NQF-ENDORSED VOLUNTARY CONSENSUS STANDARD FOR HOSPITAL CARE

Measure Information Form
Collected For: CMS Outcome Measures (Claims Based)

Measure Set: CMS Readmission Measures

Set Measure ID #: READM-30-COPD

Performance Measure Name: Hospital, 30-day all-cause risk-standardized readmission rate (RSRR) following acute exacerbation of Chronic Obstructive Pulmonary Disease (COPD).

Description: The measure estimates a hospital-level, risk-standardized, all-cause unplanned 30-day readmission rate for patients discharged from the hospital with a principal discharge diagnosis of COPD, as well as those with a principal diagnosis of respiratory failure who had a secondary diagnosis of an acute exacerbation of COPD (AECOPD).

Rationale: Readmission of patients who were recently discharged after hospitalization with COPD represents an important, expensive, and often preventable adverse outcome. The risk of readmission can be modified by the quality and type of care provided to these patients. Improving readmission rates is the joint responsibility of hospitals and clinicians. Measuring readmission will create incentives to invest in interventions to improve hospital care, better assess the readiness of patients for discharge, and facilitate transitions to outpatient status.

Type of Measure: Outcome

Improvement Noted As: A decrease in the RSRR.

Numerator Statement:
This outcome measure does not have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year); thus, we are using this field to define our outcome. The calculation of the rate is defined below under Measure Calculation.

The outcome for this measure is 30 day all-cause unplanned readmission. We define this as readmission for any unplanned cause within 30 days from the date of discharge of the index COPD admission.

Denominator Statement:
The target population for this measure includes admissions for Medicare Fee-for-Service (FFS) beneficiaries aged greater than or equal to 65 years discharged from acute care non-federal hospitals with a principal discharge diagnosis of COPD, as well as those with a principal diagnosis of respiratory failure who had a secondary diagnosis of AECOPD.

Included Populations:
Admissions for Medicare FFS beneficiaries greater than or equal to 65 years of age discharged from non-federal acute care hospitals, having a principal discharge diagnosis of COPD, as well as those with a principal diagnosis of respiratory failure who had a secondary diagnosis of AECOPD.

CMS FFS beneficiaries hospitalized within an acute care non-federal hospital are included if they have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of admission to ensure a full year of administrative data for risk-adjustment.

For patients who are transferred between one acute care hospital and another, the measures consider these multiple contiguous hospitalizations as a single acute episode of care. Readmission for transferred patients is attributed to the hospital that ultimately discharges the patient to a non acute care setting (e.g., to home or a skilled nursing facility). Thus, for patients who are transferred between two or more hospitals, if the patient is readmitted in the 30 days following the final hospitalization, the readmission is attributed to the final hospital.

ICD-9-CM codes that define the patient cohort

491.21	Obstructive chronic bronchitis; With (acute) exacerbation; acute exacerbation of COPD, decompensated COPD, decompensated COPD with exacerbation
491.22	Obstructive chronic bronchitis; with acute bronchitis
491.8	Other chronic bronchitis. Chronic: tracheitis, tracheobronchitis
491.9	Unspecified chronic bronchitis
492.8	Other emphysema; emphysema (lung or pulmonary): NOS, centriacinar, centrilobular, obstructive, panacinar, panlobular, unilateral, vesicular. MacLeod's syndrome; Swyer-James syndrome; unilateral hyperlucent lung
493.20	Chronic obstructive asthma; asthma with COPD, chronic asthmatic bronchitis, unspecified
493.21	Chronic obstructive asthma; asthma with COPD, chronic asthmatic bronchitis, with status asthmaticus
493.22	Chronic obstructive asthma; asthma with COPD, chronic asthmatic bronchitis, with (acute) exacerbation
496	Chronic: nonspecific lung disease, obstructive lung disease, obstructive pulmonary disease (COPD) NOS. NOTE: This code is not to be used with any code from categories 491-493
518.81*	Other diseases of lung; acute respiratory failure; respiratory failure NOS
518.82*	Other diseases of lung; acute respiratory failure; other pulmonary insufficiency, acute respiratory distress
518.84*	Other diseases of lung; acute respiratory failure; acute and chronic respiratory failure
799.1*	Other ill-defined and unknown causes of morbidity and mortality; respiratory arrest, cardiorespiratory failure

*Patients with a principal diagnosis represented by these codes are included in the measure if the code is accompanied by a secondary diagnosis of AECOPD (491.21, 491.22, 493.21, or 493.22)

Cohort exclusions (excluded admissions):

- Admissions for patients with an in-hospital death are excluded because they are not eligible for readmission.
- Admissions for patients without at least 30 days post-discharge enrollment in FFS Medicare are excluded because the 30-day readmission outcome cannot be assessed in this group.
- Admissions for patients having a principal diagnosis of COPD during the index hospitalization and subsequently transferred to another acute care facility are excluded because we are focusing on discharges to non-acute care settings.
- Admissions for patients who are discharged against medical advice (AMA) are excluded because providers did not have the opportunity to deliver full care and prepare the patient for discharge.

In addition, if a patient has one or more COPD admissions within 30 days of discharge from the index COPD admission, only one is counted as a readmission. "Unplanned" readmissions occurring within the 30-day post-discharge timeframe are not eligible to be counted as additional index admissions for COPD. However, once the 30-day measurement period that is associated with the first index admission has passed, the next eligible hospitalization is considered a new index admission.

