



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 #: 0709

Corresponding Measures:

De.2. Measure Title: Proportion of patients with a chronic condition that have a potentially avoidable complication during a calendar year.

Co.1.1. Measure Steward: Altarum Institute

De.3. Brief Description of Measure: Percent of adult population aged 18+ years who were identified as having at least one of the following six chronic conditions: Asthma, Chronic Obstructive Pulmonary Disease (COPD), Coronary Artery Disease (CAD), Heart Failure (HF), Hypertension (HTN), or Diabetes Mellitus (DM), were followed for at least one-year, and had one or more potentially avoidable complications (PACs) during the most recent 12 months. Please reference attached document labeled NQF_Chronic_Care_PACs_01_24_17.xls, in the tabs labeled PACs I-9 & I-10 for a list of code definitions of PACs relevant to each of the above chronic conditions.

We define PACs as one of two types:

- (1) Type 1 PACs - PACs related to the index condition: Patients are considered to have a PAC, if they receive services during the episode time window for any of the complications directly related to the chronic condition, such as for acute exacerbation of the index condition, respiratory insufficiency in patients with Asthma or COPD, hypotension or fluid and electrolyte disturbances in patients with CAD, HF or diabetes etc.
- (2) Type 2 PACs - PACs related to Patient Safety or broader System Failures: Patients are also considered to have a PAC, if they receive services during the episode time window for any of the complications related to patient safety or health system failures such as for sepsis, infections, phlebitis, deep vein thrombosis, pressure sores etc.

All relevant hospitalizations for patients with chronic conditions are considered potentially avoidable and flagged as PACs. This particularly applies to hospitalizations due to acute exacerbations of the index condition. For example, a hospitalization for diabetic emergency in a diabetic patient, or a hospitalization for acute pulmonary edema in a heart failure patient is considered a PAC.

PACs are counted as a dichotomous (yes/no) outcome. If a patient had one or more PACs, they get counted as a "yes" or a 1. The summary tab in the enclosed workbook labeled NQF_Chronic_Care_PACs_01_24_17.xls gives the overview of the frequency and costs associated with each of these types of PACs for each of the six chronic conditions. Detailed drill-down tabs with graphs are also provided in the same workbook for each of the six chronic conditions to highlight high-frequency PACs. The Decision Tree tabs in the same workbook highlight the flow diagrams for the selection of patients into each chronic condition episode.

The information is based on a two-year claims database from a commercial insurer with 3,258,706 covered lives and \$25.9 billion in "allowed amounts" for claims costs. The database is an administrative claims database with medical as well as pharmacy claims.

It is important to note that while the overall frequency of PAC hospitalizations is low (for all chronic care conditions summed together, PAC frequency was 1.6% for all PAC occurrences), they amount to over 52% of the PAC medical costs.

1b.1. Developer Rationale: Accountability for and measurement of PACs occurs at the practice, medical group, provider system or purchaser/payer level, not for an individual physician's performance. PAC rates are calculated as absolute not relative values. For example, a health plan would report that 60% of its plan members with a given chronic condition incurred PACs in the study time window. The objective of the measure is to encourage the unit being measured to progressively reduce that amount, not to discriminate performance between two units being measured. An output of the calculation of PACs is the establishment of a

comprehensive list of these PACs, which would allow the unit being measured to establish frequency counts and gain insights into the types of system and care management failures that might be contributing to these events.

Comparisons of PAC rates across plans or provider systems is appropriate and these organizations should be encouraged to publicly report their PAC rates. There are several tools available for provider systems and health plans to impact PAC rates. These include care coordination across care settings, post-discharge planning and patient follow-up, active care management, sharing medical record data between care settings and providers, total quality management within hospitals and active reduction of patient safety failures.

Reducing PACs has the potential to significantly improve the overall level of quality. Creating a single measure of accountability for physicians and hospitals tied to gaps in quality, and a measure of accountability for health plans to improve the ways in which they engage patients in more optimal care management and coordination, is likely to yield much improved outcomes for patients.

S.4. Numerator Statement: Outcome: Number of patients with at least one of the following six chronic conditions: Asthma, Chronic Obstructive Pulmonary Disease (COPD), Coronary Artery Disease (CAD), Heart Failure (HF), Hypertension (HTN), or Diabetes Mellitus (DM), and had one or more potentially avoidable complications (PACs), during the most recent 12 months.

S.6. Denominator Statement: Adult patients aged 18+ years who were identified as having at least one of the following six chronic conditions: Asthma, Chronic Obstructive Pulmonary Disease (COPD), Coronary Artery Disease (CAD), Heart Failure (HF), Hypertension (HTN), or Diabetes Mellitus (DM), and were followed for at least 12 months.

S.8. Denominator Exclusions: Patients are excluded from the measure if they are less than 18 years of age, have an incomplete episode of care (less than 18 months of claims), have an enrollment gap of more than 30 days, or have outlier costs for the most recent 12 months of claim costs.

Claims are excluded from the episode if they are for services that are not relevant to the chronic condition.

De.1. Measure Type: Outcome

S.17. Data Source: Claims

S.20. Level of Analysis: Clinician : Group/Practice, Health Plan, Other, Population : Community, County or City, Population : Regional and State

IF Endorsement Maintenance – Original Endorsement Date: Jan 17, 2011 **Most Recent Endorsement Date:** Jan 17, 2011

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?

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
0709_Evidence_MSF5.0_Data-636426301968333442.doc

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.

