



## Measure Information - Composite

This document contains the information submitted by measure developers/stewards, but is organized according to NQF's measure evaluation criteria and process. The item numbers refer to those in the submission form but may be in a slightly different order here. In general, the item numbers also reference the related criteria (e.g., item 1b.1 relates to subcriterion 1b).

### Brief Measure Information

**NQF #: 0532**

**De.2. Measure Title:** Pediatric Patient Safety for Selected Indicators (PDI 19)

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

**De.3. Brief Description of Measure:** Pediatric Patient Safety for Selected Indicators (PDI 19) is a weighted average of the observed-to-expected ratios for the following component indicators: PDI 01 Accidental Puncture or Laceration Rate, PDI 02 Pressure Ulcer Rate, PDI 05 Iatrogenic Pneumothorax Rate, PDI 10 Postoperative Sepsis Rate, PDI 11 Postoperative Wound Dehiscence Rate, and PDI 12 Central Venous Catheter-Related Blood Stream Infection Rate.

The weights include component weights and shrinkage weights. The component weights are numerator weights, defined as the relative frequency of the numerators for the component indicators in the reference population. The shrinkage weights are the signal-to-noise ratio, where the signal variance is estimated from the reference population, and the noise variance is estimated from the user's data and is unique to each provider in the user's data.

For more information, see Quality Indicator Empirical Methods, PDI Composite Measure Workgroup Final Report, and AHRQ QI User Guide: PDI Composite available online at [www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov)

**1d.3. Developer Rationale:** The overall area of quality is pediatric patient safety for selected indicators. Component measures include the Pediatric Quality Indicators (PDI) related to in-hospital adverse events. The pediatric patient safety composite measure was developed to summarize pediatric patient safety across multiple indicators to monitor performance over time or across regions and populations using a methodology that can be applied at the national, regional, State and provider level. Practically, a composite was constructed to increase statistical precision due to an increase in the effective sample size and to address the issue of competing priorities where more than one component measure may be important; and to assist consumers in selecting healthcare, providers allocating resources, and payers assessing performance.

**S.4. Numerator Statement:** Not applicable for the composite. The numerator for component indicators is the number of potentially preventable adverse events (i.e., PDI 01 Accidental Puncture or Laceration Rate, PDI 02 Pressure Ulcer Rate, PDI 05 Iatrogenic Pneumothorax Rate, PDI 10 Postoperative Sepsis Rate, PDI 11 Postoperative Wound Dehiscence Rate, and PDI 12 Central Venous Catheter-Related Blood Stream Infection Rate).

**S.7. Denominator Statement:** Not applicable for the composite. The denominator for component indicators is the number of eligible discharges (all indicators limited to the pediatric population)

**S.10. Denominator Exclusions:** Not applicable for the composite. The denominator for component indicators has exclusion criteria as shown in the technical specifications.

**De.1. Measure Type:** Composite

**S.23. Data Source:** Claims

**S.26. Level of Analysis:** Facility

**IF Endorsement Maintenance – Original Endorsement Date:** Jun 19, 2009 **Most Recent Endorsement Date:** Jun 19, 2009

**1d.1. Composite Measure Construction:** two or more individual performance measure scores combined into one score  
**Component Measures (if endorsed or submitted for endorsement):**

### 1. Evidence, Performance Gap, Priority – Importance to Measure and Report

Extent to which the specific measure focus is evidence-based, important to making significant gains in healthcare quality, and improving health outcomes for a specific high-priority (high-impact) aspect of healthcare where there is variation in or overall less-than-optimal performance. **Measures must be judged to meet all subcriteria to pass this criterion and be evaluated against the remaining criteria.**

**1a. Evidence to Support the Measure Focus – See attached Evidence Submission Form**

[PDI\\_19\\_Supporting\\_Docs\\_Specs\\_Evidence\\_Tests.pdf](#)

**1b. Performance Gap**

Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating:

- considerable variation, or overall less-than-optimal performance, in the quality of care across providers; and/or
- disparities in care across population groups.

