

# Evidence-Based Management of Sepsis

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Sepsis is a potential life-threatening oncologic emergency. Early recognition and prompt intervention can decrease the morbidity and mortality associated with sepsis. The Surviving Sepsis Campaign Guidelines Committee updated its recommendations in 2012, outlining specific evidence-based interventions to manage sepsis.

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Sepsis is the clinical syndrome characterized by a systemic response to infection. A potential life-threatening oncologic emergency, sepsis occurs on a continuum starting with infection. When left unrecognized and untreated, sepsis can lead to septic shock and death. Although estimates of the incidence of sepsis vary up to 3.5 times depending on the methods used, it still remains unacceptably high, ranging from 894,013–3,110,630 (Gaieski, Edwards, Kallan, & Carr, 2013). Inpatient mortality rates range from 14%–30%, whereas the average annual increase in incidence of severe sepsis ranges from 13%–13.3% (Gaieski et al., 2013). In addition, the Healthcare Cost and Utilization Project of the Agency for Healthcare Research and Quality lists septicemia as the most expensive condition treated in the United States (\$20.3 billion), accounting for 5% of national costs (Torio & Andrews, 2013).

Bone (1996) and the Society of Critical Care Medicine first defined sepsis in 1992. Sepsis occurs along a continuum. The first stage of the continuum occurs when a pathogen enters the patient and

an infection occurs. If the pathogen enters the bloodstream, it is considered bacteremia. The next stage of the continuum, systemic inflammatory response syndrome (SIRS), occurs when two or more of the following occur in a patient: temperature greater than 100.4°F or less than 96.8°F; heart rate greater than 90 beats per minute; respiratory rate greater than 20 breaths per minute or partial pressure of carbon dioxide less than 32 mm Hg; and white blood cell count greater than 12,000 cells/mm<sup>3</sup>, less than 4,000 cells/mm<sup>3</sup>, or greater than 10% immature bands (Levy et al., 2003). The systemic response to this infection is known as sepsis, followed by severe sepsis, where a patient experiences additional complications of organ dysfunction, hypoperfusion, or hypotension. When a patient does not respond hemodynamically to aggressive fluid challenge and no other explainable causes exist, septic shock ensues. Finally, multiple organ dysfunction occurs when the function of one or more organs is altered, and homeostasis cannot be maintained without immediate intervention.

## Start Immediately and Complete Within Three Hours

- Measure lactate level.
- Administer 30 mg/kg crystalloid over 10–15 minutes.
- Obtain blood cultures.
- Administer broad-spectrum antibiotics following blood cultures.

## Complete Within Six Hours

- Administer vasopressors for hypotension unrelieved by crystalloids.
- Measure central venous pressure and venous oxygen saturation.
- Remeasure lactate.

## Complete Within 24 Hours

- Administer low-dose corticosteroids if hypotensive despite vasopressors.
- Maintain glucose between lower limit of normal and 150 mg/dl.
- Maintain inspiratory plateau pressure less than 30 cm H<sub>2</sub>O for mechanically ventilated patients.

## Additional Supportive Measures

- Maintain adequate nutrition.
- Prevent deep vein thrombosis.
- Prevent stress and pressure ulcers.
- Prevent additional infection.

## FIGURE 1. Sepsis Care Groups

Note. Based on information from Dellinger et al., 2013; Institute for Healthcare Improvement, 2013.

## Evidence-Based Interventions

To address the growing incidence of sepsis, a panel of experts convened to develop recommendations for sepsis management. The Surviving Sepsis Campaign (SCC) Guidelines Committee first published *Guidelines for the Management of Severe Sepsis and Septic Shock* in 2004,