NATIONAL QUALITY FORUM

Memo

TO: NQF Members
FR: NQF Staff
RE: Voting Draft Report: NQF-Endorsed Measures for All-cause Admissions and Readmissions
DA: June 8, 2017

Background

For this project, the 26-member Admissions and Readmissions Standing Committee evaluated two newly submitted measures against NQF's standard evaluation criteria. The Committee recommended one measure for endorsement and did not reach consensus on one measure.

Comments Received

NQF solicits comments on measures undergoing review in various ways and at various times throughout the evaluation process. First, NQF solicits comments on endorsed measures on an ongoing basis through the Quality Positioning System (QPS). Second, NQF solicits member and public comments prior to the evaluation of the measures via an online tool located on the project webpage. Third, NQF opens a 30-day comment period to both members and the public after measures have been evaluated by the full committee and once a report of the proceedings has been drafted.

Pre-evaluation comments

The pre-evaluation comment period was open from February 2-17, 2017 for the two measures under review. NQF received one pre-evaluation comment. The pre-evaluation comment was provided to the Committee prior the Committee's web meeting.

Post-evaluation comments

The Draft Report went out for Public and Member comment from April 05, 2017 - May 04, 2017. During this commenting period, NQF received 35 comments[1] from 14 member organizations:

Consumers – 0	Professional – 1
Purchasers – 0	Health Plans – 0
Providers – 9	QMRI – 1
Supplier and Industry – 0	Public & Community Health - 2

[1] One comment was received after the measure submission deadline on 5/11 and is not included in this tabulation.

NQF MEMBER votes are due June 22, 2017 by 6:00 PM ET

A complete table of comments, submitted pre- and post-evaluation, along with the responses to each comment and the actions taken by the Standing Committee, are posted to the project page on the NQF website, along with the measure submission forms.

The Committee reviewed all comments received and considered the pre-meeting comments prior to making an endorsement recommendation. The Committee also responded to all post-evaluation comments. Revisions to the draft report and the accompanying measure specifications are identified as red-lined changes. (Note: Typographical errors and grammatical changes have not been red-lined, to assist in reading.)

Comments and their Disposition

Three major themes were identified in the post-evaluation comments, as follows:

1. Support for the Validity of Measure #3188
2. Adjustment for Social Risk Factors
3. Acceptable Levels of Reliability

Theme 1 - Support for the Validity of Measure #3188

At the in-person meeting, consensus was not reached on the validity of measure #3188: 30-Day Unplanned Readmissions for Cancer Patients. Public commenters expressed support for measure 3188. Commenters noted that currently endorsed readmission measures do not include cancer patients and this measure would fill a critical measurement gap. Commenters recognized the need to improve cancer care quality and believe that use of this measure could help avoid unnecessary hospitalizations.

Commenters believed the measure is valid. Commenters expressed support for the statistical model of the measure, the specified exclusions, and the risk adjustment strategy.

After the post-comment call, the committee re-voted on the measures Validity (H-1 M-14; L-3; I-1) and Overall Endorsement (Y-15**;** N-4), as a result the committee recommends the measure for endorsement.

Developer Response:

We appreciate commenters' support for this measure, as currently specified and validated. We will continue to work with stakeholders to identify opportunities to refine the risk adjustment in the future.

Committee Response:
Thank you for your feedback on measure #3188. The committee took these comments into account during the post-comment conference call.

Theme 2 - Adjustment for Social Risk Factors

Commenters expressed concern regarding potentially insufficient adjustments made for sociodemographic status (SDS) factors for measure #2515. Commenters disagreed with the measure developer's assertion that sociodemographic adjustment is unnecessary, and questioned the potential disagreement with recent findings by ASPE as well as the developer's

interpretation of the decomposition analysis. Comments noted that CABG readmission rates are higher among patients who are dually eligible for Medicare and Medicaid, as well as those scoring highly on the AHRQ SES index. As a result, the American Hospital Association expressed concern that "hospital effects" may be a result of community-level variables, such as hospital location and population, reducing the ability for the measure to accurately assess quality of care within the hospital's control. Commenters called for new analyses to assess the impact of SDS factors that they felt were not adequately addressed by the developer in the measure submission. Some commenters also noted the importance of having the capacity to update the factors used for SDS adjustment in the future, allowing measures to factor in new information and changing methods as the SDS adjustment field evolves.

Developer Response:

As previously acknowledged, we agree that patients' socioeconomic status (SES) affects health and health outcomes in important ways. In the conceptual model presented to the Committee, we explain that many patients with low SES indicators may have poorer health status at the start of an index admission that increases their risk of readmission. The decrease in the strength of the association between SES variables and the readmission outcome when we added patients' comorbidities to the risk model supports this proposed mechanism. Additionally, the results presented showed that the effect of SES variables on readmission rates in the multi-variate or fully adjusted model was significant but small. However, inclusion of these variables did not change hospitals risk-standardized readmission rates or their performance on the measures. We explained that the remaining small effect of SES in the risk models could be a hospital-level effect, if patients with low SES indicators more often receive care at lower quality hospitals. Alternatively, it could be a patient-level effect, if patients have other unmeasured factors that increase their risk of readmission that are beyond the hospitals' control or if they receive inappropriate care from hospitals due to bias or discrimination. The results of the decomposition analyses we performed confirmed that most of the small residual effect of SES variables on readmission rates is a hospital-level effect, suggesting that it is due to the clustering of patients with low SES indicators and low quality hospitals. We acknowledge that the large hospital effects could represent a larger community context and note that hospitals can influence the community factors in important ways. In light of these results, we concluded that the evidence did not support including SES variables in the measures risk models.

Finally, we would like to underscore Yale-CORE's commitment to examining alternative solutions that better reflect the balance of hospital- and patient-level influences on hospital outcome measures and to considering appropriate ways to incorporate community factors into the outcomes measures.

We performed the decomposition analysis to assess whether the effects of specific socioeconomic status (SES) variables were primarily at the patient level (within hospital) or at the hospital level (between hospital). We did this assessment to evaluate the appropriateness of including SES variables as patient level factors in the model. Our results showed that the effects of SES variables were primarily exerted at the hospital level and thus it may not be appropriate to include as patient level variables. We did not address the question of whether the corresponding hospital level factor should be included in the model. We agree that the large hospital effects could represent a larger community context and note that hospitals can influence the community factors in

important ways. We performed the decomposition analyses for only a sample of the clinical risk variables for the CABG readmission measure because these analyses require significant time and resources. As noted by the AHA, our findings do suggest that most variables have some mixed hospital-level and patient-level effect. However, the conceptual model is what is unique for SES compared to clinical variables. In contrast to clinical and basic sociodemographic variables like age, there is evidence and a strong conceptual framework that supports concerns about differential access to high quality care for low SES populations. For example, there is no evidence that older patients tend to cluster in poor quality hospitals.

Concerning the issue of using race as a proxy for socioeconomic status (SES), we agree with the AHA and with the NQF's guidance suggesting that race should not be used as a proxy for SES. Race was not used in the analyses as a proxy for SES but as an important comparator with SES variables. Although the NQF Expert Panel on Risk Adjustment for Sociodemographic (SDS) Factors did not provide clear guidance regarding the inclusion of race in measure's risk models, the panel did broaden the term from SES to SDS to account for consideration of racial disparities, and we feel it is useful to understand the pattern of racial disparities along with SES disparities. We believe it is helpful to show analyses with race, not as a proxy, but as a point of comparison with SES variables. The conceptual rationale for not including SES variables in the measures' risk models has important parallels with race in that both SES and race are associated with access to differential quality hospitals and can lead to differential care within hospitals. These comparisons can be helpful in understanding causal pathways and for making decisions about incorporating SES variables in risk-adjustment models.

Committee Response:

The Committee has reviewed your comment and appreciates your input. The Committee agrees that research shows the impact social risk factors can have but recognizes that the challenge developers face in getting accurate data on these factors can lead to a discrepancy between the conceptual basis for including social risk factors and the empirical analyses demonstrating their impact. The Committee recognizes that developers may make a determination about whether or not to include SDS factors based on whether the factors was related to hospital quality versus a person's intrinsic risk of readmission. However, the Committee also notes the need to maximize the predictive value of a risk adjustment model and ensure that hospitals serving vulnerable populations are not penalized unfairly.

While the Committee generally accepted the findings of the analyses conducted by the developer, the Committee agrees that more work is needed to identify more robust data elements and methods to isolate and account for unmeasured clinical and social risk for patients. The Committee encourages the developer to continue testing the risk adjustment model with additional SDS factors in an effort to better understand unmeasured patient risk.

Theme 3 - Acceptable Levels of Reliability

Commenters raised questions on what is an appropriate level of reliability. In particular, commenters expressed concern for the level of reliability demonstrated by measure #2515. Commenters noted that reliability is a "must pass" criterion for NQF endorsement, yet believed the measure demonstrated low test-retest reliability, indicating only "fair" agreement.

Commenters emphasized the believed these low levels of agreement fall short of what should be accepted for a national standard and should not be used as measures to judge provider performance.

Developer Response:

We used the Inter-Class Correlation (ICC) method to establish the reliability of the measure score. This is a test/re-test approach using two randomly split samples from a single 3-year measurement period. This is a purposefully conservative approach to assessing reliability and traditional thresholds for acceptability do not apply to interpreting these results.

The national standards referred to by AHA are not appropriate for this particular analytic approach. Other guidelines or reference values for ICC should be used. In the absence of empirically supported standards, our position is that 'acceptability' depends on context. For simple concepts or constructs, such as a patient's weight, the expectation is that the test-retest reliability of a measure of that construct should be quite high. However, for complex constructs, such as clinical severity, patient comorbidity, or symptom profiles used to identify a condition or clinical state, reliability of measures used to define these constructs is quite a bit lower. We have cited the more appropriate convention, which describes the ICC values as moderate (0.41-0.60) for this measure when the estimate was adjusted for low case volumes (Landis JR and Koch GG. The Measurement of Observer Agreement for Categorical Data. Biometrics 1977; 33:159-174).

We would also like to refer the AHA to the memo on measure reliability we provided as part of our responses to the Appeal for the All-Cause Admissions and Readmissions Project in February 2017. In this memo, we offer several examples of the reliability of measures of complex constructs using the ICC. These examples provide the necessary context for interpreting the acceptability of ICC values in the ranges found for the readmission measures. These empirical findings indicate that our reported ICC value for CAGB readmission (NQF # 2515) is consistent with those in similar contexts.

Committee Response:

The Committee has reviewed your comment and appreciates your input. The Committee struggled with determining what acceptable thresholds for reliability testing should be. Although NQF does not maintain set thresholds for reliability, the Committee has discussed the need to ensure measures are acceptable for accountability purposes and do distinguish performance between hospitals to identify quality improvement opportunities. The Committee recognized the payment implications of several measures used in the Hospital Readmissions Reduction Program and stressed the need to ensure measures accurately reflect and distinguish performance.

The Committee believes the level of reliability demonstrated for measure #2515 represents an acceptable benchmark and sufficient levels of agreement for use for accountability purposes.

NQF Member Voting

Information for electronic voting has been sent to NQF Member organization primary contacts. Accompanying comments must be submitted via the online voting tool.

Please note that voting concludes on June 22, 2017 at 6:00 pm ET – no exceptions.

All-Cause Admissions and Readmissions 2017

DRAFT REPORT FOR VOTING

June 8, 2017

NATIONAL QUALITY FORUM

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Contents

All-Cause Admissions and Readmissions 2017

DRAFT REPORT

Executive Summary

Reducing unnecessary hospital admissions and readmissions is a key component of healthcare quality improvement. High rates of readmissions are costly to the healthcare system and can be indicative of low quality care during a hospital stay and poor quality care coordination. Trends in hospital admission rates have improved in recent years, particularly among Medicare fee-for-service beneficiaries. However, there remain disparities in progress between disease areas.

NQF currently has 47 endorsed admissions and readmissions measures. A number of federal quality initiative programs have adopted these measures with the aim of reducing unnecessary admissions and remissions by fostering improved care coordination across the healthcare system.

