



## 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 #: 0450**

**Corresponding Measures:**

**De.2. Measure Title:** Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate (PSI 12)

**Co.1.1. Measure Steward:** Agency for Healthcare Research and Quality

**De.3. Brief Description of Measure:** Perioperative pulmonary embolism or proximal deep vein thrombosis (secondary diagnosis) per 1,000 surgical discharges for patients ages 18 years and older. Excludes discharges with a principal diagnosis of pulmonary embolism or proximal deep vein thrombosis; with a secondary diagnosis of pulmonary embolism or proximal deep vein thrombosis present on admission; in which interruption of the vena cava or a pulmonary arterial thromboectomy occurs before or on the same day as the first operating room procedure; with extracorporeal membrane oxygenation; with acute brain or spinal injury present on admission; and obstetric cases.

[NOTE: The software provides the rate per hospital discharge. However, common practice reports the measure as per 1,000 discharges. The user must multiply the rate obtained from the software by 1,000 to report in-hospital deaths per 1,000 hospital discharges.]

**1b.1. Developer Rationale:** Deep vein thrombosis (DVT) is the formation of a blood clot in a deep vein—usually in the leg or pelvic veins. The most serious complication of a proximal DVT is that the clot dislodges and can travel to the lungs, becoming a pulmonary embolus (PE). Venous thromboembolism (VTE) is common in the perioperative setting, especially after high-risk operations, and can be deadly. Clinical trials have demonstrated that mechanical and pharmacologic interventions can substantially reduce the risk of perioperative VTE among moderate and high-risk surgical patients, especially when these interventions are initiated before or immediately after surgery and continued until or after discharge. Case control studies have demonstrated that early ambulation after surgery can further reduce the risk of perioperative VTE among high-risk surgical patients who receive appropriate mechanical or pharmacologic prophylaxis. Effective and safe prophylactic measures are now available for most high risk patients, and numerous evidence-based guidelines have been published for the prevention of VTE (most notably by the American College of Chest Physicians and the American Academy of Orthopedic Surgeons).

As summarized in a 2015 AHRQ report on Preventing Hospital Associated Venous Thromboembolism (available at <http://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/patient-safety-resources/resources/vtguide/vtguide.pdf>):

"Thromboprophylaxis for at-risk inpatients can reduce VTE by 30% to 65%, has a low incidence of major bleeding complications, and has well-documented cost-effectiveness... Numerous guidelines from authoritative bodies outlining appropriate use of thromboprophylaxis are available... yet study after study reflects unacceptably low rates of thromboprophylaxis in patients at risk... For example, a recent cross-sectional international study of almost 70,000 patients in 358 hospitals found that appropriate prophylaxis was administered in only 58.5% of surgical and 39.5% of medical inpatients at risk for VTE; another U.S. registry found only 42 percent of patients with hospital-associated DVT received prophylaxis within 30 days prior to diagnosis... This constellation of facts presents a powerful imperative for improvement."

"This 'implementation gap' in VTE prophylaxis between evidence-based best practice and actual practice in the real world has not gone unnoticed as a major opportunity for improvement. In 2008, the U.S. Surgeon General produced a call-to-action document for VTE prevention... In addition, key goals for VTE prevention are in place from the National Quality Forum and the Joint Commission... VTE Prevention is one of the focus areas of the Partnership for Patients, a major effort from the Centers for Medicare & Medicaid Services (CMS) to foster accelerated improvement.... Reports commissioned by AHRQ called thromboprophylaxis the 'number one' patient safety practice... and a 2013 update continues to list improved prophylaxis for VTE as a top 10 patient safety strategy to act

on now.... The American Public Health Association has stated that the “disconnect between evidence and execution as it relates to DVT prevention amounts to a public health crisis...”

“Various strategies to improve the use of thromboprophylaxis have been demonstrated to be effective, including computerized order sets with electronic alerts, or pre-printed orders and quality improvement in the form of clinician education programs, audit, and feedback, but further efforts are required at improving the translation of data from clinical trials into clinical practice...” Use of PSI 12, and related measures developed by The Joint Commission, encourages providers to adopt the processes or structures of care of the best performing providers, and may empower consumers to select better performing providers or to adhere to recommended prophylactic modalities.

**S.4. Numerator Statement:** Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with a secondary ICD-10-CM diagnosis code for proximal deep vein thrombosis (DEEPVIB) or a secondary ICD-10-CM diagnosis code for pulmonary embolism (PULMOID).

**S.6. Denominator Statement:** Surgical discharges, (Appendix E: SURGI2R) for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure (Appendix A: ORPROC). Surgical discharges are defined by specific MS-DRG codes.

**S.8. Denominator Exclusions:** Exclude cases:

- with a principal ICD-10-CM diagnosis code (or secondary diagnosis present on admission) for proximal deep vein thrombosis (DEEPVIB), among patients otherwise qualifying for the numerator
- with a principal ICD-10-CM diagnosis code (or secondary diagnosis present on admission) for pulmonary embolism (PULMOID), among patients otherwise qualifying for the numerator
- where a procedure for interruption of vena cava occurs before or on the same day as the first operating room procedure\* (VENACIP)
- where the only operating room procedure was for interruption of vena cava (VENACIP)
- with any-listed ICD-10-CM diagnosis code present on admission for acute brain or spinal injury (NEURTRAD)
- with any-listed ICD-10-PCS procedure code for extracorporeal membrane oxygenation (ECMO) (ECMOP)
- where a procedure for pulmonary arterial thrombectomy occurs before or on the same day as the first operating room procedure (THROMP)
- where the only operating room procedure was for pulmonary arterial thrombectomy (THROMP)
- MDC 14 (pregnancy, childbirth, and puerperium)
- with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

\* If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available.

