

## Surviving Sepsis at a Community Teaching Hospital

**Introduction:** Septicemia is the 10<sup>th</sup> leading cause of death in the US and severe sepsis (with organ dysfunction and/or hypotension) accounts for 20 % of Intensive Care Unit (ICU) admissions with a mortality rate of 20%-50%. In 2002 the Surviving Sepsis Campaign (SSC) was launched and evidence-based guidelines and definitions were disseminated in 2004 (revised in 2008). Recent studies demonstrate that the guidelines can be applied institutionally and that outcomes can be improved.

**Objectives:** 1) To create a Sepsis Alert Team (SAT) to respond to all cases of severe sepsis. 2) To standardize the process of identifying patients with severe sepsis. 3) To improve compliance with the treatment guidelines of the SSC. 4) To establish metrics and prospectively study the outcomes of the project.

**Methods:** 1) In the fall of 2009 the Sepsis Alert Performance Improvement Team (SAPIT) was established and has met weekly since. 2) During the first six months SAPIT developed an ED pathway to facilitate early identification and initiation of “bundled” treatment of patients with suspected sepsis, criteria to trigger sepsis alerts for cases of severe sepsis, a SAT to respond to such alerts, ED and admission order sets and a treatment algorithm to guide and standardize care, metrics to monitor and a hospital policy to govern the process. 3) Next, educational sessions were carried out with all ED physicians and nurses, the IM house staff and a presentation was made to the medical staff. The main focus of the project is in the ED but sepsis alerts can be called from any unit and nursing in-services were performed on all units. 4) On March 1, 2010 the hospital wide sepsis alert program went live and SAPIT began to review cases weekly. 5) In June, minor modifications were made, wallet cards were distributed and the policies and procedures were re-affirmed to the ED and IM house staff.

**Results:** From March 1, 2010 to February 2, 2011 287 sepsis alerts have been called (275 (96%) from the ED). Time from ED arrival to sepsis alert averaged 132 minutes and time from alert to SAT arrival averaged 5 minutes. After chart abstraction, 265 (96%) of ED alerts met SSC criteria for severe sepsis. Of all 275 ED sepsis alerts, 223 (81%) had lactates of 2.0 or greater, 116 (42%) had hypotension and 76 (28%) had a serum creatinine greater than 2.0. 88 patients (32%) had a positive BC. On average, time from ED arrival to blood culture (BC) was 54 minutes, to initiation of a saline bolus was 95 minutes, to administration of antibiotics was 147 minutes and to admission was 256 minutes. All but two (99%) patients received BC prior to antibiotics and 265 (96%) received antibiotics within 6 hours of ED arrival. Most patients received volume resuscitation before a sepsis alert was called so SAPIT chose to monitor the volume of fluid administered within 2 and 6 hours from ED arrival. The average volume received within 2 hours was 569 cc and within 6 hours was 1391 cc. Of the 265 ED cases with severe sepsis, 50 patients (19%) died, but only 21 (8%) died within 5 days of presentation to the ED. Of the 133 patients who met SSC criteria for septic shock (lactate > 4.0 and/or hypotension despite volume resuscitation), average volume received in 6 hours was 1,756 cc, average lactate was 3.4 and 44 (33%) died.

**Discussion:** It is feasible to develop and use a sepsis alert process based on the Surviving Sepsis Campaign in a Community Teaching Hospital with excellent adherence to guidelines and patient care outcomes. Our survival rate of 67% in patients with septic shock compares favorably with recent studies of evidence based goal directed therapy at large tertiary care centers.