As measures for admission and readmission are expanded across settings and diseases, novel measures and novel use of measures can be used to promote shared accountability and to ensure providers are working together to prevent unnecessary readmissions. However, as the portfolio grows to include measures that address conditions with smaller patient volumes and as readmission measures are increasingly used in value-based purchasing programs, appropriate testing criteria are needed ensure that measures accurately reflect health care quality. In addition, the impact of social risk factors on a person's risk for hospital admission or readmission continued to be an important topic of discussion for the Standing Committee. The Committee noted that that there is a need to improve quality of care for people with social risk factors while finding ways to better account for the impact of social risk for the purposes of evaluating hospitals and healthcare providers.

For this project, the Standing Committee evaluated two newly submitted measures against NQF's standard evaluation criteria. The Standing Committee recommended two measures for endorsement:~~one measure and did not reach consensus on one measure~~.

- ~~-~~Measure #2515: Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery
- Measure #3188: 30-Day Unplanned Readmissions for Cancer Patients

Brief summaries of the measures currently under review are included in the body of the report; detailed summaries of the Committee's discussion and ratings of the criteria for each measure are in Appendix A.

Introduction

Reducing unnecessary hospital admissions and readmissions is a key component of healthcare quality improvement. High rates of readmissions are not only costly to the healthcare system, but they also can be indicative of low quality care during a prior hospital stay or poor care coordination. An unnecessary hospitalization is stressful for the patient and can expose patients to additional medical risk. A number of strategies can be successful in reducing avoidable admissions and readmissions rates such as improved communication of patient discharge instructions, coordination with post-acute care providers and primary care physicians, and reducing complications such as hospital-acquired conditions.[1,2]

This opportunity to improve both quality and cost has made reducing unnecessary admissions and readmissions a focus of quality reporting and value-based purchasing programs. Proposed under the Affordable Care Act, Medicare's Hospital Readmissions Reduction (HRRP) program was implemented in 2013. The program functions by reducing payment rates to hospitals with higher than expected readmission rates. Since implementation, hospital readmissions have fallen consistently, suggesting that hospitals have undertaken system-wide interventions in order to drive down rates[3].

Successful efforts to drive down readmissions are also being applied beyond inpatient hospital stays, to post-acute care settings and across the entire continuum of care. A 2016 study reported that over 20% of patients discharged from post-acute care facilities were readmitted, perhaps an unintended negative consequence of payment systems that financially incentivize shorter-term hospital stays[4]. To address these inappropriate readmissions, CMS programs have begun to expand accountability to additional providers. The Improving Medicare Post-Acute Care Transformation Act of 2014 (IMPACT Act) required CMS to implement quality measures for potentially preventable readmission rates to long-term care hospital, inpatient rehabilitation facilities, skilled nursing facilities, and home health agencies. In addition, CMS's Merit-based Incentive Program, which adjusts Medicare payments at the physician level, includes an option of an all-cause hospital readmission measure for groups with at least 16 clinicians and a sufficient number of cases[5]. Groups that report on the readmission measure are eligible for higher payment rates than clinician groups that do not.

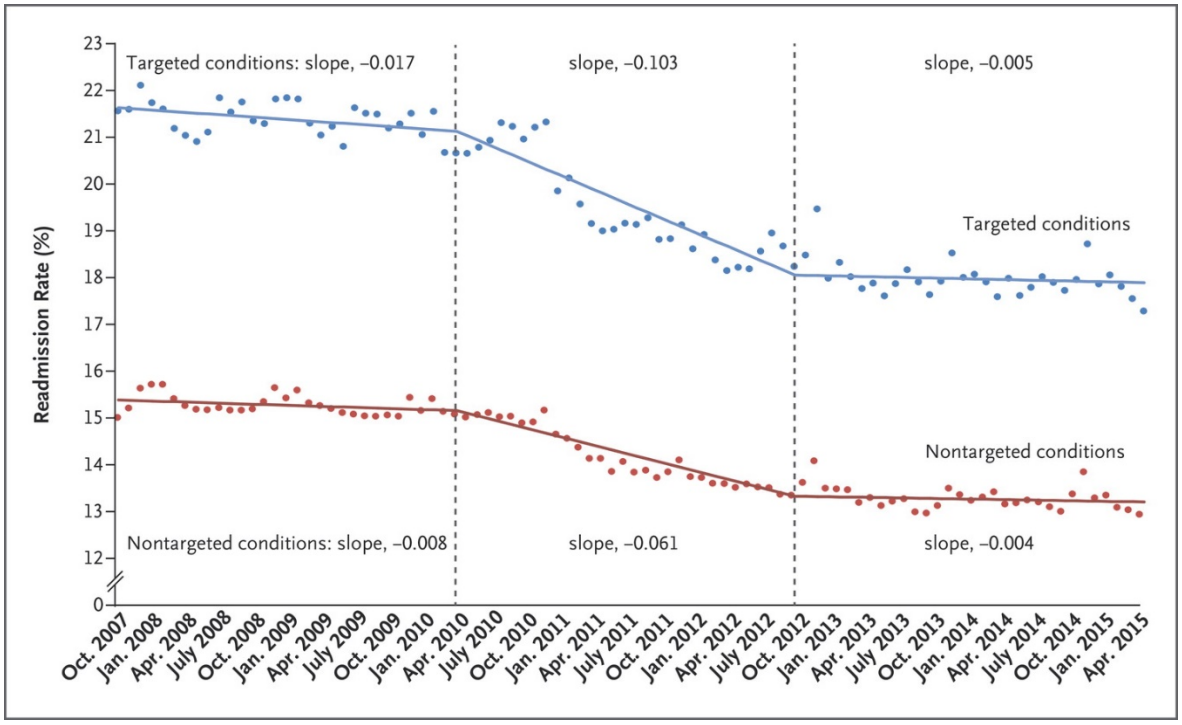
While reducing readmissions is a goal supported by a wide variety of healthcare stakeholders, debates remain what it means to be on target for readmission rates. Systematic reviews have found that less than a third of readmissions could be considered preventable[6]. Moreover, there are many factors related to readmission rates that may be outside of a hospital's control, such as the resources available to the community it serves. Research has shown that readmission rates and penalties have found be significantly higher in hospitals that serve larger proportions of low-income Medicare patients as well as major teaching hospitals, which tend to care for the sickest patients[7]. Some even argue that readmission measures can lead to inversely correlated results. For example, hospitals with low mortality rates may experience high readmission rates, if only because they are successful in keeping their sickest patients alive[8]. Similarly, low readmission rates may be associated with higher rates of observation stays or emergency department use[9].

Trends and Performance

Trends in hospital admission rates have improved in recent years, particularly among Medicare fee-for-service beneficiaries. A 2016 study found that the announcement of HRRP was associated with significant reductions in readmissions for hospitals subject to penalties[10]. In addition, analyses have found that declines beginning in 2012 have continued to fall in subsequent years (see **Figure 1**), resulting in 565,000 fewer Medicare patient readmissions between April 2010 through May 2015[11]. Despite

general improvement, over 2,500 hospitals still faced readmissions penalties in 2016 for higher-than-expected numbers of readmissions. While the total number of hospitals receiving penalties remained relatively constant between 2015 and 2016, the amount of the penalties increased by $108 million from 2015, for a total of $528 Million of withheld reimbursements in 2016[12].

Figure 1: Change in Readmission Rates for Targeted Conditions and Nontargeted Conditions within 30 Days after Discharge.



Source: Zuckerman, Rachael B., et al. "Readmissions, observation, and the hospital readmissions reduction program." New England Journal of Medicine 374.16 (2016): 1543-1551.

While there has been general improvement in readmission rates—there remain disparities in progress between disease types. Results from a 2016 Health Care Cost Institute analysis found that there was significant variation across targeted measures, both in rates and amount of change over time. For example, between 2013-2014, annual percentage change in thirty-day, all-cause hospital readmissions per 100 index admissions saw reductions by 5.7% for heart failure patients, but only a 0.5% reduction for pneumonia patients[13]. Other disparities exist in terms of population. Studies have shown that chronically ill beneficiaries account for 98% of Medicare readmissions[14]. A study found that clinically complex individuals were found to be involved in nearly all 'avoidable' admissions, with the highest risk of avoidable readmission attributed to patients with cancer, heart failure, and chronic kidney disease[15].

NQF Portfolio of Performance Measures for All-Cause Admissions and Readmissions Conditions

The All-Cause Admissions and Readmissions Standing Committee (see Appendix D) oversees NQF's portfolio of Admissions and Readmissions measures that includes all-cause and condition specific

measures. This portfolio contains over 40 admission and readmission measures addressing numerous healthcare settings:

Table 1. NQF Admissions and Readmissions Portfolio of Measures

	All-Cause	Condition Specific
Hospital	4	13
Home Health	4	0
Skilled Nursing Facility	4	0
Long-term Care Facility	1	0
Inpatient Rehab Facility	1	0
Inpatient Psychiatric Facility	1	0
Dialysis Facility	2	0
Health Plan	1	0
Population-Based	4	11
Hospital Outpatient/Ambulatory Surgery Center	0	1
Total	22	25

See Appendix B for information on all measures included in NQF's All-Cause Admissions and Readmissions Portfolio. Additional measures related to admissions and readmissions may be reviewed by other Standing Committee based on appropriate expertise. These measures address issues such as population level admission rates and readmissions to specific subpopulations such as the Neonatal Intensive Care Unit (NICU).

National Quality Strategy

NQF-endorsed measures for Admission and Readmissions support the National Quality Strategy (NQS). The NQS serves as the overarching framework for guiding and aligning public and private efforts across all levels (local, state, and national) to improve the quality of healthcare in the U.S. The NQS establishes the "triple aim" of better care, affordable care, and healthy people/communities, focusing on six priorities to achieve those aims: *Safety, Person and Family Centered Care, Communication and Care Coordination, Effective Prevention and Treatment of Illness, Best Practices for Healthy Living, and Affordable Care.*

Improvement efforts for avoidable admissions and readmissions are consistent with the NQS triple aim and align with several of the NQS priorities, including:

- **Making Care Safer by Reducing Harm Caused in the Delivery of Care**. The MedPAC Data Book reported that since Congress enacted the Hospital Readmission Reduction Program (HRRP) in 2010 the rates of potentially preventable readmissions declined across all conditions between 2010 and 2014. MedPAC also reported the changes in readmissions is not due primarily to an increase in observation stays. Between 2011 and 2016, only a quarter of the decline could be attributed to increases in the use of observation stays[16].
- **Promoting Effective Communication and Coordination of Care**. Readmissions are events that are associated with gaps in follow-up care. Costs for readmissions are also more expensive than index admissions for all types of payers: 5% higher for Medicare, 11% higher for uninsured patients, and 30% higher for Medicaid/private insurance patients[17]. Researchers have estimated that inadequate care coordination, including inadequate management of care

transitions, was responsible for $25 to $45 billion in wasteful spending in 2011 as a result of avoidable complications and unnecessary hospital readmissions.[13]

Each measure in the admissions and readmissions portfolio is listed in the Measurement Framework below.

Use of Measures in the Portfolio

Endorsement of measures by NQF is valued not only because the evaluation process itself is both rigorous and transparent, but also because evaluations are conducted by multi-stakeholder Committees comprised of clinicians and other experts from the full range of healthcare providers, employers, health plans, public agencies, community coalitions, and patients—many of whom use measures on a daily basis to ensure better care. Moreover, NQF-endorsed measures undergo routine "maintenance" (i.e., re-evaluation) to ensure that they are still the best-available measures and reflect the current science. Importantly, federal law requires that preference be given to NQF-endorsed measures for use in federal public reporting and performance-based payment programs. NQF measures also are used by a variety of stakeholders in the private sector, including hospitals, health plans, and communities.

