

UNIVERSITY OF UTAH HEALTH



THE CHALLENGE

The patient was admitted for hypoxia and fatigue, and by the next day, he had his first fever and registered a modified early warning system (MEWS) score of 8. Sepsis protocol was initiated to alert the rapid response team, and the provider was at the bedside within just seven minutes. Within twenty minutes, lactate and blood cultures were collected, and fluids and antibiotics were infused in less than an hour. The patient improved over the next few days and was discharged home.

This is the sepsis response at University of Utah Health now, but it wasn't always that fast and smooth. Like at countless other hospitals across the U.S., sepsis response is a priority for University of Utah Health. Sepsis, a life-threatening complication of an infection, occurs when chemicals released into the bloodstream to fight the infection trigger inflammatory responses throughout the body. It's one of the leading causes of death in the U.S., and costs hospitals nearly \$24 billion annually.

Sepsis is treatable, but the condition must be identified and treated quickly. As part of its ongoing care quality improvement program, University of Utah Health launched a sepsis initiative to evaluate their sepsis response workflow and determine how they could both better identify when patients are showing signs of sepsis, and more quickly rally the rapid response team for treatment, with the goal to improve their sepsis mortality rates.

The process they had in place previously involved a nurse or nursing assistant writing down the vital signs, then entering them into the EHR, sometimes in a delayed manner. The nurse would then have to make a judgment call about the patient's condition if vitals were out of range, and could decide to manually page the rapid response team for assistance. The step-intensive process wasn't very efficient and had the potential for error.

THE SOLUTION

A longtime customer of the Spok healthcare communication platform, Spok Care Connect®, University of Utah Health recognized that there may be a way to use Spok to automate sepsis alert notifications.

"Getting people to act faster has a huge amount of value, especially when you're talking about sepsis. We wanted to get providers to the bedside in minutes every single time that sepsis is recognized," explains Dr. Kencee Graves, internist and assistant professor of internal medicine at University of Utah Health, and co-director of the sepsis initiative. "We knew that making electronic communication more efficient was something Spok could help us with."

OVERVIEW

University of Utah Health is the mountain west's only academic health system, combining excellence in patient care, the latest in medical research, and teaching to provide leading-edge medicine in a caring and personal setting. The system provides care for residents of Utah and five surrounding states in a referral area encompassing more than 10 percent of the continental U.S. University of Utah Health is frequently ranked among U.S. News & World Report's Best Hospitals and is consistently ranked No. 1 in quality in the nation among academic medical centers.

INDUSTRY

Healthcare

BUSINESS DRIVERS

- Streamline sepsis identification and notification workflow
- Recognize and treat sepsis more quickly for better outcomes
- Implement new streamlined workflow as system-wide standard

SOLUTION

- Spok® clinical alerting
- Spok® paging

RESULTS

- Reduced sepsis mortality rate for patients with MEWS scores 7-11 by 20 percent
- Piloted in acute care units and successfully rolled out system-wide following success
- Boosted clinician satisfaction by eliminating manual steps, and strengthened their confidence in the automated process through shared patient success stories and mortality rate data

CASE STUDY

Dr. Graves and her colleague, Dr. Devin Horton, a hospitalist and assistant professor in the division of internal medicine, leveraged their EHR system (Epic), and Spok Care Connect to hardwire sepsis alerts, automating steps within the recognition and communication processes in the sepsis response workflow. They used a Best Practice Alert (BPA) within Epic to trigger the MEWS score alert, which was then automatically sent to the rapid response team via Spok, their healthcare communications platform.

Here's how it works: Epic automatically uses vital signs entered to calculate a Modified Early Warning Score (MEWS). If the MEWS is sufficiently high, Spok sends that MEWS alert as a message, and sends to either the charge nurse (tier 1—MEWS score above 5) or the rapid response team (tier 2—MEWS score at 7 or above). The recipients then receive the notification to evaluate that patient right away.

“That’s the magical part of this—the alert that automatically goes from Epic as a message to the charge nurse or rapid response team,” says Horton. “When you can automate the protocol, it just works.”



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Dr. Devin Horton
Hospitalist and Assistant Professor
in the Division of Internal Medicine

THE RESULTS

University of Utah Health implemented the new process in its acute care units in May 2016 and began seeing results: From May through December 2016, mortality rates for most MEWS scores began to improve. However, they realized that even people with lower MEWS scores would benefit from the rapid response team protocol. Originally, Graves and Horton had set the protocol to alert the rapid response team for a MEWS score of 8 or above. They adjusted it to 7 and above instead. This step, along with more time using the new process, indicates promising results. In preliminary analysis, there was a mortality reduction of 20 percent for MEWS scores 7-11 from pre- to post-implementation.

MEWS Score	Pre-implementation (1 year)		Post (May 2016- Dec 2016 RRT at 8)		Post (Feb 7 - July 31 RRT at 7)	
	Count of Visits	Mortality Rate	Count of Visits	Mortality Rate	Count of Visits	Mortality Rate
11	6	33%	4	100%	0	0%
10	16	50%	9	56%	7	0%
9	43	30%	29	28%	13	23%
8	99	26%	85	26%	57	25%
7	207	19%	155	27%	129	17%
6	410	15%	315	11%	302	18%
5	784	10%	522	11%	586	15%

Ongoing analysis will be done as more time passes to test for significance, but the early success has been enough to launch the new workflow hospital-wide. Graves and Horton say it demonstrates the importance of hardwiring communications for sepsis management. “The bottom line is that this streamlined sepsis response workflow has really helped our patients,” Graves says. “The data and the anecdotal stories we’ve consistently heard from clinicians illustrate that this process aids care team collaboration and gets patients the treatment they need.”