M S DePoint January 2019. Internal analysis performed for confidential employer

A brief examination of Sepsis diagnosis and preemptive methods toward mitigation

Sepsis is a leading cause of mortality in hospitals, competing only with acute myocardial infarction mortalities. Proper medical coding of sepsis has been identified as an issue that hindered mitigation. Angus (2001) lead an influential examination of this topic, leading to recommendations to look for (more properly coded) organ dysfunction and infection as leading indicators. Whittaker (2013) has updated the analysis and recommendations to include even more consistently documented measures: lactate levels, ICU admission, presence of shock, bacteremia, and increased Acute Physiology and Chronic Health Evaluation II score.

This brief looks at the result from about 25k cases during the first quarter of 2018 in a nationally recognized hospital and care center conglomerate. It seeks to examine the efficacy of the existing Alert system and the consistency of sepsis documentation as it relates to mortality rates and flagging of false positives.

At risk populations

Organ dysfunction and infection themselves are an at-risk population. Sepsis is even more so, as are the various combinations of diagnosis. This is confirmed with the mortality rates presented below.

Code Groups	Mortality Rates
Organ dysfunction, infection, and/or sepsis	4.5%
Infection alone	4.7%
Organ Dysfunction alone	6.7%
coded as Sepsis	9.4%
Infection & Organ Dysfunction (per Angus)	10.0%
coded with Infection, Organ dysfuntion, & Sepsis	15.7%

Current preemptive trigger

Following the guidance from papers such as Whittaker (2013), the institution in question has installed a real-time trigger in the Employee Health Record system. For the population examined above, the trigger was set off 78 percent of the time. This seems a bit excessive, in that the mortality rate associated with the trigger is similar to the overall population at 4.7 percent. Of course, without a proper test and control structure, we cannot truly assess the efficacy of the trigger in that, because of intervention, the chance of mortality could have been higher.

Suggestions for future analysis

To better estimate the value of the preemptive trigger, we need to pull the chart level details that looks at the suggested tests and vitals as suggested by Whittaker (2013). I also suggest we examine what trigger rules where, in fact, installed in the E.H.R. system and confirm that conform with Whittaker.

M S DePoint January 2019. Internal analysis performed for confidential employer

References

Angus DC, Linde-Zwirble WT, Lidicker J, et al. Epidemiology of severe sepsis in the United States: analysis of incidence, outcome, and associated costs of care. Crit Care Med. 2001; 29(7):1303–10.

Whittaker S, Mikkelsen M , Gaieski D , et al. SEVERE SEPSIS COHORTS DERIVED FROM CLAIMS-BASED STRATEGIES APPEAR TO BE BIASED TOWARDS A MORE SEVERELY ILL PATIENT POPULATION. Crit Care Med. 2013 April ; 41(4)