

SEPSIS MORTALITY REDUCTION PROJECT



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Problem

Sepsis is a complex syndrome that is difficult to define, diagnose, and treat. It is a range of clinical conditions caused by the body's systemic response to an infection. If it develops into severe sepsis complicated with single or multiple organ dysfunction or failure, sepsis may lead to death. Sepsis is a common leading cause of death in the United States, and the mortality rate of severe sepsis ranges from 28% to 50% (Daniels, 2011). Sepsis affects more than 800,000 people in the United States annually, and costs more than \$20 billion in 2011 (National Institute of Health/National Institute of General Medical Sciences, 2014).

Improvement Process

The "Stomp Out Sepsis" (SOS) initiative began at Contra Costa Regional Medical Center (CCRMC) in October 2009. Its roll-out began in January 2010 with refinements continuing to this day. A multidisciplinary team involves physicians, nurses, lab personnel, infection control practitioners, pharmacist, and other drawn from throughout the hospital to implement the SOS project. The team utilized classic quality management techniques, such as standardized work (checklists and standard sepsis order sets), inter-departmental collaboration, inter-professional collaboration, staff education, team building, frontline nurse champions, and close monitoring to ensure continuous improvement towards our goals.

Goals

By June 30, 2015, we will reduce sepsis mortality to below 10% by achieving 62% compliance with the Early Goal Directed Therapy (EGDT) bundle for management of severe sepsis and septic shock within the first hour from the time of presentation (TOP). Our first hour sepsis bundle is based on the studies indicating that early implementation of sepsis bundle and timely antibiotic administration within 60 minutes of suspected infection are the keys to improving sepsis outcomes.

Sepsis Bundle Element Compliance:

1. Stat lactate ordered after positive sepsis screens.
2. Blood cultures taken before antibiotics.
3. Broad spectrum antibiotic given within 1 hour of the TOP.
4. Fluid resuscitation – 20ml/kg or 2L of crystalloid within 1 hour before or after the TOP.

Target Population

Inclusions:

All patients age 18 years and older presenting to the emergency department (ED) or inpatients on acute care units have positive sepsis screening for possible severe sepsis or septic shock.

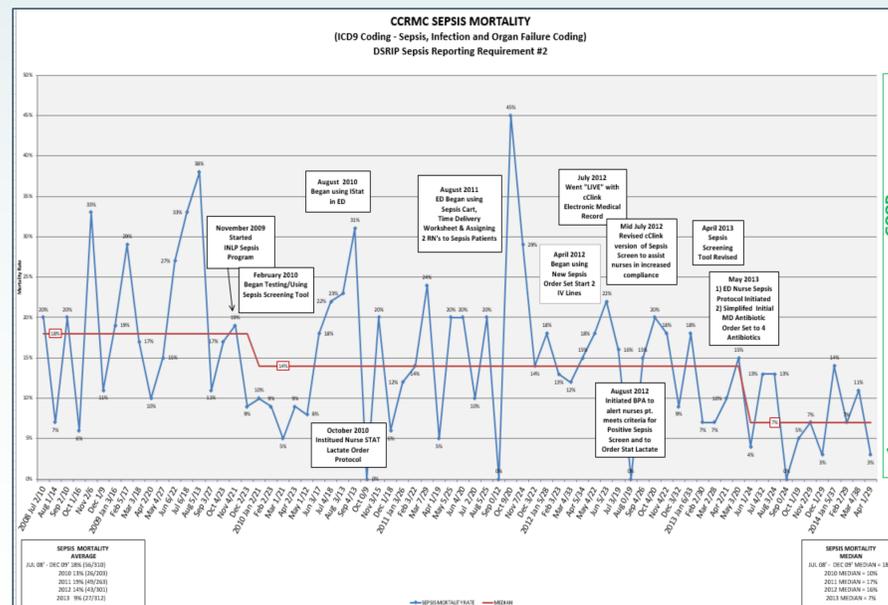
Exclusions

The following patients are excluded from the data collection:

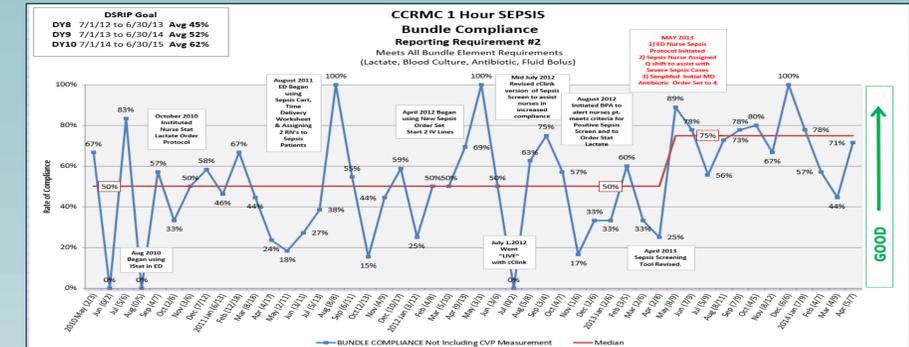
1. Inpatients on the hospital skilled nursing facility (SNF) units,
2. Obstetric patients,
3. Patients transferred to ICU from outside facilities with severe sepsis or septic shock,
4. Patients who are "Do not Resuscitation" (DNR), "Do not Intubation" (DNI), comfort care, or palliative care on admission or ordered within 24 hours,
5. Patients who signed out "Against Medical Advice" (AMA), left the ED without being seen (LWBS), or who refuse care.

CCRMC Sepsis Mortality

(ICD Coding – Sepsis, Infection and Organ Failure Coding)



First Hour Sepsis Bundle Compliance (Lactate, Blood Culture, Antibiotic, Fluid Bolus)



Results

As of April 2014, we reduce mortality due to sepsis at CCRMC to 7%, and achieve 75% compliance with the EDGT bundle (serum lactate, blood culture, antibiotic, fluid bolus) within the first hour of suspected or confirmed infection with a positive sepsis screen.

Lessons Learned/Challenges

What works:

1. Interprofessional collaboration.
2. Development and implementation of a user-friendly sepsis screening tool hospital-wide.
3. Conducting random audits of the screening tool to identify possible barriers to compliance and identify additional education and improvement.
4. Institution of a new ED Nursing Sepsis Protocol Order Set and Physician Sepsis Antibiotic Order Set.
5. Implementation of ISTAT lactate for ED patients.

Challenges:

1. Low bundle compliance for inpatient sepsis cases.
2. An increase in false positive sepsis screen due to improper use of sepsis screening tool.

References

1. Daniels, R. (2011). Surviving the first hour in sepsis: Getting the basics right (an intensivist's perspective). *Journal of Antimicrobial Chemotherapy*, 66(Supplement 2), ii11-ii23.
2. Dellinger et al. (2008). Surviving Sepsis Campaign: International guidelines for management of severe sepsis and septic shock: 2008. *Critical Care Medicine*, 36(1), 296-327.
3. Rivers, E.P. & Ahrens, T. (2008). Improving outcomes for severe sepsis and septic shock: Tools for early identification of at-risk patients and treatment protocol implementation. *Critical Care Clinics*, 23, S1-S47.
4. Dellinger et al. (2013). Surviving Sepsis Campaign: International guidelines for management of severe sepsis and septic shock: 2012. *Critical Care*, 42(2), 580-637.