Accountability for and measurement of PACs occurs at the practice, medical group, provider system or purchaser/payer level, not for an individual physician's performance. PAC rates are calculated as absolute not relative values. For example, a health plan would report that 60% of its plan members with a given chronic condition incurred PACs in the study time window. The objective of the measure is to encourage the unit being measured to progressively reduce that amount, not to discriminate performance between two units being measured. An output of the calculation of PACs is the establishment of a comprehensive list of these PACs, which would allow the unit being measured to establish frequency counts and gain insights into the types of system and care management failures that might be contributing to these events.

Comparisons of PAC rates across plans or provider systems is appropriate and these organizations should be encouraged to publicly report their PAC rates. There are several tools available for provider systems and health plans to impact PAC rates. These include care coordination across care settings, post-discharge planning and patient follow-up, active care management, sharing medical record data between care settings and providers, total quality management within hospitals and active reduction of patient safety failures.

Reducing PACs has the potential to significantly improve the overall level of quality. Creating a single measure of accountability for physicians and hospitals tied to gaps in quality, and a measure of accountability for health plans to improve the ways in which they engage patients in more optimal care management and coordination, is likely to yield much improved outcomes for patients.

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.*

In our own developmental database constituting 4.7 million covered lives and over 95 billion dollars in medical spend, of all the patients finally retained in the chronic care analysis (n=648,825 patients), 72% of them had at least one PAC. This number varied from about 90% of CHF patients having at least one PAC to 67.7% of patients with hypertension having a PAC (please see Summary tab in the enclosed workbook entitled NQF_Chronic_Care_PACs_Risk_Adjustment_2.9.10).

A geographical variation analysis demonstrated that across the 50 states in the country, the average percent of patients having at least one potentially avoidable complication when compared across all the six chronic conditions varied from 60% in Vermont to 79% in Alabama. Running the same analysis on various health plan databases demonstrated that the proportion of patients with a chronic condition that had one or more PACs varied from 53.5% to 74.1%. We have similar comparative statistics for each of the six chronic conditions along with a list of highest frequency PACs for each condition, which suggests both high degrees of variation and significant opportunities for improvement.

While PACs may not be eliminated completely, identifying the magnitude of PACs and understanding their cause could place an emphasis in reducing them and, as a consequence, improve patient outcomes.

The medical literature is replete with evidence of gaps in care. In their landmark paper, McGlynn and colleagues demonstrated that less than 55% of the US population received all recommended services. AHRQ recently reported that for patients with chronic illnesses, congestive heart failure and bacterial pneumonia were the two most common causes of potentially preventable hospitalizations and accounted for half of the avoidable hospitalization costs. In their studies, Yuen et al, Ahern and Hendryx, and Kim demonstrate that 32%-36% of all diabetes-related hospitalizations were caused by short-term complications and uncontrolled diabetes, and were considered avoidable using criteria from AHRQ. Additionally, an age and sex-adjusted population-attributable relative risk study by Li et al demonstrated that 45% of strokes in hypertensive patients might be attributable to uncontrolled BP (BP >= 140/90).

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.

1. B. McGlynn, S. Asch, et. al, "The Quality of Health Care Delivered to Adults in the United States", New England Journal of Medicine Volume 348:2635-2645 Number 26, June 2003.
2. Jiang HJ, Russo CA, and Barrett ML. Nationwide Frequency and Costs of Potentially Preventable Hospitalization, 2006. AHRQ-HCUP Statistical Brief # 72. Available at: <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb72.jsp>. Accessed February 10, 2010.
3. E. Yuen, "Severity of Illness and Ambulatory Care-Sensitive Conditions," Med Care Res Rev 61, no. 3 (2004): 376-391.
4. M. Ahern, "Avoidable Hospitalizations for Diabetes," Disease Management 10, no. 6 (2007): 347-355.
5. S. Kim, "Burden of Hospitalizations Primarily Due to Uncontrolled Diabetes: Implications of Inadequate Primary Health Care in the United States," Diabetes Care 30, no. 5 (2007): 1281-1282.
6. Li C, Engstrom G, Hedblad B et al, Blood Pressure Control and Risk of Stroke: A Population-Based Prospective Cohort Study. Stroke 2005; 36: 725-730.
7. Braunstein JB. Noncardiac comorbidity increases preventable hospitalizations and mortality among Medicare beneficiaries with chronic heart failure. JACC 2003; 42(7): 1226-1233.
8. Bindman AB, Grumbach K, Osmond D, et al. Preventable hospitalizations and access to health care. JAMA 1995;274:305-11.
9. Culler SD, Parchman ML, Przybylski M. Factors related to potentially preventable hospitalizations among the elderly. Med Care 1998;36:804-17.
10. Chin MH, Goldman L. Factors contributing to the hospitalization of patients with congestive heart failure. Am J Public Health 1997; 87:643-8.
11. Philbin EF, DiSalvo TG. Prediction of hospital readmission for heart failure: development of a simple risk score based on administrative data. J Am Coll Cardiol 1999;33:1560-6.
12. Krumholz HM, Parent EM, Tu N, et al. Readmission after hospitalization for congestive heart failure among Medicare beneficiaries. Arch Intern Med 1997;157:99-104.
13. Holguin F, Folch E, Redd SC, Mannino DM. Comorbidity and mortality in COPD-related hospitalizations in the United States. Chest. 2005;128(4):2005-2011.
14. Umscheid CA, Mitchell MD, Agarwal R, et al, Mortality from Reasonably-Preventable Hospital-Acquired Infections, (Philadelphia Penn Center for Evidence-based Practice Advisory, 2008). Available at http://www.shea-online.org/Assets/files/0408_Penn_Study.pdf. Accessed February 10, 2010.
15. Cuddigan J, Berlowitz DR, Ayello EA. Pressure Ulcers in America: Prevalence, Incidence, and Implications for the Future: An Executive Summary of the National Pressure Ulcer Advisory Panel Monograph. Advances in Skin and Wound Care 2001, 14(4) 208-215.
16. F. de Brantes and A. Rastogi, "Evidence-Informed Case Rates: Paying for Safer, More Reliable Care," The Commonwealth Fund 40, publ. 1146 (2008): 1-14.
17. F. de Brantes, A. Gosfield, D. Emery, A. Rastogi and G. D'Andrea, "Sustaining the Medical Home: How Prometheus Payment Can Revitalize Primary Care", Robert Wood Johnson Foundation Report, May 2009, <http://www.rwjf.org/pr/product.jsp?id=42555>, Accessed February 10, 2010.
18. Francois de Brantes, Amita Rastogi, Michael Painter. Managing chronic care with the Prometheus Payment model – under review with Health Services Research.
19. Francois de Brantes, Amita Rastogi, Alice Gosfield et al. Bundled and Fee-for-Episode Payments: Lessons learned from the Prometheus Payment Model. IOM workshop publication, The Healthcare Imperative: Lowering Costs and Improving Outcomes (In press).

