CENTERS for MEDICARE & MEDICAID SERVICES

ACO #9—Prevention Quality Indicator (PQI): Ambulatory Care Sensitive Conditions: Admissions for Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults

Measure Information Form (MIF)

Data Source

- Medicare Part B Carrier Claims
- Medicare Outpatient Claims
- Medicare Inpatient Claims
- Medicare beneficiary enrollment data

Measure Set ID

- ACO #9

Version Number and Effective Date

- Version 2.2, effective 1/1/16

CMS Approval Date

- 12/31/15

NQF ID

- #275, adapted for quality measurement in Medicare Accountable Care Organizations

Date Endorsed

- N/A

Care Setting

- Hospitals

Unit of Measurement

- Accountable Care Organization (ACO)

Measurement Duration

- Calendar Year

Measurement Period

- Calendar Year

Measure Type

- Outcome

Measure Scoring

- Prevention quality indicator (PQI) score, that is a ratio of observed admissions to expected admissions for Chronic Obstructive Pulmonary Disease (COPD) or Asthma. In addition to the observed to expected ratio, we will also provide ACOs with a score that reflects the risk adjusted percentage. The risk adjusted percentage is the observed to expected ratio multiplied by the overall admission percentage [(total admissions/total person years)*100] across all ACOs. ACOs can compare their performance with the 2016 and 2017 benchmarks available at http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Quality_Measures_Standards.html.

Payer Source

- Medicare Fee-for-Service

Improvement Notation

- Lower PQI scores are better

Measure Steward

Agency for Healthcare Research and Quality (AHRQ) with adaptations by Centers for Medicare and Medicaid Services (CMS) (co-stewards).

Copyright / Disclaimer

- This Medicare ACO PQI COPD/Asthma quality measure is adapted from the general population PQI quality measure for COPD/Asthma that is developed by AHRQ (AHRQ, 2013).

Measure Description

- All discharges with an ICD-10 principal diagnosis code for COPD or Asthma in adults ages 40 years and older, for ACO assigned (Shared Savings Program) or aligned (Pioneer) Medicare beneficiaries with COPD or Asthma, with risk-adjusted comparison of observed discharges to expected discharges for each ACO.

Rationale

Hospital admissions for COPD or asthma are a Prevention Quality Indicator of interest to comprehensive health care delivery systems including ACOs. COPD or Asthma can often be controlled in an outpatient setting. Evidence suggests that these hospital admissions could have been avoided through high quality outpatient care, or the condition would have been less severe if treated early and appropriately. Proper outpatient treatment and adherence to care may reduce the rate of occurrence for this event, and thus of hospital admissions.

Clinical Recommendation Statement

Bindman et al. (1995) reported that self-reported access to care explained 27 percent of the variation in COPD hospitalization rates at the ZIP code cluster level. Millman (1993) found that low-income ZIP codes had 5.8 times more COPD hospitalizations per capita than high-income ZIP codes. Physician adherence to practice guidelines and patient compliance also influence the effectiveness of therapy. Practice guidelines for COPD have been developed and published over the last decade (Hackner, 1999). With appropriate outpatient treatment and compliance, hospitalizations for the exacerbations of COPD and decline in lung function should be minimized.

Based on empirical results, areas with high rates of COPD admissions also tend to have high rates of admissions for other Ambulatory Care Sensitive Conditions. The signal ratio (i.e., the proportion of the total variation across areas that is truly

related to systematic differences in area performance rather than random variation) is very high, at 93.4 percent, indicating that the differences in age-sex adjusted rates likely represent true differences across areas (AHRQ, 2007).

Risk adjustment for age and sex exerts strongest influence in areas with highest admission rates. As a PQI, admissions for chronic obstructive pulmonary disease are not a measure of hospital quality, but rather one measure of the quality of ambulatory care.

References

AHRQ. *Guide to Prevention Quality Indicators*. Rockville, Maryland: U.S. Agency for Healthcare Research and Quality, 2007.

