Journal report – únor 2026

OBSAH

HOSPITAL CARE

– clinical trials & RCT & multicenter study

1: Pérez-García R, Alonso E, López-Izquierdo R, Del Pozo Vegas C, Idoyaga M, Losada A, Martín-Conty JL, Polonio-López B, Sanz-García A, Martín-Rodríguez F. **Artificial intelligence-driven clustering for phenotyping life-threatening prehospital trauma.** Scand J Trauma Resusc Emerg Med. 2026 Jan 15;34(1):30. doi: 10.1186/s13049-026-01553-0. PMID: 41535939; PMCID: PMC12892782.

2: Ruiz Ramos J, García Peláez M, Castellanos Clemente Y, Caballero Requejo C, Vallvé Alcón E, Romá Mora JR, Toro Blanch C, Ginés Palomares A, Gómez Costas D; en representación del grupo de trabajo FLUMA-URG. **Adverse events associated with the use of flumazenil in the Emergency Department.** Med Clin (Barc). 2026 Jan;166(1):107312. English, Spanish. doi: 10.1016/j.medcli.2025.107312. Epub 2026 Jan 13. PMID: 41534387.

3: Katzenschlager S, Kaltschmidt N, Dietrich M, Fiedler-Kalenka M, Klemm S, Kofler O, Mohr S, Eisner C, Neuhaus C, Simon C, Weigand MA, Weilbacher F, Popp E. **Prehospital transesophageal echocardiography versus conventional advanced life support in out-of-hospital cardiac arrest (PHTEE-OHCA) - a randomized controlled pilot study.** Crit Care. 2026 Jan 2;30(1):45. doi: 10.1186/s13054-025-05805-w. PMID: 41484784; PMCID: PMC12849066.

4: Gilman J, Alghamdi A, Hann M, Carlton E, Cooper JG, Cook E, Siriwardena AN, Phillips J, Thompson A, Bell S, Kirby K, Rosser A, Body R. **Diagnostic Accuracy of a Novel Point of Care High-Sensitivity Troponin Assay in the Prehospital Environment.** Acad Emerg Med. 2026 Jan;33(1):e70213. doi: 10.1111/acem.70213. PMID: 41528153; PMCID: PMC12798273.

5: 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.

6: Astasio-Picado Á, Martín-Conty JL, Polonio-López B, Rivera-Picón C, Medina Chozas ME, Palazuelos Diaz MDM, Mordillo-Mateos L, Torres-Falguera F, Ros Gomez L, Buitrago PA, Martín-Rodríguez F, Sanz-García A. **Association of Shift, Day, Month and Year with Mortality: Observational Study of Spanish and USA Emergency Care Cohorts.** Med Sci (Basel). 2026 Jan 22;14(1):56. doi: 10.3390/medsci14010056. PMID: 41718103; PMCID: PMC12922032.

7: Saviluoto A, Raatiniemi L, Mäkelä S, Toivonen T, Setälä P, Kirves H, Tommila M, Toivonen P, Tukia S, Nurmi J. **Association of Cerebral Oxygenation During Prehospital Anaesthesia and Functional Outcome: A Prospective, Observational Multi-Centre Cohort Study of 1014 Patients.** Acta Anaesthesiol Scand. 2026 Jan;70(1):e70161. doi: 10.1111/aas.70161. PMID: 41359999; PMCID: PMC12685386.

8: Myhr K, Ballangrud R, Porthun J, Sollid SJM, Vifladt A. **Medication administration errors in a Norwegian ambulance service: a quasi-experimental study on the impact of a team training program.** Scand J Trauma Resusc Emerg Med. 2026 Jan 24;34(1):41. doi: 10.1186/s13049-026-01560-1. PMID: 41580728; PMCID: PMC12911085.

9: Fagerheim Bugge H, Guterud M, Larsen K, Toft M, Hov MR, Sandset EC. **Presenting symptoms and diagnostic accuracy of prehospital stroke scales for patients with suspected mild minor stroke.** Eur Stroke J. 2026 Jan 1;11(1):23969873251360592. doi: 10.1093/esj/23969873251360592. PMID: 41614523.

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11: 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.

12: Ijuin S, Inoue A, Hifumi T, Taira T, Moriyama T, Suga M, Nishimura T, Sakamoto T, Kuroda Y, Ishihara S; SAVE-J II Study Group. **Association between conversion from an initial shockable rhythm to pulseless electrical activity before extracorporeal cardiopulmonary resuscitation and outcome: A secondary analysis of the SAVE-J II study.** Am Heart J. 2026 Jan;291:144-152. doi: 10.1016/j.ahj.2025.08.012. Epub 2025 Aug 22. PMID: 40850602.

