NATIONAL QUALITY FORUM

PATIENT OUTCOMES: ALL-CAUSE READMISSIONS EXPEDITED REVIEW, 2011

DRAFT TECHNICAL REPORT

May 10, 2012

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Draft Technical Report

INTRODUCTION

Approximately 18 percent of hospital admissions by Medicare beneficiaries result in a readmission within 30 days.[1] These readmissions amount to $15 billion in spending by the Centers for Medicare and Medicaid Services (CMS)~~, of which $12 billion is spent on preventable readmissions~~ with a substantial proportion spent on readmissions that are potentially preventable.[2]

To achieve quality healthcare across the full continuum, there is a need for measures that specifically address outcomes of care provided in our nation's healthcare system. Many outcome measures are inherently relevant because they reflect the reason consumers seek healthcare (e.g., to improve function ~~, decrease pain~~), as well as reflect the treatment objective of healthcare providers. To date, NQF has endorsed more than 100 outcome measures, most recently through the multi-phase Patient Outcomes project. However, many gaps remain, including those related to complications, all-cause readmissions, and mortality. A hospital readmission can be considered a proxy for a health outcome, specifically the deterioration in a patient's health status.

This expedited review endorsement maintenance project evaluated measures for public reporting/accountability and quality improvement that specifically address cross-cutting (not condition-specific) all-cause readmissions to hospitals. Additionally, as part of this process, all-cause hospital readmission-related consensus standards that were endorsed by NQF before June 2009 were evaluated under the maintenance process. The endorsement maintenance process provides an opportunity to harmonize measure specifications and ensures that the endorsed measure represents the best in class.

NQF EXPEDITED CONSENSUS DEVELOPMENT PROCESS

As a part of NQF's Consensus Development Process (CDP), this project has involved the active participation of representatives from across the spectrum of healthcare stakeholders and is being guided by a multi-stakeholder Steering Committee.

The NQF Board of Directors approved formal policy on the expedited review process in the fall of 2010. Expedited reviews assist the Department of Health and Human Services (HHS) meet deadlines set by legislative mandates. Three criteria must be met prior to consideration by the Consensus Standards Approval Committee (CSAC) for an expedited review:

1. Measures under consideration have been sufficiently tested and/or in widespread use;
2. The scope of the project/measure set is relatively narrow; and
3. There is a time-sensitive legislative/regulatory mandate for measures.

For this project, HHS requested an expedited review of readmission measures to meet its statutory requirements under the Patient Protection and Affordable Care Act (PPACA) Section 10303. Section 10303(f) 'Development of Outcome Measures' mandates the Secretary shall develop 10 acute and chronic-disease, provider-level (specifically including hospitals and physicians) outcome measures by March 2012. Language from PPACA relevant to this expedited project is included below: [3]

(2) CATEGORIES OF MEASURES. —The measures developed under this subsection shall include, to the extent determined appropriate by the Secretary—

(A) outcome measurement for acute and chronic diseases, including, to the extent feasible, the 5 most prevalent and resource-intensive acute and chronic medical conditions; and

(B) outcome measurement for primary and preventative care, including, to the extent feasible, measurements that cover provision of such care for distinct patient populations (such as healthy children, chronically ill adults, or infirm elderly individuals).

(3) GOALS. —In developing such measures, the Secretary shall seek to—

(A) address issues regarding risk adjustment, accountability, and sample size;

(B) include the full scope of services that comprise a cycle of care; and

(C) include multiple dimensions.

(4) TIMEFRAME-

(A) ACUTE AND CHRONIC DISEASES- Not later than 24 months after the date of enactment of this Act, the Secretary shall develop not less than 10 measures described in paragraph (2)(A).

CMS requested an expedited review to ensure its decisions regarding the selection of measures to meet the 10 measure requirement would be informed by the NQF evaluation and endorsement decision. CMS also wishes to include the Hospital Wide Readmission Measure in the Hospital Inpatient Quality Reporting (IQR) Program using the 2012 IPPS/LTCH rulemaking cycle for FY 2013, so that public reporting of the measure can occur can occur as early as 2013. CMS specifically included this measure on the pre-rulemaking list for the Hospital IQR, which was made available to the public on December 1, 2011, in order to be able to do so.

MEASURE EVALUATION

TABLE 1: READMISSIONS EXPEDITED REVIEW SUMMARY

	MAINTENANCE	NEW	TOTAL
Measures under consideration	**1**	**2**	**3**
Withdrawn from consideration			**N/A**
Recommended	**0**	**2**	**2**
Not recommended	**1**	**0**	**1**
Reasons for Not Recommending	**Scientific Acceptability - 1**		

Steering Committee members were asked to evaluate each of the measures on three occasions. Prior to the in-person meeting, Committee members provided preliminary ratings on the evaluation subcriteria for each submitted measure. Secondly, on day 1 of the December 5 and 6, 2011~~,~~ in-person meeting, the Readmissions Steering Committee provided preliminary ratings at the criteria level (i.e., Importance, Scientific Acceptability, Usability, Feasibility) on two new measures and one measure undergoing maintenance review using NQF's **measure evaluation criteria**. The preliminary ratings on the individual subcriteria were also referenced as a part of the evaluation on the measures on the first day.

The *Overarching Issues* section outlines the concerns raised by the Committee and the preliminary votes on the four evaluation criteria for each of the three measures under consideration are provided below in Table 2. Steering Committee members requested additional information on the two remaining measures (#1768, Hospital-wide all-cause unplanned readmissions measure (HWR) [CMS/Yale] and #1789, Plan all-cause readmissions [NCQA]) from the developers, for consideration on day 2. Due to the unanimous vote on the scientific acceptability criterion for Measure #0329, Risk-adjusted 30-day all-cause readmission rate (UnitedHealth Group), the discussion on the measure was not continued and the developer was not asked to provide any additional clarifying information on day 2.

TABLE 2: PRELIMINARY VOTING RESULTS (DAY 1)

Measure Number	Importance to Measure and Report (YES-NO)	Scientific Acceptability of Measure Properties (YES-NO)	Usability (HIGH-MODERATE-LOW-INSUFFICIENT)	Feasibility HIGH-MODERATE-LOW-INSUFFICIENT)	Meet Criteria for Endorsement (YES-NO)
1789	18-1	9-9	0-7-11-0	11-6-1-0	8-10
1768	18-0	8-11	3-6-7-1	6-9-2-0	6-11
0329	16-0	0-18			

Thirdly, the Committee provided updated votes on each criterion and an overall vote on whether the measure met criteria for endorsement on day 2 after receiving additional clarifying information from the developers (Appendix C) on Measures #1789 and #1768. These votes are provided in the Measure Summary Tables at the end of the document and in Table 3 below.

