

CMS Patient Safety Indicators PSI 90 National Quality Strategy Domain: Patient Safety

BPCI Advanced and Quality

The Center for Medicare and Medicaid Innovation's (Innovation Center) BPCI Advanced Model rewards healthcare providers for delivering services more efficiently, supports enhanced care coordination, and recognizes high quality care. Hospitals and physicians should work collaboratively to achieve these goals, which have potential to improve the BPCI Advanced Beneficiary experience and align to the CMS Quality Strategy goals of promoting effective communication and care coordination, highlighting best practices, and making care safer and more affordable. A goal of the BPCI Advanced Model is to promote seamless, patient-centered care throughout each Clinical Episode, regardless of who is responsible for a specific element of that care.

Background on AHRQ Patient Safety Indicators-90

Following the seminal *To Err is Human* report from the Institute of Medicine, the Agency for Healthcare Research and Quality (AHRQ) developed measures that health providers can use to identify potential in-hospital patient safety problems for targeted institution-level quality improvement efforts. These Patient Safety Indicators (PSIs) are comprised of 26 measures (including 18 provider-level indicators) that highlight safety-related adverse events occurring in hospitals following operations, procedures, and childbirth. The PSIs were developed after a comprehensive literature review, analysis of available ICD codes, review by clinical panels, implementation of risk adjustment, and empirical analyses.

Innovation Center Rationale for Including the CMS Patient Safety Indicators Measure in BPCI Advanced

The CMS Patient Safety and Adverse Events Composite (CMS PSI 90) is a subset of the AHRQ Patient Safety Indicators that are more relevant for the Medicare population utilizing ICD-10 data. The CMS PSI 90 (modified version 6.0.1 of PSI 90) measure summarizes patient safety across multiple indicators, monitors performance over time, and facilitates comparative reporting and quality improvement at the hospital level. The CMS PSI 90 composite measure (updated 8/23/2018) is intended to reflect the safety climate of a hospital by providing a marker of patient safety during the delivery of care. It may assist patients in selecting care options, providers in allocating resources, and payers in evaluating performance. The CMS PSI 90 measure was utilized in multiple Federal programs including CMS' Hospital Inpatient Quality Reporting (IQR) Program, Value-Based Purchasing Program (VBP), and Hospital-Acquired Condition (HAC) Reduction Program.

Clinical Episode Categories

The CMS PSI 90 measure applies to all Clinical Episode categories included in the BPCI Advanced Model.

Measure Specifications

The CMS PSI 90 composite measure is calculated at the hospital level and is a weighted average based on each of the following indicators:

- PSI 03 Pressure Ulcer Rate
- PSI 06 Iatrogenic Pneumothorax Rate
- PSI 08 In-Hospital Fall with Hip Fracture Rate
- PSI 09 Perioperative Hemorrhage or Hematoma Rate
- PSI 10 Post-Operative Acute Kidney Injury Requiring Dialysis Rate
- PSI 11 Postoperative Respiratory Failure Rate
- PSI 12 Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate
- PSI 13 Postoperative Sepsis Rate
- PSI 14 Postoperative Wound Dehiscence Rate
- PSI 15 Unrecognized Accidental Puncture or Laceration Rate

Acute Care Hospital (ACH) performance for the measure will be calculated at the hospital level for all Medicare beneficiaries included in the denominators below. For Physician Group Practices (PGPs), the composite measure will be calculated as specified, then weighted based on PGP Clinical Episode volume for each BPCI Advanced ACH where an episode is triggered.

Denominator and Numerator

High level descriptions of the numerator and denominator for each component of the CMS PSI 90 are provided in the table below. More detailed measure specifications, as well as inclusion and/or exclusion criteria, can be found through the links provided in the “Other Resources” table, including the “CMS Measures Inventory Tool: PSI 90” and the ten PSI measure ICD-10-CM/PCS specification overviews.

Measure	Numerator	Denominator
PSI 03: Pressure Ulcer Rate	Qualifying discharges with any secondary ICD-10-CM diagnosis codes for pressure ulcer stage III or IV (or unstageable).	Surgical or medical discharges for Medicare FFS beneficiaries ages 18 years and older.
PSI 06: Iatrogenic Pneumothorax Rate	Qualifying discharges with any secondary ICD-10-CM diagnosis codes for iatrogenic pneumothorax.	Surgical or medical discharges for Medicare FFS beneficiaries ages 18 years and older.
PSI 08: In-Hospital Fall with Hip Fracture Rate	Qualifying discharges with any secondary ICD-10-CM diagnosis codes for hip fracture.	Surgical or medical discharges for Medicare FFS beneficiaries ages 18 years and older.