**1b.1. Briefly explain the rationale for this measure (e.g., the benefits or improvements in quality envisioned by use of this measure)**

Not applicable

**1b.2. Provide performance scores on the measure as specified (current and over time) at the specified level of analysis. (This is required for endorsement maintenance. Include mean, std dev, min, max, interquartile range, scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included). This information also will be used to address the subcriterion on improvement (4b.1) under Usability and Use.**

**Table 1. Reference Population**

Year # Hospitals Pop. at Risk Overall Composite Perf. Score

2011	4,594	1,068,839	1.000
2010	4,603	1,082,230	1.000
2009	4,532	1,116,717	1.000
2008	4,496	1,093,153	1.000
2007	4,264	1,025,900	1.000

**Composite Performance Score Distribution 2011**

5th	25th	Median	75th	95th
0.289	0.590	0.898	1.300	2.059

Source: HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2007-2011. Agency for Healthcare Research and Quality, Rockville, MD. [www.hcup-us.ahrq.gov/sidoverview.jsp](http://www.hcup-us.ahrq.gov/sidoverview.jsp). (AHRQ QI Software Version 4.5)

In addition, see supporting information in the Composite Measure Testing Form for PDI 19 and Analytic Templates for component indicators.

All analyses were completed using data from the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID), 2007-2011. HCUP is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, private data organizations, and the Federal government to create a national information resource of encounter-level health care data. The HCUP SID contain the universe of the inpatient discharge abstracts in participating States, translated into a uniform format to facilitate multi-State comparisons and analyses. Together, the SID encompass about 97 percent of all U.S. community hospital discharges (in 2011, 46 states participated for a total of more than 38.5 million hospital discharges with approximately 5 million pediatric (including births) hospital discharges). As defined by the American Hospital Association, community hospitals are all non-Federal, short-term, general or other specialty hospitals, excluding hospital units of institutions. Veterans hospitals and other Federal facilities are excluded. General and specialty children's hospitals are included in the hospital universe. Taken from the Uniform Bill-04 (UB-04), the SID data elements include ICD-9-CM coded principal and secondary diagnoses and procedures, additional detailed clinical and service information based on revenue codes, admission and discharge status, patient demographics, expected payment source (Medicare, Medicaid, private insurance as well as the uninsured), total charges and length of stay ([www.hcup-us.ahrq.gov](http://www.hcup-us.ahrq.gov))

**1b.3. If no or limited performance data on the measure as specified is reported in 1b2, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement.**

Detailed information provided in 1b2

**1b.4. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability.** *(This is required for endorsement maintenance. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include.) This information also will be used to address the subcriterion on improvement (4b.1) under Usability and Use.*

There are limited data on the impact of disparities on PSI 90 rates. There are reported differences when looking at individual measures. Using 2004-2006 HCUP SID data (described under 1b2), Berdahl et al. (1) found that after adjusting for community-level income, Black and Hispanic children from the poorest communities and Black children from the upper-middle income communities had lower rates of accidental puncture (PDI 01) compared with White children from the same areas ((0.845 and 0.694, respectively, vs 1.086 per 1000 discharges among children from the poorest communities, and 0.668 vs 1.021 per 1000 discharges among children from upper-middle income communities). Overall patterns show that Hispanic and Asian Pacific Islander children were less likely to have a decubitus ulcer (PDI 02) compared with white children (2.525 and 2.452, respectively, vs 3.580 per 1000 discharges), patterns varied by community-level income. Note: these estimates are based on 2004-2005 data, prior to the adoption of Present-on-Admission indicator and staging codes.

In addition, using 2010 HCUP SID data, supplemental tables for the National Healthcare Disparities Report(2) shows that Whites had a significantly lower rate of iatrogenic pneumothorax (PDI 05) than Hispanics (0.191 vs 0.152 per 1,000 surgical admissions, respectively). Moreover, Whites had a significantly lower rate of postoperative sepsis (PDI 10) than Blacks and Hispanics (28.793 per 1,000 elective surgical admissions vs 36.207 and 33.159, respectively). White children had significantly lower rates of central venous catheter-related blood stream infection rate (PDI 12) than Black, Asian Pacific Islander and Hispanic children (3.139 per 1,000 medical and surgical discharges vs 4.222, 4.031, and 3.556, respectively).

**1b.5. If no or limited data on disparities from the measure as specified is reported in 1b4, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement. Include citations.**

References:

1. Berdahl T, Owens PL, Dougherty D, McCormick MC, Pylypchuk Y, Simpson LA. Annual report on health care for children and youth in the United States: Racial/ethnic and socioeconomic disparities in children's health care quality. *Ambulatory Pediatrics*. 2010; 10:95-118.

2. US Department of Health and Human Services. 2012 National Healthcare Disparities Report Rockville, MD: Agency for Healthcare Research and Quality; May 2013. AHRQ Publication No. 13-0003. Available at: [www.ahrq.gov/research/findings/nhqrdr/index.html](http://www.ahrq.gov/research/findings/nhqrdr/index.html) (Detailed tables available upon request)

**1c. High Priority** (previously referred to as High Impact)

The measure addresses:

- a specific national health goal/priority identified by DHHS or the National Priorities Partnership convened by NQF; OR
- a demonstrated high-priority (high-impact) aspect of healthcare (e.g., affects large numbers of patients and/or has a substantial impact for a smaller population; leading cause of morbidity/mortality; high resource use (current and/or future); severity of illness; and severity of patient/societal consequences of poor quality).

