SEPSIS BUNDLE UPDATE

Sepsis Brief: The New "Hour-One" Sepsis Bundle

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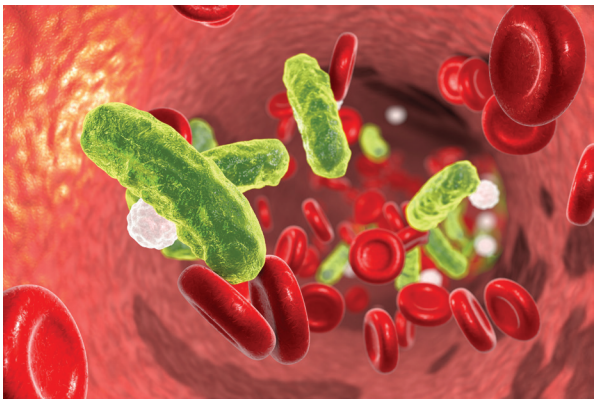
Since its inception in 2002, the Surviving Sepsis Campaign (SSC) has made significant contributions to the field of sepsis. The primary objectives of the SSC are to reduce mortality related to sepsis, to improve the quality of sepsis care, and increase awareness of sepsis. The guidelines for the management of sepsis and septic shock and the sepsis "bundles" are both publications stemming from the SSC initiative and have become a foundation for both medical providers and healthcare institutions in ensuring and guiding implementation of evidence-based interventions in the management of sepsis. Experts in critical care medicine from both the Society of Critical Care Medicine (SCCM) and the European Society of Intensive Care Medicine for the SSC, develop these guidelines, which are revised regularly and driven by updates to literature, research, and knowledge surrounding sepsis.

Updates to the clinical management guidelines typically precede the updates to the sepsis bundles. The first sepsis bundle was published in 2004 and included a "Sepsis Resuscitation Bundle" to be completed "as soon as possible" within the first six (6) hours of presentation to medical care and a "Sepsis Management Bundle" to be completed "as soon as possible" within the first 24 hours of presentation. These initial bundles were revised in 2012. Changes included a "three (3) -hour bundle" and "six (6) -hour bundle," with similar elements to the 2004 bundles, with an emphasis to perform the interventions in a shorter time period. These three- (3) and six- (6) hour bundles were further revised in 2015, again with similar elements, but the measurement of central venous pressure (CVP) and SCVO2 measurement were eliminated as elements necessary to assess volume status and replaced with "re-assess volume status and tissue perfusion."



The most recent guidelines from the SSC were published in 2017. The International Guidelines for Management of Sepsis and Septic Shock: 2016 (Rhodes et al. 2017) led to further changes to the sepsis bundles. In June 2018, "The Surviving Sepsis Campaign Bundle: 2018 Update" (Levy, Evans & Rhodes, 2018) was released. While the principle elements of the bundles remain consistent (lactate measurement, obtaining blood cultures, administration of IV antibiotics, IV fluid resuscitation, and the application of vasopressors for those with refractory hypoperfusion), the goal time frame for which these interventions are implemented has been reduced.

The new "Hour-One Bundle" includes five (5) steps that are recommended to begin immediately upon presentation in all patients with clinical elements suspicious for sepsis or

septic shock. "Time zero" is the time of presentation to triage in the emergency department OR if presentation occurs in a different setting (outpatient, nursing home, intensive care unit, hospital floor); "time zero" would be the first documentation in the chart with the elements of sepsis (Levy, Evans & Rhodes, 2018). It is understood that the interventions may not be completed within the hour.

The Hour-One interventions are (Levy, Evans & Rhodes, 2018):

1. Measure lactate level (repeat lactate if initial lactate elevated [>2mmol/L]).
2. Obtain blood cultures before administering antibiotics.
3. Administer broad-spectrum antibiotics.
4. Begin rapid administration of 30mL/kg crystalloid for hypotension or lactate ≥ 4mmol/L.
5. Apply vasopressors if hypotensive during or after fluid resuscitation to maintain mean arterial pressure ≥ 65mm Hg.

Since the publication of the first sepsis bundles in 2004, there has been a trend toward earlier interventions when elements of sepsis are recognized. This stems from the concept that sepsis is a medical emergency and, with early, appropriate treatment, morbidity and mortality will decrease. As with all guidelines and protocolized approaches to care, it is imperative to emphasize that the sepsis bundles should not take the place of clinical judgement and individualized patient factors that influence medical decision-making. The importance of individualized care is even more critical in sepsis, which lacks a gold standard for the diagnosis.

References

1. Levy, M.M., Evans, L.E., & Rhodes, A. (2018). The Surviving Sepsis Campaign Bundle: 2018 Update. Critical Care Medicine, 46(6), 997-1000. doi.org/10.1097/CCM.0000000000003119
2. Rhodes, A., Evans, L., Alhazzani, W., Levy, M., Antonelli, M., Ferrer, R., . . . Dellinger, R. (2017). Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2016. Critical Care Medicine, 486-452. doi:10.1097/CCM.0000000000002255