**De.1. Measure Type:** Outcome

**S.17. Data Source:** Claims

**S.20. Level of Analysis:** Facility

**IF Endorsement Maintenance – Original Endorsement Date:** Jul 31, 2008 **Most Recent Endorsement Date:** Jan 26, 2017

**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?** N/A

## 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**

PSI12\_Measure\_Evidence\_Form\_160513\_v2.docx

**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.*

Deep vein thrombosis (DVT) is the formation of a blood clot in a deep vein—usually in the leg or pelvic veins. The most serious complication of a proximal DVT is that the clot dislodges and can travel to the lungs, becoming a pulmonary embolus (PE). Venous thromboembolism (VTE) is common in the perioperative setting, especially after high-risk operations, and can be deadly. Clinical trials have demonstrated that mechanical and pharmacologic interventions can substantially reduce the risk of perioperative VTE among moderate and high-risk surgical patients, especially when these interventions are initiated before or immediately after surgery and continued until or after discharge. Case control studies have demonstrated that early ambulation after surgery can further reduce the risk of perioperative VTE among high-risk surgical patients who receive appropriate mechanical or pharmacologic prophylaxis. Effective and safe prophylactic measures are now available for most high risk patients, and numerous evidence-based guidelines have been published for the prevention of VTE (most notably by the American College of Chest Physicians and the American Academy of Orthopedic Surgeons).

As summarized in a 2015 AHRQ report on Preventing Hospital Associated Venous Thromboembolism (available at <http://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/patient-safety-resources/resources/vtguide/vtguide.pdf>):

“Thromboprophylaxis for at-risk inpatients can reduce VTE by 30% to 65%, has a low incidence of major bleeding complications, and has well-documented cost-effectiveness... Numerous guidelines from authoritative bodies outlining appropriate use of thromboprophylaxis are available... yet study after study reflects unacceptably low rates of thromboprophylaxis in patients at risk... For example, a recent cross-sectional international study of almost 70,000 patients in 358 hospitals found that appropriate prophylaxis was administered in only 58.5% of surgical and 39.5% of medical inpatients at risk for VTE; another U.S. registry found only 42 percent of patients with hospital-associated DVT received prophylaxis within 30 days prior to diagnosis... This constellation of facts presents a powerful imperative for improvement.”

“This “implementation gap” in VTE prophylaxis between evidence-based best practice and actual practice in the real world has not gone unnoticed as a major opportunity for improvement. In 2008, the U.S. Surgeon General produced a call-to-action document for VTE prevention... In addition, key goals for VTE prevention are in place from the National Quality Forum and the Joint Commission... VTE Prevention is one of the focus areas of the Partnership for Patients, a major effort from the Centers for Medicare & Medicaid Services (CMS) to foster accelerated improvement.... Reports commissioned by AHRQ called thromboprophylaxis the “number one” patient safety practice... and a 2013 update continues to list improved prophylaxis for VTE as a top 10 patient safety strategy to act on now.... The American Public Health Association has stated that the “disconnect between evidence and execution as it relates to DVT prevention amounts to a public health crisis...”

“Various strategies to improve the use of thromboprophylaxis have been demonstrated to be effective, including computerized order sets with electronic alerts, or pre-printed orders and quality improvement in the form of clinician education programs, audit, and feedback, but further efforts are required at improving the translation of data from clinical trials into clinical practice...” Use of PSI 12, and related measures developed by The Joint Commission, encourages providers to adopt the processes or structures of care of the best performing providers, and may empower consumers to select better performing providers or to adhere to recommended prophylactic modalities.

**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.

Table 1 is also included in the supplemental materials.

Table 1. Reference Population Rate and Distribution of Hospital Performance for PSI 12 Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate in 2-year Pooled Data (2011-2013)

Overall Reference Population Rate

Year3	Number of Hospitals (Numerator)1	Population at Risk (Denominator)1	Observed Rate Per 1000 Surgical Discharges1	Outcome of Interest
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2011-2012	3,437	46,056	11,638,019	3.9574
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2012-2013	3,620	43,301	11,386,129	3.8030
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Distribution of Hospital-level Observed Rates in Reference Population

Year3	Number of Hospitals	Rates per 1000 Surgical Discharges (p=percentile)2						
		Mean	SD2	p5	p25	Median	p75	p95
2011-2012	3,437	3.07	3.51	0.00	1.06	2.72	4.37	7.61
2012-2013	3,620	2.98	3.31	0.00	0.87	2.61	4.19	7.38

Source: HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2011 - 2013. Agency for Healthcare Research and Quality, Rockville, MD. [www.hcup-us.ahrq.gov](http://www.hcup-us.ahrq.gov) (AHRQ QI Software Version 6.0)

1The observed rate refers to the total rate for all observations included in the reference population data (numerator) divided by the total combined eligible population of all hospitals included in the reference population data (denominator).

2The distribution of hospital rates reports the mean and standard deviation (SD) of the observed rates for all hospitals in the dataset with at least one case in the denominator, as well as the observed rate for hospitals in the 5th, 25th, 50th (median), 75th, and 95th percentile. Standard deviation refers to the spread in observed values in relation to the mean.

3 Reference population is limited to states with present on admission data (POA). Since many states did not report POA data prior to 2011 we have not included testing prior to 2011.

**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.**

N/A

**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.**

Table 2 is also included in the supplemental materials.

