NATIONAL QUALITY FORUM

Measure Evaluation 4.1
January 2010

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The sub-criteria and most of the footnotes from the evaluation criteria are provided in Word comments and will appear if your cursor is over the highlighted area (or in the margin if your Word program is set to show revisions in balloons). Hyperlinks to the evaluation criteria and ratings are provided in each section.

TAP/Workgroup (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each sub-criterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the* sub-criteria *(yellow highlighted areas)*.

Steering Committee: Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the sub-criterion, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the criteria are met
C = Completely (unquestionably demonstrated to meet the criterion)
P = Partially (demonstrated to partially meet the criterion)
M = Minimally (addressed BUT demonstrated to only minimally meet the criterion)
N = Not at all (NOT addressed; OR incorrectly addressed; OR demonstrated to NOT meet the criterion)
NA = Not applicable (only an option for a few sub-criteria as indicated)

(for NQF staff use) **NQF Review** #: OT2-003-09 **NQF Project:** Patient Outcomes Measures: Phases I and II
MEASURE DESCRIPTIVE INFORMATION
De.1 **Measure Title:** 30-day Post-hospital PNA Discharge ED measure
De.2 **Brief description of measure***:* This measure estimates the percentage of eligible Medicare hospital discharges with the diagnosis of pneumonia (PNA) and evidence of an Emergency Department (ED) visit within 30 days of the hospital discharge and prior to any hospital readmission.
1.1-2 **Type of Measure:** outcome De.3 **If included in a composite or paired with another measure, please identify composite or paired measure** The proposed measure is one component of a three component composite measure, 30-day Post-hospital PNA Discharge Care Transition measure, being submitted concurrently under the Patient Outcomes Phase II Measures project's call for measures.
De.4 **National Priority Partners Priority Area:** care coordination De.5 **IOM Quality Domain**: efficiency De.6 **Consumer Care Need:** Getting Better

CONDITIONS FOR CONSIDERATION BY NQF	
Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards:	**NQF Staff**
A. The measure is in the public domain or an intellectual property (measure steward agreement) is signed. *Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.* A.1 **Do you attest that the measure steward holds intellectual property rights to the measure and the right to use aspects of the measure owned by another entity (e.g., risk model, code set)?** Yes	**A** **Y**☐ **N**☐

A.2 Indicate if Proprietary Measure (*as defined in measure steward agreement*)**:** **A.3 Measure Steward Agreement:** government entity- public domain- No Agreement **A.4 Measure Steward Agreement attached:**	
B. The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. Yes, information provided in contact section	**B** **Y☐** **N☐**
C. The intended use of the measure includes <u>both</u> public reporting <u>and</u> quality improvement. ►**Purpose:** public reporting, quality improvement Accountability	**C** **Y☐** **N☐**
D. The requested measure submission information is complete. Generally, measures should be fully developed and tested so that all the evaluation criteria have been addressed and information needed to evaluate the measure is provided. Measures that have not been tested are only potentially eligible for a time-limited endorsement and in that case, measure owners must verify that testing will be completed within 12 months of endorsement. **D.1Testing:** Yes, fully developed and tested **D.2 Have NQF-endorsed measures been reviewed to identify if there are similar or related measures?** Yes	**D** **Y☐** **N☐**
(for NQF staff use**)** **Have all conditions for consideration been met?** **Staff Notes to Steward** (*if submission returned*)**:**	**Met** **Y☐** **N☐**
Staff Notes to Reviewers (*issues or questions regarding any criteria*)**:**	
Staff Reviewer Name(s):	

TAP/Workgroup Reviewer Name:	
Steering Committee Reviewer Name:	
1. IMPORTANCE TO MEASURE AND REPORT	
Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in or overall poor performance. *Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria.* (<u>evaluation criteria</u>) **1a. High Impact**	<u>Eval Rating</u>
(for NQF staff use) **<u>Specific NPP goal</u>**:	
1a.1 Demonstrated High Impact Aspect of Healthcare: affects large numbers, a leading cause of morbidity/mortality, high resource use, severity of illness **1a.2** **1a.3 Summary of Evidence of High Impact:** PNA is a frequently occurring and high cost acute infection resulting in about 500,000 hospital admissions annually among elders (Martinez, 2009; Niederman, 1998); two-thirds of all PNA hospitalizations occur in elders with high cost co-morbid conditions such as HF, COPD/asthma, and diabetes (Kaplan, 2002). PNA is responsible for the second highest rate of hospital readmission following HF (Jencks et al, 2009); rehospitalizations are cited as potential preventable costs to the Medicare program and PNA specifically has been identified as a priority condition (MedPac, 2007). Ideally, effective integrated outpatient medical care would avert an Emergency Department visit following hospitalization. Moreover, this measure examines a primary outcome of interest in intervention studies aimed at improving transitions across care settings, comprehensive and effective discharge planning and coordination of care (Coleman et al, 2006; MedPAC, 2007; Naylor, 2004; Phillips et al, 2004; Epstein, 2009; Chiu et al, 2007; Kripalani et al, 2007: Sherman et al, 2009).	**1a** **C☐** **P☐** **M☐** **N☐**