TABLE 3: UPDATED VOTING RESULTS (DAY 2)

Measure Number	Importance to Measure and Report (YES-NO)	Scientific Acceptability of Measure Properties (YES-NO)	Usability (HIGH-MODERATE-LOW-INSUFFICIENT)	Feasibility HIGH-MODERATE-LOW-INSUFFICIENT)	Meet Criteria for Endorsement (YES-NO)
1789	18-1 (day 1)	13-6	1-8-11-0	14-5-0-0	12-8
1768	18-0 (day 1)	12-7	5-4-9-1	8-6-4-1	10-9

At the conclusion of the second day of the in-person meeting, the developers of Measures #1789 and #1768 (CMS/Yale and NCQA, respectively) were asked to respond to the harmonization issues identified within one week, which were subsequently discussed on a conference call on December 16, 2011. These additional discussions are outlined under the Related and Competing Measures section. The Committee agreed that all of the harmonization issues were sufficiently addressed and the results in Table 3 were considered final after the conference call discussions. Both Measures #1789 and #1768 met NQF criteria for endorsement.

On January 31 the Steering Committee met via conference call to review and discuss the submitted comments received during the Public and Member Comment period. Due to the number of comments surrounding the issues of SES and usability, the Committee agreed to re-vote on whether Measures #1789 (CMS/Yale) and #1768 (NCQA) met the NQF criteria for endorsement.

Following the re-vote, both Measures #1789 and #1768 were recommended by the Committee for NQF endorsement (see Table 4). Measure #1789 was recommended with the following recommendations:

1. In order to support fair and appropriate comparisons, hospital performance on this measure should be reported within like comparison groups (e.g., disproportionate share hospitals); and
2. In order to support performance improvement and accountability, feedback to hospitals should be timely and provide information on all readmissions.

TABLE 4: UPDATED VOTING RESULTS (FOLLOWING THE JANUARY 31 CALL)

Measure Number	Meet Criteria for Endorsement (YES-NO)
1789	14-5
1768	13-6

On January 27, UnitedHealthcare submitted additional information, such as data on calibration and c-statistics (Appendix C). On the January 31 conference call, the Committee agreed to vote on whether the additional materials submitted by UnitedHealthcare warranted further discussion on the measure. As a result of the vote (Y=7, N=12), the Committee will not rediscuss the measure. The Committee's recommendation to not recommend Measure #0329 will remain.

Overarching Issues

During the Steering Committee's discussion of the measures, several overarching issues emerged that were factored into their ratings and recommendations. These issues are discussed in detail in the following sections:

Modeling Approaches

Statistical Modeling

The measures submitted for this project used different approaches to statistical modeling. All three measures used logistic regression modeling for the purpose of controlling for differences in patient case-mix characteristics (e.g., clinical severity, comorbidity, age). The CMS/Yale measure also used a hierarchical model to estimate the hospital risk adjusted readmission rate. A hierarchical model is often used when the data have a hierarchical structure (e.g., patients clustered within hospitals). Some Steering Committee members expressed concern that with hierarchical modeling, the risk adjusted rates for low volume hospitals tend to be no different from the average rate. CMS/Yale explained that the hierarchical model incorporates information for the specific hospital as well as the average hospital. When there is little information about a hospital (i.e., few patients), more weight is placed on the average hospital performance. With small volume, the rates can vary substantially due to random chance, and will have large confidence intervals that often overlap the average rate. When rates have large confidence intervals they often cannot be differentiated from the average. Some Committee members expressed a strong preference for using only logistic regression modeling over hierarchical modeling. While the NQF criteria do not prescribe a specific approach to statistical modeling, the criteria do require that measures be tested to demonstrate reliability, validity, and address threats to

validity by demonstrating adequacy of risk adjustment/stratification and appropriateness of exclusions. Statistical methods are determined by the type and structure of the data and there may be more than one appropriate statistical approach.

The Committee agreed that the methodological concerns for hospitals with lower volume are significant; however, because this project seeks to evaluate measures of all condition, all-cause hospital readmissions they agreed that there should theoretically be less of a concern of low volume hospitals than for other applications. In response to the Committee's concern about shrinkage estimates for small volume hospitals, the Committee was presented with the distribution statistics for measure scores of large volume hospitals and small volume hospitals (Appendix C). CMS/Yale calculated frequency distributions of the risk adjusted, hospital level, 30-day readmissions rates across their sample (N=4081). Hospitals with at least 25 index admissions were considered 'large volume hospitals' (N=3655) and below 25 index admissions were considered 'small volume hospitals' (N=426). Looking at the Risk Standardized Readmission Rate (RSRR), the distribution for large volume hospitals was as follows: median 16.50, 90^{th} percentile 18.23, and 10^{th} percentile 15.22. Among small volume hospitals the distribution of measure scores are as follows: median 16.43, 90^{th} percentile 17.47, and 10^{th} percentile 15.48. The Committee did not reach consensus about whether the distribution for small volume hospitals was narrower or similar to large volume hospitals.

Selection of Covariates

The Committee was interested in the rationale for the inclusion or exclusion of hospital volume and socioeconomic status as covariates in the readmissions model. Both CMS/Yale and NCQA chose to use covariates that help to create a level playing field across hospitals, adjusting for patient clinical condition at the time of admission. In addition, the CMS/Yale measure uses 5 clinical cohorts (medicine, surgery/gynecology, cardiorespiratory, cardiovascular and neurology) to account for the variation in service mix across hospitals; risk standardized rates are computed for each cohort and combined for the overall performance measure score. The NCQA model includes an indicator of major surgery. The Committee discussed the methodological effects and policy implication of including hospital volume and socio-economic status covariates in the risk adjustment models.

Hospital Volume

The Committee considered the developer's rationale for not including volume as a covariate in the risk adjustment model for the CMS/Yale measure readmissions. Committee members noted that literature supports a relationship between hospital volume and quality; thus, including volume as a covariate may improve the statistical performance of the risk adjustment model. However, the developer argued that there is limited evidence to support any justification that differences in readmission performance between hospitals, on the basis of volume, are acceptable.

Socioeconomic Status (SES)

NQF measure evaluation criteria indicate that in general, factors associated with disparities in care (i.e., race, ethnicity, SES) should not be included in risk adjustment models because it assumes that differences in outcomes based on those factors are acceptable. Some Steering Committee members expressed concern that in the case of hospital readmission, SES influences resources available after hospitalization that can affect readmission. CMS/Yale presented data that demonstrated that hospitals with a high proportion of Medicaid patients have performed well on the measure.

The Committee also discussed potential stratification (i.e., hospital performance by SES category) or using hospital comparison groups based on SES category (i.e., compare hospitals with similar percentages of low SES). Several members of the Committee felt that stratifying results by SES (or a proxy such as Medicaid status) can help to: 1) surface any disparities of care, and 2) provide information which might better inform policy decisions especially with regard to the possible unintended consequences associated with diverting resources away from vulnerable populations based on factors beyond the control of an individual institution.

Both CMS/Yale and NCQA explained that they did not risk adjust for SES because they did not want to assume there are different standards of care based on SES. The developers explained that including an SES variable has the potential to mask differences across groups in the risk adjustment of a measure. In order to address disparities, measures should allow users to highlight differences in performance based on population groups across hospitals.