Measure	Numerator	Denominator
PSI 09: Perioperative Hemorrhage and Hematoma Rate	Qualifying discharges with any secondary ICD-10-CM diagnosis codes for perioperative hemorrhage or hematoma AND any-listed ICD-10-PCS procedure codes for treatment of hemorrhage or Hematoma.	Surgical discharges for Medicare FFS beneficiaries ages 18 years and older.
PSI 10: Postoperative Acute Kidney Injury Rate	Qualifying discharges with any secondary ICD-10-CM diagnosis codes for acute kidney failure AND any listed ICD-10-PCS procedure codes for dialysis.	Elective surgical discharges for Medicare FFS beneficiaries ages 18 years and older.
PSI 11: Postoperative Respiratory Failure Rate	Qualifying discharges with either: <ul style="list-style-type: none"> • Any secondary ICD-10-CM diagnosis code for acute respiratory failure; • Any secondary ICD-10-PCS procedure codes for a mechanical ventilation for 96 consecutive hours or more that occurs zero or more days after the first major operating room procedure code; • Any secondary ICD-10-PCS procedure codes for a mechanical ventilation for less than 96 consecutive hours (or undetermined) that occurs two or more days after the first major operating room procedure code; or • Any secondary ICD-10-PCS procedure codes for a reintubation that occurs one or more days after the first major operating room procedure code. 	Elective surgical discharges for Medicare FFS beneficiaries ages 18 years and older.
PSI 12: Perioperative Pulmonary Embolism and Deep Vein Thrombosis Rate	Qualifying discharges with a secondary ICD-10-CM diagnosis code for proximal deep vein thrombosis OR a secondary ICD-10-CM diagnosis code for pulmonary embolism.	Surgical discharges for Medicare FFS beneficiaries ages 18 years and older.
PSI 13: Postoperative Sepsis Rate	Qualifying discharges with any secondary ICD-10-CM diagnosis codes for sepsis.	Elective surgical discharges for Medicare FFS beneficiaries ages 18 years and older.
PSI 14: Postoperative Wound Dehiscence Rate	Qualifying discharges with any listed ICD-10-PCS procedure code for repair of abdominal wall AND with any listed ICD-10-CM diagnosis code for disruption of internal surgical wound.	Discharges for Medicare FFS beneficiaries ages 18 years and older with any-listed ICD-10-PCS procedure codes for abdominopelvic surgery, open approach OR any-listed ICD-10-PCS procedure codes for abdominopelvic surgery, other than open approach.

Measure	Numerator	Denominator
PSI 15: Unrecognized Abdominopelvic Accidental Puncture/Laceration Rate	Qualifying discharges with any secondary ICD-10-CM diagnosis code for accidental puncture or laceration during a procedure AND a second abdominopelvic procedure =>1 day after an index abdominopelvic procedure.	Surgical or medical discharges for Medicare FFS beneficiaries/patients ages 18 years and older with any ICD-10-PCS procedure code for an abdominopelvic procedure.

Measure Submission and Calculation

This measure is already collected by CMS under the Hospital IQR Program using Medicare Claims data and calculated using a performance period of three years. The BPCI Advanced Model uses two calendar years of data, from January 1st through December 31st, for measure calculation. This two year time period better aligns with the BPCI Advanced Model. This means that the BPCI Advanced measure results may differ from those that providers receive under the Hospital IQR Program and as posted on Hospital Compare.

Revisions from the Published Specifications

The BPCI Advanced version of this measure follows two calendar years rather than a three year period.

Composite Quality Score

The CMS PSI 90 measure is one component of the BPCI Advanced Composite Quality Score (CQS) calculation. The CQS is used to adjust a portion of any Positive Total Reconciliation Amount and any Negative Total Reconciliation Amount for Model Participants. The CQS adjustment will not adjust the Positive Total Reconciliation Amount down, nor will it adjust the Negative Total Reconciliation Amount up by more than 10 percent. More information is available below.

Other Resources

Organization/Resource	Website Address
Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicators Overview	https://www.qualityindicators.ahrq.gov/Modules/psi_resources.aspx;
AHRQ PSI 90 Fact Sheet	https://www.qualityindicators.ahrq.gov/News/PSI90_Factsheet_FAQ_v1.pdf
BPCI Advanced website	https://innovation.cms.gov/initiatives/bpci-advanced
CMS Measures Inventory Tool: PSI 90 (August 2018)	https://cmit.cms.gov/CMIT_public/ListMeasures?struts.token.name=token&token=IGEF13TEK7QGBQUOLWH26NA2S8PP41M3&filters=&view=&makeStick=&wasSearchSubmitted=true&q=psi+90

Organization/Resource	Website Address
CMS Hospitals Inpatient Prospective Payment (IPPS) Final Rule (August 17, 2018)	https://www.federalregister.gov/documents/2018/08/17/2018-16766/medicare-program-hospital-inpatient-prospective-payment-systems-for-acute-care-hospitals-and-the
Institute of Medicine: To Err is Human	https://www.ncbi.nlm.nih.gov/pubmed/25077248
PSI 03: Pressure Ulcer Rate	https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2018/TechSpecs/PSI_03_Pressure_Ulcer_Rate.pdf
PSI 06: Iatrogenic Pneumothorax Rate	https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2018/TechSpecs/PSI_06_Iatrogenic_Pneumothorax_Rate.pdf
PSI 08: In-Hospital Fall with Hip Fracture Rate	https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2018/TechSpecs/PSI_08_In_Hospital_Fall_with_Hip_Fracture_Rate.pdf
PSI 09: Perioperative Hemorrhage and Hematoma Rate	https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2018/TechSpecs/PSI_09_Periooperative_Hemorrhage_or_Hematoma_Rate.pdf
PSI 10: Postoperative Acute Kidney Injury Rate	https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2018/TechSpecs/PSI_10_Postoperative_Acute_Kidney_Injury_Requiring_Dialysis.pdf
PSI 11: Postoperative Respiratory Failure Rate	https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2018/TechSpecs/PSI_11_Postoperative_Respiratory_Failure_Rate.pdf
PSI 12: Perioperative Pulmonary Embolism and Deep Vein Thrombosis Rate	https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2018/TechSpecs/PSI_12_Periooperative_Pulmonary_EMBOLISM_or_Deep_Vein_Thrombosis_Rate.pdf
PSI 13: Postoperative Sepsis Rate	https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2018/TechSpecs/PSI_13_Postoperative_Sepsis_Rate.pdf
PSI 14: Postoperative Wound Dehiscence Rate	https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2018/TechSpecs/PSI_14_Postoperative_Wound_DeHiscence_Rate.pdf
PSI 15: Unrecognized Abdominopelvic Accidental Puncture/Laceration Rate	https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2018/TechSpecs/PSI_15_Accidental_Puncture_or_Laceration_Rate.pdf