

# Simulation to Manage the Septic Patient in the Intensive Care Unit

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## KEYWORDS

- Sepsis • Severe sepsis • Septic shock • High-fidelity human patient simulation
- Simulation

## KEY POINTS

- Sepsis and septic shock are complex clinical conditions with high rates of morbidity and mortality.
- Nurses are directly involved with patient care and must have knowledge of evidence-based guidelines for the sepsis patient.
- High-fidelity human patient simulation (HF-HPSim) is used to increase the quality and quantity of student learning experiences in nursing education, while providing an experiential and safe learning environment.
- With its complexity and associated risks to patients, sepsis and septic shock are appropriate content to be taught with HF-HPSim.

Health care reform and advancing technologies in clinical practice and education are influencing today's health care professional student (eg, nurse, physician, respiratory therapist) to acquire clinical skills before graduation to care for patients in diverse health care settings. Today's health care settings have increasing complexity regarding technology and level of patient acuity. All health care graduates, especially nurses, who are directly involved with patient care must transition into practice as practitioners who can provide safe, quality, timely, and competent care.

Sepsis and septic shock are associated with high morbidity and mortality rates. Most patients with a diagnosis of sepsis are cared for by the health care team in the intensive care unit. However, evidence-based recommendations now indicate the need for screening of patients in the emergency departments and general medical floors.<sup>1-3</sup> Nurses provide direct patient care in these areas. Therefore, nurses can

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be a patient's first line of defense against sepsis through early recognition, comprehensive nursing assessments, and knowledge of evidence-based treatment plans for sepsis. To facilitate positive patient outcomes regarding sepsis, simulation, specifically, high-fidelity human patient simulation (HF-HPSim), can be used as an educational tool in nursing education. HF-HPSim is a student-centered, experiential, educational pedagogy that engages and prepares learners for real-world practice without risk of harm.<sup>4</sup>

## **SEPSIS**

### ***Definitions of Sepsis***

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Sepsis is defined as "a life-threatening organ dysfunction resulting from a dysregulated host response to infection."<sup>3</sup> A subset of sepsis associated with circulatory, cellular, and metabolic alterations is considered septic shock, with the inclusion of higher mortality rates than sepsis alone.<sup>3</sup>

### ***Overview***

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A source of infection (abscess, infected necrosis, infected intravascular access devices, oral decontamination with ventilated patients leading to ventilator-associated pneumonia) stimulates the innate immune system, activates white blood cells with an endothelial response, and releases mediators or cytokines in the process of sepsis.<sup>1</sup> The activation of this process results in a multitude of physiologic changes, including vasodilation, increased expression of adhesion molecules, capillary permeability, clot formation, and decreased fibrinolysis.<sup>1</sup> The overactivity of mediators contributes to endothelial cell damage, microcapillary permeability changes, capillary leak, vasodilation, and hypotension.<sup>1</sup> The progression of sepsis when not recognized or treated early leads to sepsis, septic shock, and the development of multiple organ system dysfunction.

To assist health care clinicians in managing sepsis through early recognition and treatment, and to improve patient outcomes and decrease mortality rates, new evidence-based guidelines have been released. The Surviving Sepsis Campaign implemented in 2012, with updates in 2016, organizes recommendations for sepsis care into 3 categories: (1) recommendations targeting the management of severe sepsis, (2) recommendations targeting high-priority general care, and (3) pediatric considerations.<sup>1-3</sup> These guidelines identify aims of early recognition, early treatment, and reduction of morbidity and mortality rates surrounding sepsis and its progression.

Nurses are a crucial component of the health care team. Nurses can integrate the new evidence-based recommendations surrounding sepsis into practice, thus improving the care of patients who are at risk for developing sepsis.

## **SIMULATION**

### ***Definitions of Simulation***

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Simulation is defined as "a student or group of students providing care for a patient who is represented by a mannequin, an actor, or a standardized patient, depending on the clinical situation."<sup>5</sup> The clinical situation can be represented through a scripted, predetermined scenario or an unscripted on-the-fly scenario. The clinical scenario is followed by a debriefing session. The debriefing session is an opportunity for learners and educators to reflect on the scenario as it unfolded. Constructive feedback is provided by educators and is used as a complement and experiential application to didactic and clinical learning.

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