Journal report – březen 2026

OBSAH

HOSPITAL CARE

– clinical trials & RCT & multicenter study

1: Navi BB, Wang M, Yamal JM, Rajan SS, Czap AL, Parker SA, Nour M, Spokoyny I, Mir S, Fink ME, Willey JZ, Jones WJ, Grotta JC. **Potential Missed Opportunities to Administer Intravenous Thrombolysis to Patients With Acute Ischemic Stroke.** Stroke. 2026 Mar;57(3):633-640. doi: 10.1161/STROKEAHA.125.054326. Epub 2026 Jan 29. PMID: 41608799.

2: Caputo S, Piehl M, Broome J, Holleman G, Taylor C, Dransfield T, Tatum D, Smith A, Marino M, Rayburn D, Azar F, Gomez M, Rodriguez Mederos D, Gibson K, Krause M, Hamilton D, Jacome T, Davis G, Branney S, Harwood L, Dorlac W, Baxter B, Puente I, Duchesne J. **Is There a Role for Prehospital Precision Resuscitation? A Prospective Multi-Institutional Blood Analysis.** J Am Coll Surg. 2026 Apr 1;242(4):785-793. doi: 10.1097/XCS.0000000000001780. Epub 2026 Mar 26. PMID: 41568824.

3: Fan TH, Lawrence M, Goicoechea EB, Wick A, Prabhakaran S. **Impact of prehospital comprehensive stroke center vs. primary stroke center triage protocol on outcome of patients with spontaneous intracerebral hemorrhage.** J Stroke Cerebrovasc Dis. 2026 Mar;35(3):108555. doi: 10.1016/j.jstrokecerebrovasdis.2026.108555. Epub 2026 Jan 7. PMID: 41513161.

4: Ramgopal S. **Children Brought to the Pediatric Emergency Department by Emergency Medical Services: An Evaluation of the Pediatric Emergency Care Applied Research Network Registry.** Acad Pediatr. 2026 Mar;26(2):103156. doi: 10.1016/j.acap.2025.103156. Epub 2025 Oct 28. PMID: 41167462.

Journal report – březen 2026

PREHOSPITAL CARE

– systematic review & meta-analysis & scoping review

1: Kertam A, Hatem N, Al-Azzawi OM, Tu LH, Harb A, Hassanin MS, Abdeen I, Mostafa M, Allam S, Mostafa M, Nabil Y. **Efficacy, safety, route of administration of midazolam and diazepam for pediatric status epilepticus: systematic review, meta-analysis, and trial sequential analysis.** Pediatr Res. 2026 Mar 28. doi: 10.1038/s41390-025-04722-6. Epub ahead of print. PMID: 41904318.

2: Butoi MA, Belghiru VI, Puticiu MI, Tat R, Golea A, Rotaru LT. **Burnout and Biological Biomarkers in Emergency and Acute-Care Healthcare Workers: A Systematic Scoping Review with Evidence Mapping.** Medicina (Kaunas). 2026 Mar 12;62(3):526. doi: 10.3390/medicina62030526. PMID: 41901607; PMCID: PMC13027818.

3: Cucci F, Marasciulo D, Lupo R, Conte L, Soldano G, Caldararo C, Zizzi L, Lagazzi E, Bonetti M. **Prehospital spinal immobilization and motion restriction strategies: A scoping review of the literature.** Injury. 2026 Mar;57(3):113024. doi: 10.1016/j.injury.2026.113024. Epub 2026 Jan 9. PMID: 41547085.

4: Almubarak A, Alshibani A, Walker S. **Exploring Maternity Related Emergencies in Prehospital Settings and Available Obstetric Training for Emergency Medical Services Personnel: An Integrative Review of Literature.** Birth. 2026 Mar;53(1):3-21. doi: 10.1111/birt.70014. Epub 2025 Sep 12. PMID: 40936412.

