

# AHRQ Patient Safety Indicators: Initial Software Release – Version 2.1

March 13, 2003

## Summary of Changes From Published Reference “Measures of Patient Safety Based on Hospital Administrative Data – The Patient Safety Indicators<sup>1</sup>” to the Software Release

The following changes were implemented in version 2.1 of the Patient Safety Indicator (PSI) software code and reflect changes based on updates to ICD-9-CM codes as well as refinements of the indicator definitions in response to research utilizing the beta version. The ICD-9-CM code updates incorporate changes from Fiscal Year (FY) 2003 (effective 10-1-2002). There were no changes from FY 2002 (effective 10-1-2001) that impacted the PSI definitions. Version 2.1 is the first public release of the PSI software.

Changes listed below summarize differences between the publication of the technical report and the actual codes in the PSI software, version 2.1.

| <i>Indicator Module</i> | <i>Indicator Name (#)</i> | <i>Component</i>                    | <i>Change</i>  |
|-------------------------|---------------------------|-------------------------------------|--|
| PSI                     | Multiple Indicators       | Denominator (exclusion, population) | Removed MDC 15 exclusions for the following indicators because DRGs for most neonates are not included in the population at risk, making the exclusion redundant: Postoperative hemorrhage and hematoma, Postoperative metabolic and physiologic derangement, Accidental puncture and laceration, Postoperative respiratory failure, Postoperative PE and DVT, Postoperative sepsis, Postoperative wound dehiscence. |
| PSI                     | Multiple Indicators       | Immuno-compromised State            | Added code 52.82 “Pancreatic homotransplant” to the definition of Immunocompromised state used as an exclusion in several indicators. Removed all DRGs from definition.  |
| PSI                     | Multiple Indicators       | Medical discharges                  | New DRGs from FY 2002 and 2003 and the DRGs related to burns (inadvertently excluded in the earlier work) of 505, 508-511, and 521-524 were added to the definition of medical discharges for the applicable PSI denominators.   |

<sup>1</sup> McDonald K, Romano P, Geppert J, et al. Measures of Patient Safety Based on Hospital Administrative Data: The Patient Safety Indicators. Technical Review 5 (Prepared by the University of California San Francisco/Stanford Evidence-based Practice Center under Contract No. 290-97-0013). AHRQ Publication No. 02-0038. Rockville, MD: Agency for Healthcare Research and Quality. August 2002. ISBN 1-58763-121-0

| <b>Indicator Module</b> | <b>Indicator Name (#)</b>                          | <b>Component</b>                    | <b>Change</b>  |
|-------------------------|--|-------------------------------------|--|
| PSI                     | Multiple Indicators                                | Surgical discharges                 | New DRGs from FY 2002 and 2003 and the DRGs related to burns (inadvertently excluded in the earlier work) of 504, 506, 507, 512 – 520, and 525-527 were added to the definition of surgical discharges for the applicable PSI denominators.  |
| PSI                     | Multiple Indicators                                | Trauma exclusion                    | <ol style="list-style-type: none"> <li>1. The new codes (FY 2003) 813.45, "Torus fracture of radius," and 823.4x, "Torus fracture," were added to the exclusion definition of trauma for the applicable PSIs.</li> <li>2. Modified to include DRGs for trauma in pediatric patients (DRGs 30, 33) and DRGs for burns (DRGs 456-460, 504-511). In addition, DRGs which do not directly indicate trauma were removed (DRGs 447-455).</li> <li>3. All e-codes were removed from the format definition of trauma.</li> </ol> |
| PSI                     | Accidental Puncture or Laceration (PSIs 15 and 25) | Naming convention                   | The indicator "Technical Difficulty with Procedure" was renamed "Accidental Puncture or Laceration" to clarify the indicator description.  |
| PSI                     | Birth Trauma (PSI 17)                              | Denominator (exclusion, premature)  | A modification was made to the exclusion of premature infants with cerebral hemorrhage based on new codes for gestational age (FY 2003). The new codes 765.21 "<24 completed weeks of gestation" through 765.27 "33-34 completed weeks of gestation" were added to the exclusion for this indicator. These are in addition to the existing exclusion for birth weight under 2500 grams (codes 765.01-765.08, 765.11-765.18).   |
| PSI                     | Death in Low Mortality DRGs (PSI 2)                | Denominator (exclusion, cancer)     | Added code V10.53 "Renal pelvis" to the exclusion definition of cancer.  |
| PSI                     | Death in Low Mortality DRGs (PSI 2)                | Denominator (exclusion, population) | DRGs for neonatal discharges (386-391) were removed from the denominator, since these are by definition zero mortality. As a result, the neonatal subindicator was removed.  |
| PSI                     | Decubitus ulcer (PSI 3)                            | Denominator (exclusion, population) | MDC 14 (obstetrics) was excluded from the population at risk.  |

