Using electronic systems to detect and treat sepsis

SIGNATURE HEALTHCARE BROCKTON HOSPITAL

Signature Healthcare is an integrated health care delivery system on the South Shore comprised of the award-winning not-for-profit Signature Healthcare Brockton Hospital; Signature Medical Group (SMG), a multi-specialty physician group of more than 150 physicians practicing in 18 ambulatory locations; and the Brockton Hospital School of Nursing.

Challenge

The emergency department at Signature Healthcare Brockton serves over 60,000 patients each year. Sepsis can be difficult to diagnose because the symptoms are vague and there is no definitive test that can be done to confirm sepsis. Using tools in the electronic health record to alert for the possibility of sepsis when vital signs are abnormal can help, as do use of electronic order sets.

Action

Signature Healthcare Brockton Hospital utilizes several tools to help their clinical team identify, manage and treat patients with severe sepsis and septic shock. Within the last three years, the hospital has adopted an electronic early warning system for sepsis and incorporated electronic order sets for sepsis into their MEDITECH Expanse electronic health record (EHR) system. Just recently, the hospital also implemented Dascena Insight software that uses machine learning to identify patients that might be at high risk for developing septic shock.

Brockton Hospital's work to optimize their EHR for sepsis began in 2015 with the implementation of a sepsis early warning system, using the MEDITECH surveillance toolkit as a starting point for the build. In addition to the vital signs that are proposed in the MEDITECH toolkit, the team also added lab values so they could incorporate more data points into the screening process. This allowed them to factor in lactate and procalcitonin lab values, in addition to the typical vital sign data. Now, when the system "sees" two abnormal vital signs plus one abnormal lab value, or three abnormal vital signs, it sends a SIRS alert to the nurse and the provider. Upon seeing the alert, nurses are directed to inform the provider and to document this communication. For providers, the alert screen gives the option to acknowledge the SIRS alert and go directly to the sepsis order set screen. Providers also have the option to decline the alert and document that the patient has a condition other than sepsis that is causing the abnormal vitals and lab values.

Like all EHR-related projects, the sepsis alerts have taken time to refine, and require the ongoing dedication of not only the IT team but also the clinical team. However, the alerts have been very successful in getting providers to utilize the electronic order sets for sepsis. This is due, in part, because the team sought input from frontline nurses and doctors when designing the alerts and sought to make the transition from alert to order sets as seamless as possible. They also broke the sepsis order sets into four different sets, because the large, consolidated order set was too confusing and unwieldy for providers to navigate. **They are pleased to note that they have 100 percent compliance on the septic shock order set and are working for similar compliance levels on the other sepsis order sets.**

Just recently, the hospital deployed Dascena InSight software that uses machine learning to try to identify patients who are at risk of developing septic shock. While they are still in the early stages of testing the software, they have been impressed so far by its ability to identify the cases. With the whole hospital pushing to get the septic shock mortality rate down to single-digit numbers, the team is looking for any and all tools that might be able to help, and the InSight tool shows a lot of promise.

501 Boylston Street, 5th Floor, Boston, MA 02116
BetsyLehmanCenterMA.gov
617-701-8271 • info@BetsyLehmanCenterMA.gov

Massachusetts Sepsis Consortium