

# Reducing Sepsis Mortality Rates by Improving Electronic Health Record Workflow

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## Background

Sepsis remains as one of the leading causes of death among patients in the United States. The CDC states that at least 1 in 3 patients who die in a hospital have been diagnosed with sepsis and over 1.7 million adults die each year due to the condition (2016).

Several treatments such as intravenous fluid resuscitation and antibiotics are necessary and must be done within a timely manner to ensure patient safety and improve outcomes. However, reports have shown that best practice for sepsis care have seen a compliance rate of less than 35% (Cooke & Iwashyna, 2014). As a result, costs associated with sepsis remain high with an average of \$18,000 if identified on admission and an average of \$51,000 if not identified on admission (Paoli, Reynolds, Sinha, Gitlin, & Crouser, 2018).

Fortunately, CMS sepsis mandates are in the works to reduce overall costs and provide greater improvements in patient outcomes. In addition, such protocols must be balanced with the nursing environment on individual units which can cause some tension to arise as a result of miscommunication, lack of compliance and/or education, and the stress of added workload.

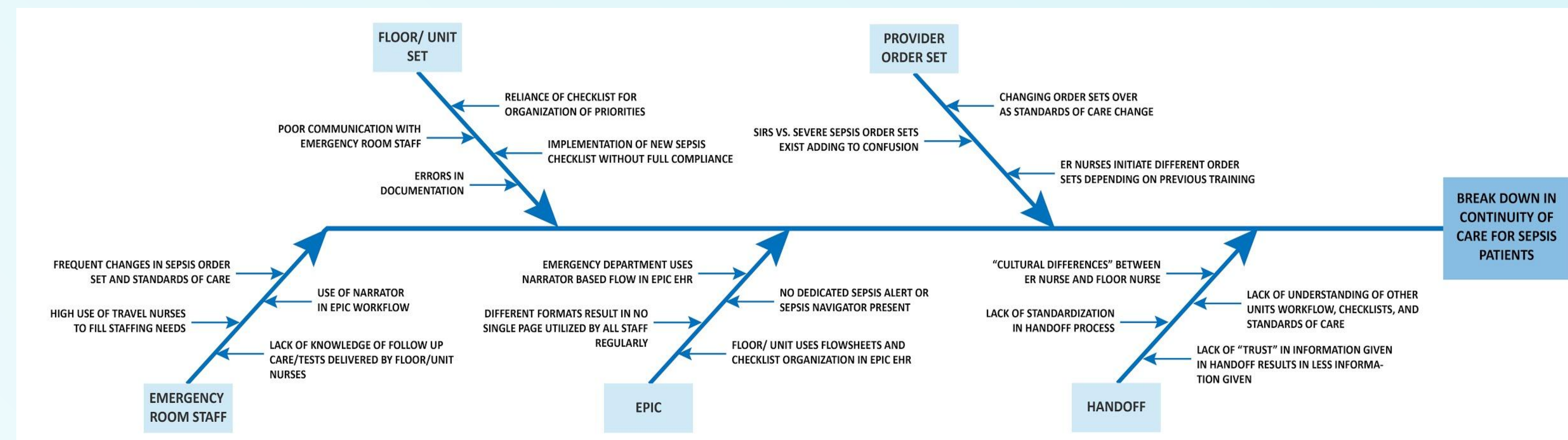
Being sensitive to both the need for improved sepsis care and the flow of individual units was necessary to provide a solution with miscommunication in an East Bay medical center. The goal of this study was to assess the root causes of the lack of continuity regarding sepsis care between the ED and the floor units (medical-surgical, ICU, and PCU). In addition, the study involved implementing a sepsis navigator within EPIC's system interface to provide data on patients that would be accessible by all pertinent staff members as a potential solution.