**1c.1. Demonstrated high priority aspect of healthcare**

Affects large numbers, A leading cause of morbidity/mortality, High resource use, Patient/societal consequences of poor quality

**1c.2. If Other:**

**1c.3. Provide epidemiologic or resource use data that demonstrates the measure addresses a high priority aspect of healthcare.**

**List citations in 1c.4.**

Pediatric Quality Indicator (PDI) 19 is a weighted composite measure of the most salient 6 individual PDIs used in evaluating the quality and safety of pediatric healthcare. In 2000, patients under the age of 18 years accounted for 18% of all of the hospitalizations in the United States, and >6-million children were hospitalized at an approximate cost of \$46 billion(1). As in the adult population, pediatric patients are at risk for preventable medical errors and events. The PDIs, developed in 2006 and based on the adult Patient Safety Indicators (PSIs), specifically focus on iatrogenic and other potentially preventable adverse events that occur in children, with the aim of providing a perspective on problems in the healthcare system that may be amenable to changes at the systems level. The presence of a PDI increases morbidity, mortality, and medical costs. For example, Miller, Elixhauser and Zhan(2) reported, using 1997 data, that pediatric discharge records with an identified patient safety indicator event had a 2-fold to 6-fold longer hospital stay, a 2-fold to 18-fold higher rate of inpatient mortality, and 2-fold to 20-fold higher total hospital charge than pediatric discharge records without such events. A follow-up study by Miller and Zhan(3) using 2000 data showed similar results. More recently

McDonalds et al(4), showed rates (limited to measures included in PDI 19) in 2003 to vary from a low of 0.21 cases per 1000 for intragenic pneumothorax to 26.12 per 1000 for postoperative sepsis. Scanlon et al(5), using HCUP KIDS data from 2003-2005 (3 years) showed similar results with a low of 0.41 cases per 1000 discharges for intragenic pneumothorax and a high of 35.04 per 1000 discharges for postoperative respiratory failure. In Scanlon's study the rate of postoperative pediatric sepsis was 29.41 cases per 1000 discharges.

**1c.4. Citations for data demonstrating high priority provided in 1a.3**

1. Owens P, Thompson J, Elixhauser A, Ryan K. Care of Children and Adolescents in U.S. Hospitals. HCUP Fact Book No. 4. AHRQ Publication No. 04-0004. Rockville, MD: Agency for Healthcare Research and Quality; 2003.
2. Miller MR, Elixhauser A, Zhan C. Patient safety events during pediatric hospitalizations. *Pediatrics*. 2003;111 (6 pt 1):1358- 1366.
3. Miller MR, Zhan C. Pediatric patient safety in hospitals: a national picture in 2000 [published correction appears in *Pediatrics*. 2004;114(3):907].
4. McDonald KM, Davies SM, Haberland CA, Geppert JJ, Ku A, Romano PS. Preliminary assessment of pediatric health care quality and patient safety in the United States using readily available administrative data. *Pediatrics*. 2008 Aug;122(2):e416-25.
5. Scanlon MC, Harris JM 2nd, Levy F, Sedman A. Evaluation of the agency for healthcare research and quality pediatric quality indicators. *Pediatrics*. 2008 Jun;121(6):e1723-31.

**1c.5. If a PRO-PM (e.g. HRQoL/functional status, symptom/burden, experience with care, health-related behaviors), provide evidence that the target population values the measured PRO and finds it meaningful. (Describe how and from whom their input was obtained.)**

Not applicable.

**1d. Composite Quality Construct and Rationale**

**1d.1. A composite performance measure is a combination of two or more component measures, each of which individually reflects quality of care, into a single performance measure with a single score.**

For purposes of NQF measure submission, evaluation, and endorsement, the following will be considered composites:

- Measures with two or more individual performance measure scores combined into one score for an accountable entity.
- Measures with two or more individual component measures assessed separately for each patient and then aggregated into one score for an accountable entity:
  - all-or-none measures (e.g., all essential care processes received, or outcomes experienced, by each patient); or
  - any-or-none measures (e.g., any or none of a list of adverse outcomes experienced, or inappropriate or unnecessary care processes received, by each patient).