| <b>Indicator Module</b> | <b>Indicator Name (#)</b> | <b>Component</b>                             | <b>Change</b>   |
|-------------------------|---------------------------|--|---|
| PSI                     | Failure to Rescue (PSI 4) | Denominator (exclusion population)           | <ol style="list-style-type: none"> <li>1. For all subindicators a principal diagnosis exclusion was added for the inclusion population to ensure only patients with only qualifying secondary codes are included (e.g. FTR – pneumonia, exclude principal dx of pneumonia).</li> <li>2. To incorporate recommendations from the clinical review panel, patients age 75 and older were excluded from the population at risk.</li> <li>3. Modified to exclude MDC 15, neonates, from the denominator definition, since complications in this population may be clinically distinct from other populations and are coded in a different manner.</li> </ol> |
| PSI                     | Failure to Rescue (PSI 4) | Denominator (inclusion, acute renal failure) | Codes for complication in obstetric patients were added to the denominator inclusion renal failure definition including “Acute renal failure following labor and delivery” (669.3x) and “Complications following abortion and ectopic and molar pregnancies, renal failure” (639.3).  |
| PSI                     | Failure to Rescue (PSI 4) | Denominator (exclusion, acute renal failure) | <ol style="list-style-type: none"> <li>1. A principal diagnosis exclusion for acute renal failure after abortion was added (codes 634.3x, 635.3x, 636.3x, 637.3x, and 638.3x).</li> <li>2. The codes defining trauma were added to this exclusion.</li> <li>3. The codes for GI hemorrhage were added to this exclusion.</li> <li>4. Definition of shock used as an exclusion with Acute Renal Failure was modified to include additional types of shock (ICD-9-CM codes: 995.0, 995.4, 998.0, 669.1x, 999.4, 785.5, 634.5x, 635.5x, 636.5x, 637.5x, 638.5, 639.5).</li> </ol>  |
| PSI                     | Failure to Rescue (PSI 4) | Denominator (exclusion, DVT/PE)              | The denominator exclusion was expanded by adding the codes 415.11 “Iatrogenic pulmonary embolism and infarction,” 415.19 “Other pulmonary embolism and infarction,” 673.2x, “Obstetrical pulmonary embolism” and codes indicating thromboembolism following abortion (634.6x, 635.6x, 636.6x, 637.6x, 638.6 and 639.6).   |

