HIMSS

Wellspan Health

EMRAM **7**

Case Study

Wellspan Health

Profile

WellSpan Health (WSH) is an integrated health care delivery system that serves the communities of central Pennsylvania and northern Maryland with a multispecialty medical group comprised of 1,500 highly skilled physicians and advanced practice clinicians, one of the nation's largest behavioral health organizations, a home care organization, eight respected hospitals, and more than 19,000 employees.

WellSpan has more than 170 patient care locations offering expert care in local communities, with services such as diagnostic imaging, laboratory, rehabilitation, primary care, retail pharmacy, walk-in health care, durable medical equipment, and other essential services.

The health system additionally offers the region's only accredited Level 1 Regional Resource Trauma Center and Comprehensive Stroke Center with an endovascular neurosurgery program and provides regional referral services in heart and vascular care, oncology, women and children services, orthopedics and spine care, neurosciences, and behavioral health.

WSH is a charitable, mission-driven organization, committed to exceptional care for all, lifelong wellness, and healthy communities.

Date Stage 7 was achieved: June 26, 2019 (acute care) & June 27, 2019 (ambulatory)

The Challenge

Sepsis is the leading cause of death in U.S. hospitals, and mortality from sepsis increases 8% for every hour that treatment is delayed.[1] Approximately 80% of sepsis deaths could be prevented with rapid diagnosis and treatment. WSH determined through internal data analysis that sepsis, severe sepsis, and septic shock were the number one admitting diagnosis for each of its inpatient acute hospitals, with overall average mortality rates greater than 11%, and a corresponding observed to expected (O:E) ratio of greater than 1.5. Additionally, hospital transfers from one acute hospital to another had a 40% mortality rate.

The evidence regarding the criticality of early identification of sepsis, and the type and related timing for intervention and treatment best known to decrease mortality and avoid harm for the septic patient (the sepsis treatment bundle as defined by the International Surviving Sepsis Campaign), is well-published and studied. Despite evidence to support the effectiveness of the bundle,[2] bundle compliance at WSH was averaging 39%. Historically at WellSpan, the original care model design implemented at one WSH hospital included a conventional Help Team or "boots-on-the-ground rapid response nursing team." This model was limited by immediate access to the patient record, competing priorities and related patient conditions, and physical limitations such as hospital geography and how fast one person can physically respond. The screening time averaged greater than 67 minutes on average, and a considerable number (average 22%) of sepsis alerts never received Help Team response, depending on the hospitalwide patient acuity. Monitoring for patient treatment bundle compliance was on the fly, and time zero was often unknown concurrently. The traditional "boots on the ground" response team model were

not working for sepsis. The analysis determined there was a direct correlation between the alert, our response, and patient outcome. The analysis determined there was a direct correlation between the alert, our response, and patient outcome.

WSH focused on a creative solution with the following goals: become top-performing in sepsis care and treatment compared to our peers, improve patient care quality for all sepsis patients through early identification and timely evidenced-based treatment, and reduce overall sepsis mortality. Goals were developed with these requirements: implement standard work system-wide, avoid distracting alerts that overburden the busy clinicians with alarm fatigue, demonstrate efficiency and cost-effectiveness, and leverage technology.

Implementation Overview

The Vice President of the Medicine Service Line and Executive Sepsis Champion of the Health System had an idea for a remote clinically staffed telemonitoring bunker that could provide real-time surveillance for early identification of sepsis utilizing tools and standard work developed within the electronic health system (EHR). Much like air traffic control, this team could provide continued clinical support to initiate evidenced-based treatment quickly with ongoing monitoring for related treatment timing and compilation, and positive patient response. WSH invested in this innovation with the goal of patient care quality and safety, and beginning with the sepsis initiative implementation om May 2017, the Central Alert Team (CAT), and a new care model were born.for sepsis. The analysis determined there was a direct correlation between the alert, our response, and patient outcome. The analysis determined there was a direct correlation between the alert, our response, and patient outcome.