1a.4 Citations for Evidence of High Impact: 1. Martinez R, Reyes S, Lorenzo MJ, Menendez R: Impact of guidelines on outcome: the evidence. Semin Respir Crit Care Med 2009; 30(2): 172-8.
2. Niederman MS, McCombs JS, Unger AN, Kumar A, Popovian R: The cost of treating community-acquired pneumonia. Clin Ther 1998; 20(4): 820-37.
3. Kaplan V, Angus DC, Griffin MF, Clermont G, Scott Watson R, Linde-Zwirble WT: Hospitalized community-acquired pneumonia in the elderly: age- and sex-related patterns of care and outcome in the United States. Am J Respir Crit Care Med 2002; 165(6): 766-72.
4. Jencks SF, Williams MV, Coleman EA: Rehospitalizations among patients in the Medicare fee-for-service program. N Engl J Med 2009; 360(14): 1418-28.
5. Coleman EA, Berenson RA: Lost in transition: challenges and opportunities for improving the quality of transitional care. Ann Intern Med 2004; 141(7): 533-6.
6. Naylor MD: Transitional care for older adults: a cost-effective model. LDI Issue Brief 2004; 9(6): 1-4.
7. Chiu WK, Newcomer R: A systematic review of nurse-assisted case management to improve hospital discharge transition outcomes for the elderly. Prof Case Manag 2007; 12(6): 330-6; quiz 337-8.
8. Sherman FT: Rehospitalizations: packaging discharge and transition services to prevent "bounce backs". Geriatrics 2009; 64(5): 8-9.
9. Epstein AM: Revisiting readmissions--changing the incentives for shared accountability. N Engl J Med 2009; 360(14): 1457-9.
10. Kripalani S, LeFevre F, Phillips CO, Williams MV, Basaviah P, Baker DW: Deficits in communication and information transfer between hospital-based and primary care physicians: implications for patient safety and continuity of care. JAMA 2007; 297(8): 831-41.
11. MedPac: Promoting Greater Efficiency in Medicare. Medicare Payment Advisory Commission, 2007.

1b. Opportunity for Improvement

1b.1 Benefits (improvements in quality) envisioned by use of this measure:

1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:
Jencks and colleagues recently provided a current profile of readmissions among the Medicare population and found that one in five hospitalized patients were readmitted to the hospital within 30 days and that half of these patients had no ambulatory visit before subsequent hospitalization (Jencks et al, 2009). When transitions of care from hospital to home or SNF are not optimized by the direct transfer of medical accountability with appropriate follow-up, the probability of an adverse event necessitating an ED visit and/or readmission increase.

1b.3 Citations for data on performance gap:
Jencks SF, Williams MV, Coleman EA: Rehospitalizations among patients in the Medicare fee-for-service program. N Engl J Med 2009; 360(14): 1418-28.

1b.4 Summary of Data on disparities by population group:
Variation in health care utilization and spending has been well-documented by the Dartmouth research group. There has been some mixed evidence of racial/ethnic differences in hospital readmissions (Jiang et al, 2005). Empirical evaluation of the racial/ethnic differences in elder ED visits following hospital discharge for PNA however has not been conducted.

1b.5 Citations for data on Disparities:
Jiang HJ, Andrews R, Stryer D, Friedman B: Racial/ethnic disparities in potentially preventable readmissions: the case of diabetes. Am J Public Health 2005; 95(9): 1561-7.

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1c. Outcome or Evidence to Support Measure Focus

1c.1 Relationship to Outcomes (*For non-outcome measures, briefly describe the relationship to desired outcome. For outcomes, describe why it is relevant to the target population*)**:** NQF has identified transitions or "hand-offs" as the fifth domain in their definition and framework for measuring care coordination. Transitions between care settings involve multiple providers and often compromised patients

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with complex needs resulting in care that is often unsafe, disconnected, and uncoordinated. Experts agree that breakdown in medical information occurs frequently during transitions between care settings, especially hospital to home.

While lack of an ED visit following discharge does not necessarily indicate that a comprehensive, effective transition plan was executed the development of an ED Visit measure is consistent with current evaluation of intervention programs designed to improve transitions or care coordination. The ED visit rate is used extensively as an outcome of interest in intervention programs (Naylor et al, 1999; Martineau et al, 2004; Doughtery et al, 2005; Hershberger et al, 2005; Reigel et al, 2005; Bell et al, 2009).

1c.2-3. **Type of Evidence:** expert opinion

1c.4 **Summary of Evidence** (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*)**:**
As stated above evidence exists for the validity of an ED measure from the numerous intervention studies specifically designed to improve care coordination and care transitions across care settings that utilize the ED rate as an outcome to determine the effectiveness of the intervention.