| <b>Indicator Module</b> | <b>Indicator Name (#)</b> | <b>Component</b>                                     | <b>Change</b>  |
|-------------------------|---------------------------|--|--|
| PSI                     | Failure to Rescue (PSI 4) | Denominator (inclusion, sepsis)                      | The new codes (FY 2003), 995.91 "Systemic inflammatory response syndrome due to infectious process without organ dysfunction" and 995.92 "Systemic inflammatory response syndrome due to infection process with organ dysfunction" were added to the denominator-inclusion definition of sepsis.   |
| PSI                     | Failure to Rescue (PSI 4) | Denominator (exclusion, sepsis)                      | Definition of infection used in the sepsis exclusion criteria was modified to include DRGs for infection in pediatric patients (DRGs 70, 81, 91, 279, 322, 417) and additional DRGs for bacterial infections (DRGs 415 and 423).   |
| PSI                     | Failure to Rescue (PSI 4) | Denominator (inclusion, shock)                       | <ol style="list-style-type: none"> <li>1. The code for complication in obstetric patients was added to the denominator inclusion shock definition "Complications following abortion and ectopic and molar pregnancies, shock "(639.5).</li> <li>2. Also added the codes for "Shock, unspecified, without mention of trauma" (785.50) and "Shock, cardiogenic" (785.51 ).</li> </ol>  |
| PSI                     | Failure to Rescue (PSI 4) | Denominator (exclusion, shock)                       | <ol style="list-style-type: none"> <li>1. A principal diagnosis exclusion for shock after abortion was added (634.5x, 635.5x, 636.5x, 637.5x, 638.5, 639.5).</li> <li>2. Expanded to include the GI hemorrhage codes in the exclusion for Shock.</li> </ol>  |
| PSI                     | Failure to Rescue (PSI 4) | Denominator (inclusion, gastrointestinal hemorrhage) | <ol style="list-style-type: none"> <li>1. The new codes (FY 2003) 537.84 "Dieulafoy lesion (hemorrhagic) of stomach and duodenum" and 569.86 "Dieulafoy lesion (hemorrhagic) of intestine" were added to the denominator-inclusion definition of gastrointestinal hemorrhage.</li> <li>2. In addition to the new codes above, the code 456.20 "Bleeding esophageal varices in diseases classified elsewhere, with bleeding" was added to this denominator-inclusion definition.</li> </ol> |

| <b>Indicator Module</b> | <b>Indicator Name (#)</b>                                    | <b>Component</b>                                     | <b>Change</b>   |
|-------------------------|--|--|---|
| PSI                     | Failure to Rescue (PSI 4)                                    | Denominator (exclusion, gastrointestinal hemorrhage) | This exclusion criteria was modified to exclude a specific diagnosis of alcoholism (see list of codes below) and the exclusion for drug dependency was removed.<br>Alcoholism codes:<br>291.0 - Alcohol withdrawal delirium; 291.1 - Alcohol amnestic syndrome; 291.2 - Other alcoholic dementia; 291.3 - Alcohol withdrawal hallucinosis; 291.4 - Idiosyncratic alcohol intoxication; 291.5 - Alcoholic jealousy; 291.81 - Other specified alcoholic psychoses, alcohol withdrawal; 291.89 - Other specified alcoholic psychoses, other; 291.9 - Unspecified alcoholic psychosis; 303.0x - Acute alcohol intoxication; 303.9x - Other and unspecified alcohol dependence; 305.0x - Nondependent abuse of drugs, alcohol abuse; 425.5 - Alcoholic cardiomyopathy; 571.0 - Alcoholic fatty liver; 571.1 - Acute alcoholic hepatitis; 571.2 - Alcoholic cirrhosis of liver; 571.3 - Alcoholic liver damage, unspecified; 535.3x - Alcoholic gastritis; 980.0 - Toxic effect of alcohol, ethyl alcohol; 980.9 - Toxic effect of alcohol, unspecified alcohol |
| PSI                     | Iatrogenic Pneumothorax (PSI 6)                              | Denominator (exclusion, population)                  | MDC 14 (obstetrics) was excluded from the population at risk.   |
| PSI                     | Iatrogenic Pneumothorax (PSI 6)                              | Denominator (exclusion, thoracic surgery)            | The new code (FY 2002) 81.34 "Refusion of dorsal and dorsolumbar spine, anterior technique" was added to the denominator-exclusion definition of thoracic surgery.  |
| PSI                     | Postoperative hip fracture (PSI 8)                           | Denominator (exclusion, population)                  | MDC 14 (obstetrics) was excluded from the population at risk.   |
| PSI                     | Postoperative hip fracture (PSI 8)                           | Denominator (exclusion, stroke)                      | Based on new coding guidelines (FY 2003), the code 997.02 "Postoperative cerebrovascular accident" was added to the denominator-exclusion definition of stroke.   |
| PSI                     | Postoperative Physiologic and Metabolic Derangement (PSI 10) | Denominator (exclusion, gastrointestinal hemorrhage) | The new codes (FY 2003) 537.84 "Dieulafoy lesion (hemorrhagic) of stomach and duodenum" and 569.86, "Dieulafoy lesion (hemorrhagic) of intestine" were added to the denominator-exclusion definition of gastrointestinal hemorrhage.  |
| PSI                     | Postoperative Physiologic and Metabolic Derangement (PSI 10) | Denominator (exclusion, shock)                       | Definition of shock was modified to include additional types of shock (ICD-9-CM codes: 995.0, 995.4, 998.0, 669.1x, 999.4, 785.5, 634.5x, 635.5x, 636.5x, 637.5x, 638.5, 639.5).  |
| PSI                     | Postoperative Sepsis (PSI 13)                                | Denominator (exclusion, infection)                   | Definition of infection was modified to include DRGs for infection in pediatric patients (DRGs 70, 81, 91, 279, 322, 417) and additional DRGs for bacterial infections (DRGs 415 and 423).  |

