NATIONAL QUALITY FORUM

Measure Submission and Evaluation Worksheet 5.0

This form contains the information submitted by measure developers/stewards, organized according to NQF's measure evaluation criteria and process. The evaluation criteria, evaluation guidance documents, and a blank online submission form are available on the submitting standards web page.

NQF #: 0345 **NQF Project:** Patient Safety Measures-Complications Project

(for Endorsement Maintenance Review)
Original Endorsement Date: May 15, 2008 **Most Recent Endorsement Date:** May 15, 2008

BRIEF MEASURE INFORMATION

De.1 **Measure Title:** Accidental Puncture or Laceration Rate (PSI 15)

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

De.2 **Brief Description of Measure:** Percent of discharges among cases meeting the inclusion and exclusion rules for the denominator with ICD-9-CM code denoting accidental cut, puncture, perforation, or laceration during a procedure in any secondary diagnosis field.

2a1.1 **Numerator Statement:** Discharges among cases meeting the inclusion and exclusion rules for the denominator with ICD-9-CM code denoting accidental cut, puncture, perforation, or laceration during a procedure in any secondary diagnosis field.

2a1.4 **Denominator Statement:** All surgical and medical discharges age 18 years and older defined by specific DRGs or MS-DRGs.

2a1.8 **Denominator Exclusions:** Exclude cases:
- with principal diagnosis denoting accidental cut, puncture, perforation, or laceration or secondary diagnosis present on admission
- MDC 14 (pregnancy, childbirth, and puerperium)
- with ICD-9-CM code for spine surgery
- with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing)

1.1 **Measure Type:** Outcome
2a1. 25-26 **Data Source:** Administrative claims
2a1.33 **Level of Analysis:** Facility

1.2-1.4 **Is this measure paired with another measure?** No

De.3 **If included in a composite, please identify the composite measure** (*title and NQF number if endorsed*)**:**
0531 Patient Safety for Selected Indicators (composite)

STAFF NOTES (*issues or questions regarding any criteria*)

Comments on Conditions for Consideration:

Is the measure untested? Yes☐ No☐ If untested, explain how it meets criteria for consideration for time-limited endorsement:

1a. Specific national health goal/priority identified by DHHS or NPP addressed by the measure (*check De.5*)**:**
5. Similar/related endorsed or submitted measures (*check 5.1*)**:**
Other Criteria:

Staff Reviewer Name(s):

1. IMPACT, OPPORTUITY, EVIDENCE - IMPORTANCE TO MEASURE AND REPORT

Importance to Measure and Report is a threshold criterion that must be met in order to recommend a measure for endorsement. All three subcriteria must be met to pass this criterion. See guidance on evidence.
Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria. **(evaluation criteria)**

1a. High Impact: H☐ M☐ L☐ I ☐
(*The measure directly addresses a specific national health goal/priority identified by DHHS or NPP, or some other high impact aspect of healthcare.*)

De.4 **Subject/Topic Areas** *(Check all the areas that apply)*: Surgery : General Surgery
De.5 **Cross Cutting Areas** (*Check all the areas that apply*): Safety : Complications

1a.1 **Demonstrated High Impact Aspect of Healthcare:** Affects large numbers, Patient/societal consequences of poor quality

1a.2 **If "Other," please describe:**

1a.3 **Summary of Evidence of High Impact** *(Provide epidemiologic or resource use data)*:
Compared to other PSI, the four year trend for this QI was consistent, and it was one of the most frequent QI in a sample of Veteran´s Administration data, with risk-adjusted rate of 4.29 per 1,000 eligible patients in FY 2004.a Similar findings have been reported by community hospitals in the Healthcare Cost and Utilization Project, with a risk-adjusted rate of 2.83 per 1,000 eligible patients in 2008 (http://qualityindicators.ahrq.gov/Downloads/Software/SAS/V43/Comparative%20Data%20PSI%204.3.pdf). About 16,533 of these events are estimated to have occurred in US community hospitals in 2008. International data from the Organization for Economic Cooperation and Development show substantial variation across countries, with a maximum rate of 4.03 per 1,000 eligible patients from Canada.c
Cases from the Nationwide Inpatient Sample that were flagged by this PSI had 2.2% excess mortality, 1.3 days of excess hospitalization, and $8,300 in excess hospital charges, relative to carefully matched controls that were not flagged.e This finding was confirmed in the Veterans Affairs hospital system, where cases that were flagged by this PSI had 3.2% excess mortality, 1.4-3.1 days of excess hospitalization, and $3,359-6,880 in excess hospital costs, relative to carefully matched controls that were not flagged.b In another study based on State Inpatient Databases from seven states that permit linkage of serial hospitalizations, this indicator was associated with relative risk ratios of 1.52 for inpatient death, 1.16 for readmission within three months, and 1.25 for readmission within one month (after adjusting for age, gender, payer, comorbidities, and specific surgical DRGs, and APR-DRG severity levels).d

1a.4 **Citations for Evidence of High Impact cited in 1a.3:** (a)Rosen AK, Zhao S, Rivard P, Loveland S, Montez-Rath ME, Elixhauser A, Romano PS. Tracking rates of Patient Safety Indicators over time: lessons from the Veterans Administration. Med Care. 2006 Sep;44(9):850-61.

(b) Rivard PE, Luther SL, Christiansen CL, Zhao S, Loveland S, Elixhauser E, Romano PS, Rosen AK. Using Patient Safety Indicators to estimate the impact of potential adverse events on outcomes. Med Care Res Rev 2008; 65(1):67-87.
(c) Drösler SE, Romano PS, Tancredi DJ, Klazinga NS. International comparability of Patient Safety Indicators in 15 OECD member countries: A methodological approach of adjustment by secondary diagnoses. Health Serv Res 2011; Jul 15. [Epub ahead of print].
(d) Friedman B, Encinosa W, Jiang HJ, Mutter R. Do patient safety events increase readmissions? Med Care 2009; 47(5):583-90.
(e) Zhan C, Miller MR. Excess length of stay, charges, and mortality attributable to medical injuries during hospitalization. JAMA 2003;290(14):1868-1874.

1b. Opportunity for Improvement: H☐ M☐ L☐ I ☐
(*There is a demonstrated performance gap - variability or overall less than optimal performance*)

1b.1 **Briefly explain the benefits (improvements in quality) envisioned by use of this measure:**
This indicator is intended to flag cases of complications that arise due to technical difficulties in medical care; specifically those involving an accidental puncture or laceration.