1c.5 **Rating of strength/quality of evidence (***also provide narrative description of the rating and by whom***):**
Expert opinion

1c.6 **Method for rating evidence:** NA

1c.7 **Summary of Controversy/Contradictory Evidence:** None identified

1c.8 **Citations for Evidence (***other than guidelines***):** 1. Bell CM, Schnipper JL, Auerbach AD, et al.: Association of communication between hospital-based physicians and primary care providers with patient outcomes. J Gen Intern Med 2009; 24(3): 381-6.
2. Dougherty CM, Thompson EA, Lewis FM: Long-term outcomes of a telephone intervention after an ICD. Pacing Clin Electrophysiol 2005; 28(11): 1157-67.
3. Hershberger RE, Nauman DJ, Byrkit J, et al.: Prospective evaluation of an outpatient heart failure disease management program designed for primary care: the Oregon model. J Card Fail 2005; 11(4): 293-8.
4. Martineau P, Frenette M, Blais L, Sauve C: Multidisciplinary outpatient congestive heart failure clinic: impact on hospital admissions and emergency room visits. Can J Cardiol 2004; 20(12): 1205-11.
5. Riegel B, Naylor M, Stewart S, McMurray JJ, Rich MW: Interventions to prevent readmission for congestive heart failure. JAMA 2004; 291(23): 2816; author reply 2816-7.

1c.9 **Quote the Specific guideline recommendation (***including guideline number and/or page number***):**
NA

1c.10 **Clinical Practice Guideline Citation:** NA
1c.11 **National Guideline Clearinghouse or other URL:** NA

1c.12 **Rating of strength of recommendation (***also provide narrative description of the rating and by whom***):**
NA

1c.13 **Method for rating strength of recommendation** (*If different from* USPSTF system*, also describe rating and how it relates to USPSTF)***:**
NA

1c.14 **Rationale for using this guideline over others:**
NA

TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria **for** *Importance*	**1**

to Measure and Report?	
Steering Committee: Was the threshold criterion, *Importance to Measure and Report*, **met?** **Rationale:**	**1** **Y☐** **N☐**
2. 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. (evaluation criteria)	Eval Rating
2a. MEASURE SPECIFICATIONS	
S.1 Do you have a web page where current detailed measure specifications can be obtained? **S.2 If yes, provide web page URL:** **2a. Precisely Specified**	
2a.1 Numerator Statement (*Brief, text description of the numerator - what is being measured about the target population, e.g. target condition, event, or outcome***):** The numerator is the number of eligible hospital discharges in the target population for which there is evidence of an ED visit within 30 days of a hospital discharge with the principal diagnosis of PNA or prior to any readmission. **2a.2 Numerator Time Window (***The time period in which cases are eligible for inclusion in the numerator***):** The opportunity for each eligible Medicare discharge is 30-days following an eligible hospitalization. **2a.3 Numerator Details (***All information required to collect/calculate the numerator, including all codes, logic, and definitions***):** ED visit occurring any time within a 30-day period following a hospital discharge for PNA among Medicare beneficiaries age 65 years and older identified via CMS's Outpatient Standard Analytical File (SAF) using revenue codes = 0450 to 0459 and 0981. ED visit is not counted in the numerator if the beneficiary has a hospital claim prior to the ED visit or is part of a hospital claim during the 30-day post hospital discharge period. The numerator is the sum of beneficiaries who meet this criterion.	
2a.4 Denominator Statement (*Brief, text description of the denominator - target population being measured***):** Medicare Fee-For-Service beneficiaries having been discharged from the hospital with a principal discharge diagnosis of PNA. **2a.5 Target population gender:** Female, Male **2a.6 Target population age range:** Medicare Fee-For-Service Medicare beneficiaries age 65 years and older **2a.7 Denominator Time Window (***The time period in which cases are eligible for inclusion in the denominator***):** Computed as a three-year rolling average (January through December each year) **2a.8 Denominator Details (***All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions***):** Identify admissions for Medicare beneficiaries 65 years of age and older with a principal discharge diagnosis of PNA and a complete history for 12 months prior to admission (for risk adjustment purposes). As a first step, identify all hospitalizations for any condition in each calendar year among Medicare beneficiaries. Second, remove all hospital readmissions within 30-days of an admission as a hospitalization cannot be both an index and readmission, and remove all admissions for persons not enrolled in both Parts A and during the 12 months immediately preceding the admission. From the resulting index hospitalizations, select hospitalizations with a principal discharge diagnosis of PNA using one or more of the qualifying ICD-9 codes in CMS's Inpatient Standard Analytic File. ICD-9 codes for pneumonia include the following: 480.0, 480.1, 480.2, 480.3, 480.8, 480.9, 481, 482.0, 482.1, 482.2, 482.30, 482.31, 482.32, 482.39, 482.40, 482.41, 482.49, 482.81, 482.82, 482.83, 482.84, 482.89, 482.9, 483.0, 483.1, 483.8, 485, 486, and 487.0.	**2a-specs** **C☐** **P☐** **M☐** **N☐**

