AHRQ Quality Indicators Case Study: Johns Hopkins Health System

Key Findings

- The Johns Hopkins Hospital worked diligently to improve its performance for Postoperative Respiratory Failure (PSI 11). The effort started back in 2012 when only 30 percent were able to be removed from a ventilator within the desired timeframe. Today, nearly 60 percent of cardiac patients are taken off a ventilator in less than six hours following surgery.
- With the development of a mandatory, service-specific decision support tool combined with innovative patient and nurse education efforts, The Johns Hopkins Hospital significantly reduced the incidence of Perioperative Pulmonary Embolism (PSI 12) over the past five years.
- By implementing clinical improvements and coding changes, The Johns Hopkins Hospital also achieved a dramatic decline in the rate of Perioperative Hemorrhage or Hematoma (PSI 09).

Johns Hopkins Health System: At a Glance

- The Johns Hopkins Health System comprises six inpatient facilities with over 2600 beds, including its flagship Johns Hopkins Hospital, with 1,059 beds.
- The Johns Hopkins Health System employs nearly 28,000 staff across its facilities and locations.
- Johns Hopkins Medicine had operating revenues of $8 billion in FY 2018.

The Johns Hopkins Health System adopted the AHRQ Patient Safety Indicators (PSIs) to bolster the health system's clinical quality processes to improve patient care. "There is a strong focus from Johns Hopkins' top leadership to ensure that Johns Hopkins Health System provides the highest quality and safest care to all patients. As a result, we have a strong clinical improvement focus across the system," said Renee Demski, Vice President, Quality Improvement, Johns Hopkins Health System. "The AHRQ PSIs have been critical in achieving that objective," Demski said. While this case study focuses on Johns Hopkins Health System's use of the AHRQ Patient Safety Indicators, the health system uses other Quality Indicators as well, for example AHRQ's Prevention Quality Indicators.

Communicating PSI Results Leads to Alignment with Quality Goals

As part of its annual strategic plan, the Johns Hopkins Health System has incorporated goals related to quality improvement using the AHRQ PSIs. "Our overarching goals are to eliminate harm, improve patient outcomes and experience, and reduce cost in healthcare delivery," Demski stated. This effort involves implementing the PSIs alongside other quality measures to achieve system-wide improvement goals. "The PSIs are one group of measures we use to align our system-wide quality improvement goals and communicate our resolve for accountability to executive leadership and the Board," said Demski.

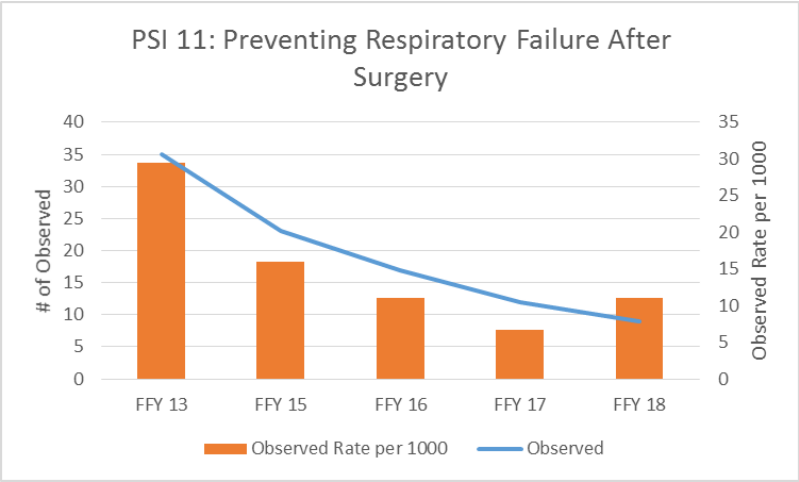
In addition, the quality improvement staff report provider-level PSI results to individual providers on a monthly basis. "We want our providers to see their trend data, and to provide them with data illustrating the root cause for any quality issue, even if that cause is due to documentation issues," said Carol Ware, Quality Improvement / Systems Engineering Harm Reduction Outcomes Manager.

Without accurate coding and documentation, it would be difficult to identify true opportunities for quality improvement, Demski explained. As a first step toward its improvement goals, the Quality Improvement Department did a retrospective review of administrative data to assess the accuracy of coding and documentation. After addressing issues found through this investigation, the Department identified an opportunity to improve performance on the Postoperative Respiratory Failure (PSI 11), Perioperative Pulmonary Embolism or Deep Vein Thrombosis (PSI 12), and Perioperative Hemorrhage or Hematoma (PSI 09) indicators within the 1,059-bed Johns Hopkins Hospital. This case study focuses on the work of Johns Hopkins Hospital to improve its performance for these three PSIs.

