'Sepsis sniffer' generates faster sepsis care and suggests reduced mortality

9 October 2014

Craig A. Umscheid, M.D., M.S.C.E., is the director of Penn's Center for Evidence-based Practice. Credit: Penn Medicine

An automated early warning and response system for sepsis developed by Penn Medicine experts has resulted in a marked increase in sepsis identification and care, transfer to the ICU, and an indication of fewer deaths due to sepsis. A study assessing the tool is published online in the *Journal of Hospital Medicine*.

Sepsis is a potentially life-threatening complication of an infection; it can severely impair the body's organs, causing them to fail. There are as many as three million cases of severe sepsis and 750,000 resulting deaths in the United States annually. Early detection and treatment, typically with antibiotics and intravenous fluids, is critical for survival.

The Penn prediction tool, dubbed the "sepsis sniffer," uses laboratory and vital-sign data (such as body temperature, heart rate, and blood pressure) in the electronic health record of hospital inpatients to identify those at risk for sepsis. When certain data thresholds are detected, the system automatically sends an electronic communication to physicians, nurses, and other members of a rapid response team who quickly perform a bedside evaluation and take action to stabilize or transfer the patient to the intensive care unit if warranted.

The study developed the prediction tool using 4,575 patients admitted to the University of Pennsylvania Health System (UPHS) in October 2011. The study then validated the tool during a pre-implementation period from June to September 2012, when data on admitted patients was evaluated and alerts triggered in a database, but no notifications were sent to providers on the ground. Outcomes in that control period were then compared to a post-implementation period from June to September 2013. The total number of patients included in the pre and post periods was 31,093.

In both the pre- and post-implementation periods, four percent of patient visits triggered the alert. Analysis revealed 90 percent of those patients received bedside evaluations by the care team within 30 minutes of the alert being issued. In addition, the researchers found that the tool resulted in:

- A two to three-fold increase in orders for tests that could help identify the presence of sepsis
- A 1.5 to two-fold increase in the administration of antibiotics and intravenous fluids
- An increase of more than 50 percent in the proportion of patients quickly transferred to the ICU
- A 50 percent increase in documentation of sepsis in the patients' electronic health

record

The study found a lower death rate from sepsis and an increase in the number of patients successfully discharged home, although these findings did not reach statistical significance.

"Our study is the first we're aware of that was implemented throughout a multihospital health system," said lead author Craig A. Umscheid, MD, MSCE, director of Penn's Center for Evidence-based Practice. "Previous studies that have examined the impact of sepsis prediction tools at other institutions have only taken place on a limited number of inpatient wards. The varied patient populations, clinical staffing, practice models, and practice cultures across our health system increases the generalizability of our findings to other health care settings."

Umscheid also noted that the tool could help triage patients for suitability of ICU transfer. "By better identifying those with sepsis requiring advanced care, the tool can help screen out patients not needing the inevitably limited number of ICU beds."

Provided by University of Pennsylvania School of Medicine

APA citation: 'Sepsis sniffer' generates faster sepsis care and suggests reduced mortality (2014, October 9) retrieved 4 December 2021 from https://medicalxpress.com/news/2014-10-sepsis-sniffer-faster-mortality.html