The Committee considered this rationale against a concern that differences in readmissions performance, across hospitals, have many different factors. While the differences are driven in part by variation in quality within hospitals, differences in readmissions performance are also influenced by the availability of support for patients as they transition from the hospital into the community. Some Committee members explained that readmissions are not uniquely a measure of hospital quality, but rather a measure of health system and community health quality. The hospital is dependent on resources available in the community, such as effective transitional care and other community level factors, including distance to the hospital. Both CMS/Yale and NCQA expressed interest in exploring community level factors.

Socioeconomic status continues to be an extremely complex construct that is difficult to capture in a reliable and valid fashion. The experts agreed that there is no established methodology in the literature that could be used by the developer community, further limiting the ability of developers to include this variable in the measure. The developers explained that the use of SES is further complicated by its interpretability. The differences in SES may be attributed to intrinsic characteristics of the patients, or the hospital's ability to treat various types of patients (i.e. health literacy materials provided by the hospital, or social support/community relationships built by the hospital).

Usability for quality improvement

The Committee expressed concern that measure results for the CMS/Yale measure would not be available in a timely fashion. Some Committee members indicated that measure results from CMS are often received one or two years after the patient is discharged, making it not effective for hospitals to create actionable performance improvement strategies for reducing readmissions, nor for patients in their selection of providers.

Several members viewed the plan-level NCQA measure as a way to hold plans accountable for readmissions with the understanding that the hospital and physicians are not the only entities responsible for effective care transitions. Members also expressed frustration that measuring performance at the plan level may lead providers to focus on the care of only insured patients; thus, the Committee urged future efforts to consider how to expand to all patients not simply all payers.

Both the CMS/Yale and NCQA measures count readmissions to any hospital, not simply readmissions to the index hospital. Some Committee members expressed frustration that CMS does not provide the index hospitals with the name of the hospital where a patient is readmitted when the readmitting hospital is different from the index hospital. Providing hospitals this information is helpful for analysis and improvement efforts in care coordination.

Related and competing measures

The Committee concluded that the two recommended measures were related and not competing because the levels of analysis were different (NCQA-plan level and CMS/Yale-hospital level). Ideally, NQF prefers measures that would encompass the broadest applicability including both levels of analysis. Members of the Committee emphasized that providers face significant challenges and frustration when they receive discordant signals from reports based upon differing measurement methodologies. The Committee expressed a strong desire that the NCQA and CMS/Yale measures should be harmonized for both hospital and plan level measurement.

The Committee asked CMS/Yale and NCQA to provide responses to the harmonization issues identified during the discussion on day 2 of the in-person meeting. The Committee met via conference call on December 16, 2011, to review and discuss the measure developers' responses. The developers were unable to make modifications to the measures to address the harmonization issues in the time given but did indicate willingness and a plan to achieve this goal. The Committee decided to recommend the measures as presently specified with the expectation that: 1) the developers will have updated their measures and harmonized the short-term issues that do not require significant changes to the measure specifications in one year at the time of the annual update; and 2) additional testing and changes to the risk adjustment models to fully harmonize the measures will likely take three years and should be reviewed at the time of their maintenance review. Because no additional modifications were made to the measures, the votes on the criteria and recommendation on endorsement from day 2 of the in-person meeting remained. The specific harmonization issues, developer responses, and Committee discussion from the conference call are outlined below.

Hierarchical condition category (HCC) versus Condition categories (CCs)
As currently specified, the NCQA measure uses HCC and the CMS/Yale measure uses CCs. The Committee suggested that both developers need to harmonize and use a single approach. In a memo responding to the Committee's request, both developers indicated that they would assess the effect of the recommendation on each of their measures. The developers are to inform the Committee of their efforts in harmonizing this issue at the annual update and harmonization should be fully completed and submitted at the time of maintenance review.

Logistic or hierarchical modeling
Each measure used a different modeling approach; NCQA used only logistic modeling as opposed to CMS/Yale, which uses a hierarchical logistic model. The Committee preferred that the developers harmonize their risk models. Some Committee members expressed a preference for using only logistic regression modeling. In the past, however, the NQF has endorsed approaches that are multilevel or clustered to reflect the true underlying structure of the data, and several members of the Committee also favored such an approach. Both developers determined that they will continue to use separate models. CMS/Yale stated that the use of hierarchical modeling accounts for data clustering of patients in hospitals. The Committee still was concerned with having two approaches and asked the developers

to further evaluate the possibility of harmonization. The developers are to inform the NQF of their efforts in harmonizing this issue at the annual update and harmonization should be fully completed and submitted at the time of maintenance review.

Inclusion of structured cohorts
Members of the Committee requested that NCQA harmonize their denominator to include the five cohorts/conditions (medicine, surgery/gynecology, cardiorespiratory, cardiovascular and neurology) that are presently in the CMS/Yale measure to account for patient and service mix across hospitals. NCQA has noted that they would evaluate the impact of the proposal on their measure. The developers are to inform the NQF of their efforts in harmonizing this issue at the annual update and harmonization should be fully completed and submitted at the time of maintenance review.

Exclusion of planned readmissions
It was suggested that NCQA exclude planned readmissions from their measure as including planned readmissions is not a signal of poor quality of care. NCQA is willing to work on removing planned readmissions and will assess the effect it has on the measure. Harmonization of this issue should be fully completed and submitted in one year at the annual update.

Ex~~In~~clusion of ~~patients with~~ cancer patients with planned readmissions
As currently specified, the NCQA measure includes planned readmissions, which contain the cancer patient population. The Committee suggested that NCQA exclude planned readmissions, but to retain the cancer patients that are not planned readmissions. CMS/Yale excluded patients treated for cancer for the following reasons: 1) post-discharge mortality is higher than the remaining hospital population; 2) a low correlation between the other cohorts (medicine, surgery/gynecology, cardiorespiratory, cardiovascular and neurology) and cancer patients and readmission hospital performance; 3) obtained support from other organizations for excluding the patients; 4) there are cancer patients that are included in the measure, many with a secondary diagnosis of cancer; and 5) CMS is currently in the process of developing measures for cancer specialty hospitals. Harmonization of this issue should be fully completed and submitted in one year at the annual update.

Counting readmissions as index admissions
The NCQA measure as currently specified did not permit a readmission to serve as an index hospitalization for additional readmissions. This raised a concern because all institutions should be held accountable for all hospital readmissions. The Committee requested that NCQA harmonize with the CMS/Yale measure to count readmissions as index admissions. Harmonization of this issue should be fully completed and submitted in one year at the annual update.

~~*Inclusion of patients with behavioral health/substance abuse conditions*~~
~~Both measures include behavioral health and substance abuse conditions; however, the conditions included were not identical. The Committee asked the developers to harmonize and include the same behavioral health and substance abuse conditions. Harmonization of this issue should be fully completed and submitted in one year at the annual update.~~

Inclusion of patients with psychiatric conditions

There are patients who receive primary psychiatric treatment at acute care hospitals. CMS/Yale was asked to incorporate these patients into their measure because of possible implications of the readmission rates for patients with comorbid psychiatric disorders. CMS/Yale agreed to evaluate the impact of including patients with psychiatric conditions in the medicine cohort or creating a sixth cohort. Harmonization of this issue should be fully completed and submitted in one year at the annual update.