2a.9 Denominator Exclusions (*Brief text description of exclusions from the target population***):** 1) In-hospital mortality
2) Transfers-out to another acute care facility

2a.10 Denominator Exclusion Details (*All information required to collect exclusions to the denominator, including all codes, logic, and definitions***):**
1) In-hospital mortality does not permit for any post-hospital follow-up; identify exclusion via the patient status discharge table, code='20'
2) If the patient is transferred to another acute care facility during the hospitalization then receiving hospital is accountable for the post-hospital follow-up; identify exclusion via the patient discharge table, code='02'

2a.11 Stratification Details/Variables (*All information required to stratify the measure including the stratification variables, all codes, logic, and definitions***):**
NA

2a.12-13 Risk Adjustment Type: risk adjustment method widely or commercially available

2a.14 Risk Adjustment Methodology/Variables (*List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method***):**
We employ the Yale risk-adjusted methodology used in the NQF-endorsed Hospital 30-day PNA Readmission Measure. It consists of a modified approach to the Hierarchical Condition Category (HCC) clinical classification system (Pope et al, 2000) and incorporates 1) Part A secondary diagnoses from the index admission, excluding those mapping to CCs that are potential complications as identified by the Yale-convened team of medical experts; 2) Part A principal diagnosis from any hospitalization in the 12 months prior to the index admission; 3) Part A secondary diagnoses from any hospitalization in the 12 months prior to the index admission; 4) diagnoses from hospital outpatient services in the 12 months prior to the index admission; 5) diagnoses from Part B physician encounters in the 12 months prior to the index admission. Diagnoses identified from all of these sources are grouped into single CC indicator flags. A subset of the CCs assigned in this manner, some of them aggregated, are used in the final model, along with age, sex and a history of CABG as risk adjusters in the final statistical models.

2a.15-17 Detailed risk model available Web page URL or attachment:

2a.18-19 Type of Score: rate/proportion
2a.20 Interpretation of Score: better quality = lower score
2a.21 Calculation Algorithm (*Describe the calculation of the measure as a flowchart or series of steps***):**
Step 1: Claims for all beneficiaries (regardless of clinical condition) from 2003-2007 Medicare Inpatient files were combined and cleaned to create a claims file with one claim per inpatient per provider stay. Next, a single-stay claims file for all beneficiaries (regardless of clinical condition) in which transfer claims are combined into a single inpatient stay record was created. This process is described in the "Input File Processing for 2009 CMS 30-day Mortality and Readmission Measures" documentation.

Step 2: Each stay in the five year period is then defined as either an index admission or a 30-day readmission. A single stay cannot count as both an index admission and a readmission for another index admission. Thus, additional admissions within 30-days of an index admission are not counted as index admissions. Index admissions with a qualifying primary discharge pneumonia diagnosis from beneficiaries meeting the inclusion criteria were included in this measure. This process is described in the Hospital 30-Day Pneumonia Readmission Measure Methodology submitted by YNHH-CORE, and the Hospital 30-Day Heart Failure Readmission Measure Methodology submitted by YNHH-CORE; the one substantive difference is this method defines index admissions independent of the pneumonia diagnosis criterion. Thus, no index PNA admission is a readmission for a hospitalization based on some other diagnostic condition.

Step 3: For each qualifying index admission, the beneficiary's inpatient and outpatient claims in the 12-months prior to the hospitalization are examined. All diagnoses from non-DME, non-diagnostic testing claims are used to construct flags for 184 clinical Condition Categories (CCs). Secondary diagnoses (excluding diagnoses associated with potential complications) from the index admission are used also to assign the 184 CCs. The process for creating the CC flags is described in the RiskSmart Stand Alone Users

Guide, v2.2. These flags are used for risk adjustment, by combining the two sets of CCs described above using the resulting set of CCs to assign the comorbidity flags defined by YNHH-CORE.

Step 4: The following three flags (0/1 indicators) are then set for each index admission.
• Readmission=1 if a subsequent readmission occurs within 30 days of discharge from the qualifying index admission
• ED visit=1 if an ED visit occurs in the 30 days after discharge from the index admission, and the ED visit is not after the first readmission (or associated with a readmission)

Step 5: For each hospital, calculate the ratio of the number of ED visit = 1 events over the total number of qualifying index admissions to get unadjusted ED rate. This is for descriptive purposes only.

Step 6: Estimate a hierarchical logistic regression model on the ED visit indicator using the methodology developed for the CMS 30-day all cause readmission measure.

