Detecting Sepsis: Advanced Technologies Help Improve Care

Predictive algorithms measure, aggregate and make sense of data to create care trends.

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—Darinda Reberry, RN
President/CEO
Western Missouri Medical Center
Warrensburg, Mo.

Sepsis, a complication of the body’s response to an infection, can quickly become life threatening if left untreated or if there is a delay in appropriate treatment. According to the Sepsis Alliance, more than 250,000 people die from sepsis every year in the United States. Even for those who survive, chronic pain, hearing or vision loss and amputations can be lasting effects of a condition that is alarmingly common and easily treatable yet often goes undetected.

Part of the challenge is that, taken into account individually, the constellation of symptoms shown by a patient who is septic or on the way to becoming septic are not necessarily indicative of sepsis. Patients and medical professionals alike often do not recognize the signs of sepsis, and, unfortunately, by the time it is diagnosed, the situation is critical and a life is at risk.

As healthcare and healthcare informatics have continued to advance, machine learning has aided in the development of computerized algorithms that create powerful tools for delivering patient care.

Triggering the Alarm
It is no secret that technological advancements in healthcare have helped remove manual processes traditionally conducted by clinicians, such as use of smart pumps that report data directly into an EHR. These technologies offer additional opportunities, including the ability to quickly analyze large and disparate quantities of data. This data can provide caregivers with a more robust picture of a patient’s condition, helping to inform treatment plans.

One example of a prime use of machine learning and cloud-deployed predictive algorithms is Cerner’s St. John Sepsis Surveillance Agent. This predictive algorithm continually monitors patients at risk for sepsis and triggers an alarm when a certain number of qualifying symptoms are present. Such symptoms include an unusually high or low temperature, elevated heart rate, and levels of lactate and creatinine that may indicate organ failure.

This kind of detection mechanism is key to catching sepsis early enough to reduce mortality rates. Before Western Missouri Medical Center, Warrensburg, Mo., implemented the St. John Sepsis Surveillance Agent in May 2017, the organization didn’t have an electronic method for diagnosing or treating sepsis patients. Care teams leveraged a manual paper process for monitoring patients. The St. John Sepsis Surveillance Agent is now embedded into the medical center’s EHR, and the tool works behind the scenes to monitor patients at risk of sepsis based on the information already provided in patients’ records.

Taking this a step further, WMMC added this technology to its admission process. The algorithm is designed to immediately screen for patients who might be at risk for sepsis or who have already become septic. Ultimately, the algorithm allows the medical center to evaluate and detect sepsis much more quickly.
Enabling Early Detection

This method of early detection is especially important for WMMC, a medical center that serves a predominantly rural community. Using the same healthcare innovations as those found in larger, more urban medical centers is vital for rural healthcare providers. With limited resources, however, these providers do not necessarily have the intensive therapies a septic patient might need, especially if he or she has reached a stage of septic shock. The time needed to transport a patient to a larger facility can mean the difference between life and death. If organizations can stop sepsis through early detection, they are going to save lives.

Healthcare providers face mounting financial pressures and volatile market challenges. Leveraging technology that can offset these pressures helps organizations create value for their patients while supporting their business objectives.

For Western Missouri Medical Center, the St. John Sepsis Surveillance Agent represents more lives saved and more patients who get to go home sooner and healthier. It also represents what is possible when advanced computing technology and medical expertise come together.

In a setting where patient care depends on the judgement of people using automated records, any time providers can elevate their use of technology to deliver the most optimal care is critical to patients. This equates to achieving success in the commitment to improving the patient experience at a lower cost to the organization.

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