



Measure Information

This document contains the information submitted by measure developers/stewards, but is organized according to NQF's measure evaluation criteria and process. The item numbers refer to those in the submission form but may be in a slightly different order here. In general, the item numbers also reference the related criteria (e.g., item 1b.1 relates to sub criterion 1b).

Brief Measure Information

NQF #: 2393

Corresponding Measures:

De.2. Measure Title: Pediatric All-Condition Readmission Measure

Co.1.1. Measure Steward: Center of Excellence for Pediatric Quality Measurement

De.3. Brief Description of Measure: This measure calculates case-mix-adjusted readmission rates, defined as the percentage of admissions followed by 1 or more readmissions within 30 days, for patients less than 18 years old. The measure covers patients discharged from general acute care hospitals, including children's hospitals.

1b.1. Developer Rationale: Readmissions have become a major focus for improving the quality of health systems. Hospitals, payers, states, and the federal government are seeking to improve the quality of care by measuring and reducing readmissions.

In many cases, readmissions signal how well disease is managed, indicating a worsening of health status that may have been prevented, and can reflect the quality of key processes, including discharge planning and education, care transitions, and follow-up care. The number of children who experience readmissions is substantial, and readmission rates for some conditions are high. Disparities in pediatric readmission exist based on race/ethnicity, socioeconomic status, and special health care needs. Readmission rates vary among hospitals, and effective interventions to reduce readmissions have suggested potential for improvement.

Our candidate measure fills gaps in pediatric quality measurement. It addresses the current dearth of measures that assess inpatient care. It also meets the need for readmission measures developed for use in children. It estimates readmission rates following hospitalization for almost all pediatric conditions. Our measure focuses on patients less than 18 years old, thus complementing adult readmission measures, including the CMS all-cause and condition-specific measures and the NCQA all-cause measure. It uses a case-mix adjustment model specifically developed for pediatric patients, allowing for comparisons among health systems whose patient populations differ in their demographic characteristics or chronic condition status.

An inherent limitation of readmission rates is that they do not indicate which factors most influence readmissions for a given population and are thus most important to address. Gaining these insights requires looking further to identify patterns in why patients were readmitted and which contributing factors could be modified to prevent future readmissions. Measuring readmission rates, however, is an essential first step to gauge the magnitude of the problem and to motivate investigations to understand the causes of readmission, including those that health systems can remedy.

S.4. Numerator Statement: The numerator consists of hospitalizations at general acute care hospitals for patients less than 18 years old that are followed by 1 or more readmissions to general acute care hospitals within 30 days. Readmissions are excluded from the numerator if the readmission was for a planned procedure or for chemotherapy.

The measure outcome is a readmission rate, defined as the percentage of index admissions with 1 or more readmissions within 30 days. The readmission rate, unadjusted for case-mix, is calculated as follows:

number of index admissions with 1 or more readmissions within 30 days/
total number of index admissions

S.6. Denominator Statement: Hospitalizations at general acute care hospitals for patients less than 18 years old.

S.8. Denominator Exclusions: EXCLUSIONS FROM THE NUMERATOR (READMISSIONS) AND DENOMINATOR (INDEX HOSPITALIZATIONS)

We exclude certain hospitalizations from the measure entirely (i.e., from the numerator and denominator) based on clinical criteria

or for issues of data completeness or quality that could prevent assessment of eligibility for the measure cohort or compromise the accuracy of readmission rates. Hospitalizations are excluded from the measure if they meet any of the following criteria:

1. The hospitalization was at a specialty or non-acute care hospital.

Rationale: The focus of the measure is admissions to hospitals that provide general pediatric acute care. Records for admissions to specialty and non-acute care hospitals are therefore omitted from the dataset. Because hospital type cannot be determined for records with missing data in the hospital type variable, these records are also removed from the dataset.

2. Records for the hospitalization contain incomplete data for variables needed to assess eligibility for the measure or calculate readmission rates, including hospital type, patient identifier, admission date, discharge date, disposition status, date of birth, primary ICD-9 or principal ICD-10 diagnosis codes, or gender.

Rationale: Complete and valid information for the variables listed above is needed to define the measure cohort and calculate case-mix-adjusted readmission rates. Identifying readmissions within 30 days requires information on dates of admission and end-of-service dates and the ability to link unique patient identifiers across inpatient claims records. Hospital identifiers are needed to determine the hospital at which index admissions occurred. The disposition status is needed to determine whether a patient was discharged or experienced some other outcome (e.g., was transferred to another acute care hospital, left against medical advice, died). Establishing a patient's eligibility for membership in the pediatric cohort and performing case-mix adjustment requires an accurate date of birth and end-of-service date. Because gender is 1 of the variables used for case-mix adjustment, episodes of care with missing or inconsistent gender cannot be evaluated in the measure.

3. Records for the hospitalization contain data of questionable quality for calculating readmission rates, including

- a. Inconsistent date of birth across records for a patient.
- b. Discharge date prior to admission date.
- c. Admission or discharge date prior to date of birth.
- d. Admission date after a disposition status of death during a prior hospitalization.

Rationale: Complete and valid information for the variables listed above is needed to define the measure cohort and calculate case-mix-adjusted readmission rates. Identifying readmissions within 30 days requires information on dates of admission and end-of-service. A valid disposition status is needed to determine whether a patient was discharged or experienced some other outcome (e.g., was transferred to another acute care hospital, left against medical advice, died). Establishing a patient's eligibility for membership in the pediatric cohort and performing case-mix adjustment requires an accurate date of birth and end-of-service date.

4. Codes other than ICD-9 or ICD-10 codes are used for the primary procedure.

Rationale: ICD-9 or ICD-10 procedure codes are necessary for applying clinical exclusions.

5. The patient was older than 18 years, 29 days at the time of admission.

Rationale: This age exclusion limits the population to pediatric patients and prevents inclusion of records that overlap with adult readmission measures. Age eligibility for inclusion in the measure is based on age at the time of discharge from the index admission. Because the focus of the measure is pediatric patients, a patient's hospitalization is ineligible for inclusion in the measure as an index admission if the patient was 18 years old or greater at the time of discharge. Because the subsequent observation period for readmissions is 30 days, a patient's hospitalization is ineligible for inclusion in the measure as a readmission if the patient was older than 18 years, 29 days at the start of the readmission.

6. The hospitalization was for obstetric care, including labor and delivery.

Rationale: Hospitalizations for obstetric conditions are excluded because care related to pregnancy does not generally fall within the purview of pediatric providers.

7. The primary ICD-9 or principal ICD-10 diagnosis code was for a mental health condition.

Rationale: Hospitalizations for mental health conditions are excluded because patients admitted for psychiatric treatment are typically cared for in separate psychiatric centers that are not comparable to short-term acute care hospitals. We describe this analysis in detail in Section 2b.3 of the Measure Testing Submission Form.

8. The hospitalization was for birth of a healthy newborn.

Rationale: Hospitalizations for birth of healthy newborns are excluded because these hospitalizations, unlike all others, are not for evaluation and management of disease.

EXCLUSIONS FROM THE DENOMINATOR ONLY (INDEX HOSPITALIZATIONS ONLY)

We also apply further exclusions to the denominator only (i.e., these hospitalizations are excluded from index hospitalizations but could still meet criteria for readmissions). Hospitalizations are excluded from the denominator only if they meet any of the following criteria:

9. The patient was 18 years old or older at the time of discharge.

Rationale: Age eligibility for inclusion in the measure is based on age at the time of discharge from the index admission. Because the measure covers pediatric patients, a patient's hospitalization is ineligible for inclusion in the measure as an index admission if the patient was 18 years old or greater at the time of discharge.

10. The discharge disposition was death.

Rationale: A patient must be discharged alive from an index admission in order to be readmitted. Therefore, any record with a discharge disposition of death cannot serve as an index admission.

11. The discharge disposition was leaving the hospital against medical advice.

Rationale: A discharge disposition of leaving against medical advice indicates that a patient left care before the hospital determined that the patient was ready to leave.

12. The hospital has less than 80% of records with complete patient identifier, admission date, and discharge date or less than 80% of records with complete primary ICD-9 or principal ICD-10 diagnosis codes. (Records for these hospitals are still assessed as possible readmissions, but readmission rates are not calculated for these hospitals due to their lack of complete data.)

Rationale: Readmission rates are not calculated for hospitals missing large amounts of data for the above variables because these hospitals have limited data to accurately apply measure cohort exclusions and calculate case-mix-adjusted readmission rates.

Assessing eligibility for the measure cohort and performing case-mix adjustment requires information on admission dates, end-of-service dates, and diagnosis codes. Identifying readmissions requires information on admission dates and end-of-service dates and the ability to link unique patient identifiers across inpatient claims records.

13. The hospital is in a state not being analyzed.

Rationale: A claims database used for readmission analysis may contain records for hospitals located in states that are not included in the database (because covered patients may sometimes be admitted to out-of-state hospitals). Records for these out-of-state hospital admissions are not excluded from the measure dataset because these records may meet criteria for being counted as readmissions as part of an in-state hospital's readmission rate. However, readmission rates are not calculated for out-of-state hospitals due to the lack of complete data for these hospitals.