1b.2 **Summary of Data Demonstrating Performance Gap** *(Variation or overall less than optimal performance across providers)*:
[*For Maintenance* – *Descriptive statistics for performance results for this measure - distribution of scores for measured entities by*

quartile/decile, mean, median, SD, min, max, etc.]
In regard to figures below:
rates are risk adjusted rates per 1,000 (except where a US figure is presented, which is a per 1,000 observed rate)
1st figure: estimate
2nd figure: standard error
3rd figure: p value relative to marked group (marked group = "c")
4th figure: p value: current year relative to prior year

Key:
"c": Reference for p-value test statistics
"*": Data do not meet criteria for statistical reliability, data quality, or confidentiality

Hospital characteristic:
Location of inpatient treatment:
Northeast c 4.331 0.029 0.000
Midwest 4.765 0.026 0.000 0.000
South 4.661 0.021 0.000 0.000
West 5.529 0.029 0.000 0.436

Ownership/control:
Private, not-for-profit c 4.779 0.015 0.000
Private, for-profit 4.356 0.035 0.000 0.000
Public 5.332 0.036 0.000 0.252

Teaching status:
Teaching 4.885 0.020 0.000 0.000
Nonteaching c 4.732 0.016 0.000

Location of hospital (NCHS):
Large central metropolitan 4.703 0.020 0.000 0.000
Large fringe metropolitan c 4.263 0.031 0.028
Medium metropolitan 5.052 0.027 0.000 0.000
Small metropolitan 5.186 0.037 0.000 0.000
Micropolitan 5.154 0.048 0.000 0.000
Not metropolitan or micropolitan 4.713 0.103 0.000 0.001

Bed size of hospital:
Less than 100 4.685 0.046 0.273 0.000
100 - 299 c 4.741 0.022 0.000
300 - 499 4.759 0.022 0.560 0.000
500 or more 4.951 0.026 0.000 0.000

1b.3 Citations for Data on Performance Gap: [*For Maintenance* – *Description of the data or sample for measure results reported in 1b.2 including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included*]**
Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2007, and AHRQ Quality Indicators, version 3.1.

1b.4 Summary of Data on Disparities by Population Group: [*For Maintenance* –*Descriptive statistics for performance results for this measure by population group***]**
In regard to figures below:
rates are risk adjusted rates per 1,000 (except where a US figure is presented, which is a per 1,000 observed rate)
1st figure: estimate
2nd figure: standard error
3rd figure: p value relative to marked group (marked group = "c")

4th figure: p value: current year relative to prior year

Key:
"c": Reference for p-value test statistics
"*": Data do not meet criteria for statistical reliability, data quality, or confidentiality

Patient characteristic:
Age groups for conditions affecting any age:
18-44 c 4.513 0.028 0.727
45-64 5.584 0.024 0.000 0.000
65 and over 4.365 0.017 0.000 0.000

Age groups for conditions affecting primarily elderly:
65-69 c 5.729 0.046 0.000
70-74 5.168 0.043 0.000 0.000
75-79 4.673 0.040 0.000 0.011
80-84 4.299 0.039 0.000 0.000
85 and over 2.322 0.027 0.000 0.000

Gender:
Male c 4.130 0.017 0.000
Female 5.359 0.018 0.000 0.000

Median income of patient´s ZIP code:
First quartile (lowest income) 4.727 0.025 0.016 0.000
Second quartile 4.926 0.026 0.000 0.000
Third quartile 4.886 0.026 0.000 0.000
Fourth quartile (highest income) c 4.640 0.025 0.249

Location of patient residence (NCHS):
Large central metropolitan 4.595 0.024 0.000 0.000
Large fringe metropolitan c 4.440 0.026 0.003
Medium metropolitan 5.165 0.029 0.000 0.000
Small metropolitan 5.128 0.041 0.000 0.000
Micropolitan 5.120 0.038 0.000 0.000
Not metropolitan or micropolitan 4.794 0.048 0.000 0.138

Expected payment source:
Private insurance c 4.613 0.020 0.000
Medicare 5.001 0.019 0.000 0.000
Medicaid 4.906 0.051 0.000 0.131
Other insurance 4.576 0.060 0.564 0.012
Uninsured / self-pay / no charge 4.481 0.066 0.056 0.000

1b.5 Citations for Data on Disparities Cited in 1b.4: [*For **Maintenance* –** *Description of the data or sample for measure results reported in 1b.4 including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included*]**
Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2007, and AHRQ Quality Indicators, version 3.1.

1c. Evidence (*Measure focus is a health outcome OR meets the criteria for quantity, quality, consistency of the body of evidence.*)
Is the measure focus a health outcome? Yes☐ No☐ If not a health outcome, rate the body of evidence.

Quantity: H☐ M☐ L☐ I☐ Quality: H☐ M☐ L☐ I☐ Consistency: H☐ M☐ L☐ I☐

Quantity	Quality	Consistency	Does the measure pass subcriterion1c?
M-H	**M-H**	**M-H**	**Yes**☐
L	**M-H**	**M**	**Yes**☐ IF additional research unlikely to change conclusion that benefits to patients outweigh harms: otherwise **No**☐
M-H	**L**	**M-H**	**Yes**☐ IF potential benefits to patients clearly outweigh potential harms: otherwise **No**☐
L-M-H	**L-M-H**	**L**	**No** ☐

Health outcome – rationale supports relationship to at least one healthcare structure, process, intervention, or service	**Does the measure pass subcriterion1c?** **Yes**☐ IF rationale supports relationship

1c.1 Structure-Process-Outcome Relationship *(Briefly state the measure focus, e.g., health outcome, intermediate clinical outcome, process, structure; then identify the appropriate links, e.g., structure-process-health outcome; process- health outcome; intermediate clinical outcome-health outcome)***:**
Accidental laceration or puncture is a health outcome measure.
This measure captures an injury to an organ (e.g., bowel, bladder, liver, diaphragm) or blood vessel that was entirely unintended and was NOT due to an underlying disease process. This definition would be met if (for example) placement of a retractor underneath the symphysis pubis accidentally enters the bladder. Another example would be use of a cautery device or scissors to dissect a tissue plane that errantly causes an injury to underlying bowel. The rationale for this measure is that these injuries have adverse consequences for patients, and are often preventable.
The exact proportion of PSI 15 events that is preventable, with optimal surgical technique, is unknown. However, in one series of 170 confirmed cases (based on earlier version of the indicator that did not exclude spinal surgery), 51 (30%) involved enterotomy or other perforation of the gastrointestinal tract, 33 (19%) involved a dural tear, 27 (16%) involved vascular injury, 7 involved the heart or coronary arteries, 5 involved the ureter or kidney, 3 involved the biliary tract, and 2 involved other structures (Utter GH, et al. Positive predictive value of the AHRQ accidental puncture or laceration patient safety indicator. Ann Surg 2009; 250(6):1041-5).

1c.2-3 Type of Evidence *(Check all that apply)***:**
Selected individual studies (rather than entire body of evidence)

1c.4 Directness of Evidence to the Specified Measure *(State the central topic, population, and outcomes addressed in the body of evidence and identify any differences from the measure focus and measure target population)***:**
Not applicable

1c.5 Quantity of Studies in the Body of Evidence *(Total number of studies, not articles)***:** Not applicable

1c.6 Quality of Body of Evidence (*Summarize the certainty or confidence in the estimates of benefits and harms to patients across studies in the body of evidence resulting from study factors. Please address: a) study design/flaws; b) directness/indirectness of the evidence to this measure (e.g., interventions, comparisons, outcomes assessed, population included in the evidence); and c) imprecision/wide confidence intervals due to few patients or events*)**:** Not applicable

1c.7 Consistency of Results across Studies *(Summarize the consistency of the magnitude and direction of the effect):* Not applicable

1c.8 Net Benefit *(Provide estimates of effect for benefit/outcome; identify harms addressed and estimates of effect; and net benefit - benefit over harms)***:**
Not applicable

1c.9 Grading of Strength/Quality of the Body of Evidence. Has the body of evidence been graded? No

1c.10 If body of evidence graded, identify the entity that graded the evidence including balance of representation and any disclosures regarding bias: Not applicable

1c.11 System Used for Grading the Body of Evidence: Other

1c.12 **If other, identify and describe the grading scale with definitions:** Not applicable