In February 2017, NQF's All-Cause Admissions and Readmissions Standing Committee endorsed 16 measures, 10 new measures and 6 maintenance measures. Currently, NQF's admissions and readmissions portfolio includes 47 different measures, across eight categories of measures. The portfolio of measures is expected to continue to grow, as there remains significant interest in these measures from NQF members and other stakeholders. NQF endorsed readmission measures are currently used in multiple federal programs, including the Home Health Quality Reporting Program, Ambulatory Surgical Center Quality Reporting Program, the Hospital Inpatient Quality Reporting Program, Hospital Readmission Reduction Program, Medicare Shared Savings Program, Inpatient Rehabilitation Facility Quality Reporting Program, Long Term Care Hospital Quality Reporting Program, and the Skilled Nursing Facility Value Based Purchasing Program.

See Appendix C for details of federal program use for the measures in the portfolio.

All-Cause Admissions and Readmissions Measure Evaluation

The Admissions and Readmissions Standing Committee evaluated one measure during a webinar on February 27, 2017 and the second measure on a webinar on March 6, 2017. Both new measures were reviewed against NQF's standard evaluation criteria.

Table 2. All-Cause Admissions and Readmissions Measure Evaluation Summary

	Maintenance	New	Total
Measures under consideration	0	2	2
Measures recommended for endorsement	0	2	2
Measures where consensus is not yet reached	0	0	0

Comments Received Prior to Committee Evaluation

NQF solicits comments on endorsed measures on an ongoing basis through the Quality Positioning System (QPS). In addition, NQF solicits comments prior to the evaluation of the measures via an online

tool located on the project webpage. For this evaluation cycle, the pre-evaluation comment period was open from February 3, 2017 – February 17, 2017 for the two measures under review. One pre-evaluation comment was received (Appendix G).

The submitted comment was provided to the Standing Committee prior to its initial deliberations during the evaluation webinars.

Overarching Issues

During the Standing Committee's discussion of the measures, several overarching issues emerged that were factored into the Committee's ratings and recommendations for multiple measures and are not repeated in detail with each individual measure.

Expansion of Readmissions Measures across Settings and Conditions

An unnecessary admission or readmission is often the result of fragmentation in the healthcare system. Improving coordination and communication between care settings is a crucial component of reducing readmissions. Early efforts to measure readmission rates focused on hospital performance. Since then the NQF admissions and readmissions measure portfolio has expanded to include additional settings such as nursing homes, inpatient rehabilitation facilities, home health agencies, and long-term care hospitals. Use of these measures can help to promote shared accountability and ensure providers are working together to prevent unnecessary readmissions. The portfolio has also expanded to include all cause and additional condition specific measures. These measures can help to provide additional information about readmissions and allow providers to pinpoint opportunities for improvements.

Reducing unnecessary hospital admissions is also an important focus for healthcare quality improvement. The portfolio has expanded to include measures addressing admission rates and avoidable admissions from Accountable Care Organizations. These measures could help ensure patients are having their care managed in the community and can avoid the stress and disruption of a hospital stay.

Although the Committee is encouraged by the growth of the Admissions and Readmissions portfolio, the Committee cautioned about the use of measures in ways other than how they are endorsed. In particular, the Committee noted the need to review NQF #1789 Hospital-Wide All-Cause Unplanned Readmission Measure at the clinician group level to ensure that application of the measure meets NQF's standards for endorsement.

One public commenter raised concerns about the continued growth of the admissions and readmissions portfolio. The commenter urged continued work to identify best in class measures. The Committee recognized the growth of the portfolio over the years, and the importance of endorsing high impact measures. NQF's strategic plan includes a focus on identifying the most important measures to improve U.S. healthcare. By identifying priority measures, NQF can focus the quality community on specific metrics needed to improve the quality, safety, and affordability of care. This prioritization work should yield fewer, more meaningful measures overall.

Reliability

As the portfolio grows to include measures that address conditions with smaller patient volumes and as readmission measures are increasingly used in value-based purchasing programs such as HRRP and MIPS

the Committee grappled with determining appropriate exclusion criteria and acceptable reliability testing results. The Committee recognized the need to ensure measures deliver consistent results but wanted to ensure measurement can drive improvement across many conditions and for a broad patient population.

The Committee noted the need to include as many patients as possible in a measure to ensure quality improvements for all. During its review of 3188: 30-Day Unplanned Readmissions for Cancer Patients committee ~~memebers~~ members raised concerns about some of the exclusion criteria. The Committee was concerned that the measure only addressed patients who were admitted. The Committee noted that its increasingly likely an emergency department visit will not result in an inpatient admission and recognized the need to ensure all returns to an acute care setting are considered, including observation stays and emergency department visits. The Committee also noted the need to improve the reliability of coding in administrative claims data.

The Committee struggled with determining what acceptable thresholds for reliability testing should be. Although NQF does not maintain set thresholds for reliability, the Committee discussed the need to ensure measures are acceptable for accountability purposes. Specifically, the Committee noted a number of challenges that could result in lower than expected tests of reliability, such as intraclass correlation coefficients when a split half reliability test is performed. In particular, the Committee highlighted the issue of small sample size for certain conditions and that Medicare data is limited to patients over 65. The Committee noted the need to ensure measures are able to distinguish performance between hospitals to identify quality improvement opportunities. The Committee recognized the payment implications of several measures used in the Hospital Readmissions Reduction Program and stressed the need to ensure measures accurately reflect and distinguish performance.

Public and member comments raised questions about ~~on~~ appropriate thresholds for reliability. In particular, commenters expressed concern for the level of reliability demonstrated by measure #2515. Commenters noted that reliability is a "must pass" criterion for NQF endorsement, yet they noted that the measure demonstrated low test-retest reliability, indicating only "fair" agreement. Commenters emphasized that these low levels of agreement fall short of what should be accepted for a national standard, especially when measures are used to judge provider performance.

The Committee struggled with determining acceptable thresholds for reliability testing. Although NQF does not define set thresholds for reliability, the Committee discussed the need to ensure measures are acceptable for accountability purposes and can ~~do~~ distinguish performance between hospitals. The Committee recognized the payment implications of several measures used in the Hospital Readmissions Reduction Program and stressed the need to ensure that measures accurately reflect and distinguish performance. Ultimately, the Committee determined that the two measures reviewed in this project met the requirements for the reliability criterion. NQF is currently working with CSAC and others to address the need for greater specificity in measure testing requirements.

Adjustment for Sociodemographic Factors

The impact of social risk factors on a person's risk for hospital admission or readmission continues to be an important question. The Committee reiterated that its decision to endorse a measure without sociodemographic factors included in its risk adjustment model is not the same as saying that social risk factors do not make an important contribution to patient outcomes. The Committee agreed that

research shows the impact social risk factors[18] can have but recognized that the challenge developers face in getting accurate data on these factors can lead to a discrepancy between the conceptual basis for including social risk factors and the empirical analyses demonstrating their impact.

The Committee noted that that there is a need to improve quality of care for people with social risk factors while finding ways to better account for the impact of social risk so value-based purchasing programs reward providers fairly. The Committee reiterated the need to ensure that disparities in care are not masked. The Committee recognized that developers may make a determination about whether or not to include SDS factors based on whether the factors was related to hospital quality versus a person's intrinsic risk of readmission. However, the Committee also noted the need to maximize the predictive value of a risk adjustment model and ensure that hospitals serving vulnerable populations are not penalized unfairly.

Commenters expressed concern regarding potentially insufficient adjustments made for sociodemographic status (SDS) factors for measure #2515. Commenters disagreed with the measure developer's assertion that sociodemographic adjustment is unnecessary, and questioned the potential disagreement with recent findings by ASPE as well as the developer's interpretation of the decomposition analysis. Comments noted that CABG readmission rates are higher among patients who are dually eligible for Medicare and Medicaid, as well as those scoring highly on the AHRQ SES index. As a result, commenters expressed concern that "hospital effects" may be a result of community-level variables, such as hospital location and population, reducing the ability for the measure to accurately assess quality of care within the hospital's control. Commenters called for new analyses to assess the impact of SDS factors that were not addressed by the developer in the measure submission. Some commenters also noted the importance of having the capacity to update the factors used for SDS adjustment in the future, allowing measure developers to consider new information and changing methods as the SDS adjustment field evolves.

The Committee agreed with commenters that research shows the impact social risk factors can have but recognized that the challenge that developers faced in getting accurate data on these factors. This can lead ~~can lead~~ to a discrepancy between the conceptual basis for including social risk factors and the empirical analyses demonstrating their impact. The Committee recognized that developers may make a determination about whether or not to include SDS factors based on whether the factors was related to hospital quality versus a person's intrinsic risk of readmission. However, the Committee also noted the need to maximize the predictive value of a risk adjustment model and ensure that hospitals serving vulnerable populations are not penalized unfairly.

While the Committee generally accepted the findings of the analyses conducted by the developer, the Committee agreed that more work is needed to identify more robust data elements and methods to isolate and account for unmeasured clinical and social risk for patients. The Committee encouraged the developer to continue testing the risk adjustment model with additional SDS factors in an effort to better understand unmeasured patient risk. The Committee recommended that the developer provide this information through the annual update process.

Summary of Measure Evaluation

The following brief summaries of the measure evaluation highlight the major issues that were considered by the Committee. Details of the Committee's discussion and ratings of the criteria for each measure are in included in Appendix A.

Recommended Measures

2515: Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery (Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (YNHHSC/CORE)): Recommended

Description: The measure estimates a hospital-level risk-standardized readmission rate (RSRR), defined as unplanned readmission for any cause within 30 days from the date of discharge of the index CABG procedure, for patients 18 years and older discharged from the hospital after undergoing a qualifying isolated CABG procedure. The measure was developed using Medicare Fee-for-Service (FFS) patients 65 years and older and was tested in all-payer patients 18 years and older. An index admission is the hospitalization for a qualifying isolated CABG procedure considered for the readmission outcome. **Measure Type**: Outcome; **Level of Analysis**: Facility; **Setting of Care**: Hospital: Acute Care Facility, Hospital; **Data Source**: Claims (Only)

NQF #2515 was initially reviewed in 2015 and was endorsed with conditions. To satisfy the conditions, the developer (YNHHSC/CORE/CMS) submitted additional testing analyses on the impact of socio-demographic status factors (SDS) to the risk adjustment model. The developer concluded that their analyses did not support the addition of SDS factors in the risk adjustment model. The Standing Committee reviewed the developer's analyses and voted to maintain its endorsement and remove the conditions. The Consensus Standards Approval Committee (CSAC) ratified this decision. However, the Executive Committee of the NQF Board narrowly voted not to maintain endorsement.

NQF #2515 was resubmitted for endorsement review during the current All-Cause Admissions & Readmissions Project. The Standing Committee evaluated this measure with the evidence and testing information submitted during Phase I of the project. The Standing Committee agreed that the measure addressed an important area of measurement and was generally reliable and valid. The Committee did raise concerns about the lack of SDS adjustment in the risk adjustment model but the developers reiterated that their analyses did not support the inclusion of such factors in the risk adjustment model. The Standing Committee acknowledged the measure's current use in accountability programs and found the measure to be feasibly reported and usable. The Standing Committee generally agreed that the measure met the NQF criteria of endorsement and recommended NQF #2515 for endorsement.

~~*Consensus Not Reached Measures*~~

3188: 30-Day Unplanned Readmissions for Cancer Patients (Alliance of Dedicated Cancer Centers): Recommended ~~Consensus Not Reached~~

Description: 30-Day Unplanned Readmissions for Cancer Patients measure is a cancer-specific measure. It provides the rate at which all adult cancer patients covered as Fee-for-Service Medicare beneficiaries have an unplanned readmission within 30 days of discharge from an acute care hospital. The unplanned readmission is defined as a subsequent inpatient admission to a short-term acute care hospital, which occurs within 30 days of the discharge date of an eligible index admission and has an admission type of "emergency" or "urgent."; **Measure Type**: Outcome; **Level of Analysis**: Facility; **Setting of Care**: Hospital: Acute Care Facility; **Data Source**: Claims (Only)

NQF #3188 was initially reviewed during the 2015-2017 NQF All-Cause Admissions & Readmissions Project. The measure evaluates patients admitted to an acute care hospital with a cancer diagnosis and captures unplanned readmissions within 30 days of discharge. During the initial review there was broad Committee support for this measure concept. However, the Committee had concerns the challenges of implementing the measure due to coding of the underlying data elements and ~~ultimately~~ the measure did not initially pass the reliability subcriterion.