**1d.1.** Please identify the composite measure construction: **two or more individual performance measure scores combined into one score**

**1d.2. Describe the quality construct, including:**

- the overall area of quality
- included component measures and
- the relationship of the component measures to the overall composite and to each other.

Pediatric Patient Safety for Selected Indicators (PDI 19) is the weighted average of the observed-to-expected ratios for the following component indicators:

- PDI 01 Accidental Puncture or Laceration Rate
- PDI 02 Pressure Ulcer Rate
- PDI 05 Iatrogenic Pneumothorax Rate
- PDI 10 Postoperative Sepsis Rate
- PDI 11 Postoperative Wound Dehiscence Rate
- PDI 12 Central Venous Catheter-Related Blood Stream Infection Rate
- PDI 08 Perioperative Hemorrhage or Hematoma Rate\*
- PDI 09 Postoperative Respiratory Failure Rate\*

\*Note: All measure properties submitted in this application use NQF weights which exclude PDI 08 and PDI 09 (by assigning them a weight of zero).

The weights include component weights and shrinkage weights. The component weights are numerator weights, defined as the relative frequency of the numerators for the component indicators in the reference population. The shrinkage weights are the signal-to-noise ratio, where the signal variance is estimated from the reference population, and the noise variance is estimated from the user's data and is unique to each provider in the user's data.

NQF originally endorsed the composite with the following 6 component indicators: PDI 01 Accidental Puncture or Laceration Rate, PDI 02 Pressure Ulcer Rate, PDI 05 Iatrogenic Pneumothorax Rate, PDI 10 Postoperative Sepsis Rate, PDI 11 Postoperative Wound Dehiscence Rate, and PDI 12 Central Venous Catheter-Related Blood Stream Infection Rate. These 6 component indicators have non-zero weights. Two other indicators were originally proposed to be included in the PDI 19 composite: PDI 08 Perioperative Hemorrhage or Hematoma Rate and PDI 09 Postoperative Respiratory Failure Rate. These indicators were given a weight of zero in the NQF-endorsed PDI 19. Consideration could be given to inclusion of these additional indicators for inclusion in the composite in the future.

For more information, see Quality Indicator Empirical Methods, PDI Composite Measure Workgroup Final Report, and AHRQ QI User Guide: PDI Composite available in the supporting documents or online at [www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov)

**1d.3. Describe the rationale for constructing a composite measure, including how the composite provides a distinctive or additive value over the component measures individually.**

The overall area of quality is pediatric patient safety for selected indicators. Component measures include the Pediatric Quality Indicators (PDI) related to in-hospital adverse events. The pediatric patient safety composite measure was developed to summarize pediatric patient safety across multiple indicators to monitor performance over time or across regions and populations using a methodology that can be applied at the national, regional, State and provider level. Practically, a composite was constructed to increase statistical precision due to an increase in the effective sample size and to address the issue of competing priorities where more than one component measure may be important; and to assist consumers in selecting healthcare, providers allocating resources, and payers assessing performance.

**1d.4. Describe how the aggregation and weighting of the component measures are consistent with the stated quality construct and rationale.**

The composite is a weighted average of reliability-adjusted observed to expected ratios, where the component weights are the relative frequency of the numerator in the reference population. The rationale is that numerator weights reflect the probability that an individual patient would experience a particular adverse event.

## 2. Reliability and Validity—Scientific Acceptability of Measure Properties

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. ***Measures must be judged to meet the subcriteria for both reliability and validity to pass this criterion and be evaluated against the remaining criteria.***

**2a.1. Specifications** The measure is well defined and precisely specified so it can be implemented consistently within and across organizations and allows for comparability. eMeasures should be specified in the Health Quality Measures Format (HQMF) and the Quality Data Model (QDM).

**De.5. Subject/Topic Area** (check all the areas that apply):

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

**S.1. Measure-specific Web Page** (Provide a URL link to a web page specific for this measure that contains current detailed specifications including code lists, risk model details, and supplemental materials. Do not enter a URL linking to a home page or to general information.)

indicator information: [http://qualityindicators.ahrq.gov/modules/pdi\\_resources.aspx](http://qualityindicators.ahrq.gov/modules/pdi_resources.aspx); data source: [www.hcup-us.ahrq.gov/sidoverview.jsp](http://www.hcup-us.ahrq.gov/sidoverview.jsp)

**S.2a. If this is an eMeasure**, HQMF specifications must be attached. Attach the zipped output from the eMeasure authoring tool (MAT) - if the MAT was not used, contact staff. (Use the specification fields in this online form for the plain-language description of the specifications)

**Attachment:**

**S.2b. Data Dictionary, Code Table, or Value Sets** (and risk model codes and coefficients when applicable) must be attached. (Excel or csv file in the suggested format preferred - if not, contact staff)

**Attachment Attachment:** [Pediatric\\_Safety\\_for\\_Selected\\_Indicators\\_\\_\\_PDI\\_19.xlsx](#)

**S.3. For endorsement maintenance**, please briefly describe any changes to the measure specifications since last endorsement date and explain the reasons.

