

Letter to the Editor

Comments on "Shock index for prehospital sepsis recognition"

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Keywords: Shock index, Emergency medical services, Sepsis recognition, Risk stratification

<https://doi.org/10.62186/001c.144343>

Academic Medicine & Surgery

To the Editor:

Banerjee et al. report that elevated shock index (SI) and extreme modified SI (MSI) among EMS patients flagged by a prehospital sepsis alert correlate with hyperlactataemia and worse in-hospital outcomes. This is an appealing case for SI as an "invisible lactate" where laboratory testing is unavailable.¹ Their observations echo prior work linking higher SI with higher lactate and mortality, including paediatric septic-shock cohorts in which referred patients arrived with significantly higher SI, higher lactate, and higher mortality than direct presenters.¹

I agree that simple vital-sign indices deserve attention in the field, but several points may sharpen interpretation and implementation.

1) Screening context and comparators. Prehospital sepsis identification is heterogeneous, with variable sensitivity and specificity across Systemic Inflammatory Response Syndrome (SIRS), quick Sequential Organ Failure Assessment (qSOFA), Prehospital Early Sepsis Detection (PRESEP), Modified Early Warning Score (MEWS) / National Early Warning Score (NEWS) / National Early Warning Score 2 (NEWS2); notably, qSOFA performs poorly in the prehospital setting.² Any SI/MSI rule intended for field use should be benchmarked head-to-head against validated prehospital instruments and combinations thereof (e.g., SI layered onto NEWS2), using discrimination, calibration and clinical-utility metrics.

2) Prognostic layering with NEWS2. In a multicentre prehospital septic-shock cohort, a prehospital NEWS2 ≥ 7 was associated with higher in-hospital, 30-day and 90-day mortality (adjusted risk ratios ≈ 2).³ Testing whether SI/MSI adds incremental prognostic value beyond NEWS2, via net reclassification improvement and decision-curve analysis, would clarify its unique role (rapid flag versus full triage).

3) Prehospital process effects on SI. SI at first EMS contact reflects underlying pathophysiology and the pre-hospital journey (referral delays, transport conditions, early treatments). In children with septic shock, referral from another facility is independently associated with higher admission SI, higher lactate and higher mortality after adjustment.¹ This illustrates how transport factors shape haemodynamics before arrival. Future analyses should adjust for referral/transfer status, transport time and pre-arrival care to isolate SI's biological signal from system effects.

Methodologic and implementation suggestions. I encourage (a) pre-specified, single operational cut-offs for SI/MSI with sensitivity analyses; (b) full reporting of Area Under the Receiver Operating Characteristic curve (AUROC), sensitivity/specificity, predictive values, and calibration (slope/intercept); and (c) evaluation of serial change (Δ SI) to capture trajectory. Operationally, embedding SI triggers within protocolised bundles, i.e. repeat vitals to confirm instability, a brief sepsis screen (suspected source, respiratory rate, mentation), and, where available, point-of-care lactate may translate predictive signal into action. Calibrating thresholds for older adults and those on rate-limiting agents could reduce false positives.

Bottom line. Banerjee et al. propose a practical "first-touch" tool. Improving external validity through system-level adjustments and testing incremental value over NEWS2 should speed up adoption and assist EMS leaders in determining where SI fits, whether in screening, risk stratification, or bundle activation, across diverse prehospital setting environments.²⁻⁴

Submitted: September 10, 2025 EST. Accepted: September 12, 2025 EST. Published: November 06, 2025 EST.



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