Step 7: Applying the predicted and expected estimates from Step 6, compute for each hospital the predicted-to-expected (P/E) ratio and corresponding risk standardized rate (the RSR is defined as P/E times overall population mean).

Step 8: Rank computed RSR rates across all hospitals and calculate percentile values.

2a.22 Describe the method for discriminating performance *(e.g., significance testing)***:**
Individual hospital 30-day post discharge ED visit measures are standardized and all hospitals are ranked on the resulting standardized percentile; which may be converted to 5-star ratings based upon quintile.

2a.23 Sampling (Survey) Methodology *If measure is based on a sample (or survey), provide instructions for obtaining the sample, conducting the survey and guidance on minimum sample size (response rate)*:
NA; all eligible cases are included in the measure.

2a.24 Data Source (*Check the source(s) for which the measure is specified and tested)*
Electronic adminstrative data/claims

2a.25 Data source/data collection instrument (*Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.***):**
CMS' Outpatient Standard Analytic File (SAF) and Inpatient (SAF) or MEDPAR files.

2a.26-28 Data source/data collection instrument reference web page URL or attachment:

2a.29-31 Data dictionary/code table web page URL or attachment:

2a.32-35 Level of Measurement/Analysis (*Check the level(s) for which the measure is specified and tested)*
Population: national

2a.36-37 Care Settings (*Check the setting(s) for which the measure is specified and tested)*
Hospital

2a.38-41 Clinical Services (*Healthcare services being measured, check all that apply*)

TESTING/ANALYSIS

2b. Reliability testing

2b.1 Data/sample *(description of data/sample and size)***:** The reliability testing and other analyses described in this submission use the Dartmouth Atlas 20% sample of Medicare Carrier Claim files for 2003-2007. Data from 2003 are used only for pre-admission information for risk-adjustment for patients admitted during 2004, and are not included directly in any of the analysis presented. December 2007 is

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used only for information about the 30-day post-discharge period; hence December 2007 index admissions are not in the results presented.

Reliability testing used only pneumonia index admissions to the 2,571 hospitals having 10 or more pneumonia index admissions in 2006. This sub-sample has 61,453 pneumonia index admissions for 2006 and 199,852 for the three year period 2004-2006. The 30-day ED visit rates for these patients were 0.066 in 2004, 0.068 in 2005 and 0.070 in 2006.

2b.2 Analytic Method *(type of reliability & rationale, method for testing)***:**
Reliability was examined two ways: using correlations across years, and using kappa statistics for hospitals divided into quintiles based on risk-standardized rates in years being compared. In the case of correlations, both Pearson and Spearman (rank) correlations were computed.

Both correlations and kappa statistics were each computed for two periods: (1) between years 2006 and 2007; and (2) between 2007 and the average of three years (2004 through 2006). The proposed measure uses the second, i.e., three years of data, updated annually, in order to increase the signal-to-noise ratio relative to simple annual calculations. We also present here the one-year statistics to show what is gained in exchange for the loss of 'currentness' resulting from the three-year approach.

Both statistics were also computed for risk-standardized rates based on observed-to-expected (O/E) ratios as well as the proposed predicted-to-expected (P/E) ratios. The O/E rate for three years is a weighted average of three one year rates, with weights of 0.5 for the most recent year, 0.3 for the prior year and 0.2 for the first year. This and other approaches will be investigated during the provisional period, seeking to improve the ability of the measure to discriminate among hospitals while drawing on power of persistence in performance over time.

2b.3 Testing Results *(reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:**
Correlations to check reliability over time were always highly significant ($p<0.001$). Pearson correlations between single years (2007 and 2006) were 0.094 using P/E and 0.078 using O/E. Spearman correlations (which are less sensitive to outliers) were 0.098 and 0.061 respectively. Pearson correlations between 2007 and the three year average (2004-2006) were stronger: 0.148 for P/E and 0.118 for O/E. For the same measures Spearman correlations were 0.150 and 0.097 respectively.

Weighted kappas measuring agreement within quintiles showed the same pattern of reliability. The weighted kappa was 0.102 ($p<0.001$) for 2007 predicted compared with the prior three year average and 0.074 ($p<0.001$) for 2007 observed compared with the prior three year average. For single years (2007 compared to 2006) the weighted kappas were 0.061 and 0.063 respectively (both $p<0.001$).

In contrast, these correlations over time and weighted kappas are somewhat higher than those computed for the 30-day readmission measure using the same sample of pneumonia index admissions. For example, the Pearson correlations on the readmission measure between 2007 and the three year average (2004-2006) are 0.139 using P/E and 0.114 using O/E. The weighted kappas for the same period are 0.081 using P/E and 0.090 using O/E.