Table 2. Weighted Rates for PSI 12 Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate (per 1,000 surgical discharges)

Group	PSI 12 v6.0		Risk Adjusted Rate			Standard Error	95% Confidence Interval	Numerator	Denominator
	Observed Rate								
Overall	3.707	3.710	0.025	3.661	3.758	22,235	5,997,737		
Gender									
Male	3.928	3.928	0.037	3.855	4.001	11,032	2,808,568		
Female	3.513	3.518	0.033	3.453	3.583	11,203	3,189,169		
Age									
18-44	2.218	2.217	0.046	2.127	2.308	2,272	1,024,063		
45-64	3.357	3.361	0.038	3.286	3.435	7,761	2,311,921		
65+	4.585	4.588	0.041	4.507	4.669	12,203	2,661,754		

Payer								
Medicare	4.409	4.413	0.039	4.336	4.490	12,475	2,829,236	
Medicaid	3.926	3.922	0.090	3.746	4.098	1,877	478,144	
Private	2.912	2.917	0.037	2.845	2.989	6,163	2,116,711	
Other	2.971	2.970	0.100	2.775	3.165	876	294,985	
Self Pay/Uninsured		3.026	3.022	0.103	2.819	3,224	843	278,661
Race/Ethnicity(1)								
White	3.663	3.674	0.029	3.616	3.731	15,345	4,189,545	
Black	5.000	5.008	0.088	4.835	5.181	3,161	632,244	
Hispanic	2.979	2.983	0.075	2.836	3.130	1,563	524,639	
Asian/Pacific Islander		2.761	2.758	0.147	2.470	3,046	348	125,932
Other	3.461	3.453	0.081	3.295	3.611	1,818	525,377	
Residence								
Non-Metro	2.787	1.974	0.063	1.851	2.098	1,352	485,064	
Metropolitan	3.788	3.796	0.026	3.745	3.847	20,883	5,512,674	

Source: HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2013. Agency for Healthcare Research and Quality, Rockville, MD. [www.hcup-us.ahrq.gov](http://www.hcup-us.ahrq.gov) (AHRQ QI Software Version 6.0)

1. Hospitals missing race data are excluded. Weighted to approximate national estimates.

**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**

N/A

## 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):

Surgery : General Surgery

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

Safety : Complications

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

Populations at Risk

**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.qualityindicators.ahrq.gov/Modules/psi\\_resources.aspx](http://www.qualityindicators.ahrq.gov/Modules/psi_resources.aspx)

**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:** [PSI\\_12\\_Perioperative\\_Pulmonary\\_EMBOLISM\\_or\\_Deep\\_Vein\\_Thrombosis\\_Rate.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.

[No, this is not an instrument-based measure](#) **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.

[Not an instrument-based measure](#)

**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.

[As standard protocol, the AHRQ QI program annually updates all measures with Fiscal Year coding changes, refinements based on stakeholder input, refinements to improve specificity and sensitivity based on additional analyses, and necessary software changes. In addition, approximately every two years, AHRQ updates the risk adjustment parameter estimates and composite weights based on the most recent year of data \(i.e., the most current reference population possible\). The refined measures are tested and confirmed to be valid and reliable prior to release of the updated software.](#)

**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 \(S.14\).](#)

[Discharges, among cases meeting the inclusion and exclusion rules for the denominator, with a secondary ICD-10-CM diagnosis code for proximal deep vein thrombosis \(DEEPVIB\) or a secondary ICD-10-CM diagnosis code for pulmonary embolism \(PULMOID\).](#)

**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 \(S.14\).](#)

[DEEPVIB: proximal deep vein thrombosis](#)

[PULMOID: pulmonary embolism](#)

[\(See attached technical specifications for detailed list of codes.\)](#)

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

[Surgical discharges, \(Appendix E: SURGI2R\) for patients ages 18 years and older, with any-listed ICD-10-PCS procedure codes for an operating room procedure \(Appendix A: ORPROC\). Surgical discharges are defined by specific MS-DRG codes.](#)

**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 \(S.14\).](#)

[Appendix A - Operating Room Procedure Codes](#)

[Appendix E - Surgical Discharge MS-DRGs](#)

[\(See attached technical specifications, Appendix A and Appendix E, for detailed list of codes.\)](#)

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

[Exclude cases:](#)



- with a principal ICD-10-CM diagnosis code (or secondary diagnosis present on admission) for proximal deep vein thrombosis (DEEPVIB), among patients otherwise qualifying for the numerator
- with a principal ICD-10-CM diagnosis code (or secondary diagnosis present on admission) for pulmonary embolism (PULMOID), among patients otherwise qualifying for the numerator
- where a procedure for interruption of vena cava occurs before or on the same day as the first operating room procedure\* (VENACIP)
- where the only operating room procedure was for interruption of vena cava (VENACIP)
- with any-listed ICD-10-CM diagnosis code present on admission for acute brain or spinal injury (NEURTRAD)
- with any-listed ICD-10-PCS procedure code for extracorporeal membrane oxygenation (ECMO) (ECMOP)
- where a procedure for pulmonary arterial thrombectomy occurs before or on the same day as the first operating room procedure (THROMP)
- where the only operating room procedure was for pulmonary arterial thrombectomy (THROMP)
- MDC 14 (pregnancy, childbirth, and puerperium)
- with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

\* If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available.

**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.)

VENACIP: Interruption of vena cava procedure code

ECMOP: Extracorporeal membrane oxygenation (ECMO) procedure codes

NEURTRAD: Acute brain or spinal injury diagnosis code

THROMP: Pulmonary arterial thrombectomy procedure codes

(See attached technical specifications for detailed list of codes.)

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

Not applicable

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

No risk adjustment or risk stratification

If other:

**S.12. Type of score:**

Rate/proportion

If other:

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

Better quality = Lower score

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

Risk adjustment is not currently included in the ICD-10-CM/PCS v2018 of the AHRQ QI specifications, due to the transition to ICD-10-CM/PCS (October 1, 2015). At least one full year of data coded in ICD-10-CM/PCS is needed in order to develop robust risk adjustment models. A full year of ICD-10-CM/PCS coded all-payer data will not be available until mid-2019. AHRQ will announce an anticipated date as soon as one is known.