The developer updated the measure based on the Standing Committee's feedback and resubmitted it for this phase of work. During the current review of the measure the Standing Committee agreed that the measure reflects critical aspects of cancer care and that there are numerous actions that can be taken to improve performance on the measure. The Standing Committee had a lengthy discussion regarding the scientific acceptability of the measure and raised concerns regarding risk adjustment methods, and exclusions. The Committee questioned the approach of collapsing multiple comorbidities in to a single risk adjustment indicator variable, use of age 65 and less as the reference age in the risk adjustment model and the use of 'hospitalization in the prior 60 days' as a proxy for frequent admitters. The Committee also had concerns that patients with metastatic cancer may have been inappropriately excluded from the measure. The Committee had no concerns regarding the measure's usability or feasibility.

The Standing Committee did not reach consensus on Validity during the initial meeting. The Committee considered public comments as well as additional input from~~m~~ the developer during the post-comment call. Committee members continued to express concerns about the population included in the measure and the lack of granularity in the approach used to risk adjust for comorbidities. However, the Committee ultimately determined the measure met the Validity criterion. The Standing Committee generally agreed that the measure met the NQF criteria of endorsement and recommended NQF #3188 for endorsement.

~~The Committee had no concerns regarding the measure's usability or feasibility.~~ ~~Overall, the Standing Committee did not reach consensus on Validity and thus a vote on the overall recommendation was not taken. The measure was designated as "consensus not reached" and will be put out for public and member comment to gather input from the field before proceeding. The Committee agreed to discuss measure #3188 again at the post-comment call.~~

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Appendix A: Details of Measure Evaluation

Rating Scale: H=High; **M**=Moderate; **L**=Low; **I**=Insufficient; **NA**=Not Applicable; **Y**=Yes; **N**=No

Measures Recommended

2515 Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery

Submission | Specifications

Description: The measure estimates a hospital-level risk-standardized readmission rate (RSRR), defined as unplanned readmission for any cause within 30 days from the date of discharge of the index CABG procedure, for patients 18 years and older discharged from the hospital after undergoing a qualifying isolated CABG procedure. The measure was developed using Medicare Fee-for-Service (FFS) patients 65 years and older and was tested in all-payer patients 18 years and older.

An index admission is the hospitalization for a qualifying isolated CABG procedure considered for the readmission outcome.

Numerator Statement: The outcome for this measure is 30-day all-cause readmission. We define all-cause readmission as an unplanned inpatient admission for any cause within 30 days after the date of discharge from the index admission for patients 18 years and older who were discharged from the hospital after undergoing isolated CABG surgery. If a patient has one or more unplanned admissions (for any reason) within 30 days after discharge from the index admission, only one is counted as a readmission.

Denominator Statement: This claims-based measure can be used in either of two patient cohorts: (1) patients aged 65 years or older or (2) patients aged 18 years or older. We have tested the measure in both age groups.

The cohort includes admissions for patients a) who receive a qualifying isolated CABG procedure and b) with a complete claims history for the 12 months prior to admission. For simplicity of implementation and as testing demonstrated, closely correlated patient-level and hospital-level results using models with or without age interaction terms, the only recommended modification to the measure for application to all-payer data sets is replacement of the "Age-65" variable with a fully continuous age variable.

Exclusions: In order to create a clinically coherent population for risk adjustment and in accordance with existing NQF-approved CABG measures and clinical expert opinion, the measure is intended to capture isolated CABG patients (i.e., patients undergoing CABG procedures without concomitant valve or other major cardiac or vascular procedures).

For all cohorts, hospitalizations are excluded if they meet any of the following criteria, for admissions:

1. Without at least 30 days post-discharge enrollment in FFS Medicare
2. Discharged against medical advice (AMA)
3. Admissions for subsequent qualifying CABG procedures during the measurement period

Adjustment/Stratification: Statistical risk model; "Our approach to risk adjustment is tailored to and appropriate for a publicly reported outcome measure, as articulated in the American Heart Association (AHA) Scientific Statement, "Standards for Statistical Models Used for Public Reporting of Health Outcomes" (Krumholz et al., 2006).

Level of Analysis: Facility

Setting of Care: Hospital : Acute Care Facility, Hospital

Type of Measure: Outcome

Data Source: Claims (Only)

Measure Steward: Centers for Medicare & Medicaid Services

STANDING COMMITTEE MEETING [3/06/2017]

1. Importance to Measure and Report: The measure meets the Importance criteria

(1a. Evidence, 1b. Performance Gap)

2515 Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery

1a. Evidence: **Y-20; N-0**; 1b. Performance Gap: **H-2**; **M-16**; **L-1**; **I-1**

Rationale:

- The developer states a number of recent studies have demonstrated that improvements in care at the time of patient discharge can reduce 30-day readmission rates. The developer noted a variety of research studies that revealed readmission rates are influenced by the quality of care provided within the health system and, specifically, that interventions such as improved discharge planning, reconciling patient medications, and improving communications with outpatient providers can reduce readmission rates.
- The developer noted this readmission measure was developed to identify institutions, whose performance is better or worse than expected based on patient case-mix.
- The Committee agreed that a relationship exists between measured health outcome and at least one health care action, and that there are quality improvement activities that hospitals can undertake to reduce readmissions following CABG surgery.
- The Committee expressed concern about the literature cited by the measure developer noting that more contemporary articles should be considered. The developer responded by noting that the measure was undergoing review for initial endorsement. As such, the developer collected evidence at the initiation of the endorsement process (2015) but would consider updates to this section in the future.
- The Committee concluded that there is a performance gap based on the 0.5 to 1 percent readmission rate difference in the interquartile range.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria

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

2a. Reliability: **H-1**; **M-16**; **L-3**; **I-0** 2b. Validity: **H-1**; **M-16**; **L-3**; **I-0**

Rationale:

- The reliability of the measure was assessed at both the measure score and data element levels.
- The developers state that they tested the face validity of the measure's critical data elements using the CMS audit process to ensure accuracy of claims coding as these data elements are consequential for payment. NQF guidelines require a systematic assessment of face validity. NQF requires a systematic and transparent process to evaluate the face validity by experts who are not involved in measure development. The developers also compared variable frequencies and odds ratios from logistic regression models across the three years of data.
- The developers take a "test-retest" approach to measuring reliability. The developers randomly spilt the dataset into two equal subsets and calculated the RSRR for each sample. The developers use a metric of agreement known as an intra-class correlation coefficient (ICC) to measure agreement between the two samples. The initial ICC between the two RSRRs for each hospital submitted by the developer was 0.331.
- The developer clarified that since their initial submission, they applied the Spearman Brown Prophesy formula to the Interclass Correlation Coefficient. This approach adjusts the estimate for the low case volume generated by splitting the three-year sample into 2 halves for the reliability analysis. By applying this formula the ICC increased to 0.50, which is generally considered moderate. The Committee generally accepted this approach as appropriate.
- The developer performed several validity tests. First, the developer asserted the validity of claims-based measures noting that prior measures for alternate conditions have been endorsed and used for public reporting. Prior measures have been tested against their authoritative source to demonstrate that the underlying data elements are valid. However, NQF requirement require validity testing be conducted with the measure as specified. The developer noted that the measure is valid since it was developed based on measure development guidelines. While following measure development guidelines is highly encouraged, NQF requires testing on either data elements or the measure score. The developer explained that the measure was assessed by external groups providing results of a

systematic assessment of face validity. The developers surveyed their technical expert panel. A systematic assessment of face validity generally requires an assessment of experts not involved in the development of the measure. Finally, the developer evaluated the validity of the measure cohort and risk adjustment model with registry data validation.

- The developer tested three SDS and race variables in their analysis: dual eligible status, African American race, AHRQ SES index.
    - These variables were tested based on four potential pathways that were considered:
        - Relationship of socioeconomic status factor to health at admission
        - Use of low-quality hospital
        - Differential care within a hospital
        - Influence of SES on readmission risk outside of hospital quality and health status
    - When the SDS and race variables were tested in a multivariate model, the effect size of each of the variables was modest. The c-statistic was unchanged, and the model with the SDS factors had little to no effect on hospital performance.
    - The developers also undertook a decomposition analysis. They found that patient-level race and low AHRQ SES index effects were not appreciably different from zero. However, hospital-level race and low AHRQ SES effects were significant. Based on these findings the developer noted that inclusion of SDS factors could potentially limit the measures ability to distinguish hospital quality.
- The Committee was generally satisfied with the measure validity, however the Committee reiterated that its decision to endorse a measure without sociodemographic factors included in its risk adjustment model is not the same as saying that they do not make an important contribution to the outcome of the measure.
- While beyond the requirements of a CDP review, Committee members suggested that stakeholders would be interested in an assessment demonstrating the financial impact of including SDS risk adjustment on the HRRP cut-off in order to support the developer claim that the impact would be limited.

3. Feasibility: H-17; M-3; L-0; I-0

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c.Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- This measure is calculated using administrative claims data from defined data fields in electronic claims. Thus, the measure's required data elements are routinely collected as part of the facilities billing process.
- The Committee acknowledged that the measure is currently in use. As such, the Committee agreed that the measure is feasible.

4. Usability and Use: H-8; M-11; L-1; I-0

(Used and useful to the intended audiences for 4a. Accountability and Transparency; 4b. Improvement; and 4c. Benefits outweigh evidence of unintended consequences)

Rationale:

- The measure is currently used in CMS' Hospital Inpatient Quality Reporting (IQR) Program. Based on the number of participating hospitals, the risk-standardized readmission rate (RSRR) was reported for 4,663 hospitals across the United States for 2015 public reporting. The final index cohort included 925,315 admissions.
- The measure has also been used in CMS' Hospital Readmission Reduction (HRRP) Program. The number of accountable entities participating in the HRRP program varies by reporting year.
- The Committee noted that the measure is usable given its use for multiple purposes.

5. Related and Competing Measures

2515 Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery

- The Committee previously discussed potentially related and competing measures during the All-Cause Admissions and Readmissions 2015 project. Additional details on the Committees deliberations can be found it the report on that project.

Standing Committee Recommendation for Endorsement: **Y-18**; **N-2**

Rationale

- The Committee agreed that this measure meets all the NQF criteria for endorsement.

6. Public and Member Comment

- Commenters expressed concern for the level of reliability demonstrated by measure #2515. Commenters noted that reliability is a "must pass" criterion for NQF endorsement, yet believed the measure demonstrated low test-retest reliability, indicating only "fair" agreement.
- Commenters expressed concern regarding potentially insufficient adjustments made for sociodemographic status (SDS) factors for measure #2515. Commenters disagreed with the measure developer's assertion that sociodemographic adjustment is unnecessary, and questioned the potential disagreement with recent findings by ASPE as well as the developer's interpretation of the decomposition analysis. Comments noted that CABG readmission rates are higher among patients who are dually eligible for Medicare and Medicaid, as well as those scoring highly on the AHRQ SES index. As a result, commenters expressed concern that "hospital effects" may be a result of community-level variables, such as hospital location and population, reducing the ability for the measure to accurately assess quality of care within the hospital's control. Commenters called for new analyses to assess the impact of SDS factors that they felt were not adequately addressed by the developer in the measure submission. Some commenters also noted the importance of having the capacity to update the factors used for SDS adjustment in the future, allowing measures to factor in new information and changing methods as the SDS adjustment field evolves.