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

Since the last update, the following changes have been made to the composite:

- The data upon which to base the reference population was updated. V4.4 uses a 2008 reference population; v4.5 uses a 2010 reference population. The 2010 data includes more complete Present-on-Admission (POA) indicator data (required in FY 2008 with payment penalties beginning in FY 2009) and pressure ulcer staging codes (implemented in FY 2009)
- The specification of PDI 05 (Iatrogenic Pneumothorax Rate) was refined slightly. Denominator exclusion codes for any cardiac procedure were added. This resulted in no change to the number of cases identified using an unweighted convenience sample from the 2010 HCUP SID.
- Fiscal Year coding updates

For additional information, see Pediatric Quality Indicator (PDI) Log of ICD-9-CM and DRG Coding Updates and Revisions to PDI Documentation and Software in the supporting materials and available online at:

[http://www.qualityindicators.ahrq.gov/Downloads/Modules/PDI/V45/PDI\\_Changes\\_4.5.pdf](http://www.qualityindicators.ahrq.gov/Downloads/Modules/PDI/V45/PDI_Changes_4.5.pdf) and in the supporting information

**S.4. Numerator Statement** (Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome)

IF an OUTCOME MEASURE, state the outcome being measured. Calculation of the risk-adjusted outcome should be described in the calculation algorithm.

Not applicable for the composite. The numerator for component indicators is the number of potentially preventable adverse events (i.e., PDI 01 Accidental Puncture or Laceration Rate, PDI 02 Pressure Ulcer Rate, PDI 05 Iatrogenic Pneumothorax Rate, PDI 10 Postoperative Sepsis Rate, PDI 11 Postoperative Wound Dehiscence Rate, and PDI 12 Central Venous Catheter-Related Blood Stream Infection Rate).

**S.5. Time Period for Data** (What is the time period in which data will be aggregated for the measure, e.g., 12 mo, 3 years, look back to August for flu vaccination? Note if there are different time periods for the numerator and denominator.)

The time window can be determined by user, but is generally a calendar year.

**S.6. 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, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)

IF an OUTCOME MEASURE, describe how the observed outcome is identified/counted. Calculation of the risk-adjusted outcome should be described in the calculation algorithm.

See Pediatric Quality Indicators: Technical Specifications for additional details (available at:

[http://www.qualityindicators.ahrq.gov/Modules/PDI\\_TechSpec.aspx](http://www.qualityindicators.ahrq.gov/Modules/PDI_TechSpec.aspx) and in supporting documentation



**S.7. Denominator Statement** *(Brief, narrative description of the target population being measured)*

Not applicable for the composite. The denominator for component indicators is the number of eligible discharges (all indicators limited to the pediatric population)

**S.8. Target Population Category** *(Check all the populations for which the measure is specified and tested if any):*

Children

**S.9. Denominator Details** *(All information required to identify and calculate the target population/denominator such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)*

See Pediatric Quality Indicators: Technical Specifications for additional details (available at:

[http://www.qualityindicators.ahrq.gov/Modules/PDI\\_TechSpec.aspx](http://www.qualityindicators.ahrq.gov/Modules/PDI_TechSpec.aspx) and in supporting documentation

**S.10. Denominator Exclusions** *(Brief narrative description of exclusions from the target population)*

Not applicable for the composite. The denominator for component indicators has exclusion criteria as shown in the technical specifications.

**S.11. Denominator Exclusion Details** *(All information required to identify and calculate exclusions from the denominator such as definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)*

See Pediatric Quality Indicators: Technical Specifications for additional details (available at

[http://www.qualityindicators.ahrq.gov/downloads/pdi/pdi\\_technical\\_specs\\_v32.pdf](http://www.qualityindicators.ahrq.gov/downloads/pdi/pdi_technical_specs_v32.pdf))

**S.12. Stratification Details/Variables** *(All information required to stratify the measure results including the stratification variables, definitions, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format with at S.2b)*

Not applicable

**S.13. Risk Adjustment Type** *(Select type. Provide specifications for risk stratification in S.12 and for statistical model in S.14-15)*

No risk adjustment or risk stratification

If other:

**S.14. Identify the statistical risk model method and variables** *(Name the statistical method - e.g., logistic regression and list all the risk factor variables. Note - risk model development and testing should be addressed with measure testing under Scientific Acceptability)*

Not applicable for the composite. Component measures are risk adjusted.

