

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 #: 0344 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 (PDI 1)
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 under age 18 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 - normal newborn - neonate with birth weight less than 500 grams (Birth Weight Category 1) - MDC 14 (pregnancy, childbirth, and puerperium) - with ICD-9-CM code for spine surgery - with missing discharge gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing) See Pediatric Quality Indicators Appendices: - Appendix I – Definitions of, Neonate, Newborn, Normal Newborn, and Outborn - Appendix L – Low Birth Weight Categories
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): 0532 Ped Patient Safety for Selected Indicators (composite)

STAFF NOTES <i>(issues or questions regarding any criteria)</i>
Comments on Conditions for Consideration:
Is the measure untested? Yes <input type="checkbox"/> No <input type="checkbox"/> 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, OPPORTUNITY, 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):

Using data from 19 states from 2006 to 2008 over five million pediatric hospitalizations were examined. Pediatric patients who experienced an adverse event had a 6.15% mortality rate and excess cost of \$1.3 billion. This QI was one of the highest volume events. The trend in this QI worsened over time and was one of the most variable across the hospitals studied.(HealthGrades, 2010)

More recently, data from the Healthcare Cost and Utilization Project from 2000 to 2007 were used to examine trends in pediatric care.{Friedman, 2011} Accidental puncture and laceration increased 25.6% from 2000 to 2007, with the largest increase for children between the ages of 5 and 14 years. However, the authors did caution that "present on admission data" were not used and the sample of hospitals varied over the years.

PDI 01 functions appropriately in pediatric populations to identify adverse events that are associated with excess length of stay and total charges. Using the Nationwide Inpatient Sample from 1998-2005 and the KIDS Inpatient Database from 1997, 2000, and 2003, Camp and colleagues identified 6,459 unique records flagged by PDI 01, and matched them with 19,377 control records with the same age, race, gender, and hospital identification code. Multiple regression analyses were performed for inpatient mortality, length of stay and total hospital charges (controlling for procedure category, admission type, and insurance status in the matched case-control data set). Adjusted for procedure category, admission type, and insurance status, patients with PDI 1 were more likely to die (OR: 1.9., P < 0.001), had a 4.81 day longer length of stay (95% CI: 4.26-5.36, P < 0.001), and had \$36,291 higher total hospital charges (95% CI: \$32,583-\$40,000, P < 0.001) compared with patients without PDI 01.

In a similar study using nearest-neighbor propensity score matching in the Pediatric Health Information System database from 2006 (an administrative database with data from 38 academic, nonprofit pediatric hospitals affiliated with the Child Health Corporation of America), Kronman and colleagues reported mean excess length of stay of 2.77 days and mean excess total charges of \$34,884 for each PDI 01 case, relative to matched controls. The excess charges came from all hospital cost centers, including pharmacy (\$7,705), supplies (\$1,718), laboratory (\$7,622), imaging (\$1,956), and other clinical activities (\$4,827).

1a.4 Citations for Evidence of High Impact cited in 1a.3: Kronman MP, Hall M, Slonim AD, Shah SS. Charges and lengths of stay attributable to adverse patient-care events using pediatric-specific quality indicators: a multicenter study of freestanding children's hospitals. Pediatrics 2008;121(6):e1653-e1659.

Camp M, Chang DC, Zhang Y, Chrouser K, Colombani PM, Abdullah F. Risk factors and outcomes for foreign body left during a procedure: analysis of 413 incidents after 1 946 831 operations in children. Arch Surg 2010;145(11):1085-1090.

Friedman B, Berdahl T, Simpson LA, McCormick MC, Owens PL, Andrews R, Romano PS. Annual report on healthcare for children and youth in the United States: Focus on trends in hospital use and quality. Acad Pediatr 2011; 11(4):263-79.