2c. Validity testing

2c.1 Data/sample *(description of data/sample and size)***:** NA (see discussion under Analytic Method)

2c.2 Analytic Method *(type of validity & rationale, method for testing)***:**
Our ED visit measure is not a direct measure of care coordination, but rather an indication of the outcome of care coordination. Indeed, correlation of other, more direct measures of care coordination with our proposed ED visit indicator (within a specified time period) is used as a test of the direct measure's predictive validity. As such, we would argue that our ED visit measure is intrinsically valid.

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2c.3 Testing Results *(statistical results, assessment of adequacy in the context of norms for the test conducted)*:
NA (see discussion under Analytic Method)

2d. Exclusions Justified

2d.1 Summary of Evidence supporting exclusion(s):
This measure follows the previously NQF endorsed cohort specification for index admissions for PNA among Medicare FFS beneficiaries 65 years of age. Cohort specification becomes the measure denominator and includes defensible exclusions identified by the Yale research team in their development of the NQF endorsed Hospital 30-Day Pneumonia Readmission measure.

2d.2 Citations for Evidence:
NA (see discussion under Summary of Evidence Supporting Exclusion)

2d.3 Data/sample *(description of data/sample and size)*: NA (see discussion under Summary of Evidence Supporting Exclusion)

2d.4 Analytic Method *(type analysis & rationale)*:
NA (see discussion under Summary of Evidence Supporting Exclusion)

2d.5 Testing Results *(e.g., frequency, variability, sensitivity analyses)*:
NA (see discussion under Summary of Evidence Supporting Exclusion)

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NA☐

2e. Risk Adjustment for Outcomes/ Resource Use Measures

2e.1 Data/sample *(description of data/sample and size)*: The risk adjustment method was assessed and applied using the 20% Medicare sample described in the section on reliability testing. However, for model estimation we used all index admissions, regardless of hospital volume. The total sample was 239,266 pneumonia index admissions for 2004-2006.

2e.2 Analytic Method *(type of risk adjustment, analysis, & rationale)*:
Since the risk adjustment method is the same as that used for an existing NQF approved measure, and is used for public reporting by CMS, the primary question examined in our analysis was the appropriateness of using the fixed covariates selected for 30-day readmissions for 30-day ED visits, both following IP pneumonia care. Our method was to estimate the same GLM model used by the YNHH-CORE developers of the model, using our sample of index admissions for 2004-2006 and the ED visit outcome, and to compute the same performance statistics. To gauge the potential for improvement by selecting different covariates for ED visits we estimated an alternate model in which all DxCG condition categories (CCs) were used in lieu of the CC-based covariates in the readmission model.

2e.3 Testing Results *(risk model performance metrics)*:
The maximum re-scaled R2 is 0.013 and the c-statistic 0.580. The decile with the lowest predicted ED visit rate had an actual rate of 0.043 whereas the highest decile had an actual rate of 0.108. Additional statistics are presented in Table 2 of the attached supporting document.

The CC model's maximum re-scaled R2 is 0.017 and its c-statistic 0.591. The decile with the lowest predicted ED visit rate had an actual rate of 0.040 whereas the highest decile had an actual rate of 0.116. The alternate model performs somewhat better, but the improvement was judged not sufficient to justify further development at this time, though revision of the set of covariates representing co-morbid conditions may be an area for future refinement of the measure specification.

The attached supporting document also provides the incidence in our sample of each co-morbid condition used for risk adjustment and the parameter estimates.

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2e.4 If outcome or resource use measure is not risk adjusted, provide rationale: NA

2f. Identification of Meaningful Differences in Performance

2f.1 Data/sample from Testing or Current Use *(description of data/sample and size)*: The distribution of performance was assessed using the 20% Medicare sample described in the section on reliability testing.

2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance *(type of analysis & rationale)*:

We calculated the intra-hospital correlation coefficient (ICC) to estimate the proportion of overall variance in 30-day post discharge ED visits which is variation between hospitals. We also examined the distribution of risk-standardized rates, and compared it to the distribution for the existing 30-day readmission measure.

2f.3 Provide Measure Scores from Testing or Current Use *(description of scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance)*:

For the three year period 2004-6 the between hospital variance estimate is 0.102 (se=0.008), residual variance estimate is 0.946 (se=0.003) and the resulting ICC was 0.097, indicating that differences among hospitals account for approximately 10% of total variation. The result is similar for 2006 alone. The between hospital variance estimate is 0.140 (se=0.020), residual variance estimate is 0.913 (se=0.005), with a resulting ICC of 0.133.

This is substantially more variation among hospitals than observed for the 30-day post-discharge readmission measure, for which the between-hospital variance using this sample of index admissions is 0.025 (ICC is also 0.025) and that reported by the developers of the measure using all 2006 admissions was 0.029.

The median hospital with 10 or more admissions in 2006 has a risk-standardized ED visit rate for 2004-6 of 0.069. The inter-quartile range is 0.062 to 0.077 and the range of the 5th percentile to the 95th is 0.053 to 0.091. The 25th percentile hospital is predicted to have 20% fewer patients with a pneumonia discharge having an ED visit with 30 days of discharge than the 75th percentile hospital.