Admissions not counted as readmissions:

Admissions identified as planned by the planned readmissions algorithm are not counted as readmissions. The "algorithm" is a set of criteria for classifying readmissions as planned or unplanned using Medicare claims. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital. CMS based the planned readmission algorithm on three principles:

1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy, rehabilitation);
2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and
3. Admissions for acute illness or for complications of care are never planned.

The planned readmission algorithm uses a flow chart and four tables of procedures and conditions to operationalize these principles and to classify readmissions as planned. The flow chart and tables are available in the COPD Readmission 2013 Measure Updates and Specifications Report posted on QualityNet (http://www.qualitynet.org).

Risk Adjustment:

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

The measure adjusts for key variables that are clinically relevant and have strong relationships with the outcome (e.g., age, sex, comorbid diseases, and indicators of frailty). For each patient, covariates are obtained from administrative data extending 12 months prior to, and including, the index admission. For all patients, information from

Medicare inpatient claims, physician Part B claims and hospital outpatient claims are used for risk adjustment.

The model seeks to adjust for case differences based on the clinical status of the patient at the time of the index admission. Accordingly, only comorbidities that convey information about the patient at that time or in the 12 months prior, and not complications that arise during the course of the index hospitalization are included in the risk adjustment.

The final set of risk-adjustment variables included:

Demographics	Age
Cardiovascular/ Respiratory	History of Mechanical Ventilation Sleep Apnea Respirator Dependence/Respiratory Failure Cardio-Respiratory Failure and Shock Congestive Heart Failure Acute Coronary Syndrome Chronic Atherosclerosis Arrhythmias Other and Unspecified Heart Disease Vascular or Circulatory Disease Fibrosis of Lung and Other Chronic Lung Disorder Pneumonia
Comorbidity	History of Infection Metastatic Cancer and Acute Leukemia Lung, Upper Digestive Tract, and Other Severe Cancers Lymphatic, Head and Neck, Brain, and Other Major Cancers; Breast, Colorectal and other Cancers and Tumors; Other Respiratory and Heart Neoplasms Other Digestive and Urinary Neoplasms Diabetes and DM Complications Protein-Calorie Malnutrition Disorders of Fluid/Electrolyte/Acid-Base Other Endocrine/Metabolic/Nutritional Disorders Pancreatic Disease Peptic Ulcer, Hemorrhage, Other Specified Gastrointestinal Disorders Other Gastrointestinal Disorders Severe Hematological Disorders Iron Deficiency and Other/Unspecified Anemia and Blood Disease Dementia or Senility Drug/Alcohol Induced Dependence/Psychosis Major Psychiatric Disorders Depression Anxiety Disorders Other Psychiatric Disorders Quadriplegia, Paraplegia, Paralysis, Functional Disability Polyneuropathy Hypertensive Heart and Renal Disease or Encephalopathy

Demographics	Age
	Stroke Renal Failure Decubitus Ulcer or Chronic Skin Ulcer Cellulitis, Local Skin Infection Vertebral Fractures

Full details of the development of the risk-standardization model for this measure are available at: http://www.qualitynet.org.

Data Collection Approach: Medicare claims data

Data Accuracy: The administrative claims data used to calculate the measure are maintained by CMS' Office of Information Services. These data undergo additional quality assurance checks during measure development and maintenance

Measure Analysis Suggestions: None

Sampling: No

Data Reported As: Hospital 30-day, all-cause, unplanned risk-standardized readmission rate (RSRR) following acute exacerbation of Chronic Obstructive Pulmonary Disease (COPD).

Measure Calculation:
The measure estimates hospital-level 30 day all-cause RSRR for COPD using hierarchical logistic regression modeling. In brief, the approach simultaneously models two levels (patient and hospital) to account for the variance in patient outcomes within and between hospitals. At the patient level, the model adjusts the log-odds of a hospital readmission within 30 days of discharge for age, sex, selected clinical covariates, and a hospital-specific intercept. At the hospital level, it models the hospital-specific intercepts as arising from a normal distribution. The hospital intercept represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific intercepts are given a distribution in order to account for the clustering (non-independence) of patients within the same hospital. If there were no differences among hospitals, then after adjusting for patient risk the hospital intercepts should be identical across all hospitals.

The RSRR is calculated as the ratio of the number of “predicted” readmissions to the number of “expected” readmissions, multiplied by the national unadjusted readmission rate. For each hospital, the “numerator” of the ratio is the number of readmissions within 30 days predicted on the basis of the hospital’s performance with its observed case-mix, and the “denominator” is the number of readmissions expected on the basis of the nation’s performance with that hospital’s case-mix. This approach is analogous to a ratio of “observed” to “expected” used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital’s performance given its case-mix to an average hospital’s performance with the same case-mix. Thus, a lower ratio indicates lower-than-expected readmission (i.e., better quality), and a higher ratio indicates higher-than-expected readmission (i.e., worse quality).

The predicted number of readmissions (the numerator) is calculated by regressing the risk factors and the hospital-specific intercept on the risk of readmission, multiplying the estimated regression coefficients by the patient characteristics in the hospital, transforming, and then summing over all patients attributed to the hospital to get a value. The expected number of readmissions (the denominator) is obtained by regressing the risk factors and a common intercept on the readmission outcome using all hospitals in our sample, multiplying the subsequent estimated regression coefficients by the patient characteristics observed in the hospital, transforming, and then summing over all patients in the hospital to get a value. To assess hospital performance in any reporting period, we re-estimate the model coefficients using the years of data in that period.

The statistical modeling approach is described fully in the original methodology report.

Selected References:

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