

# AHRQ Quality Indicators™ Case Study: Yale New Haven Health System

## Key Findings

- ▲ Yale New Haven Health System (YNHHS) uses the AHRQ Patient Safety Indicators (PSIs) as a key component in its “Quality Variation Indicators,” or QVIs, which were developed by YNHHS to identify cases in which patients experience a potentially preventable variation in quality and to assess the implications for quality patient care and cost.
- ▲ Under this QVI methodology, YNHHS determined that about 7 percent of its patients experienced a variation in quality that could potentially have been prevented to some degree; the care for these patients accounted for 28 percent of YNHHS’ direct costs.
- ▲ YNHHS also implemented a common electronic medical record (EMR) system anchored to an advanced cost accounting system, and with the QVI methodology provided actionable data for clinicians and the multiyear clinical redesign effort, assisting YNHHS to improve the quality of care for patients while reducing the associated cost. While patient care improved, YNHHS’ expense per equivalent discharge dropped by 4.61 percent between 2012 and 2014.

## YNHHS Uses AHRQ’s Patient Safety Indicators (PSIs) as Critical Tool in Identifying Quality Variations

As Yale New Haven Health System (YNHHS) planned for continued reductions in revenue per unit of service, in early 2012, it implemented a number of key multiyear strategic initiatives aimed at improving overall value, including the installation of a common EMR. The multiyear clinical

redesign work, which was anchored to an advanced cost accounting system, included the “language” to identify quality variations in a manner that is meaningful and actionable to physicians and nurses. Stephen Allegretto, YNHHS’ Vice President of Strategic Analytics and Financial Planning, partnered with key physician and nursing leadership in the development of a set of tailored indicators that identify variations in the quality of care provided at YNHHS, to target areas for potential improvement. These “Quality Variation Indicators” are an amalgam of

### YNHHS: At a Glance

- ▲ With more than 20,000 employees and a medical staff of 6,491, YNHHS had more than 109,000 discharges in 2014, generating about \$3.3 billion in revenue.
- ▲ YNHHS’ flagship facility is the Yale-New Haven Hospital (YNHH), a nonprofit, 1,541-bed tertiary medical center.
- ▲ YNHHS also includes Bridgeport Hospital, Greenwich Hospital, and Northeast Medical Group.



AHRQ Patient Safety Indicators (PSIs), hospital-acquired infections (HAI) indicators, as well as other types of measures based on certain diagnosis-related groups (DRGs) and ICD-9 codes.

***“To understand cost variation, you first need a definition of quality, and we anchored that definition to the AHRQ Patient Safety Indicators.”***

***—Stephen Allegretto, Vice President of Strategic Analytics and Financial Planning***

“Patients who experience a variation in quality stay on average three times longer and their care costs about four times as much,” Allegretto noted, hence the importance in identifying and understanding the drivers of these quality and cost variations. For example, one of YNHHS’ hospitals identified a need to reduce ventilator-associated pneumonia (VAP) in the surgical intensive care unit. Identifying this as a QVI and taking steps to address the clinical treatment variation responsible for avoidable cases of VAP allowed the hospital to reduce the rate of VAP cases from 9.8 to 1.2 over a 1-year period. This resulted in a savings of approximately \$200,000 in labor and \$500,000 in non-labor costs during that year. Performance has been replicated in all critical care units and sustained since 2012; annual costs associated with VAP cases have dropped from \$1,350,000 in 2012 to \$75,000 in August 2015 (year-to-date fiscal year). Medical literature<sup>1</sup> estimated in 2013 that the incremental hospital cost for cases with VAP were more than \$40,000 per case, which means the hospital cumulatively spent more than \$1.5 million less by reducing VAP cases in all critical care units.