For 2006 alone the median rate is 0.069, the inter-quartile range is 0.063 to 0.077 and the range of the 5th percentile to the 95th is 0.057 to 0.091.

As described elsewhere in this submission, we also computed risk-standardized rates using observed-to-expected (O/E) ratios instead of predicted-to-expected (P/E). These rates are somewhat more dispersed. For example, the inter-quartile range of the risk-standardized rates using the 2004-6 weighted O/E average is 0.042 to 0.094 and the range of the 5th percentile to the 95th is 0.012 to 0.146.

The attached support document has more detail, including histograms for a visual representation of these distributions.

2f
C☐ P☐ M☐ N☐

2g. Comparability of Multiple Data Sources/Methods

2g.1 Data/sample *(description of data/sample and size)*: NA

2g.2 Analytic Method *(type of analysis & rationale)*:
NA

2g.3 Testing Results *(e.g., correlation statistics, comparison of rankings)*:
NA

2g
C☐ P☐ M☐ N☐ NA☐

2h. Disparities in Care

2h
C☐

2h.1 If measure is stratified, provide stratified results *(scores by stratified categories/cohorts)*: We examined hospital mean scores stratified by race/ethnicity quartiles (the ranked proportion of white, black and "other" [non-white, non-black] patients served). No differences were observed in the mean score (0.07) by race/ethnicity quartile. **2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:** We recommend continued monitoring of disparities in measure results. We did not evaluate the measure at the individual patient level but rather stratified the measure by the proportion of ethnic minorities served by hospitals. Our preliminary findings do not suggest a relationship between performance on the measure and the proportion of non-white patients served. Additional examination of the distribution of scores within each race/ethnic quartile may be warranted.	**P☐ M☐ N☐ NA☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria **for** *Scientific Acceptability of Measure Properties?*	**2**
Steering Committee: Overall, to what extent was the criterion, *Scientific Acceptability of Measure Properties*, **met?** **Rationale:**	*2* **C☐ P☐ M☐ N☐**
3. USABILITY	
Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making. (evaluation criteria)	Eval Rating
3a. Meaningful, Understandable, and Useful Information **3a.1 Current Use:** not in use but testing completed **3a.2 Use in a public reporting initiative (disclosure of performance results to the public at large)** (*If used in a public reporting initiative, provide name of initiative(s), locations, Web page URL(s). If not publicly reported, state the plans to achieve public reporting within 3 years*): NA **3a.3 If used in other programs/initiatives (***If used in quality improvement or other programs/initiatives, name of initiative(s), locations, Web page URL(s). If not used for QI, state the plans to achieve use for QI within 3 years***):** NA **Testing of Interpretability** (*Testing that demonstrates the results are understood by the potential users for public reporting and quality improvement*) **3a.4 Data/sample** *(description of data/sample and size)*: Measure has not yet been tested for provider and consumer interpretation. Such testing would be recommended as part of initial measure implementation and use. **3a.5 Methods** *(e.g., focus group, survey, QI project)*: NA **3a.6 Results** *(qualitative and/or quantitative results and conclusions)*: NA	**3a** **C☐ P☐ M☐ N☐**
3b/3c. Relation to other NQF-endorsed measures **3b.1 NQF # and Title of similar or related measures:**	
(for NQF staff use) **Notes on similar/related** endorsed **or submitted measures:**	
3b. Harmonization If this measure is related to measure(s) already endorsed by NQF (e.g., same topic, but different target population/setting/data source or different topic but same target population):	**3b** **C☐ P☐**

3b.2 **Are the measure specifications harmonized? If not, why?**	**M☐ N☐ NA☐**
3c. Distinctive or Additive Value 3c.1 **Describe the distinctive, improved, or additive value this measure provides to existing NQF-endorsed measures:** 5.1 **Competing Measures If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), describe why it is a more valid or efficient way to measure quality:**	**3c C☐ P☐ M☐ N☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria **for** *Usability?*	**3**
Steering Committee: Overall, to what extent was the criterion, *Usability*, **met?** **Rationale:**	**3 C☐ P☐ M☐ N☐**
4. FEASIBILITY	
Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. (evaluation criteria)	Eval Rating
4a. Data Generated as a Byproduct of Care Processes 4a.1-2 **How are the data elements that are needed to compute measure scores generated?** coding/abstraction performed by someone other than person obtaining original information,	**4a C☐ P☐ M☐ N☐**
4b. Electronic Sources 4b.1 **Are all the data elements available electronically?** (*elements that are needed to compute measure scores are in defined, computer-readable fields, e.g., electronic health record, electronic claims*) Yes 4b.2 **If not, specify the near-term path to achieve electronic capture by most providers.**	**4b C☐ P☐ M☐ N☐**
4c. Exclusions 4c.1 **Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications?** No 4c.2 **If yes, provide justification.**	**4c C☐ P☐ M☐ N☐ NA☐**
4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences 4d.1 **Identify susceptibility to inaccuracies, errors, or unintended consequences of the measure and describe how these potential problems could be audited. If audited, provide results.** Several methodologies might be employed to produce the measure denominator (Medicare FFS beneficiaries 65 years of age and older with a principal discharge diagnosis of PNA). As hospital readmissions would not be counted as an index admission differing approaches to indexing the PNA hospital discharges could be used with differing results. Once measure specification has been endorsed rates for E&M measure following hospital discharge with the principal diagnosis of PNA can be validated; it would be important to validate consistency in denominator specification.	**4d C☐ P☐ M☐ N☐**