14. Thirty days of follow-up data are not available for assessing readmissions.

Rationale: Identifying readmissions within 30 days requires a full 30 days of follow-up data.

De.1. Measure Type: Outcome

S.17. Data Source: Claims

S.20. Level of Analysis: Facility

IF Endorsement Maintenance – Original Endorsement Date: Dec 23, 2014 **Most Recent Endorsement Date:** Dec 09, 2016

IF this measure is included in a composite, NQF Composite#/title:

IF this measure is paired/grouped, NQF#/title:

De.4. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results? Not applicable.

1. Evidence, Performance Gap, Priority – Importance to Measure and Report

Extent to which the specific measure focus is evidence-based, important to making significant gains in healthcare quality, and improving health outcomes for a specific high-priority (high-impact) aspect of healthcare where there is variation in or overall less-than-optimal performance. ***Measures must be judged to meet all sub criteria to pass this criterion and be evaluated against the remaining criteria.***

1a. Evidence to Support the Measure Focus – See attached Evidence Submission Form

[Pediatric_All-Condition_Readmission_Measure_-NQF-_2393-_Evidence_Form_2014-02-05-635272129109687507.pdf](#)

1a.1 For Maintenance of Endorsement: Is there new evidence about the measure since the last update/submission?

Do not remove any existing information. If there have been any changes to evidence, the Committee will consider the new evidence. Please use the most current version of the evidence attachment (v7.1). Please use red font to indicate updated evidence.

1b. Performance Gap

Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating:

- considerable variation, or overall less-than-optimal performance, in the quality of care across providers; and/or
- Disparities in care across population groups.

1b.1. Briefly explain the rationale for this measure (e.g., how the measure will improve the quality of care, the benefits or improvements in quality envisioned by use of this measure)

If a COMPOSITE (e.g., combination of component measure scores, all-or-none, any-or-none), SKIP this question and answer the composite questions.

Readmissions have become a major focus for improving the quality of health systems. Hospitals, payers, states, and the federal government are seeking to improve the quality of care by measuring and reducing readmissions.

In many cases, readmissions signal how well disease is managed, indicating a worsening of health status that may have been prevented, and can reflect the quality of key processes, including discharge planning and education, care transitions, and follow-up care. The number of children who experience readmissions is substantial, and readmission rates for some conditions are high. Disparities in pediatric readmission exist based on race/ethnicity, socioeconomic status, and special health care needs. Readmission rates vary among hospitals, and effective interventions to reduce readmissions have suggested potential for improvement.

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1b.2. Provide performance scores on the measure as specified (current and over time) at the specified level of analysis. *(This is required for maintenance of endorsement. Include mean, std dev, min, max, interquartile range, scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include.) This information also will be used to address the sub-criterion on improvement (4b1) under Usability and Use.*

Not applicable.

1b.3. If no or limited performance data on the measure as specified is reported in 1b2, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement.

READMISSIONS: A QUALITY GAP

Readmissions disrupt the lives of patients and families, expose patients to risks of harm during hospitalization, and are costly. The number of children who experience readmissions is substantial, and readmission rates for some conditions are high. In many cases, readmissions signal how well disease is managed, indicating a worsening of health status that may have been prevented. They also can reflect the quality of key processes, including discharge planning and education, care transitions, and follow-up care. In addition, disparities in pediatric readmission exist based on race/ethnicity, socioeconomic status, and special health care needs. Readmission rates vary among hospitals, and effective interventions to reduce readmissions have suggested potential for improvement.

VARIATION IN READMISSION RATES

Multiple studies have revealed variation in pediatric readmission rates, suggesting that at least some health systems have the potential to reduce readmissions. A study of readmissions following hospitalization at both children's and non-children's hospitals for 7 common conditions identified few hospitals that met criteria for being an outlier but found significant variation in readmission rates across hospitals for all but 1 condition.[1] In a study of readmissions to children's hospitals, readmission rates varied significantly across hospitals for 8 of the 10 diagnoses with the highest number of readmissions.[2]

POTENTIAL FOR QUALITY IMPROVEMENT

Adults at high risk of readmission toward whom interventions to reduce readmissions could be targeted include those who are older, have chronic or multiple co-morbidities, possess limited financial resources, or lack social or emotional support.[3–6]

Most evidence for strategies to improve readmission rates arises from studies of adults, particularly those greater than 65 years old with cardiac conditions.[7] Results for multi-component interventions are most promising,[8–14] whereas those for single-component interventions are mixed.[4,15–18] Single-component interventions effective in reducing readmissions for patients with heart failure include home visits and telephone or telemonitoring follow-up.[19,20] Multi-component interventions have reduced readmissions in several adult populations with various clinical conditions. These interventions include use of a primary care medical home model,[8] multi-disciplinary heart failure care management,[9] and provision of inpatient care in an interdisciplinary Acute Care for Elders unit.[10] Effective multi-component interventions aimed at improving peri-discharge management include comprehensive discharge planning plus post-discharge support for heart failure and involvement of advanced practice clinicians.[11–14] In addition, a number of national and other large-scale efforts are addressing readmission rates for adults by improving care transitions.[21–25]

In children, Medicaid insurance and having complex chronic conditions are associated with higher readmission rates.[26–31] Non-White race has also been identified as a risk factor.[29] Disease-specific readmission risk factors have been described for patients with sickle cell disease and asthma.[32–35] The relationship of having a medical home with hospitalizations is variable,[36–38] but having poor access to a medical home may be associated with increased readmissions.[39]

Interventions to reduce readmissions for children have not yet been widely studied.[40] However, as in adults, improving the quality of care during the peri-discharge period and the transition period to home, particularly with regard to knowledge reinforcement and self-management activation for children with chronic illnesses that require substantial self-management (e.g., asthma, sickle cell disease), is effective in decreasing readmissions.[41–45]

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1b.4. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability. *(This is required for maintenance of endorsement. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included.) For measures that show high levels of performance, i.e., "topped out", disparities data may demonstrate an opportunity for improvement/gap in care for certain sub-populations. This information also will be used to address the sub-criterion on improvement (4b1) under Usability and Use.*

We developed and tested the measure using 2008 MAX data for 26 states, which include Medicaid claims from 395,754 index hospitalizations at 2,111 children's and non-children's hospitals. We also used 2005-2009 AHRQ Revisit data for New York and Nebraska, which include claims for all payers from 758,347 index hospitalizations at 260 children's and non-children's hospitals, to evaluate disparities in readmission risk associated with race/ethnicity and insurance status. We chose which states' data to use based on assessment of data quality and completeness. Both datasets can be used to evaluate readmissions back to the same hospital or to different hospitals.

DISPARITIES ASSOCIATED WITH RACE/ETHNICITY

We assessed disparities in readmission risk associated with race/ethnicity using both 2005-2009 AHRQ Revisit data for New York (all-payer) and the MAX dataset (Medicaid only). AHRQ Revisit data for Nebraska do not include a race/ethnicity variable and so could not be used in the analysis.

Race/ethnicity is recorded in AHRQ Revisit data using the categories Asian or Pacific Islander, Black, Hispanic, Native American, Other, or White. For our analysis, we combined the Asian or Pacific Islander, Native American, and Other categories into a single "Other" category because each category contained a very small number of observations. We found that compared with White patients, Black patients (odds ratio [OR] 1.18, 95% CI 1.13–1.22; $p < .001$) and Hispanic patients (OR 1.24, 95% CI 1.20–1.29; $p < .001$) had higher odds of readmission, independent of case-mix (age, gender, and chronic conditions) and index admission hospital.

Race/ethnicity is recorded in MAX data using the categories Asian/Pacific Islander, Black, Latino, Mixed race, Native American, or White. When we assessed the relationship between readmission risk and each race/ethnicity category using White patients as the reference group, controlling for case-mix (age, gender, and chronic conditions) and index admission hospital, we found no significant differences in the odds of readmission.

The finding of a higher likelihood of readmission for Black and Hispanic patients compared with White patients in our all-payer dataset but not in our Medicaid-only dataset suggests that socioeconomic status, as reflected by insurance status, might explain at least some of the apparent difference in readmission risk. To test this hypothesis, we repeated the race/ethnicity analysis in the AHRQ Revisit New York dataset and also controlled for insurance status. We found that the differences in readmission risk for Black patients (OR 1.07, 95% CI 1.05–1.13; $p < .001$) or Hispanic patients (OR 1.13, 95% CI 1.08–1.19; $p < .001$) compared with White patients were attenuated but not eliminated. This finding suggests some association, at least for this particular patient sample, of race/ethnicity with higher readmission risk, independent of insurance status.

