

Surveillance tool helps hospitals in rapid detection of sepsis

LOWELL GENERAL HOSPITAL

Lowell General Hospital is a non-profit community hospital serving the Greater Lowell area and surrounding communities. The hospital has two campuses in Lowell – Main Campus and Saints Campus – that offer round-the-clock emergency medical care as well as a network of urgent care centers for non-life-threatening conditions.

Challenge

Sepsis can be a difficult condition to detect. The symptoms of sepsis are often vague and may be easily confused with other, more benign conditions. Moreover, there is no objective standard diagnostic test that can be used for sepsis, so clinicians must look at a combination of abnormal vital signs, laboratory results, and patient-reported information to determine whether sepsis is a possibility. In addition, patients with sepsis can decline quickly so a patient who seemed only mildly sick at first may rapidly become critically ill, making reassessment important.

Action

In 2010, the Cerner Corporation developed the St. John Sepsis Surveillance Agent as a tool within its electronic health records (EHR) system to assist hospitals in rapid detection of sepsis. The tool is available to all hospitals that utilize the Cerner platform, and according to the company, over 550 hospitals are currently using it. The St. John Sepsis Surveillance Agent is programmed to scan patient electronic health records, including a 30-hour look-back window, for a combination of abnormal vital signs and abnormal lab values. The surveillance system is set up to look for vital signs consistent with CMS sepsis guidelines, but it can be customized so that the alerts are more tailored to the hospital's patient population.

At Lowell General, the sepsis surveillance tool has been in use since around 2014, and is used in both the emergency department and inpatient units. Lowell General has programmed its algorithm so that its clinicians get a "SIRS alert" when the patient has three SIRS criteria met or

a "sepsis alert" when the patient has two SIRS criteria plus a sign of organ dysfunction, which would include an abnormal result for blood lactate levels, creatinine or bilirubin.

Outcomes

Overall, the hospital team has found the tool to be helpful, flexible and easy to use. "When I see the sepsis alert, I'm a little more suspicious. I've found that it's more right than it's wrong and once you know what the false positives will be you can mentally account for that," said Dr. Nathan MacDonald, Lowell General's Chief of Emergency Medicine.

The focus for Lowell General is on early detection of sepsis. The surveillance system is constantly scanning a patient's vital signs and can see when new lab values are entered. "As a clinician, it's useful, because it makes you stop for a second and consider whether the patient could have sepsis," said Dr. MacDonald. "And that's one of the biggest barriers- that you're not necessarily thinking of it, especially if the only symptom is that the patient seems a little confused or out-of-it. With the alert, it brings it to your attention and makes you think that it might be sepsis."

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Since first adopting the sepsis surveillance tool in 2014, the hospital has made several adjustments to the algorithm that sends up the alerts in an effort to reduce the number of false positives and head-off the challenges associated with alert-fatigue.

Recently, for example, the clinical team decided to change the threshold for what constitutes an abnormal respiratory rate, which has had the effect of lowering the number of false SIRS alerts that are triggered. It has also helped that the alerts provide detailed information to the nurse who receives it regarding the criteria that caused the alert to fire and points to appropriate next steps. In the ED, the alert also goes up on the tracking board so that everyone can see it. Once the alert pops up, the nurse can then go straight to a “power form” with a guided note that displays the criteria that caused the trigger and allows for documentation of next steps for treatment and the recommendation that the clinician be notified.

The process of creating an effective sepsis alert is iterative and needs periodic changes in order to remain useful. The Lowell General team says that implementation of the alert and the “tweaks” that they have had to make haven’t been too burdensome to accomplish. In part, this is because they have subcontracted with Cerner to provide on-site IT support. This close working relationship has allowed the IT team to participate on the hospital’s sepsis committee and to be available to help make changes.

It’s a constant challenge to refine the alerts to make sure that the right person gets the right alert at the right time. The team has worked with Cerner and with their clinical team to continue identify the patient populations who inappropriately trigger the alert to fire and adjust the system to suppress the alert.

As a next step, the sepsis committee will be looking at the reports that are generated from the SIRS/sepsis alerts to refine the way the data is collected from the Power Forms after the alerts fire. Currently, the Power Forms are the same for both the SIRS and sepsis alerts, which makes it difficult to understand how each alert is impacting the clinicians’ behavior. Once the team is able to look at the responses to the different alerts, they will be able to better understand how each alert influences the care that’s being delivered to the patient.