Clinical Position Statement

Sepsis

Effective: *August 2018*
Next Review: *April 2019*

CLINICAL POSITION STATEMENT

Sepsis is a life-threatening condition that requires rapid identification and action to prevent mortality or other devastating consequences. A review of the 2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference[1] and the American College of Chest Physicians/Society of Critical Care Medicine Consensus Conference[2] and other research and professional organization statements, documents all the following statements (I-III) regarding sepsis:

I. Sepsis, the systemic response to infection, manifested by two or more of the following conditions as a result of suspected infection:
   - Temperature: fever (> 38.0°C) or hypothermia (< 36.0°C)
   - Tachycardia (pulse > 90)
   - Tachypnea (respiratory rate > 20 bpm)
   - WBC > 12,000 or < 4,000 or Bands > 10%
   - Lactate > 1.0 mmol/L (> 4.0 is equivalent to septic shock)
   - Procalcitonin elevated >2 SD above the normal value
   - C-reactive protein elevated >2 SD above the normal value
   - Altered mental status
   - Mottling of the skin or prolonged capillary refill
   - Non-diabetic hyperglycemia (blood sugar > 110mg/dl); AND

II. The physiologic changes in sepsis should represent an acute alteration from baseline in the absence of other known causes for such abnormalities, including but not limited to chemotherapy, induced neutropenia, and leukopenia; AND

III. When sepsis is identified, a response should be initiated including rapid treatment and frequent reassessment of the patient. There must be clear and consistent provider documentation of sepsis that aligns with the documented clinical findings (e.g., labs, treatments, vital signs, etc.).

Sepsis is a syndrome in which there is no validated standard diagnostic test nor universally-accepted clinical diagnostic criteria. There are many studies evaluating the diagnosis and treatment of sepsis, and the definition and recommended courses of action are constantly evolving. The professional organization guidelines and recommendations described above

summarize the available literature and present recommendations based on the evidence in combination with expert consensus. Many aspects of care are supported by strong agreement within and across guidelines, including rapid treatment and frequent reassessment of patients after sepsis is identified. In addition, while there are a variety of definitions of sepsis, this clinical position statement aligns with the 2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference and the American College of Chest Physicians/Society of Critical Care Medicine Consensus Conference which are the most firmly established and well-supported definitions. In addition, the criteria align with current medical procedural coding.

PROFESSIONAL ASSOCIATION AND ORGANIZATION SUMMARY

AMERICAN COLLEGE OF CHEST PHYSICIANS/SOCIETY OF CRITICAL CARE MEDICINE

In 1992, an American College of Chest Physicians/Society of Critical Care Medicine Consensus Conference was held to define sepsis, and the results were published in "Definitions for Sepsis and Organ Failure and Guidelines for the Use of Innovative Therapies in Sepsis".[2] The report proposed the phrase systemic inflammatory response syndrome (SIRS) to describe the inflammatory process observed during sepsis. Sepsis, severe sepsis, and septic shock are defined as follows:

- Sepsis as the systemic response to infection, manifested by two or more of the following conditions as a result of infection: (1) temperature >38°C or <36°C; (2) heart rate >90 beats per minute; (3) respiratory rate >20 breaths per minute or PaCO2 <32 mm Hg; and white blood cell count > 12,000/cu mm, <4,000/cu mm, or >10% immature (band) forms;
- Severe sepsis as sepsis associated with organ dysfunction, hypoperfusion, or hypotension. Hypoperfusion and perfusion abnormalities may include, but are not limited to lactic acidosis, oliguria, or an acute alteration in mental status; and
- Septic shock as sepsis-induced hypotension, persisting despite adequate fluid resuscitation along with the presence of perfusion abnormalities that may include, but are not limited to, lactic acidosis, oliguria, or an acute alteration in mental status. Patients receiving inotropic or vasopressor agents may no longer be hypotensive by the time they manifest hypoperfusion abnormalities or organ dysfunction, yet they would still be considered to have septic shock.

These definitions are widely used, although alternative definitions have been proposed, as described below.

2001 SCCM/ESICM/ACCP/ATS/SIS INTERNATIONAL SEPSIS DEFINITIONS CONFERENCE

In 2001, several North American and European intensive care societies convened a conference to reevaluate the definition of sepsis proposed at the 1992 conference. The conclusions from this conference, sponsored by the Society of Critical Care Medicine (SCCM), The European Society of Intensive Care Medicine (ESICM), The American College of Chest Physicians (ACCP), the American Thoracic Society (ATS), and The Surgical Infection Society (SIS) were reported in two publications by Levy (2003).[1,3] The group concluded that although the current definition of sepsis did not allow precise staging and the diagnostic criteria are

overly sensitive and nonspecific, SIRS remains a useful concept. They proposed an expanded list of signs and symptoms of sepsis to better reflect the clinical response to infection. This expanded list is referred to as Sepsis 2.

EUROPEAN SOCIETY OF INTENSIVE CARE MEDICINE/SOCIETY OF CRITICAL CARE MEDICINE

In 2014, the European Society of Intensive Care Medicine and the Society of Critical Care Medicine convened a task force of specialists to create an updated definition of sepsis supported by the current evidence. The group published recommendations in 2016 with new definition for sepsis, which was labeled as Sepsis 3. The Sepsis 3 definition is “life-threatening organ dysfunction caused by a dysregulated host response to infection.”[4] Functionally, sepsis is defined as a suspected infection and an acute change in total Sequential Organ Failure Assessment (SOFA) score of two or more points, with SOFA measures including respiration, platelets, bilirubin, MAP, Glasgow Coma scale, creatinine, and urine output.

Septic shock is defined as “a subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities are profound enough to substantially increase mortality.” Functionally, “patients with septic shock can be identified with a clinical construct of sepsis with persisting hypotension requiring vasopressors to maintain MAP ≥65 mm Hg and having a serum lactate level >2 mmol/L (18 mg/dL) despite adequate volume resuscitation.”

The task force also proposed quick SOFA (qSOFA), a clinical tool that can be used to rapidly score patients at the bedside. It is stated to be less robust, but a rapid measure that can indicate the need for further investigation and increased monitoring.

THE NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

The National Institute for Health and Care Excellence (NICE) published a guideline addressing diagnosis and early management of sepsis in 2016 that was updated in 2017.[5] The guideline stratifies patients by risk for sepsis, using the presence of a number of signs and symptoms, including altered mental state, elevated heart or respiratory rate, low blood pressure, low urine output, mottled or ashen appearance, cyanosis of skin, lips, or tongue, or non-blanching rash. For those at high risk of sepsis, it recommends monitoring continuously, or at a minimum of every 30 minutes, conducting blood tests, delivering IV antibiotics, fluid administration. In addition, for those with suspected sepsis and any high-risk criteria, it recommends immediate review by a senior clinical decision maker.

SURVIVING SEPSIS CAMPAIGN

The Surviving Sepsis Campaign, initiated in 2002, is a collaboration between the Society of Critical Care Medicine and the European Society of Intensive Care Medicine, with the goal of reducing mortality from severe sepsis and septic shock. In 2012, the campaign gathered an international consensus committee consisting of 68 international experts representing 30 organizations. The results of this discussion were published in International Guidelines for management of Sepsis and Septic Shock (2012).[6] The guideline lists many recommendations, including blood cultures prior to the delivery of antibiotics, confirmation of the source of infection, and fluid resuscitation with a crystalloid.

In 2016, the campaign gathered another consensus committee, this time including 55 international experts representing 25 international organizations. This panel published International Guidelines for Management of Sepsis and Septic Shock (2016).[7] Regarding the

definition of sepsis, the publication states “As these guidelines were being developed, new definitions for sepsis and septic shock (Sepsis-3) were published. Sepsis is now defined as life-threatening organ dysfunction caused by a dysregulated host response to infection. Septic shock is a subset of sepsis with circulatory and cellular/metabolic dysfunction associated with a higher risk of mortality. The Sepsis-3 definition also proposed clinical criteria to operationalize the new definitions; however, in the studies used to establish the evidence for these guidelines, patient populations were primarily characterized by the previous definition of sepsis, severe sepsis, and septic shock stated in the 1991 and 2001 consensus documents.”

The guideline includes 93 statements on early management and resuscitation of patients with sepsis or septic shock, but does not include specific criteria for determining the presence of sepsis. Regarding evaluation of patients, the guideline states the following:

> One of the most important principles to understand in the management of these complex patients is the need for a detailed initial assessment and ongoing reevaluation of the response to treatment. This evaluation should start with a thorough clinical examination and evaluation of available physiologic variables that can describe the patient’s clinical state (heart rate, blood pressure, arterial oxygen saturation, respiratory rate, temperature, urine output, and others as available).

REFERENCES

1. Levy, MM, Fink, MP, Marshall, JC, et al. 2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference. *Intensive care medicine*. 2003 Apr;29(4):530-8. PMID: 12664219
2. Bone, RC, Balk, RA, Cerra, FB, et al. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. The ACCP/SCCM Consensus Conference Committee. American College of Chest Physicians/Society of Critical Care Medicine. *Chest*. 1992;101:1644-55. PMID: 1303622
3. Levy, MM, Fink, MP, Marshall, JC, et al. 2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference. *Critical care medicine*. 2003 Apr;31(4):1250-6. PMID: 12682500
4. Singer, M, Deutschman, CS, Seymour, CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA*. 2016;315:801-10. PMID: 26903338
5. National Guideline Centre (UK). Sepsis: recognition, assessment and early management. London: National Institute for Health and Care Excellence (UK); 2016 Jul. (NICE Guidance; no. 51). [cited 12/20/2017]; Available from: https://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0088862/pdf/PubMedHealth_PMH0088862.pdf
6. Dellinger, RP, Levy, MM, Rhodes, A, et al. Surviving Sepsis Campaign: international guidelines for management of severe sepsis and septic shock, 2012. *Intensive care medicine*. 2013 Feb;39(2):165-228. PMID: 23361625
7. Rhodes, A, Evans, LE, Alhazzani, W, et al. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. *Intensive care medicine*. 2017;43:304-77. PMID: 28101605

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