The WSH Sepsis Clinical Effectiveness Team (CET), a collection of clinicians across the health system, established consensus to rely upon the evidence and the published clinical criteria driving the best practice protocols, with the guiding principles to focus on interventions and tactics which were clinically (not administratively) impactful and, in consideration of all the continuing literature and disparate recommendations, looked to the Surviving Sepsis Campaign as a framework. The WSH clinical teams worked with the technical and informatics experts to review data and recommendations and developed/disseminated an evidence-based bundle of treatment/care intervention within the HER for adoption and spread across hospitals. Clinical teams/subgroups have been established at each entity to assure engagement and clinical reliability. Additionally, within the EHR, the clinical teams developed a customized algorithm based upon evidence of learned hemodynamic changes/thresholds and lab value combinations, to create automated alerts to address early recognition of people with – or who are at risk for – sepsis.

In this new care model, time zero in the septic patient is the time of the EHR generated sepsis alert. This is documented clearly in the record and established by a validated best practice alert (BPA), inclusive of the sepsis bundle treatment time requirements (3 and 6 hours) for ease in reference and monitoring/tracking by the CAT. A nursing and quality management expert team convened to develop all new and conceptual workflows, processes and procedures, inclusive of timing and documentation standards and escalation protocols. Sepsis and sepsis treatment education for adults, pediatric, and OB patients were emphasized and trained. In addition to the executive sponsor, physician champions were identified, participated in the training, and were made available for consultation or questions. These included: intensivists, hospitalists, and pediatric and OB medical directors.

The CAT went live with the implementation of Epic and activation of the sepsis alerts at two WSH inpatient acutecare hospitals in May 2017 and at two additional acute-care hospitals and one specialty care hospital pre-Epic implementation (within Cerner) July-August 2017. These hospitals later transitioned to Epic in October 2017. The CAT RN, via *telemonitoring*, receives alerts in real-time through a dedicated mailbox (work queue), and provide identification of potential sepsis in patients in the Emergency Department (ED), ED waiting room, and inpatient settings for multiple hospitals. Working in 12-hour shifts, 24/7/365, the RNs screen, validate and research various EHR generated BPA types such as SIRs, sepsis, pediatric and OB sepsis, and ED triage. The CAT RN communicates directly with the bedside care team for appropriate interventions, monitoring for action/response and patient 3 responsiveness. These RNs provide early identification and allow for timely initiation of the bundle, with ongoing monitoring for treatment compilation that results in positive/improved patient clinical response.

Further, Epic-generated cube reports are developed for activity monitoring of CAT operations such as volume and production, and clinical feedback for alert type, timing, hospital location, patient details, bundle compliance, and treatment outliers. Utilizing Epic data, sepsis cases discharged one week were abstracted the next, with a detailed weekly report including bundle performance outlier specifics and mortalities transparently released to entity's clinical teams each Friday, inclusive of the treating physician, nurse, and hospital. The CAT RN documentation is included as a part of this reporting, providing further critical treatment and the patient's individual circumstances. All hospitals recognized this rapid feedback loop as being invaluable for quickly correcting negative performance, identifying trends, and proactively intervening for the avoidance of future preventable events or actions.

Resulting Value / ROI

Exceptional results were achieved. At the end of Performance Year 2, there have been (internally calculated) 227 patient lives saved who had the principal diagnosis of sepsis. Inpatient mortality rates improved at every hospital, with a system average mortality rate of 4.8% (March 2019) and with each hospital achieving top-decile performance (compared to peers)[3] with an O:E of well under 1.0 and ranging from 0.47-0.81. WellSpan York Hospital (a more than 500-bed, tertiary/quaternary teaching hospital) achieved the top 1% performing (compared to peers).

Over the course of Performance Year 1, the CAT supported the care of 11,520 unique patients, and at the end of Year 2, the CAT reports care support of 24,915 unique patients. With the implementation of the CAT, the screening time for sepsis alerts decreased to 12.12 average minutes or an 82% improvement from baseline. The average sepsistreatment bundle compliance time improved from a baseline of 34% (July 2016) to 91% (March 2019). Overall implementation costs of this new care model are less compared to more traditional care models, impacting both the quality and cost components of the value proposition. The Central Alert Team staffed with 4.8 FTEs[4] was able to monitor four inpatient acute hospitals and one specialty care hospital 24/7. The traditional boots on the ground response team physically located at each hospital would require a minimum of 4.5 FTEs for 24/7/365 coverage per entity; multiplied by the number of hospitals, this would equate to approximately 22.5 FTEs needed.