MEASURES RECOMMENDED

MEASURES NOT RECOMMENDED

MEASURE EVALUATION SUMMARY TABLES

MEASURES RECOMMENDED

1789 Hospital-wide call-cause unplanned readmissions measure (HWR)
Measure Submission and Evaluation Form Description: This measure estimates the hospital-level, risk-standardized rate of unplanned, all-cause readmission after admission for any eligible condition within 30 days of hospital discharge (RSRR) for patients aged 18 and older. The measure reports a single summary RSRR, derived from the volume-weighted results of five different models, one for each of the following specialty cohorts (groups of discharge condition categories or procedure categories): surgery/gynecology, general medicine, cardiorespiratory, cardiovascular, and neurology, each of which will be described in greater detail below. The measure also indicates the hospital standardized risk ratios (SRR) for each of these five specialty cohorts. We developed the measure for patients 65 years and older using Medicare fee-for-service (FFS) claims and subsequently tested and specified the measure for patients aged 18 years and older using all-payer data. We used the California Patient Discharge Data (CPDD), a large database of patient hospital admissions, for our all-payer data. Numerator Statement: (Note: This outcome measure does not have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year); thus, we use this field to define the measure outcome.) The outcome for this measure is unplanned all-cause 30-day readmission. We defined a readmission as an inpatient admission to any acute care facility which occurs within 30 days of the discharge date of an eligible index admission. All readmissions are counted as outcomes except those that are considered planned. Denominator Statement: This claims-based measure can be used in either of two patient cohorts: (1) admissions to acute care facilities for patients aged 65 years or older or (2) admissions to acute care facilities for patients aged 18 years or older. We have tested the measure in both age groups. Exclusions: We exclude from the measure all admissions for which full data are not available or for which 30-day readmission by itself cannot reasonably be considered a signal of quality of care. Exclusions: 1. Admissions for patients without 30 days of post-discharge data Rationale: This is necessary in order to identify the outcome (readmission) in the dataset. 2. Admissions for patients lacking a complete enrollment history for the 12 months prior to admission Rationale: This is necessary to capture historical data for risk adjustment. 3. Admissions for patients discharged against medical advice (AMA) Rationale: Hospital had limited opportunity to implement high quality care. 4. Admissions for patients to a PPS-exempt cancer hospital Rationale: These hospitals care for a unique population of patients that is challenging to compare to other hospitals. 5. Admissions for patients with medical treatment of cancer (See Table 3 in Section 2a1.9) Rationale: These admissions have a very different mortality and readmission profile than the rest of the Medicare population, and outcomes for these admissions do not correlate well with outcomes for other admissions. (Patients with cancer who are admitted for other diagnoses or for surgical treatment of their cancer remain in the measure). 6. Admissions for primary psychiatric disease (see Table 4 in Section 2a1.9) Rationale: Patients admitted for psychiatric treatment are typically cared for in separate psychiatric or rehabilitation centers which are not comparable to acute care hospitals. 7. Admissions for “rehabilitation care; fitting of prostheses and adjustment devices” Rationale: These admissions are not for acute care or to acute care hospitals. Additionally, in the all-payer testing, we excluded obstetric admissions because the measure was developed among patients aged 65 years or older (approximately 500,000). Adjustment/Stratification: Hierarchical logistic regression models are used to model the log-odds of readmission within 30 days of discharge, as a function of patient-level demographic and clinical characteristics and a random hospital-level intercept. This model specification accounts for within-hospital correlation of the observed outcomes and models the assumption that underlying differences in quality among the health care facilities being evaluated lead to systematic differences in outcomes. In brief, the approach simultaneously models two levels (patient and hospital) to account for the variance in patient outcomes within and between hospitals [1]. At the patient level, each model adjusts the log-odds of readmission within 30-days of discharge for age and selected clinical covariates. The second level models the hospital-specific intercepts as following a normal distribution. The hospital intercept represents the underlying hospital specific risk of readmission, after accounting for patient risk. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

1789 Hospital-wide call-cause unplanned readmissions measure (HWR)
We use a fixed, common set of variables in all our models for simplicity and ease of data collection and analysis. However, we estimate a hierarchical logistic regression model for each specialty cohort separately, and the coefficients associated with each variable may vary across specialty cohorts. To group ICD-9-CM codes into comorbid risk variables, we use CMS Condition Category (CMS-CCs) groups, the grouper used in previous CMS risk-standardized outcomes measures [2]. See Table 5 for the final list of comorbid risk variables. The models also include a condition-specific indicator for all condition categories with sufficient volume (defined as those with more than 1,000 admissions nationally each year for Medicare FFS data) as well as a single indicator for conditions with insufficient volume in each model. See Table 5, of the Measure Submission and Evaluation Worksheetfor the final list of comorbid risk variables. Stratification: Not Applicable Level of Analysis: Facility Type of Measure: Outcome Data Source: Administrative claims Measure Steward: Centers for Medicare & Medicaid Services (CMS)
1. Importance to Measure and Report: Y-18; N-1
Subcriteria rating prior to in-person meeting: (1a. High Impact: 1b. Performance Gap, 1c. Evidence) 1a. Impact: H-17; M-2; L-0; I-0 1b. Performance Gap: H-15; M-4; L-0; I-0 1c. Evidence: Not applicable; outcome measure Rationale: While evaluating the measures' importance to measure and report, the Committee agreed that the subcriteria was met and provided the following rationale: • All readmission/care transitions goals have been identified in the National Quality Strategy under Patient Safety and Care Coordination and are further elaborated upon in the Partnership for Patients. • As a stand-alone issue, readmissions is important to measure due to (1) high economic burden and (2) a complex relationship between the different elements of utilization, health status, transitions of care, and care coordination. • An all-cause readmission measure would provide an opportunity to improve hospital accountability and performance. • While discussing the evidence for the measure focus, there were concerns as to whether this measure was a health outcome or if hospital readmissions are an appropriate proxy for health outcomes. • The Committee, particularly consumer representatives, agreed that readmissions are health outcomes because it is a proxy for deterioration in health status.
2. Scientific Acceptability of Measure Properties: Y-13; N-6
Subcriteria rating prior to in-person meeting: (2a. Reliability – precise specifications, testing; 2b. Validity – testing, threats to validity) 2a. Reliability: H-10; M-8; L-1; I-0 2b. Validity: H-7; M-12; L-1; I-1 Rationale: While evaluating the measures' scientific acceptability, the Committee agreed that the subcriteria was met and identified 3 major issues: 1) Use of Hierarchical logistic regression model (HLM) 2) Hospital volume 3) Adjusting for socioeconomic status Use of Hierarchical logistic regression model (HLM) • Several Committee members expressed a wide range of concerns about the use of HLM due to its treatment of smaller volume hospitals, heavily relying on the assumption that the model does not make as much of an inference from patients within a small volume hospital, effectively pulling a smaller volume hospital towards more average estimates. • The use of HLM attempts to level the playing field by adjusting for patient comorbidities and differences in services a hospital provides. • The developer also stated that due to the fact that this is an all-cause measure, they did not have a large number of hospitals with small volumes, as may be seen in a condition-specific measure. With an all-cause measure, every hospital will have at least 'several hundred' observations. • Small volume hospital readmission rates are calculated with less precision than larger hospitals. Hospital volume • Several Committee members felt that the decision to exclude hospital volume ignores the literature that explains that smaller volume hospitals generally have higher readmission rates. • The Committee also expressed concern that the measure results may not be a true representation of a hospital readmission. This

1789 Hospital-wide call-cause unplanned readmissions measure (HWR)

could pose an issue, when public reporting websites (i.e. Hospital Compare) use the results to educate consumers.