Journal report – březen 2026

HOSPITAL CARE

– clinical trials & RCT & multicenter study –

1. Stroke. 2026 Mar;57(3):633-640. doi: 10.1161/STROKEAHA.125.054326. Epub 2026 Jan 29.

Potential Missed Opportunities to Administer Intravenous Thrombolysis to Patients With Acute Ischemic Stroke.

Navi BB(1), Wang M(2), Yamal JM(2), Rajan SS(2), Czap AL(3), Parker SA(3), Nour M(4), Spokoyny I(5), Mir S(1), Fink ME(1), Willey JZ(6), Jones WJ(7), Grotta JC(8).

BACKGROUND: Recent years have seen improvements in stroke-care pathways, including mobile stroke units (MSUs), and this may have affected the rate, predictors, and outcomes of patients with acute ischemic stroke who qualify for but do not receive treatment with intravenous thrombolysis (IVT).

METHODS: This was a secondary observational cohort analysis of the prospective, multicenter BEST-MSU trial (Benefits of Stroke Treatment Delivered by a Mobile Stroke Unit Compared With Standard Management by Emergency Medical Services), conducted in 7 US cities from 2014 to 2020, comparing MSU management versus standard emergency department management for patients with suspected acute ischemic stroke. The analytical cohort comprised enrolled patients with confirmed acute ischemic stroke and no guideline contraindications to IVT. The outcome was a potential missed IVT opportunity, defined as patients not treated with IVT despite lacking contraindications. We used multivariable logistic regression to evaluate whether demographics, prestroke modified Rankin Scale, study site, comorbidities, National Institutes of Health Stroke Scale, blood pressure, international normalized ratio, glucose, antithrombotic use, and thrombectomy were associated with this outcome.

RESULTS: Of 1515 enrolled patients, 927 met criteria for this analysis. Fifty-one participants (5.5%) had a potential missed IVT opportunity, including 4 of 555 (0.7%) in the MSU group versus 47 of 372 (12.6%) in the emergency department group (odds ratio, 0.05 [95% CI, 0.02-0.12]). In multivariable analysis, omitting study group, lower National Institutes of Health Stroke Scale (odds ratio, 0.95 [95% CI, 0.90-0.99]) and longer last known well-to-door time (odds ratio per 10 minutes, 1.08 [95% CI, 1.03-1.13]) were independently associated with a potential missed IVT opportunity. The leading reasons documented for withholding IVT were resolving symptoms (43%), time window concerns (18%), and minor deficits (10%). Among

participants with a potential missed IVT opportunity and a recorded 3-month modified Rankin Scale (n=49), 19 (39%) had a score of 3 to 6.

CONCLUSIONS: In the BEST-MSU trial, potential missed IVT opportunities occurred in 1-in-8 patients in the emergency department, and rarely on the MSU. Although often due to early improvement or minor deficits, more than one-third of these patients had poor functional status at 3 months.

REGISTRATION: URL: https://www.clinicaltrials.gov; Unique identifier: NCT02190500.

DOI: 10.1161/STROKEAHA.125.054326

PMID: 41608799 [Indexed for MEDLINE]

2. J Am Coll Surg. 2026 Apr 1;242(4):785-793. doi: 10.1097/XCS.0000000000001780. Epub 2026 Mar 26.

Is There a Role for Prehospital Precision Resuscitation? A Prospective Multi-Institutional Blood Analysis.

Caputo S(1), Piehl M(2), Broome J(3), Holleman G(4), Taylor C(4), Dransfield T(5), Tatum D(4), Smith A(6), Marino M(5), Rayburn D(6), Azar F(7), Gomez M(8), Rodriguez Mederos D(8), Gibson K(9), Krause M(9), Hamilton D(10), Jacome T(11), Davis G(11), Branney S(12), Harwood L(12), Dorlac W(13), Baxter B(13), Puente I(14), Duchesne J(15).

BACKGROUND: Military experience has paved the way for the development of civilian prehospital (PH) blood programs. Although whole blood (WB) is considered the product of choice for prehospital transfusion, data comparing WB to packed RBC (pRBCs) are lacking. We aimed to compare patient outcomes among multiple fast-paced emergency medical services systems nationwide, hypothesizing that overall patient outcomes with WB would be superior to pRBCs.

