HIMSS Analytics

HIMSS Analytics Stage 7 Case Study

Yale-New Haven Hospital

Profile

Yale-New Haven Hospital is a 1,541-bed private, nonprofit teaching hospital that ranks among the premier medical centers in the nation. Including the Yale-New Haven Children's Hospital, Yale-New Haven Psychiatric Hospital, Smilow Cancer Hospital and the 2 Yale-New Haven Hospital campuses at York Street and the Saint Raphael Campus, YNHH is regularly included among the Best Hospitals in the U.S. in the annual U.S. News & World Report rankings of specialty services. With two main campuses, Yale-New Haven is the largest acute care provider in southern Connecticut and one of the Northeast's major referral centers. YNHH achieved Stage 7 status on September 18, 2015.

The Challenge

Yale-New Haven Hospital has a long history of leveraging electronic medical records and other technology to enhance care, quality, safety, and workflow efficiency. YNHH was one of the first hospitals in the nation to adopt computerized provider order entry (CPOE) in the early 1990s and by 2010 had a robust inpatient and ambulatory EMR deployment. The approach to that point, though, was a "best of breed" model with several clinical, ancillary, and EMR solutions in use at YNHH, its satellites, and affiliate hospitals across the Yale New Haven Health System, which includes Bridgeport Hospital, Greenwich Hospital, and the Northeast Medical Group. With multiple EMRs in use across and within our hospitals, care continuity and data analysis were hindered. Our partners in the Yale School of Medicine, were also challenged by disparate medical record technologies that limited integration and research capabilities. In 2010, we recognized the need to transform our technology base to enable longitudinal care, population health, clinical, operational and business analytics, support research and to empower delivery of higher value.

Implementation Overview

In July of 2010, we completed due diligence on EMR selection, choosing the Epic EMR and revenue cycle platform for Yale-New Haven Hospital, Bridgeport and Greenwich Hospitals, the Northeast Medical Group and the Yale Medical Group. We endeavored to deploy a single electronic medical record for our patients across all sites of care and in tandem offered Epic access via Community Connect contracts to community providers and agencies with whom we share patients. We implemented Epic as a big bang strategy at each hospital and in a rolling manner through the physician practices in the Medical Groups. Our initial implementation included the core EMR for inpatient and ambulatory as well as the registration, scheduling, billing, pharmacy, radiology, cardiology, transplant, oncology, obstetrics, ophthalmology, anesthesia, operating room, health information management, reporting and data warehouse, patient portal, and provider remote access portal applications. YNHHS has been a Care Everywhere participant since 2010. In the few years following our initial implementation we have added the Epic modules for bed management, care management, population health and are in the process of implementing Beaker (Laboratory) and ICON (Infection Control) modules. The Epic solutions are fully integrated to critical third party solutions for PACS, Anatomic Pathology, Blood Bank, Radiation Oncology, biomedical device integration (BMDI) and various business and clinical support solutions.

"Implementing Epic was transformational for our health system and has provided a standard, clinical and business platform to drive greater value", said Lisa Stump (interim CIO for the Yale New Haven Health System and Yale School of Medicine and former Epic project Director)

Resulting Value / ROI

1. Through fiscal year 2014, YNHHS saw $150.6 M in benefits from Cost & Value initiatives driven through and supported by the EMR, financial and analytics platforms. These annual benefits are expected to remain sustainable through fiscal year 2015 and beyond. The following examples reflect results specific to Yale-New Haven Hospital.

   - The cost and value positioning initiative was built on strong partnerships between YNHHS's finance team, analytics and ITS team, and clinical teams. These teams applied data collected through Epic to identify and track opportunities to increase efficiencies, reduce waste, and drive down the cost of patient care and leveraged the Epic EMR to deploy real-time decision support and other tools to drive changes. Through these partnerships, YNHHS measured results across health system and the following are examples from Yale-New Haven hospital, who achieved Stage 7:

     Financial Results:
     - Blood Utilization Management- Applied streamlined transfusion protocols [$200,000]
     - Optimize Abdominal Surgery- Reduce complications of small and large bowel surgery patients [$2,000,000
     - Oncology Medications use- Reduce inpatient administration of Rituximab and Ifosfamide [$921,000]
     - Head and Neck Care Process Redesign- Reduced ALOS for H&N ENT patients [$214,000]
     - Sickle Cell Care Redesign- Reduce ALOS and readmissions for sickle-cell patients [$2,300,000]
     - Hip Fracture- Reduced ALOS and Quality Variance Indicator (measure of adverse event) incidence [$235,000]

     Clinical Quality Results:
     - Duplicate Laboratory Tests- reduce redundant lab ordering through real time clinical decision support [20% reduction in tests ordered]
     - Clustering Care- reduce patient awakening between 8PM and 6AM by redesigning medication administration standard schedules and decision support for laboratory draw times and vital signs schedules- [35% reduction in patient awakening episodes]
     - Facilitate smoking cessation- created clinical alert to drive referral to cessation services and orders for nicotine replacement products [34% referred to the Quit Line; 43% had medication orders placed; Tobacco use disorder was added to the problem list in 48%; Email messages sent to patient's PCP 99% of the time]
     - Improving Medication Reconciliation- Pharmacist-Pharmacy Technician led medication reconciliation workflow targets high risk patients; EMR enables patient identification, retrieval and documentation of med history, and care team communication [35% increase in admission medication reconciliation rates in high risk populations]
     - Tele-ICU- remote, centralized intensivist oversight of critical care patients across the health system has enabled cost-effective, specialist care in all of the ICU's and resulted in decreased cost/case and LOS.

     Research:
     - Enhancing patient outreach for research- created a research portal within the EMR patient portal to inform patients of research trials and enlist their interest in clinical trials. [To date over 500 patients have been recruited]

     Care Team Communication:
     - Auto-routing of provider notes- upon closing the encounter in Epic, the specialist's note is auto-routed to the Primary Care Provider (PCP) of record. This improves the communication among the care team and has saved ~20-30 minutes/provider/day.

2. The strategies YNHH employed to improve value depends on data from three sources: the electronic medical record (Epic), the advanced cost accounting system (Strata), and comprehensive quality metrics. Quality Variation Indicators (QVI)s were developed to track rank-ordered adverse hospital events or conditions not present on admission. Analyzing QVIs captures the frequency and cost of complications in care delivery and allows the clinical review teams to determine levels of preventability, clinical significance, and provider attribution for the QVIs.

3. YNHH uses the collected data to drive clinical standards through system-wide order sets, decision support, and streamlined care processes. Real-time and retrospective delivery of patient and operational data help providers see the benefits of clinical redesign for their patients, and helps the YNHH team optimize resources and patient outcomes with monthly results reflected in the System's financial statements.

4. As shown in the Revenue and Expense per Equivalent Discharge graph, YNHHS has reduced the cost of care each year since FY 2011, when Epic implementation began, through the cost and value positioning initiative. And in 2013, when Yale-New Haven Hospital implemented Epic, revenue per case began to increase due to more accurate and complete data capture, while the costs continued to decline.

Lessons Learned

- Stakeholder engagement in understanding and design of the new platform is critical to success in the short term at implementation and most importantly in the long term in leveraging the tools for success. Coordination across teams and across organizations is central to creation of a common, standard build within the EMR. Proper payment incentives should be considered to ensure clinician participation.
- Workflow analysis and design require attention and resources to pave the way for the EMR and related technologies. Implementing these tools will uncover many workflow and communication inefficiencies at play in your health system. Focus on getting the workflow right and consistent with the EMR tools pays dividends in the long run.
- Taking the time to celebrate successes reinforces the value of the work and bolsters morale during the stress of major change characteristic of large implementations like the EMR.
- Adhere to timelines, scope, and budget. There will be a natural tendency to want to slow down, to make things perfect, or to do more analysis. Moving quickly and sticking to timelines enables you to move through the initial change, fight inertia, and move through implementation to the really important work of improving performance and quality. Maintaining the pace helps you drive necessary decisions toward that goal.
- Maintain vigilant focus on safety, quality, the patient experience and key performance indicators to ensure a successful transition and to avoid unexpected adverse outcome.

"HIMSS Stage 7 recognition validates our commitment to using data and technology to advance care. We are honored by this recognition and humbled by the expectation it sets to push the limits on all that we can accomplish." – Lisa Stump