For more information on risk adjustment models for the component measures, see supporting materials including the Quality Indicator Empirical Methods and Pediatric Quality Indicators Parameter Estimates, Version 4.5. The information is also available on the AHRQ Quality Indicator website at [www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov)

**S.15. Detailed risk model specifications** *(must be in attached data dictionary/code list Excel or csv file. Also indicate if available at measure-specific URL identified in S.1.)*

Note: Risk model details (including coefficients, equations, codes with descriptors, definitions), should be provided on a separate worksheet in the suggested format in the Excel or csv file with data dictionary/code lists at S.2b.

Available in attached Excel or csv file at S.2b

**S.15a. Detailed risk model specifications** *(if not provided in excel or csv file at S.2b)*

Detailed risk adjustment model specification for component indicators are available in Pediatric Patient Safety for Selected Indicators PSI 19.xls

**S.16. Type of score:**

Ratio

If other:

**S.17. Interpretation of Score** *(Classifies interpretation of score according to whether better quality is associated with a higher score,*

a lower score, a score falling within a defined interval, or a passing score)

Better quality = Lower score

**S.18. 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.)

The composite performance score is a weighted average of reliability-adjusted observed to expected ratios

**S.19. Calculation Algorithm/Measure Logic Diagram URL or Attachment** (You also may provide a diagram of the Calculation Algorithm/Measure Logic described above at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1)

No diagram provided

**S.20. Sampling** (If measure is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.)

IF a PRO-PM, identify whether (and how) proxy responses are allowed.

Not applicable.

**S.21. Survey/Patient-reported data** (If measure is based on a survey, provide instructions for conducting the survey and guidance on minimum response rate.)

IF a PRO-PM, specify calculation of response rates to be reported with performance measure results.

Not applicable.

**S.22. Missing data** (specify how missing data are handled, e.g., imputation, delete case.)

Required for Composites and PRO-PMs.

Component measures missing for individual hospitals are set equal to the overall reference population rate (that is a ratio of 1.0 and a posterior variance equal to the signal variance)

**S.23. Data Source** (Check ONLY the sources for which the measure is SPECIFIED AND TESTED).

If other, please describe in S.24.

Claims

**S.24. Data Source or Collection Instrument** (Identify the specific data source/data collection instrument e.g. name of database, clinical registry, collection instrument, etc.)

IF a PRO-PM, identify the specific PROM(s); and standard methods, modes, and languages of administration.

All analyses were completed using data from the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID), 2007-2011. HCUP is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, private data organizations, and the Federal government to create a national information resource of encounter-level health care data. The HCUP SID contain the universe of the inpatient discharge abstracts in participating States, translated into a uniform format to facilitate multi-State comparisons and analyses. Together, the SID encompass about 97 percent of all U.S. community hospital discharges (in 2011, 46 states participated for a total of more than 38.5 million hospital discharges with approximately 5 million pediatric (including births) hospital discharges). As defined by the American Hospital Association, community hospitals are all non-Federal, short-term, general or other specialty hospitals, excluding hospital units of institutions. Veterans hospitals and other Federal facilities are excluded. General and specialty children's hospitals are included in the hospital universe. Taken from the Uniform Bill-04 (UB-04), the SID data elements include ICD-9-CM coded principal and secondary diagnoses and procedures, additional detailed clinical and service information based on revenue codes, admission and discharge status, patient demographics, expected payment source (Medicare, Medicaid, private insurance as well as the uninsured), total charges and length of stay ([www.hcup-us.ahrq.gov](http://www.hcup-us.ahrq.gov))

HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2007-2011. Agency for Healthcare Research and Quality, Rockville, MD. [www.ahrq.gov/sidoverview.jsp](http://www.ahrq.gov/sidoverview.jsp) (AHRQ QI Software Version 4.5, [www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov))

**S.25. Data Source or Collection Instrument** (available at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1)

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



**S.26. Level of Analysis** (Check *ONLY* the levels of analysis for which the measure is SPECIFIED AND TESTED)

Facility

**S.27. Care Setting** (Check *ONLY* the settings for which the measure is SPECIFIED AND TESTED)

Inpatient/Hospital

If other:

**S.28. COMPOSITE Performance Measure** - Additional Specifications (Use this section as needed for aggregation and weighting rules, or calculation of individual performance measures if not individually endorsed.)

