

## Fact Sheet on Patient Safety Indicators

### What are the Patient Safety Indicators?

The Patient Safety Indicators (PSIs) include 18 provider-level indicators established by the Agency for Healthcare Research and Quality (AHRQ) that screen for adverse events that patients experience as a result of exposure to the health care system. These events may be amenable to prevention by changes at the system or provider level. PSIs are defined on two levels:

- **Provider-level indicators** capture potentially preventable complications for patients who received their initial care and the complication of care within the same hospitalization. Provider-level indicators include only those cases where a secondary diagnosis and/or procedure code flags a potentially preventable complication. These indicators can serve as a screening tool for hospitals to identify areas for further examination and improvement.
- **Area-level indicators** capture all cases of the potentially preventable complication that occur in a given population (e.g., metropolitan area, county, or health plan) either during hospitalization or in a subsequent hospitalization. Area-level indicators are specified to include principal diagnoses as well as secondary diagnoses, which adds cases involving a complication that occurred in a separate hospitalization.

**Patient Safety for Selected Indicators** is a new composite measure that AHRQ established in 2009. The composite is estimated as a weighted average, across 11 PSIs, of the ratio of a hospital's observed rate (OR) to its expected rate (ER), based on a reference population:  $OR/ER$ . The PSI-specific ratios are adjusted for reliability before they are averaged, to minimize the influence of ratios that are high or low at a specific hospital by chance. Users may select from among several weighting options, including National Quality Forum (NQF)-endorsed weights that omit three PSIs that have not been individually endorsed by NQF.

The composite indicator is intended to be used primarily to monitor performance in national and regional reporting, and also for comparative reporting and quality improvement at the provider level. It is not intended to reflect any broader construct of quality, beyond what is reflected in the component indicators themselves.

### A Snapshot of the Indicators

The current provider-level PSIs are listed in Table 1, along with information on their annual rates of incidence and status regarding NQF endorsement. Some of the PSIs also have area-level versions, which are noted in the table.

A detailed Guide to Patient Safety Indicators, software for calculating the measures, and software documentation are available on the AHRQ Quality Indicators Web site: [www.qualityindicators.ahrq.gov/modules/psi\\_resources.aspx](http://www.qualityindicators.ahrq.gov/modules/psi_resources.aspx). The Guide includes a summary assessment for each of the individual indicators.

Each year, AHRQ updates the PSIs to reflect changes made to the International Classification of Diseases, 9<sup>th</sup> Revision, Clinical Modification and diagnosis-related group (DRG) coding specifications, specifications of the indicators themselves, data elements reported in the Uniform

Billing form, and other technical changes. Other revisions also are made to the indicators from time to time, as determined by continued analysis of the indicators and review by expert panels. Changes made each year are reported in an online change log on the AHRQ QI Web pages.

**Table 1. The 2013 Provider-Level Patient Safety Indicators, With 2011 Rates and National Quality Forum Endorsement Status**

Indicator	Area-Level Indicator	Rate per 1,000	NQF Endorsement	
			ID	Year
2 Death in low-mortality DRGs		0.27	0347	2008
3 Pressure ulcer (formerly decubitus ulcer)		N/A		
4 Death among surgical inpatients		125.00	0351	2008
5 Retained Surgical Item or Unretrieved Device Fragment Count (formerly foreign body left during procedure)	X	N/A*	0363	2008
6 Iatrogenic pneumothorax	X	0.48	0346	2008
7 Central venous catheter-related bloodstream infection	X	0.75		
8 Postoperative hip fracture		0.17		
9 Perioperative hemorrhage or hematoma rate (formerly postoperative hemorrhage or hematoma)	X	2.55		
10 Postoperative physiologic and metabolic derangements		1.59		
11 Postoperative respiratory failure		10.74	0533	2009
12 Perioperative pulmonary embolism or deep vein thrombosis (formerly postoperative pulmonary embolism or deep vein thrombosis)		8.14	0450	2008
13 Postoperative sepsis		17.43		
14 Postoperative wound dehiscence	X	1.83		
15 Accidental puncture or laceration	X	2.60	0345	2008
16 Transfusion reaction	X	N/A	0349	2013
17 Birth trauma – injury to neonate		2.19		
18 Obstetric trauma – vaginal with instrument		133.93		
19 Obstetric trauma – vaginal without instrument		21.78		

**Source:** Nationwide Inpatient Sample, 2011; rates per 1,000.

\*Please note that the provider-level PSI 5 is a count (i.e., has no denominator), but the area-level PSI 21 is a rate.

## AHRQ Quality Indicators Software

AHRQ provides free software—in both SAS® and Windows—for organizations to apply the PSIs to their own data to assist quality improvement efforts in acute care hospital settings. Both versions of the software include all the AHRQ QI modules, including the PSIs. Both versions of the software include the PSI composite.

Included in the software are data that allow hospitals to compare their measures to national benchmarks, based on data from the State Inpatient Databases (SID). The most recent release of the software uses the most current data available from the SID for computation of benchmarks, which is a change from previous versions that had used 3-year averages.

Many of the PSIs are calculated using present on admission (POA) codes in the hospital discharge data. In the latest version of the software, the user has the option to choose whether to use actual or predicted data for POA. For users with POA data that choose to use it, PSIs are calculated based on that data element. For users without POA data or those who choose to use predicted data, the model incorporates the likelihood that the numerator event or the comorbidity was present on admission.

Rates for most PSIs can be risk adjusted except for PSI 17 (Birth Trauma - injury to neonate), PSI 18 (OB trauma – vaginal w/instrument) and PSI 19 (OB trauma – vaginal w/o instrument). These three PSIs are not risk-adjusted because materially important risk factors are not available in the State inpatient discharge data. Several other PSIs cannot be risk adjusted because they are very rare and/or treated as sentinel events (PSI 2, PSI 5, PSI 16).