- Using this type of risk-adjustment in this setting may introduce bias for a small volume hospital performing well. Hospitals with low volume may appear as average, effectively removing an incentive to improve quality.
- The developers argued that they could have included volume in the model to improve the predicative power; however, it does not seem appropriate to allow quality expectations to vary based on hospital volume.
- At the request of the Committee, the CMS/Yale team presented additional information to address the question of hospital volume and quality performance. For large and small volume hospitals they demonstrated that there is no pull to the mean, a major concern expressed by the Committee.

Adjusting for socioeconomic status

- The measure was not adjusted for socio-economic status (SES).
- The Committee felt strongly those patient variables such as health literacy, access to care, dual eligibility, homelessness, domestic violence, and access to childcare drive patient's access to follow-up care.
- Committee members also expressed concern that to exclude SES might lead to an increase in cherry picking among hospitals.
- The developer pointed out that the measure was not adjusted for SES for several reasons:
    - In examining the data across hospitals with a different proportion of Medicaid patients, there was a wide range of performance on the measure due to quality of care and resource availability.
    - There is no reliable and acceptable proxy for SES using administrative data.
    - The developers did not want to adjust away differences in SES, but rather highlight the disparities seen across hospitals.
- Supplemental information was provided demonstrating that among hospitals with the highest proportion of Medicaid patients, 25 percent of them performed better than the average hospital with very few Medicaid patients.
- Calibration curves showed the CMS/Yale model was able to predict risk for aggregate groups of patients well (i.e. how well the model is able to predict a low risk patient's low risk).

Additional items

- *The exclusion of patients with a primary diagnosis of a psychiatric condition*. The developer excluded patients readmitted for primary psychiatric conditions for 3 reasons: (1) the number of patients falling into this category was a 'small number' not evenly distributed across hospitals, (2) smaller volume hospitals do not code these readmissions in a consistent manner, and (3) this patient population is usually treated in rehabilitation facilities or specialized psychiatric hospitals. One Committee member argued that many psychiatric patients are treated in single units, within acute care hospitals and should be included in this measure, because exclusion has implications for the readmission rates of patients with comorbid psychiatric disorders. The developer clarified that the exclusion is for Psychiatric patients readmitted with a primary psychiatric diagnosis only, and that patients with comorbid secondary psychiatric diagnosis that are admitted for other medical conditions are still included.
- *The use of the 5 specialty cohorts.* The developers noted that in order to account for variation and service mix across hospitals, the best risk adjustment and model performance came when using the 5 cohorts. Limiting the measure to 5 cohorts also gave the measure better utility for the hospital because the measure is able to provide detailed data on each service line.
- *The surgery/gynecology cluster does not include obstetrics*. Given the limited time during the call for measures, and because the measure was initially built upon a 65+ population the developers did not include obstetrics; however they will work to update the measure.
- The model only accounts for the receiving hospitals' performance, not the transferring hospital performance. This was a particular concern for transfers from a community-based facility to a larger hospital known more for specialty care.
- An additional recommendation to add reporting stratification by SES guidance was voted down (Y-8; N-11).

3. Usability: H-1; M-8; L-11; I-0

Subcriteria rating prior to in-person meeting:
(*Meaningful, understandable, and useful to the intended audiences for 3a. Public Reporting/Accountability and 3b. Quality Improvement)*
3a. Public Reporting: H-6; M-5; L-5; I-3
3b. QI: H-5; M-6; L-6; I-2

Rationale: While evaluating the measures' usability, the Committee found the usability to be low and identified 3 major issues:
1) Measurement issues regarding the model approach
2) Consumer use of the measure
3) Time lag

Measurement issues regarding the shrinkage model

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- The Committee felt that smaller volume hospitals would not receive useful information to improve quality.
- Committee members expressed concerns that smaller volume hospitals would look better than larger hospitals because their means would be pulled to an overall national average. As such, the data generated may not be meaningful for public reporting.

Consumer Use of the Measure

- Addressing the issue of consumer use, the CMS/Yale group pointed out that the rate of readmission at which the public can call something 'good' vs. 'bad' is a policy decision by CMS. CMS currently uses a 95 percent confidence interval and large confidence intervals are a genuine representation of hospital performance. Committee members felt that a wide confidence interval makes the measure less useful for consumers.
- The Committee felt that to make this measure understandable and meaningful would require more education for consumers on readmissions, specifically that reduction of readmission rates is not rationing of care but rather improved quality
- The developer reiterated that their measure was built for two purposes: (1) public reporting in order to adequately compare different types of hospitals; and (2) for quality improvement by allowing hospitals to benchmark themselves against other hospitals to identify areas in which quality improvement is necessary, and catalyze activity.

Time lag

- The Committee was concerned that for the purposes of quality improvement, the lag in data collection and reporting (approximately 12 to 18 months) would be inadequate.
- The time lag would limit the ability to apply rapid cycle improvement events.

4. Feasibility: H-14; M-5 ; L-0 ; I-0

Subcriteria rating prior to in-person meeting:
(4a. Data generated during care; 4b. Electronic sources; 4c. Susceptibility to inaccuracies/ unintended consequences identified; 4d. Data collection can be implemented)
4a. Byproduct of Care Processes: H-14; M-5; L-0; I-0
4b. Electronic data sources: H-13; M-5; L-1; I-3
4c. Susceptability to inaccuracies, consequences: H-7; M-9; L-1; I-2
4d. Data collection strategy: H-11; M-6; L-0; I-2

Rationale:

- Members discussed ability of hospitals to receive information about readmissions to other hospitals and its effect on the measure implementation.

Steering Committee Vote: Meets Criteria for Endorsement: Y-142 ; N-58
Following harmonization discussion, the measure was recommended for endorsement

Rationale:

- This measure addresses a high impact area.
- This measure can be used at the hospital level.

Public and Member Comments

- Inclusion of SES/race variables in the model
- Stratification to avoid differences related to disparities in care
- Difficulty replicating the measure for quality improvement purposes

Socioeconomic (SES)/Race variables in the risk adjustment model

Committee Response: Many members of the Committee agreed that the socio-economic status of patients can drive the likelihood of a readmission. This relationship is driven, in part by differences in the hospital quality; but also the availability of community support to patients. Thus, many Committee members agreed that readmissions are not simply a measure of hospital quality but also community health quality. The hospital is dependent on resources available in the community, such as effective transitional care and other community level factors, including distance to the hospital. However, the use of SES at the individual patient level in a risk adjustment model would hide differences in performance. Further, SES is an extremely difficult construct to measure in a reliable and valid way using administrative data. After reviewing the comments submitted surrounding SES, the Committee decided to re-vote on whether the CMS/Yale measure (#1789) met the NQF criteria for endorsement. Following the re-vote, Measure #1789 was recommended for NQF endorsement with the following recommendation: in order to support fair and appropriate comparisons, hospital performance on this measure should be reported within like comparison groups (e.g., disproportionate share hospitals).