## Literature Review

- A quality improvement process performed by Sorrentino (2016) utilized a failure mode and effects analysis (FMEA) to evaluate nurse handoff between the emergency department and inpatient units. Results showed numerous areas with actionable failures including 55 potential failure modes and 84 potential causes of failure. The analysis led to critical evaluation by the FMEA committee and subsequent need for standardized handoff processes.
- A quality improvement project by Pandya et al. (2019) highlighted the importance of utilizing an electronic medical record based handoff tool as a way to improve nurse handoff processes. After 1 year of data collection, the percentage of medication errors due to ineffective handoff was decreased from 60% to 32% through the use of the EMR based handoff tool..
- Gonzalo et al. (2014) evaluated the implementation of a purely electronic handoff tool with optional verbal communication between an ED to inpatient ward and found that it was similarly effective in both completeness of information and patient safety as before the implementation, but with increased efficiency.

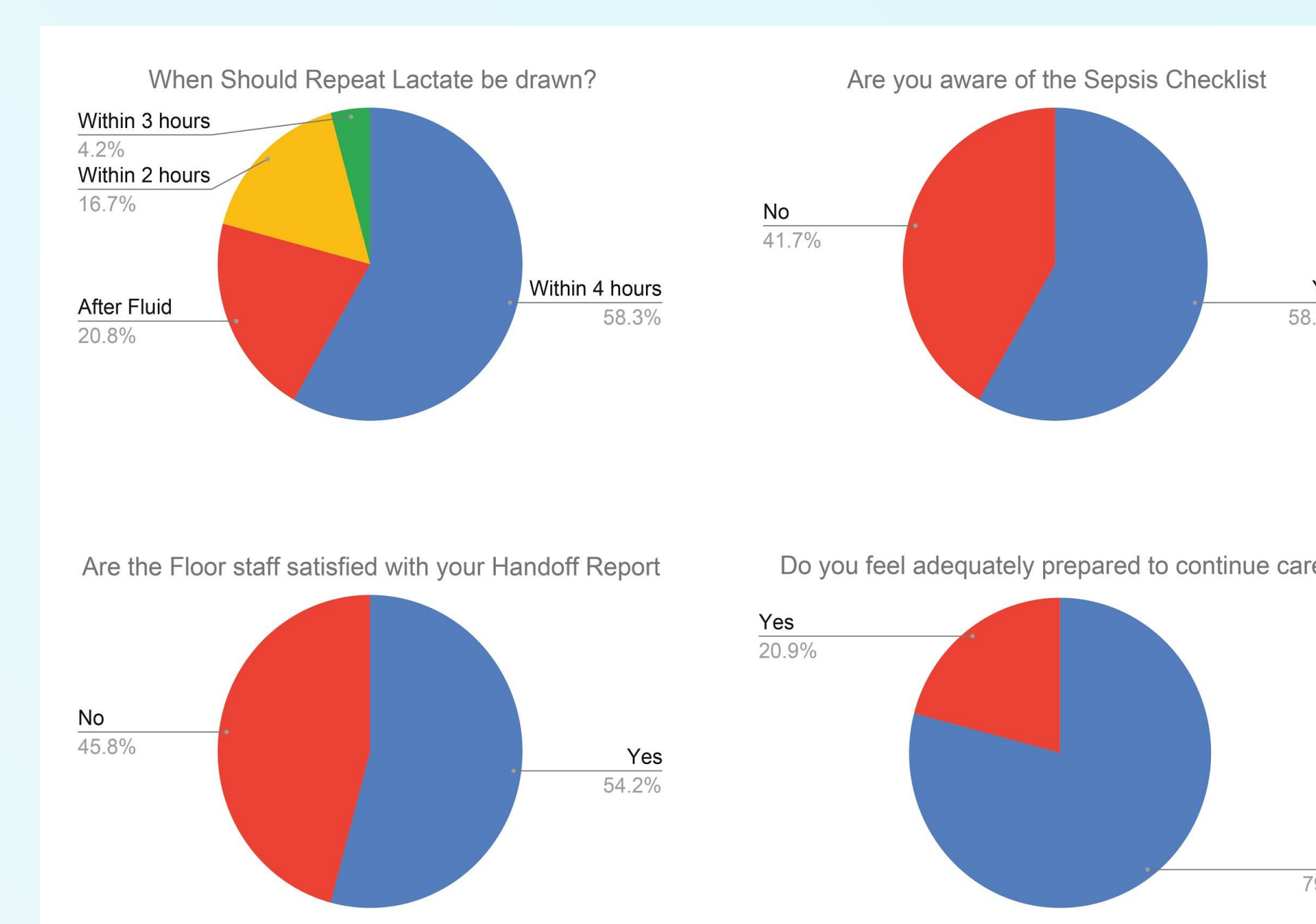
## Root Cause Analysis and Significant Findings