DISPARITIES ASSOCIATED WITH INSURANCE STATUS

We assessed disparities in readmission risk associated with insurance status using 2005-2009 AHRQ Revisit New York and Nebraska data. We found that compared with Medicaid-insured patients, the odds of readmission were significantly lower for those who had

private insurance (OR 0.76, 95% CI 0.75–0.78; $p < .001$), other types of insurance (such as Medicare or other government-sponsored insurance)(OR 0.85, 95% CI 0.78–0.92; $p < .001$), or self-pay status (OR 0.73, 95% CI 0.69–0.78; $p < .001$) independent of case-mix (age, gender, and chronic conditions) and index admission hospital.

We also evaluated whether a given hospital's readmission performance tends to correlate among patients with different insurance statuses. We fitted the measure model to 2005–2009 AHRQ Revisit New York and Nebraska data, adding a random slope indicator variable for Medicaid, private insurance, and self-pay statuses (we were unable to include an indicator variable for other types of insurance because the model would not converge, perhaps due to low numbers of observations in this category at some hospitals). We found that the regression coefficients were highly correlated among different insurance statuses. Correlations were 0.84 for Medicaid and self-pay, 0.92 for Medicaid and private insurance, and 0.90 for private insurance and self-pay. This finding indicates that hospitals tend to have similarly high or low readmission rates for patients with different insurance statuses, suggesting that disparities in readmission risk associated with insurance status tend to occur between rather than within hospitals.

DISPARITIES ASSOCIATED WITH RURALITY/URBANICITY

Using our MAX dataset, we assessed disparities in readmission risk associated with residence in rural versus urban areas. We used patients' 5-digit zip codes to assign rural-urban commuting area (RUCA) codes, which are a Census tract-based classification system that uses Bureau of Census Urbanized Area and Urban Cluster definitions together with work commuting information to characterize Census tracts regarding their rural and urban status.[1] We then used the RUCA codes to assign the area of each patient's residence to 1 of 5 levels of a rurality/urbanicity classification scheme created by the Dartmouth Atlas Working Group: urban core, suburban, large town, small town, or isolated rural.[2]

Controlling for case-mix (age, gender, and chronic conditions) and index admission hospital, we found that readmission risk did not vary significantly among the 5 levels of rurality/urbanicity ($p = .22$ for chi-square test).

REFERENCES

1. WWAMI Rural Health Research Center. UW RHRC rural urban commuting area codes - RUCA. Available at: <http://depts.washington.edu/uwruca/>. Accessed October 2, 2013.
2. Dartmouth Atlas Working Group. PCSA-RUCA (rural-urban commuting areas) designations. 2007. Available at: http://www.dartmouthatlas.org/downloads/pcsa/crosswalks/PCSA_RUCA_README.pdf. Accessed October 3, 2013.

1b.5. If no or limited data on disparities from the measure as specified is reported in 1b.4, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement. Include citations. Not necessary if performance data provided in 1b.4

Not applicable.

2. Reliability and Validity—Scientific Acceptability of Measure Properties

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. **Measures must be judged to meet the sub criteria for both reliability and validity to pass this criterion and be evaluated against the remaining criteria.**

2a.1. Specifications The measure is well defined and precisely specified so it can be implemented consistently within and across organizations and allows for comparability. eMeasures should be specified in the Health Quality Measures Format (HQMF) and the Quality Data Model (QDM).

De.5. Subject/Topic Area (check all the areas that apply):

Cancer, Cancer : Bladder, Cancer : Breast, Cancer : Colorectal, Cancer : Gynecologic, Cancer : Hematologic, Cancer : Liver, Cancer : Lung, Esophageal, Cancer : Skin, Cardiovascular, Cardiovascular : Arrhythmia, Cardiovascular : Congestive Heart Failure, Cardiovascular : Coronary Artery Disease, Cardiovascular : Coronary Artery Disease (AMI), Cardiovascular : Coronary Artery Disease (PCI), Cardiovascular : Hyperlipidemia, Cardiovascular : Hypertension, Critical Care, Dental, Ears, Nose, Throat (ENT), Ears, Nose, Throat (ENT) : Ear Infection, Ears, Nose, Throat (ENT) : Hearing, Ears, Nose, Throat (ENT) : Pharyngitis, Endocrine, Endocrine : Diabetes, Endocrine : Thyroid Disorders, Eye Care, Gastrointestinal (GI), Gastrointestinal (GI) : Gall Bladder Disease, Gastrointestinal (GI) : Gastroenteritis, Gastrointestinal (GI) : Gastro-Esophageal Reflux Disease (GERD), Gastrointestinal (GI) : Peptic Ulcer, Genitourinary (GU), Genitourinary (GU) : Incontinence/pelvic floor disorders, Infectious Diseases (ID), Infectious Diseases (ID) : HIV/AIDS, Infectious Diseases (ID) : Pneumonia and respiratory infections, Infectious Diseases (ID) : Sexually Transmitted, Infectious

Diseases (ID) : Tuberculosis, Liver : Viral Hepatitis, Musculoskeletal, Musculoskeletal : Falls and Traumatic Injury, Musculoskeletal : Joint Surgery, Musculoskeletal : Low Back Pain, Musculoskeletal : Osteoarthritis, Musculoskeletal : Osteoporosis, Musculoskeletal : Rheumatoid Arthritis, Neurology, Neurology : Brain Injury, Neurology : Stroke/Transient Ischemic Attack (TIA), Perinatal Health : Newborn Care, Perinatal Health : Preconception Care, Renal, Renal : Chronic Kidney Disease (CKD), Renal : End Stage Renal Disease (ESRD), Respiratory, Respiratory : Asthma, Respiratory : Chronic Obstructive Pulmonary Disease (COPD), Respiratory : Dyspnea, Respiratory : Pneumonia, Respiratory : Sleep Apnea, Surgery, Surgery : Cardiac Surgery, Surgery : General Surgery, Surgery : Perioperative and Anesthesia, Surgery : Thoracic Surgery, Surgery : Vascular Surgery

De.6. Non-Condition Specific(check all the areas that apply):

Care Coordination, Care Coordination : Readmissions, Care Coordination : Transitions of Care

De.7. Target Population Category (Check all the populations for which the measure is specified and tested if any):

Children, Populations at Risk, Populations at Risk : Individuals with multiple chronic conditions

S.1. Measure-specific Web Page (Provide a URL link to a web page specific for this measure that contains current detailed specifications including code lists, risk model details, and supplemental materials. Do not enter a URL linking to a home page or to general information.)

Not applicable.

S.2a. If this is an eMeasure, HQMF specifications must be attached. Attach the zipped output from the eMeasure authoring tool (MAT) - if the MAT was not used, contact staff. (Use the specification fields in this online form for the plain-language description of the specifications)

This is not an eMeasure Attachment:

S.2b. Data Dictionary, Code Table, or Value Sets (and risk model codes and coefficients when applicable) must be attached. (Excel or csv file in the suggested format preferred - if not, contact staff)

Attachment Attachment: 2018_ICD-10_All_Condition_Readmission_Data_Dictionary.xlsx

S.2c. Is this an instrument-based measure (i.e., data collected via instruments, surveys, tools, questionnaires, scales, etc.)? Attach copy of instrument if available.

Attachment:

S.2d. Is this an instrument-based measure (i.e., data collected via instruments, surveys, tools, questionnaires, scales, etc.)? Attach copy of instrument if available.

S.3.1. For maintenance of endorsement: Are there changes to the specifications since the last updates/submission. If yes, update the specifications for S1-2 and S4-22 and explain reasons for the changes in S3.2.

S.3.2. For maintenance of endorsement, please briefly describe any important changes to the measure specifications since last measure update and explain the reasons.

Not applicable. Not applicable.

S.4. Numerator Statement (Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome) DO NOT include the rationale for the measure.

IF an OUTCOME MEASURE, state the outcome being measured. Calculation of the risk-adjusted outcome should be described in the calculation algorithm (S.14).

The numerator consists of hospitalizations at general acute care hospitals for patients less than 18 years old that are followed by 1 or more readmissions to general acute care hospitals within 30 days. Readmissions are excluded from the numerator if the readmission was for a planned procedure or for chemotherapy.

The measure outcome is a readmission rate, defined as the percentage of index admissions with 1 or more readmissions within 30 days. The readmission rate, unadjusted for case-mix, is calculated as follows:

number of index admissions with 1 or more readmissions within 30 days/
total number of index admissions

S.5. Numerator Details *(All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)*

IF an OUTCOME MEASURE, describe how the observed outcome is identified/counted. Calculation of the risk-adjusted outcome should be described in the calculation algorithm (S.14).

A readmission is operationalized as the first unplanned admission to any acute care hospital within 30 days of discharge from a prior hospitalization at an acute care hospital. This prior admission, which serves as the reference point for enumerating 30-day readmissions, is the index admission. Additional admissions within 30 days from discharge from an index admission are not counted as index admissions. An admission more than 30 days from discharge from an index admission is counted as a new index admission.

We chose 30 days as the follow-up period during which to evaluate readmissions for multiple reasons. Readmissions within 30 days seem likely to reflect the quality of care provided both in the hospital and following discharge, which is consistent with the measure's intended purpose of assessing quality not just for a hospital but also for its wider health system. A follow-up period of 30 days is consistent with many readmission measures already in use, including the CMS readmission measures for adults. In addition, when we used a time-to-event curve to evaluate the proportion of readmissions within 1 year that occur within timeframes from 1 day up to 365 days, we observed a smooth curve with no obvious break to suggest an alternative follow-up period.