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.

Not Applicable

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):

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

Safety, Safety : Complications

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

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.)

http://www.hci3.org/programs-efforts/prometheus-payment/evidence_informed_case_rates/ecrs-and-definitions

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: NQF_Chronic_Care_PACs_01_24_17-636208880581539140-636426301962864692.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.

Yes

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.

Measure specifications have been updated since the last endorsement in the following ways:

1. The code tables have been revised to make them more user-friendly and readable. Earlier we had referenced the AHRQ-CCS categories that mapped to the PAC definitions. Now we have displayed the codes as either I-9 or I-10 codes so it is easier for users to use and implement the measure in their own programs.
2. All codes have been updated to 2016 codes and ICD-10 code conversions are included.
3. The measure is based on the most recent 12 months of claims for a given chronic condition episode instead of 12 months from the trigger date. This change helps capture the most recent activity for a given patient and creates a more level playing field for comparing provider performance.
3. We no longer define PACs with procedure codes. PAC definitions are based on diagnosis codes and these drive the services for care of the complication. For example, if there is an in-patient infectious disease consultation service for sepsis, the diagnosis code of sepsis on the claim is the tag that alerts the user that there is a complication. Previously, certain services (e.g. ED visits) were systematically classified as PACs, whereas the service now requires the presence of a diagnosis code included in the list of PAC codes.
4. Inpatient claims can trigger a chronic condition episode in order to capture acute events. This may be the first service delivered in relationship to the chronic condition.
5. Instead of three types of PACs, there are now two - Type 1 PACs are related to the index condition and type 2 PACs are related to patient safety and other system-wide failures. The PACs previously categorized as Type 2 have, for the most part, become PACs of Type 1 for other episodes. The earlier versions of our measures only included a small set of episodes, but the full PROMETHEUS model has expanded to dozens of conditions and each has its own list of PACs.
6. Our service assignment logic has been modified. All services that are relevant to an episode are multi-assigned to all relevant open episodes. If a patient had both an open diabetes episode and an open CAD episode, the services relevant to both (such as office visits) will be assigned to both, which better reflects the way in which patients are managed. As a result, a service with a PAC code can get counted in more than one episode.
7. We have expanded our databases to include the Medicaid population.
8. We have expanded our analysis to include all adult patients, 18 and above, rather than only the 18-65 population. This has broadened the measure in its scope and use. As a result, we have applied the measures on dozens of datasets, commercial, Medicaid and Medicare Advantage.
9. We have updated our risk adjustment methodology to match methods employed by the Centers for Medicare and Medicaid Services (CMS), endorsed by the National Quality Forum (NQF) to construct similar provider-level measures (i.e., mortality, readmissions, etc.), and in keeping with the most current risk-adjustment techniques.

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).

Outcome: Number of patients with at least one of the following six chronic conditions: Asthma, Chronic Obstructive Pulmonary Disease (COPD), Coronary Artery Disease (CAD), Heart Failure (HF), Hypertension (HTN), or Diabetes Mellitus (DM), and had one or more potentially avoidable complications (PACs), during the most recent 12 months.

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).

Patients with at least one of the following six chronic conditions: Asthma, Chronic Obstructive Pulmonary Disease (COPD), Coronary Artery Disease (CAD), Heart Failure (HF), Hypertension (HTN), or Diabetes Mellitus (DM), that were identified as having services that included a potentially avoidable complications (PACs) diagnosis code during the most recent 12 months of the episode. The enclosed excel workbook entitled NQF_Chronic_Care_PACs_01_24_17.xls gives the detailed codes for PACs. There are six PAC tabs for each of the six chronic conditions identified above (i.e., Asthma PACs I-9 & I-10, COPD PACs I-9 & I-10, CAD PACs I-9 & I-10, HF PACs I-9 & I-10, HTN PACs I-9 & I-10, and Diabetes PACs I-9 & I-10). In each of the PAC tabs, a PAC group name is given in column B, PAC type in column C, PAC ICD-9 diagnosis codes in column D and PAC ICD-10 diagnosis codes in column E. PACs are identified only based on

diagnosis codes.