1c.13 **Grade Assigned to the Body of Evidence:** Not applicable

1c.14 **Summary of Controversy/Contradictory Evidence:** Not applicable

1c.15 **Citations for Evidence other than Guidelines*(Guidelines addressed below)*:**
Not applicable

1c.16 **Quote verbatim, the specific guideline recommendation** *(Including guideline # and/or page #)*:
Not applicable

1c.17 **Clinical Practice Guideline Citation:** Not applicable

1c.18 **National Guideline Clearinghouse or other URL:** Not applicable

1c.19 **Grading of Strength of Guideline Recommendation.** Has the recommendation been graded? No

1c.20 **If guideline recommendation graded, identify the entity that graded the evidence including balance of representation and any disclosures regarding bias:**

1c.21 **System Used for Grading the Strength of Guideline Recommendation:** Other

1c.22 **If other, identify and describe the grading scale with definitions:** Not applicable

1c.23 **Grade Assigned to the Recommendation:** Not applicable

1c.24 **Rationale for Using this Guideline Over Others:** Not applicable

Based on the NQF descriptions for rating the evidence, what was the developer's assessment of the quantity, quality, and consistency of the body of evidence?
1c.25 Quantity: Moderate 1c.26 Quality: Moderate1c.27 Consistency: Moderate

Was the threshold criterion, *Importance to Measure and Report*, met?
(*1a & 1b must be rated moderate or high and 1c yes*) Yes☐ No☐
Provide rationale based on specific subcriteria:

For a new measure if the Committee votes NO, then STOP.
For a measure undergoing endorsement maintenance, if the Committee votes NO because of 1b. (no opportunity for improvement), it may be considered for continued endorsement and all criteria need to be evaluated.

2. RELIABILITY & 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. **(evaluation criteria)**
Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. Testing information and results should be entered in the appropriate field. Supplemental materials may be referenced or attached in item 2.1. See guidance on measure testing.

S.1 **Measure Web Page** *(In the future, NQF will require measure stewards to provide a URL link to a web page where current detailed specifications can be obtained*). Do you have a web page where current detailed specifications for this measure can be obtained? Yes

S.2 **If yes, provide web page URL:** http://qualityindicators.ahrq.gov/modules/psi_resources.aspx

2a. RELIABILITY. Precise Specifications and Reliability Testing: H☐ M☐ L☐ I☐

2a1. Precise Measure Specifications. (*The measure specifications precise and unambiguous.*)

2a1.1 Numerator Statement *(Brief, narrative description of the measure focus or what is being measured about the target population, e.g., cases from the target population with the target process, condition, event, or outcome)*:
Discharges among cases meeting the inclusion and exclusion rules for the denominator with ICD-9-CM code denoting accidental cut, puncture, perforation, or laceration during a procedure in any secondary diagnosis field.

2a1.2 Numerator Time Window *(The time period in which the target process, condition, event, or outcome is eligible for inclusion)*:
User may specify the time window; generally one calendar year

2a1.3 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, codes with descriptors, and/or specific data collection items/responses*:
ICD-9-CM Accidental puncture or laceration diagnosis codes:
E8700
SURGICAL OPERATION
E8701
INFUSION OR TRANSFUSION
E8702
KIDNEY DIALYSIS OR OTHER PERFUSION
E8703
INJECTION OR VACCINATION
E8704
ENDOSCOPIC EXAMINATION
E8705
ASPIRATION OF FLUID OR TISSUE, PUNCTURE, AND CATHETERIZATION
E8706
HEART CATHETERIZATION
E8707
ADMINISTRATION OF ENEMA
E8708
OTHER SPECIFIED MEDICAL CARE
E8709
UNSPECIFIED MEDICAL CARE
9982
ACCIDENTAL PUNCTURE OR LACERATION DURING A PROCEDURE

2a1.4 Denominator Statement *(Brief, narrative description of the target population being measured)*:
All surgical and medical discharges age 18 years and older defined by specific DRGs or MS-DRGs.

2a1.5 Target Population Category *(Check all the populations for which the measure is specified and tested if any)*: Adult/Elderly Care

2a1.6 Denominator Time Window *(The time period in which cases are eligible for inclusion)*:
User may specify the time window; generally one calendar year

2a1.7 Denominator Details (*All information required to identify and calculate the target population/denominator such as definitions, codes with descriptors, and/or specific data collection items/responses)*:
See Patient Safety Indicators Appendices:
- Appendix B – Medical Discharge DRGs
- Appendix C – Medical Discharge MS-DRGs
- Appendix D – Surgical Discharge DRGs
- Appendix E – Surgical Discharge MS-DRGs

Link to PSI appendices:
http://qualityindicators.ahrq.gov/Downloads/Software/SAS/V43/TechnicalSpecifications/PSI%20Appendices.pdf

2a1.8 Denominator Exclusions *(Brief narrative description of exclusions from the target population)*:
Exclude cases:
- with principal diagnosis denoting accidental cut, puncture, perforation, or laceration or secondary diagnosis present on admission
- MDC 14 (pregnancy, childbirth, and puerperium)
- with ICD-9-CM code for spine surgery
- with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing)

2a1.9 Denominator Exclusion Details *(All information required to identify and calculate exclusions from the denominator such as definitions, codes with descriptors, and/or specific data collection items/responses)*:
ICD-9-CM Spine surgery procedure codes:
0301
REMOVAL OF FOREIGN BODY FROM SPINAL CANAL
0302
REOPENING OF LAMINECTOMY SITE
0309
OTHER EXPLORATION AND DECOMPRESSION OF SPINAL CANAL
0353
REPAIR OF VERTEBRAL FRACTURE
036
LYSIS OF ADHESIONS OF SPINAL CORD AND NERVE ROOTS
8053
REPAIR OF THE ANULUS FIBROSUS WITH GRAFT OR PROSTHESIS (OCT08)
8054
OTHER AND UNSPECIFIED REPAIR OF THE ANULUS FIBROSUS (OCT08)
8100
SPINAL FUSION, NOT OTHERWISE SPECIFIED
8101
ATLAS-AXIS SPINAL FUSION
8102
OTHER CERVICAL FUSION, ANTERIOR TECHNIQUE
8103
OTHER CERVICAL FUSION, POSTERIOR TECHNIQUE
8104
DORSAL AND DORSOLUMBAR FUSION, ANTERIOR TECHNIQUE
8105
DORSAL AND DORSOLUMBAR FUSION, POSTERIOR TECHNIQUE
8106
LUMBAR AND LUMBOSACRAL FUSION, ANTERIOR TECHNIQUE
8107
LUMBAR AND LUMBOSACRAL FUSION, LATERAL TRANSVERSE PROCESS TECHNIQUE
8108
LUMBAR AND LUMBOSACRAL FUSION, POSTERIOR TECHNIQUE
8130
REFUSION OF SPINE, NOT OTHERWISE SPECIFIED
8131
REFUSION OF ATLAS-AXIS SPINE
8132
REFUSION OF OTHER CERVICAL SPINE, ANTERIOR TECHNIQUE
8133
REFUSION OF OTHER CERVICAL SPINE, POSTERIOR TECHNIQUE
8134
REFUSION OF DORSAL AND DORSOLUMBAR SPINE, ANTERIOR TECHNIQUE

