Improving Pediatric Sepsis Outcomes Through Application of The Phoenix Criteria

Madison Barber

Margaret H. Rollins School of Nursing

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Dr. A. Watson

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Around the world, pediatric sepsis remains as a global health concern. It is of the utmost importance with pediatric sepsis that symptoms are recognized early to reduce mortality rates. Since sepsis can manifest as an array of symptoms, a criteria is the best way to provide a structured approach in recognizing and caring for the pediatric patient. According to an article from the Journal of the American Medical Association, in 2024, the Pediatric Sepsis Definition Task Force updated the pediatric sepsis definition to multiple organ dysfunction in the presence of an infection. To support this new definition, an updated criteria was created to replace the past, outdated criteria from 2005 (Sanchez-Pinto, Bennet, DeWitt, et al., 2024). The new checklist evaluates respiratory, cardiovascular, coagulation, and neurologic function on a point scale to rapidly identify and classify a pediatric sepsis condition (Pomrantz and Carlton, 2025). In turn, it can help to provide appropriate intervention measures in a timely matter to improve the outcome of the patient.

Overview of The Phoenix Criteria

Due to the constant challenges of treatment in pediatric sepsis, it is important that assessment tools and treatments stay up to date with the current advancements of medicine. According to the article from the Journal of the American Medical Association, in 2016, the Sepsis-3 Task Force changed the definition of adult sepsis to a severe infection that leads to multiple organ dysfunction, along with creating a new criteria to be used in the electronic health record as a clinical tool for assessments. In 2019, the Society of Critical Care Medicine Pediatric Sepsis Task Force followed these actions by adopting the same definition for pediatric patients, as well as creating a new tool to be used in the EHR and in the clinical setting. The last criteria to be

created dated back to 2005, by the Pediatric Sepsis Consensus Conference. Since the update of the new definition of sepsis, the older criteria's disadvantages became evident, such as lack of detail and assessments that could not be used in lower resourced facilities. The Pediatric Sepsis Task Force recognized these limitations and took them into consideration with making the new and updated standards (Sanchez-Pinto, Bennet, DeWitt, et al., 2024). According to UpToDate Phoenix Sepsis Score criteria, the result was a body system-based point scale that would consider lab values, vital signs, and level of conscious in a sepsis event. The first category is the respiratory category that assesses a PaO2:FiO2 ratio, a SpO2:FiO2 ratio, and what kind of respiratory support is being utilized. The next category is cardiovascular, where it assesses the use of vasoactive medications, a lactate level, and the mean arterial blood pressure based on age range. The following category is coagulation, where it assesses platelets, international normalized ratio, d-dimer, and fibrinogen levels. The final category assesses neurological function and takes into consideration the Glasgow Coma Scale score, as well as pupil function. Once all the categories are added together, sepsis is indicated if there is a score of equal to or greater than 2 points from any category. The criteria also can help to assess for septic shock, which is equal to or greater than 1 point in the cardiovascular section (Pomrantz and Carlton, 2025). With the definitions of sepsis and septic shock implemented into the criteria, it was set to be used in emergency rooms, inpatient hospital units, and the pediatric intensive care unit to help classify the extent of sepsis rapidly (Sanchez-Pinto, Bennett, DeWitt, et al., 2024). By implementing the new criteria in clinical settings, it would provide a new standard of care to decrease mortality rates in a decompensating patient.

Significance of The Phoenix Criteria in Clinical Settings

In clinical settings, the criteria have helped to create a standard approach of assessments in relation to a pediatric sepsis event to help improve the outcome of the patient. A recent study from the Society of Critical Care Medicine took Phoenix Sepsis Scores from 6 different continents EHR. The results of the study showed that in patients with a Phoenix Sepsis Score equal to or greater then 2, there was a 7.1% mortality rate in higher resource settings, and a 28.5% mortality rate in lower resource settings (Schlapbach, Watson, Source, et al., 2024). The results emphasized that the Phoenix Criteria performed well in the early recognition of sepsis to improve the outcome for the pediatric patient, regardless of the facilities resources. Due to the past criteria having assessments only higher resourced facilities can follow, the new criteria would have the following:

> They acknowledged that serum lactate testing and mechanical ventilation or vasoactive medications may not be available in lower-resource settings. However, they noted that built-in redundancy in the score allows other score items to be used instead to ensure high accuracy in identifying life-threatening sepsis, even in lower-resource settings". (*SCCM Task Force Develops New Criteria to Identify Pediatric Sepsis*, 2024).