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

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

Not applicable

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

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

Not applicable

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

If other, please describe in S.18.

Claims

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

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

While the measure is tested and specified using data from the Healthcare Cost and Utilization Project (HCUP) (see section 1.1 and 1.2 of the measure testing form), the measure specifications and software are specified to be used with any ICD-9-CM or ICD-10-CM/PCS coded administrative billing/claims/discharge dataset.

**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)

Available at measure-specific web page URL identified in S.1

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

Facility

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

Inpatient/Hospital

If other:

**S.22. COMPOSITE Performance Measure** - Additional Specifications (Use this section as needed for aggregation and weighting rules, or calculation of individual performance measures if not individually endorsed.)

Not applicable

## 2. Validity – See attached Measure Testing Submission Form

[PSI12\\_Measure\\_Testing\\_Form\\_160513\\_v5.docx](#)

### 2.1 For maintenance of endorsement

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

### 2.2 For maintenance of endorsement

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

### 2.3 For maintenance of endorsement

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



### 3. Feasibility

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

#### 3a. Byproduct of Care Processes

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

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

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

If other:

#### 3b. Electronic Sources

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

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

ALL data elements are in defined fields in electronic claims

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

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

Attachment:

#### 3c. Data Collection Strategy

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

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

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

Because the indicator is based on readily available administrative billing and claims data, feasibility is not an issue. This version of the indicator requires present-on-admission (POA) data for risk-adjustment and for specification of the numerator and denominator. POA indicators were added as data elements to the uniform bill form (UB-04) effective October 1, 2007. Hospitals incurred a payment penalty for not including POA status on Medicare records beginning October 1, 2008. Each of the secondary diagnoses in a discharge record can be flagged as "present at the time the order for inpatient admission occurs" or not (see [http://www.cdc.gov/nchs/icd/icd9cm\\_addenda\\_guidelines.htm](http://www.cdc.gov/nchs/icd/icd9cm_addenda_guidelines.htm)). The number of states reporting consistent POA has increased dramatically since 2008.

The AHRQ QI software has been publicly available at no cost since 2001; Users have over ten years of experience using the AHRQ QI software in SAS and Windows.

**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*).

There are no fees. Software is freely available from the AHRQ Quality Indicators website (<http://www.qualityindicators.ahrq.gov/>).

## 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)
	<p>Public Reporting</p> <p>Arizona Department of Health Services, AZ Hospital Compare, MONAHRQ website  <a href="http://pub.azdhs.gov/hospital-discharge-stats/2012/AboutQualityRatings.html#J">http://pub.azdhs.gov/hospital-discharge-stats/2012/AboutQualityRatings.html#J</a></p> <p>CareChex (Division of Quantros)  <a href="http://www.carechex.com/QualityIndicators.aspx">http://www.carechex.com/QualityIndicators.aspx</a></p> <p>Cigna Centers of Excellence Hospital Value Tool  <a href="http://www.cigna.com/pdf/CentersOfExcellence.pdf">http://www.cigna.com/pdf/CentersOfExcellence.pdf</a></p> <p>CMS Medicare Hospital Compare Program  <a href="https://www.medicare.gov/hospitalcompare/Data/Measures-Displayed.html#">https://www.medicare.gov/hospitalcompare/Data/Measures-Displayed.html#</a></p> <p>Colorado Hospital Association  <a href="http://www.cohospitalquality.org/corda/dashboards/COLORADO_REPORT_CARD_BY_MEASURE/main.dashxml">http://www.cohospitalquality.org/corda/dashboards/COLORADO_REPORT_CARD_BY_MEASURE/main.dashxml</a></p> <p>Commonwealth Fund, Why Not the Best  <a href="http://whynotthebest.org/methodology">http://whynotthebest.org/methodology</a></p> <p>Connecticut Department of Health Services, CT Hospital Compare, MONAHRQ website  <a href="http://ctmonahrq.ct.gov/2012/index.html#/resources/AboutQualityRatings">http://ctmonahrq.ct.gov/2012/index.html#/resources/AboutQualityRatings</a></p> <p>Connecticut Hospital Association  <a href="http://www.cthosp.org/advocacy/quality-and-patient-safety/hospital-quality-reporting-website/">http://www.cthosp.org/advocacy/quality-and-patient-safety/hospital-quality-reporting-website/</a></p> <p>Florida Agency for Health Care Administration  <a href="http://www.floridahealthfinder.gov">www.floridahealthfinder.gov</a></p> <p>Healthcare Association of New York State  <a href="http://www.hanys.org/quality/data/report_cards/2013/docs/2013_hanys_report_card_book.pdf">http://www.hanys.org/quality/data/report_cards/2013/docs/2013_hanys_report_card_book.pdf</a></p> <p>HealthGrades  <a href="https://d2dcgio3q2u5fb.cloudfront.net/54/98/f79cdfd84640a03792ea092f20a8/2014-patient-safety-methodology.pdf">https://d2dcgio3q2u5fb.cloudfront.net/54/98/f79cdfd84640a03792ea092f20a8/2014-patient-safety-methodology.pdf</a></p> <p>Hospital Safety Score  <a href="http://www.hospitalsafetyscore.org/media/file/HospitalSafetyScore_ScoringMethodology_Spring2015_Final.pdf">http://www.hospitalsafetyscore.org/media/file/HospitalSafetyScore_ScoringMethodology_Spring2015_Final.pdf</a></p> <p>Illinois Department of Public Health  <a href="http://healthcarereportcard.illinois.gov/methodology">http://healthcarereportcard.illinois.gov/methodology</a></p> <p>Iowa Healthcare Collaborative  <a href="https://iowareport.ihconline.org/Public/Reports.aspx?FID=778&amp;F1ID=0&amp;F2ID=0&amp;F3ID=0&amp;CID=2&amp;PID=4">https://iowareport.ihconline.org/Public/Reports.aspx?FID=778&amp;F1ID=0&amp;F2ID=0&amp;F3ID=0&amp;CID=2&amp;PID=4</a></p> <p>Kentucky Cabinet for Health and Family services</p>