Readmissions are excluded if they are for a planned procedure or for chemotherapy. Readmissions for planned procedures and for chemotherapy are part of a patient's intended course of care and thus unlikely to be related to health system quality. This measure therefore focuses on unplanned readmissions because they are more likely to be related to a defect in quality of care during the index admission or during the interval between the index admission and readmission. In adult and pediatric medicine, most planned readmissions are for planned procedures or chemotherapy; therefore, these exclusions are intended to capture the majority of planned readmissions.

We identify planned procedures using an algorithm based on primary procedure codes. Expert pediatric clinicians in 15 different procedure-oriented specialties reviewed procedures typically performed by their specialty. The reviewers indicated which procedures (1) are usually planned (defined as planned in more than 80% of cases) and (2) could require hospitalization. Admissions for which the primary International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) procedure code or the principal International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS) procedure code for a planned procedure coded was 1 of these procedures are excluded from readmissions. ICD-9-CM codes will henceforth be referred to as ICD-9 codes. ICD-10-CM diagnosis codes and ICD-10 Procedure Coding System (PCS) codes will be referred to as ICD-10 diagnosis and ICD-10 procedure codes, respectively.

EXCLUSIONS FROM THE NUMERATOR (READMISSIONS):

- Hospitalizations with a primary ICD-9 code or a principal ICD-10 code for a planned procedure (i.e., planned = 1).
- Hospitalizations with a primary ICD-9 or a principal ICD-10 diagnosis or procedure code for chemotherapy (i.e., chemo = 1).

These exclusions are applied without deleting the records from the dataset as these hospitalizations may still meet criteria for index admissions, detailed in Section S.10.

Variable definitions and ICD-9 or ICD-10 codes for identifying readmissions for planned procedures and for chemotherapy are provided in the Data Dictionary.

If a planned readmission occurs within 30 days of an index admission, it does not count as a readmission against the index admission, and no subsequent admissions occurring within 30 days of discharge from the index admission count as readmissions against the index admission. After 30 days from discharge from the index admission, a new index admission can be counted. A readmission is operationalized as the first unplanned admission to any acute care hospital within 30 days of discharge from a prior hospitalization at an acute care hospital. This prior admission, which serves as the reference point for enumerating 30-day readmissions, is the index admission. Additional admissions within 30 days from discharge from an index admission are not counted as index admissions. An admission more than 30 days from discharge from an index admission is counted as a new index admission.

We chose 30 days as the follow-up period during which to evaluate readmissions for multiple reasons. Readmissions within 30 days seem likely to reflect the quality of care provided both in the hospital and following discharge, which is consistent with the measure's intended purpose of assessing quality not just for a hospital but also for its wider health system. A follow-up period of 30 days is consistent with many readmission measures already in use, including the CMS readmission measures for adults. In addition, when we used a time-to-event curve to evaluate the proportion of readmissions within 1 year that occur within timeframes from 1 day up to 365 days, we observed a smooth curve with no obvious break to suggest an alternative follow-up period.

Readmissions are excluded if they are for a planned procedure or for chemotherapy. Readmissions for planned procedures and for chemotherapy are part of a patient's intended course of care and thus unlikely to be related to health system quality. This measure therefore focuses on unplanned readmissions because they are more likely to be related to a defect in quality of care during the index admission or during the interval between the index admission and readmission. In adult and pediatric medicine, most planned readmissions are for planned procedures or chemotherapy; therefore, these exclusions are intended to capture the majority of planned admissions.

We identify planned procedures using an algorithm based on primary procedure codes. Expert pediatric clinicians in 15 different procedure-oriented specialties reviewed procedures typically performed by their specialty. The reviewers indicated which procedures (1) are usually planned (defined as planned in more than 80% of cases) and (2) could require hospitalization. Admissions for which the primary International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) procedure code or the principal International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS) procedure code for a planned procedure coded was 1 of these procedures are excluded from readmissions. ICD-9-CM and ICD-10-PCS will henceforth be referred to as ICD-9 and ICD-10, respectively.

EXCLUSIONS FROM THE NUMERATOR (READMISSIONS):

- Hospitalizations with a primary ICD-9 code or a principal ICD-10 code for a planned procedure (i.e., planned = 1).
 - Hospitalizations with a primary ICD-9 or a principal ICD-10 diagnosis or procedure code for chemotherapy (i.e., chemo = 1).
- These exclusions are applied without deleting the records from the dataset as these hospitalizations may still meet criteria for index admissions, detailed in Section S.10.

If a planned readmission occurs within 30 days of an index admission, it does not count as a readmission against the index admission, and no subsequent admissions occurring within 30 days of discharge from the index admission count as readmissions against the index admission. After 30 days from discharge from the index admission, a new index admission can be counted.

S.6. Denominator Statement *(Brief, narrative description of the target population being measured)*

Hospitalizations at general acute care hospitals for patients less than 18 years old.

S.7. Denominator Details *(All information required to identify and calculate the target population/denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b.)*

IF an OUTCOME MEASURE, describe how the target population is identified. Calculation of the risk-adjusted outcome should be described in the calculation algorithm (S.14).

All index hospitalizations are included in the denominator unless excluded based on 1 of the criteria in Sections S.10 and S.11 below.

S.8. Denominator Exclusions *(Brief narrative description of exclusions from the target population)*

EXCLUSIONS FROM THE NUMERATOR (READMISSIONS) AND DENOMINATOR (INDEX HOSPITALIZATIONS)

We exclude certain hospitalizations from the measure entirely (i.e., from the numerator and denominator) based on clinical criteria or for issues of data completeness or quality that could prevent assessment of eligibility for the measure cohort or compromise the accuracy of readmission rates. Hospitalizations are excluded from the measure if they meet any of the following criteria:

1. The hospitalization was at a specialty or non-acute care hospital.

Rationale: The focus of the measure is admissions to hospitals that provide general pediatric acute care. Records for admissions to specialty and non-acute care hospitals are therefore omitted from the dataset. Because hospital type cannot be determined for records with missing data in the hospital type variable, these records are also removed from the dataset.

2. Records for the hospitalization contain incomplete data for variables needed to assess eligibility for the measure or calculate readmission rates, including hospital type, patient identifier, admission date, discharge date, disposition status, date of birth, primary ICD-9 or principal ICD-10 diagnosis codes, or gender.

Rationale: Complete and valid information for the variables listed above is needed to define the measure cohort and calculate case-mix-adjusted readmission rates. Identifying readmissions within 30 days requires information on dates of admission and end-of-service dates and the ability to link unique patient identifiers across inpatient claims records. Hospital identifiers are needed to determine the hospital at which index admissions occurred. The disposition status is needed to determine whether a patient was discharged or experienced some other outcome (e.g., was transferred to another acute care hospital, left against medical advice, died). Establishing a patient's eligibility for membership in the pediatric cohort and performing case-mix adjustment requires an accurate date of birth and end-of-service date. Because gender is 1 of the variables used for case-mix adjustment, episodes of care with missing or inconsistent gender cannot be evaluated in the measure.

3. Records for the hospitalization contain data of questionable quality for calculating readmission rates, including

- a. Inconsistent date of birth across records for a patient.
- b. Discharge date prior to admission date.
- c. Admission or discharge date prior to date of birth.
- d. Admission date after a disposition status of death during a prior hospitalization.

Rationale: Complete and valid information for the variables listed above is needed to define the measure cohort and calculate case-mix-adjusted readmission rates. Identifying readmissions within 30 days requires information on dates of admission and end-of-service. A valid disposition status is needed to determine whether a patient was discharged or experienced some other outcome (e.g., was transferred to another acute care hospital, left against medical advice, died). Establishing a patient's eligibility for membership in the pediatric cohort and performing case-mix adjustment requires an accurate date of birth and end-of-service date.

4. Codes other than ICD-9 or ICD-10 codes are used for the primary procedure.

Rationale: ICD-9 or ICD-10 procedure codes are necessary for applying clinical exclusions.

5. The patient was older than 18 years, 29 days at the time of admission.

Rationale: This age exclusion limits the population to pediatric patients and prevents inclusion of records that overlap with adult readmission measures. Age eligibility for inclusion in the measure is based on age at the time of discharge from the index admission. Because the focus of the measure is pediatric patients, a patient's hospitalization is ineligible for inclusion in the measure as an index admission if the patient was 18 years old or greater at the time of discharge. Because the subsequent observation period for readmissions is 30 days, a patient's hospitalization is ineligible for inclusion in the measure as a readmission if the patient was older than 18 years, 29 days at the start of the readmission.

6. The hospitalization was for obstetric care, including labor and delivery.

Rationale: Hospitalizations for obstetric conditions are excluded because care related to pregnancy does not generally fall within the purview of pediatric providers.