The composite performance score is a weighted average of reliability-adjusted observed to expected ratios. The component weights are numerator weights based on the relative frequency of the component measure numerators in the reference population. The reliability weight is an signal-to-noise ratio.

**2a. Reliability** – See attached Measure Testing Submission Form

**2b. Validity** – See attached Measure Testing Submission Form

[PDI\\_19\\_Measure\\_Testing\\_Form-635260879099539770.pdf](#)

### 3. Feasibility

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

#### 3a. Byproduct of Care Processes

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

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

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

If other:

#### 3b. Electronic Sources

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

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

ALL data elements are in defined fields in electronic claims

**3b.2. If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.**

**3b.3. If this is an eMeasure, provide a summary of the feasibility assessment in an attached file or make available at a measure-specific URL.**

Attachment:

#### 3c. Data Collection Strategy

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

**3c.1. 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.**

**IF a PRO-PM, consider implications for both individuals providing PROM data (patients, service recipients, respondents) and those**

whose performance is being measured.

Because the indicator is based on readily available administrative data is not an issue

**3c.2. Describe any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk model, programming code, algorithm).**

No cost to use publicly available software. Public use SAS and Windows software available at [www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov)

## 4. Usability and Use

Extent to which potential audiences (e.g., consumers, purchasers, providers, policy makers) are using or could use performance results for both accountability and performance improvement to achieve the goal of high-quality, efficient healthcare for individuals or populations.

### 4a. Accountability and Transparency

Performance results are used in at least one accountability application within three years after initial endorsement and are publicly reported within six years after initial endorsement (or the data on performance results are available). If not in use at the time of initial endorsement, then a credible plan for implementation within the specified timeframes is provided.

#### 4.1. Current and Planned Use

NQF-endorsed measures are expected to be used in at least one accountability application within 3 years and publicly reported within 6 years of initial endorsement in addition to performance improvement.

Planned	Current Use (for current use provide URL)
	Public Reporting AHRQ Healthcare Cost and Utilization Project (HCUP) <a href="http://www.hcup-us.ahrq.gov/">http://www.hcup-us.ahrq.gov/</a> CPM HealthGrades <a href="https://www.cpmhealthgrades.com/index.cfm/portfolio/research-studies/">https://www.cpmhealthgrades.com/index.cfm/portfolio/research-studies/</a>

#### 4a.1. For each CURRENT use, checked above, provide:

- Name of program and sponsor
- Purpose
- Geographic area and number and percentage of accountable entities and patients included

Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP)

Largest collection of longitudinal hospital care data in the United States, with patient-level data from State data organizations, hospital associations, private data organizations, and the Federal government.

<http://www.hcup-us.ahrq.gov/>

CPM HealthGrades, Pediatric Safety Studies

2010: The First Annual HealthGrades Pediatric Patient Safety in American Hospitals Study

Evaluates hospitals nationally based on clinical outcomes: risk-adjusted mortality and in-hospital complications. Analysis is based on approximately 40 million Medicare discharges for the most recent three-year time period available.

<https://www.cpmhealthgrades.com/index.cfm/portfolio/research-studies/>

[http://hg-article-center.s3-website-us-east-](http://hg-article-center.s3-website-us-east-1.amazonaws.com/9a/4a/6f74da634ab1869d55c074ca9e0d/PediatricPatientSafetyInAmericanHospitalsStudy2010.pdf)

[1.amazonaws.com/9a/4a/6f74da634ab1869d55c074ca9e0d/PediatricPatientSafetyInAmericanHospitalsStudy2010.pdf](http://hg-article-center.s3-website-us-east-1.amazonaws.com/9a/4a/6f74da634ab1869d55c074ca9e0d/PediatricPatientSafetyInAmericanHospitalsStudy2010.pdf)

**4a.2. If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing) what are the reasons? (e.g., Do policies or actions of the developer/steward or accountable entities restrict access to performance results or impede implementation?)**

The events are relatively rare and relevant to a small group of mostly pediatric hospitals.

See: Bardach NS, Chien AT, Dudley RA. Small numbers limit the use of the inpatient pediatric quality indicators for hospital comparison. Acad Pediatr. 2010 Jul-Aug;10(4):266-73. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2897835/>

**4a.3. If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes -- any accountability application within 3 years and publicly reported within 6 years of initial endorsement.** (Credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.)

Use of statistical methods for increasing the effective sample size will improve the usability of the composite for public reporting.