STUDY DESIGN: This was a prospective multicenter analysis of adult trauma patients who received prehospital transfusion within 9 emergency medical services systems from January 2020 to December 2024. Patients with isolated traumatic brain injury, penetrating injury to the head, or PH cardiac arrest were excluded. The primary endpoint was in-hospital mortality.

RESULTS: A total of 339 patients were included, 84 (24.9%) received WB and 255 (75.1%) pRBCs. Penetrating injury was more common in the pRBC group than in the WB group (54.1% vs 39.3%, p = 0.006). No differences were observed between groups in age, injury severity, or initial PH vital signs. In-hospital transfusion requirements at 24 hours were lower in the WB vs

pRBC groups: pRBC units (2 vs 3, p < 0.001) and plasma units (0 vs 2, p < 0.001). Kaplan-Meier survival analysis revealed no difference in 24-hour mortality (3.5% vs 6.25%, p = 0.34) or mortality at hospital discharge (7.1% vs 13.7 %, p = 0.11) between WB and pRBCs groups, respectively (KM1). Subgroup analysis of only blunt injury (KM2) showed a survival advantage for WB vs pRBCs (94.1% vs 79.5%, p = 0.02).

CONCLUSIONS: Although pRBCs were not inferior to WB overall, prehospital WB was associated with improved survival in blunt trauma patients and reduced subsequent in-hospital transfusion requirements, supporting injury-specific precision resuscitation strategies.

DOI: 10.1097/XCS.0000000000001780

PMID: 41568824 [Indexed for MEDLINE]

3. J Stroke Cerebrovasc Dis. 2026 Mar;35(3):108555. doi: 10.1016/j.jstrokecerebrovasdis.2026.108555. Epub 2026 Jan 7.

Impact of prehospital comprehensive stroke center vs. primary stroke center triage protocol on outcome of patients with spontaneous intracerebral hemorrhage.

Fan TH(1), Lawrence M(2), Goicoechea EB(3), Wick A(4), Prabhakaran S(5).

PURPOSE: While prehospital triage protocols for suspected large vessel occlusion (LVO) improve ischemic stroke outcomes, their impact in spontaneous intracerebral hemorrhage (sICH) remain uncertain. We evaluated whether a regional LVO-focused emergency medical service (EMS) transport protocol affected time-based process outcomes and clinical outcomes in sICH patients.

METHOD: We conducted a multicenter pre-post implementation retrospective cohort study using the Get-With-The-Guidelines-Stroke database in Chicago (April 2017-January 2020). Included were EMS-transported sICH patients arriving ≤6 hours from last known normal at 8 comprehensive stroke centers (CSCs) and 15 primary stroke centers (PSCs). In September 2018, EMS implemented the 3-Item Stroke Scale (3I-SS) to triage suspected LVO stroke patients; those scoring ≥4 were routed to a CSC bypassing PSC. Primary outcome was favorable discharge disposition (home/acute rehabilitation). Secondary outcomes included in-hospital mortality, good neurologic outcome (independent ambulation) at discharge and time based process outcomes (door-to-CT, symptom-to-arrival, symptom-to-CT). Interrupted time series (ITS) analysis assessed changes while accounting for temporal trends.

FINDINGS: Among 303 sICH patients (111 pre-, 192 post-implementation), there was no difference in favorable discharge disposition (58% vs. 64%, p=0.3), in-hospital mortality (12%

vs. 9%, p=0.4) or good neurologic outcomes (13% vs. 19%, p=0.4) between pre-post implementation periods for both unadjusted or ITS analyses. Time based process outcomes showed no significant changes in unadjusted or ITS analyses. The protocol also did not impact CSC admission and inter-hospital transfer rates in ITS analyses.

DISCUSSION/CONCLUSION: Implementation of an LVO-focused EMS transport protocol did not improve clinical outcomes or time-based process outcomes among sICH patients, nor did it influence CSC admission or transfer rates. These findings suggest that while beneficial for ischemic stroke care, LVO triage protocols may not confer the same advantages for sICH patients and may require tailored approaches for this population.

DOI: 10.1016/j.jstrokecerebrovasdis.2026.108555

PMID: 41513161 [Indexed for MEDLINE]

4. Acad Pediatr. 2026 Mar;26(2):103156. doi: 10.1016/j.acap.2025.103156. Epub 2025 Oct 28.

Children Brought to the Pediatric Emergency Department by Emergency Medical Services: An Evaluation of the Pediatric Emergency Care Applied Research Network Registry.

Ramgopal S(1).

OBJECTIVE: To characterize the demographics and clinical features of children brought to the pediatric emergency department (ED) by emergency medical services (EMS), and to evaluate the association between mode of arrival and clinical outcomes.

METHODS: We conducted a retrospective cross-sectional study using the multicenter Pediatric Emergency Care Applied Research Network (PECARN) Registry to compare ED encounters among children arriving by EMS versus other means. We used logistic regression to assess associations between arrival mode and outcomes: in-hospital mortality, hospital admission or transfer, and admission >48 hours.

RESULTS: We analyzed 5,063,641 ED encounters, of which 368,187 (7.3%) involved children brought by EMS. The most common diagnoses for EMS arrivals were trauma (23.0%), respiratory disease (14.3%), and neurologic disease (11.4%), while non-EMS arrivals most often presented with trauma (16.3%), ENT/dental (15.2%), and gastrointestinal disease (13.3%). Among EMS patients, seizures (7.8%), psychiatric conditions (7.8%), and extremity fractures/dislocations (5.4%) were the most common diagnosis subgroups. EMS arrivals had higher rates of mortality (0.4% vs <0.1%), hospital admission (35.0% vs 11.2%), and secondary transfer (2.0% vs 0.7%), but fewer admissions lasting over 48 hours (44.2% vs 48.8%). In multivariable models, EMS arrival was associated with increased odds of mortality (OR 3.04,

95% CI 2.70-3.44), admission or transfer (OR 2.31, 95% CI 2.29-2.33), and >48-hour admission (OR 0.90, 95% CI 0.89-0.91).

CONCLUSION: Children brought to pediatric hospitals by EMS more frequently presented with higher acuity of illness and/or injury, as suggested by multiple clinical outcomes. These findings underscore the importance of targeted clinical strategies and resource planning for this higher-risk population.

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PMID: 41167462 [Indexed for MEDLINE]

Journal report – březen 2026

PREHOSPITAL CARE

– systematic review & meta-analysis & scoping review –

1. Pediatr Res. 2026 Mar 28. doi: 10.1038/s41390-025-04722-6. Online ahead of print.

Efficacy, safety, route of administration of midazolam and diazepam for pediatric status epilepticus: systematic review, meta-analysis, and trial sequential analysis.

Kertam A(#)(1), Hatem N(#)(2), Al-Azzawi OM(3), Tu LH(4), Harb A(5), Hassanin MS(5), Abdeen I(6), Mostafa M(7), Allam S(8), Mostafa M(6), Nabil Y(9).

BACKGROUND: Status epilepticus (SE) is a life-threatening pediatric emergency requiring rapid anticonvulsants. While midazolam and diazepam are standard benzodiazepines, their comparative efficacy across various administration routes remains debated. We synthesized high-quality evidence to guide clinical protocols.

METHODS: We searched PubMed, Scopus, Web of Science, and Cochrane for randomized controlled trials comparing buccal, intramuscular, and intravenous formulations. We evaluated treatment outcomes including therapeutic success (seizure cessation), recurrence, and drug-related side effects. We employed meta-analysis, trial sequential analysis (TSA), and GRADE to ensure the robustness of the evidence.

RESULTS: Nine RCT studies (n = 1135 children) were included. Midazolam demonstrated superior therapeutic success (RR = 1.13, 95% CI 1.03-1.25, p = 0.01), with TSA confirming conclusive benefit for the buccal route (RR = 1.30, p = 0.002). Midazolam significantly reduced treatment failure (RR = 0.74, 95% CI 0.57-0.95, p = 0.02) and seizure recurrence (RR = 0.51, p = 0.04). Time-to-cessation was shorter with non-intravenous routes (MD = -2.39 min, p = 0.01). Safety profiles regarding respiratory depression were comparable between groups.

CONCLUSION: Midazolam is the preferred first-line anticonvulsant for pediatric status epilepticus. It offers superior therapeutic success, lower failure rates, and reduced recurrence, particularly via buccal and intramuscular routes. Given comparable safety, this evidence strongly supports updating emergency medical services guidelines to prioritize non-intravenous midazolam.

IMPACT: Midazolam demonstrates superior efficacy over diazepam, particularly via buccal and intramuscular routes. It addresses critical prehospital delays by bypassing the high failure rates associated with pediatric vascular access. Intramuscular administration matches intravenous efficacy while enabling immediate intervention without specialized equipment. Additionally, buccal and nasal formulations represent the most cost-effective non-intravenous rescue

options available. Guidelines must prioritize these practical routes for EMS settings, necessitating policy updates to remove insurance barriers.

DOI: 10.1038/s41390-025-04722-6

PMID: 41904318

2. Medicina (Kaunas). 2026 Mar 12;62(3):526. doi: 10.3390/medicina62030526.

Burnout and Biological Biomarkers in Emergency and Acute-Care Healthcare Workers: A Systematic Scoping Review with Evidence Mapping.

Butoi MA(1), Belghiru VI(1), Puticiu MI(2), Tat R(3), Golea A(3), Rotaru LT(1).

Background and Objectives: Burnout is highly prevalent among emergency and acute care healthcare workers (HCWs), yet biological correlates remain debated because candidate biomarkers are strongly shaped by circadian timing, shift work, sleep loss, and overlapping affective symptoms. We mapped post-2018 evidence of biological biomarkers assessed alongside validated burnout measures in emergency department (ED), emergency medical services (EMS), and related acute care settings. Specifically, we asked whether reproducible biological correlates of burnout can be identified in emergency and acute-care healthcare workers when biomarker endpoint class and sampling context are systematically considered.

Materials and Methods: We conducted a systematic scoping review with evidence mapping (PRISMA-ScR). PubMed/MEDLINE and the MDPI platform were searched for English-language studies published from 2018 onward (through January 2026). Eligible quantitative studies enrolled ED/EMS or acute care HCWs, assessed burnout using validated instruments, and reported at least one biological biomarker. Evidence was charted by biomarker domain and endpoint class (basal measures, stress reactivity paradigms, and chronic indices such as hair-based markers).

Results: Overall, 19 studies were included in mapping/synthesis. Biomarker selection clustered around the hypothalamic-pituitary-adrenal axis (cortisol; n = 10/19), with fewer studies focused on autonomic function (heart rate variability; n = 2/19) and immune-inflammatory markers (n = 2/19), and single-study coverage for oxidative stress (n = 1/19), cardiometabolic candidates (n = 1/19), cellular aging (n = 1/19), neuroglial/multi-system candidates (n = 1/19), and feasibility-oriented multi-marker designs (n = 1/19). Reported associations with burnout were heterogeneous in direction and magnitude, but were more interpretable when endpoint class, timing anchors, and shift/sleep-related covariates were explicitly reported. Rates of confounder adjustment were low across studies (e.g., only 3/19 reported multivariable

adjustment, and none systematically measured sleep or circadian factors), substantially limiting interpretability.

Conclusions: The 2018+ literature does not support a single reproducible biomarker for burnout in emergency and acute care workforces. Evidence instead suggests multi-system dysregulation that is highly sensitive to endpoint class, sampling timing, and contextual confounding. Future studies should prioritize timing-anchored repeated-measures protocols across shift and recovery windows, jointly model sleep/circadian factors and depressive symptoms, and evaluate multi-marker panels and intervention responsiveness.

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PMCID: PMC13027818

PMID: 41901607 [Indexed for MEDLINE]

3. Injury. 2026 Mar;57(3):113024. doi: 10.1016/j.injury.2026.113024. Epub 2026 Jan 9.

Prehospital spinal immobilization and motion restriction strategies: A scoping review of the literature.

Cucci F(1), Marasciulo D(2), Lupo R(3), Conte L(4), Soldano G(5), Caldararo C(6), Zizzi L(7), Lagazzi E(8), Bonetti M(9).

BACKGROUND: Prehospital management of suspected spinal injury has long relied on routine full immobilization. In recent years, several studies have questioned its benefit and highlighted possible adverse effects. The aim of this scoping review is to describe the evidence on the management of patients with suspected spinal injury, focusing on models based on full immobilization with rigid devices and a cervical collar, and on strategies of selective spinal motion restriction (SMR).

METHODS: A scoping review was conducted according to JBI methodology and PRISMA-ScR guidance, with a protocol registered on the Open Science Framework. The literature search was carried out in the PubMed, Scopus and Web of Science databases. Studies on adults or children with suspected traumatic spinal injury managed in the out-of-hospital setting were included when strategies of full immobilization, selective SMR or no immobilization were described or compared.

RESULTS: Twenty-seven studies met the inclusion criteria, including observational cohorts, experimental studies on volunteers, simulation studies and qualitative research. Overall, no clear advantage of routine full immobilization over more selective strategies emerges.

Selective SMR based on clinical assessment and decision rules appears to reduce the use of rigid devices without evidence of increased missed unstable injuries. Prolonged immobilization is instead associated with pain, discomfort, alterations in tissue perfusion and greater use of imaging examinations. The overall body of evidence is heterogeneous and largely based on observational studies, in which the influence of confounding factors cannot be fully ruled out.

CONCLUSIONS: The available evidence supports moving away from routine full immobilization towards selective SMR in the prehospital setting. Emergency medical services should update protocols and training accordingly and promote prospective studies focused on clinical outcomes and patient experience.

DOI: 10.1016/j.injury.2026.113024

PMID: 41547085 [Indexed for MEDLINE]

4. Birth. 2026 Mar;53(1):3-21. doi: 10.1111/birt.70014. Epub 2025 Sep 12.

Exploring Maternity Related Emergencies in Prehospital Settings and Available Obstetric Training for Emergency Medical Services Personnel: An Integrative Review of Literature.

Almubarak A(1)(2), Alshibani A(3), Walker S(4).

OBJECTIVES: The vulnerability of maternity patients is exacerbated by the prehospital setting. EMS providers are often underexposed and undertrained for maternal emergencies, which further complicates care delivery. This review aimed to explore prehospital maternity-related emergencies encountered by EMS providers, their experiences, and the training available for such cases.

METHODS: Medline, EMBASE, Maternity, Scopus, and Web of Science were searched for published studies in English from 01/01/2002 to 10/08/2024 using a pre-set list of terms. Studies concerning prehospital maternity-related events attended by EMS, the description or evaluation of maternity care training courses for EMS providers, were included. Eligible studies were critically appraised using the (MMAT) tool. An integrative synthesis was used in this review as the heterogeneity of the studies prevented a meta-analysis.

RESULTS: From 9678 identified studies, 35 studies were included. Prehospital maternity-related emergencies remain infrequent, less than 1% of EMS emergency calls globally, with a higher incidence rate in low-income countries. Most of these were labor and childbirth-related emergencies. Maternal and neonatal outcomes were positive, with less than 0.1% of maternal and infant mortality. Qualitative data highlighted providers' lack of confidence when attending

to maternal emergencies. Language barriers and cultural competency should be considered when caring for maternal patients. Training courses included common maternal emergencies, and post-training evaluations showed improvements in knowledge and skills for EMS providers.

CONCLUSIONS: EMS providers showed critical involvement during prehospital maternity-related emergencies, indicating the importance of high-quality training. When designing training courses, the unique environments of prehospital settings and the needs of their targeted population should be considered. Further research should explore the impact of training courses on patient outcomes.

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