4e. Data Collection Strategy/Implementation

4e.1 Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data/missing data, timing/frequency of data collection, patient confidentiality, time/cost of data collection, other feasibility/ implementation issues:
NA-administrative claims-based measure

4e.2 Costs to implement the measure (*costs of data collection, fees associated with proprietary measures*)**:**
NA-administrative claims-based measure that does not add data collection burden to hospitals or providers

4e.3 Evidence for costs:
NA

4e.4 Business case documentation: NA

4e
C☐
P☐
M☐
N☐

TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria **for** *Feasibility*?

4

Steering Committee: Overall, to what extent was the criterion, *Feasibility*, **met?**
Rationale:

4
C☐
P☐
M☐
N☐

RECOMMENDATION

(for NQF staff use) **Check if measure is untested and only eligible for time-limited endorsement.**

Time-limited ☐

Steering Committee: Do you recommend for endorsement?
Comments:

Y☐
N☐
A☐

CONTACT INFORMATION

Co.1 Measure Steward (Intellectual Property Owner)
Co.1 Organization
Centers for Medicare and Medicaid Services | 7500 Security Blvd. | Baltimore | Maryland | 21244

Co.2 Point of Contact
Shaheen | Halim, PhD | Shaheen.Halim@cms.hhs.gov | 410-786-0641

Measure Developer If different from Measure Steward
Co.3 Organization
Brandeis University | 415 South Street | Waltham | Massachusetts | 02454

Co.4 Point of Contact
Christopher | Tompkins, PhD | Tompkins@brandeis.edu | 781-736-3913

Co.5 Submitter If different from Measure Steward POC
Marian | Ryan, PhD | mryan@brandeis.edu | 781-736-8493- |Brandeis University

Co.6 Additional organizations that sponsored/participated in measure development

ADDITIONAL INFORMATION

Workgroup/Expert Panel involved in measure development
Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.
Workgroup/Expert Panel Involved in Measure Development

Technical Expert Panel (TEP):
Lisa Latts, MD, MBA -WellPoint
Julie Bynum, MD, MPH -Dartmouth Medical School
Joanne Lynn, MD-DC Department of Health –CDCCHA
Anthony Armada, MHA, MBA -Henry Ford Hospital

TEP Role:
The Technical Expert Panel assisted our workgroup developing measures by providing input to:
1) Supplement, and provide texture, to the knowledge gathered through the literature review prior to measure development;
2)Discuss existing measures and provide input as to next steps for CMS to adopt, adapt, and/or develop measures of care coordination relevant to the hospital setting; and
3) Review and provide input on draft measures and measure development testing.

Workgroup:
Kristine Martin Anderson, MBA -Booz Allen Hamilton
Sandra Lesikar, PhD-Booz Allen Hamilton
Arlene Ash, PhD-Boston University
James Burgess, PhD-Boston University
Gary Young, JD,PhD-Boston University
Christopher Tompkins, PhD-Brandeis University
John Chapman, PhD-Brandeis University
Grant Ritter, PhD-Brandeis University
Timothy Martin, PhD-Brandeis University
Sue Lee, MS-Brandeis University
Marian Ryan, PhD-Brandeis University

Workgroup Role:
The workgroup participated in development of measures, review of interim results during development, and reviewing NQF submission forms. Listed members participated on the CMS project team working on the development of measures under a hospital VBP program.

Ad.2 If adapted, provide name of original measure: 30-day Post-hospital PNA Discharge ED Visit Measure
Ad.3-5 If adapted, provide original specifications URL or attachment

Measure Developer/Steward Updates and Ongoing Maintenance
Ad.6 Year the measure was first released:
Ad.7 Month and Year of most recent revision:
Ad.8 What is your frequency for review/update of this measure?
Ad.9 When is the next scheduled review/update for this measure?

Ad.10 Copyright statement/disclaimers: NA

Ad.11 -13 Additional Information web page URL or attachment: Attachment NQF Pneumonia ED Visit Measure Support (Sci Accept) - 28Oct2009.doc

Date of Submission (*MM/DD/YY*)**:** 04/14/2010