Figure 1. Root Cause Analysis



- 106 nurses were surveyed between the ED, Medical-Surgical, PCU, and ICU.
- Main areas of concern that are quantifiable included:
  - Poor sepsis handoff from ED to inpatient units (78.1%)
  - Underutilization of sepsis action checklist on inpatient units (43.1%)
  - Incorrect sepsis protocol parameters in the ED (38.5%)
  - Lack of knowledge with navigation of EHR for information gathering on inpatient units (31.7%)
- Other areas of concern included:
  - Difference in the area of documentation of patient information within EHR between ED and inpatient units resulting in poor communication.
  - Cultural differences between ED and inpatient units resulting in increasing tension.
  - Frequent changes in sepsis order set without subsequent education resulting in loss of time due to provider confusion.
  - Errors in documentation resulting in the lack of trust towards ED nurses.

Figure 2. Key Findings from Staff Survey



## Discussion

Based on the results of the survey, a solution was determined through collaboration with key stakeholders. To meet the needs of both the ED and inpatient units, an electronic health record-based sepsis checklist (sepsis navigator) similar to the 2019 sepsis action paper checklist would be a suitable substitute for the inpatient units.

The ED would retain the use of their sepsis narrator tool, however, input data from the ED will auto populate into the sepsis navigator for the inpatient side to access. To implement the idea, several meetings were arranged with an EPIC health systems liaison to determine the viability of a sepsis navigator given the current algorithms in place.

Fortunately, a sepsis navigator would be possible to create, but our group met an inopportune barrier. The medical center is going to experience a system-wide EPIC interface upgrade in early 2020 and with such an update requires careful consideration of the addition of a new data entry form. With that, the implementation of a sepsis navigator has been moved to the year 2020 in parallel to the system-wide EPIC interface upgrade. In the interim, 47 in-services were performed over the course of a week to remind ED staff nurses of what items needed to be handed off on report of sepsis patients.

## Future Recommendations

- Creation of sepsis alert banner within EPIC summary page interface
- Implementation of a standardized electronic SBAR or IPASS handoff tool that includes sepsis checklist information.

Figure 3. Sepsis Action Checklist - Physical / Paper form

SEPSIS 2018 ACTION CHECKLIST		PATIENT LABEL	
DATE _____	PT WEIGHT _____ kg	ED TIME ZERO = End of Triage _____ (Time)	
INPATIENT TIME ZERO= Positive sepsis screen (SBP <90 or Lactate >2) _____ (Time)		eCART RN PATHWAY COMPLETED Y/N	
<b>GOAL TO INITIATE IN FIRST HOUR</b> LACTATE Time Drawn _____ YES / NO Lactate result _____ At least 30ml/kg Fluid Bolus ordered _____ YES / NO Reason fluid bolus not given? _____ Start Time _____ Amount Given _____ mL (Please document total volume in EPIC)		<b>TIME ZERO TO 3 HOUR</b> Repeat Lactate (if first >2) _____ YES / NO / N/A Repeat Draw Completed within 4 hours? _____ YES / NO / N/A SBP/MAP Documented _____ YES / NO / N/A Vasopressors started for refractory hypotension _____ YES / NO / N/A	
BP After Bolus Documented? _____ YES / NO BLOOD CULTURES BEFORE ANTIBIOTIC _____ YES / NO		<b>TIME ZERO TO 6 HOUR</b> if hypotension X 2 (BP <90 or MAP <65) within first hour after bolus start vasopressors _____ YES/NO Comments/Concerns: _____	
<b>Antibiotic started within 1 hour</b> YES / NO Time Given _____			
<b>RN HAND OFF</b> RN #1 _____ @ _____ Hospitalist ED MD _____ RN #2 _____ @ _____ Intensivist			

## Project Timeline



Figure 4. Project Timeline

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