Implemented into the criteria is enough assessment measures that if a lower resource facility has a lack of resources, they can still make a classification of the extent of the septic event. This is a far advancement from any past criteria used in the classification of pediatric sepsis since they all had favored higher resourced facilities. Another key significance from the Phoenix Criteria is that it allows for high specificity during a pediatric sepsis event. An article from the National Library of Medicine said the following:

> By requiring organ dysfunction for sepsis diagnosis, the new Sepsis Criteria (Phoenix Score) ensures that only truly severe cases are classified as sepsis, which aligns with the

> original intent of the term “life-threatening condition”, reducing unnecessary treatments such as antibiotics and fluid overload from aggressive resuscitation. (Shamavu and Mohamoud, 2025).

By changing the official definition of pediatric sepsis to be more critical, this meant that the Phoenix Criteria needed to involve more critical assessments. So, the criteria focused on findings in patient after the sepsis has progressed to multiple organ dysfunction. By doing this, it allows for an accurate classification of sepsis, as well as not starting any unnecessary treatment measures. By implementing a fluid bolus or antibiotics on a non-septic patient, this can cause harm to the patient and create problems that did not originally exist. Last, with the use of a criteria, it allows for consistency in the classification of organ dysfunction in the event of sepsis. According to the article from the Journal of the American Medical Association, “New pediatric sepsis criteria should maximize identification of true-positive cases so that infected children with life threatening organ dysfunction receive best-practice sepsis care, are appropriately enrolled in clinical studies, and are correctly represented in epidemiological surveillance (Sanchez-Pinto, Bennett, Dewitt, et al., 2024). This highlights the importance of a systematic approach that the Phoenix Criteria focuses on, to overall improve the care and outcome for the pediatric patient. In conclusion, the Phoenix Criteria is effective in improving mortality rates in the pediatric population, involving assessments for higher and lower resourced facilities, having high specificity that can rule out a false diagnosis of sepsis and creating a standardized approach to the classification of sepsis.

The Impact on Nursing and Patient Care

In the care of a pediatric sepsis patient, nurses are an essential part of the care team. They perform assessments, take vital signs, maintain orders, and provide interventions for the patient.

By implementing the Phoenix Criteria into EMRs, nurses can determine if a patient's condition is declining through assessments and vital signs. They can then escalate the situation to the provider, where the multidisciplinary team can collaborate on the next treatment measure. Common treatments that nurses can provide in the care of a septic pediatric patient include administering antibiotics and IV fluid boluses, such as Lactated Ringers (The American Nurse, 2022). Even in lower resourced facilities, nurses and the care team can still use the Phoenix Criteria to guide their assessments. According to the article from the Journal of the American Medical Association, "For example, even though platelets were commonly measured at most sites, coagulation tests (e.g., D-Dimer and fibrinogen) were less commonly available" (Sanchez-Pinto, Bennett, Dewitt, et al., 2024). By including measurements that lower resourced facilities can use, this allows for nurses to still be able to perform an accurate assessment of the status of a pediatric septic patient. Improved patient results is the greatest outcome of the Phoenix Criteria, as it shows as a 7.1% mortality rate in higher resource settings, and a 28.5% mortality rate in lower resource settings (Schlapbach, Watson, Source, et al., 2024). A reduced mortality rate in the presence of use of the Phoenix Criteria shows that it is effective in recognizing a worsening septic patient. It also shows that the worsening condition was able to be caught in time for the care team to provide life saving interventions. By providing these interventions, that can increase patient and family trust in the care team. Overall, the Phoenix Criteria helps to guide nurses and the care team on assessments and interventions to provide the best quality patient care no matter what resources the facility has.

In conclusion, the Phoenix Criteria has shown to be a positive addition in clinical settings to classify sepsis in a pediatric patient. The Society of Critical Care Medicine Pediatric Sepsis Task Force defined pediatric sepsis as a multiple organ dysfunction in the presence of an infection

(Sanchez-Pinto, Bennet, DeWitt, et al., 2024). By including multiple organ dysfunction in the definition of sepsis, it allowed for the assessments to only be applied in a higher acuity patient. The new checklist evaluates respiratory, cardiovascular, coagulation, and neurologic function on a point scale. (Pomrantz and Carlton, 2025). In turn, with the application of the scoring system, it then can help to guide interventions to improve the outcome of the patient. Compared to past criteria's, which followed a lesser acuity definition of sepsis, it has outperformed them in the sense of decreased mortality rates, higher sensitivity to reduce a false positive diagnosis, and being accessible to higher and lower sourced facilities. All in all, the Phoenix Criteria is a strong clinical resource to be used in the care of a pediatric septic patient.

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