7. Consensus Standards Approval Committee (CSAC) Vote: Y-X; N-X

8. Board of Directors Vote: Y-X; N-X

9. Appeals

~~Measures Where Consensus Is Not Yet Reached~~

3188 30-Day Unplanned Readmissions for Cancer Patients

Submission | Specifications

Description: 30-Day Unplanned Readmissions for Cancer Patients measure is a cancer-specific measure. It provides the rate at which all adult cancer patients covered as Fee-for-Service Medicare beneficiaries have an unplanned readmission within 30 days of discharge from an acute care hospital. The unplanned readmission is defined as a subsequent inpatient admission to a short-term acute care hospital, which occurs within 30 days of the discharge date of an eligible index admission and has an admission type of "emergency" or "urgent."

Numerator Statement: This outcome measure demonstrates the rate at which adult cancer patients have unplanned readmissions within 30 days of discharge from an eligible index admission. The numerator includes all eligible unplanned readmissions to any short-term acute care hospital—defined as admission to a PPS-Exempt Cancer Hospital (PCH), a short-term acute care Prospective Payment (PPS) hospital, or Critical Access Hospital (CAH)—within 30 days of the discharge date from an index admission that is included in the measure denominator. Readmissions with an admission type (UB-04 Uniform Bill Locator 14) of "emergency = 1" or "urgent = 2" are considered unplanned readmissions within this measure. Readmissions for patients with progression of disease (using a principal diagnosis of metastatic disease as a proxy) and for patients with planned admissions for treatment (defined as a principal diagnosis of chemotherapy or radiation therapy) are excluded from the measure numerator.

Denominator Statement: The denominator includes inpatient admissions for all adult Fee-for-Service Medicare beneficiaries where the patient is discharged from a short-term acute care hospital (PCH, short-term acute care PPS hospital, or CAH) with a principal or secondary diagnosis (i.e., not admitting diagnosis) of malignant cancer within the defined measurement period.

Exclusions: The following index admissions are excluded from the measure denominator:

1) Less than 18 years of age;
2) Patients who died during the index admission;
3) Patients discharged AMA;
4) Patients transferred to another acute care hospital during the index admission;
5) Patients discharged with a planned readmission;
6) Patients having missing or incomplete data; and,
7) Patients not admitted to an inpatient bed.

Adjustment/Stratification: Statistical risk model; Rate/proportion

Level of Analysis: Facility

Setting of Care: Hospital : Acute Care Facility

Type of Measure: Outcome

Data Source: Claims (Only)

Measure Steward: Seattle Cancer Care Alliance

STANDING COMMITTEE MEETING [2/27/2017]

1. Importance to Measure and Report: The measure meets the Importance criteria

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Y-23; N-0**; 1b. Performance Gap: **H-10**; **M-11**; **L-0 I-0**

Rationale:

- As a rationale for measuring this health outcome, the developer lists several studies from peer-reviewed journals explaining that cancer is the second cause of death in the United States, with nearly 600,000 cancer-related deaths expected this year.

3188 30-Day Unplanned Readmissions for Cancer Patients

- The developer explains that this measure intends to reflect the unique clinical aspects of oncology patients and to yield readmission rates that may be obscured by a broader readmission measure, such as the Hospital-Wide All-Cause Unplanned Readmission Measure (HWR). The developer notes that there are several clinical actions that can be taken by the accountable entity to improve the outcome of 30-day readmissions. Specifically, the logic model notes that providers can ensure that patients are clinically ready for discharge with clear and appropriate follow-up care planned. These actions will help foster improved patient care, better population health, and reduce readmission risk.
- The Committee agreed that the measure was supported by the literature and reflects critical aspects of cancer care for patients. The Committee also agreed that there are numerous clinical actions that can be taken to impact the result of the measure.
- The developer studied 4,975 acute care hospitals and evaluated their potential performance gap over three years. The Committee noted that differences in performance across quartiles (Average: 16.54; 25th percentile: 12.5, 50th percentile: 17.32, and 75th percentile: 20.80) demonstrated a significant opportunity for improvement on the measure.
- Committee members noted that there was a disparity by race (i.e. black patients had a higher readmission rate). Committee members also supported the developers decision not to include race in the risk adjustment model due to potential concerns about masking disparities.
- One committee member questioned the assumption that scheduled care is high quality by definition and questioned the evidence base for the assumption. The committee member noted that there are many readmissions that are scheduled that are not patient-centered or protocol-driven, but instead based on timing issues with specialty providers, etc.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria

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

2a. Reliability: **H-0**; **M-17**; **L-5**; **I-0** 2b. Validity: **H-0**; **M-11**; **L-11**; **I-0** ***(Consensus Not Reached)*** Revote Post-Comment: **H-1** M-1**4;** L-3**;** I-1

Rationale:

- This outcome measure demonstrates the rate at which adult cancer patients have unplanned readmissions within 30 days of discharge from an eligible index admission.
- The numerator includes all eligible unplanned readmissions to any short-term acute care hospital—defined as admission to a PPS-Exempt Cancer Hospital (PCH), a short-term acute care Prospective Payment (PPS) hospital, or Critical Access Hospital (CAH)—within 30 days of the discharge date from an index admission that is included in the measure denominator. Readmissions with an admission type (UB-04 Uniform Bill Locator 14) of "emergency = 1" or "urgent = 2" are considered unplanned readmissions within this measure. Readmissions for patients with progression of disease (using a principal diagnosis of metastatic disease as a proxy) and for patients with planned admissions for treatment (defined as a principal diagnosis of chemotherapy or radiation therapy) are excluded from the measure numerator.
- The denominator includes inpatient admissions for all adult Fee-for-Service Medicare beneficiaries where the patient is discharged from a short-term acute care hospital (PCH, short-term acute care PPS hospital, or CAH) with a principal or secondary diagnosis (i.e., not admitting diagnosis) of malignant cancer within the defined measurement period.
- The measure is specified for a facility level of analysis and the hospital setting.
- The Committee discussed the specifications of the measure's numerator and denominator. Committee members agreed that it was appropriate to specify the numerator using emergency and urgent codes and excluding codes that relate to planned admissions. One committee member questioned if use of emergency/urgent codes varied across hospitals based on documentation processes.
- The Committee noted that there were several exclusions from the denominator—including transfer patients, the missing data patients and the patients not admitted. A Committee member expressed concerned about patient-level exclusions, and noted that up to 20% of data in the numerator would

not be included due to exclusions. The developer clarified that the exclusions are important to the measure. The developer noted that planned readmissions for chemotherapy, radiation oncology and disease progression are important, otherwise the measure would just closely resemble a measure for all-cause readmission for cancer patients.

- A Committee member noted that the exclusion based on progression might lead to biases by cancer type. Some cancers are more likely to be metastatic in terms of their behavior than others. Another committee member suggested that the use of metastatic codes identified through medical records might help address the issue. Committee members also noted that the distribution of metastatic patients may be variable across hospitals. The developer clarified that the measure includes risk adjustment for solid tumor without metastasis and then a separate metastasis adjuster. The developer noted that they did not exclude patients with metastatic cancer from the measure itself but are excluding patients have a principal guidance of metastatic disease on the readmission claim—to differentiate between quality of care and disease status.
- The Committee noted that the measure only looks at hospitals with more than 50 readmissions, so low-volume hospitals would not be included in the measure. Committee members commented that they would like to see sensitivity analysis for excluded data at the hospital level. The developer clarified that they were interested in including as many hospitals as possible in the measure, but noted that smaller volume hospitals would have less reliability. Their analysis found that 50 readmissions seemed to be the point where they were able to generate strong validity and reliability scores. The developer also noted that they did conduct sensitivity analysis around three cut points: 50, 75 and 100.
- Reliability was tested at the measure score level. To demonstrate measure score reliability, the developer conducted a test/retest analysis to evaluate the measure's ability to generate consistent results with randomly selected subset of patients over time. The developers calculated two metrics of agreement – the intraclass correlation coefficient (ICC) and the Spearman-Brown Prophecy Formula (S-B). The ICC is estimated from a random effects model producing risk adjusted rates. The S-B formala projects correlation as if the full sample is used and not spilt randomly.
- The reliability testing results for the three-year period (CY2013-CY2015) produced an ICC of 0.570 (95% CI: 0.567, 0.572) and 0.482 (95% CI: 0.479, 0.485), for unadjusted and risk-adjusted values, respectively. The developer notes that this result may be interpreted as "fair" reliability. The mean S-B for the same period was 0.726 (95% CI: 0.724, 0.728) for unadjusted rates and 0.650 (95% CI: 0.648, 0.653) for risk-adjusted rates. The developer notes that both of these values are significantly higher than the 0.5 that indicates a large effect size with p-values < 0.001. When applied to each year individually, the S-B analysis exceeded 0.50 (p-values<0.001) in 2013 and 2014 but not 2015.
- Committee members asked if the measure was meant to be calculated using three years of data, as that reliability testing was implemented using this timeframe. The developer clarified that the measure is intended to be an annual measure. They tested the three-year period in total but also evaluated each calendar year independently.
- A Committee member suggested that the measure should consider including observation stays and emergency room visits.
- The developer assessed validity at both the measure score and data element levels.
- The developer conducted two analyses to test the validity of the measure score. These analyses were:
- 1) evaluating the sensitivity and specificity of the UB-04 inpatient admission type code. This analysis was previously conducted using a manual chart review. 2) correlation between this measure and NQF #1789 CMS Hospital-Wide All-Cause Readmissions measure.
- The results of the two analysis are as follows:
    - The previous data element validity testing generated a global sensitivity and specificity score of 0.879 and 0.896, respectively.
    - The overall correlation between NQF #1789 and NQF #3188 was 0.2769 with a p-value of <0.001. This is a statistically significant positive correlation between the two measures.
- Committee members noted that the correlation with the all cause readmissions measure (NQF #1789) was on the low end, but still significant to provide sufficient evidence of validity.

3188 30-Day Unplanned Readmissions for Cancer Patients

- A Committee member asked about the relationship of the measure with 30 day mortality rates after noting that patient populations 85 and older had the lowest readmission rates, perhaps due to out of hospital deaths. The developer noted that six percent of patients in the denominator had been excluded because they expired during the index admission.
- The Committee raised several concerns around the methods for risk adjustment used. First, the Committee was concerned about collapsing multiple comorbidities into a single risk adjustment variable. Committee members were concerned that quaternary centers who serve the most clinically complex patients may not be accurately characterized using this method. Further, the Committee noted that not all comorbidities have an equal impact on readmissions. Second, the Committee was concerned with the use of age 65 and less as the reference age for the model. Third, the Committee was concerned with the use of 'hospitalization in the prior 60 days' as a proxy for frequent admitters. The Committee was concerned that the risk adjusting for patients who are high utilizers could possibly inadvertently adjust for the hospital's quality, as high utilization is a poor outcome in itself.
- The developers noted that there was a conceptual and empirical rationale for adjustment based on dual-eligibility status. Dual-eligibility can serve as a proxy for low income status and other measures of SDS. Several studies were referenced that note that low SDS factors are a risk factor for later-state cancer diagnosis, delayed health care receipt, and higher utilization of hospital-based care.
- The patient-level observed 30-Day Unplanned Readmissions for Cancer Patients rate was 22.49%, compared with an 18.32% observed rate for all other patients. "Dual-Eligible Status" was associated with a Chi-Square of 5547.9628 ($p<0.001$). "Dual-Eligible Status" was included in the risk adjustment model.
- Ultimately, the Committee did not reach consensus on the validity sub criterion.
- The Committee requested~~s~~ feedback from the member and public comment period and ~~will discuss~~discussed the measure during the post-comment call.
- The developers presented additional information to address the Committee's previous questions and support the validity of the measure.
- Committee members discussed the challenges of determining an appropriate population for this measure given the heterogeneous nature of cancer. Committee members wanted to include as many patients as possible but recognized the need to ensure the measure reflects readmissions due to quality of care.
- Committee members also raised concerns about the lack of granularity on the adjustment for co-morbidity.
- Ultimately, the Committee determined the measure met the validity subcriterion.

3. Feasibility: H-19; M-2; L-0; I-0

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c.Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- This measure is calculated using administrative claims data from established data fields. Thus, the measure's required data elements are routinely generated as part of the facilities billing process.
- Committee members believed that the feasibility is high as all data are available through the administrative claims.