| <b>Indicator Module</b> | <b>Indicator Name (#)</b>                               | <b>Component</b>                               | <b>Change</b>   |
|-------------------------|---|--|---|
| PSI                     | Postoperative Sepsis (PSI 13)                           | Numerator (sepsis)                             | The new codes (FY 2003) 995.91 "Systemic inflammatory response syndrome due to infectious process without organ dysfunction" and 995.92 "Systemic inflammatory response syndrome due to infection process with organ dysfunction" were added to the numerator definition of sepsis.   |
| PSI                     | Selected Infections Due to Medical Care (PSIs 7 and 23) | Naming convention                              | The indicator "Infection Due to Medical Care" was renamed "Selected Infections Due to Medical Care" to clarify the indicator description.   |
| PSI                     | Multiple Indicators (Risk adjustment)                   | Comorbidity Index, Congestive Heart Failure    | The new codes (FY 2003), 428.20-3, "Systolic heart failure," 428.30-3, "Diastolic heart failure," and 428.40-3, "Combined systolic and diastolic heart failure" were added to the comorbidity index definition of congestive heart failure.   |
| PSI                     | Multiple Indicators (Risk adjustment)                   | Comorbidity Index, Peripheral Vascular Disease | <ol style="list-style-type: none"> <li>1. The new codes (FY 2003), 445.01 and 445.02 "atheroembolism involving the extremities," 445.81, "atheroembolism of the renal artery," and 445.89 "atheroembolism of other sites" were added to the comorbidity definition of peripheral vascular disease.</li> <li>2. DRGs 108, 100, 111, 478 and 479 were excluded from this comorbidity definition, in order to remove all of the cases that were admitted with a cardiac principal diagnosis and underwent arterial surgery..</li> <li>3. Codes describing arterial dissection (441.00-3) were removed from this comorbidity definition, since these codes often do not reflect a chronic disease.</li> </ol> |
| PSI                     | Multiple Indicators (Risk adjustment)                   | Risk-Adjustment, DRGs                          | <p>Modified to incorporate new DRGs from FY 2003:</p> <ol style="list-style-type: none"> <li>1. DRGs 512-518, 524-527 were individually added to the DRG risk adjustment model.</li> <li>2. DRGs 519 and 520 were aggregated and added to the DRG risk adjustment model.</li> <li>3. DRGs 521, 522, and 523 were aggregated and added to the DRG risk adjustment model.</li> </ol>  |
| PSI                     | Multiple Indicators (Risk adjustment)                   | Risk-Adjustment, DRGs                          | Identified five DRGs that were no longer valid as of 10/1/01 (112, 434-437) however they were retained for backward compatibility.  |
| PSI                     | Software reference files                                | Parameter files                                | All parameter files were renamed to reflect the module to which they belong.  |