jennings B, Lollis SS, Levitsky S, Lahey SJ. Predictors of 30-day hospital readmission after coronary artery bypass. Ann Thorac Surg 2000; 70(1):169-174.
24. Sun X, Zhang L, Lowery R et al. Early readmission of low-risk patients after coronary surgery. Heart Surg Forum 2008; 11(6):E327-E332.
25. Hannan EL, Zhong Y, Lahey SJ et al. 30-day readmissions after coronary artery bypass graft surgery in New York State. JACC Cardiovasc Interv 2011; 4(5):569-576.
26. Rumsfeld JS, Allen LA. Reducing readmission rates: Does coronary artery bypass graft surgery provide clarity? JACC Cardiovasc Interv 2011; 4(5):577-578.
27. Hammill BG, Curtis LH, Fonarow GC et al. Incremental value of clinical data beyond claims data in predicting 30-day outcomes after heart failure hospitalization. Circ Cardiovasc Qual Outcomes 2011; 4(1):60-67.
28. Hartford K, Wong C, Zakaria D. Randomized controlled trial of a telephone intervention by nurses to provide information and support to patients and their partners after elective coronary artery bypass graft surgery: effects of anxiety. Heart Lung 2002; 31(3):199-206.
29. Beckie T. A supportive-educative telephone program: impact on knowledge and anxiety after coronary artery bypass graft surgery. Heart Lung 1989; 18(1):46-55.
30. Gilliss CL, Gortner SR, Hauck WW, Shinn JA, Sparacino PA, Tompkins C. A randomized clinical trial of nursing care for recovery from cardiac surgery. Heart Lung 1993; 22(2):125-133.
31. Berry SA, Doll MC, McKinley KE, Casale AS, Bothe A, Jr. ProvenCare: quality improvement model for designing highly reliable care in cardiac surgery. Qual Saf Health Care 2009; 18(5):360-368.
32. Casale AS, Paulus RA, Selna MJ et al. "ProvenCareSM": a provider-driven pay-for-performance program for acute episodic cardiac surgical care. Ann Surg 2007; 246(4):613-621.

**1a.2.1.** **State the rationale supporting the relationship between the health outcome (or PRO) and at least one healthcare structure, process, intervention, or service**.

See response in 1a.2. above

*Note: For health outcome performance measures, no further information is required; however, you may provide evidence for any of the structures, processes, interventions, or service identified above.*

**intermediate outcome, PROCESS, or STRUCTURE PERFORMANCE measure**

**1a.3.****Briefly state or diagram the linkages between structure, process, intermediate outcome, and health outcomes**. Include all the steps between the measure focus and the health outcome.

**1a.3.1.** **What is the source of the systematic review of the body of evidence that supports the performance measure?**

Clinical Practice Guideline recommendation – ***complete sections*** [***1a.4***](#Section1a4)***, and*** [***1a.7***](#Section1a7)

US Preventive Services Task Force Recommendation – ***complete sections*** [***1a.5***](#Section1a5) ***and*** [***1a.7***](#Section1a7)

Other systematic review and grading of the body of evidence (*e.g., Cochrane Collaboration, AHRQ Evidence Practice Center*) – ***complete sections*** [***1a.6***](#Section1a6) ***and*** [***1a.7***](#Section1a7)

Other – ***complete section*** [***1a.8***](#Section1a8)

*Please complete the sections indicated above for the source of evidence. You may skip the sections that do not apply.*

**1a.4. CLINICAL PRACTICE GUIDELINE RECOMMENDATION**

**1a.4.1.** **Guideline citation** (*including date*) and **URL for guideline** (*if available online*):

**1a.4.2.** **Identify guideline recommendation number and/or page number** and **quote verbatim, the specific guideline recommendation**.