Journal report – únor 2026

PREHOSPITAL CARE

– systematic review & meta-analysis & scoping review

1: McGlynn C, Choudhury A**. Mental Health Safety Challenges Among Pre-Hospital Emergency Medical Service Providers: A Scoping Review.** IISE Trans Occup Ergon Hum Factors. 2026 Jan-Mar;14(1):30-61. doi: 10.1080/24725838.2025.2572580. Epub 2025 Oct 31. PMID: 41173278.

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3: Alabas MA, Hakami NM, Azyabi FY, Alsayed HY, Idris MA, Alshanbari NF, Althagafi NN, Alabdele AH, Alfaidi MM, Alabdulrahman AA, Aljerayed JK. **Prehospital Point-of-Care Lactate as a Predictor of Early Operative and Emergency Interventions in Trauma Patients: A Systematic Review.** Cureus. 2026 Jan 1;18(1):e100559. doi: 10.7759/cureus.100559. PMID: 41625023; PMCID: PMC12860213.

4: Brammer M, Gerstner D, Heinze S, Grümme L, Kneißl K, Trentzsch H, Birk A, Prückner S, Weilnhammer V, Quartucci C. **City characteristics and heat vulnerability: insights from emergency medical services in Bavaria, Germany.** Int J Biometeorol. 2026 Jan 21;70(2):35. doi: 10.1007/s00484-025-03076-2. PMID: 41563511.

5: Shapovalov V, Tran QK, Sarani B, Zohery M, Caggiula A, Ashraf R, Pourmand A. **Comparative Clinical Outcomes of Trauma Transport: Emergency Medical Services vs. Police Transport, A Systematic Review and Meta-Analysis.** J Emerg Med. 2026 Jan;80:8-19. doi: 10.1016/j.jemermed.2025.10.013. Epub 2025 Oct 10. PMID: 41265133.

6: Zarei E, Safari M, Zamani Z, Kakemam E. **Turnover intention and its predictors among Emergency Medical Services (EMS) professionals: a systematic review and meta-analysis.** Scand J Trauma Resusc Emerg Med. 2026 Jan 26;34(1):42. doi: 10.1186/s13049-026-01567-8. PMID: 41588459; PMCID: PMC12918125.

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8: Penn J, McAleer R, Ziegler C, Cheskes S, Nolan B, von Vopelius-Feldt J. **Effectiveness of Prehospital Critical Care Scene Response for Major Trauma: A Systematic Review.** Prehosp

Emerg Care. 2026;30(2):309-322. doi: 10.1080/10903127.2025.2483978. Epub 2025 Apr 1. PMID: 40131291.

9: Tran KT, Nguyen KD, Nguyen TN, Pham LT, Nguyen LM, Nguyen PH, Tran NH, Le CTK. **The role, challenges, and solutions of laboratories in disaster medicine: a systematic review.** Front Public Health. 2026 Jan 13;13:1726280. doi: 10.3389/fpubh.2025.1726280. PMID: 41607900; PMCID: PMC12834775.

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13: Smith R, Carley S, Mills-Moore R. **Haemodynamic monitoring during cardiac arrest: a systematic review of diastolic blood pressure and coronary perfusion pressure.** Emerg Med J. 2026 Jan 27:emermed-2025-215389. doi: 10.1136/emermed-2025-215389. Epub ahead of print. PMID: 41592949.

14: Pool AJ, Smit PC, Slabber H, Stassen W. **ST-Elevation Myocardial Infarction Systems of Care in Africa: A Scoping Review.** Glob Heart. 2026 Feb 17;21(1):11. doi: 10.5334/gh.1524. PMID: 41726855; PMCID: PMC12922679.

HOSPITAL CARE

– clinical trials & RCT & multicenter study –

1. Scand J Trauma Resusc Emerg Med. 2026 Jan15;34(1):30.doi:10.1186/s13049-026-01553-0.

Artificial intelligence-driven clustering for phenotyping life-threatening prehospital trauma.

Pérez-García R(1), Alonso E(2)(3), López-Izquierdo R(1)(4)(5), Del Pozo Vegas C(4)(6), Idoyaga M(7), Losada A(8)(9), Martín-Conty JL(10)(11)(12), Polonio-López B(10)(11)(12), Sanz-García A(#)(10)(11)(12), Martín-Rodríguez F(#)(4)(13).

BACKGROUND: Traumatic patients usually suffer from several complex conditions that hinder their risk characterization. The aim of this study was to derive phenotypes of prehospital acute life-threatening trauma via nonsupervised artificial intelligence (AI) clustering methods.