#### 4b. Improvement

Progress toward achieving the goal of high-quality, efficient healthcare for individuals or populations is demonstrated. If not in use for performance improvement at the time of initial endorsement, then a credible rationale describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

##### 4b.1. Progress on Improvement. (Not required for initial endorsement unless available.)

Performance results on this measure (current and over time) should be provided in 1b.2 and 1b.4. Discuss:

- Progress (trends in performance results, number and percentage of people receiving high-quality healthcare)
- Geographic area and number and percentage of accountable entities and patients included

Table 1. Reference Population

Year	# Hospitals	Pop. at Risk	Composite Perf Score
2011	4,594	1,068,839	1.000
2010	4,603	1,082,230	1.000
2009	4,532	1,116,717	1.000
2008	4,496	1,093,153	1.000
2007	4,264	1,025,900	1.000

##### Composite Performance Score Distribution 2011

5th	25th	Median	75th	95th
0.289	0.590	0.898	1.300	2.059

Source: HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2007-2011. Agency for Healthcare Research and Quality, Rockville, MD. [www.hcup-us.ahrq.gov/sidoverview.jsp](http://www.hcup-us.ahrq.gov/sidoverview.jsp). (AHRQ QI Software Version 4.5)

**4b.2. If no improvement was demonstrated, what are the reasons? If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.**

Not applicable.

#### 4c. Unintended Consequences

The benefits of the performance measure in facilitating progress toward achieving high-quality, efficient healthcare for individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists).

**4c.1. Were any unintended negative consequences to individuals or populations identified during testing; OR has evidence of unintended negative consequences to individuals or populations been reported since implementation? If so, identify the negative unintended consequences and describe how benefits outweigh them or actions taken to mitigate them.**

None known.

## 5. Comparison to Related or Competing Measures

If a measure meets the above criteria and there are endorsed or new related measures (either the same measure focus or the same target population) or competing measures (both the same measure focus and the same target population), the measures are compared to address harmonization and/or selection of the best measure.

### 5. Relation to Other NQF-endorsed Measures

Are there related measures (conceptually, either same measure focus or target population) or competing measures (conceptually both the same measure focus and same target population)? If yes, list the NQF # and title of all related and/or competing measures.

<p>No</p> <p><b>5.1a. List of related or competing measures (selected from NQF-endorsed measures)</b></p> <p><b>5.1b. If related or competing measures are not NQF endorsed please indicate measure title and steward.</b></p>
<p><b>5a. Harmonization</b></p> <p>The measure specifications are harmonized with related measures;  <b>OR</b>  The differences in specifications are justified</p> <p><b>5a.1. If this measure conceptually addresses EITHER the same measure focus OR the same target population as NQF-endorsed measure(s):</b>  <b>Are the measure specifications completely harmonized?</b></p> <p><b>5a.2. If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on interpretability and data collection burden.</b>  Not applicable.</p>
<p><b>5b. Competing Measures</b></p> <p>The measure is superior to competing measures (e.g., is a more valid or efficient way to measure);  <b>OR</b>  Multiple measures are justified.</p> <p><b>5b.1. If this measure conceptually addresses both the same measure focus and the same target population as NQF-endorsed measure(s):</b>  <b>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.)</b>  Not applicable.</p>

<p><b>Appendix</b></p> <p><b>A.1 Supplemental materials may be provided in an appendix.</b> All supplemental materials (such as data collection instrument or methodology reports) should be organized in one file with a table of contents or bookmarks. If material pertains to a specific submission form number, that should be indicated. Requested information should be provided in the submission form and required attachments. There is no guarantee that supplemental materials will be reviewed.  <b>Attachment:</b></p>
<p><b>Contact Information</b></p> <p><b>Co.1 Measure Steward (Intellectual Property Owner):</b> <a href="#">Agency for Healthcare Research and Quality</a>  <b>Co.2 Point of Contact:</b> <a href="#">Pamela, Owens, Pam.Owens@ahrq.hhs.gov</a>, 301-427-1412-  <b>Co.3 Measure Developer if different from Measure Steward:</b>  <b>Co.4 Point of Contact:</b></p>
<p><b>Additional Information</b></p> <p><b>Ad.1 Workgroup/Expert Panel involved in measure development</b>  Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.</p> <p><b>Measure Developer/Steward Updates and Ongoing Maintenance</b>  <b>Ad.2 Year the measure was first released:</b> <a href="#">2007</a></p>

<b>Ad.3 Month and Year of most recent revision:</b> 05, 2013 <b>Ad.4 What is your frequency for review/update of this measure?</b> Annually <b>Ad.5 When is the next scheduled review/update for this measure?</b> 12, 2014
<b>Ad.6 Copyright statement:</b> <b>Ad.7 Disclaimers:</b>
<b>Ad.8 Additional Information/Comments:</b>