7. The primary ICD-9 or principal ICD-10 diagnosis code was for a mental health condition.

Rationale: Hospitalizations for mental health conditions are excluded because patients admitted for psychiatric treatment are typically cared for in separate psychiatric centers that are not comparable to short-term acute care hospitals. We describe this analysis in detail in Section 2b.3 of the Measure Testing Submission Form.

8. The hospitalization was for birth of a healthy newborn.

Rationale: Hospitalizations for birth of healthy newborns are excluded because these hospitalizations, unlike all others, are not for evaluation and management of disease.

EXCLUSIONS FROM THE DENOMINATOR ONLY (INDEX HOSPITALIZATIONS ONLY)

We also apply further exclusions to the denominator only (i.e., these hospitalizations are excluded from index hospitalizations but could still meet criteria for readmissions). Hospitalizations are excluded from the denominator only if they meet any of the following criteria:

9. The patient was 18 years old or older at the time of discharge.

Rationale: Age eligibility for inclusion in the measure is based on age at the time of discharge from the index admission. Because the measure covers pediatric patients, a patient's hospitalization is ineligible for inclusion in the measure as an index admission if the

patient was 18 years old or greater at the time of discharge.

10. The discharge disposition was death.

Rationale: A patient must be discharged alive from an index admission in order to be readmitted. Therefore, any record with a discharge disposition of death cannot serve as an index admission.

11. The discharge disposition was leaving the hospital against medical advice.

Rationale: A discharge disposition of leaving against medical advice indicates that a patient left care before the hospital determined that the patient was ready to leave.

12. The hospital has less than 80% of records with complete patient identifier, admission date, and discharge date or less than 80% of records with complete primary ICD-9 or principal ICD-10 diagnosis codes. (Records for these hospitals are still assessed as possible readmissions, but readmission rates are not calculated for these hospitals due to their lack of complete data.)

Rationale: Readmission rates are not calculated for hospitals missing large amounts of data for the above variables because these hospitals have limited data to accurately apply measure cohort exclusions and calculate case-mix-adjusted readmission rates. Assessing eligibility for the measure cohort and performing case-mix adjustment requires information on admission dates, end-of-service dates, and diagnosis codes. Identifying readmissions requires information on admission dates and end-of-service dates and the ability to link unique patient identifiers across inpatient claims records.

13. The hospital is in a state not being analyzed.

Rationale: A claims database used for readmission analysis may contain records for hospitals located in states that are not included in the database (because covered patients may sometimes be admitted to out-of-state hospitals). Records for these out-of-state hospital admissions are not excluded from the measure dataset because these records may meet criteria for being counted as readmissions as part of an in-state hospital's readmission rate. However, readmission rates are not calculated for out-of-state hospitals due to the lack of complete data for these hospitals.

14. Thirty days of follow-up data are not available for assessing readmissions.

Rationale: Identifying readmissions within 30 days requires a full 30 days of follow-up data.

S.9. Denominator Exclusion Details *(All information required to identify and calculate exclusions from the denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b.)*

DATA PREPARATION AND APPLICATION OF EXCLUSIONS TO THE MEASURE COHORT (NUMERATOR AND DENOMINATOR) AND TO THE DENOMINATOR ONLY

Steps 1 through 8, below, describe the data preparation steps to implement and the exclusions to apply to the measure cohort (numerator and denominator) and to the denominator only before fitting the pediatric all-condition readmission model to inpatient claims data.

STEP 1: IDENTIFY HOSPITALS ELIGIBLE FOR INCLUSION IN THE MEASURE

This measure focuses on calculating pediatric readmission rates for general acute care hospitalizations. Criteria for retaining only hospitals identified as general acute care facilities are specified below.

Exclusions at the Hospital Level:

- Drop records for specialty and non-acute care hospitals: For the list of American Hospital Association (AHA) hospital codes and Centers for Medicare & Medicaid Services (CMS) taxonomy codes for general acute care hospitals eligible for inclusion in the measure, see the Data Dictionary submitted in Section S.2b. Drop records for a hospital if the records contain only an AHA code or only a CMS code and the code is NOT for a general acute care hospital. If a hospital's records include both an AHA and a CMS code, drop the records for the hospital if either code is NOT for a general acute care hospital.
- Drop records for which hospital type is missing.

STEP 2: IDENTIFY HOSPITALS FOR WHICH READMISSION RATES SHOULD NOT BE CALCULATED

Hospitals with very incomplete data may lack adequate information to calculate accurate readmission rates. Readmission rates should therefore not be evaluated for these hospitals (i.e., their admissions should not be included in the measure as index admissions). To provide an accurate assessment based on the full dataset, data completeness at the hospital level should be assessed before excluding individual records for data quality or clinical criteria. Criteria for identifying hospitals for which

readmission rates should not be calculated are listed below.

Exclusions at the Hospital Level for Calculating Readmission Rates:

- Hospitals with less than 80% of records with complete unique patient identifier, admission date, and end-of-service date
- Hospitals with less than 80% of records with complete primary ICD-9 or principal ICD-10 diagnosis code
- Out-of-state hospitals

Create a dichotomous variable named “hosp_noindex,” coded 1 for hospitals meeting the above exclusion criteria (this variable will be used to exclude these hospitals’ admissions from being evaluated as index admissions) and 0 for all other hospitals. Although readmission rates should not be calculated for these hospitals, these hospitals’ records should remain in the dataset so that their admissions can be evaluated as potential readmissions for other hospitals.

STEP 3: EXCLUDE PATIENTS WHO HAVE MISSING OR INVALID DATA FOR ANALYZING READMISSIONS

Exclusions at the Patient Level:

- Drop all records for a patient if ANY record is missing patient identifier, hospital identifier, admission date, end-of-service date, or disposition status.
- Drop all records for a patient if date of birth is missing in ALL records.
- Drop all records for a patient if date of birth is not consistent across records.
- Drop all records for a patient if ANY record has an end-of-service date prior to the admission date.
- Drop all records for a patient if ANY record has an admission date or end-of-service date prior to the date of birth.
- Drop all records for a patient if ANY record uses codes other than ICD-9 or ICD-10 codes for the primary procedure.
- Drop all records for a patient if gender is missing in ALL records.
- Drop all records for a patient if gender is not consistent across records.

STEP 4: SPECIFY VARIABLES DEFINED AT THE RECORD LEVEL

The variables listed in the Data Dictionary provided in Section S.2b are used to construct the measure cohort and/or to calculate readmission rates. These variables must be named and coded as specified in the Data Dictionary and should be created prior to identifying episodes of care and applying further exclusions to the data.

STEP 5: DEFINE EPISODES OF CARE

Data for a single period of inpatient care may be contained in more than 1 claims record. It therefore may be necessary to collapse instances of multiple claims for the same hospitalization into a single episode of care prior to applying some exclusion criteria and evaluating readmissions. This allows all data relevant to a given hospitalization to be appropriately evaluated for measure cohort exclusion. The process for defining episodes of care is detailed below.

1. IDENTIFY TRUE DUPLICATES AND DROP ALL BUT 1.

- True duplicates are records that have identical values for all key variables needed to assess cohort eligibility and calculate case-mix-adjusted readmission rates, where these key variables include all variables listed in the Data Dictionary (provided in Section S.2b) except hasprimary. Combine true duplicates, using the MAXIMUM value of hasprimary.

2. IDENTIFY AND COMBINE MULTIPLE VALID RECORDS FROM THE SAME HOSPITAL FOR THE SAME HOSPITALIZATION.

- Sort records by the following variables, in the specified order: patientid, hospitalid, admit_dt, end_service_dt, and disp_status.
- Define records to be part of the same hospitalization at the same hospital if (a) patientid and hospitalid are equal to those in the previous record and (b) admission dates and end-of-service dates indicate consecutive time periods or nesting of 1 time period within another in that any of the following is true:
 - o admission date is before the previous record’s end-of-service date
 - o admission date is equal to the previous record’s end-of-service date AND the previous record’s disposition status is other (i.e., disp_status = 0) or transfer to an acute care hospital (i.e., disp_status = 2)
 - o admission date is 1 day after the previous record’s end-of-service date AND the previous record’s disposition status is other (i.e., disp_status = 0) or transfer to an acute care hospital (i.e., disp_status = 2)
 - o admission and end-of-service dates are both the same as those of the previous record, and admission date is equal to end-of-service date (i.e., the records are for a same-day discharge)

If the above criteria for multiple valid records from the same hospital for the same hospitalization are met, combine all of the

records. Retain the variables patientid, dob, hospitalid, male, and hosp_noindex, which will be the same across records by this step. Use the MINIMUM value for admit_dt. Use the MAXIMUM value for end_service_dt, hasprimary, cci1-cci10 and cci12-cci18, planned, chemo, mh, obstetric, and newborn. Use the value of disp_status and ins_end (this variable is only used in single-payer analyses) from the record with the maximum end-of-service date. If multiple records have the same maximum end-of-service date but inconsistent values for disp_status, use the MAXIMUM value of disp_status within those records. Using the maximum value for end_service_dt captures the discharge date that serves as the starting point for the 30-day follow-up period for evaluating readmissions. Using the maximum value for chronic condition indicator and clinical exclusion variables across records captures the presence of a chronic condition or clinical exclusion for the entire episode of care. For example, if 1 record contains a primary ICD-9 or principal ICD-10 mental health diagnosis, this diagnosis will be applied to the entire episode of care, and the entire episode of care will be excluded.

