



Reducing Sepsis Mortality via Electronic Tools

M. Mansour, MD, G. Kelly, DO, M. Doskoz, BS, RN, E. Morley, MD, S. Boudreau, MSN, RN, G. Propper, MS, RN
Stony Brook Medicine, Stony Brook New York



Background:

- Sepsis is life threatening organ dysfunction caused by a dysregulated host response to infection and is associated with increased mortality
- Stony Brook Medicine made the goal of improving sepsis patient mortality outcomes a priority in 2012, utilizing the 2012 Surviving Sepsis Campaign (SSC) international treatment bundle guidelines
- Electronic systemic inflammatory response alert (SIRS Alert) rollout began in 2011, fired to nursing staff
- Tracking sepsis bundle compliance and mortality metrics are part of our mandatory reporting to the New York State Department of Health (NYSDOH) and, beginning in 2015, a core measure, (SEP-1), for the Center for Medicare and Medicaid Services (CMS)
- Electronic Health Records (EHRs) can be leveraged to ensure bundle compliance

Actions Taken:

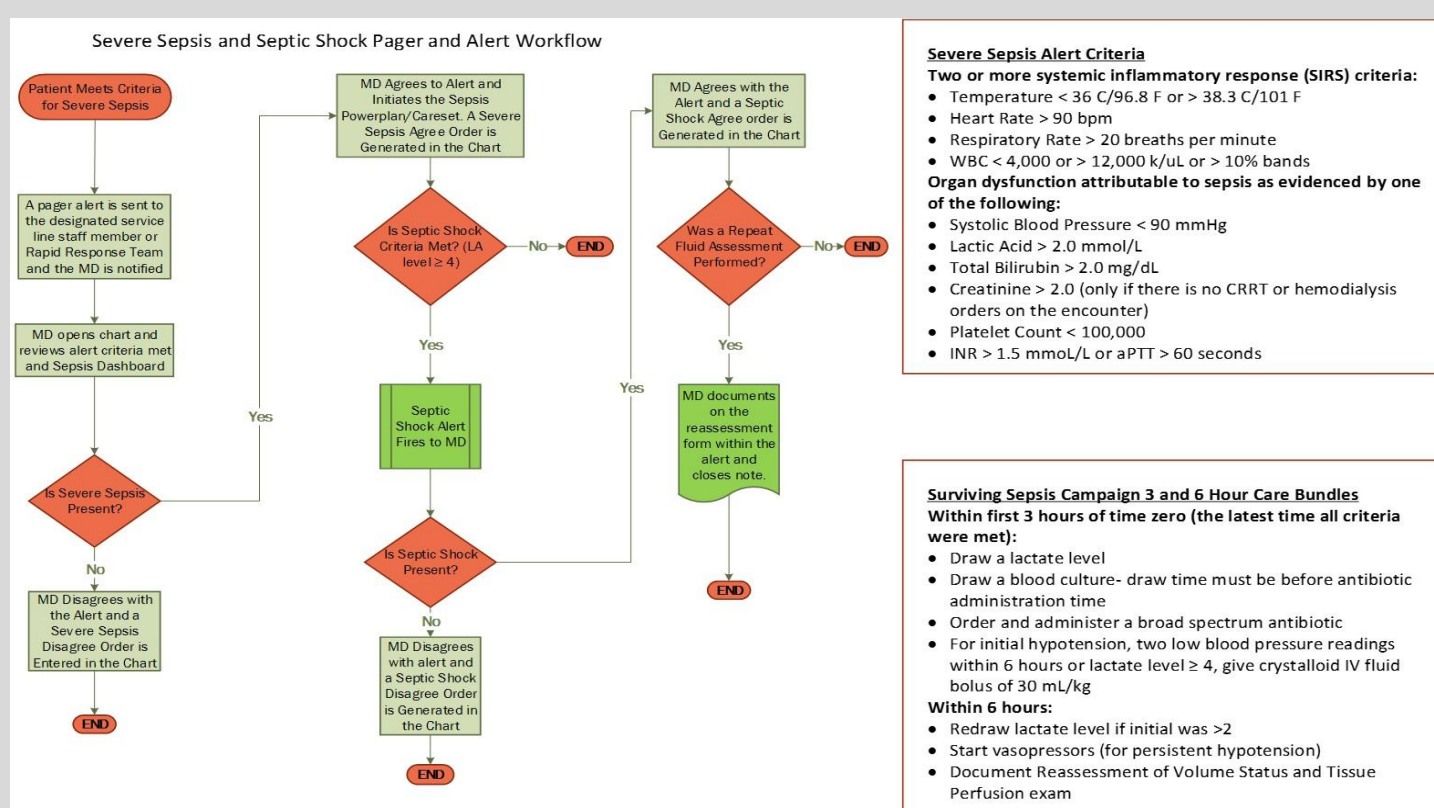
- A multidisciplinary sepsis quality improvement workgroup was formed. This group included physicians, nurses, pharmacists, Information Technology (IT), Clinical Documentation Improvement (CDI) and Quality Improvement (QI) representatives
- A gap analysis was conducted of the variance between current and optimal state
- A rapid Plan-Do-Check-Act (PDCA) cycle was initiated
- Severe sepsis and septic shock alerts were built to fire to the licensed provider with a link to the sepsis intervention dashboard (see severe sepsis alert criteria inset on the pager workflow graph)
- Sepsis Dashboard implemented to provide a visual timeline for severe sepsis identification and interventions needed. Hovering over time line events provides timely patient data