A Concerted Effort to Reduce Postoperative Respiratory Failure (PSI 11)

Starting in 2012, Johns Hopkins Hospital examined data related to its rate of postoperative respiratory failure. "Our goal was to drill down on the data – we wanted to know where quality issues were occurring, to whom and how – and then determine the root cause," said Demski. This investigation found that avoidable respiratory incidents were occurring more frequently than expected for cardiac surgery patients, and more specifically for patients undergoing isolated coronary artery bypass grafting (CABG). After collecting and examining data, the team found that the primary issue affecting ventilator time was fluid volume control – by controlling fluid better, the team was able to take patients off ventilators sooner. "You have to have a clearly defined population in order to achieve measurable improvements in the quality of care," Demski noted.

Specifically, quality improvement staff identified an opportunity to reduce post-operative ventilation time to less than the 96 consecutive hours stipulated by PSI 11. The cardiac surgery ICU staff responded by establishing a goal to reduce patients' postoperative ventilation time to less than six hours. The hospital introduced a number of interventions to achieve this goal. As a result, between 2012 and 2014, the percent of postoperative isolated coronary artery bypass surgery patients taken off ventilators within six hours of surgery jumped from 30 to 50 percent. By early 2016, nearly 60 percent of postoperative CABG patients were on a ventilator for less than six hours after surgery. In 2019 (year to date), 70% of CABG patients are on a ventilator less than 6 hours after surgery.

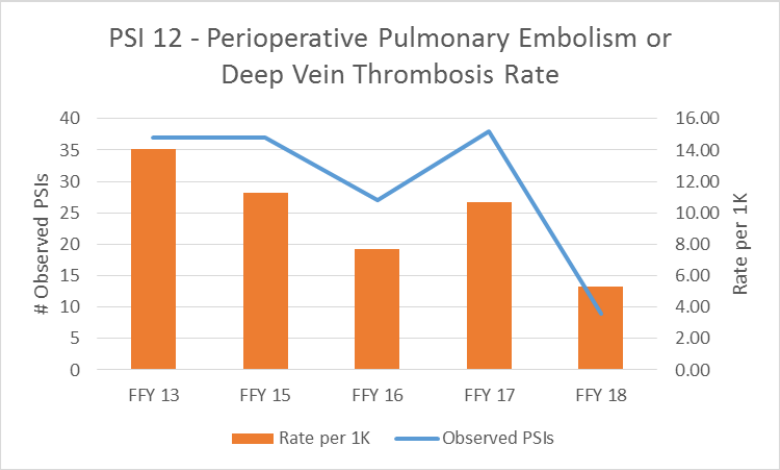


"The entire team – anesthesia, pharmacists, physicians – all participated in reviewing the intubation/extubation process, asking themselves 'what processes could we put in place to ensure patients are removed from the ventilator within six hours?'" said Ware. She noted that the team wanted to make sure they did not extubate patients too early, but found the re-intubation rate remained unchanged despite reductions in the average ventilation time. Because of this work, the

Anesthesia Department started a Respiratory Failure Task Force, with a goal to achieve similar successes for other types of respiratory failure across the hospital, including for non-cardiac patients.

VTE Collaborative Drives Down Rate of Perioperative Pulmonary Embolism (PSI 12)

Johns Hopkins Health System launched the Venous Thromboembolism (VTE) Collaborative in 2006 with the goal of preventing hospital-acquired VTE. The Collaborative – made up of a large, multidisciplinary, multispecialty team – focuses on the identification of risk factors for VTE and ensuring that patients receive the appropriate prophylaxis. The Collaborative identified service-specific champions, and investigated strategies to improve VTE prophylaxis administration. The Collaborative used VTE outcomes data to identify opportunities for improvement and to validate the efficacy of those efforts.



The initial work of the Collaborative led to the development of a mandatory service-specific VTE order set and a Pulmonary Embolism / Deep Vein Thrombosis (PE/DVT) decision support tool embedded in the EMR. The tool requires patient risk stratification and generates an algorithm for administration of prophylaxis. Current improvement efforts include compliance with ordering and administration of appropriate prophylaxis. The Collaborative is working to optimize the PE/DVT decision support tool, which assists providers in placing the correct orders for prophylactic medications. The Collaborative also implemented nurse education to improve prophylactic administration rates.