3. IDENTIFY AND COMBINE MULTIPLE VALID RECORDS FROM MULTIPLE HOSPITALS FOR HOSPITALIZATIONS THAT INCLUDED TRANSFERS.

- Sort records by the following variables, in the specified order: patientid, admit_dt, end_service_dt, and disp_status.
- Define records to be in the same episode of care if (a) patientid is equal to patientid in the previous record, (b) the previous record's disposition status is transfer to an acute care hospital (i.e., disp_status = 2), and (c) the admission date is equal to or is 1 day after the previous record's end-of-service date.

If the above criteria for connected hospitalizations are met, combine all of the records. Retain the variables patientid, dob, and male, which will be the same across records by this step. Use the MINIMUM value for admit_dt. Use the MAXIMUM value for end_service_dt, hasprimary, cci1-cci10 and cci12-cci18, planned, chemo, mh, obstetric, and newborn. Use the value of hospitalid, disp_status, ins_end, and hosp_noindex from the last record.

4. IDENTIFY AND EXCLUDE INVALID EPISODES OF CARE

There may be episodes of care that are temporally overlapping (i.e., in which it appears that a patient was in 2 different hospitals at the same time). These episodes should be dropped.

- Drop all episodes of care that share the same patient identifier, admission date, and end-of-service date but have different hospital identifiers.
- For each patient identifier, drop all temporally adjacent episodes of care if there are overlapping dates (i.e., admission date is before the end-of-service date for the preceding episode of care) but different hospital identifiers.

STEP 6: SPECIFY VARIABLES DEFINED AT THE EPISODE-OF-CARE LEVEL

Because multiple records may be combined to create an episode of care, some variables used for measure cohort exclusions and readmission analysis should be defined only after defining valid episodes of care. This sequencing assures that the variable values accurately represent information for the entire hospitalization, rather than capturing only a subset of information for the hospitalization. These variables should be created as specified in the Data Dictionary provided in Section S.2b, prior to applying further exclusion criteria to the data.

STEP 7: DEFINE EPISODES OF CARE ELIGIBLE FOR INCLUSION IN MEASURE COHORT

The exclusions listed below are applied only after defining episodes of care (in Step 5) and defining variables at the episode-of-care level (in Step 6).

Exclusions at the Patient Level Based on Data Completeness Criteria:

- Drop all episodes of care for a patient if the primary ICD-9 or principal ICD-10 diagnosis code is missing (i.e., hasprimary = 0) for ANY episode of care for that patient.

Exclusions at the Episode-of-Care Level Based on Data Quality Criteria:

- Drop episodes of care with admission dates that occur after a discharge status of death during a prior episode of care.

Exclusions at the Episode-of-Care Level Based on Clinical Criteria:

- Drop episodes of care for patients greater than 18 years, 29 days old at the time of admission.
- Drop episodes of care for birth of healthy newborns (i.e., newborn = 1).
- Drop episodes of care with a primary ICD-9 or principal ICD-10 non-delivery obstetric diagnosis or any labor and delivery diagnosis or procedure (i.e., obstetric = 1).
- Drop episodes of care with a primary ICD-9 or principal ICD-10 mental health diagnosis (i.e., mh = 1).

STEP 8: DEFINE INDEX ADMISSIONS AND READMISSIONS

A clean dataset containing only eligible admissions must be prepared before defining index admissions and readmissions. This dataset should consist of all admissions that are eligible for inclusion in the measure cohort based on the criteria detailed in data preparation steps 1 through 7, above.

Exclusions at the Episode-of-Care Level for Defining Index Admissions:

- Episodes of care for patients 18 years, 0 days old or greater at the time of discharge
- Episodes of care with a discharge disposition of death
- Episodes of care with a discharge disposition of leaving the hospital against medical advice
- Episodes of care for which 30 days of follow-up data are unavailable, either (a) because the dataset's time range for claims does not include the full 30 days, or (b) because, for single-payer analyses, the patient was not enrolled with the payer for the full 30 days (i.e., the difference between ins_end and end_service_dt is less than 30 days)

The above exclusions are applied without deleting the records from the dataset as these episodes of care may still meet criteria for readmissions.

Exclusions at the Hospital Level for Defining Index Admissions:

- Hospitals with less than 80% of records with complete unique patient identifier, admission date, and end-of-service date
- Hospitals with less than 80% of records with complete primary ICD-9 or principal ICD-10 diagnosis code
- Out-of-state hospitals

Hospitals meeting the above exclusion criteria were identified in Step 2, above. The dichotomous variable hosp_noindex was created in Step 2 and coded 1 for hospitals meeting the above criteria and 0 for all other hospitals. Episodes of care for hospitals with hosp_noindex = 1 are therefore excluded from index admissions.

Although these hospitals' episodes of care should not be evaluated as index admissions (i.e., readmission rates should not be calculated for these hospitals), their episodes of care should remain in the dataset so they can be evaluated as potential readmissions for other hospitals.

S.10. Stratification Information (Provide all information required to stratify the measure results, if necessary, including the stratification variables, definitions, specific data collection items/responses, code/value sets, and the risk-model covariates and coefficients for the clinically-adjusted version of the measure when appropriate – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format with at S.2b.)

Not applicable.

S.11. Risk Adjustment Type (Select type. Provide specifications for risk stratification in measure testing attachment)

Statistical risk model

If other:

S.12. Type of score:

Rate/proportion

If other:

S.13. Interpretation of Score (Classifies interpretation of score according to whether better quality is associated with a higher score, a lower score, a score falling within a defined interval, or a passing score)

Better quality = Lower score

S.14. Calculation Algorithm/Measure Logic (Diagram or describe the calculation of the measure score as an ordered sequence of steps including identifying the target population; exclusions; cases meeting the target process, condition, event, or outcome; time period for data, aggregating data; risk adjustment; etc.)

PREPARATION OF DATA AND IDENTIFICATION OF MEASURE COHORT

Identify Hospitals Eligible for Inclusion in the Measure

1. Starting with the complete set of claims from the time period being analyzed, exclude hospitalizations that occurred at specialty or non-acute care hospitals or at hospitals for which hospital type is missing.

Identify Hospitals for which Readmission Rates Should Not Be Calculated

2. Identify and flag out-of-state hospitals and hospitals with incomplete data for key variables for more than 20% of records.

Exclude Patients Who Have Missing or Invalid Data for Analyzing Readmissions

3. Exclude patients whose records use procedure codes other than ICD-9 or ICD-10 codes or have missing or invalid data for 1 or more of the following variables: patient identifier, hospital identifier, admission date, end-of-service date, disposition status, date of birth, and gender.

Specify Variables Defined at the Record Level

4. Define variables for measure cohort exclusions and readmission analysis that should be created at the record level.

Define Episodes of Care

5. For hospitalizations with data contained in more than 1 claim, combine the multiple claims into a single record for each hospitalization.

Specify Variables Defined at the Episode of Care Level

6. Define variables for measure cohort exclusions and readmission analysis that should be created at the episode of care level.

Define Episodes of Care Eligible for Inclusion in Measure Cohort

7. Exclude hospitalizations with a missing primary ICD-9 or principal ICD-10 diagnosis code.

8. Exclude hospitalizations with an admission date occurring after a previous hospitalization with a disposition status of death.

9. Exclude hospitalizations for patients older than 18 years, 29 days at the time of admission.

10. Exclude hospitalizations for obstetric conditions, mental health conditions, and birth of healthy newborns.

DEFINE INDEX HOSPITALIZATIONS

11. Exclude hospitalizations for patients 18 years, 0 days old or older at the time of discharge.

12. Exclude hospitalizations with a discharge disposition of death.

13. Exclude hospitalizations with a discharge disposition of leaving against medical advice.

14. Exclude hospitalizations for which 30 days of follow-up data are not available for assessing readmissions.

15. Exclude hospitalizations that occurred at hospitals that (a) have less than 80% of records with complete patient identifier, admission date, and end-of-service date; (b) have less than 80% of records with complete primary ICD-9 or principal ICD-10 diagnosis codes; or (c) are located in a state not being analyzed.

DEFINE READMISSIONS

16. Identify index hospitalizations followed by one or more readmissions within 30 days.

17. When identifying readmissions, exclude hospitalizations with (a) a primary ICD-9 or principal ICD-10 procedure code for a planned procedure or (b) a primary ICD-9 or principal ICD-10 diagnosis code or procedure code for chemotherapy.

CASE-MIX ADJUSTMENT MODEL FITTING AND DIRECT STANDARDIZATION

18. Fit the case-mix adjustment model to the prepared dataset to estimate coefficients for the case-mix variables (age, gender, presence of chronic conditions in each of 17 body systems, and number of body systems affected by chronic conditions) and a hospital random intercept for each hospital.