The QVI methodology identifies patients who experience a quality event that is potentially avoidable (i.e., was not present on admission), Allegretto explained. Out of approximately 80,000 discharges at YNHHS in 2014, the care provided to 7 percent of YNHHS’s patients involved a potentially preventable variation in quality, according to Allegretto, accounting for 28 percent of costs. These 7 percent of patients include three significant AHRQ PSIs: PSI 06 (Iatrogenic Pneumothorax Rate), PSI 12 (Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate), and PSI 15 (Accidental Puncture or Laceration Rate). In analyzing the coded data associated with these three PSIs, YNHHS clinicians concluded that there was a high degree of clinical concordance between data coded in the patients’ medical records and in the YNHHS clinical registries for these conditions. The clinical analysis of the QVI data supported both the process of care and outcomes variation as reporting in the clinical registry data. Corrective actions included clinical practice changes to reduce variability in the quality of care experienced by patients as well as eliminating coding discrepancies.

YNHHS’s key goal in implementing the PSIs, as part of the QVI methodology, is to both reduce Medicare’s financial revenue penalties and achieve standardization in clinical practice so that patients consistently receive better care at lower cost. For example, Allegretto noted that there continues to be some clinical debate regarding the appropriate clinical protocol for application of

deep venous thrombosis prophylaxis associated with hip or knee replacement; as medical literature has demonstrated, standardization in preventive treatment of deep vein thrombosis is worthwhile to consistently minimize potentially avoidable clinical outcomes.

***“The AHRQ QIs allowed the link between clinical and financial variation, and the identification of those things that are important to patients. Without that foundation we would not have been able to get to where we are. In both finance, clinical and quality, it allows us to have a common language.”***

***—Stephen Allegretto, Vice President of Strategic Analytics and Financial Planning***

In addition to using the AHRQ QIs when developing a list of QVIs, YNHHS examined registry and financial data. The use of registry data was particularly important in gaining physician acceptance of the QVIs, based on physicians’ trust of the specialty and subspecialty societies that govern these registries.

## **Building Trust and Identifying Opportunities To Avoid Variation in Quality Outcomes**

A key component of actionable data is achieving buy-in from physicians and involving executive leadership. Allegretto described a three-step process that YNHHS uses to identify opportunities for “potential QVI avoidance” in clinical populations. First, quality and clinical leaders are provided the QVI-specific sample patient lists to validate against clinical registry data. These lists are generated as required for review by clinicians. Next, the clinicians review patient records for consistency between QVIs and the registry as well as provider attribution. Finally, clinicians identify the specific patients for whom variations in quality of care are potentially avoidable.

## **Achieving Better Patient Care at a Lower Cost Per Case**

YNHHS’ foresight to prepare for the continued erosion of their revenue per unit of service by implementing a common EMR system anchored to an advanced cost accounting system with a standardized QVI methodology—involving the AHRQ QIs and the associated clinical redesign effort—has assisted in driving reductions in the cost per case. In the 3-year period from 2012 to 2014, while most hospitals experienced rising costs, the expense to YNHHS per equivalent discharge was actually reduced by 4.6 percent, moving from \$16,390 down to \$15,635. In the same time period, similar to many hospitals, Yale has also seen a reduction in revenue per equivalent discharge. Given the movement toward bundled payments and value-based care, using a quality-first approach to effectively managing to a shrinking dollar per unit of service while providing better care for their patients will allow YNHHS the continued opportunity to succeed in the future.

## References

1. Zimlichman E, Henderson D, Tamir O, et al. Health care-associated infections: A meta-analysis of costs and financial impact on the US health care system, *JAMA Intern Medicine*. 2013;173(22):2039-46.

### *Interview Participants*

YNHHS: Steve Allegretto and Elaine Forte; SWI: Diane Stollenwerk and Margaret Trinity; Pantheon: Rob Timmons

### **About the AHRQ Quality Indicators (QIs)**

The AHRQ QIs include four sets of measures—Patient Safety Indicators, Inpatient Quality Indicators, Prevention Quality Indicators, and Pediatric Quality Indicators—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), which is considered the gold standard for health care measurement in the United States. 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/>.

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