Bindman AB, Grumbach K, Osmond D, et al. Preventable hospitalizations and access to health care. *JAMA* 1995;274(4):305–11.

Hackner D, Tu G, Weingarten S, et al. Guidelines in pulmonary medicine: a 25-year profile. *Chest* 1999; 116(4):1046–62.

Millman M, editor. Committee on Monitoring Access to Personal Health Care Services. Washington, DC: National Academy Press; 1993.

2015 Release Notes / Summary of Changes

- There have been no substantial changes made to the measure specifications. The specifications reflect the most recent version (version 5, October 2015) of the technical specifications posted on the AHRQ website for PQI #8.

Technical Specifications

- Target Population: ACO assigned or aligned Medicare beneficiaries

Denominator

- Denominator Statement

  Assigned/Aligned Medicare FFS Beneficiaries aged 40 years and older that have a diagnosis of COPD or Asthma (as identified in table below).

- Denominator Details

  The ICD-10 codes used to identify Medicare beneficiaries with COPD or Asthma for this Medicare ACO PQI quality measure are as follows:

ICD-10 Code	Description
J41.0	Simple chronic bronchitis
J41.1	Mucopurulent chronic bronchitis
J41.8	Mixed simple and mucopurulent chronic bronchitis
J42.	Unspecified chronic bronchitis
J43.0	Unilateral pulmonary emphysema [MacLeod's syndrome]
J43.1	Panlobular emphysema
J43.2	Centrilobular emphysema
J43.8	Other emphysema
J43.9	Emphysema, unspecified
J44.0	Chronic obstructive pulmonary disease with acute lower respiratory infection
J44.1	Chronic obstructive pulmonary disease with (acute) exacerbation
J44.9	Chronic obstructive pulmonary disease, unspecified

ICD-10 Code	Description
J47.0	Bronchiectasis with acute lower respiratory infection
J47.1	Bronchiectasis with (acute) exacerbation
J47.9	Bronchiectasis, uncomplicated
J45.21	Mild intermittent asthma with (acute) exacerbation
J45.22	Mild intermittent asthma with status asthmaticus
J45.31	Mild persistent asthma with (acute) exacerbation
J45.32	Mild persistent asthma with status asthmaticus
J45.41	Moderate persistent asthma with (acute) exacerbation
J45.42	Moderate persistent asthma with status asthmaticus
J45.51	Severe persistent asthma with (acute) exacerbation
J45.52	Severe persistent asthma with status asthmaticus
J45.901	Unspecified asthma with (acute) exacerbation
J45.902	Unspecified asthma with status asthmaticus
J45.990	Exercise induced bronchospasm
J45.991	Cough variant asthma
J45.998	Other asthma

These ICD-10 codes for COPD or Asthma can be found in any diagnosis position for any Medicare Outpatient claims, Inpatient claims, or Part B Carrier claims for the ACO's assigned or aligned beneficiary in the performance year for the beneficiary to be included in the denominator.

The Medicare ACO PQI quality measure denominator specifications are adapted from the AHRQ PQI specifications with adjustments to the reference population to focus on Medicare beneficiaries since they are likely to be older and more disabled than the general population. Additionally, ACOs may have more and varying proportions of patients with the chronic conditions targeted by the PQI quality measures (COPD or Asthma for this ACO PQI). As a result, the changes made to adapt the AHRQ PQIs to the Medicare population for the Medicare ACO PQIs include the following:

1. Change the PQI denominator to include only Medicare beneficiaries assigned or aligned to a Medicare ACO, instead of the general population in a geographic area (as currently specified for AHRQ PQIs), and allow part-year Medicare beneficiaries to be included in the denominator.

2. Change the PQI denominators to include only those beneficiaries who were diagnosed with the condition under consideration (COPD/Asthma) instead of patients of any disease status (as currently specified for AHRQ PQIs).

3. Exclude beneficiaries with a diagnosis of ESRD from the denominator populations for. ESRD patients are significantly more prone to hospitalization, are severely ill, and are a much larger proportion of Medicare beneficiaries than they are in the general population. As a result, the PQI measures may not be good measures of quality of care in treatment of Medicare beneficiaries with COPD or Asthma who also have ESRD.