4. Usability and Use: H-4; M-15; L-3; I-0

(Used and useful to the intended audiences for 4a. Accountability and Transparency; 4b. Improvement; and 4c. Benefits outweigh evidence of unintended consequences)

Rationale:

- The measure is publically reported by Vizient, Inc. with external benchmarking to multiple organizations.
- The developer notes that the measure is also used in quality improvement applications at the City of Hope Comprehensive Care Center, University of Miami Sylvester Comprehensive Cancer Care, Seattle Cancer Care Alliance

3188 30-Day Unplanned Readmissions for Cancer Patients
• The measure is used in the Annual Hospital Ratings for Colon and Lunch Cancer Surgery. • The measure is used in an ACO payment program at Moffitt Cancer Center with Florida Blue. • Committee members noted that the measure is current used in both QI and accountability applications at several health centers, and would be under consideration for possible future rulemaking as early as FY 2018.
5. Related and Competing Measures • No related or competing measures noted.
Standing Committee Recommendation for Endorsement: **Y-15~~X~~; N-~~4X~~** Rationale • The Standing Committee did not conduct a vote for Overall Suitability for Endorsement during the February 27, 2017 webinar because Consensus was Not Reached on the Validity criterion. The Standing Committee ~~will~~ discussed and re-voted on the Validity criterion during the Post-Comment Call on May 16, 2017. The~~. If the~~ Standing Committee agreed ~~s~~ the measure meets the Validity criterion, ~~they will~~and then also then voted Yes on Overall Suitability for Endorsement.
6. Public and Member Comment • Public commenters expressed support for measure 3188. Commenters noted that currently endorsed readmission measures do not include cancer patients and this measure would fill a critical measurement gap. Commenters recognized the need to improve cancer care quality and believe that use of this measure could help avoid unnecessary hospitalizations. • Commenters believed the measure is valid. Commenters expressed support for the statistical model of the measure, the specified exclusions, and the risk adjustment strategy.
7. Consensus Standards Approval Committee (CSAC) Vote: Y-X; N-X
8. Board of Directors Vote: Y-X; N-X
9. Appeals

Appendix B: NQF All-Cause Admissions and Readmissions Portfolio and Related Measures

NQF's portfolio of measures related to admissions and readmissions consists of 47 measures. Some measures within the admissions and readmissions portfolio have been assigned, for various reasons, to other Standing Committees, including for example, Perinatal (NICU readmissions), Pulmonary (PICU readmissions and length of stay, COPD and asthma admission rates), and Renal (dialysis facility hospitalizations).

All Cause/All Condition Specific Population Based Measures

Measure Number	Measure Title
1768	Plan All-Cause Readmissions [NCQA]
2504	30-day Rehospitalizations per 1000 Medicare fee-for-service (FFS) Beneficiaries [CMS]
2503	Hospitalizations per 1000 Medicare fee-for-service (FFS) Beneficiaries [Colorado Foundation for Medical Care]
2888	Risk-Standardized Acute Admission Rates for Patients with Multiple Chronic Conditions [Yale/CORE]

Condition Specific Population Based Measures

Measure Number	Measure Title
0272	Diabetes Short-Term Complications Admission Rate (PQI 1) [AHRQ]
0273	Perforated Appendix Admission Rate (PQI 2) [AHRQ]
0274	Diabetes Long-Term Complications Admission Rate (PQI 3) [AHRQ]
0277	Heart Failure Admission Rate (PQI 8) [AHRQ]
0279	Bacterial Pneumonia Admission Rate (PQI 11) [AHRQ]
0280	Dehydration Admission Rate (PQI 10) [AHRQ]
0281	Urinary Tract Infection Admission Rate (PQI 12) [AHRQ]
0283	Asthma in Younger Adults Admission Rate (PQI 15) [AHRQ]
0638	Uncontrolled Diabetes Admission Rate (PQI 14) [AHRQ]

Admissions Measures

Measure Number	Measure Title
0727	Gastroenteritis Admission Rate (pediatric) [AHRQ]
0728	Asthma Admission Rate (Pediatric) [AHRQ]
2886	Risk-Standardized Acute Admission Rates for Patients with Heart Failure [Yale/CORE]
2887	Risk-Standardized Acute Admission Rates for Patients with Diabetes [Yale-CORE]

Hospital All-Cause/All-Condition Readmission Measures

Measure Number	Measure Title
0335	PICU Unplanned Readmission Rate [Virtual PICU Systems, LLC]
1789	Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) [CMS]
2393	Pediatric All-Condition Readmission Measure [Center of Excellence for Pediatric Quality Measurement]
2879	Hybrid Hospital-Wide Readmission Measure with Claims and Electronic Health Record Data [Yale/CORE]

Cardiovascular Condition-Specific Hospital Readmission Measures

Measure Number	Measure Title
0330	Hospital 30-day, all-cause, risk-standardized readmission rate following heart failure hospitalization for patients 18 and older [CMS]
0505	Thirty-day all-cause risk standardized readmission rate following acute myocardial infarction (AMI) hospitalization [CMS]
0695	Hospital 30-Day Risk-Standardized Readmission Rates following Percutaneous Coronary Intervention (PCI) [American College of Cardiology]
2514	Risk-Adjusted Coronary Artery Bypass Graft (CABG) Readmission Rate [STS]
2515*	Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery [CMS]
2880	Excess days in acute care (EDAC) after hospitalization for heart failure [Yale/CORE]
2881	Excess days in acute care (EDAC) after hospitalization for acute myocardial infarction (AMI) [Yale/CORE]

*Denotes measures reviewed in this current project

Pulmonary Condition-Specific Hospital Readmission Measures

Measure Number	Measure Title
0506	Thirty-day all-cause risk standardized readmission rate following pneumonia hospitalization. [CMS]
1891	Hospital 30-Day, All-Cause, Risk-Standardized Readmission Rate (RSRR) following Chronic Obstructive Pulmonary Disease (COPD) Hospitalization [CMS]
2414	Pediatric Lower Respiratory Infection Readmission Measure [Center of Excellence for Pediatric Quality Measurement]
2882	Excess days in acute care (EDAC) after hospitalization for pneumonia

Surgical Condition-Specific Hospital Readmission Measures

Measure Number	Measure Title
2513	Hospital 30-Day All-Cause Risk-Standardized Readmission Rate (RSRR) following Vascular Procedures [CMS]
1551	Hospital-level 30-day, all-cause risk-standardized readmission rate (RSRR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA) [CMS]

Setting-Specific Readmission Measures

Measure Number	Measure Title
0171	Acute Care Hospitalization During the First 60 Days of Home Health (Risk-Adjusted) [CMS]
0173	Emergency Department Use without Hospitalization During the First 60 Days of Home Health (Risk Adjusted)
1463	Standardized Hospitalization Ratio for Dialysis Facilities [CMS]
2375	PointRight OnPoint-30 Skilled Nursing Facility Rehospitalizations [AHCA]
2510	Skilled Nursing Facility 30-Day All-Cause Readmission Measure (SNFRM) [RTI]
2380	Rehospitalization During the First 30 Days of Home Health [CMS]
2505	Emergency Department Use without Hospital Readmission During the First 30 Days of Home Health [CMS]
2512	All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Long-Term Care Hospitals (LTCHs) [CMS]
2502	All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Inpatient Rehabilitation Facilities [CMS]
2496	Standardized Readmission Ratio (SRR) for dialysis facilities [CMS]
2539	Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy [CMS]
2827	PointRight® Pro Long Stay(TM) Hospitalization Measure (PointRight)
2858	Discharge to Community [ACHA]
2860	Thirty-day all-cause unplanned readmission following psychiatric hospitalization in an inpatient psychiatric facility (IPF)

Appendix C: All-Cause Admissions and Readmissions Portfolio—Use in Federal Programs

NQF #	Title	Federal Programs: Finalized as of July 8, 2016
0171	Acute Care Hospitalization During the First 60 Days of Home Health	Home Health Quality Reporting
0173	Emergency Department Use without Hospitalization During the First 60 Days of Home Health	Home Health Quality Reporting
0275	Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults Admission Rate (PQI 5)	Medicare Shared Savings Program
0277	Heart Failure Admission Rate (PQI 8)	Medicare Shared Savings Program
0330	Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following heart failure (HF) hospitalization	Hospital Inpatient Quality Reporting, Hospital Readmission Reduction Program
0505	Hospital 30-day all-cause risk-standardized readmission rate (RSRR) following acute myocardial infarction (AMI) hospitalization.	Hospital Inpatient Quality Reporting, Hospital Readmission Reduction Program
0506	Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following pneumonia hospitalization	Hospital Inpatient Quality Reporting, Hospital Readmission Reduction Program
1551	Hospital-level 30-day, all-cause risk-standardized readmission rate (RSRR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA)	Hospital Inpatient Quality Reporting, Hospital Readmission Reduction Program
1891	Hospital 30-Day, All-Cause, Risk-Standardized Readmission Rate (RSRR) following Chronic Obstructive Pulmonary Disease (COPD) Hospitalization	Hospital Inpatient Quality Reporting, Hospital Readmission Reduction Program
1789	Hospital-Wide All-Cause Unplanned Readmission Measure (HWR)	Hospital Inpatient Quality Reporting, Medicare Shared Savings Program
2496	Standardized Readmission Ratio	End Stage Renal Disease-Quality Incentive Program
2380	Rehospitalization During the First 30 Days of Home Health	Home Health Quality Reporting
2502	All-Cause Unplanned Readmission Measure for 30 Days Post Discharge from Inpatient Rehabilitation Facility (IRF)	Inpatient Rehabilitation Facilities Quality Reporting
2505	Emergency Department Use without Hospital Readmission During the First 30 Days of Home Health	Home Health Quality Reporting
2510	Skilled Nursing Facility 30-Day All-Cause Readmission Measure	Skilled Nursing Facility Value-Based Purchasing Program, Medicare Shared Savings Program

NQF #	Title	Federal Programs: Finalized as of July 8, 2016
2512	30-Day All Cause Post Long-Term Care Hospital (LTCH) Discharge Hospital Readmission Measure	Long-term Care Hospital Quality Reporting
2505	Emergency Department Use without Hospital Readmission During the First 30 Days of Home Health	Home Health Quality Reporting
2539	Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy	Hospital Outpatient Quality Reporting Program, Ambulatory Surgery Center Quality Reporting Program

Appendix D: Project Standing Committee and NQF Staff

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Appendix E: Measure Specifications

	2515 Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery
Status	Submitted
Steward	Centers for Medicare & Medicaid Services
Description	The measure estimates a hospital-level risk-standardized readmission rate (RSRR), defined as unplanned readmission for any cause within 30 days from the date of discharge of the index CABG procedure, for patients 18 years and older discharged from the hospital after undergoing a qualifying isolated CABG procedure. The measure was developed using Medicare Fee-for-Service (FFS) patients 65 years and older and was tested in all-payer patients 18 years and older. An index admission is the hospitalization for a qualifying isolated CABG procedure considered for the readmission outcome.
Type	Outcome
Data Source	Claims (Only) Data sources for the Medicare FFS measure: Medicare Part A inpatient and Part B outpatient claims: This data source contains claims data for FFS inpatient and outpatient services including: Medicare inpatient hospital care, outpatient hospital services, as well as inpatient and outpatient physician claims for the 12 months prior to an index admission. Medicare Enrollment Database (EDB): This database contains Medicare beneficiary demographic, benefit/coverage, and vital status information. This data source was used to obtain information on several inclusion/exclusion indicators such as Medicare status on admission as well as vital status. These data have previously been shown to accurately reflect patient vital status (Fleming et al., 1992). The American Community Survey (2008-2012): The American Community Survey data is collected annually and an aggregated 5-years data was used to calculate the AHRQ socioeconomic status (SES) composite index score. Data sources for the all-payer testing: For our analyses to examine use in all-payer data, we used all-payer data from California. California is a diverse state, and, with more than 37 million residents, California represents 12% of the US population. We used the California Patient Discharge Data, a large, linked database of patient hospital admissions. In 2006, there were approximately 3 million adult discharges from more than 450 non-Federal acute care hospitals. Records are linked by a unique patient identification number, allowing us to determine patient history from previous hospitalizations and to evaluate rates of both readmission and mortality (via linking with California vital statistics records). Using all-payer data from California, we performed analyses to determine whether the HF readmission measure can be applied to all adult patients, including not only FFS Medicare patients aged 65 years or over, but also non-FFS Medicare patients aged 18-64 years at the time of admission. Reference: Fleming C., Fisher ES, Chang CH, Bubolz D, Malenda J. Studying outcomes and hospital utilization in the elderly: The advantages of a merged data base for Medicare and Veterans Affairs Hospitals. Medical Care. 1992; 30(5): 377-91. No data collection instrument provided Attachment NQF_2515_CABG_Readmission_Data_Dictionary_01-11-17_v1.0.xlsx
Level	Facility
Setting	Hospital : Acute Care Facility, Hospital