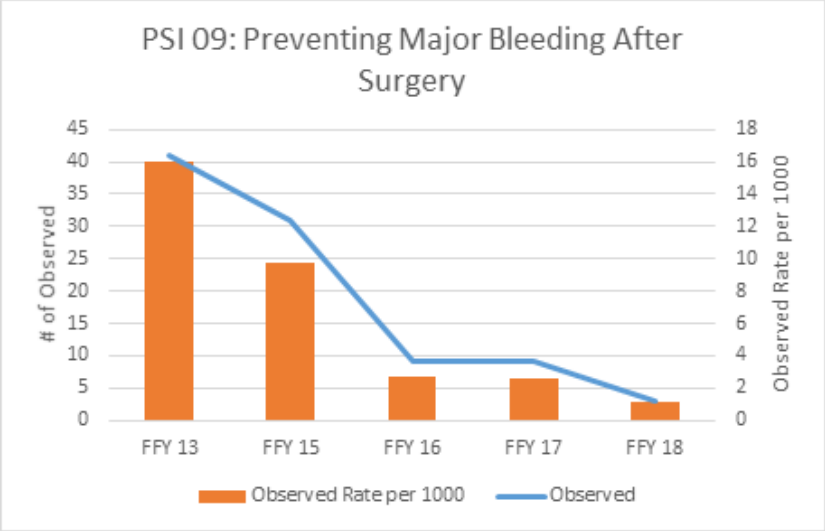
In an initiative funded by the Patient-Centered Outcomes Research Institute and in collaboration with the Johns Hopkins Armstrong Institute for Patient Safety and Quality, the Collaborative engaged former patients in developing educational materials, including both a patient video and training for nurses on how to discuss blood clot risks and prevention with patients. The Collaborative found that missed doses declined by 50 percent as a result of these education initiatives.

Identification of Quality of Care Opportunities and Coding Improvements Leads to Decline in Perioperative Hemorrhage or Hematoma (PSI 09)

Johns Hopkins Hospital began efforts to improve the rate of Perioperative Hemorrhage or Hematoma (PSI 09) in 2014. The Quality Department first conducted an intensive review of cases of perioperative hemorrhage or hematoma in order to identify quality of care issues. They identified several clinical focus areas that merited further examination and possible adjustment in protocols, including:

- Participation and/or oversight of the attending physician during the opening and closing process in the operating room.

- Participation and/or oversight of the attending physician during vascular access, done via surgical cutdown and percutaneous approaches.
- Anticoagulation practices for specific patient populations with certain comorbidities during the pre-, peri- and post-operative periods.
- Procedures used before, during and after organ transplants.
- Procedures used during Valve Replacement, done via surgical and percutaneous approaches.



The Quality Department's review also uncovered opportunities to improve documentation, including: 1) education for providers regarding accurate Estimated Blood Loss (EBL) values; 2) preventing duplicative EBL values from being entered into the medical record by a different team; and 3) coding guidelines to appropriately assign complication flags.

Together, the Quality Department, Health Information Management Department and clinical teams successfully improved both the clinical and documentation opportunities uncovered by the rigorous review conducted by the Quality Department. During this time the Johns Hopkins Hospital also implemented Enhanced Recovery After Surgery (ERAS) protocols. These protocols – designed to maintain preoperative organ function and reduce the profound stress response following surgery – contributed to reducing the PSI 09 rate.

Interview Participants

Johns Hopkins: Renee Demski, Vice President for Quality for Johns Hopkins Health System and the Armstrong Institute, and Carol Ware, Quality Improvement / Systems Engineering Harm Reduction Outcomes Manage; StollenWerks, LLC.: Diane Stollenwerk, Margaret Trinity

About the AHRQ Quality Indicators (QIs)

The AHRQ QIs include four sets of measures—Prevention Quality Indicators (PQIs), Inpatient Quality Indicators (IQIs), Patient Safety Indicators (PSIs), and Pediatric Quality Indicators (PDIs)—which address quality of care for patients hospitalized for a broad range of procedures or conditions that are high risk, problem prone, and/or high volume. The AHRQ QIs represent a national standard and are publicly available at no cost to the user. Many of the indicators are endorsed by the National Quality Forum (NQF), suggesting that stakeholders across the healthcare enterprise view the measures as "best in class." They can be used to support quality improvement efforts, public reporting, and accountability programs, and ultimately to help provide safe, effective care to patients. Many of the AHRQ QIs are used by the Centers for Medicare and Medicaid Services (CMS) and other payers for quality monitoring, pay-for-performance, and value-based purchasing initiatives. Hospitals and health systems can use AHRQ QIs as part of an overall performance initiative to improve the quality of care. For more information about the AHRQ QIs visit http://www.qualityindicators.ahrq.gov/.