- Denominator Exceptions and Exclusions

    1. Beneficiaries with a diagnosis of ESRD

    2. Beneficiaries not eligible for both Medicare Part A and Part B

    3. Beneficiaries with missing data for gender, age, or principal diagnosis

- Denominator Exceptions and Exclusions Details

  To identify beneficiaries for the ESRD exclusion the MS_CD variable (CWF Beneficiary Medicare Status Code) is used. Excluded beneficiaries including those with MS_CD values equal to 11 (aged with ESRD), 21 (disabled with ESRD), or 31 (ESRD only).

Numerator

- Numerator Statement

  Observed discharges from an acute care hospital or critical access hospital with a principal diagnosis of Chronic Obstructive Pulmonary Disease or Asthma, for Medicare beneficiaries in the denominator population for this measure.

- Numerator Details

  The ICD-10 codes used to identify hospital discharges with a principal diagnosis of COPD or Asthma for this Medicare ACO PQI quality measure are as follows:

  1. An ICD-10 principal diagnosis code that indicates COPD (listed in **Appendix A**)

     OR

  2. An ICD-10 principal diagnosis code that indicates acute bronchitis (listed in **Appendix A**) **AND** an ICD-10 secondary diagnosis code that indicates COPD (Listed in **Appendix A**)

     OR

  3. An ICD-10 principal diagnosis code that indicates asthma (Listed in **Appendix A**)

  These ICD-10 codes for COPD or Asthma can be found for any Medicare Inpatient claims for the ACO's assigned or aligned beneficiary in the performance year for that discharge to be included in the numerator. The sum of all of these discharges is calculated for the performance year for all of the assigned or aligned beneficiaries for each ACO to calculate the numerator.

- Numerator Exceptions and Exclusions

  1. Transfers to a hospital, Skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF), or another health care facility are excluded from the numerator

  2. Discharges are excluded from the numerator if the admission is associated with a diagnosis of Cystic fibrosis or anomalies of the respiratory system

- Numerator Exceptions and Exclusions Details

  1. The AHRQ PQI SAS software excludes admissions that are transfers to a hospital, skilled nursing facility or Intermediate Care Facility, or another healthcare facility, identifying these transfers using HCUP variables SID ASOURCE and POINTOFORIGINUB04 codes. The Medicare claims data available from the IDR does not include these codes. As a result, the Medicare ACO PQIs use the Medicare claims variable "Source of Admission (SRC_ADMS)" to identify transfers. For the Medicare ACO PQIs patients were excluded with an SCR_ADMS value of 4 (transfer from hospital), 5 (transfer from skilled nursing facility), or 6 (transfer from another health care facility). However, previous work with the SCR_ADMS variable has found that it is sometimes unreliable. As a result, to better ensure that all transfers were excluded the Medicare ACO PQI software excludes beneficiaries with two Part A Inpatient claims admissions on the same day at two different facilities.

2. Discharge is excluded from the numerator if the admission is associated with a diagnosis of Cystic fibrosis or anomalies of the respiratory system, as indicated by any of the following ICD-10 diagnosis codes:

ICD-10 Code	Description
E84.0	Cystic fibrosis with pulmonary manifestations
E84.11	Meconium ileus in cystic fibrosis
E84.19	Cystic fibrosis with other intestinal manifestations
E84.8	Cystic fibrosis with other manifestations
E84.9	Cystic fibrosis, unspecified
J84.83	Surfactant mutations of the lung
J84.841	Neuroendocrine cell hyperplasia of infancy
J84.842	Pulmonary interstitial glycogenosis
J84.843	Alveolar capillary dysplasia with vein misalignment
J84.848	Other interstitial lung diseases of childhood
P27.0	Wilson-Mikity syndrome
P27.1	Bronchopulmonary dysplasia originating in the perinatal period
P27.8	Other chronic respiratory diseases originating in the perinatal period
P27.9	Unspecified chronic respiratory disease originating in the perinatal period
Q25.4	Other congenital malformations of aorta
Q31.1	Congenital subglottic stenosis
Q31.2	Laryngeal hypoplasia
Q31.3	Laryngocele
Q31.5	Congenital laryngomalacia
Q31.8	Other congenital malformations of larynx
Q31.9	Congenital malformation of larynx, unspecified
Q32.0	Congenital tracheomalacia
Q32.1	Other congenital malformations of trachea
Q32.2	Congenital bronchomalacia
Q32.3	Congenital stenosis of bronchus
Q32.4	Other congenital malformations of bronchus
Q33.0	Congenital cystic lung
Q33.1	Accessory lobe of lung
Q33.2	Sequestration of lung
Q33.3	Agenesis of lung
Q33.4	Congenital bronchiectasis
Q33.5	Ectopic tissue in lung
Q33.6	Congenital hypoplasia and dysplasia of lung
Q33.8	Other congenital malformations of lung
Q33.9	Congenital malformation of lung, unspecified
Q34.0	Anomaly of pleura
Q34.1	Congenital cyst of mediastinum
Q34.8	Other specified congenital malformations of respiratory system
Q34.9	Congenital malformation of respiratory system, unspecified
Q39.0	Atresia of esophagus without fistula
Q39.1	Atresia of esophagus with tracheo-esophageal fistula
Q39.2	Congenital tracheo-esophageal fistula without atresia
Q39.3	Congenital stenosis and stricture of esophagus

ICD-10 Code	Description
Q39.4	Esophageal web
Q89.3	Situs inversus

Stratification or Risk Adjustment

This measure uses risk adjustment and is not stratified.

A Medicare claims data 5% file was used for re-estimating the AHRQ COPD/Asthma hospital discharge logistic regression prediction model used for risk adjustment for this Medicare ACO COPD/Asthma PQI measure. The 5% file is nationally representative for the Medicare FFS population, and replaced the general population data used for the AHRQ PQI measure prediction models. For this Medicare ACO PQI risk adjustment analysis it was further restricted to Medicare beneficiaries who met the inclusion criteria for the ACO program and the COPD/Asthma disease diagnosis criteria for the Medicare ACO PQI quality measure denominator. The prediction variables in this model were the age-sex categories identified for the Medicare populations for the ACO PQI quality measures. These models produced coefficients that were included in the ACO PQI calculation SAS software as risk adjusters to calculate the expected rate of hospital discharges for an ACO population given its age and sex distribution.

For this Medicare ACO PQI prediction model, the AHRQ age ranges used for risk adjustment were revised to reflect age ranges that are more appropriate for the Medicare FFS population. The new age ranges are: 0 to 39, 40 to 65, 65 to 69, 70 to 74, 75 to 79, 80 to 84, and 85+. They were used to calculate the age-sex categories used as predictors in the risk adjustment model.

Sampling

- N/A

Calculation Algorithm

Calculation of this Medicare ACO COPD/Asthma PQI quality measure includes the following steps:

1. Identify the assigned or aligned beneficiaries for each ACO.

2. Apply the eligibility criteria to identify beneficiaries of the correct age, Medicare enrollment status, ESRD status, and satisfying the other eligibility criteria.

3. Search Medicare Part A Inpatient, Outpatient and Part B Carrier claims data to find all of the eligible assigned or aligned beneficiaries with at least one ICD-10 diagnosis code for COPD or Asthma during the performance year for the denominator.

4. Apply the risk adjustment prediction model using the age/sex categories and distribution of the eligible assigned or aligned beneficiaries to calculate the expected number of admissions with a principal diagnosis of COPD or Asthma for each ACO for the performance year. This constitutes the denominator (i.e., expected rate).

5. Search Medicare Inpatient claims data to find all admissions with a principal diagnosis of COPD or Asthma for those eligible assigned or aligned beneficiaries with COPD or Asthma. This constitutes the numerator (i.e., observed rate).

6. Divide the numerator by the denominator to find the Medicare ACO COPD/Asthma PQI score.

Appendix A: ICD-10 Codes to Identify Discharges with a
Principal Diagnosis of COPD or Asthma

The ICD-10 codes used to identify hospital discharges with a principal diagnosis of COPD or Asthma for this Medicare ACO PQI quality measure are as follows:

1. An ICD-10 principal diagnosis code that indicates COPD

    OR

2. An ICD-10 principal diagnosis code that indicates acute bronchitis **AND** an ICD-10 secondary diagnosis code that indicates COPD

    OR

3. An ICD-10 principal diagnosis code that indicates asthma

1.   An ICD-9 or ICD-10 principal diagnosis code that indicates COPD

ICD-10 Code	Description
J41.0	Simple chronic bronchitis
J41.1	Mucopurulent chronic bronchitis
J41.8	Mixed simple and mucopurulent chronic bronchitis
J42.	Unspecified chronic bronchitis
J43.0	Unilateral pulmonary emphysema [MacLeod's syndrome]
J43.1	Panlobular emphysema
J43.2	Centrilobular emphysema
J43.8	Other emphysema
J43.9	Emphysema, unspecified
J44.0	Chronic obstructive pulmonary disease with acute lower respiratory infection
J44.1	Chronic obstructive pulmonary disease with (acute) exacerbation
J44.9	Chronic obstructive pulmonary disease, unspecified
J47.0	Bronchiectasis with acute lower respiratory infection
J47.1	Bronchiectasis with (acute) exacerbation
J47.9	Bronchiectasis, uncomplicated

OR

2. An ICD-10 principal diagnosis code that indicates acute bronchitis

ICD-10 Code	Description
J20.0	Acute bronchitis due to Mycoplasma pneumoniae
J20.1	Acute bronchitis due to Hemophilus influenzae
J20.2	Acute bronchitis due to streptococcus
J20.3	Acute bronchitis due to coxsackievirus
J20.4	Acute bronchitis due to parainfluenza virus
J20.5	Acute bronchitis due to respiratory syncytial virus
J20.6	Acute bronchitis due to rhinovirus
J20.7	Acute bronchitis due to echovirus
J20.8	Acute bronchitis due to other specified organisms
J20.9	Acute bronchitis, unspecified
J40.	Bronchitis, not specified as acute or chronic

AND

An ICD-10 principal diagnosis code that indicates COPD

ICD-10 Code	Description
J41.0	Simple chronic bronchitis
J41.1	Mucopurulent chronic bronchitis
J41.8	Mixed simple and mucopurulent chronic bronchitis
J42.	Unspecified chronic bronchitis
J43.0	Unilateral pulmonary emphysema [MacLeod's syndrome]
J43.1	Panlobular emphysema
J43.2	Centrilobular emphysema
J43.8	Other emphysema
J43.9	Emphysema, unspecified
J44.0	Chronic obstructive pulmonary disease with acute lower respiratory infection
J44.1	Chronic obstructive pulmonary disease with (acute) exacerbation
J44.9	Chronic obstructive pulmonary disease, unspecified
J47.0	Bronchiectasis with acute lower respiratory infection
J47.1	Bronchiectasis with (acute) exacerbation
J47.9	Bronchiectasis, uncomplicated

OR

3. **An ICD-9-CM principal diagnosis code that indicates asthma**

ICD-10 Code	Description
J45.21	Mild intermittent asthma with (acute) exacerbation
J45.22	Mild intermittent asthma with status asthmaticus
J45.31	Mild persistent asthma with (acute) exacerbation
J45.32	Mild persistent asthma with status asthmaticus
J45.41	Moderate persistent asthma with (acute) exacerbation
J45.42	Moderate persistent asthma with status asthmaticus
J45.51	Severe persistent asthma with (acute) exacerbation
J45.52	Severe persistent asthma with status asthmaticus
J45.901	Unspecified asthma with (acute) exacerbation
J45.902	Unspecified asthma with status asthmaticus
J45.990	Exercise induced bronchospasm
J45.991	Cough variant asthma
J45.998	Other asthma