Letter to Editor

Bull Emerg Trauma 2026;14(3):2-4.

Bulletin of Emergency And Trauma



EMR-Integrated Trauma Scoring: Transitioning from Traditional Registries to a Real-Time Infrastructure for Research and Quality Improvement

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Received: November 11, 2025
Revised: February 14, 2026
Accepted: April 13, 2026

Keywords: Electronic medical record (EMR); Trauma-scoring systems; Registries.

Please cite this paper as:
Karajizadeh M, HematiAlamdarlo MA, Paydar S, Yadollahi M. EMR-Integrated Trauma Scoring: Transitioning from Traditional Registries to a Real-Time Infrastructure for Research and Quality Improvement. *Bull Emerg Trauma*. 2026;14(3):2-4. doi: 10.30476/beat.2026.109655.1648.

Dear Editor

Each year, over 4.4 million people die from injuries worldwide, with 90% of these deaths occurring in low- and middle-income countries, where trauma registries are often incomplete or absent [1]. Traditional trauma registries have long served as the cornerstone of trauma research and quality improvement [2, 3]. However, they are inherently limited by retrospective data entry, selective variable sets, and delayed processing.

We propose that embedding validated trauma-scoring systems—such as the abbreviated injury scale (AIS), injury severity score (ISS), and revised trauma score (RTS)—directly into comprehensive electronic medical record (EMR) platforms offers a powerful, real-time alternative. When fully integrated into clinical workflows, an EMR-based trauma-scoring architecture can:

Capture incident data at the point of care, reducing reliance on manual abstraction [2].

Link pre-hospital, in-hospital, laboratory, imaging, and rehabilitation data in a longitudinal continuum [3].

Enable continuous analytics and predictive modelling, including time-to-intervention, blood-product utilization, intensive care unit (ICU) demand, and mortality risk [4].

Automatically generate International Classification of Diseases, 10th Revision (ICD-10), International Classification of Diseases, 11th Revision (ICD-11), and Systematized Nomenclature of Medicine – Clinical Terms (SNOMED CT) codes from real-time AIS entries, lowering coding costs and enhancing interoperability [5].

Compared with standalone registries and data warehouses, EMR-integrated systems provide bidirectional data flow, supporting both bedside decision support and advanced research (Table 1) [6, 7]. In addition to these advantages, EMR-integrated trauma-scoring systems offer several further benefits. Automated data capture reduces transcription and abstraction errors, improving the overall quality and reliability of trauma data. Standardized, real-time coding enhances the feasibility of multicenter comparative research, enabling institutions to participate in large-scale studies with consistent variable definitions. Moreover, access to real-time

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Table 1. Comparison of trauma data systems

Feature	Traditional Registry	EMR-Integrated Scoring	Data Warehouse
Data collection timing	Retrospective	Real-time	Retrospective/Batch
Data flow	One-way	Bidirectional (clinical decision support)	One-way/Limited analytics
Coding and standardization	Manual, variable quality	Automated, standardized (ICD-10[a]/ICD-11[b]/SNOMED CT[c])	Semi-automated, dependent on ETL[d]
Coding cost and effort	High (manual)	Low (automated)	Moderate/Semi-automated
Predictive capability	Limited	High	Moderate
Interoperability	Moderate	High	Moderate
Data quality	Variable, prone to errors	High, near real-time	Moderate, depends on ETL
Accessibility	Limited to registry staff	Broad (clinical and research)	Moderate, research-focused
Longitudinal patient tracking	Limited	High (pre-hospital to rehab)	Moderate, depends on sources
Decision support	None	Yes (alerts, dashboards)	None/Limited
Research utility	Moderate	High	High
Regulatory compliance	Standard reporting	Yes	Limited

a: International Classification of Diseases 10th Revision, b: International Classification of Diseases 11th Revision, c: Systemized Nomenclature of Medicine–Clinical Terms, d: Extract, transform, and load

clinical data provides an effective platform for training and performance improvement, supporting simulation, audit, and rapid feedback for clinical teams.

Implementation challenges—including initial infrastructure costs, standardized AIS mapping across EMR vendors, staff training, and data governance—are significant yet surmountable [8]. At present, this proposal represents a conceptual framework and a call to action rather than a report of a completed pilot study. Nonetheless, several key implementation considerations inform the feasibility of EMR-integrated trauma-scoring systems.

Workflow and Algorithmic Integration: Trauma scores, such as the ISS and RTS, can be calculated at specific trigger points within the patient encounter. For example, the ISS can be auto-generated once the attending physician enters structured anatomical injury codes or selects AIS-mapped diagnoses. Similarly, the RTS can update dynamically as vital signs and Glasgow Coma Scale (GCS) scores are captured, allowing for continuous risk stratification.

Technical Challenges: Implementation requires resolving several informatics obstacles, including interoperability across different EMR platforms, standardized structured data entry versus reliance on free text, and the need for validated AIS-to-ICD and AIS-to-SNOMED CT mapping tools. Another important issue is liability and oversight, particularly when automated scoring feeds into clinical decision support pathways. Ensuring that scores are transparent and auditable is essential for safe adoption.

Data Privacy and Governance: EMR-integrated scoring produces rich longitudinal datasets that must be governed responsibly. Access for research should follow strict data-governance rules, including role-based access control, de-identification procedures, and compliance with national health-information privacy regulations. Institutions may require formal data-access committees to review requests and maintain audit trails.

We urge trauma-care institutions and researchers to prioritize EMR-based trauma-scoring platforms as the primary research backbone in resource-limited settings and as a powerful complement to traditional registries elsewhere. This paradigm shift can transform routine clinical documentation into a living research resource, accelerating evidence generation and ultimately improving patient outcomes.

Declarations

Ethics Approval and Consent to Participate: Not Applicable.

Consent for Publication: All the authors declare their consent for publication.

Conflict of Interest: The authors have no competing interests for this research.

Funding: The authors have no funding source for this research.

Authors' Contributions: MK: Study conception and design, drafting and revision; SHP: Drafting and revision; MY: Drafting and revision.

Data Availability: De-identified data may be available from the corresponding author upon reasonable request and with institutional approvals.

References

1. World Health Organization. Injuries and violence. Geneva: WHO; 2023. Available at: https://www.who.int/news-room/fact-sheets/detail/injuries-and-violence
2. Zehtabchi S, Nishijima DK, McKay MP, Mann NC. Trauma registries: history, logistics, limitations, and contributions to emergency medicine research. *Acad Emerg Med*. 2011;**18**(6):637-43.
3. Porgo TV, Moore L, Tardif PA. Evidence of data quality in trauma registries: A systematic review. *J Trauma Acute Care Surg*. 2016;**80**(4):648-58.
4. Lu HX, Du J, Wen DL, Sun JH, Chen MJ, Zhang AQ, et al. Development and validation of a novel predictive score for sepsis risk among trauma patients. *World J Emerg Surg*. 2019;**14**:11.
5. Wan V, Reddy S, Thomas A, Issa N, Posluszny J, Schwulst S, et al. How does Injury Severity Score derived from International Classification of Diseases Programs for Injury Categorization using International Classification of Diseases, Tenth Revision, Clinical Modification codes perform compared with Injury Severity Score derived from Trauma Quality Improvement Program? *J Trauma Acute Care Surg*. 2023;**94**(1):141-7.
6. Lecky F, Woodford M, Edwards A, Bouamra O, Coats T. Trauma scoring systems and databases. *Br J Anaesth*. 2014;**113**(2):286-94.
7. Bågenholm A, Lundberg I, Straume B, Sundset R, Bartnes K, Ingebrigtsen T, et al. Injury coding in a national trauma registry: a one-year validation audit in a level 1 trauma centre. *BMC Emerg Med*. 2019;**19**(1):61.
8. Pape HC, Starr AJ, Gueorguiev B, Wanner GA. The role of big data management, data registries, and machine learning algorithms for optimizing safe definitive surgery in trauma: a review. *Patient Saf Surg*. 2024;**18**(1):22.

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