<https://prd.chfs.ky.gov/MONAHQRQ/2012/MONAHQRQ/AboutQualityRatings.html>  
 Kentucky Hospital Association Quality Data  
<http://info.kyha.com/QualityData/>  
 Louisiana Hospital Inform  
<http://lahospitalinform.org/index.html>  
 Maine Health Data Organization (MHDO), MONAHQRQ Website  
<https://mhdo.maine.gov/monahrq/#/resources/AboutQualityRatings>  
 Maryland Health Care Commission, MONAHQRQ Website  
<http://www.hscrc.state.md.us/documents/md-maphs/wg-meet/di/2014-03-04/MHCC%20Inpatient%20Measures%20Inventory%20QBR%20highlights.pdf>  
 Minnesota Community Measurement  
<http://mncm.org/reports-and-websites/reports-and-data/#-available-data>  
 Nevada Compare Care, MONAHQRQ website  
<http://nevadacomparecare.net/MQ2014/index.html#/professional/resources/AboutQualityRatings>  
 Nevada Hospital Association  
<http://www.nvhospitalquality.net/old-home>  
 New Jersey Department of Health  
[http://web.doh.state.nj.us/apps2/hpr/docs/2012/technicalreport\\_psi.pdf](http://web.doh.state.nj.us/apps2/hpr/docs/2012/technicalreport_psi.pdf)  
 Niagara Health Quality Coalition, New York State Hospital Report Card  
[http://www.myhealthfinder.com/newyork15/main\\_byproc.php](http://www.myhealthfinder.com/newyork15/main_byproc.php)  
 Norton Healthcare  
<http://www.nortonhealthcare.com/QualityReport>  
 Oklahoma State Department of Health, MONAHQRQ  
<https://www.phin.state.ok.us/ahrq/MONAHQRQ%202010/Methodology.html>  
 South Dakota Association of Healthcare Organizations  
<http://www.sdhospitalquality.org/search.php>  
 Texas Health Resources  
[https://www.texashealth.org/Documents/System/Quality\\_Patient\\_Safety/Reports/03-02-2016\\_Surgery.pdf](https://www.texashealth.org/Documents/System/Quality_Patient_Safety/Reports/03-02-2016_Surgery.pdf)  
 Think About It Colorado  
[http://www.cohospitalquality.org/corda/dashboards/COLORADO\\_REPORT\\_CARD\\_BY\\_HOSPITAL/main.dashxml#cordaDash=1005](http://www.cohospitalquality.org/corda/dashboards/COLORADO_REPORT_CARD_BY_HOSPITAL/main.dashxml#cordaDash=1005)  
 U.S. News and World Report  
<http://www.usnews.com/pubfiles/BH2015-16MethodologyReport.pdf>  
 Utah Department of Health, MONAHQRQ website  
<https://health.utah.gov/myhealthcare/monahrq/>  
 Virginia Health Information  
<http://www.vhi.org/MONAHQRQ/default.asp?yr=2013>  
 Washington State, MONAHQRQ website  
[http://www.wamonahrq.net/MONAHQRQ\\_5p0\\_WA\\_2012/index.html#/resources/AboutQualityRatings](http://www.wamonahrq.net/MONAHQRQ_5p0_WA_2012/index.html#/resources/AboutQualityRatings)  
 WHA Information Center (Wisconsin Hospital Association)  
[http://www.whainfocenter.com/uploads/PDFs/Publications/QualityIndicators/2012\\_WI\\_IQIReport.pdf](http://www.whainfocenter.com/uploads/PDFs/Publications/QualityIndicators/2012_WI_IQIReport.pdf)  
  
 Quality Improvement (Internal to the specific organization)  
 Greenville Health System, Quality and Safety Report  
<http://www.ghs.org/upload/docs/Reports/2013-April-Quality-Report.pdf>  
 Northwestern Memorial Hospital, Patient Safety Indicator Monitoring Plan  
<http://www.nmh.org/nm/quality-bleeding-or-bruising-following-surgery>  
 Upstate University Hospital  
[http://qoc.upstate.edu/QualityOfCare.cfm?quality\\_measure\\_group\\_id=7](http://qoc.upstate.edu/QualityOfCare.cfm?quality_measure_group_id=7)

**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

#### Public Reporting

Arizona Department of Health Services, AZ Hospital Compare, MONAHRQ website

Hospital quality ratings from all hospitals in Arizona

<http://pub.azdhs.gov/hospital-discharge-stats/2012/AboutQualityRatings.html#J>

CareChex (Division of Quantros)

Provides comprehensive reports of hospitals to consumers, providers and purchasers

<http://www.carechex.com/QualityIndicators.aspx>

Cigna

Centers of Excellence Hospital Value Tool – Health insurance company

<http://www.cigna.com/pdf/CentersOfExcellence.pdf>

CMS Medicare Hospital Compare Program

Publically available database containing information about the quality of care at over 4,000 Medicare-certified hospitals across the U.S.

<https://www.medicare.gov/hospitalcompare/Data/Measures-Displayed.html#>

Colorado Hospital Association

Hospital quality ratings from hospitals in Colorado

[http://www.cohospitalquality.org/corda/dashboards/COLORADO\\_REPORT\\_CARD\\_BY\\_MEASURE/main.dashxml](http://www.cohospitalquality.org/corda/dashboards/COLORADO_REPORT_CARD_BY_MEASURE/main.dashxml)

Commonwealth Fund, Why Not the Best

Provides performance and quality ratings for most US hospitals

<http://whynotthebest.org/methodology>

Connecticut Department of Health Services, CT Hospital Compare, MONAHRQ website

Hospital quality ratings from all hospitals in Connecticut.