Hospital revenue was positively impacted by the identification of more cases of sepsis and the increased percentage of cases coded as severe sepsis. At WellSpan York Hospital, commercial payer

Highmark demonstrated our performance excellence in Commercial and Managed Medicare patients with quality incentive earnings of an additional $2,500,000 as it relates to the total 90-day cost of care per episode spend for pneumonia. Additionally, there was a commercial payer-identified decrease in the cost of care for readmissions (2016 through 2018). Other pay for performance and incentive payment gains are believed to exist and continue to be assessed.

Lessons Learned

The CAT is an illustration of the power of a care platform – integrating digital science (technology) and biological science (best practice medicine) to augment humanity (human strengths). The WSH sepsis initiative lessons learned include that a collaborative team approach to communication and workflow development is critical. Early implementation identified a blind spot in the EHR alert monitoring for those patients that are in the ED waiting room. Once identified and mapped, CAT leadership worked with the technical experts to design waiting room surveillance ability for patients not yet bedded but otherwise initially screened, and as a result, have expanded the safety net to a critical high-risk area. Further, to maintain a lean staffing model and in the utilization of lean processes, constant diligence must be made for opportunities for eliminating wasteful efforts. This includes the necessary turning off of alerts that do not hold value or maximize the sensitivity based on experience and as clinically directed. Further, EHR-developed reports have informed CET clinical teams, providing valuable performance improvement tools and resulting in discussions of sepsis patient populations and outcomes. CAT sepsis patient monitoring experiences/documentation and multidisciplinary clinician input have led to the development of improved order sets for sepsis treatment specific to pneumonia.

EHR data and tool-supported implementation of evidenced-based treatment, utilizing standard work and CAT real-time support, provide clinical reliability, quality improvement in care outcomes, and sustainable results.

Key participants involved in the process

The following WellSpan Health team members were involved in the process:

Steven L. Delaveris, DO, Vice President, Medical Service Line

Jodi R. Cichetti, MS, RN, CCM, CPHQ, Senior Director, Quality and Clinical Improvement
Emily Edleblute, MS, RN, ACNS-BC, CCRN-K, CIC Program Director, Medicine Service Line
Holly Wolfe, MBA, Director of Quality and Clinical Improvement

Lee Maddox, MD, Medical Director, Medical Service Line
Alyssa Moyer, MD, Chief Medical Officer, WellSpan Surgery and Rehabilitation Hospital

Kristin Thomas, MA, Director, Healthcare Analytics
Benjamin Proud, MS, Senior Data Analyst
Jeremey Stone, MSN, RN, PHRN, Application Coordinator, EpicCare Inpatient
Robin Walker, RRT, Clinical Improvement Quality Specialist III

The Central Alert Team Registered Nurses

QUOTE FROM ORGANIZATION EXECUTIVE:

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"Technology and best practice medicine can, and should, augment humanity. As healthcare practitioners, we can enhance our medicinal judgment through real-time tools that enable the human experience. Care, empathy, ethical and personal choices, considered exceptions, and a personalized approach to communication facilitation across the continuum of care is the expected outcome. The incorporation of trust, communication, active listening, emotional bonding, friendship-like connections, mutual respect, accountability, and an expert advisor with clinical reliability, population health, and patient activation is the tool for success."

– Steven L. Delaveris, DO, Vice President, Medicine Service Line

ONE SENTENCE THAT ENCAPSULATES THE EXPERIENCE AS A WHOLE:

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Experience is a wonderful thing; however, do not be influenced by the confines of "how we did it before." With the patient in mind, our challenge is to create processes that make it easy for our teams to do the right things all of the time.

[1] *https://www.sepsis.org/wp-content/uploads/2017/05/Sepsis-Fact-Sheet-2018.pdf*

[2] *"Bundle", "Sepsis treatment bundle" and "WSH Bundle" are synonymous in the context of this writing and refer to the evidenced based 3- and 6-hour sepsis treatment, lab work/chemistries and related timing, adopted from the Surviving Sepsis Campaign and specific to WSH sepsis populations and review definition.*

[3] *As reported by Premier®*

[4] *FTE in this case equals 0.9 FTE or 36 hrs/week*

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