8135
REFUSION OF DORSAL AND DORSOLUMBAR SPINE, POSTERIOR TECHNIQUE
8136
REFUSION OF LUMBAR AND LUMBOSACRAL SPINE, ANTERIOR TECHNIQUE
8137
REFUSION OF LUMBAR AND LUMBOSACRAL SPINE, LATERAL TRANSVERSE PROCESS TECHNIQUE
8138
REFUSION OF LUMBAR AND LUMBOSACRAL SPINE, POSTERIOR TECHNIQUE
8139
REFUSION OF SPINE, NOT ELSEWHERE CLASSIFIED
8162
FUSION OR REFUSION OF 2-3 VERTEBRAE*
8163
FUSION OR REFUSION OF 4-8 VERTEBRAE*
8164
FUSION OR REFUSION OF 9 OR MORE VERTEBRAE*
8165
VERTEBROPLASTY
8166
KYPHOPLASTY
8451
INSERTION OF INTERBODY SPINAL FUSION DEVICE*
8452
INSERTION OF RECOMBINANT BONE MORPHOGENETIC PROTEIN*
8458
IMPLANTATION OF INTERSPINOUS PROCESS DECOMPRESSION DEVICE (ONLY BEFORE OCT 1, 2007)
8459
INSERTION OF OTHER SPINAL DEVICES
8460
INSERTION OF SPINAL DISC PROSTHESIS, NOT OTHERWISE SPECIFIED
8461
INSERTION OF PARTIAL SPINAL DISC PROSTHESIS, CERVICAL
8462
INSERTION OF TOTAL SPINAL DISC PROSTHESIS, CERVICAL
8463
INSERTION OF SPINAL DISC PROSTHESIS, THORACIC
8464
INSERTION OF PARTIAL SPINAL DISC PROSTHESIS, LUMBOSACRAL
8465
INSERTION OF TOTAL SPINAL DISC PROSTHESIS, LUMBOSACRAL
8466
REVISION OR REPLACEMENT OF ARTIFICIAL SPINAL DISC PROSTHESIS, CERVICAL
8467
REVISION OR REPLACEMENT OF ARTIFICIAL SPINAL DISC PROSTHESIS, THORACIC
8468
REVISION OR REPLACEMENT OF ARTIFICIAL SPINAL DISC PROSTHESIS, LUMBOSACRAL
8469
REVISION OR REPLACEMENT OF ARTIFICIAL SPINAL DISC PROSTHESIS, NOT OTHERWISE SPECIFIED
8480
INSERTION OR REPLACEMENT OF INTERSPINOUS PROCESS DEVICE(S)
8481
REVISION OF INTERSPINOUS PROCESS DEVICE(S)
8482
INSERTION OR REPLACEMENT OF PEDICLE-BASED DYNAMIC STABILIZATION DEVICE(S)

8483
REVISION OF PEDICLE-BASED DYNAMIC STABILIZATION DEVICE(S)
8485
REVISION OF FACET REPLACEMENT DEVICE(S)

2a1.10 Stratification Details/Variables *(All information required to stratify the measure results including the stratification variables, codes with descriptors, definitions, and/or specific data collection items/responses)*:
Not applicable

2a1.11 Risk Adjustment Type *(Select type. Provide specifications for risk stratification in 2a1.10 and for statistical model in 2a1.13)*: Statistical risk model **2a1.12 If "Other," please describe:**

2a1.13 Statistical Risk Model and Variables *(Name the statistical method - e.g., logistic regression and list all the risk factor variables. Note - risk model development should be addressed in 2b4.)*:
The predicted value for each case is computed using a hierarchical model (logistic regression with hospital random effect) and covariates for gender, age, modified CMS DRG, transfer status, procedure day availability, and the AHRQ Comorbidity category. The reference population used in the regression is the universe of discharges for states that participate in the HCUP State Inpatient Data (SID) for the years 2008, a database consisting of 42 states and approximately 30 million adult discharges. The expected rate is computed as the sum of the predicted value for each case divided by the number of cases for the unit of analysis of interest (i.e., hospital). The risk adjusted rate is computed using indirect standardization as the observed rate divided by the expected rate, multiplied by the reference population rate.

Covariates used in this measures:
Sex Female
Age 18 to 24
Age 25 to 29
Age 30 to 59
MDRG 101
MDRG 103
MDRG 107
MDRG 302
MDRG 401
MDRG 402
MDRG 416
MDRG 502
MDRG 503
MDRG 504
MDRG 505
MDRG 506
MDRG 507
MDRG 508
MDRG 510
MDRG 511
MDRG 513
MDRG 514
MDRG 519
MDRG 520
MDRG 522
MDRG 601
MDRG 602
MDRG 603
MDRG 604
MDRG 606
MDRG 609

MDRG 610
MDRG 611
MDRG 621
MDRG 701
MDRG 702
MDRG 703
MDRG 704
MDRG 705
MDRG 712
MDRG 806
MDRG 807
MDRG 815
MDRG 816
MDRG 1001
MDRG 1003
MDRG 1005
MDRG 1006
MDRG 1101
MDRG 1102
MDRG 1103
MDRG 1104
MDRG 1105
MDRG 1107
MDRG 1109
MDRG 1201
MDRG 1204
MDRG 1301
MDRG 1302
MDRG 1303
MDRG 1304
MDRG 1305
MDRG 1306
MDRG 1307
MDRG 1308
MDRG 1707
MDRG 1709
MDRG 1801
MDRG 1802
MDRG 2104
MDRG 2108
MDRG 2408
MDRG 7702
MDC 3
MDC 4
MDC 5
MDC 6
MDC 7
MDC 8
MDC 9
MDC 11
MDC 12
MDC 13
MDC 16
MDC 17

MDC 18
MDC 21
MDC 24
MDC Other
TRNSFER Transfer-in
NOPRDAY Procedure Days Data Not Available
COMORB PERIVASC
COMORB DM
COMORB DMCX
COMORB RENLFAIL
COMORB OBESE
COMORB WGHTLOSS
COMORB BLDLOSS
COMORB ANEMDEF

2a1.14-16 Detailed Risk Model Available at Web page URL (or attachment). Include coefficients, equations, codes with descriptors, definitions, and/or specific data collection items/responses. Attach documents only if they are not available on a webpage and keep attached file to 5 MB or less. NQF strongly prefers you make documents available at a Web page URL**.** Please supply login/password if needed**:**
URL
http://qualityindicators.ahrq.gov/Downloads/Software/SAS/V43/Risk%20Adjustment%20Tables%20PSI%204.3.pdf
Not applicable

2a1.17-18. Type of Score: Rate/proportion

2a1.19 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

2a1.20 Calculation Algorithm/Measure Logic*(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; aggregating data; risk adjustment; etc.)***:**
Each indicator is expressed as a rate, is defined as outcome of interest / population at risk or numerator / denominator. The AHRQ Quality Indicators (AHRQ QI) software performs six steps to produce the rates. 1) Discharge-level data is used to mark inpatient records containing the outcome of interest and 2) the population at risk. For provider indicators, the population at risk is also derived from hospital discharge records; for area indicators, the population at risk is derived from U.S. Census data. 3) Calculate observed rates. Using output from steps 1 and 2, rates are calculated for user-specified combinations of stratifiers. 4) Calculate expected rates. Regression coefficients from a reference population database are applied to the discharge records and aggregated to the provider or area level. For indicators that are not risk-adjusted, this is the reference population rate. 5) Calculate risk-adjusted rate. Use the indirect standardization to account for case-mix. For indicators that are not risk-adjusted, this is the same as the observed rate. 6) Calculate smoothed rate. A Univariate shrinkage factor is applied to the risk-adjusted rates. The shrinkage estimate reflects a reliability adjustment unique to each indicator

2a1.21-23 Calculation Algorithm/Measure Logic Diagram URL or attachment:
URL
http://qualityindicators.ahrq.gov/Downloads/Resources/Publications/2011/QI%20Empirical%20Methods%2005-03-11.pdf
Not applicable

2a1.24 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)**:**
Not applicable

2a1.25 Data Source *(Check all the sources for which the measure is specified and tested*). If other, please describe**:**
Administrative claims

2a1.26 Data Source/Data Collection Instrument (*Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.*)**:** HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). Agency for Healthcare Research and Quality, Rockville, MD.