Sepsis Dashboard:



- Pager workflow to alert providers to the severe sepsis alert firing. Designated clinical staff/RRT identified in each area to manage sepsis pager. Real time interaction with medical staff to review alert criteria and begin appropriate interventions (see pager workflow graph)

Pager Workflow Graph:



- A robust education plan for alert management and sepsis bundle implementation
 - Resident Training- orientation and annual hospital Learning Management System (LMS) module; Academic Wednesday presentations; and Rapid Response Team/Attending mentorship
 - Annual LMS training module for all clinical staff
 - Clinical Nurse Specialist (CNS) and Unit Educator manage pager alerts and review alert data with resident staff in real time
 - Quick reference sepsis bundle education cards distributed to clinical staff

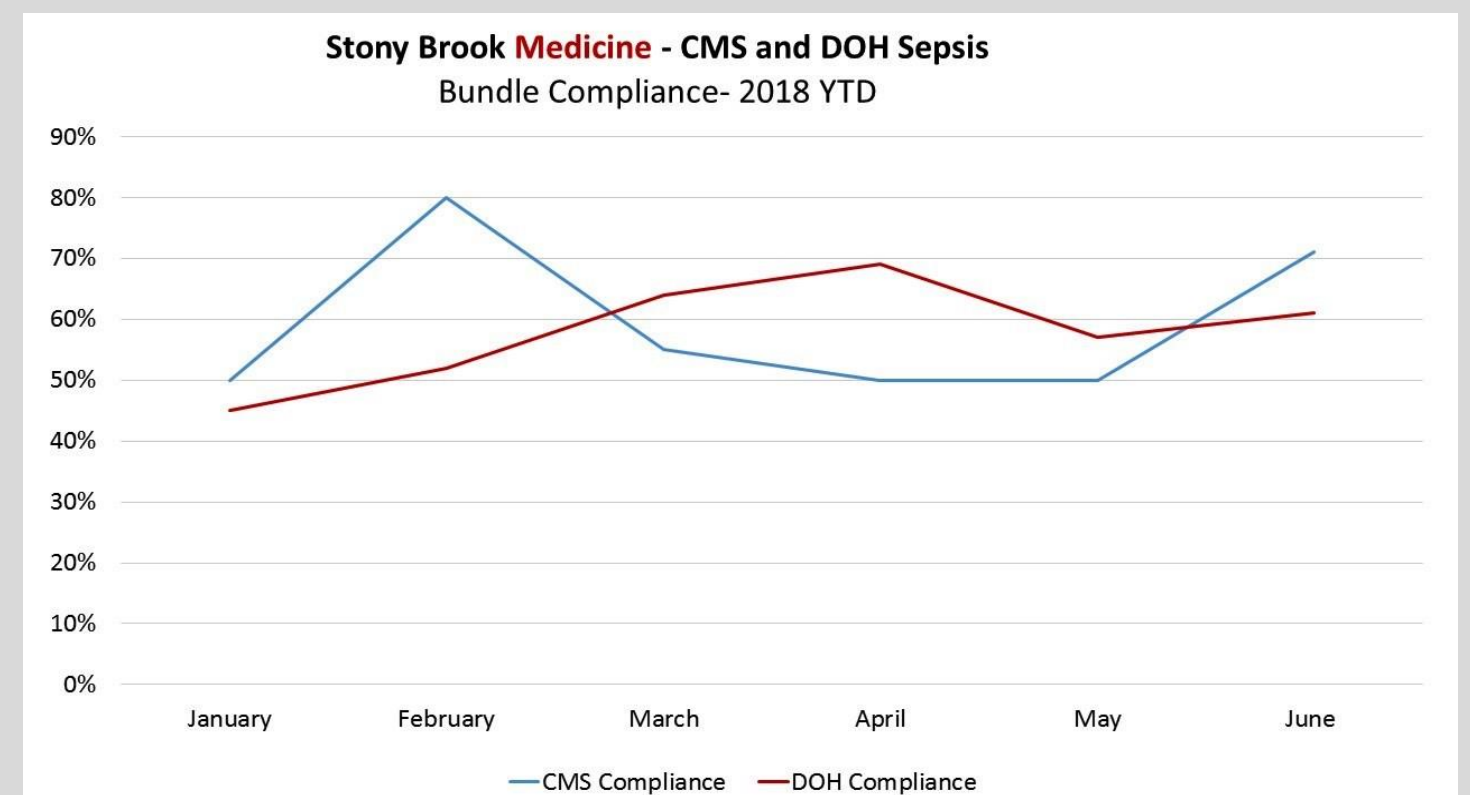
Aim Statement:

To increase early identification of severe sepsis/septic shock and compliance with evidence based sepsis bundles to decrease mortality

Outcomes:

- In 2018, specific tools and process changes realized an improvement in the identification of time zero, increased bundle compliance to 80% and reduced sepsis mortality to 20.32%
- Monthly and daily reports provided to clinical staff and leadership reflect compliance with alerts and bundle implementation

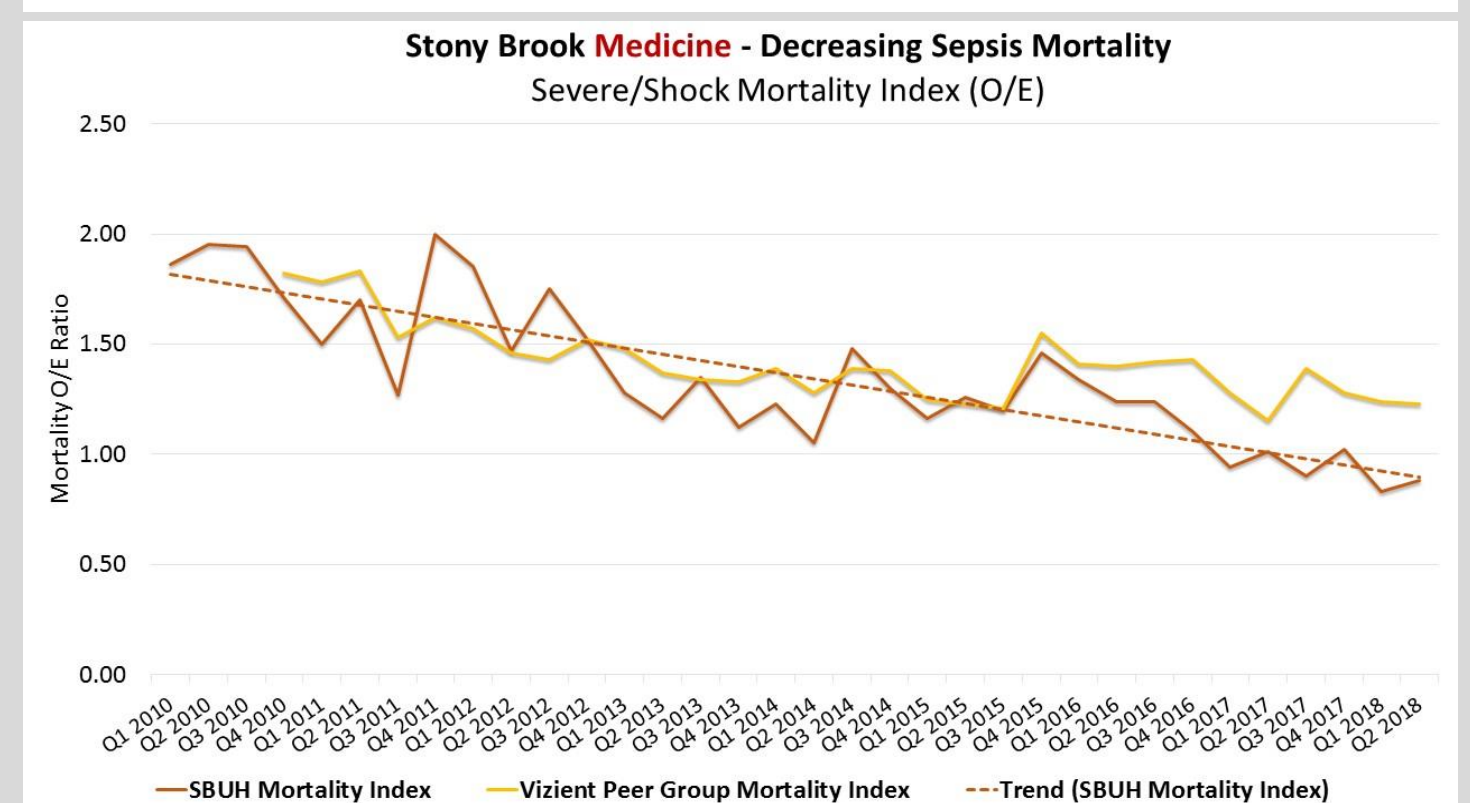
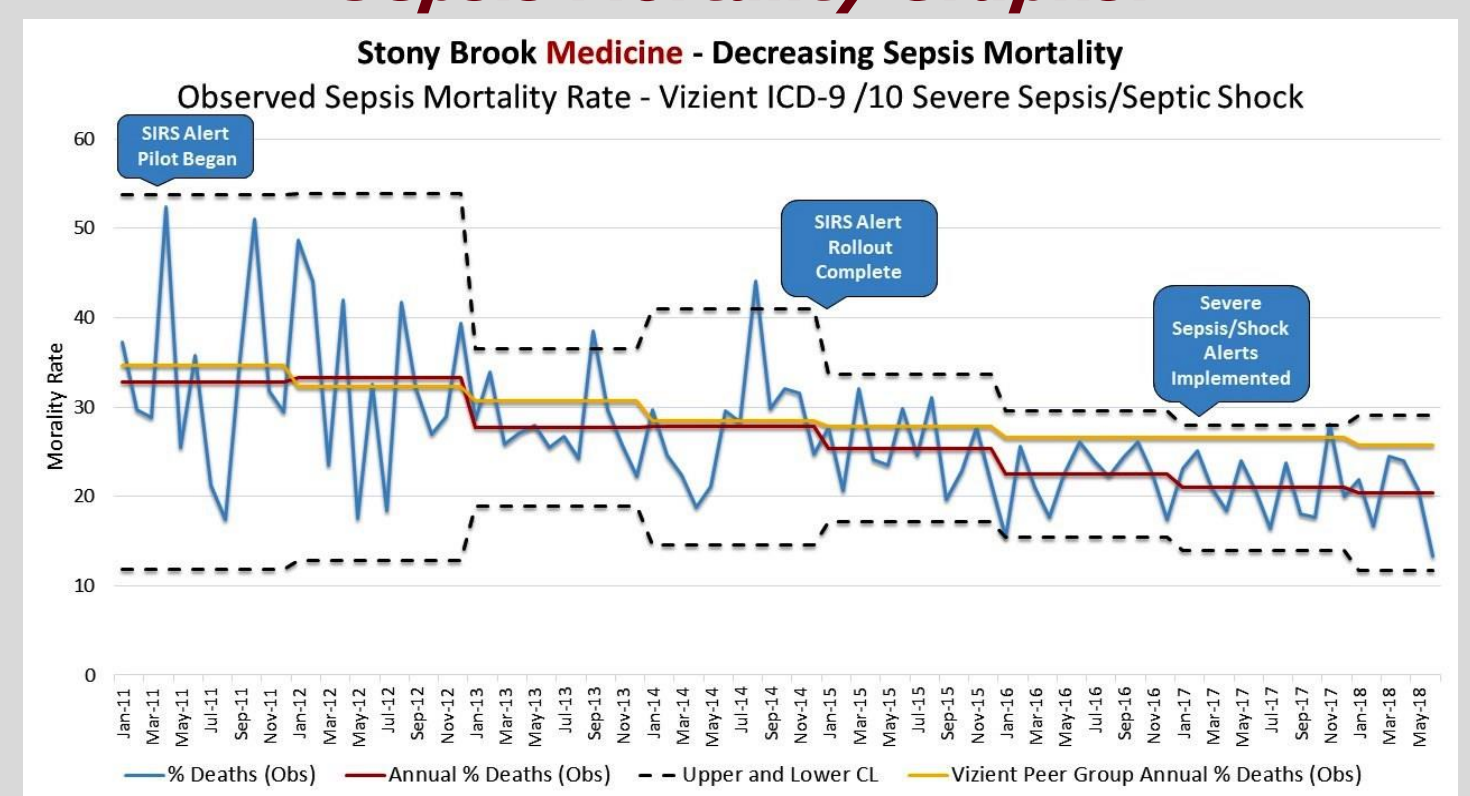
CMS and NYSDOH Bundle Compliance:



Conclusions:

- EHR tools increase consistent use of evidence-based care bundles which improves processes of care and patient outcomes
- We anticipated that increasing compliance with the treatment bundle would improve patient mortality. By 2015, our institution realized a decrease in sepsis mortality to an average 24% and set a new goal of reaching top decile within 3 years
- Our goal of reaching top decile was achieved in the first quarter of 2018 with an observed severe sepsis and shock mortality rate of $\leq 20\%$

Sepsis Mortality Graphs:



Next Steps:

- Implementation of single crystalloid fluid bolus orders by documented weight or ideal body weight (IBW)
- Sepsis power plan and ED care set revisions to promote more efficient ordering
- Addition of a Pediatric Severe Sepsis Alert
- Weekly tracking of alert responses
- Ongoing real time alert education