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 0.796 0.041 0.002

Midwest 0.988 0.034 0.000 0.000

South 0.770 0.024 0.583 0.000

West 0.911 0.038 0.040 0.929

Ownership/control:

Private, not-for-profit c 0.836 0.019 0.002

Private, for-profit 0.761 0.050 0.161 0.131

Public 0.963 0.041 0.004 0.001

Teaching status:

Teaching 0.819 0.020 0.011 0.427

Nonteaching c 0.907 0.028 0.000

Location of hospital (NCHS):

Large central metropolitan 0.863 0.023 0.000 0.412

Large fringe metropolitan c 0.674 0.034 0.000

Medium metropolitan 0.840 0.038 0.001 0.000

Small metropolitan 1.066 0.065 0.000 0.917

Micropolitan 1.357 0.082 0.000 0.126

Not metropolitan or micropolitan 0.953 0.191 0.150 0.000

Bed size of hospital:

Less than 100 1.375 0.088 0.000 0.025

100 - 299 c 0.914 0.031 0.002

300 - 499 0.833 0.030 0.060 0.000

500 or more 0.768 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

NQF #0344 Accidental Puncture or Laceration Rate (PDI 1)

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

Total U.S. 0.848 0.016 0.000

Patient characteristic:

Age groups for pediatric conditions

0-4 c 0.703 0.018 0.000

5-9 0.830 0.052 0.020 0.929

10-14 1.421 0.057 0.000 0.513

15-17 1.157 0.056 0.000 0.127

Gender:

Male c 0.983 0.023 0.010

Female 0.648 0.022 0.000 0.009

Median income of patient's ZIP code:

First quartile (lowest income) 0.790 0.030 0.957 0.000

Second quartile 1.013 0.033 0.000 0.624

Third quartile 0.804 0.034 0.801 0.471

Fourth quartile (highest income)c 0.792 0.034 0.091

Location of patient residence (NCHS):

Large central metropolitan 0.777 0.029 0.412 0.503

Large fringe metropolitan c 0.742 0.031 0.208

Medium metropolitan 0.974 0.038 0.000 0.455

Small metropolitan 0.848 0.055 0.092 0.289

Micropolitan 1.043 0.052 0.000 0.093

Not metropolitan or micropolitan 1.017 0.067 0.000 0.026

Expected payment source:

Private insurance c 0.846 0.023 0.010

Medicare 1.625 0.239 0.001 0.232

Medicaid 0.874 0.024 0.404 0.218

Other insurance 0.514 0.077 0.000 0.000

Uninsured / self-pay / no charge 0.864 0.089 0.841 0.414

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.**

NQF #0344 Accidental Puncture or Laceration Rate (PDI 1)

Quantity: H <input type="checkbox"/> M <input type="checkbox"/> L <input type="checkbox"/> I <input type="checkbox"/> Quality: H <input type="checkbox"/> M <input type="checkbox"/> L <input type="checkbox"/> I <input type="checkbox"/> Consistency: H <input type="checkbox"/> M <input type="checkbox"/> L <input type="checkbox"/> I <input type="checkbox"/>			
Quantity	Quality	Consistency	Does the measure pass subcriterion1c?
M-H	M-H	M-H	Yes <input type="checkbox"/>
L	M-H	M	Yes <input type="checkbox"/> IF additional research unlikely to change conclusion that benefits to patients outweigh harms: otherwise No <input type="checkbox"/>
M-H	L	M-H	Yes <input type="checkbox"/> IF potential benefits to patients clearly outweigh potential harms: otherwise No <input type="checkbox"/>
L-M-H	L-M-H	L	No <input type="checkbox"/>
Health outcome – rationale supports relationship to at least one healthcare structure, process, intervention, or service			Does the measure pass subcriterion1c? Yes <input type="checkbox"/> 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 PDI 01 events that is preventable, with optimal surgical technique, is unknown. However, in one series of 247 confirmed cases from 28 participating hospitals in the National Association of Children’s Hospitals and Related Institutions (Scanlon MC, Harris JM II, Levy F, et al. Evaluation of the agency for healthcare research and quality pediatric quality indicators. Pediatrics 2008; 121:e1723–31), 80 (32%) were deemed preventable, 79 (32%) were deemed nonpreventable, and 88 (36%) were characterized as having uncertain preventability. This determination was made independently by clinicians at each site, who lacked formal training but were guided by teleconference discussions. The authors concluded that the average children’s hospital in the US reports 3.8-7.9 preventable PDI 01 events each year. In a previous review of 119 cases from 14 children’s hospitals (Scanlon MC, Miller M, Harris JM, Schulz K, Sedman A. Targeted chart review of pediatric patient safety events identified by the Agency for Healthcare Research and Quality’s patient safety indicators methodology. J Patient Saf 2006; 2:191-7), using similar methods, 64% were deemed preventable, 14% were deemed unpreventable, and 22% were classified as “unable to determine.”

