

RAISING AWARENESS FOR SEPSIS, SEPSIS SCREENING, EARLY RECOGNITION, AND TREATMENT IN THE EMERGENCY DEPARTMENT

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Contribution to Emergency Nursing Practice

- Early recognition and initiation of treatment is vital to patient outcomes and survival from sepsis.
- Sepsis screening in triage to be completed by nurses on all patients with suspected infection.
- Initiation of sepsis protocol and/or standing orders for positive sepsis screens should be implemented.
- Educate staff, patients, and families regarding signs and symptoms of sepsis, severe sepsis, and severe sepsis with shock; raise awareness.

Introduction

Sepsis is a medical emergency. As defined by the Surviving Sepsis Campaign (SSC), “sepsis is the life-threatening organ dysfunction caused by the host body’s response to the presence of infection.”¹ The presence of sepsis requires a suspected source of infection plus 2 of the following: hyperthermia (>38.8 Celsius [101.8 F]) or hypothermia (<36 Celsius [96.8 F]), heart rate greater than 90 beats per minute, leukocytosis or leukopenia, altered mental status, respiratory rate greater than 20 or hyperglycemia >120 mg/dL in a nondiabetic patient (Table 1).²

As sepsis progresses, severe sepsis starts to develop with further body organ dysfunction.¹ Severe sepsis includes symptoms present with sepsis along with one sign of hypoperfusion or organ dysfunction.¹ Signs of hypoperfusion and organ dysfunction include hypotension (systolic blood pressure <90), mottled skin, capillary refill greater than 3 seconds, disseminated intravascular coagulation,

creatinine >2.0 mg/dL, acute renal failure or urine output <0.5 mL/kg/h for 2 hours, lactate >2 , cardiac dysfunction, bilirubin >2 , international normalized ratio >1.5 , and acute lung injury (Table 2).² Septic shock is characterized as a subset of sepsis with circulatory, cellular, and metabolic dysfunction associated with increased risk for mortality (Table 3).¹

Each year, it is estimated that 30 million people worldwide are diagnosed with this life-threatening condition.³ In the United States, studies conclude that sepsis occurs in approximately 65.5 per 100,000 persons.⁴ High mortality rates are associated with sepsis because of its progressive nature. Based on data from the Joint Commission Center for Transforming Healthcare (JCCTH), sepsis has an estimated mortality rate of 25% to 50% and costs patients, health care facilities, and insurance companies an estimated \$17 billion per year combined.⁵ Research suggests that—with early screening, recognition, and treatments—outcomes related to sepsis can be improved.¹

Sepsis Screening and Recognition

Efficiency and timely workflow in emergency departments is imperative to surviving sepsis. In the emergency department, sepsis screening for high-risk and potentially septic patients is imperative at the triage level. Based on the most recent guidelines and evidence-based practice, screening for sepsis should be focused on the suspected source of infections and the body’s response as demonstrated by changes in vital signs.¹

Although there are many different approaches to sepsis screening in the emergency department, many focus on monitoring basic vital signs. Monitoring vital signs can be a tool to aid in identifying septic patients by assessing the following changes: temperature >38 degrees Celsius (100.4 F) or <36 degrees Celsius (96.8 F), heart rate >90 , respiratory rate >20 , altered mental status, and point-of-care lactate 2.0 or greater.⁶ Another valuable tool is inclusion of oxygen saturation (SpO₂) levels as part of sepsis screening. One study found the use of SpO₂—along with changes in heart rate, respiratory rate, and temperature—as a predictor of possible sepsis.⁷

Recommendations, based on the SSC, state that hospitals and hospital systems benefit from programs to identify sepsis.¹

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TABLE 1

Sepsis**With suspected infection, plus 2 of the following:**

Hyperthermia >38.8 Celsius (101.8 F) OR hypothermia <36 Celsius (96.8 F)	WBC >12,000 or <4,000 or bands >10%	Respiratory rate >20 bpm
Heart rate >90 bpm	Altered mental status	Hyperglycemia >120 mg/dL (nondiabetic)

Source: Stony Brook Medicine, 2013.
bpm = beats per minute.

TABLE 2

Severe sepsis**Suspected infection: 2 items from Table 1, plus 1 of the following:**

Hypotension (SBP <90/60) or MAP <65	DIC	Lactate >2	Bilirubin >2
Mottled, cool, clammy skin	Creatinine >2.0 mg/dL	Cardiac dysfunction	INR >1.5
Capillary refill >3 seconds	ARF or UO <0.5 ml/kg/h x 2 hours	Platelet count <100,000	Acute lung injury or ARDS

Source: Stony Brook Medicine, 2013.
ARDS = Respiratory distress syndrome; INR = international normalized ratio; DIC = disseminated intravascular coagulation; ARF = acute renal failure; UO = urine output; SBP = systolic blood pressure; MAP = mean arterial pressure.

SSC improvement projects aim at earlier recognition of sepsis through the use of screening tools and sepsis care bundles.¹ With delay in screening, there is delay in the identification of sepsis and, therefore, postponed treatment. Multiple research studies show an association with early screening for sepsis and decreased rates of mortality.¹

Highlights Regarding Sepsis Treatment Bundles

Positive sepsis screening in triage commences the initiation of sepsis protocols, standing orders, and treatment. Because of the possible rapid progression of sepsis, antimicrobial

therapy is recommended as soon as possible, with national goal set at within 1 hour of patient arrival.¹ Based on the SSC treatment bundles, the following steps need to be completed within 3 hours of patient arrival:

- Measure lactate level.¹
- Obtain blood cultures before administration of antibiotics, recommendations for 2 sets of blood cultures.¹
- Administer broad-spectrum antibiotics.¹
- Administer 30 mL/kg crystalloid for hypotension.¹

After 6 hours of the patient's arrival, and the completion of the previous bundle, the following must be completed:

- Apply vasopressors (if warranted because of persistent hypotension) to maintain mean arterial pressure greater than 65 mm Hg.¹
- If initial lactate is >4 mmol/L, reassess volume status and tissue perfusion to include 2 of the following: central venous pressure (CVP), central venous oxygen saturation (ScvO₂), cardiovascular ultrasound, fluid challenge, or passive leg raises.¹
- Repeat lactate level (if initial level was elevated).¹
- Focused assessment should be performed by health care provider.¹

TABLE 3

Severe sepsis with shock**Suspected infection plus criteria met from Table 1 and Table 2 plus the following:**

SBP <90 after fluid resuscitation	Serum lactate > or equal to 4.0 mmol/L
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Source: Stony Brook Medicine, 2013.

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