



Beyond Mean Arterial Pressure: Critical Nuances in Hemodynamic Targeting for Severe Traumatic Brain Injury

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Dear Editor,

The multi-center study by Jiang et al. provides a provocative challenge to the traditional systolic blood pressure (SBP) <90 mmHg hypotension threshold in severe traumatic brain injury (STBI) (3). However, several methodological gaps warrant discussion before these findings can influence clinical guidelines.

First, the authors conclude that mean arterial pressure (MAP) is the strongest predictor of one-week mortality. Yet, in neurosurgical practice, MAP is primarily a surrogate for cerebral perfusion pressure (CPP=MAP-ICP). Without concurrent data on intracranial pressure (ICP), a high MAP may simply be a compensatory response to intracranial hypertension rather than an independent driver of survival. This distinction is vital; targeting a specific MAP range without acknowledging the underlying intracranial physiology risks mismanaging the very perfusion the authors aim to optimize.

Furthermore, the optimal SBP range (120–129 mmHg) must be viewed through the lens of potential confounding by indication. Admission blood pressure and lactate are heavily influenced by pre-hospital fluid resuscitation and vasopressor use—variables not explicitly controlled for in this analysis (1,2). This raises questions about whether the authors' preference for MAP over SBP is a statistical artifact of their specific cohort rather than a universal physiological truth.

Finally, while the utility of lactate is emphasized for resource-limited settings, its lack of specificity for neuro-metabolic crises—as opposed to systemic polytrauma—remains a limitation. Did the authors adjust for extracranial injury severity to isolate lactate's neuro-specific prognostic value?

Even though Jiang et al. correctly highlighted the inadequacy of binary hypotension definitions, clinicians should exercise caution in adopting these narrow numerical targets until the

interplay between systemic hemodynamics and intracranial physiology is clarified (3).

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AUTHORSHIP CONTRIBUTION

The author (OOA) confirm responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

REFERENCES

- 1 Burke EG, Hartley BW, Succar B, Dumas RP: Rethinking vasopressor use in the trauma bay : a shifting perspective. *Trauma Surg Acute Care Open* 10(e001788):1–7, 2025. <https://doi.org/10.1136/tsaco-2025-001788>
- 2 Hußmann B, Lefering R, Taeger G, Waydhas C, Ruchholtz S: Influence of prehospital fluid resuscitation on patients with multiple injuries in hemorrhagic shock in patients from the DGU trauma registry. *J Emerg Trauma Shock* 4:465–471, 2011. <https://doi.org/10.4103/0974-2700.86630>
- 3 Jiang H, Zeng W, Zhang X, Dong L, Pei Y, Peng A: Associations of blood pressure and serum lactate levels upon admission with one-week mortality in patients with severe traumatic brain injury: a multi-center retrospective study. *Turk Neurosurg* 35:492–502, 2025. <https://doi.org/10.5137/1019-5149.JTN.47272-24.1>