METHODS: This was a prospective multicenter study in adult trauma patients treated in prehospital care and transferred to the emergency department. The study included 147 ambulances, 4 helicopters, and 11 hospitals in Spain between 1 January 2021 and 31 August 2024. Epidemiological variables, trauma-related data, baseline vital signs and blood tests were collected. The primary outcome was all-cause 2-day in-hospital mortality.

RESULTS: A total of 1474 patients were included, with a 2-day in-hospital mortality rate of 8.3%. The selected clustering method identified three clusters: the T-1 phenotype comprised 6.9% (101 cases) with a mortality rate of 93.1%, the T-2 phenotype represented 23.6% (348 cases) with a mortality rate of 68.1%, and T-3 represented 69.5% (1,025 cases) with a mortality rate of 10.6%. The T-1 phenotype mainly involves traumatic brain injuries, followed by thoracic trauma and burns; the T-2 phenotype presents a similar distribution; and the T-3 phenotype predominantly involves orthopedic trauma.

CONCLUSION: The AI method identified three clusters with implications for therapy and outcomes. This novel approach could help emergency medical services characterize trauma patients by providing benefits, treatment and resource optimization.

DOI: 10.1186/s13049-026-01553-0

PMCID: PMC12892782

PMID: 41535939 [Indexed for MEDLINE]

2. Med Clin (Barc). 2026 Jan;166(1):107312. doi: 10.1016/j.medcli.2025.107312. Epub 2026 Jan 13.

Adverse events associated with the use of flumazenil in the Emergency Department.

Ruiz Ramos J(1), García Peláez M(2), Castellanos Clemente Y(3), Caballero Requejo C(4), Vallvé Alcón E(5), Romá Mora JR(6), Toro Blanch C(7), Ginés Palomares A(8), Gómez Costas D(9); en representación del grupo de trabajo FLUMA-URG.

INTRODUCTION: Benzodiazepine poisoning is a frequent cause of attendance in hospital emergency departments (ED). Despite its widespread use, the conditions under which flumazenil is administered and the frequency of adverse effects remain unclear. The objective of this study is to describe the conditions of flumazenil administration, as well as the frequency and associated factors of adverse effects.

METHODS: A retrospective observational study was conducted, including adult patients treated with flumazenil in 11 EDs during 2023. To assess factors associated with the occurrence of adverse effects, logistic regression analysis was performed, including variables with a p-value <0.100 from a previous univariate analysis.

RESULTS: A total of 798 patients [mean age: 51.4 (SD:21.4) years] were included. Benzodiazepine intoxication was confirmed in 513 (64.3%) patients. Concomitant intoxication with alcohol was present in 22.8% and with tricyclic antidepressants in 5.6%. The median administered dose of flumazenil was 0.75mg (range: 0.12-23.1mg). Continuous infusion was used in 338 (42.4%) patients. Adverse effects related to flumazenil were reported in 63 (7.9%) patients, with agitation or anxiety being the most common. A history of epilepsy [OR:2.85 (1.17-6.90)] and the use of doses greater than 0.5mg [OR:2.14 (1.02-4.68)] were significantly associated with the occurrence of adverse effects.

CONCLUSIONS: The administration of flumazenil in EDs is highly heterogeneous and is associated with a significant incidence of adverse effects. A history of epilepsy and higher doses of flumazenil are associated with an increased risk of adverse events.

DOI: 10.1016/j.medcli.2025.107312

PMID: 41534387 [Indexed for MEDLINE]

3. Crit Care. 2026 Jan 2;30(1):45. doi: 10.1186/s13054-025-05805-w.

Prehospital transesophageal echocardiography versus conventional advanced life support in out-of-hospital cardiac arrest (PHTEE-OHCA) - a randomized controlled pilot study.

Katzenschlager S(1), Kaltschmidt N(2), Dietrich M(2), Fiedler-Kalenka M(2), Klemm S(2), Kofler O(2), Mohr S(2), Eisner C(2), Neuhaus C(2), Simon C(2), Weigand MA(2), Weilbacher F(2), Popp E(2).

BACKGROUND: Transesophageal echocardiography during out-of-hospital cardiac arrest can be performed during ongoing chest compressions and may improve resuscitation quality, but its prehospital use has not been systematically evaluated. To assess the feasibility, diagnostic yield, and impact of prehospital TEE on resuscitation metrics and advanced life support (ALS) interventions during OHCA.

