



## Reducing Antibiotic Administration Delay in Emergency Department Sepsis Patients

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### **Background**

In the United States, it is estimated that sepsis is associated with more than 250,000 deaths annually (Rhee, et al., 2019). Each hour of delay in antibiotic administration for patients with septic shock increases their risk of death by 7.6% per hour (Kumal, et al. 2006), culminating in an in-hospital mortality rate ranging from 20% - 50% of afflicted patients and an annual medical expenditure exceeding \$24 billion (Ahiawodji, et al., 2018). The 2018 Surviving Sepsis Campaign recommends administration of IV antibiotics within one hour of sepsis recognition. The Columbia VA Health Care System (HCS) recognized this opportunity for improvement and through our Continuous Process Improvement model, made improvements that significantly improved our antibiotic administration time, and further improved strong performance when assessing our Mortality data across the health care system. Through use of this multi-pronged approach to addressing sepsis, other health care systems will be able to reduce length of stay, reduce readmission rates, and decrease the incidence of mortality.

### **Objective**

- Create a standardized sepsis screening tool to ensure inter-rater reliability for identification of potential sepsis patients.
- Provide education regarding current best practices to elevate clinical awareness of recent advancements in sepsis identification and treatment recommendations, while promoting constant re-evaluation to further improve performance in increasing timely antibiotic administration.
- Improve sepsis patient triage prioritization.
- Reduce median antibiotic administration times to within one hour of patient presentation to emergency department.

### **Planning/Research Methods**

Record audits were conducted for all Columbia VA HCS patients with an inpatient diagnosis of sepsis from September 2018 through February 2019 (n = 160) to create a dataset comprised of the following variables: date & time of emergency department presentation, date & time of first antibiotic administration, suspected illness, met sepsis criteria, sepsis trigger alert, presence of blood cultures, fluid administration, lactic acid lab results, patient mortality, & emergency severity index. A group of subject matter experts then analyzed the resultant dataset for antibiotic administration time distributions and staff accuracy in early identification and prioritization of potentially septic patients.

### **Implementation Methods**

An interdisciplinary team of Physicians, mid-level providers, nurses, pharmacists, & clinical application coordinators developed a two-part triage screen using modified qSOFA methodology to assess heart rate, temperature, blood pressure, respiratory rate, mental status, white blood cell count, blood glucose, & chills/rigor to achieve a balance of sensitivity and specificity. Patients meeting two or more criteria are then evaluated for potential sources of infection. This screening tool was hardwired into the electronic medical record to ensure screening is completed on 100% of patients presenting to the emergency department, as well as ensuring that all potential sepsis patients are immediately identified and prioritized appropriately. Extensive education was provided for all emergency department clinical personnel who serve as the first encounter point of contact for arriving patients. Additionally, annual sepsis education was added to the nursing Skills Fair and competency requirements to establish standards for best practice sustainment.

### **Results**

- Initial process improvement project outcomes were selected for presentation at the Society for Health Systems 2020 Healthcare Systems Process Improvement Conference.
- Median antibiotic administration times were reduced by 55.7% from 150 minutes to 66.5 minutes.
- Percent of septic patients identified and treated with one hour of arrival at Emergency Department increased from 8.5% to 35%.
- Accurate identification of sepsis in triage increased from 44.1% to 80.0%.
- Appropriate triage prioritization increased from 50.9% to 90.0%
- Through our Continuous Process Improvement approach, constant re-evaluation of the processes in place is always an area of focus. Within the past 4 months a new enhanced approach has been tied into our sepsis protocol which now uses Monocyte Distribution Width (MDW). Currently, the Columbia VA HCS is only one of three facilities in the nation that are using this test.