

Optimization of a Sepsis Screening System

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Abstract

Evidenced-based clinical guidelines and new technology can promote meaningful use and improve the quality, safety, and efficiency of patient care. To this end, our team developed an electronic sepsis screening tool and process based on the Surviving Sepsis Campaign's (SSC) International Guidelines for the Management of Patients with Severe Sepsis and Septic Shock. To measure the usability of the sepsis tool and process, compliance with SSC guidelines, and the impact on hospital sepsis rates and mortality, we employed a quantitative correlative study using a survey methodology. The Systems Usability Scale (SUS) survey yielded a usability score for the tool and process of 61.54. Suboptimal usability of the tool and process can be expected to have negative effects on efficiency and patient outcomes. Aggregate quantitative data were collected and analyzed. The aggregated data included 1) response rate of the Rapid Response Team (RRT) to alerts; 2) number of Medical Doctor (MD) Order Sets initiated; 3) number of lactates drawn; and 4) hospital sepsis mortality rates. The aggregated data suggest that patients with an RRT response to their alert have increased number of lactates drawn and MD Sepsis Order Sets initiated. Three months of analyzed data showed a decrease in hospital sepsis mortality rates from 16.27 to 15.6%. A Pearson product-moment correlation coefficient was computed to assess the relationships among hospital sepsis mortality rates, the number of sepsis alerts responded to by the RRT, the number of lactates drawn, and the number of MD protocols implemented. There was a perfect correlation between the number of sepsis alerts responded to by the RRT and lactates drawn [$r=1.000$]. The number of sepsis alerts responded to by the RRT had a positive correlation [$r=.791$] with MD protocols ordered and a negative correlation [$r= -.950$] with the hospital sepsis mortality rate. Using a dedicated team to respond to sepsis alerts immediately and using the Registered Nurse (RN) and MD order sets may decrease sepsis mortality rates. However, more data are needed to assess patient outcomes related to the use of the SSC guidelines.