METHODS: We conducted a randomized controlled trial in a physician-staffed two-tiered emergency medical service (EMS). Adults with ongoing non-traumatic OHCA were randomized 1:1 to standard ALS or ALS plus TEE. The primary endpoints were hands-off time and chest compression fraction (CCF) from EMS arrival to return of spontaneous circulation (ROSC) or resuscitation termination. Secondary endpoints included ROSC at hospital admission, survival to hospital discharge, neurological status at hospital discharge, and TEE findings. Analyses followed the intention-to-treat principle.

RESULTS: Of 249 screened patients, 35 were randomized and 32 analyzed (TEE n = 15; control n = 17). Median hands-off time was 4 s in both groups. Mean CCF was higher in the TEE group (96.2%) than the control group (91.6%), with a mean difference of 4.6% (95% confidence interval 2.5-6.7; $p < 0.001$). Sustained ROSC occurred in 40% (TEE) versus 71% (control; $p = 0.083$). The control group had an eCPR rate of 41%, compared to 20% in the TEE group. Using TEE, an incorrect area of maximal compression or inadequate depth was identified in 23% and 14%, respectively.

CONCLUSION: Prehospital TEE during OHCA was feasible without negatively interfering with CPR metrics, and provided clinically relevant diagnostic information and procedural guidance, warranting further evaluation in larger trials.

DOI: 10.1186/s13054-025-05805-w

PMCID: PMC12849066

PMID: 41484784 [Indexed for MEDLINE]

4. Acad Emerg Med. 2026 Jan;33(1):e70213. doi: 10.1111/acem.70213.

Diagnostic Accuracy of a Novel Point of Care High-Sensitivity Troponin Assay in the Prehospital Environment.

Gilman J(1), Alghamdi A(2)(3), Hann M(4), Carlton E(5), Cooper JG(6)(7), Cook E(8), Siriwardena AN(9), Phillips J(10), Thompson A(4), Bell S(11), Kirby K(12), Rosser A(13), Body R(8)(14).

OBJECTIVE: To evaluate the diagnostic accuracy of a novel point of care (POC) high-sensitivity troponin (hs-cTn) assay, used alone or incorporated within validated decision aids, for acute myocardial infarction (AMI) in the prehospital setting.

METHODS: A pre-specified secondary analysis of the Prehospital Evaluation of Sensitive Troponin (PRESTO) prospective diagnostic accuracy study, conducted in four ambulance services and 12 Emergency Departments (EDs; February 2019-March 2020). Paramedics included consenting adults with suspected AMI and no other reason for conveyance. Clinical data and venous blood were collected at the scene, and samples conveyed to hospital with participants. Plasma samples were later analyzed for hs-cTn using a novel POC hs-cTn assay (Abbott Point of Care i-STAT hs-TnI). The target condition was an adjudicated index diagnosis of type 1 AMI.

RESULTS: Of 817 consenting participants, 704 were eligible for inclusion in this analysis, with type 1 AMI occurring in 89 (12.6%). At the limit of detection (< 2 ng/L), POC hs-cTn had 100.0% sensitivity (95% CI 95 9%-100.0%) but only 4.6% specificity (95% CI 3.1%-6.5%). A Troponin-only Manchester Acute Coronary Syndromes (T-MACS) very-low risk outcome identified 134 (19.7%) patients for non-conveyance with 98.9% sensitivity (95% CI 94.9%-100.0%), 99.3% negative predictive value (NPV, 95% CI 95.0%-99.9%), and 22.5% specificity (95% CI 19.2%-26.1%). A low-risk modified HEART score identified 150 (22.0%) patients with 93.2% sensitivity (95% CI 85.8%-97.5%), 96.0% NPV (91.6%-98.1%), and 24.3% specificity (95% CI 20.9%-27.9%). In an exploratory analysis, hs-cTn < 5 ng/L identified 295 (41.9%) patients with 98.9% sensitivity (93.9%-100.0%), 99.7% NPV (97.7%-100.0%), and 47.8% specificity (95% CI 43.8%-51.8%).

CONCLUSIONS: This novel POC hs-cTn assay achieves high sensitivity and NPV when used alongside the T-MACS decision aid, but efficiency may be greater at a 5 ng/L threshold without requiring any decision aid.

DOI: 10.1111/acem.70213

PMCID: PMC12798273

PMID: 41528153 [Indexed for MEDLINE]

5. 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]

6. Med Sci (Basel). 2026 Jan 22;14(1):56. doi: 10.3390/medsci14010056.

Association of Shift, Day, Month and Year with Mortality: Observational Study of Spanish and USA Emergency Care Cohorts.