<http://ctmonahrq.ct.gov/2012/index.html#/resources/AboutQualityRatings>

Connecticut Hospital Association

Provide quality of care for hospitals in Connecticut

<http://www.cthosp.org/advocacy/quality-and-patient-safety/hospital-quality-reporting-website/>

Florida Agency for Health Care Administration

Provide quality of care ratings from hospitals within Florida

[www.floridahealthfinder.gov](http://www.floridahealthfinder.gov)

Healthcare Association of New York State

Supports availability of hospital quality and safety information to help patients make choices and assist providers in improving care

[http://www.hanys.org/quality/data/report\\_cards/2013/docs/2013\\_hanys\\_report\\_card\\_book.pdf](http://www.hanys.org/quality/data/report_cards/2013/docs/2013_hanys_report_card_book.pdf)

HealthGrades

Healthgrades measures 40 million patient records from 4,500 hospitals nationwide for the most recent three-year period.

Consumer-targeted hospital and provider ratings

<https://d2dcgio3q2u5fb.cloudfront.net/54/98/f79cdfd84640a03792ea092f20a8/2014-patient-safety-methodology.pdf>

Hospital Safety Score

PSI 12 is one component of a single composite score that represents a hospital's overall performance in patient safety

[http://www.hospitalsafetyscore.org/media/file/HospitalSafetyScore\\_ScoringMethodology\\_Spring2015\\_Final.pdf](http://www.hospitalsafetyscore.org/media/file/HospitalSafetyScore_ScoringMethodology_Spring2015_Final.pdf)

Illinois Department of Public Health

Provides access to information on hospital and safety data in hospitals in Illinois

<http://healthcarereportcard.illinois.gov/methodology>

Iowa Healthcare Collaborative

Hospital quality ratings from hospitals in Iowa

<https://iowareport.ihconline.org/Public/Reports.aspx?FID=778&F1ID=0&F2ID=0&F3ID=0&CID=2&PID=4>

Kentucky Cabinet for Health and Family services

Hospital quality ratings from hospitals in Kentucky

<https://prd.chfs.ky.gov/MONAHQRQ/2012/MONAHQRQ/AboutQualityRatings.html>

Kentucky Hospital Association Quality Data

Hospital quality ratings from most hospitals in Kentucky

<http://info.kyha.com/QualityData/>

Louisiana Hospital Inform

Hospital quality ratings from hospitals in Louisiana

<http://lahospitalinform.org/index.html>

Maine Health Data Organization (MHDO), MONAHRQ Website

Hospital quality ratings from all hospitals in Maine

<https://mhdo.maine.gov/monahrq/#/resources/AboutQualityRatings>

Maryland Health Care Commission, MONAHRQ Website

Collects and provides quality ratings on hospitals across Maryland

<http://www.hscrc.state.md.us/documents/md-maphs/wg-meet/di/2014-03-04/MHCC%20Inpatient%20Measures%20Inventory%20QBR%20highlights.pdf>

Minnesota Community Measurement

Minnesota Community Measurement is a nonprofit healthcare data reporting organization. Provides quality ratings on hospitals across Minnesota.

<http://mncm.org/reports-and-websites/reports-and-data/#-available-data>

Nevada Compare Care, MONAHRQ website

Hospital quality ratings from most hospitals in Nevada

<http://nevadacomparecare.net/MQ2014/index.html#/professional/resources/AboutQualityRatings>

Nevada Hospital Association

Transparency and Performance: Demonstrates Nevada hospitals activity relating to specific clinical indicators.

<http://www.nvhospitalquality.net/old-home>

New Jersey Department of Health

Public report of PSI performance for New Jersey Hospital

[http://web.doh.state.nj.us/apps2/hpr/docs/2012/technicalreport\\_psi.pdf](http://web.doh.state.nj.us/apps2/hpr/docs/2012/technicalreport_psi.pdf)

Niagara Health Quality Coalition, New York State Hospital Report Card

Consumer focused public report of quality indicator performance for NY hospitals.

[http://www.myhealthfinder.com/newyork15/main\\_byproc.php](http://www.myhealthfinder.com/newyork15/main_byproc.php)

Norton Healthcare

Report patient satisfaction scores in Norton Healthcare hospitals and their performance on nationally recognized quality indicators and practices <http://www.nortonhealthcare.com/QualityReport>

Oklahoma State Department of Health, MONAHRQ

Compares quality ratings on hospitals across Oklahoma

<https://www.phin.state.ok.us/ahrq/MONAHQR%202010/Methodology.html>

South Dakota Association of Healthcare Organizations

Use PSI 12 in a composite of serious complications in report of Oregon hospital quality.

<http://www.sdhospitalquality.org/search.php>

Texas Health Resources

Provides quality and safety reports for all Texas Health Resources

[https://www.texashealth.org/Documents/System/Quality\\_Patient\\_Safety/Reports/03-02-2016\\_Surgery.pdf](https://www.texashealth.org/Documents/System/Quality_Patient_Safety/Reports/03-02-2016_Surgery.pdf)

Think About It Colorado

Report hospital quality for all hospitals in Colorado

[http://www.cohospitalquality.org/corda/dashboards/COLORADO\\_REPORT\\_CARD\\_BY\\_HOSPITAL/main.dashxml#cordaDash=1005](http://www.cohospitalquality.org/corda/dashboards/COLORADO_REPORT_CARD_BY_HOSPITAL/main.dashxml#cordaDash=1005)

U.S. News and World Report

National publication that lists ratings of U.S. medical centers based on performance