	2515 Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery
Numerator Statement	The outcome for this measure is 30-day all-cause readmission. We define all-cause readmission as an unplanned inpatient admission for any cause within 30 days after the date of discharge from the index admission for patients 18 years and older who were discharged from the hospital after undergoing isolated CABG surgery. If a patient has one or more unplanned admissions (for any reason) within 30 days after discharge from the index admission, only one is counted as a readmission.
Numerator Details	This is an all-cause readmission measure and therefore any readmission within 30 days of discharge from the index hospitalization (hereafter, referred to as discharge date) is included in the measure unless that readmission is deemed a "planned" readmission. The outcome is attributed to the hospital that provided the index CABG procedure. Planned Readmission Definition Planned readmissions are scheduled admissions for elective procedures or for planned care such as chemotherapy or rehabilitation. Because planned readmissions are not necessarily a signal of quality of care, we chose to exclude planned readmissions from being considered as an outcome in this readmission measure. Although clinical experts agree that planned readmissions are rare after CABG, they likely do occur. Therefore, to identify these planned readmissions we have adapted and applied an algorithm originally created to identify planned readmissions for a hospital-wide (i.e., not condition-specific) readmission measure. This algorithm underwent two rounds of public comment, a validation study using data from a medical record review, and was finalized based upon technical input of 17 surgeons nominated by 9 surgical societies as well as 10 other expert surgeons. In brief, the algorithm identifies a short list of always planned readmissions (those where the principal discharge diagnosis is major organ transplant, obstetrical delivery, or maintenance chemotherapy) as well as those readmissions with a potentially planned procedure (e.g., total hip replacement) AND a non-acute principle discharge diagnosis code. For example, a readmission for colon resection is considered planned if the principal diagnosis is colon cancer but unplanned if the principal diagnosis is abdominal pain, as this might represent a complication of the CABG procedure or hospitalization. Readmissions that included potentially planned procedures with acute diagnoses or procedures that might represent specific complications of CABG, such as PTCA or repeat CABG are not excluded from the measure outcome as they are not considered planned in this measure. Readmissions are considered planned if any of the following occurs during the readmission: 1. A procedure is performed that is in one of the procedure categories that are always planned regardless of diagnosis; 2. The principal diagnosis is in one of the diagnosis categories that are always planned; or, 3. A procedure is performed that is in one of the potentially planned procedure categories and the principal diagnosis is not in the list of acute discharge diagnoses. Only the first readmission following an index hospital stay is counted in the numerator of this measure. If a patient has two or more readmissions within 30 days of discharge from the index hospital stay, only the first will be considered an outcome of interest; the second or later readmissions are not counted in the outcome. Full detail, including lists of procedures and diagnoses, are included in the Measure Methodology Report in the attached appendix. It should be noted that this approach differs from that adopted by STS for their registry-based measure, in which all 30-day readmissions were considered to be unplanned. Outcome Attribution Attribution of the outcome in situations where a patient has multiple contiguous admissions, at least one of which involves an index CABG procedure (i.e., the patient is

	2515 Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery
	either transferred into the hospital that performs the index CABG or is transferred out to another hospital following the index CABG) is as follows: - If a patient undergoes a CABG procedure in the first hospital and is then transferred to a second hospital where there is no CABG procedure, the readmission outcome is attributed to the first hospital performing the index CABG procedure and the 30-day window starts with the date of discharge from the final hospital in the chain. Rationale: A transfer following CABG is most likely due to a complication of the index procedure and that care provided by the hospital performing the CABG procedure likely dominates readmission risk even among transferred patients. - If a patient is admitted to a first hospital but does not receive a CABG procedure there and is then transferred to a second hospital where a CABG is performed, the readmission outcome is attributed to the second hospital performing the index CABG procedure and the 30-day window starts with the date of discharge from the final hospital in the chain. Rationale: Care provided by the hospital performing the CABG procedure likely dominates readmission risk. -If a patient undergoes a CABG procedure in the first hospital and is transferred to a second hospital where another CABG procedure is performed, the readmission outcome is attributed to the first hospital performing the index (first) CABG procedure and the 30-day window starts with the date of discharge from the final hospital in the chain. Rationale: A transfer following CABG is most likely due to a complication of the index procedure, and care provided by the hospital performing the index CABG procedure likely dominates readmission risk even among transferred patients.
Denominator Statement	This claims-based measure can be used in either of two patient cohorts: (1) patients aged 65 years or older or (2) patients aged 18 years or older. We have tested the measure in both age groups. The cohort includes admissions for patients a) who receive a qualifying isolated CABG procedure and b) with a complete claims history for the 12 months prior to admission. For simplicity of implementation and as testing demonstrated, closely correlated patient-level and hospital-level results using models with or without age interaction terms, the only recommended modification to the measure for application to all-payer data sets is replacement of the "Age-65" variable with a fully continuous age variable.
Denominator Details	The index cohort includes admissions for patients aged 18 years or older who received a qualifying "isolated" CABG procedure (CABG procedure without other concurrent major cardiac procedure such as a valve replacement). All patients in the cohort are alive at discharge (i.e., no in-hospital death). The measure was developed in a cohort of patients 65 years and older who were enrolled in Medicare FFS and admitted to non-federal hospitals. To be included in the Medicare FFS cohort, patients had to have a qualifying isolated CABG procedure AND had to be continuously enrolled in Medicare Fee-for-Service (FFS) one year prior to the first day of the index hospitalization and through 30 days post-discharge. This cohort is defined using the ICD-9 and ICD-10 Clinical Modification procedure codes identified in Medicare Part A Inpatient claims data. The ICD-10 specifications are attached in the Data Dictionary. ICD-9 and ICD-10 procedure codes that indicate a patient has undergone a NON-isolated CABG procedure (CABG surgeries that occur concomitantly with procedures that elevate patients' readmission risk) and thus does not meet criteria for inclusion in the measure cohort are listed in the attached Data Dictionary. ICD-9-CM codes that define the cohort: 36.10 - Aortocoronary bypass for heart revascularization, not otherwise specified

	2515 Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery
	36.11 - (Aorto) coronary bypass of one coronary artery 36.12 - (Aorto coronary bypass of two coronary arteries 36.13 - (Aorto) coronary bypass of three coronary arteries 36.14 - (Aorto) coronary bypass of four or more coronary arteries 36.15 - Single internal mammary- coronary artery bypass 36.16 - Double internal mammary- coronary artery bypass 36.17 - Abdominal- coronary artery bypass 36.19 - Other bypass anastomosis for heart revascularization
Exclusions	In order to create a clinically coherent population for risk adjustment and in accordance with existing NQF-approved CABG measures and clinical expert opinion, the measure is intended to capture isolated CABG patients (i.e., patients undergoing CABG procedures without concomitant valve or other major cardiac or vascular procedures). For all cohorts, hospitalizations are excluded if they meet any of the following criteria, for admissions: 1. Without at least 30 days post-discharge enrollment in FFS Medicare 2. Discharged against medical advice (AMA) 3. Admissions for subsequent qualifying CABG procedures during the measurement period
Exclusion details	In order to create a clinically coherent population for risk adjustment and in accordance with existing NQF-approved CABG measures and clinical expert opinion, the measure is intended to capture isolated CABG patients (i.e., patients undergoing CABG procedures without concomitant valve or other major cardiac or vascular procedures). For all cohorts, hospitalizations are excluded if they meet any of the following criteria: 1. Without at least 30 days post-discharge enrollment in FFS Medicare Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted. 2. Discharged against medical advice (AMA) Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge. 3. Admissions for subsequent qualifying CABG procedures during the measurement period Rationale: CABG procedures are expected to last for several years without the need for revision or repeat revascularization. A repeat CABG procedure during the measurement period likely represents a complication of the original CABG procedure and is a clinically more complex and higher risk surgery. Therefore, we select the first CABG surgery admission for inclusion in the measure and exclude subsequent CABG surgery admissions from the cohort.
Risk Adjustment	Statistical risk model Our approach to risk adjustment is tailored to and appropriate for a publicly reported outcome measure, as articulated in the American Heart Association (AHA) Scientific Statement, “Standards for Statistical Models Used for Public Reporting of Health Outcomes” (Krumholz et al., 2006). The measure calculates readmission rates using a hierarchical logistic regression model to account for the clustering of patients within hospitals while risk-adjusting for differences in patient case-mix. We modeled the log-odds of readmission within 30 days of discharge from an index CABG admission as a function of patient demographic and clinical characteristics, and a random hospital-specific intercept. This strategy accounts for within-

	2515 Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery
	hospital correlation of the observed outcomes, and models the assumption that underlying differences in quality among the health care groups being evaluated lead to systematic differences in outcomes. Methodology for calculation of risk-standardized rates is noted below in the calculation algorithm section (S.18). Variables are patient-level risk-adjustors that are expected to be predictive of readmission, based on empirical analysis, prior literature, and clinical judgment, including age and indicators of comorbidity and disease severity. For each patient, covariates are obtained from Medicare claims extending 12 months prior to and including the index admission. The model adjusts for case differences based on the clinical status of the patient at the time of admission. We use condition categories (CCs), which are clinically meaningful groupings of more than 15,000 ICD-9-CM diagnosis codes. A map showing the assignment of ICD-9 codes to CCs can be found in the attached data dictionary. We do not risk-adjust for CCs that are possible adverse events of care and that are only recorded in the index admission. In addition, only comorbidities that convey information about the patient at that time or in the 12-months prior, and not complications that arise during the course of the hospitalization are included in the risk-adjustment. The risk adjustment model includes 26 variables: Demographics Mean age minus 65 (SD) Male (%) Comorbidities History of Coronary Artery Bypass Graft (CABG) or valve surgery (ICD-9 diagnosis codes: V42.2, V43.3, V45.81, 414.02, 414.03, 414.04, 414.05, 414.06, 414.07, 996.02, 996.03; ICD-9 procedure code: 39.61) Cardiogenic shock (ICD-9 diagnosis code 785.51) Chronic Obstructive Pulmonary Disease (COPD) (CC 108) Cancer; metastatic cancer and acute leukemia (CC 7-12) Diabetes mellitus (DM) or DM complications (CC 15-19, 119-120) Protein-calorie malnutrition (CC 21) Disorders of fluid/electrolyte/acid-base (CC 22-23) Other endocrine/metabolic/nutritional disorders (CC 24) Severe hematological disorders (CC 44) Dementia or other specified brain disorders (CC 49-50) Major psychiatric disorders (CC 54-56) Hemiplegia, paraplegia, paralysis, functional disability (CC 67-69, 100-102, 177-178) Polyneuropathy (CC 71) Congestive heart failure (CC 80) Specified arrhythmias and other heart rhythm disorders (CC 92-93) Stroke (CC 95-96) Cerebrovascular disease (CC 97-99, 103) Vascular or circulatory disease (CC 104-106) Fibrosis of lung or other chronic lung disorders (CC 109) Pneumonia (CC 111-113) Other lung disorders (CC 115) Dialysis status (CC 130)