1c.2-3 Type of Evidence (Check all that apply):

Clinical Practice Guideline

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: **Moderate** 1c.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/pdi_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 under age 18 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): [Children's Health](#)

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 Pediatric Quality Indicators Appendices:](#)

- Appendix B – Surgical Discharge DRGs
- Appendix C – Surgical Discharge MS-DRGs
- Appendix D – Medical Discharge DRGs
- Appendix E – Medical Discharge MS-DRGs

Link to PDI appendices:

<http://qualityindicators.ahrq.gov/Downloads/Software/SAS/V43/TechnicalSpecifications/PDI%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
- normal newborn
- neonate with birth weight less than 500 grams (Birth Weight Category 1)
- MDC 14 (pregnancy, childbirth, and puerperium)
- with ICD-9-CM code for spine surgery
- with missing discharge gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing) or principal diagnosis (DX1=missing)

See Pediatric Quality Indicators Appendices:

- Appendix I – Definitions of, Neonate, Newborn, Normal Newborn, and Outborn
- Appendix L – Low Birth Weight Categories

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 (PRIOR TO 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)
* code has "code also" instructions

See Pediatric Quality Indicators Appendices:

- Appendix I – Definitions of, Neonate, Newborn, Normal Newborn, and Outborn
- Appendix L – Low Birth Weight Categories

Link to PDI appendices:

<http://qualityindicators.ahrq.gov/Downloads/Software/SAS/V43/TechnicalSpecifications/PDI%20Appendices.pdf>

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):
Clinical categories for PDI 1 are based on Major Diagnostic Categories (MDC).

Stratum 1. Eye, ear, nose, mouth, throat, skin, breast, and other low-risk procedures
(MDC 2, 3, 9, 19, 22, 23)

Stratum 2. Thoracic, cardiovascular, and specified neoplastic procedures
(MDC 4, 5, 17)

Stratum 3. Kidney, and male/female reproductive procedures
(MDC 11, 12, 13)

Stratum 4. Infectious, immunological, hematological, and ungroupable procedures
(MDC 0/99, 16, 18, 25)

Stratum 5. Trauma, orthopedic, and neurologic procedures
(MDC 1, 8, 21, 24)

Stratum 6. Gastrointestinal, hepatobiliary, and endocrine procedures
(MDC 6, 7, 10)

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, birthweight (500g groups), age in days (29-60, 61-90, 91+), age in years (in 5-year age groups), modified CMS DRG and AHRQ CCS comorbidities. 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 43 states and approximately 6 million pediatric 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:

- MDC 5
- MDC 6
- MDC 8
- MDC 11
- MDC 15
- MDC OTHER
- Procedure Type 2
- Procedure Type 3
- Procedure Type 4 to 5
- Procedure Type 6
- Procedure Type 7

*** Risk adjust by risk category (Procedure Type)

1. No therapeutic procedure with any or no diagnostic procedures
2. Only minor therapeutic procedure with any or no diagnostic procedures
3. One major therapeutic without diagnostic procedure
4. One major therapeutic with only minor diagnostic procedure(s)
5. One major therapeutic with major diagnostic procedure(s)
6. Two major therapeutic procedures with any or no diagnostic procedures
7. Three or more major therapeutic procedures with any or no diagnostic procedures;

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%20PDI%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

2a2. 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. Includes approximately 6 million pediatric discharges for 2,500 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 $\text{signal} / (\text{signal} + \text{noise})$. 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 0.301 to 1.191 per 1,000 from the 5th to 95th percentile after a signal ratio of 0.608 is applied as the shrinkage estimator (that is, after accounting for variation due to random factors).
California data from 2005-2007, which were used because they included "present on admission" data and allowed for hospital specific calculations, were used to determine the percentage of hospitals with appropriate patient volumes to readily use the QI for tracking performance measurement over time. Only 12 of 399 California hospitals (3.0%), with 27% of the eligible discharges statewide, had sufficient patient volume to detect a hypothetical doubling of the PDI 01 rate. This problem could be minimized by focusing public reporting of this indicator on hospitals that meet a minimum pediatric volume threshold, or by incorporating it into a more robust composite measure. (Bardach NS, Chien AT, Dudley RA. Small numbers limit the use of the inpatient pediatric quality indicators for hospital comparison. Acad Pediatr 2010; 10(4):266-73)