19. Perform direct standardization by fitting the model again for each hospital. Use the hospital's random intercept, adjusted for its own case-mix, from Step 18, but instead of using the hospital's own case-mix data, use a hypothetical dataset in which (a) all admissions are re-coded as if they are from the hospital for which a readmission rate is being estimated and (b) the readmission outcome has been set to missing. Each hospital's predicted probabilities for all records are summed by hospital and divided by the total number of index admissions in the dataset to produce the hospital-specific standardized readmission rate.

20. The upper confidence bound for this estimate is calculated as the mean of the upper confidence bound for each index admission's probability of leading to a readmission. The corresponding procedure is followed to estimate the lower confidence bound.

21. Finally, the point estimate and bound values are multiplied by a factor that corrects for estimation error produced by transformations used during estimation. The bias correction factor is a constant value specified as the observed number of readmissions across all hospitals in the dataset divided by the predicted number of readmissions across all hospitals in the dataset.

22. The resulting hospital-specific standardized readmission rate can be interpreted as the readmission rate the hospital would have if it treated a patient cohort with the case-mix composition of all eligible index admissions within the entire dataset.

Detailed Methods for Implementing Direct Standardization in SAS

One method to implement direct standardization in SAS involves obtaining the predicted values of every patient in the dataset in each hospital using the steps listed below. This is the method used in the SAS program we have prepared for the measure.

1. For each hospital being standardized, create a duplicate copy of the original dataset. The duplicate dataset should contain exactly the same variables and records as in the original dataset for all hospitals.
2. Set the outcome (readmission) in the duplicate dataset to missing. This prevents these duplicate records from being used in model estimation.
3. For ALL records in the duplicate dataset, set the hospital identifier to the hospital identifier of the hospital being standardized. Add a variable to the dataset that indicates that these records contain hypothetical data.
4. Concatenate the duplicate datasets to the original dataset. If the concatenated dataset is too large to handle, the same procedure may be conducted for subgroups of hospitals, or for 1 hospital at a time, and the results combined afterward.
5. Fit the case-mix adjustment model to the dataset created in the previous step. In SAS, the model will be fitted only on the original data since the outcome is missing for the duplicate data. This process will produce a case-mix-adjusted random intercept for each hospital. However, the procedure will also produce predicted probabilities for both original and duplicate records (SAS calculates predicted probabilities for any record in which the predictors are not missing, regardless of whether the outcome is missing).
6. Calculate the mean predicted probability and lower and upper bounds for only the duplicate records (those flagged as containing hypothetical data) in order to obtain the predicted readmission rate for the hospital being standardized. This rate represents the readmission rate for this hospital if it were to treat the entire dataset's population mix.

S.15. Sampling (If measure is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.)

IF an instrument-based performance measure (e.g., PRO-PM), identify whether (and how) proxy responses are allowed.

Not applicable.

S.16. Survey/Patient-reported data (If measure is based on a survey or instrument, provide instructions for data collection and guidance on minimum response rate.)

Specify calculation of response rates to be reported with performance measure results.

Not applicable.

S.17. Data Source (Check ONLY the sources for which the measure is SPECIFIED AND TESTED).

If other, please describe in S.18.

Claims

S.18. Data Source or Collection Instrument (Identify the specific data source/data collection instrument (e.g. name of database, clinical registry, collection instrument, etc., and describe how data are collected.)

IF instrument-based, identify the specific instrument(s) and standard methods, modes, and languages of administration.

The measure could be used with state Medicaid or all-payer databases. There are several options for calculating rates that could be compared nationally. CMS could analyze Medicaid claims from multiple states. A private payer with data from multiple states could compare hospitals from across state lines. Multiple states with all-payer databases could combine them to enable cross-state comparisons. Individual states could calculate nationally comparable rates using a method we have developed by which readmission rates can be estimated for Medicaid-insured patients and standardized using a MAX reference dataset. Please see the Detailed Measure Specifications (provided in the Appendix) for instructions on implementing this method.

S.19. Data Source or Collection Instrument (available at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1)

No data collection instrument provided

S.20. Level of Analysis (Check ONLY the levels of analysis for which the measure is SPECIFIED AND TESTED)

Facility

S.21. Care Setting (Check ONLY the settings for which the measure is SPECIFIED AND TESTED)

Inpatient/Hospital

If other:

S.22. COMPOSITE Performance Measure - Additional Specifications (Use this section as needed for aggregation and weighting rules,

or calculation of individual performance measures if not individually endorsed.)

Not applicable.

2. Validity – See attached Measure Testing Submission Form

[Pediatric_All-Condition_Readmission_Measure_-NQF-_2393-_Measure_Testing_Form_2014-02-05.pdf](#)

2.1 For maintenance of endorsement

Reliability testing: If testing of reliability of the measure score was not presented in prior submission(s), has reliability testing of the measure score been conducted? If yes, please provide results in the Testing attachment. Please use the most current version of the testing attachment (v7.1). Include information on all testing conducted (prior testing as well as any new testing); use red font to indicate updated testing.

2.2 For maintenance of endorsement

Has additional empirical validity testing of the measure score been conducted? If yes, please provide results in the Testing attachment. Please use the most current version of the testing attachment (v7.1). Include information on all testing conducted (prior testing as well as any new testing); use red font to indicate updated testing.

2.3 For maintenance of endorsement

Risk adjustment: For outcome, resource use, cost, and some process measures, risk-adjustment that includes social risk factors is not prohibited at present. Please update sections 1.8, 2a2, 2b1,2b4.3 and 2b5 in the Testing attachment and S.140 and S.11 in the online submission form. NOTE: These sections must be updated even if social risk factors are not included in the risk-adjustment strategy. You MUST use the most current version of the Testing Attachment (v7.1) -- older versions of the form will not have all required questions.

3. Feasibility

Extent to which the specifications including measure logic, require data that are readily available or could be captured without undue burden and can be implemented for performance measurement.

3a. Byproduct of Care Processes

For clinical measures, the required data elements are routinely generated and used during care delivery (e.g., blood pressure, lab test, diagnosis, medication order).

3a.1. Data Elements Generated as Byproduct of Care Processes.

[Coded by someone other than person obtaining original information \(e.g., DRG, ICD-9 codes on claims\)](#)

If other:

3b. Electronic Sources

The required data elements are available in electronic health records or other electronic sources. If the required data are not in electronic health records or existing electronic sources, a credible, near-term path to electronic collection is specified.

3b.1. To what extent are the specified data elements available electronically in defined fields (i.e., data elements that are needed to compute the performance measure score are in defined, computer-readable fields) Update this field for **maintenance of endorsement**.

[ALL data elements are in defined fields in electronic claims](#)

3b.2. If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources. For **maintenance of endorsement,** if this measure is not an eMeasure (eCQM), please describe any efforts to develop an eMeasure (eCQM).

3b.3. If this is an eMeasure, provide a summary of the feasibility assessment in an attached file or make available at a measure-specific URL. Please also complete and attach the NQF Feasibility Score Card.

Attachment:**3c. Data Collection Strategy**

Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, costs associated with fees/licensing of proprietary measures) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use). For eMeasures, a feasibility assessment addresses the data elements and measure logic and demonstrates the eMeasure can be implemented or feasibility concerns can be adequately addressed.

3c.1. Required for maintenance of endorsement. Describe difficulties (as a result of testing and/or operational use of the measure) regarding data collection, availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues.

IF instrument-based, consider implications for both individuals providing data (patients, service recipients, respondents) and those whose performance is being measured.

The measure uses pediatric inpatient claims data. These data are readily available to hospitals and payers, including state Medicaid programs and private insurers. In addition, some states maintain or are implementing all-payer claims databases.[1]

There are several options for calculating rates that could be compared nationally. CMS could analyze Medicaid claims from multiple states. A private payer with data from multiple states could compare hospitals from across state lines. Multiple states with all-payer databases could combine them to enable cross-state comparisons. Individual states could calculate nationally comparable rates using a method we have developed by which readmission rates can be estimated for Medicaid-insured patients and standardized using a MAX reference dataset. Please see the Detailed Measure Specifications (provided in the Appendix) for instructions on implementing this method.

To address potential issues with data quality or completeness, we have provided in the measure specifications guidelines for assessing records and excluding them from the measure if they contain indicators of poor data quality (e.g., an inconsistent date of birth for the same patient across records) or have missing values for key variables.

We partnered with the New York Office of Quality and Patient Safety to test implementation of our candidate measure on its Medicaid and all-payer inpatient claims databases. Like some other states, New York already maintains annual Medicaid and all-payer claims databases for other purposes and so did not have to undertake new data collection to test our measure. Feedback from New York on its testing experience indicated that the measure is straightforward and can be implemented quickly. Based on helpful suggestions from New York, we improved the clarity of the detailed measure specifications, particularly with regard to use of certain ICD-9 codes for applying clinical exclusions and identifying chronic conditions for case-mix adjustment. Testing the measure on New York's databases also illustrated potential model-fitting issues that may result when a variable has a very rare value. We have revised the specification of case-mix variables to help avoid these model-fitting issues and included guidance in the Detailed Measure Specifications for evaluating and troubleshooting such issues.