<http://www.usnews.com/pubfiles/BH2015-16MethodologyReport.pdf>

Utah Department of Health, MONAHQR website

Report hospital quality for all hospitals in Utah

<https://health.utah.gov/myhealthcare/monahrq/>

Virginia Health Information

Compares quality ratings on hospitals across Virginia

<http://www.vhi.org/MONAHQR/default.asp?yr=2013>

Washington State, MONAHQR website

Information system of inpatient care utilization, quality, and potentially avoidable stays in Washington State's community hospitals

[http://www.wamonahrq.net/MONAHQR\\_5p0\\_WA\\_2012/index.html#/resources/AboutQualityRatings](http://www.wamonahrq.net/MONAHQR_5p0_WA_2012/index.html#/resources/AboutQualityRatings)

WHA Information Center (Wisconsin Hospital Association)

Wisconsin Inpatient Hospital Quality Indicators Report

[http://www.whainfocenter.com/uploads/PDFs/Publications/QualityIndicators/2012\\_WI\\_IQIReport.pdf](http://www.whainfocenter.com/uploads/PDFs/Publications/QualityIndicators/2012_WI_IQIReport.pdf)

Quality Improvement (Internal to the specific organization)

Greenville Health System, Quality and Safety Report

All data was collected from four hospitals in the Greenville Health system and compared with internal rates

<http://www.ghs.org/upload/docs/Reports/2013-April-Quality-Report.pdf>

Northwestern Memorial Hospital, Patient Safety Indicator Monitoring Plan

Quality improvement initiative at 894-bed academic hospital

<http://www.nmh.org/nm/quality-bleeding-or-bruising-following-surgery>

Upstate University Hospital

Report of hospital rates against national benchmark (published online)

[http://qoc.upstate.edu/QualityOfCare.cfm?quality\\_measure\\_group\\_id=7](http://qoc.upstate.edu/QualityOfCare.cfm?quality_measure_group_id=7)

Quality Improvement (external benchmarking to multiple organizations)

CMS Hospital Compare

Publicly available performance measures for hospitals

<http://www.medicare.gov/hospitalcompare/Data/Measures-Displayed.html>

University HealthSystem Consortium/Vizient

Internal quality improvement efforts, documentation, and evaluation of AHRQ PSIs for quality improvement by its members



<https://www.vizientinc.com/clinical-analytics-and-benchmarking.htm>

**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?)

N/A

**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.)

N/A

**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.**

The Agency for Healthcare Research and Quality (AHRQ) provides free software, in both SAS and Windows format, to calculate the AHRQ Quality Indicators. Users may use their own hospital administrative data to calculate the QIs using this software.

In addition, AHRQ provides technical assistance to users through a QI User Support email address, [QISupport@ahrq.hhs.gov](mailto:QISupport@ahrq.hhs.gov). AHRQ triages, troubleshoots and responds to technical inquiries related to methodology and rationale behind the indicator and general questions related to the use of the software. During a calendar year, AHRQ typically provides technical support to over 1,000 queries.

**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.**

The AHRQ QI software is updated annually. Technical support is available on an on-going basis. No data updates are necessary; users apply the AHRQ QIs to their own hospital administrative data.

**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.**

Feedback is obtained from users through a variety of channels, in particular through a technical assistance support service described above. In addition, AHRQ incorporates input on QI implementation from technical workgroups convened to support QI development and maintenance, stakeholder committees such as NQF standing committees, and peer-reviewed or other research publications.

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

See the response to 4a2.2.1.

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

See the response to 4a2.2.1.

**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.**

The AHRQ Quality Indicators are updated annually, including updating indicator technical specifications in accordance with the latest coding guidance; suggestions from users and other stakeholders obtained through Technical Assistance, committees, or workgroups; and the latest clinical and scientific research. AHRQ regularly reviews these sources, identifies possible indicator updates, and prioritizes updates for each indicator and software update based on expected impact on users.

#### **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.**

There is no definite evidence of unintended consequences for this measure. However, several recent papers have focused on the problem of surveillance bias, or variation in the incidence of VTE across hospitals that may be attributable to screening and diagnostic practices. Chung et al. (2015) and Minami and Bilimoria (2015) summarized several studies demonstrating that hospital testing practices, and determinants of those practices, are associated with both PSI12 rates and postoperative VTE rates based on National Surgical Quality Improvement Program (NSQIP) data. Holcomb et al. (2015) studied 25,975 patients meeting the criteria for the Surgical Care Improvement Project (SCIP)-VTE measures at 79 VA facilities and reported a positive correlation between inpatient surveillance and inpatient VTE rates at the hospital level ( $R=0.33$ ,  $P=.003$ ) but no significant correlation of inpatient surveillance with either postdischarge surveillance ( $R=0.11$ ,  $P=.29$ ) or postdischarge VTE rates ( $R=0.03$ ,  $P=.76$ ). These studies suggest that variation in testing practices may contribute to variation in PSI12 rates across hospitals, but it remains unclear whether these data reflect underdiagnosis of VTE at low-testing hospitals, overdiagnosis at high-testing hospitals, or the true incidence of symptomatic VTE. Use of PSI12 may inappropriately reward undertesting, but it may also appropriately penalize overtesting and overdiagnosis. Discouraging overdiagnosis and overtreatment of clinically insignificant VTE would be a desirable consequence of using PSI 12, because treatment of VTE is associated with a significant risk of hemorrhagic complications. Excluding distal DVTs, as AHRQ did in its V6 modification of the PSI12 numerator specification, may resolve this concern.

Chung JW, Ju MH, Kinnier CV, Sohn MW, Bilimoria KY. Postoperative venous thromboembolism outcomes measure: analytic exploration of potential misclassification of hospital quality due to surveillance bias. *Ann Surg.* 2015;261(3):443-444.