CMS/Yale Developer Response: We recognize the concerns of this commentator and others that socioeconomic status confers

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increased risk for readmissions beyond the control of the hospital. We have considered this problem in depth and have come to the following conclusions:
1) To the extent that SES increases readmission risk by increasing severity of illness, we account for this increased risk in our readmission models. Indeed, our analyses show that the expected readmission risk per patient estimated by the model based on patient comorbidities and an average hospital intercept term is higher on average for patients treated in hospitals that treat a higher proportion of Medicaid patients than for those treated in hospitals that treat a lower proportion of Medicaid patients. Thus, our measure already substantially incorporates increased risk of low SES patients by adjusting for patient comorbidities.
2) Adding additional risk adjustment to the readmission model for low SES status both hides disparities and would potentially eliminate incentives for hospitals to invest time and resources that may be necessary to support all patients, including those of low SES, in the post-discharge period. Including some form of SES as a risk variable in the readmission model implies that it is both expected and acceptable for low SES patients to have higher readmission rates for any given level of illness. Since this measure is intended to reduce the readmission risk for all patients and is fundamentally a patient-centered outcome measure, we have elected to set one standard of care for all patients. All patients should expect to receive the same standard of care regardless of their demographic background.
3) Adjusting for SES also assumes that all of the increased risk of low SES patients is outside the control of the hospital. We do not agree. The increased risk of readmission associated with low SES comprises multiple dimensions and factors, some of which (e.g., reduced literacy) are within the control of the hospital to mitigate. The fact that one quarter of hospitals that treat the highest proportion of Medicaid patients (>30% of all hospital admissions Medicaid) have lower RSRRs than half of the hospitals with fewer than 10% Medicaid admissions is evidence that hospitals caring for low SES patients are not necessarily disadvantaged by our measure. Better quality of care is achievable regardless of the proportion of low SES patients in the hospital.
4) We recognize that many of the interventions that may improve outcomes for low SES patients are located in communities rather than inpatient settings, and we recognize that many commentators believe that these interventions are outside the scope of acute care facilities. However, we believe that this measure can help to incentivize hospitals to work together with community-based organizations to improve care for patients (both low and high SES) post-discharge. We believe that coordination and integration of care is a fundamental component of high quality care that is part of the acute care hospital mission.
5) Finally, CMS notes that there are CMS programs that provide technical and financial support that may assist hospitals in improving performance on readmission measures. In addition, CMS has indicated that it will monitor whether a pending payment program that uses other readmission measures, the Hospital Readmissions Reduction Program, will have a disparate impact on hospitals that care for large numbers of low SES patients.

Usability concerns
Committee Response: The Committee discussed concerns related to the usability noting limitations in use for quality improvement. Specifically for the CMS/Yale measure, Committee members agreed that the measure may not be able to support quality improvement within hospitals since it would be difficult to recreate the measure results without data from the readmitting hospital if it is not the same as the index hospital. The Committee also noted the limitation in rapid-cycle improvement due to the turnaround time for measure. These issues were broadly reflected in the low usability ratings for the CMS/Yale measure. While these are not limitations in the measure design, but rather measure implementation; the Committee strongly encourages CMS and other potential users to continue enhancing data platforms, timeliness of reporting and other aspects of measure implementation. After reviewing the comments submitted surrounding the usability concerns, the Committee decided to re-vote on whether the CMS/Yale measure (#1789) met the NQF criteria for endorsement. Following the re-vote, Measure #1789 was recommended for NQF endorsement with the following recommendation in addition to the recommendation above concerning SES: in order to support performance improvement and accountability, feedback to hospitals should be timely and provide information on all readmissions.

CMS/Yale Developer Response: This measure is designed to enable risk-standardized comparisons of hospital performance against national norms in order to help patients and hospitals identify areas of weakness and benchmark to peers. For this purpose, it is essential to include adequate volume for comparison (at least one year of data) and to compare to contemporary performance of other institutions. By contrast, this measure is not intended for rapid cycle improvement within a hospital, for which risk-standardized rates are neither appropriate nor necessary.

Consensus Standards Approval Committee (CSAC) Vote: Y-11; N-2

Board of Directors Vote: Y-21; N-0

1768 Plan all-cause readmissions

Measure Submission and Evaluation Form

Description: For members 18 years of age and older, the number of acute inpatient stays during the measurement year that were followed by an acute readmission for any diagnosis within 30 days and the predicted probability of an acute readmission.

1768 Plan all-cause readmissions
Data are reported in the following categories: 1. Count of Index Hospital Stays (IHS) (denominator) 2. Count of 30-Day Readmissions (numerator) 3. Average Adjusted Probability of Readmission 4. Observed Readmission (Numerator/Denominator) 5. Total Variance Note: For commercial, only members 18–64 years of age are collected and reported; for Medicare, only members 18 and older are collected, and only members 65 and older are reported. Numerator Statement: At least one acute readmission for any diagnosis within 30 days of the Index Discharge Date. Denominator Statement: For commercial health plans, ages 18-64 as of the Index Discharge Date. For Medicare and Special Needs Plans, ages 18 and older as of the Index Discharge Date. Exclusions: Exclude hospital stays where the Index Admission Date is the same as the Index Discharge Date and any inpatient stay with a discharge date in the 30 days prior to the Index Admission Date. Adjustment/Stratification: Indirect standardization, using logistic regression Uses the CC and HCC models to identify comorbidities and attaches weights to each statistically significant comorbidity by product line and age grouping. We estimated a stepwise logistic regression. The binary dependent variable was coded 1 for index hospital stays that had a subsequent readmission within 30 days, and 0 otherwise. The independent variables in the models were: - age-gender cohort: Commercial: male 18-44, female 18-44, male 45-54, female 45-54, male 55-64 (reference group), female 55-64. In year 1, the model for Medicare used: Medicare 18 and older: male 18-44, female 18-44, male 45-54, female 45-54, male 55-64, female 55-64. male 65-74 (reference group), female 65-74, male 75-84, female 75-84, male 85+, female 85+. In year 2, the model for Medicare will use: male 65-74 (reference group), female 65-74, male 75-84, female 75-84, male 85+, female 85+. - Major surgery: 1=index hospital stay was for major surgery (see code list in algorithm); 0, otherwise. - Discharge Clinical Condition (CC) from the HCC classification system: 1=index hospital stay was for the CC; 0, otherwise. Note: each index hospital stay is coded into exactly one CC and is based only on the primary diagnosis. - Comorbid Hierarchical Clinical Condition (HCC): 1=index hospital stay had the associated comorbidity (HCC) indicated through any diagnosis on a face to face claim/encounter for the 12 months prior to the index hospital stay discharge date; 0, otherwise. Stratification by risk category/subgroup. The measure includes a table that stratifies the five reporting data elements by age and gender. The five elements are: 1. Count of Index Stays 2. Count of 30-Day Readmissions 3. Average Adjusted Probability 4. Observed Readmission (Numerator/Denominator) 5. Total Variance The age stratifications are: Commercial: 18-44, 45-54, 55-64, Total Medicare: 65-74, 75-84, 85+., Total The measure is also stratified by gender. Values are reported for each stratification. Level of Analysis: Health Plan Type of Measure: Outcome Data Source: Administrative claims Measure Steward: National Committee of Quality Assurance
STEERING COMMITTEE MEETING 12/5-6/2011
1. Importance to Measure and Report: Y-18; N-0
Subcriteria rating prior to in-person meeting: (1a. High Impact: 1b. Performance Gap, 1c. Evidence)