2b. VALIDITY. Validity, Testing, including all Threats to Validity: 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 most recent study of the criterion validity of PDI 01 was based on a consecutive sample of 295 flagged cases from 28 participating hospitals in the National Association of Children’s Hospitals and Related Institutions (NACHRI) from 2003 through 2005 (Scanlon MC, Harris JM II, Levy F, et al. Evaluation of the agency for healthcare research and quality pediatric quality indicators. Pediatrics 2008; 121:e1723–31). Records were reviewed independently by clinicians at each site, who lacked formal training but were guided by teleconference discussions. A previous review of 119 flagged cases from 14 self-selected children’s hospitals in the NACHRI Pediatric PSI Collaborative (Scanlon MC, Miller M, Harris JM, Schulz K, Sedman A. Targeted chart review of pediatric patient safety events identified by the Agency for Healthcare Research and Quality’s patient safety indicators methodology. J Patient Saf 2006; 2:191-7) used similar methods

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 or chronologically sampled medical records by an experienced clinician, using a standard data collection tool and guidelines.

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 larger, more recent study published in 2008 estimated a PPV of 84%, which is very consistent with the PPV estimates for the adult version of this indicator (e.g., 85% [95% CI, 77-91%] and 91% [95% CI, 88-94%] for PSI 15). Fewer details are reported from the earlier (2006) study, but Table 1 in that paper suggests a PPV of 64% to 86%.

False positive rates were low, as reported for PSI 15. Some false positives were due to complications that were actually present on admission (i.e., 20 of 48 false positives in the NACHRI study), which would automatically be excluded by users with “present on admission” (POA) data. Adjusting for the availability of POA data, the estimated PPV in the 2008 NACHRI study was 90%. 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.

No data about the sensitivity of PDI 01 are available at this time, although the limited data presented for PSI 15 may also pertain to PDI 01.

Although precise proportions were difficult to estimate, many of the true-positive cases may not have been preventable because adhesions were associated with 8% of cases and because the goals of the operation in some cases may have warranted an increased risk of unintentional damage to other structures. For example, it was reported that many of these children “had congenital abnormalities such as gastroschisis, omphalocele, diaphragmatic hernias, cloacal defects, and cardiac defects” and they “were coming back into the hospital for 1 of multiple procedures that had previously involved significant scarring. Although the laceration or puncture was not a therapeutic part of the surgery, clinicians felt that they may have been unavoidable for the surgeon to do what was necessary. Incidents that were clearly.... preventable were often complications of line or device placements that punctured vessels, lungs, or the gastrointestinal tract.”

Face validity was systematically assessed using an expert panel process, as described in our original submission documents (McDonald K, Romano P, Davies S, Haberland C, Geppert J, Ku A, Choudry K. Measures of Pediatric Health Care Quality Based on Hospital Administrative Data: The Pediatric Quality Indicators. Rockville, MD: Agency for Healthcare Research and Quality, 2006). 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. Specifically, this indicator was reviewed by two panels with a total of 18 physicians, including a pediatric specialty panel with one neonatologist, one infectious disease specialist, one ambulatory pediatrician, one hospitalist, one cardiovascular surgeon, one oncologist, two surgeons, one interventional radiologist, and one critical care physician. Median ratings were 7 (on a scale of 1-9) with indeterminate agreement on usefulness for internal quality improvement, 6.5 with indeterminate agreement for comparative reporting, and 7 with indeterminate agreement for preventability

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. Includes approximately 6 million pediatric discharges for 2,500 hospitals.