Minami CA, Bilimoria KY. Are Higher Hospital Venous Thromboembolism Rates an Indicator of Better Quality?: Evaluation of the Validity of a Hospital Quality Measure. *Adv Surg.* 2015;49:185-204.

Holcomb CN, DeRussy A, Richman JS, Hawn MT. Association Between Inpatient Surveillance and Venous Thromboembolism Rates After Hospital Discharge. *JAMA Surg.* 2015;150(6):520-527.

Coding professionals follow detailed guidelines, are subject to training and credentialing requirements, peer review and audit.

**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.

No

#### 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](#)

## 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: PSI12\\_Supplemental\\_Files\\_160531.pdf](#)

## Contact Information

**Co.1 Measure Steward (Intellectual Property Owner):** [Agency for Healthcare Research and Quality](#)

**Co.2 Point of Contact:** [Pamela, Owens, Pam.Owens@ahrq.hhs.gov, 301-427-1412-](#)

**Co.3 Measure Developer if different from Measure Steward:** [Agency for Healthcare Research and Quality](#)

**Co.4 Point of Contact:** [Mamatha, Pancholi, Mamatha.Pancholi@ahrq.hhs.gov, 301-427-1470-](#)

## 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 2002, two workgroups were convened to provide feedback on key indicator development decisions and methodology, including the usefulness of Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate \(PSI 12\), formerly known as Postoperative Pulmonary Embolism or Deep Vein Thrombosis Rate \(PSI 12\). These workgroups included a multispecialty panel and a surgical specialty panel; the active members were:](#)

[Charles Bethea, MD, Cardiologist  
Oklahoma City, OK](#)

Duke Clinical Research Institute  
Nominated by the American College of Cardiology

John Hunt, MD, MPH, Trauma surgeon, critical care  
New Orleans, LA  
Health Science Center - Louisiana State University  
Nominated by the American College of Surgeons

Franco Laghi, MD, Critical care physician  
Maywood, IL  
Loyola University  
Nominated by the American Thoracic Society

John Nelson, MD, FACP, Internist/Hospitalist  
Bellevue, WA  
Overlake Hospital Medical Center  
Nominated by the National Association of Inpatient Physicians

Carol A. Petersen, RN, BSN, MAOM, CNOR, Perioperative nursing specialist  
Denver, CO  
Center for Nursing Practice  
Nominated by the Association of Peri-Operative Registered Nurses

Bruce Williams, MSN, RN, Critical care nurse specialist  
Orangeburg, SC  
The Regional Medical Center - of Orangeburg and Calhoun Counties  
Nominated by the American Association of Critical-Care Nurses

Preston Winters, MD, FACP, Internist  
White Plains, NY  
White Plains Hospital Center  
Nominated by the American College of Physicians

Rodney Appell, MD, urologist  
Houston, TX  
Baylor College of Medicine  
Nominated by the American Urologic Association

Alan Freeland, MD, Orthopedic surgeon  
Jackson, MS  
University of Mississippi Medical Center  
Nominated by the American Academy of Hand Surgeon)

Patricia Howson, MD, MSc, Orthopedic surgeon  
Redwood City, CA  
Kaiser Permanente  
Nominated by the American Academy of Orthopedic Surgeons

William Hozak, MD, Orthopedic surgeon  
Philadelphia, PA  
Jefferson Medical School  
Nominated by the American Association of Hip and Knee Surgeons

Mathew Indeck, MD, General Surgeon -trauma surgery  
Danville, PA

Jefferson College of Medicine  
Nominated by the American College of Surgeons

Bruce Kaufman, MD, Pediatric neurosurgeon  
Milwaukee, WI  
Medical College of Wisconsin  
Nominated by the American Association of Neurological Surgeons

In 2013, ten panels of experts were convened to support the process of converting the AHRQ QIs from ICD-9-CM to ICD-10-CM/PCS in an accurate and transparent manner, to improve the validity and usefulness of the QIs. One of these panels –focused on critical care conditions - advised AHRQ on the ICD-10-CM/PCS specifications for PSI 12. The active members of this panel were:

Bradley Chipps, MD  
Sacramento, CA  
Capital Allergy and Respiratory Disease Center

Brian A. Cason, MD  
San Francisco, CA  
Department of Anesthesia and Perioperative Care  
University of California, San Francisco and Veterans Affairs Medical Center

Colleen Stalvey, RHIT  
Los Angeles, CA  
AHIMA Approved ICD-10-CM/PCS Trainer  
Cedars-Sinai Medical Center HIM Department

Patricia Anania Firouzan, MSIS, RHIA  
Pittsburgh, PA  
AHIMA Approved ICD-10-CM/PCS Trainer  
University of Pittsburgh  
HIM Dept, School of Health & Rehab Sciences

Jeanine Baskin, RN, BSN, CPHQ  
Winston-Salem, NC  
Novant Health, Clinical Quality Performance

Theresa Smiley, RN, CPHQ  
Winston-Salem, NC  
Novant Health, Clinical Quality Performance

Vicky A. Mahn-DiNicola RN,MS,CPHQ  
Tucson, AZ  
Healthcare Provider Solutions Group  
Midas+ Solutions, A Xerox Company

Sandra Strack Arabian, CSTR, CAISS, EMT  
Boston, MA  
Tufts Medical Center  
Division of Trauma and Acute Care Surgery

**Measure Developer/Steward Updates and Ongoing Maintenance**

**Ad.2 Year the measure was first released:** 2002

**Ad.3 Month and Year of most recent revision:** 06, 2016

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

**Ad.5 When is the next scheduled review/update for this measure?** 06, 2016

**Ad.6 Copyright statement:** [The AHRQ QI software is publicly available. We have no copyright disclaimers.](#)

**Ad.7 Disclaimers:** [None](#)

**Ad.8 Additional Information/Comments:** [None](#)