REFERENCES

1. APCD Council. Interactive state report map. Available at: <http://www.apcdouncil.org/state/map>. Accessed November 21, 2013.

3c.2. Describe any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk model, programming code, algorithm).

None.

4. Usability and Use

Extent to which potential audiences (e.g., consumers, purchasers, providers, policy makers) are using or could use performance results for both accountability and performance improvement to achieve the goal of high-quality, efficient healthcare for individuals or populations.

4a. Accountability and Transparency

Performance results are used in at least one accountability application within three years after initial endorsement and are publicly reported within six years after initial endorsement (or the data on performance results are available). If not in use at the time of initial endorsement, then a credible plan for implementation within the specified timeframes is provided.

4.1. Current and Planned Use

NQF-endorsed measures are expected to be used in at least one accountability application within 3 years and publicly reported within 6 years of initial endorsement in addition to performance improvement.

Specific Plan for Use	Current Use (for current use provide URL)

4a1.1 For each CURRENT use, checked above (update for maintenance of endorsement), provide:

- Name of program and sponsor
- Purpose
- Geographic area and number and percentage of accountable entities and patients included
- Level of measurement and setting

Not applicable.

4a1.2. If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing) what are the reasons? (e.g., Do policies or actions of the developer/steward or accountable entities restrict access to performance results or impede implementation?)

The measure was newly commissioned and developed as part of the AHRQ/CMS Pediatric Quality Measures Program and is therefore not yet in use.

4a1.3. If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes -- any accountability application within 3 years and publicly reported within 6 years of initial endorsement. (Credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.)

AHRQ and CMS intend that the measure, if endorsed, be available for public use with the current expectation that the full measure specifications will be provided on the AHRQ website, CMS website, or both. For ease of implementation, we have prepared Detailed Measure Specifications and SAS programs for data preparation and estimation of adjusted readmission rates. Our testing has shown that the measure is straightforward to implement using either Medicaid or all-payer claims data. A state quality improvement program, for example, could access the measure materials and easily be able to calculate and report hospital- or state-level rates.

4a2.1.1. Describe how performance results, data, and assistance with interpretation have been provided to those being measured or other users during development or implementation.

How many and which types of measured entities and/or others were included? If only a sample of measured entities were included, describe the full population and how the sample was selected.

4a2.1.2. Describe the process(es) involved, including when/how often results were provided, what data were provided, what educational/explanatory efforts were made, etc.**4a2.2.1. Summarize the feedback on measure performance and implementation from the measured entities and others described in 4d.1.**

Describe how feedback was obtained.

4a2.2.2. Summarize the feedback obtained from those being measured.**4a2.2.3. Summarize the feedback obtained from other users****4a2.3. Describe how the feedback described in 4a2.2.1 has been considered when developing or revising the measure**

specifications or implementation, including whether the measure was modified and why or why not.

Improvement

Progress toward achieving the goal of high-quality, efficient healthcare for individuals or populations is demonstrated. If not in use for performance improvement at the time of initial endorsement, then a credible rationale describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

4b1. Refer to data provided in 1b but do not repeat here. Discuss any progress on improvement (trends in performance results, number and percentage of people receiving high-quality healthcare; Geographic area and number and percentage of accountable entities and patients included.)

If no improvement was demonstrated, what are the reasons? If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

Not applicable.

4b2. Unintended Consequences

The benefits of the performance measure in facilitating progress toward achieving high-quality, efficient healthcare for individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists).

4b2.1. Please explain any unexpected findings (positive or negative) during implementation of this measure including unintended impacts on patients.

No unintended negative consequences were identified during testing.

4b2.2. Please explain any unexpected benefits from implementation of this measure.

5. Comparison to Related or Competing Measures

If a measure meets the above criteria and there are endorsed or new related measures (either the same measure focus or the same target population) or competing measures (both the same measure focus and the same target population), the measures are compared to address harmonization and/or selection of the best measure.

5. Relation to Other NQF-endorsed Measures

Are there related measures (conceptually, either same measure focus or target population) or competing measures (conceptually both the same measure focus and same target population)? If yes, list the NQF # and title of all related and/or competing measures.

Yes

5.1a. List of related or competing measures (selected from NQF-endorsed measures)

0329 : Risk-Adjusted 30-Day All-Cause Readmission Rate

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.

0695 : Hospital 30-Day Risk-Standardized Readmission Rates following Percutaneous Coronary Intervention (PCI)

1551 : Hospital-level 30-day risk-standardized readmission rate (RSRR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA)

1768 : Plan All-Cause Readmissions (PCR)

1891 : Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following chronic obstructive pulmonary disease (COPD) hospitalization

5.1b. If related or competing measures are not NQF endorsed please indicate measure title and steward.

Not applicable.

5a. Harmonization of Related Measures

The measure specifications are harmonized with related measures;

OR

The differences in specifications are justified

5a.1. If this measure conceptually addresses EITHER the same measure focus OR the same target population as NQF-endorsed measure(s):

Are the measure specifications harmonized to the extent possible?

No

5a.2. If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on interpretability and data collection burden.

Our candidate measure fills a gap in pediatric quality measurement by addressing the current dearth of measures that assess inpatient care. The measure also addresses the need for readmission measures developed for use in children. We have harmonized our measure with the CMS Hospital-Wide All-Cause Unplanned Readmission Measure (NQF #1789) for adults. Like the adult measure, our measure calculates unplanned readmissions following hospitalization for almost all conditions, where a readmission is defined as the first unplanned admission to any acute care hospital within 30 days of discharge from a prior hospitalization at an acute care hospital. However, the adult measure allows each hospitalization to potentially count as both an index admission and a readmission and permits multiple index admissions per patient within a 30-day period. For our measure, in contrast, additional admissions within 30 days from discharge from an index admission are not counted as index admissions. An admission more than 30 days from discharge from an index admission is counted as a new index admission. We chose this approach to increase the independence of observations and thus avoid having readmission rates dominated by the relatively few children with multiple readmissions within short time periods. Our measure covers the pediatric population, with an age eligibility criterion (less than 18 years old) that is complementary to that of the adult measure (18 years or older). Like the adult measure, our measure also uses a statistical model to case-mix adjust readmission rates, but our model was specifically developed for pediatric patients. Our measure also uses an algorithm for identifying hospitalizations for planned procedures and excluding them from readmissions. However, we developed the algorithm specifically for pediatric patients through a process in which pediatric expert clinicians reviewed ICD-9-CM procedure codes and indicated whether each procedure is typically planned in advance for children. We do not anticipate that differences between our measure and the adult measure would affect the interpretability or data collection burden of our measure.

5b. Competing Measures

The measure is superior to competing measures (e.g., is a more valid or efficient way to measure);

OR

Multiple measures are justified.

5b.1. If this measure conceptually addresses both the same measure focus and the same target population as NQF-endorsed measure(s):

Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)

Not applicable. This measure does not conceptually address the same focus and target population as NQF-endorsed measure(s).

Appendix

A.1 Supplemental materials may be provided in an appendix. All supplemental materials (such as data collection instrument or methodology reports) should be organized in one file with a table of contents or bookmarks. If material pertains to a specific submission form number, that should be indicated. Requested information should be provided in the submission form and required attachments. There is no guarantee that supplemental materials will be reviewed.

Attachment Attachment: [Pediatric_All-Condition_Readmission_Measure_-NQF-_2393-_Appendix_2014-02-05.pdf](#)

Contact Information

Co.1 Measure Steward (Intellectual Property Owner): Center of Excellence for Pediatric Quality Measurement

Co.2 Point of Contact: Mark, Schuster, MD, PhD, cepqm@childrens.harvard.edu, 617-355-5859-

Co.3 Measure Developer if different from Measure Steward: Center of Excellence for Pediatric Quality Measurement

Co.4 Point of Contact: Mark, Schuster, MD, PhD, cepqm@childrens.harvard.edu, 617-355-5859-

Additional Information

Ad.1 Workgroup/Expert Panel involved in measure development

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

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Our Scientific Advisory Board, consisting of representatives from Boston Children's Hospital, the larger Harvard community, and organizations such as the National Initiative for Children's Healthcare Quality, as well as our National Stakeholder Panel, which includes representatives from diverse national organizations representing patients and families, providers, payers, and health services researchers, provided guidance and feedback on the measure. We also received comments on the measure from the Massachusetts Child Health Quality Coalition, which includes patient and family advocates, as well as representatives from academic, community, and state institutions.

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.2 Year the measure was first released:

Ad.3 Month and Year of most recent revision:

Ad.4 What is your frequency for review/update of this measure?

Ad.5 When is the next scheduled review/update for this measure?

Ad.6 Copyright statement:

Ad.7 Disclaimers:

Ad.8 Additional Information/Comments: