

Letter to the Editor Regarding “Comparative Analysis of Repeat Cranial Imaging in Mild Traumatic Brain Injury: Evaluating Risk Factors, Costs, and Radiation Exposure Between 2017 and 2023”



We read with great interest the recent article by Jehli et al.¹, “Comparative Analysis of Repeat Cranial Imaging in Mild Traumatic Brain Injury: Evaluating Risk Factors, Costs, and Radiation Exposure Between 2017 and 2023.” The authors provide strong insights into mild traumatic brain injury patients and that delayed neurosurgical interventions are predominantly triggered by clinical deterioration rather than scheduled imaging.

From an emergency medicine perspective, we believe the study invites a deeper reframing of the decision problem. Current discourse largely dichotomizes patients as “neurologically stable” or “unstable.” However, this binary classification is insufficient. The critical question is not merely whether a patient is stable at a single time point, but whether subsequent neurological deterioration would be reliably detectable in the real-world clinical environment.

Conceptually, we propose clinical observability as a missing dimension in repeat imaging decisions, defined as the likelihood that neurological deterioration will be promptly recognized. Patients may appear “stable” yet have low observability due to intoxication, cognitive impairment, communication barriers, baseline deficits, or suboptimal monitoring environments, where serial neurological assessment is inherently unreliable. We outline a simple composite, unvalidated index incorporating neurological reliability, communication capacity, monitoring quality, and discharge safety to structure this concept. Low-observability patients may require a lower threshold for repeat imaging, whereas highly observable patients may be safely managed with observation. This pragmatic, hypothesis-generating framework integrates biological risk and observability and is readily testable in prospective cohorts. This framework is not intended for immediate clinical adoption but for prospective validation.

This distinction suggests that repeat imaging strategies should not be solely risk-based (e.g., age, anticoagulation, and skull fracture), but observability-adjusted. In other words, computed tomography should be selectively considered not only in biologically high-risk patients but also in those whose clinical trajectory cannot be confidently observed. Recent guidelines emphasize the role of clinical deterioration in guiding repeat imaging decisions rather than relying solely on fixed time-based protocols.^{2,3} However, they implicitly assume reliable neurological monitoring, an assumption that may not hold across diverse emergency care settings.

Operationally, the findings by Jehli et al. highlight an underappreciated gap between radiological progression and what we term actionable progression. While imaging may reveal progression of intracranial hemorrhage, intervention appears to be temporally coupled to clinical deterioration rather than radiological change alone. This is consistent with prior observational and meta-analytic evidence demonstrating that routine repeat computed

tomography in stable patients has a relatively low likelihood of altering clinical management.^{4,5}

Importantly, clinical observability is not solely a patient characteristic but also a system property. Emergency department crowding, staffing ratios, availability of observation units, and frequency of neurological reassessment directly influence the safety of a selective imaging strategy. Thus, the same patient may warrant different approaches depending on the care setting. Selective repeat computed tomography is therefore only as safe as the system’s capacity to observe.

In this context, we suggest integrating clinical observability into existing risk frameworks rather than treating it as a parallel construct, enabling a more precise, context-sensitive approach to repeat imaging decisions. Such an approach may better balance safety with resource stewardship, particularly in high-volume emergency settings. This conceptual shift reframes repeat imaging as an observability problem rather than solely a risk stratification problem. This represents a shift from protocol-driven to context-aware decision-making.

Jehli et al. provide compelling evidence to move beyond routine imaging protocols. The next step, in our view, is to refine decision-making by explicitly incorporating the often-overlooked variable of clinical observability.

CRediT AUTHORSHIP CONTRIBUTION STATEMENT

Yalcin Golcuk: Conceptualization, Writing — original draft, Writing — review & editing. **Olca Korkmaz:** Conceptualization, Writing — original draft, Writing — review & editing.

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