Services for PACs are identified as follows:

- a. Any service (professional, outpatient facility, ancillary) that is relevant to each of the chronic conditions, and has a PAC code in any position on the claim
- b. Any admission to an inpatient facility, that has a diagnosis code in the principal position that is relevant to the chronic condition

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

Adult patients aged 18+ years who were identified as having at least one of the following six chronic conditions: Asthma, Chronic Obstructive Pulmonary Disease (COPD), Coronary Artery Disease (CAD), Heart Failure (HF), Hypertension (HTN), or Diabetes Mellitus (DM), and were followed for at least 12 months.

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).

Please refer to the enclosed excel workbook entitled NQF_Chronic_Care_PACs_01_24_17.xls - tab entitled “Triggers I-9 & I-10”

The target population is identified using the following criteria:

Using administrative claims database, patients that have triggered one of the six chronic conditions: Asthma, Chronic Obstructive Pulmonary Disease (COPD), Coronary Artery Disease (CAD), Heart Failure (HF), Hypertension (HTN), or Diabetes Mellitus (DM), based on the codes listed in tab entitled “Triggers I-9 & I-10” in the enclosed workbook “and “the following trigger criteria:

- a. Patients having an office visit with a trigger diagnosis code for any of the six chronic conditions in any position, followed by a second confirmatory claim at least 30 days later that could be an office visit, or an outpatient facility claim (with a trigger diagnosis code for the same chronic condition in any position), or an inpatient stay claim (with a trigger diagnosis code for the same chronic condition in the principal position).
- b. Patients having an emergency department visit with a trigger diagnosis code for any of the six chronic conditions in any position.
- c. Patients with an acute care facility claim with a trigger diagnosis code for any of the six chronic conditions in the principal position.

Inclusion criteria: Patients identified to have one of the six chronic conditions listed above, based on the trigger criteria listed above are retained in the measure if they meet the following inclusion criteria:

1. The patient has continuous enrollment for the entire time window, with no more than a 30-day enrollment gap.
2. The patient has at least 18 months of claims in the database.
3. Patient is at least 18 years of age

Once the episode is triggered all relevant claims are assigned to the episode. Relevant claims include inpatient facility claims, outpatient facility claims, professional services, laboratory services, imaging services, ancillary claims, home health, durable medical equipment as well as pharmacy claims across the entire continuum of care centered around the patient’s episode of care. Services that contain a PAC code and that are assigned to a chronic care episode will be flagged as indicative of a potentially avoidable complication.

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

Patients are excluded from the measure if they are less than 18 years of age, have an incomplete episode of care (less than 18 months of claims), have an enrollment gap of more than 30 days, or have outlier costs for the most recent 12 months of claim costs.

Claims are excluded from the episode if they are for services that are not relevant to the chronic condition.

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.)*

Denominator exclusions could be due to exclusion of either patients and / or claims:

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Please refer to the enclosed excel workbook entitled NQF_Chronic_Care_PACs_01_24_17.xls – tab entitled Decision Tree for each of the episodes

1. Patients are excluded from the measure if they meet any of the following criteria:

- a. age is < 18 years
- b. gender is missing
- c. there is an enrollment gap of more than 30 days during the episode time window
- d. there is less than 18 months of claims in the database for a given patient
- e. the episode is an outlier, defined as in the 1st or 99th percentile of all episodes.

2. Claims are excluded from a chronic care episode if they are not considered relevant to the care for the chronic condition, such as trauma related claims, or are for major surgical services.

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.)

None

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)

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.)

Please refer to the enclosed excel workbook entitled NQF_Chronic_Care_PACs_01_24_17.xls.

Identifying the Target Population -- Assembling the Denominator:

Using administrative claims data, patients with any of the six chronic conditions listed above are identified as those who fulfilled the trigger criteria for a chronic condition. Chronic condition patients should have claims that have a trigger diagnosis codes as defined in the TRIGGERS tab (Triggers I-9 & I-10) of the enclosed workbook. In addition, they should meet one of the following trigger criteria:

1. Have a hospitalization with a trigger code in the principal position of an inpatient stay claim
2. Have an outpatient facility visit such as an emergency department visit with one of the trigger codes in any position, OR
3. Have a physician visit with a trigger code in any position AND a confirming claim at least 30 days later that could be any of the three below:
 - An in-patient stay claim with a trigger diagnosis code of the same chronic condition code in the principal position,
 - An emergency department visit claim with a trigger code for the same chronic condition in any position or
 - Another professional visit claim with a trigger code for the same the chronic condition diagnosis in any position

Patients are retained if they are 18 years of age or more, do not have a missing gender, have continuous enrollment with an enrollment gap of less than 30 days, and have at least 18 months of data in the claims dataset.

Once the episode is triggered all relevant claims are assigned to the episode. Relevant claims could be inpatient facility claims, outpatient facility claims, professional services, laboratory services, imaging services, ancillary claims, home health, durable medical

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equipment as well as pharmacy claims across the entire continuum of care centered around the patient's episode of care. Services that contain a PAC code and that are assigned to a chronic care episode will be flagged as indicative of a potentially avoidable complication.

Hospitalizations carrying diagnosis codes relevant to a chronic condition, and relevant admissions to post-acute care facilities are also included in the episode. If a patient has more than one concurrent episode open, and the claim is relevant to both episodes, the claim gets multi-assigned to all relevant open episodes which can result in a service with a PAC code being assigned to more than one episode.

Once all the relevant services are assigned, outlier episodes (those with total episode costs below the 1st percentile or above the 99th percentile) are excluded.