**1a.4.3.** **Grade assigned to the quoted recommendation with definition of the grade:**

**1a.4.4. Provide all other grades and associated definitions for recommendations in the grading system.** (*Note: If separate grades for the strength of the evidence, report them in section 1a.7.*)

**1a.4.5. Citation and URL for methodology for grading recommendations** (*if different from 1a.4.1*)**:**

**1a.4.6. If guideline is evidence-based (rather than expert opinion), are the details of the quantity, quality, and consistency of the body of evidence available (e.g., evidence tables)?**

Yes **→ *complete section*** [***1a.7***](#Section1a7)

No **→ *report on another systematic review of the evidence in sections*** [***1a.6***](#Section1a6) ***and*** [***1a.7***](#Section1a7)***; if another review does not exist, provide what is known from the guideline review of evidence in*** [***1a.7***](#Section1a7)

**1a.5.** **UNITED STATES PREVENTIVE SERVICES TASK FORCE RECOMMENDATION**

**1a.5.1.** **Recommendation citation** (*including date*) and **URL for recommendation** (*if available online*):

**1a.5.2.** **Identify recommendation number and/or page number** and **quote verbatim, the specific recommendation**.

**1a.5.3.** **Grade assigned to the quoted recommendation with definition of the grade**:

**1a.5.4. Provide all other grades and associated definitions for recommendations in the grading system.** (*Note: the* *grading system for the evidence should be reported in section 1a.7.*)

**1a.5.5. Citation and URL for methodology for grading recommendations** (*if different from 1a.5.1*)**:**

***Complete section*** [***1a.7***](#Section1a7)

**1a.6. OTHER SYSTEMATIC REVIEW OF THE BODY OF EVIDENCE**

**1a.6.1.** **Citation** (*including date*) and **URL** (*if available online*):

**1a.6.2.** **Citation and** **URL for methodology for evidence review and grading** (*if different from 1a.6.1*)**:**

***Complete section*** [***1a.7***](#Section1a7)

**1a.7. FINDINGS FROM SYSTEMATIC REVIEW OF BODY OF THE EVIDENCE supporting the measure**

**1a.7.1.** **What was the specific structure, treatment, intervention, service, or intermediate outcome addressed in the evidence review?**

**1a.7.2.** **Grade assigned for the quality of the quoted evidence with definition of the grade**:

**1a.7.3. Provide all other grades and associated definitions for strength of the evidence in the grading system.**

**1a.7.4.** **What is the time period covered by the body of evidence? (*provide the date range, e.g., 1990-2010*). Date range**: Click here to enter date range

**QUANTITY AND QUALITY OF BODY OF EVIDENCE**

**1a.7.5.****How many and what type of study designs are included in the body of evidence**? (*e.g., 3 randomized controlled trials and 1 observational study*)

**1a.7.6.** **What is the overall quality of evidence across studies in the body of evidence**? (*discuss the certainty or confidence in the estimates of effect particularly in relation to study factors such as design flaws, imprecision due to small numbers, indirectness of studies to the measure focus or target population*)

**ESTIMATES OF BENEFIT AND CONSISTENCY ACROSS STUDIES IN BODY OF EVIDENCE**

**1a.7.7.** **What are the estimates of benefit—magnitude and direction of effect on outcome(s) across studies in the body of evidence**? (*e.g., ranges of percentages or odds ratios for improvement/ decline across studies, results of meta-analysis, and statistical significance*)

**1a.7.8.** **What harms were studied and how do they affect the net benefit (benefits over harms)?**

**UPDATE TO THE SYSTEMATIC REVIEW(S) OF THE BODY OF EVIDENCE**

**1a.7.9.** **If new studies have been conducted since the systematic review of the body of evidence, provide for each new study: 1) citation, 2) description, 3) results, 4) impact on conclusions of systematic review**.

**1a.8 OTHER SOURCE OF EVIDENCE**

*If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, please describe the evidence on which you are basing the performance measure.*

**1a.8.1** **What process was used to identify the evidence?**

**1a.8.2.** **Provide the citation and summary for each piece of evidence.**