2a1.27-29 Data Source/data Collection Instrument Reference Web Page URL or Attachment: URL
http://www.hcup-us.ahrq.gov/sidoverview.jsp
Not applicable

2a1.30-32 Data Dictionary/Code Table Web Page URL or Attachment:
URL
http://qualityindicators.ahrq.gov/Downloads/Software/WinQI/V43/AHRQ%20QI%20Software%20Instructions,%20WinQI.pdf
Not applicable

2a1.33 Level of Analysis (*Check the levels of analysis for which the measure is specified and tested)***:** Facility

2a1.34-35 Care Setting *(Check all the settings for which the measure is specified and tested)***:** Hospital/Acute Care Facility

2a. Reliability Testing. (*Reliability testing was conducted with appropriate method, scope, and adequate demonstration of reliability*.)

2a2.1 Data/Sample *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)***:**
HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2008. Agency for Healthcare Research and Quality, Rockville, MD. Consists of approximately 30 million adult discharges and 4,000 hospitals.

2a2.2 Analytic Method *(Describe method of reliability testing & rationale)***:**
The signal to noise ratio is the ratio of the between hospital variance (signal) to the within hospital variance (noise). The formula is signal / (signal + noise). The ratio itself is only a diagnostic for the degree of variance in the risk-adjusted rate systematically associated with the provider. Therefore, what matters is the magnitude of the variance in the "smoothed" rate (that is, the variance in the risk-adjusted rate after the application of the univariate shrinkage estimator based on the signal ratio).

2a2.3 Testing Results *(Reliability statistics, assessment of adequacy in the context of norms for the test conducted)***:**
What the data demonstrate is systematic variation in the provider level rate of 1.136 to 5.075 per 1,000 from the 5th to 95th percentile after a signal ratio of 0.818 is applied as the shrinkage estimator (that is, after accounting for variation due to random factors).

2b. VALIDITY. Validity, Testing, <u>including all Threats to Validity</u>: H☐ M☐ L☐ I ☐

2b1.1 Describe how the measure specifications *(measure focus, target population, and exclusions)* **are consistent with the evidence cited in support of the measure focus (***criterion 1c)* **and identify any differences from the evidence:**
No identified differences

2b2. Validity Testing. (*Validity testing was conducted with appropriate method, scope, and adequate demonstration of validity.)*

2b2.1 Data/Sample *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)***:**
The first study (Kaafarani HMA, et al. Validity of selected Patient Safety Indicators: opportunities and concerns. J Am Coll Surg 2011; 212(6):924-34) examined the criterion validity, specifically the positive predictive value (PPV), of 12 selected PSIs using clinical data abstracted from the Veterans Health Administration (VA) electronic medical record (EMR) as the gold standard.
The second study (Utter GH, et al. Positive predictive value of the AHRQ accidental puncture or laceration patient safety indicator. Ann Surg 2009; 250(6):1041-5) recruited hospitals for participation in the Validation Pilot Project through the AHRQ Quality Indicators (QI) technical support listserv and conducted web-based informational sessions to introduce the study and outline expectations of participants. Participation was voluntary and without compensation. We asked participants to commit to test the Accidental Puncture or Laceration indicator as well as four other PSIs included in Phase I of the Validation Pilot Project. The 47 participating hospitals from 29 states included a spectrum of different sizes, ownership types, and academic affiliations.

2b2.2 Analytic Method *(Describe method of validity testing and rationale; if face validity, describe systematic assessment)***:**

Calculation of the positive predictive value, which is defined as the percentage of reported events that are confirmed as true events based upon application of a "criterion (gold) standard." Sensitivity is defined as the percentage of all eligible events (based upon the same criterion standard) that are reported by hospitals in the administrative data set used for validation. In the cited studies, the criterion standard was based on review of randomly sampled medical records by a trained nurse abstractor, using a standard data collection tool and guidelines, with secondary review of clinical details by an academic surgeon. Confidence intervals (95%) were estimated with adjustment for clustering of observations within hospitals, as appropriate.

A structured review of each indicator was undertaken to evaluate the face validity (from a clinical perspective) of the indicators. Specifically, the panels approach sought to establish consensual validity, which "extends face validity from one expert to a panel of experts who examine and rate the appropriateness of each item…." The methodology for the structured review was adapted from the RAND/UCLA Appropriateness Method and consisted of an initial independent assessment of each indicator by clinician panelists using an initial questionnaire, a conference call among all panelists, followed by a final independent assessment by clinician panelists using the same questionnaire. The panel process served to refine definitions of some indicators, add new measures, and dismiss indicators with major concerns from further consideration.
Twenty-one professional clinical organizations were invited to submit nominations. These organizations were selected based on the applicability of the specialty or subspecialty to our quality indicators. Organizations that represented general practitioners (e.g., general surgeons, internists, critical care physicians, perioperative nurses, and critical care nurses) were asked to nominate more panelists than those representing sub-specialties. Fifteen organizations submitted nominations: American Association of Critical-Care Nurses; American Academy of Family Physicians; American College of Cardiology; American College of Nurse-Midwives; American College of Obstetricians and Gynecologists; American College of Physicians/American Society of Internal Medicine; American College of Radiology; American College of Surgeons; American Geriatric Society; Association of Perioperative Nurses; American Society of Anesthesiologists; American Society of Health-system Pharmacists; American Thoracic Society; Association of Women´s Health Obstetric and Neonatal Nurses; and National Association of Inpatient Physicians.
These professional organizations nominated a total of 162 clinicians. Each nominee was invited to participate in the evaluation. In order to be eligible to participate, nominees were required to spend at least 30% of their work time on patient care, including hospitalized patients. Ninety-two nominees accepted this invitation. Five nominees were ineligible to participate. Nominees were asked to provide information regarding their practice characteristics, including specialty and subspecialty and setting (i.e., urban vs. rural location, region of country, and service to underserved populations), information regarding primary hospital of practice (i.e., funding source) and personal information (i.e., clinical education history, academic affiliation).
For assignments to each panel, a list of applicable specialties was identified for the indicators to be evaluated by a given panel. Panelists were selected so that each panel had diverse membership in terms of practice characteristics and setting. Thus, when a specific area was over-represented by the pool of eligible nominees, randomly drawn members from that specific sub-group were contacted first to fill the panels. In addition, conference call scheduling logistics influenced assignments. Fifty-seven of the eligible panelists accepted the invitation to participate on specific panels. Four did not participate in the conference call, and thus were removed from the panels. All other panelists (53) completed the evaluation in full.
Eight panels were formed. Complications of medical care indicators were examined by two panels. Surgical complications indicators were reviewed by three panels. Another panel assessed indicators related to procedural complications. Finally, two panels examined obstetric complications indicators. All panels had diversity in the geographic location of panelists, and the type of practice.