Cases meeting the Outcome -- Assembling the Numerator:

Episodes included in the denominator are flagged as having a PAC (potentially avoidable complication) if:

- a. Any claim (professional, outpatient facility, ancillary) that is relevant has a PAC code in any position on the claim
- b. Any admission to an inpatient facility, that is relevant to the chronic condition as identified through a relevant principal diagnosis code

All pharmacy services are considered typical because the claims don't include diagnosis codes. Episodes that have even a single PAC claim are added to the numerator.

Time-period of data:

The time-period to be analyzed for the measure is the most recent 12 months of a triggered chronic care episode (Asthma, Chronic Obstructive Pulmonary Disease (COPD), Coronary Artery Disease (CAD), Heart Failure (HF), Hypertension (HTN), or Diabetes Mellitus (DM)).

Calculating the measure:

The proportion of patients with any of the six chronic conditions that have a service flagged as a PAC (potentially avoidable complication) is equal to the number of patients with a chronic care episode that has a PAC, divided by the number of patients that have a chronic condition, and is called the PAC rate as shown in the equation below:

$$\text{PAC rate} = \frac{\text{Patients with the chronic condition that have at least one PAC}}{\text{Total number of patients with the chronic condition}}$$

Aggregating Data & Drill Down Calculations:

Flow charts demonstrating the series of steps and the counts of patients at each step are shown in tabs entitled "Decision Tree" for each of the six chronic conditions of the enclosed workbook called NQF_Chronic_Care_PACs_01_24_17.xls.

Further analysis from this construct helps create actionable reports. As shown in the tab labeled "Summary PACs", not only do we have the PAC rate for each of the chronic conditions, we can calculate the frequency of PACs occurring due to hospitalizations, or in an outpatient facility, or in professional claims. These could be further broken down by the PAC type – type 1 being related to the chronic condition and actionable by the managing physician; and type 2 PACs related to patient safety and broader system failures and requiring collaboration among providers. The drill down details identify the highest volume PACs (see tabs labeled as "PAC Drill down Graph" for each of the chronic conditions). This helps focus strategies in reducing PACs and make the data actionable.

Risk Adjustment:

Conceptual Model:

Variations in outcomes across populations may be due to patient-related factors or due to provider-controlled factors. When we adjust for patient-related factors, the remaining variance in PAC rates are due to factors that could be controlled by all providers

that are managing or co-managing the patient, during the entire episode time window.

Once we have the observed PAC rates based on the above calculations, we risk-adjust them for patient factors such as patient demographics, comorbidities collected historically, and for severity of illness using subtypes indicators collected from the trigger claim and / or the look-back period. This helps adjust for factors outside the providers control and levels the playing field for provider performance comparisons.

Unit of Analysis:

The unit of analysis is the individual episode.

Dependent Variable:

The dependent variable is a dichotomous variable indicating whether an episode had one or more PACs (=1) or not (=0).

Independent Variables:

Several patient-related “risk factors” or covariates are included in the model: This list was selected based on input from various clinical experts in clinical working groups. Risk Factors used in the models were:

Patient demographics: age, gender, and an indicator of whether a member has enrolled within the previous 6 months. This latter risk factor is intended to account for the patient’s lack of claims history, which limits the number of potential comorbidities that can be identified.

Comorbidities: These are conditions or events that occurred prior to the start of the episode that can have a potential impact on the patient’s risk of having a PAC. The risk factors are 170 disease indicators (0/1) identified through the presence of ICD diagnosis codes on individual medical claims and collected from the historical claims data before the start of an episode. These are universally applied across all episodes. Please see the tab labeled “All Risk Factors I-9” and “All Risk Factors I-10” for a list of risk factors and their corresponding codes in the enclosed workbook called NQF_Chronic_Care_PACs_01_24_17.xls.

Episode Subtypes or Severity Markers: These are markers that distinguish an episode as being more severe than another. They indicate either specific patient comorbidities that are known to make the procedure or condition more difficult to treat (e.g., obesity) or severity of the illness itself (e.g., type 1 or type 2 diabetes, systolic vs. diastolic heart failure). Subtypes are unique to each episode. Please see the tab labeled “Subtypes I-9 & I-10” for a list of subtypes and their corresponding codes in the enclosed workbook called NQF_Chronic_Care_PACs_01_24_17.xls.

To avoid creating perverse incentives all comorbidities and subtypes are identified prior to or at the very start of the episode. None are identified during the episode period.

Statistical Methods:

We use logistic regression to model the probability of at least one PAC occurring during the episode. For each patient, based on their historic risk / severity profile, the “predicted” coefficients from the risk adjustment models are summed to give the “patient-level” predicted probabilities of the occurrence of a PAC.

To prevent unstable coefficients, comorbidities and subtypes are included in the models as covariates if they are present in at least 10 episodes. No further model building is conducted after the initial models are built. This reflects a desire to explain as much variation in the probability of having a PAC as possible, but it does not make it a priority that all covariates in the model be individually significant or even uncorrelated with each other. Accordingly, the model uses a very large group of covariates. This modeling approach allows for fewer potentially artificial constraints around the definitions of what constitutes severity of a episode condition, and lets each regression model determine for itself which of the factors are more significant for a specific episode. Non-significant covariates in episode models can not overly influence predicted outcomes, nor is much harm realized, if a group of correlated covariates work together to explain variation rather than having the variation explained by a single best factor.

