The Phoenix criteria for paediatric sepsis: 2 years on

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As one of the leading causes of childhood morbidity and mortality worldwide, paediatric sepsis is a major global public health concern. Despite advances in paediatric critical care, timely identification of children at high risk of mortality remains challenging, largely due to the non-specific nature of early clinical signs and the heterogeneity of sepsis as a clinical syndrome.

For two decades, paediatric sepsis definitions were based on systemic inflammatory response syndrome (SIRS) criteria, despite minimal validation.[1] Evidence has since shown that SIRS diagnosis lacks sensitivity and specificity for predicting mortality risk, and that paediatric sepsis is a complex, dynamic process involving both pro-inflammatory and anti-inflammatory pathways leading to organ dysfunction. In response to these limitations, the Society of Critical Care Medicine Pediatric Sepsis Definition Task Force applied a rigorous, data-driven methodology to derive new criteria for paediatric sepsis that better aligned with the contemporary understanding of sepsis pathobiology.[2] The new Phoenix criteria thus redefined paediatric sepsis as suspected or confirmed infection accompanied by organ dysfunction, and the criteria were to be operationalised by the Phoenix Sepsis Score, which integrates abnormalities across four key organ systems—cardiovascular, respiratory, neurological, and coagulation—and has been validated across the paediatric age spectrum, from term neonates to adolescents.[2]

Since the international roll-out of the Phoenix criteria for sepsis in January, 2024, important questions and concerns have emerged. One concern is that abandoning the requirement for SIRS in sepsis criteria might delay recognition and treatment, potentially increasing mortality. However, SIRS is a host response to infection rather than sepsis and therefore better suited for infection screening than for defining life-threatening organ dysfunction. Furthermore, SIRS is a dynamic process of the adaptive immune response; stringent reliance on SIRS in sepsis criteria can contribute to overtreatment, whereas a substantial proportion of children with sepsis never reach the diagnostic criteria for SIRS. These limitations underscore the need for alternative approaches to risk stratification that are aligned with contemporary concepts of paediatric sepsis.

Since 2024, multiple studies have evaluated the performance and validity of the Phoenix Sepsis Score across diverse paediatric populations and health-care settings. Overall, higher Phoenix Sepsis Scores are consistently associated with increased mortality, intensified organ support, and extended intensive care stays, demonstrating the ability of the Phoenix Sepsis Score to identify children with life-threatening infection. In multicentre cohorts from high-income settings, the Phoenix Sepsis Score has performed as well as or better than existing paediatric organ dysfunction scores in predicting sepsis-related mortality.[3–7] Notably, across these cohorts, SIRS criteria were absent in up to a third of children who did meet Phoenix criteria for sepsis and showed clinically meaningful mortality, underscoring the limitations of SIRS-based approaches.[3–7]

Nevertheless, the Phoenix Sepsis Score has clear limitations in early-care settings such as emergency departments and emergency transport.[8,9] Indeed, the Phoenix Sepsis Score was not designed as an early screening tool. Studies indicate that the Phoenix Sepsis Score has low sensitivity during the initial phases of clinical evaluation, when organ dysfunction might not yet be fully established. In this context, patients with suspected sepsis might benefit from early empirical therapy before a definitive diagnosis can be made. Together, these findings reinforce the primary role of the Phoenix Sepsis Score in identifying established organ dysfunction, diagnosing sepsis, and stratifying severity, rather than in the early recognition and triage of children with suspected sepsis. Although retrospective studies show encouraging performance across important care settings, the Phoenix criteria for sepsis still need prospective validation in real-world and resource-diverse environments.

In terms of clinical practice, two related questions have emerged in the past 2 years. Has introduction of the Phoenix Sepsis Score changed early recognition and resuscitation of suspected sepsis? How should clinicians approach children with infection and signs of hypoperfusion who do not yet meet Phoenix criteria for sepsis?

With respect to early recognition and management, the answer is clear: clinical practice should not change. Early recognition of suspected sepsis continues to

rely on clinical judgment, integrating medical history, physical examination, and overall clinical assessment. Treatment must remain presumptive, and resuscitation should not be delayed while awaiting formal fulfilment of Phoenix criteria for sepsis. SIRS parameters might assist in identifying infection, but their absence does not exclude sepsis.

Children with infection and clinical signs of hypoperfusion who do not yet meet Phoenix criteria for sepsis should be managed as having severe infection with suspected septic shock and receive prompt empirical antimicrobials and fluid resuscitation when appropriate. These early interventions might mitigate progression to overt organ dysfunction and reduce the need for intensive care.

Recent Surviving Sepsis Campaign guidelines[10] recognise and reinforce a fundamental reality that should not be overlooked: diagnosis of sepsis in children is often uncertain and, in its early stages, largely presumptive. The introduction of standardised terms such as probable sepsis and suspected septic shock reflects this uncertainty and aligns closely with real-world clinical decision making whereby treatment is often initiated before diagnostic confirmation.[10] In this context, emphasis is placed on early recognition based on clinical suspicion, ideally embedded within structured quality improvement programmes. Clinicians must continue to treat the patient, not the score: rather than a replacement of clinical judgment, the Phoenix Sepsis Score is a tool to confirm diagnosis and an aid in clinical decision making, quality assessment, and research in patients with confirmed sepsis. Management of suspected sepsis in children should stay grounded in comprehensive clinical assessment and early protocol-driven treatment, regardless of the score.

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