1768 Plan all-cause readmissions

1a. Impact: H-13; M-5; L-1; I-0 1b. Performance Gap: H-5; M-8; L-2; I-2
1c. Evidence: Not applicable; outcome measure

Rationale: While evaluating the measures' importance to measure and report, the Committee agreed that the subcriteria was met and provided the following rationale:

- This particular measure creates a standard metric for quality monitoring and accountability of the health plan, leaving it to the health plan to work with its network of hospitals, providers, medical homes, and other entities to implement quality improvement strategies to improve readmissions.
- This health plan based measure can be a complement to a hospital-based measure.
- Readmissions are important to measure due to (1) high economic burden and (2) a complex relationship between the different elements of utilization, health status, transitions of care, and care coordination.
- This all-cause readmission measure would provide an opportunity to improve hospital and health plan accountability and performance.

2. Scientific Acceptability of Measure Properties: Y-12; N-7

Subcriteria rating prior to in-person meeting:
(2a. Reliability – precise specifications, testing; 2b. Validity – testing, threats to validity)
2a. Reliability: H-4; M-9; L3-; I-3 2b. Validity: H-3; M-10; L-5; I-1

Rationale: While evaluating the measures' scientific acceptability, the Committee agreed that the subcriteria was met, and identified 3 major issues:
1) Use of Health Plan level data
2) Risk Adjustment
3) Adjusting for Socioeconomic Status

Use of Health Plan level data

- In this measure, the data collected are at the health plan level. This measure focus shifts from the hospital as the unit of accountability, to a more population based approach.
- There are no current plans to develop this measure for use at a hospital level.
- The data are collected at the health plan level. The plans take NCQA specifications and implement them either themselves or through their software vendors that perform various calculations on the number of hospitalizations, transfers, etc.
- The Committee expressed concern that underperforming hospitals would not be seen in the plan level data. Plans seeking to reduce readmissions can work with hospitals and provide selective contracting or other value based payment arrangements.

Risk Adjustment

- This measure uses indirect standardization through a logistic model.
- The data are not nested since patients are extremely cross classified. Data are clustered across multiple hospitals and across multiple health plans.
- The measure accounts for a service mix of patients in a given setting by adjusting for patient attributes such as demographic information, age, comorbid conditions, and index condition.
- This measure uses CC's from the CMS HCC system.
- The Committee expressed concern regarding selection bias between health plans, and hospitals being unfairly penalized due to variability in the patients that they treat.
- This measure has modified the risk adjustment model to have separate risk adjusters and weights for the Medicare under 65 and the Medicare 65 and older population.
- The developer presented calibration curves demonstrating that the expected versus actual risk deciles plots had adequate discriminate ability. Actual differences between expected and actual risk were less than 1 percent in each decile.

Adjusting for Socioeconomic Status

- This measure does not adjust for socioeconomic status (SES). The developers feel there is not a suitable proxy for SES within a community, as the health plans do not report that information. NCQA feels that health plan comparisons are done on a local scale, and they have no reason to believe there is an SES difference between health plans. The Committee challenged this assumption.
- NCQA argued that the measure takes SES into account to a certain degree through measurement of each health plan product line; Commercial and Medicare.

Additional Items

1768 Plan all-cause readmissions

- Behavioral health and planned admissions are included in this measure.

3. Usability: H-5; M-4; L-9; I-1

Subcriteria rating prior to in-person meeting:
(*Meaningful, understandable, and useful to the intended audiences for 3a. Public Reporting/Accountability and 3b. Quality Improvement)*
3a. Public Reporting: H-7; M-5; L-6; I-1
3b. QI: H-6; M-6; L-5; I-2

Rationale: While evaluating the measures' usability, the Committee found the usability to be low and identified the following issues:
The health plan is in a greater position to deal with the coordination issues between primary care and the care team (i.e. nurse care manager, etc.) and to follow up with the patient (i.e. about making follow up appointment, adhering to medication regiments, or other access issues).

- Coordination of care can be done by the payer within a given market.
- Useful to the health plan in setting up quality improvement methods that would affect individual institutions that are contracted with that plan.
- Consumer representatives on the Committee felt that this measure was extremely useful for purchasers and consumers, especially upon implementation of health insurance exchanges.
- There is added utility to having a health plan perspective in combination with and in complement to a hospital-based measure.

4. Feasibility: H-14; M-5; L-0; I-0

Subcriteria rating prior to in-person meeting:
(4a. Clinical data generated during care delivery; 4b. Electronic sources; 4c.Susceptibility to inaccuracies/ unintended consequences identified 4d. Data collection strategy can be implemented)
4a. Byproduct of Care Processes: H-11; M-7; L-1; I-0
4b. Electronic data sources: H-10; M-6; L-2; I-1
4c. Susceptibility to inaccuracies, consequences: H-4; M-9; L-5; I-1
4d. Data collection strategy: H-7; M-9; L-3; I-0

Rationale:

- Initial testing and development of this measure began in 2009, using commercial and Medicare Advantage plan based data from 2008 and 2009. NCQA has also collected first year measurement from Medicare Advantage commercial health plans. Those data are already in use at CMS.
- Data and evidence have been collected for one year
- The measure is already in implementation among several health plans.
- CMS is already in the process of using the measure within the STAR system for use in both health plan choice and incentive processes.

Steering Committee Vote: Meets Criteria for Endorsement : Y-130; N-69
Following harmonization discussion, the measure was recommended for endorsement.
Rationale:

- This measure demonstrated a high impact area.
- This measure can be used at the plan level.
- This measure is useful for consumers.