	2515 Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery
	Renal failure (CC 131) Please see the attached Data Dictionary for the ICD-10/V22-defined risk variables. Risk model coefficients to estimate each patient's probability for the outcome: SAS procedure PROC GLIMMIX fits the statistical model to calculate the risk-adjusted coefficients and hospital-specific effects as listed in the attached Data Dictionary. For random effect, the between-hospital variance is 0.04 (standard error 0.01) for the model using 2009 full year dataset. Reference: Krumholz HM, Brindis RG, Brush JE, et al. 2006. Standards for Statistical Models Used for Public Reporting of Health Outcomes: An American Heart Association Scientific Statement From the Quality of Care and Outcomes Research Interdisciplinary Writing Group: Cosponsored by the Council on Epidemiology and Prevention and the Stroke Council Endorsed by the American College of Cardiology Foundation. Circulation 113: 456-462. Available in attached Excel or csv file at S.2b
Stratification	N/A
Type Score	Rate/proportion better quality = lower score
Algorithm	We calculate hospital-specific risk-standardized readmission rates (RSRRs). These rates are obtained as the ratio of predicted to expected readmissions, multiplied by the national unadjusted rate. The expected number of readmissions in each hospital is estimated using its patient mix and the average hospital-specific intercept. The predicted number of readmissions in each hospital is estimated given the same patient mix but the hospital-specific intercept. Operationally, the expected number of readmissions for each hospital is obtained by regressing the risk factors on the 30-day readmission using all hospitals in our sample, applying the subsequent estimated regression coefficients to the patient characteristics observed in the hospital, adding the average of the hospital-specific intercepts, summing over all patients in the hospital, and then transforming to get a count. This is a form of indirect standardization. The predicted hospital outcome is the number of expected readmissions in the "specific" hospital and not at a reference hospital. Operationally this is accomplished by estimating a hospital-specific intercept that represents baseline readmission risk within the hospital, applying the estimated regression coefficients to the patient characteristics in the hospital, summing over all patients in the hospital, and then transforming to get a count. To assess hospital performance in any given year, we re-estimate the model coefficients using that year's data. Please see the calculation algorithm attachment for more details. Available in attached appendix at A.1
Copyright / Disclaimer	5.1 Identified measures: 0330 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following heart failure (HF) hospitalization 0505 : Hospital 30-day all-cause risk-standardized readmission rate (RSRR) following acute myocardial infarction (AMI) hospitalization. 0506 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following pneumonia hospitalization 0119 : Risk-Adjusted Operative Mortality for CABG 0115 : Risk-Adjusted Surgical Re-exploration 0114 : Risk-Adjusted Postoperative Renal Failure 0131 : Risk-Adjusted Stroke/Cerebrovascular Accident 0130 : Risk-Adjusted Deep Sternal Wound Infection 0129 : Risk-Adjusted Postoperative Prolonged Intubation (Ventilation)

	2515 Hospital 30-day, all-cause, unplanned, risk-standardized readmission rate (RSRR) following coronary artery bypass graft (CABG) surgery
	1551 : Hospital-level 30-day risk-standardized readmission rate (RSRR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA) 1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: The proposed CABG readmission measure, which has been developed in close collaboration with STS, has a target population (i.e., isolated CABG patients) that is harmonized with the above measures to the extent possible given the differences between clinical and administrative data. The exclusions are nearly identical to the STS measures' cohort exclusions with the exception of epicardial MAZE procedures; STS excludes these procedures from the registry-based CABG readmission measure cohort because the version of registry data used for measure development did not allow them to differentiate them from open maze procedures. The age range for the proposed CABG readmission and existing NQF-endorsed STS measure cohorts differs; STS measures are specified for age 18 and over, and the proposed CABG readmission measure is currently specified for age 65 and over. However, we have performed testing in patients 18 years and over and determined the measure performs well across all adult patients and payers. The proposed CABG readmission measure is harmonized with the above measures to the extent possible given the different data sources used for development and reporting. 5b.1 If competing, why superior or rationale for additive value: There are no existing NQF-endorsed measures or other measures in current use that have the same measure focus and the same target population as this measure. However, this measure was developed concurrently with a clinical registry data-based readmission measure (Risk-adjusted readmission measure for coronary artery bypass graft (CABG)). The measure steward for the registry-based readmission measure for CABG is also CMS; STS developed the measure. Effort was taken to harmonize both the registry-based and administrative-based measures to the extent possible given the differences in data sources. CMS developed these two "competing" measures at the same time to allow for maximum flexibility in implementation for quality improvement programs across different care settings. The STS cardiac surgery registry currently enrolls most, but not all, patients receiving CABG surgeries in the U.S. The proposed CABG readmission measure will capture all qualifying Medicare FFS patients undergoing CABG regardless of whether their hospital or surgeon participates in the STS registry. This claims-based CABG readmission measure was developed with the goal of producing a measure with the highest scientific rigor and broadest applicability. The measure is harmonized with the above existing and proposed measures to the extent possible given the different data sources used for development and reporting.

	3188 30-Day Unplanned Readmissions for Cancer Patients
Status	Submitted
Steward	Seattle Cancer Care Alliance
Description	30-Day Unplanned Readmissions for Cancer Patients measure is a cancer-specific measure. It provides the rate at which all adult cancer patients covered as Fee-for-Service Medicare beneficiaries have an unplanned readmission within 30 days of discharge from an acute care hospital. The unplanned readmission is defined as a subsequent inpatient admission to a short-term acute care hospital, which occurs within 30 days of the discharge date of an eligible index admission and has an admission type of "emergency" or "urgent."
Type	Outcome
Data Source	Claims (Only) The Medicare 100% Standard Analytic File (SAF) covering CY2013 through CY2016Q1 was used for testing purposes. This contains 100% of the claims for the Fee-for-Service population. The specific files used were the Inpatient file containing information on inpatient claims and the Denominator file containing information on the enrollment and demographics. As these data are released in separate files, the data files were combined by a statistician at Watson Policy Analysis for purposes of measure testing. No data collection instrument provided Attachment 2017_01_13_UnplannedReadm_Cancer_DataDictv1.0.xls
Level	Facility
Setting	Hospital : Acute Care Facility
Numerator Statement	This outcome measure demonstrates the rate at which adult cancer patients have unplanned readmissions within 30 days of discharge from an eligible index admission. The numerator includes all eligible unplanned readmissions to any short-term acute care hospital—defined as admission to a PPS-Exempt Cancer Hospital (PCH), a short-term acute care Prospective Payment (PPS) hospital, or Critical Access Hospital (CAH)—within 30 days of the discharge date from an index admission that is included in the measure denominator. Readmissions with an admission type (UB-04 Uniform Bill Locator 14) of "emergency = 1" or "urgent = 2" are considered unplanned readmissions within this measure. Readmissions for patients with progression of disease (using a principal diagnosis of metastatic disease as a proxy) and for patients with planned admissions for treatment (defined as a principal diagnosis of chemotherapy or radiation therapy) are excluded from the measure numerator.
Numerator Details	The numerator includes readmissions of the following patients with an eligible index admission in the measure denominator: 1) Readmitted to a short-term acute care hospital (PCHs, short-term acute care PPS hospitals, and CAHs) within 30 days of the discharge date of an index admission; and, 2) Readmitted with a Claim Inpatient Admission Type Code of "Emergency" or "Urgent" ("1" or "2"). The following readmissions are excluded from the measure numerator: 1) Primary Claim Diagnosis Code of metastatic disease (ICD-9-CM range: 196-198.89, 209.70-209.79; ICD-10-CM range: C77.0 – C79.9, C7B.0-C7B.8). Rationale: A primary (or principal) diagnosis of metastatic disease serves as a proxy for disease progression. Readmissions for conditions or symptoms associated with disease progression are not reflective of poor clinical care but, rather, advanced disease. 2) Patients with a Primary Claim Diagnosis Code of chemotherapy or radiation encounter (ICD-9-CM range: V58.00-V58.12; ICD-10-CM range: Z51.00 – Z51.12) as these are considered planned admissions.

	3188 30-Day Unplanned Readmissions for Cancer Patients
	Rationale: Readmissions are expected and planned for some patients who require additional cancer treatment in the inpatient setting. These readmissions reflects high-quality care that is focused on patient safety and are reliably distinguishable in claims data. Of note, if a patient has more than one unplanned admission within 30 days of discharge from the index admission, each readmission is only counted once in the numerator.
Denominator Statement	The denominator includes inpatient admissions for all adult Fee-for-Service Medicare beneficiaries where the patient is discharged from a short-term acute care hospital (PCH, short-term acute care PPS hospital, or CAH) with a principal or secondary diagnosis (i.e., not admitting diagnosis) of malignant cancer within the defined measurement period.
Denominator Details	The denominator includes index admissions at acute care hospitals (PCHs, short-term acute care PPS hospitals, and CAHs) for patients with a discharge date during the measurement period that meet the following criterion: 1) Primary Claim Diagnosis Code or Claim Diagnosis Code I-XXV of malignant cancer (ICD-9-CM range: 140.00-209.36, 209.70-209.79, 511.81, 789.51; ICD-10-CM range: C00 – C96.9, J91.0, R18.0). Of note, a readmission that meets the denominator criteria is included as an index admission within this measure if it meets all other eligibility criteria.
Exclusions	The following index admissions are excluded from the measure denominator: 1) Less than 18 years of age; 2) Patients who died during the index admission; 3) Patients discharged AMA; 4) Patients transferred to another acute care hospital during the index admission; 5) Patients discharged with a planned readmission; 6) Patients having missing or incomplete data; and, 7) Patients not admitted to an inpatient bed.
Exclusion details	The following index admissions are excluded from the measure denominator: 1) Age less than 18 years of age (based on the beneficiary's age at the end of the prior year). Rationale: Pediatric patients represent a very small and distinct Medicare population with different characteristics and outcomes. 2) Patient Discharge Status Code indicating "Expired" (20). Rationale: Patients that die during the index admission cannot be readmitted. 3) Patient Discharge Status Code indicating "Left Against Medical Advice" (07). Rationale: The hospital had limited opportunity to ensure the patient was prepared for discharge and had appropriate follow-up care. 4) Patient Discharge Status Code indicating transfer to an acute care facility (02, 05, 09, 30, 43, 66, 69). Rationale: Responsibility for any unplanned readmissions is assigned to the final discharging hospital. Intermediate index admissions within a single episode of care are ineligible for inclusion. 5) Patient Discharge Status Code indicating discharge with a planned readmission (81-95). Rationale: The patient was discharged with a planned readmission, which is ineligible for the measure numerator. 6) Patient Discharge Status Code indicating "Unknown Value" (0, 40-42) or Organization NPI Number = "".

	3188 30-Day Unplanned Readmissions for Cancer Patients
	Rationale: Admissions without a valid discharge status cannot be evaluated for measure exclusions. Admissions with a discharge status reserved for hospice claims only are not admissions for acute care or to acute care hospitals. Claims without an Organizational NPI Number cannot be evaluated for inclusion in the measure. 7) NCH Claim Type Code indicating a claim record type is not an "Inpatient Claim" (all values except 60). Rationale: These admissions are not for acute care or to acute care hospitals.
Risk Adjustment	Statistical risk model 144189| 117432 144189| 117432
Stratification	Measure is not stratified.
Type Score	Rate/proportion better quality = lower score
Algorithm	Please refer to the measure flow logic in the data dictionary. 144189| 117432
Copyright / Disclaimer	5.1 Identified measures: 1789 : Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) 5a.1 Are specs completely harmonized? No 5a.2 If not completely harmonized, identify difference, rationale, impact: The 30-Day Unplanned Readmissions for Cancer Patients measure has a different target population from the HWR measure (NQF #1789), which expressly excludes admissions to PCHs, noting that the PCHs care for a unique patient population that is challenging to compare to other hospitals. Moreover, the HWR measure excludes non-surgical admissions for cancer patients because the outcomes do not correlate well with outcomes for other admissions. Due to the different target populations for each measure, it does not require harmonization with the HWR measure (NQF #1789). 5b.1 If competing, why superior or rationale for additive value:

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