2b3.2 Analytic Method (Describe type of analysis and rationale for examining exclusions, including exclusion related to patient preference):

Exclude cases with principal diagnosis denoting accidental cut, puncture, perforation, or laceration or secondary diagnosis present on admission

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):
of 2,439 cases with the outcome of interest, 186 are present on admission

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. Includes approximately 6 million pediatric discharges for 2,500 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.

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 0.930

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. Includes approximately 6 million pediatric discharges for 2,500 hospitals.

NQF #0344 Accidental Puncture or Laceration Rate (PDI 1)

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 meaningful differences in performance):

Raw Rates (numerator / denominator):

5th	25th	Median	75th	95th
0.000301	0.000483	0.000647	0.000844	0.001191

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

Total U.S. 0.848 0.016 0.000

Patient characteristic:

Age groups for pediatric conditions:

0-4 c 0.703 0.018 0.000

5-9 0.830 0.052 0.020 0.929

10-14 1.421 0.057 0.000 0.513

15-17 1.157 0.056 0.000 0.127

Gender:

Male c 0.983 0.023 0.010

Female 0.648 0.022 0.000 0.009

Median income of patient's ZIP code:

First quartile (lowest income) 0.790 0.030 0.957 0.000

Second quartile 1.013 0.033 0.000 0.624

Third quartile 0.804 0.034 0.801 0.471

Fourth quartile (highest income) c 0.792 0.034 0.091

Location of patient residence (NCHS):

Large central metropolitan 0.777 0.029 0.412 0.503

Large fringe metropolitan c 0.742 0.031 0.208

Medium metropolitan 0.974 0.038 0.000 0.455

Small metropolitan 0.848 0.055 0.092 0.289

Micropolitan 1.043 0.052 0.000 0.093

Not metropolitan or micropolitan 1.017 0.067 0.000 0.026

Expected payment source:

Private insurance c 0.846 0.023 0.010

Medicare 1.625 0.239 0.001 0.232

Medicaid 0.874 0.024 0.404 0.218

Other insurance 0.514 0.077 0.000 0.000

Uninsured / self-pay / no charge 0.864 0.089 0.841 0.414

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/pdi_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 5 realms.

Florida (state)

Florida Health Finder

<http://www.floridahealthfinder.gov/>

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

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

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

Texas (state)
 Reports on Hospital Performance
<http://www.dshs.state.tx.us/thcic/>

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 Pediatric Quality Indicators (PDIs) are a set of measures that can be used with hospital inpatient discharge data to provide a perspective on the quality of pediatric healthcare. Specifically, PDIs screen for problems that pediatric patients experience as a result of exposure to the healthcare system and that may be amenable to prevention by changes at the system or provider level.

Development of quality indicators for the pediatric population involves many of the same challenges associated with the development of quality indicators for the adult population. These challenges include the need to carefully define indicators using administrative data, establish validity and reliability, detect bias and design appropriate risk adjustment, and overcome challenges of implementation and use. However, the special population of children invokes additional, special challenges. Four factors— differential epidemiology of child healthcare relative to adult healthcare, dependency, demographics, and development—can pervade all aspects of children’s healthcare; simply applying adult indicators to younger age ranges is insufficient.

This PDIs focus on potentially preventable complications and iatrogenic events for pediatric patients treated in hospitals, and on preventable hospitalizations among pediatric patients.

The PDIs apply to the special characteristics of the pediatric population; screen for problems that pediatric patients experience as a result of exposure to the healthcare system and that may be amenable to prevention by changes at the provider level or area level; and, help to evaluate preventive care for children in an outpatient setting, and most children are rarely hospitalized.

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

1) Child Health Corporation of America (CHCA)

CHCA reports performance in all PDIs to its 42 member hospitals for their tracking and use in quality improvement. CHCA members are large freestanding pediatric hospitals.

2) National Association of Children’s Hospitals and Related Institutions (NACHRI)

As a benefit of membership, NACHRI reports all provider level PDIs to its approximately 85 member children’s hospitals for their quality improvement applications.

3) 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.

4) Dallas Fort Worth Hospital Council (DFWHC)

The DFWHC includes this measure in a report to its 70+ member hospitals as a benefit of membership. These measures results are used by hospitals in their quality improvement efforts.

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 PDI software. Users have used the PDI since the release in 2006

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/pdi_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 lezzoni 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: 2006 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