Public and Member Comment

- Inclusion of SES/race variables in the model
- Inclusion of a readmission as an index admission

Socioeconomic (SES)/Race variables in the risk adjustment model

1768 Plan all-cause readmissions
Committee Response: Many members of the Committee agreed that the socio-economic status of patients can drive the likelihood of a readmission. This relationship is driven, in part by differences in the hospital quality; but also the availability of community support to patients. However, since this measure is at the health plan level, inclusion of SES variable was not as prominent of a concern. *NCQA Developer Response:* When considering the inclusion of SES in the model, NCQA's expert panels cited the following limitations/barriers: a) Health plans do not currently have a reliable way to identify and report information on SES; b) Attributing SES to each health plan is complicated and prone to measurement error; additionally, SES may vary widely across a health plan, undermining the impact of a generic risk adjustment method; and c) Adding SES may risk adjust away important differences in populations and can imply that different levels of performance are acceptable for populations with differing SES. Readmission as an index admission *Committee Response:* The Committee agrees that readmissions should be considered index events. The Committee also agrees that index events for unplanned non-maternity readmissions should not be included because identifying planned maternity readmissions would be difficult using administrative data. *NCQA Developer Response*: Over the next year, NCQA will test counting readmissions as index events on the overall model integrity.
Consensus Standards Approval Committee (CSAC) Vote: Y-7; N-4; A-1
Board of Directors Vote: Y-19; N-0; A-2

MEASURES NOT RECOMMENDED

0329 Risk-adjusted 30-day all-cause readmission rate

Measure Submission and Evaluation Form

Description: The existing NQF-endorsed measure provides a means for determining the risk-adjusted readmission rate for a selected adult target population and can be applied for any desired timeframe. Readmission rate is defined as the percentage of acute inpatient discharges during the measurement period followed by an acute inpatient admission for any diagnosis to any hospital within 30 days. We are proposing to change the measure and offer a risk factor approach. This method allows for calculation of a risk-adjusted readmission rate for use in two different ways: 1) retrospective analysis of hospital (or other study population) performance determination and 2) in a real-time Electronic Health Record (EHR) environment, analysis to determine the readmission risk factor for each inpatient admission.

Numerator Statement: Non-behavioral health acute inpatient admissions for patients who were readmitted following a discharge from a non-behavioral health acute inpatient admission (index admission).

Denominator Statement: The denominator contains all eligible non-behavioral acute care inpatient discharges for the target population being measured for the desired measurement period. A patient can have multiple eligible discharges during the measurement period.

Exclusions: The cases to be excluded from the denominator are those for patients who died during the hospital stay or were hospitalized for mental health disorders or substance abuse treatment.

Adjustment/Stratification: The readmission risk model is intended to be used in two ways: 1) to conduct retrospective hospital performance measurement for reporting risk-adjusted readmission rates (so that the impact of changes in case mix can be removed); and 2) within electronic hospital records, to flag current acute hospital cases with a higher chance of readmission or whose readmission is potentially avoidable. Readmission risk is assessed via a direct standardization method. Readmission Risk Categories (RRCs) with higher weights have a higher probability of readmission within 30 days. Risk stratification is based on the combination of diagnosis/procedure groups and two age bands: ages 0 to 64 and ages 65 and over. There are 176 RRCs for ages 0 to 64 and 171 for ages 65 and over. The variables needed to assign the RRC weight to an admission are the age (while hospitalized) or if already discharged, the age at discharge, along with the primary diagnosis and primary procedure.

Stratification by risk category/subgroup. Variables needed to calculate the observed readmit rate includes: admit date, discharge date, and member identifiers. If risk adjustment and/or clinical bucketing is desired, then the required additional variables include: age at discharge, primary diagnosis, primary procedure, and the associated Readmission Risk Category (RRC).

Level of Analysis: Facility, Health Plan, Population: Community, County or City, National, Regional, State

Type of Measure: Outcome

Data Source: Administrative claims

Measure Steward: UnitedHealth Group

1.Importance to Measure and Report: Y-16; N-0

Subcriteria rating prior to in-person meeting:

(1a. High Impact: 1b. Performance Gap, 1c. Evidence)

1a. Impact: H-15; M-3; L-1; I-0 1b. Performance Gap: H-6; M-2; L-7; I-4

1c. Evidence: Not applicable; outcome measure

Rationale:

- This measure is undergoing maintenance review.
- Readmissions are important to measure due to (1) high economic burden and (2) a complex relationship between the different elements of utilization, health status, transitions of care, and care coordination.
- An all-cause readmission measure would provide an opportunity to improve hospital accountability and performance

2. Scientific Acceptability of Measure Properties: Y-0; N-18

Subcriteria rating prior to in-person meeting:

(2a. Reliability – precise specifications, testing; 2b. Validity – testing, threats to validity)

2a. Reliability: H-15; M-3; L-1; I-0 2b. Validity: H-4; M-3; L-8; I-4

Rationale: While evaluating the measures' scientific acceptability, the Committee agreed that the subcriteria was not met and identified 2 major issues:

1) Testing

2) Risk Adjustment

Testing

- The measure developer indicated the measure can be used for claims based and electronic health records, however, the developer only presented testing information for claims based data.

0329 Risk-adjusted 30-day all-cause readmission rate
• The measure is a maintenance measure, thus the Committee requested information on how the measure was being used to demonstrate performance variation. The developer was not able to provide this information. Risk Adjustment • Case mix adjustment is based on age and discharge diagnosis. Each discharge diagnosis and readmission is sorted into 220 Readmission Risk Categories (RRC). A rate for each RRC is calculated and the appropriate rate is adjusted based on case mix at each institution. • The measure was developed for a population that is very broad, ages 0-64. Committee members wanted to know the effect of this broad range on case mix. • Specifically comparing children's hospitals and general hospitals on all-cause readmission seems problematic since readmissions may be very different in a pediatric population. • The developer suggested to the committee that they might be able to stratify, by age, in to 3 groups ages 0-17, 18-64, and over 65. • The developers do not consider a transfer a readmission; in this measure the developers attempted to remove, or group all transfers together. • The measure does not adjust for co-morbid conditions. The developer asserted that claims-based data has a high risk of being inaccurate, and to ensure accuracy the hospital would have to examine each patient claim and identify any comorbidity in order to be fair in doing adjustments. • The measure does not distinguish planned vs. unplanned readmission because the developers wanted to include all-cause, all readmissions. The developer felt there is no reliable way to determine what a planned readmit is using claims data. Additional Items • The developers explained that for this measure, there must be a specific time gap between index admit and discharge (i.e. discharge from acute care to rehab facility done on the same day is not a readmission).
Steering Committee Recommendation for Endorsement: Not recommended because measure did not pass Scientific Acceptability of Measure Properties criteria Rationale: • The measure had a very broad age range, 0 to 65. • The measure did not have an appropriate risk adjustment or stratification approach. • The developers did not include sufficient validity testing. • This measure does not adjust for any comorbidity. On January 27, UnitedHealthcare submitted additional information, such as data on calibration and c-statistics. Following the discussion of the additional information on the January 31 conference call, the Committee voted (Y=7, N=12) and determined that further discussion of the measure was not warranted.
Public and Member Comment • Support in Committee's decision to not recommend the measure *Committee Response:* Measure 0329 was not recommended because it did not meet the must pass criteria of 'Scientific Acceptability' due to its very broad age range, lack of appropriate risk adjustment or stratification, and lack of adjustment for comorbid conditions. In addition, the developer was unable to provide results for performance variation, despite 0329 being a maintenance measure.

NOTES

1. Medicare Payment Advisory Commission (MEDPAC). Report to the Congress: Reforming the Delivery System. Washington, DC: MedPAC; 2008. Available at http://medpac.gov/documents/Jun08_EntireReport.pdf. Accessed October 2011.
2. ibid
3. The Patient Protection and Affordable Care Act (PPACA) (2010) Section 10303(f). Development of Outcome Measures.