2b2.3 **Testing Results** *(Statistical results, assessment of adequacy in the context of norms for the test conducted; if face validity, describe results of systematic assessment)***:**
The two studies estimated a nominal PPV—i.e., considering even minor complications that did not require repair as true events—of 85% (95% CI, 77-91%) and 91% (95% CI, 88-94%), respectively. The VA study (Kaafarani HMA et al.) assessed the interrater reliability between chart abstractors and reported an estimate of 97%. However, if such minor complications were classified as false positive cases, the estimated PPV of the indicator in the two studies decreased to 79% and 68%, respectively. A large proportion of all flagged cases (76%) in the second study involved some form of repair of the unintentionally damaged structure. A smaller percentage (4%) required a separate return to the operating room because the injury was not recognized during the initial procedure. Although precise proportions were difficult to estimate, many of the true-positive cases may not have been preventable because scar tissue or adhesions were associated with 25-40% of cases and because the goals of the operation in some cases (e.g., tumor-free margin of excision of a malignant lesion or emergency control of hemorrhage) may have warranted an increased risk of unintentional damage to other structures.
False positive rates were low in both of these studies. Some false positives were due to complications that were actually present on admission (i.e., 6 of 17 false positives in the VA study, 5 of 23 false positives in the AHRQ study), which would automatically be

excluded by users with "present on admission" (POA) data. Adjusting for the availability of POA data, estimated PPVs are 90% from the VA and 93% from the AHRQ study. The remaining false positives were either non-accidental injuries (e.g., deliberate disruption of tissue to achieve surgical goals) or injuries unrelated to a puncture or laceration (e.g., bleeding, dislodgement of a tube or device).
We have very limited evidence about the sensitivity of this indicator. Investigators in New York systematically searched their hospital administrative data for procedure codes suggesting repair of iatrogenic injuries, and reported that this PSI may have missed 27% of bladder injuries from hysterectomy, 21% of bowel injuries from cholecystectomy, 47% of abdominal injuries from lysis of adhesions, 54% of abdominal injuries from nephroureterectomy, and 20% of spinal injuries from lumbar surgery (Gallagher B, Cen L, Hannan EL. Validation of AHRQ´s Patient Safety Indicator for Accidental Puncture or Laceration. In: Henriksen K, Battles JB, Marks ES, Lewin DI, editors. Advances in Patient Safety: From Research to Implementation [Volume 2: Concepts and Methodology]. Rockville, MD: Agency for Healthcare Research and Quality; 2005). In a separate study, the authors (Romano PS, Schembri ME, Rainwater JA. Can administrative data be used to ascertain clinically significant postoperative complications? Am J Med Qual 2002;17:145-154) identified 19 of 45 chart-confirmed episodes of accidental puncture or laceration using discharge abstracts of diskectomy patients at 30 California hospitals in 1990-91, with only one false positive. This latter study provided part of the justification for removing spine surgery from the denominator of PSI 15.
An alternative validation approach, based on the principle of construct validity, is to establish a correlation at the provider level between performance on this indicator and performance on an alternative measure of surgical care quality. In a study using an implicit process measure of quality (Miller MR, et al., Am J Med Qual 2005; 20:239-252), smoothed rates of this PSI among 2,116 hospitals surveyed by The Joint Commission were significantly (p=0.004) associated with summary evaluation scores, in the expected direction.

POTENTIAL THREATS TO VALIDITY. (*All potential threats to validity were appropriately tested with adequate results.*)

2b3. Measure Exclusions. (*Exclusions were supported by the clinical evidence in 1c or appropriately tested with results demonstrating the need to specify them.*)

2b3.1 Data/Sample for analysis of exclusions *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)***:**
HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2008. Agency for Healthcare Research and Quality, Rockville, MD. Consists of approximately 30 million adult discharges and 4,000 hospitals.

2b3.2 Analytic Method (*Describe type of analysis and rationale for examining exclusions, including exclusion related to patient preference)***:**
We conducted an analysis of each exclusion to determine whether the exclusion was still necessary give the availability of present on admission data. Only those exclusion that are "related to POA" were evaluated.

Exclusion Criterion	Related to POA	Related to Preventability	Little or No Risk
Exclusion 1 (Exclude Immunocompromised Diagnosis Code)	X	X	-
Exclusion 2 (Exclude Immunocompromised Procedure Code)	X	X	-
Exclusion 3 (Exclude Cancer)	X	X	-
Exclusion 4 (Exclude Infection Diagnosis Code)	X	-	-
Exclusion 5 (Exclude Pressure Ulcer Diagnosis Code)		X	-	-
Exclusion 6 (Exclude Length of stay less than 4 days)		X	-	-
Exclusion 7 (Exclude MDC 14)	-	-	X

If the user´s data lacks present on admission information, then the likelihood that the outcome of interest and the covariates are present on admission is estimated using a Markov Chain Monte Carlo (MCMC) estimation procedure. That likelihood is then used to adjust the observed and expected rates.

2b3.3 Results *(Provide statistical results for analysis of exclusions, e.g., frequency, variability, sensitivity analyses):*
Based on the analysis, we have made the following recommendations for future revisions of this indicator:
No changes are recommended for PSI #15.
Exclusion 1 should be retained for reasons related to preventability.
Retain exclusion 2; the MDC 14 exclusions are not candidates to be dropped in this work.

2b4. Risk Adjustment Strategy. (*For outcome measures, adjustment for differences in case mix (severity) across measured*

entities was appropriately tested with adequate results.)

2b4.1 **Data/Sample** *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)***:**
HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2008. Agency for Healthcare Research and Quality, Rockville, MD. Consists of approximately 30 million adult discharges and 4,000 hospitals.

2b4.2 **Analytic Method (***Describe methods and rationale for development and testing of risk model or risk stratification including selection of factors/variables)***:**
Risk-adjustment models use a standard set of categories based on readily available classification systems for demographics, severity of illness and comorbidities. Within each category, covariates are initially selected based on a minimum of 30 cases in the outcome of interest. Then a stepwise regression process on a development sample is used to select a parsimonious set of covariates where p<.05. Model is then tested on a validation sample

If the user´s data lacks present on admission information, then the likelihood that the outcome of interest and the covariates are present on admission is estimated using a Markov Chain Monte Carlo (MCMC) estimation procedure. That likelihood is then used to adjust the observed and expected rates.

Specifically, the risk-adjustment model for PSI 15 includes female sex, three age categories, about 68 modified surgical DRG categories representing different types of procedures, 16 body system categories, transfer from another hospital, and comorbidities including peripheral vascular disease, diabetes with and without complications, renal failure, obesity, weight loss, blood loss, and deficiency anemia.

2b4.3 **Testing Results** *(Statistical risk model: Provide quantitative assessment of relative contribution of model risk factors; risk model performance metrics including cross-validation discrimination and calibration statistics, calibration curve and risk decile plot, and assessment of adequacy in the context of norms for risk models. Risk stratification: Provide quantitative assessment of relationship of risk factors to the outcome and differences in outcomes among the strata)***:**
c-statistic 0.892

2b4.4 **If outcome or resource use measure is not risk adjusted, provide rationale and analyses to justify lack of adjustment:** Not applicable

2b5. Identification of Meaningful Differences in Performance. (*The performance measure scores were appropriately analyzed and discriminated meaningful differences in quality.*)

2b5.1 **Data/Sample** *(Describe the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)***:**
HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2008. Agency for Healthcare Research and Quality, Rockville, MD. Consists of approximatley 30 million adult discharges and 4,000 hospitals.

2b5.2 **Analytic Method** *(Describe methods and rationale to identify statistically significant and practically/meaningfully differences in performance)***:**
Posterior probability distribution parameterized using the Gamma distribution

2b5.3 **Results** *(Provide measure performance results/scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance)*:
Raw Rates (numerator / denominator):

5th	25th	Median	75th	95th
0.001136	0.001912	0.002629	0.003507	0.005075

2b6. Comparability of Multiple Data Sources/Methods. (*If specified for more than one data source, the various approaches result in comparable scores.*)

2b6.1 **Data/Sample** *(Describe the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)***:**
Not applicable

2b6.2 Analytic Method *(Describe methods and rationale for testing comparability of scores produced by the different data sources specified in the measure)*:
Not applicable

2b6.3 Testing Results *(Provide statistical results, e.g., correlation statistics, comparison of rankings; assessment of adequacy in the context of norms for the test conducted)*:
Not applicable

2c. Disparities in Care: H☐ M☐ L☐ I ☐ NA☐ (*If applicable, the measure specifications allow identification of disparities.*)

2c.1 If measure is stratified for disparities, provide stratified results *(Scores by stratified categories/cohorts)*: In regard to figures below:
rates are risk adjusted rates per 1,000 (except where a US figure is presented, which is a per 1,000 observed rate)
1st figure: estimate
2nd figure: standard error
3rd figure: p value relative to marked group (marked group = "c")
4th figure: p value: current year relative to prior year

Key:
"c": Reference for p-value test statistics
"*": Data do not meet criteria for statistical reliability, data quality, or confidentiality

Patient characteristic:
Age groups for conditions affecting any age
18-44 c 4.513 0.028 0.727
45-64 5.584 0.024 0.000 0.000
65 and over 4.365 0.017 0.000 0.000

Age groups for conditions affecting primarily elderly
65-69 c 5.729 0.046 0.000
70-74 5.168 0.043 0.000 0.000
75-79 4.673 0.040 0.000 0.011
80-84 4.299 0.039 0.000 0.000
85 and over 2.322 0.027 0.000 0.000

Gender:
Male c 4.130 0.017 0.000
Female 5.359 0.018 0.000 0.000

Median income of patient´s ZIP code:
First quartile (lowest income) 4.727 0.025 0.016 0.000
Second quartile 4.926 0.026 0.000 0.000
Third quartile 4.886 0.026 0.000 0.000
Fourth quartile (highest income) c 4.640 0.025 0.249

Location of patient residence (NCHS):
Large central metropolitan 4.595 0.024 0.000 0.000
Large fringe metropolitan c 4.440 0.026 0.003
Medium metropolitan 5.165 0.029 0.000 0.000
Small metropolitan 5.128 0.041 0.000 0.000
Micropolitan 5.120 0.038 0.000 0.000
Not metropolitan or micropolitan 4.794 0.048 0.000 0.138

Expected payment source:

Private insurance c 4.613 0.020 0.000
Medicare 5.001 0.019 0.000 0.000
Medicaid 4.906 0.051 0.000 0.131
Other insurance 4.576 0.060 0.564 0.012
Uninsured / self-pay / no charge 4.481 0.066 0.056 0.000

2c.2 **If disparities have been reported/identified (e.g., in 1b), but measure is not specified to detect disparities, please explain:**
Not applicable

2.1-2.3 **Supplemental Testing Methodology Information:**
URL
http://qualityindicators.ahrq.gov/Downloads/Modules_Non_Software/Modules%20Development%20Bullet/psi_development.zip
Not applicable

Steering Committee: Overall, was the criterion, *Scientific Acceptability of Measure Properties*, met?
(*Reliability and Validity must be rated moderate or high*) Yes☐ No☐
Provide rationale based on specific subcriteria:

If the Committee votes No, STOP

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)**

C.1 **Intended Purpose/ Use** *(Check all the purposes and/or uses for which the measure is intended)*: Public Reporting, Quality Improvement (Internal to the specific organization)

3.1 **Current Use** *(Check all that apply; for any that are checked, provide the specific program information in the following questions)*: Public Reporting, Quality Improvement (Internal to the specific organization)

3a. Usefulness for Public Reporting: H☐ M☐ L☐ I ☐
(*The measure is meaningful, understandable and useful for public reporting.*)

3a.1. **Use in Public Reporting - disclosure of performance results to the public at large** *(If used in a public reporting program, provide name of program(s), locations, Web page URL(s)).* If not publicly reported in a national or community program, state the reason AND plans to achieve public reporting, potential reporting programs or commitments, and timeline, e.g., within 3 years of endorsement: **[*For Maintenance* –** *If not publicly reported, describe progress made toward achieving disclosure of performance results to the public at large and expected date for public reporting; provide rationale why continued endorsement should be considered.***]**
This measure is used for public reporting in 12 realms.

Illinois (state hospital association)
Illinois Hospitals Caring for You
www.illinoishospitals.org

Iowa (Iowa Healthcare Collaborative)
Iowa Healthcare Collaborative
http://www.ihconline.org/aspx/publicreporting/iowareport.aspx

Kentucky (Norton Healthcare, a hospital system)
Norton Healthcare Quality Report
http://www.nortonhealthcare.com/body.cfm?id=157

Kentucky (state hospital association)

Kentucky Hospital Association Quality Data
http://info.kyha.com/QualityData/IQISite/

Louisiana (state)
Louisiana Health Finder
http://www.healthfinderla.gov/default.aspx

Maine (state)
Maine Health Data Organization
http://gateway.maine.gov/mhdo2008Monahrq/home.html

New Hampshire (NY QIO)
New York State Health Accountability Foundation
http://nyshaf.org/juice/IPROSpikeChart.html

Nevada (state)
Nedava Compare Care
http://nevadacomparecare.net/Monahrq/home.html

Nevada (state hospital association)
Nevada Hospital Association Hospital Performance
http://www.nvhospitalquality.net/

New Jersey (state)
Find and Compare Quality Care in NJ Hospitals
http://www.nj.gov/health/healthcarequality/

New York (health care coalition)
New York State Hospital Report Card
http://www.myhealthfinder.com/

Oklahoma (state)
Oklahoma Hospital Report
http://www.ok.gov/health/documents/08%20Hospital%20AR.pdf

3a.2.**Provide a rationale for why the measure performance results are meaningful, understandable, and useful for public reporting**. If usefulness was demonstrated (e.g., focus group, cognitive testing), describe the data, method, and results**:** A research team from the School of Public Affairs, Baruch College, under contracts with the Department of Public Health, Weill Medical College and Battelle, Inc., has developed a pair of Hospital Quality Model Reports at the request of the Agency for Healthcare Research & Quality (AHRQ). These reports are designed specifically to report comparative information on hospital performance based on the AHRQ Quality Indicators (QIs). The work was done in close collaboration with AHRQ staff and the AHRQ Quality Indicators team.

The Model Reports (discussed immediately above) are based on:
• Extensive search and analysis of the literature on hospital quality measurement and reporting, as well as public reporting on health care quality more broadly;
• Interviews with quality measurement and reporting experts, purchasers, staff of purchasing coalitions, and executives of integrated health care delivery systems who are responsible for quality in their facilities;
• Two focus groups with chief medical officers of hospitals and/or systems and two focus groups with quality managers from a broad mix of hospitals;
• Four focus groups with members of the public who had recently experienced a hospital admission; and
• Four rounds of cognitive interviews (a total of 62 interviews) to test draft versions of the two Model Reports with members of the public with recent hospital experience, basic computer literacy but widely varying levels of education

3.2 **Use for other Accountability Functions (payment, certification, accreditation).** If used in a public accountability program,

provide name of program(s), locations, Web page URL(s): Not applicable

3b. Usefulness for Quality Improvement: H☐ M☐ L☐ I ☐
(*The measure is meaningful, understandable and useful for quality improvement.*)

3b.1. Use in QI. If used in quality improvement program, provide name of program(s), locations, Web page URL(s):
[*For Maintenance* – *If not used for QI, indicate the reasons and describe progress toward using performance results for improvement*].
The Patient Safety Indicators (PSIs) are a set of indicators providing information on potential in hospital complications and adverse events following surgeries, procedures, and childbirth. The PSIs were developed after a comprehensive literature review, analysis of ICD-9-CM codes, review by a clinician panel, implementation of risk adjustment, and empirical analyses.

The PSIs can be used to help hospitals identify potential adverse events that might need further study; provide the opportunity to assess the incidence of adverse events and in hospital complications using administrative data found in the typical discharge record; include indicators for complications occurring in hospital that may represent patient safety events; and, indicators also have area level analogs designed to detect patient safety events on a regional level.
http://qualityindicators.ahrq.gov/modules/psi_overview.aspx

The following are several entities that use the measure in quality improvement:

1) University Healthcare Consortium (UHC)
UHC is an alliance of 103 academic medical centers and 219 of their affiliated hospitals. UHC reports this and other AHRQ QIs to their member hospitals for their internal quality improvement purposes.

2) Minnesota Hospital Association

3) Ministry
Ministry is a 14 hospital system in WI, which includes the Marshfield Clinic in its system.

4) Premier
Premier uses the measure in their "QUEST" tool, which is used by hundreds of hospitals in their quality assurance and improvement work.

3b.2. Provide rationale for why the measure performance results are meaningful, understandable, and useful for quality improvement. If usefulness was demonstrated *(e.g., QI initiative),* describe the data, method and results:
The AHRQ QI support line receives approximately 150 user queries per month and almost 50 user per month download the AHRQ QI PSI software. Users have used the PSI since the release in 2003.

Users can readily use the risk-adjusted rate and the observed to expected results to identify opportunities for improvement for specific patient populations based on default stratifiers or risk adjustment model covariates. In addition, comparative data from the AHRQ SID and NIS databases provides relative performance information.

Overall, to what extent was the criterion, *Usability*, met? H☐ M☐ L☐ I ☐
Provide rationale based on specific subcriteria:

4. FEASIBILITY

Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. **(evaluation criteria)**

4a. Data Generated as a Byproduct of Care Processes: H☐ M☐ L☐ I ☐

4a.1-2 How are the data elements needed to compute measure scores generated? *(Check all that apply).*
Data used in the measure are**:**
Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims)

4b. Electronic Sources: H☐ M☐ L☐ I ☐

4b.1 **Are the data elements needed for the measure as specified available electronically** *(Elements that are needed to compute measure scores are in defined, computer-readable fields)***:** ALL data elements in electronic claims

4b.2 **If ALL data elements are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources:**

4c. Susceptibility to Inaccuracies, Errors, or Unintended Consequences: H☐ M☐ L☐ I ☐

4c.1 **Identify susceptibility to inaccuracies, errors, or unintended consequences of the measurement identified during testing and/or operational use and strategies to prevent, minimize, or detect. If audited, provide results:**
Coding professionals follow detail guidelines, are subject to training and credentialing requirements, peer review and audit.

4d. Data Collection Strategy/Implementation: H☐ M☐ L☐ I ☐

A.2 **Please check if either of the following apply** (*regarding proprietary measures*)**:**
4d.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 and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues** *(e.g., fees for use of proprietary measures)***:**
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.

Overall, to what extent was the criterion, *Feasibility*, met? H☐ M☐ L☐ I ☐
Provide rationale based on specific subcriteria:

OVERALL SUITABILITY FOR ENDORSEMENT

Does the measure meet all the NQF criteria for endorsement? Yes☐ No☐
Rationale:

If the Committee votes No, STOP.
If the Committee votes Yes, the final recommendation is contingent on comparison to related and competing measures.

5. COMPARISON TO RELATED AND 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 before a final recommendation is made.

5.1 **If there are related measures *(either same measure focus or target population)* or competing measures *(both the same measure focus and same target population*), list the NQF # and title of all related and/or competing measures:**

5a. Harmonization

5a.1 **If this measure has EITHER the same measure focus OR the same target population as NQF-endorsed measure(s): Are the measure specifications completely harmonized?**

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

5b. Competing Measure(s)

5b.1 **If this measure has 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)***:**

CONTACT INFORMATION
Co.1 **Measure Steward (Intellectual Property Owner):** Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850 Co.2 **Point of Contact:** John, Bott, Contractor, AHRQ Quality Indicators Measure Expert Center for Delivery, Organization and Markets, John.Bott@ahrq.hhs.gov, 301-427-1317-
Co.3 **Measure Developer if different from Measure Steward:** Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, Maryland, 20850 Co.4 **Point of Contact:** John, Bott, Contractor, AHRQ Quality Indicators Measure Expert Center for Delivery, Organization and Markets, John.Bott@ahrq.hhs.gov, 301-427-1317-
Co.5 **Submitter:** John, Bott, Contractor, AHRQ Quality Indicators Measure Expert Center for Delivery, Organization and Markets, John.Bott@ahrq.hhs.gov, 301-427-1317-, Agency for Healthcare Research and Quality
Co.6 **Additional organizations that sponsored/participated in measure development:** University of California-Davis Stanford University Battelle Memorial Institute
Co.7 **Public Contact:** John, Bott, Contractor, AHRQ Quality Indicators Measure Expert Center for Delivery, Organization and Markets, John.Bott@ahrq.hhs.gov, 301-427-1317-, Agency for Healthcare Research and Quality

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.** Multi-specialty Panel and Surgical Panel members are listed in the technical report: http://qualityindicators.ahrq.gov/Downloads/Modules_Non_Software/Modules%20Development%20Bullet/psi_development.zip
Ad.2 **If adapted, provide title of original measure, NQF # if endorsed, and measure steward. Briefly describe the reasons for adapting the original measure and any work with the original measure steward:** This indicator was originally proposed by Iezzoni et al. as part of the Complications Screening Program (CSP "sentinel events")
Measure Developer/Steward Updates and Ongoing Maintenance Ad.3 **Year the measure was first released:** 2003 Ad.4 **Month and Year of most recent revision:** 08, 2011 Ad.5 **What is your frequency for review/update of this measure?** Annual Ad.6 **When is the next scheduled review/update for this measure?** 12, 2011
Ad.7 **Copyright statement:** Not applicable
Ad.8 **Disclaimers:** Not applicable
Ad.9 **Additional Information/Comments:** Not applicable
Date of Submission (*MM/DD/YY*)**:** 09/14/2011