The risk adjustment models for each of the six chronic conditions are shown in the enclosed workbook entitled NQF_Chronic_Care_PACs_01_24_17.xls. Please see tabs called Asthma_Risk_Model, COPD_Risk_Model, CAD_Risk_Model, HF_Risk_Model, HTN_Risk_Model and Diabetes_Risk_Model for each of the model coefficients. All the variables with an n>=10 are retained in the model and their coefficients are shown, along with their z-scores and p-values. As you may notice some of the covariates such as obesity are collected from both historical claims (risk factors) as well as from the episode trigger date and look-

back period of the episode (subtypes).

When more than one line of business is included in the data, separate models are calculated for each sample (i.e., commercial, Medicaid etc.).

Provider Attribution and calculating PAC rates by provider group:

Once episodes are constructed they are attributed to the provider group that has the maximum number of E&M claims during the episode time window.

To directly compare PAC rates across provider groups while also appropriately accounting for differences in patient severity, we calculate a risk-standardized PAC rate (RSPR) for each provider group. This method is similar to the methods employed by the Centers for Medicare and Medicaid Services (CMS) and endorsed by the National Quality Forum (NQF) to construct similar provider-level measures (i.e., mortality, readmissions, etc.).

1. For each provider group, for each chronic condition, the actual number of PAC occurrence is summed across all attributed patients, to give the “observed” PAC rates for that condition for the provider group.
2. Similarly, patient-level probability estimates are summed across all attributed patients to give “expected” PAC rates for the provider group.
3. The observed sum is then divided by the summed probabilities (O/E). This number yields whether the provider group had more PACs than expected (ratio>1), as expected (ratio=1), or less than expected (ratio<1). This calculation yields a practice-level unstandardized performance ratio.
4. To facilitate accurate comparisons of rates across provider groups, the O/E ratio is multiplied by the overall expected PAC rate across all provider groups, to obtain the risk-standardized PAC rate (RSPR) for the group.

The formula for this calculation is as follows:

$$RSPR_j = \{(\text{SUM Observed}_{ij}) / (\text{SUM Prob}_{ij})\} \times \{(\text{SUM Prob}_i) / (\# \text{ of episodes})\}$$

Where an individual i is attributed to the unit of attribution j (e.g., physician group)

The risk-standardized PAC rate (RSPR) therefore adjusts the provider group’s observed PAC rate, by the severity of it’s patients. It represents what a provider group’s PAC rate would be if its patient population was reflective of the overall population, leveling the playing field, and allowing for meaningful comparisons across all groups adjusted similarly.

This is what we call RSPR (risk standardized PAC rate) and is used for provider group outcomes comparisons.

Minimum sample size requirements for PAC measures are a function of the reliability testing of the measures on every dataset on which the measures are applied. Our research suggests that minimum sample sizes to achieve high degrees of reliability in the measures are a function of the dataset analyzed, and as such may vary from dataset to dataset. One should not infer that a minimum sample size achieved in one dataset will apply to another.

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.

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.

CIP: Commercially insured population database

A two-year national commercially insured population (CIP) claims database was used as our developmental database. The database had 4.7 million covered lives and \$95 billion in “allowed amounts” for claims costs. The database was an administrative claims database with medical as well as pharmacy claims. The methodology can be used on any claims database with at least two years of data and a minimum of 150 patients with the anchor condition or hospitalization. Having pharmacy data adds to the richness of the risk-adjustment models. A standardized SAS-based program has been developed that users could download from our website (www.prometheuspayment.org) to calculate PAC rates using their own data. The methodology has been tested on databases of several health plans as well as on a few employer databases.

No data collection instrument was used.

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)

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

Clinician : Group/Practice, Health Plan, Other, Population : Community, County or City, Population : Regional and State

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

Other, Outpatient Services

If other: Cross-cutting, Across care continuum

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.)

2. Validity – See attached Measure Testing Submission Form

[0709_MeasureTesting_MSF5.0_Data-636426301972395942.doc](#)

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.

No

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 results of field testing the measures by running the analysis through several different claims datasets has highlighted the importance of having a well organized claims set prior to running the measures. For example, we have learned that failure to have diagnosis codes on procedural claims can lead to significant underreporting of PACs. In addition, failure to have a two-year dataset leads to many patients being eliminated from the study, due to failure to meet the one-year enrollment criteria from the date of the trigger, resulting in a small sample set that maybe inadequate for risk-adjustment. We have therefore clarified the data requirements necessary for appropriate calculation of the measures. When claims datasets are organized in the way we specify in the measure analysis, and contain the coding information required, the analysis of the measure and its results are highly reliable.

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).

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)
Public Reporting	
Payment Program	
Quality Improvement (Internal to the specific organization)	

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

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?)

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.)

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.

Measures associated to potentially avoidable complications (PACs) are in use today with private and public sector payers, in particular:

Horizon Blue Cross Blue Shield of New Jersey has been using PACs as part of its on-going alternative payment model implementation for the past 5 years. Some of the results have been captured in a Case Study (see: <http://www.hci3.org/wp-content/uploads/2016/02/Horizon-Prometheus-Case-Study-4-Feb-2015.pdf>). Comprehensive reports are given to providers to help them identify and reduce the frequency of avoidable complications and lower the costs of managing patients.

An on-going bundled payment program focusing on maternity with Community Health Choice in Houston, TX and two obstetrics groups from the University of Texas Health System have been using detailed reports on avoidable complications to improve their performance. This effort has been featured in a Case Study published by the NEJM Catalyst (see: <http://catalyst.nejm.org/bundled->

[payments-maternity-care/](#)

New York State's Delivery System Reform Incentive Payment program includes the use of PACs as key performance measures for all providers engaged in Value-based Payment contracts. Reports are generated through the state's Medicaid Data Warehouse, and PAC measures were reviewed and approved by various Clinical Advisory Groups. For more information, see:

https://www.health.ny.gov/health_care/medicaid/redesign/dsrip/vbp_reform.htm, and in particular:

? [VBP Roadmap](#) that includes specific references to PACs:

https://www.health.ny.gov/health_care/medicaid/redesign/dsrip/2016/2016-jun_annual_update.htm#apxv

? [Diabetes Clinical Advisory Group report](#) reflecting PAC measures:

https://www.health.ny.gov/health_care/medicaid/redesign/dsrip/vbp_library/2016-09-13_diabetes_rpt.htm

We have also created reports for rates of PACs for the following organizations:

-Vermont Payment Reform

-Maine Health Management Coalition

- Anthem CT

-NH's All-payer Claims Database

-CT Medicaid

-CO All-payer Claims Database, Center for Improving Value in Health Care

There are several companies that are leveraging the PAC measures to create analytics and software for customers – these include McKesson/HealthQx, Aver Informatics, and TriZetto. These organizations provide detailed reports on PACs to large national and regional payers.

In 2017 the Maryland Health Care Commission is releasing comparative data on prices and rates of complications for chronic care and other episodes.

Below are some references that highlight research and findings associated with Potentially Avoidable Complications (PACs).

1.Hibbard JH, Greene J, Sofaer S, Firminger K, and Hirsh J. Experiment shows that a well-designed report on costs and quality can help consumers choose high value health care. *Health Affairs*, 31, no.3 (2012):560-568 (doi: 10.1377/hlthaff.2011.1168)

2.Rastogi A, de Brantes F, Costley J, and Tompkins C. HCI3 Improving Incentives Issue Brief – Analysis of Medicare and Commercial Insurer-Paid Total Knee Replacement Reveals Opportunity for Cost Reduction. Available from: <http://www.hci3.org/wp-content/uploads/files/files/HCI-2012-IssueBrief-L6-2.pdf>, Accessed Jan 17 2017.

3.de Brantes F, Rastogi A, and Sorensen CM. Episode of Care Analysis Reveals Sources of Variation in Costs. *Am J Manag Care*. 2011; 17(10): e383-e392.

4.de Brantes F, Rastogi A, and Painter M. Reducing Potentially Avoidable Complications in Patients with Chronic Diseases: The Prometheus Payment Approach. *Health Services Research* 2010; 45(6), Part II: 1854-1871.

5.Pierre L. Yong and LeighAnne Olsen. The Healthcare Imperative: Lowering Costs and Improving Outcomes: Workshop Series Summary; Roundtable on Evidence-Based Medicine; Institute of Medicine. 2010. ISBN: 0-309-14434-5, <http://www.nap.edu/catalog/12750.html>, accessed June 14, 2015.

6.Pham HH, Ginsburg PB, Lake TK, and Maxfield MM. Episode-based Payments: Charting a course for Health care Payment Reform. National Institute for Health Care Reform. Policy Analysis, No.1. Jan 2010. Available from: http://www.nihcr.org/Episode_Based_Payments.html. Accessed Jun 1 2015.

7.François de Brantes, M.S., M.B.A., Meredith B. Rosenthal, Ph.D., and Michael Painter, J.D., M.D. Building a Bridge from Fragmentation to Accountability —The Prometheus Payment Model. *NEJM* 2009; 361:1033 (Perspective)

8.de Brantes F, D'Andrea G, Rosenthal MB. Should health care come with a warranty? *Health Aff (Millwood)* 2009; 28:w678-w687.

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.

Most users of PAC measures provide quarterly reports to providers, and that is what we recommend. We have created on-line courses to help everyone understand the way in which episodes are constructed, services are assigned and flagged as typical or PAC, and adjusted for patient characteristics (see: <http://www.hci3.org/thought-leadership/online-courses>). The organizations mentioned in the prior section provide detailed reports to providers on a regular basis that drill down into the types and frequencies

of PACs as well as the amount of dollars per episode consumed by PACs. All of which helps providers institute process improvement activities. In another Case Study (see: <http://www.hci3.org/wp-content/uploads/2016/08/PEBTF-Case-Study.pdf>) we show how one provider group in Pennsylvania used the information provided by such reports to redesign post-acute care and other processes.

As importantly, and illustrated by New York State's work, the definitions of PACs are continuously being scrutinized by external groups, such as the Clinical Advisory Groups. The NYS CAGs spent weeks reviewing the diagnosis codes that are included in the chronic care PAC codes. Feedback from these CAGs and field implementations create a constant link between our work and the provider community.

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.

As we work with various clinicians in the field who are implementing the PAC measures for performance measurement, specialists often come back with clinical questions related to PAC definitions and how certain PACs may not be avoidable. Our feedback has always been that if a PAC could be avoided even in one patient, then the measure is serving its purpose. The measure is intended to identify poor performance in aggregate and help identify areas of opportunity for improvement. It is not designed as a punitive measure and, in fact, what gets reported is the difference between the expected rate of PACs and the actual rate, which means that providers don't get "dinged" when a patient has a PAC. Rather, that patient gets added to the numerator, and it's only if a provider has an excessive number of those patients compared to the expected number that they will end up with a performance that is below average. This measurement philosophy has gotten providers engaged in the process and they look at their outputs longitudinally across the care continuum. Drill down reports have helped them focus on process improvement activities targeted at the high-volume PACs in their respective practices. Some providers have acted proactively with various practice improvement activities such as increasing patient engagement and outreach activities to monitor patients with chronic conditions in between scheduled visits.

Feedback was obtained via one of several ways:

1. Conference calls
2. Onsite visits
3. Set-up of Clinical Working Groups

4a2.2.2. Summarize the feedback obtained from those being measured.

To-date, the feedback from providers has been split into two categories:

- Usefulness of reports – Getting detailed reports on which patients experienced PACs and the nature and impact of those PACs creates an important understanding of outcomes and leads to process improvement
- Breadth of PAC definitions – While many providers are initially surprised by the number of diagnosis codes that are included in the list of PAC codes, they understand that many of those codes never have an impact on the actual measure because the frequency of occurrence is incredibly small. In some instances, comments on specific diagnosis codes has helped us to refine our lists of PAC codes.

4a2.2.3. Summarize the feedback obtained from other users

Payers have embraced the measure as part of broader efforts to introduce alternative payment models because improving the measure also reduces total costs of care for managing a chronic condition. As such, the messaging to providers remains consistent that improving clinical outcomes will also improve financial outcomes.

States like Maryland have indicated the approach appeals to consumers and providers by communicating a simple message about quality of care and the link between better quality and lower costs.

Studies by Judy Hibbard and Shoshanna Sofaer have shown that consumers understand what PACs represent and equate lower PAC rates to lower costs of care.

Some providers have reacted negatively to the measure, pointing out that it may be too broad, in particular the Type 2 PACs and that individual physicians may not be able to impact the underlying causes that lead to the occurrence of those PACs. However, those same providers recognize that PACs of Type 2 could be useful measures for larger provider organizations who are being held accountable for the total outcomes of attributed patients.

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.

Feedback from the field is continuously reviewed and can lead to modifications in the codes that are associated with PACs, or the rules that govern the assignment of services to episodes. None of these change the measure construct but can change the measure result.

When suggestions on code changes are made, they are evaluated through careful data analyses to determine the magnitude of the impact and the clinical logic of the change. To the extent these analyses confirm the validity of making the changes, they are incorporated in the routine update of episode definitions.

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.

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.

The PAC analysis is as good as the coding in the claims databases. If the secondary diagnosis codes are not identified completely, or if the pharmacy data is missing, the risk adjustment models suffer. The PACs may also get underreported if there is incomplete coding.

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.

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

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

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?

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

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](#)

[Related Measures: AHRQ-PQIs \(PQI 1\): Diabetes Short-term complications admission rate; AHRQ-PQIs \(PQI 3\): Diabetes Long-term complications admission rate; AHRQ-PQIs \(PQI 5\): Chronic Obstructive Pulmonary Disease admission rate; AHRQ-PQIs \(PQI 7\): Hypertension Admission Rate; AHRQ-PQIs \(PQI 8\): Congestive Heart Failure \(CHF\) Admission Rate; AHRQ-PQIs \(PQI 11\): Bacterial Pneumonia Admission Rate; AHRQ-PQIs \(PQI 12\): Urinary Tract Admission Rate; AHRQ-PQIs \(PQI 13\): Angina without procedure admission rate; AHRQ-PQIs \(PQI 14\): Uncontrolled diabetes Admission Rate; AHRQ-PQIs \(PQI 15\): Adult Asthma Admission Rate; AHRQ CCS \(Clinical Classification System\) for ICD-9 diagnosis and procedure codes; AHRQ CCS \(Clinical Classification System\): CCS for CPT codes](#)

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: NQF_Chronic_Care_PACs_Risk_Adjustment_2.9.10-635538123138078951-636426301982864692.xls](#)

Contact Information

Co.1 Measure Steward (Intellectual Property Owner): [Altarum Institute](#)

Co.2 Point of Contact: [Francois, deBrantes](#), Francois.deBrantes@altarum.org, 734-205-6102-

Co.3 Measure Developer if different from Measure Steward: [Bridges To Excellence](#)

Co.4 Point of Contact: [Amita, Rastogi](#), amita.rastogi@hci3.org, 219-934-9624-

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.

[In 2006 the Prometheus Payment Design Team convened a series of meetings with physicians that had been organized in Clinical Working Groups. These groups focused on Cancer, Cardiac, Chronic, Orthopedic and Preventive care. The results of this work were summarized in a Commonwealth Fund report published in June 2007 and served as an input to the initial modeling work performed in 2007 and early 2008. The specific criteria laid out by the Clinical Working Group for the diabetes measure served as a framework](#)

for the development of other chronic care measures.

Prometheus Clinical Working Group described the boundaries of several episodes including diabetes, congestive heart failure etc., defining what was considered as routine and "typical" care and what diagnoses and services were considered for care of potentially avoidable complications. In addition, the Prometheus Design Team members contributed significantly to the shaping of the final ECR. Clinicians and experts in the field of cardiology and primary care were members of the Prometheus design team, and they edited the definitions of PACs and the boundaries of the episodes based on clinical judgment as well as empirical analysis.

The entire history of the development of the Prometheus Payment model-defined Potentially Avoidable Complications along with the relevant references is enclosed under section Ad.3.

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.2 Year the measure was first released: 2008

Ad.3 Month and Year of most recent revision: 10, 2009

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

Ad.5 When is the next scheduled review/update for this measure? 10, 2010

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Ad.7 Disclaimers:

Ad.8 Additional Information/Comments: