

# Sepsis Rapid Response Teams

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## KEYWORDS

• Septic shock • Sepsis • Infection

## KEY POINTS

- Sepsis rapid response teams can improve patient outcomes.
- Protocol-based therapies in the treatment of septic shock have been shown effective.
- Hospital-wide quality-improvement initiatives are the backbone of the rapid response team.

## BACKGROUND

Sepsis remains the leading cause of death in critically ill patients. Septic shock continues to carry a mortality risk of 20% to 40%, contributing to approximately 1 in every 3 deaths in the United States.<sup>1,2</sup> Studies have shown that the best predictors of improved mortality outcome are early recognition of septic shock and timely administration of antibiotics.<sup>3,4</sup> Rapid response teams (RRTs) provide an ideal means to achieve these goals for hospitalized patients outside the ICU.

Sepsis is defined as a syndrome of dysregulated host response to infection leading to life-threatening organ dysfunction.<sup>5,6</sup> Unlike other life-threatening conditions, like acute coronary events, stroke, or trauma, early sepsis syndrome can be initially associated with subtle nonspecific signs that are easy to miss. Additionally, numerous previous clinical trials attempting to target key factors that are inappropriately elaborated or not cleared, such as nitric oxide or lipopolysaccharide, have not demonstrated mortality benefit.<sup>7</sup> Rather, some have found increased mortality. Thus, the standard of care remains early recognition of septic shock and implementation of a treatment bundle centered on optimizing perfusion, obtaining source control when possible, and delivery of appropriately dosed, broad-spectrum antibiotics within 1 hour of onset of shock.<sup>8</sup>

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As in many life-threatening conditions, early identification of sepsis is key. Identification of septic patients and the implementation of early resuscitation along with early antibiotic administration seem to be what makes the difference in these patients' outcomes; hence, early goal-directed therapy is recommended by the Surviving Sepsis Campaign.<sup>3,8</sup> This strategy focuses on early resuscitation with fluids and pressors (when needed) and the early administration of antibiotics when a bacterial infection is suspected, while monitoring for end-organ ischemia as a guide for ongoing resuscitation. Multiple barriers have been identified, however, when it comes to the management of septic patients: these include the inability to continuously monitor all hospitalized patients, the inability to recognize critical illness early on, and the inability to use available resources when needed.<sup>3</sup> Aside from providing resources for timeliness of resuscitation and antibiotic therapy, RRTs and medical emergency teams (METs) provide clinicians who are versed in the latest resuscitation methods and treatment modalities for septic shock. In net sum, a sepsis RRT can provide the needed multidisciplinary expertise and resources to implement the evidence-based guidelines put forth by various national organizations as best practice for the initial management of septic shock.

### **SEPSIS RAPID RESPONSE TEAMS: WHAT ARE THEY? HOW ARE THEY DIFFERENT FROM OTHER RAPID RESPONSE TEAMS?**

One important resource available to address the initial evaluation and timely initiation of treatment to critically ill patients is an RRT/MET dedicated and trained specifically to manage septic patients in a standardized fashion. Health care systems have started to incorporate sepsis as a specific entity when it comes to activating the rapid response system (RRS), with the main goal of raising awareness among health care providers and staff on the importance of early identification and early management of these patients. These teams are typically multidisciplinary, consisting of nurses, respiratory therapists, critical care staff, and pharmacists who are trained in recognition and implementation of sepsis-specific protocols.

The dedicated sepsis RRT/MET evaluates these patients in a standardized fashion, using established diagnostic criteria, such as systemic inflammatory response syndrome (SIRS)/sequential organ dysfunction assessment (SOFA) scores, modified early warning scores (MEWS), or basic physiologic and laboratory work parameters to identify at-risk patients. Patients who are hypotensive (systolic blood pressure <90 mmHg, or mean arterial pressure <60 mmHg) or normotensive, with concerning signs of tachypnea, skin mottling, acute encephalopathy, oliguria, or lactic acidosis, benefit from having a dedicated team that follows a standardized treatment protocol.<sup>9</sup>

What makes sepsis response teams different is their education in early sepsis recognition, resuscitative therapy, and rapid administration of appropriate antibiotic treatment, often as part of a hospital-wide initiative. To augment the ability to administer antibiotics in a timely fashion, large hospitals can include a clinical pharmacist as part of the responding team.<sup>10</sup> This sepsis RRT, which is specifically educated in sepsis management, can then choose the ideal antibiotics based on an antibiotic algorithm specific to the hospital.<sup>11</sup> This forward planning has been shown to improve both the timely administration of antibiotics as well as the probability of appropriately covering the offending microbe(s).

### **OUTCOMES AFTER IMPLEMENTATION OF SEPSIS RAPID RESPONSE TEAM/MEDICAL EMERGENCY TEAM**

The concept of an RRS was described in the 1990s.<sup>12,13</sup> Since then, the implementation of an RRS has been shown to significantly reduce time to intensivist arrival, time to

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