Astasio-Picado Á(1)(2), Martín-Conty JL(2)(3)(4), Polonio-López B(2)(3)(4), Rivera-Picón C(2), Medina Chozas ME(5), Palazuelos Diaz MDM(5), Mordillo-Mateos L(2)(3), Torres-Falguera F(2)(3), Ros Gomez L(6), Buitrago PA(7), Martín-Rodríguez F(8)(9), Sanz-García A(2)(3)(4).

Background/Objectives: Emergency medical services (EMSs) are essential for reducing mortality among critically ill patients. This study aims to evaluate the influence of temporal factors, such as time of day, day of the week, month, and year, on mortality in EMS activations, comparing health systems in the U.S. and Spain. Methods: This multicenter observational study, which is based on two databases (Spain's Sacyl and the U.S.'s NEMSIS), analyzed EMS activation in high-priority adult patients (>18 years) between 2018 and 2023. Demographic variables, transport characteristics, and response times were included. Short-term mortality was the primary outcome. Results: A total of 54,981 EMS activations (11,713 from the Sacyl dataset and 43,268 from the NEMSIS dataset) were analyzed. Mortality was higher among older patients and males, with significant increases during shifts from 06:00 to 12:00 and from 18:00 to 24:00. Mortality also varied by year, with higher rates in 2022 and 2023 than in 2018. Notable differences were observed between the U.S. and Spain, especially in shifts and months, with higher mortality during the 12:00 to 18:00 shift and in October in the NEMSIS cohort. Conclusions: These findings have direct implications for emergency medical service operations, suggesting that resource allocation, staffing models, and clinical protocols should be strategically optimized based on temporal risk patterns to improve patient outcomes during identified high-risk periods.

DOI: 10.3390/medsci14010056

PMCID: PMC12922032

PMID: 41718103 [Indexed for MEDLINE]

7. Acta Anaesthesiol Scand. 2026 Jan;70(1):e70161. doi: 10.1111/aas.70161.

Association of Cerebral Oxygenation During Prehospital Anaesthesia and Functional Outcome: A Prospective, Observational Multi-Centre Cohort Study of 1014 Patients.

Saviluoto A(1)(2), Raatiniemi L(3)(4)(5), Mäkelä S(6), Toivonen T(7), Setälä P(8), Kirves H(1), Tommila M(9), Toivonen P(10), Tukia S(11), Nurmi J(1)(7).

BACKGROUND: Many patients undergoing prehospital anaesthesia may be at risk of inadequate cerebral oxygenation due to underlying conditions or adverse events like hypotension or hypoxia. This study examined whether a decrease in regional cerebral oxygen saturation (rSO2) measured with near-infrared spectroscopy (NIRS) during prehospital anaesthesia associates with worse outcomes.

METHODS: We conducted a prospective, observational study including adult patients anaesthetised by six prehospital critical care teams. A relative cerebral desaturation event (rCDE) was defined as a ≥ 10% decrease in rSO2 for ≥ 5 min from baseline. An absolute cerebral desaturation event (aCDE) was defined as rSO2 < 60% during anaesthesia or lower than baseline if already < 60%. The primary outcome was favourable functional outcome (modified Rankin Scale ≤ 2) at 30 days and secondary outcomes included 30-day survival, 1-year functional outcome, and 1-year survival.

RESULTS: Among 1014 patients, 199 experienced an rCDE, with 125 (63%) having supraphysiological baseline. rCDE was not associated with outcomes. Of 182 patients with aCDE, 30-day favourable outcomes were not significantly different (30% vs. 36%, p = 0.14, adjusted OR 0.92, 95% confidence interval 0.62-1.34). However, aCDE was associated with lower 30-day survival (46% vs. 58%, p = 0.006) and less favourable 1-year outcomes (31% vs. 41%, p = 0.043). Adjusted analyses showed no significant associations.

CONCLUSION: An rCDE was not associated with worse functional outcomes. While aCDEs were linked to unfavourable outcomes in unadjusted analyses, these associations were not significant after adjustment, highlighting the complexity of interpreting NIRS in heterogeneous populations. Condition-specific studies are needed to clarify its role.

EDITORIAL COMMENT: Cerebral oxygen delivery may be jeopardized in critically ill patients undergoing prehospital anaesthesia. This study assessed near-infrared spectroscopy on the forehead in a large number of cases requiring general anaesthesia and subsequent transportation to hospital by helicopter. In unadjusted analysis, patients with an at least 10% decline in forehead saturation had higher survival and better functional outcome, whereas those with a forehead saturation below 60% had lower survival and worse functional outcome. Upon multivariable regression, age, patient category, systemic oxygen saturation and Glasgow

Coma Scale score were independent predictors of worse outcomes, but forehead oxygen saturation was not. NIRS-measured forehead saturation decrease appears to associate in a complex fashion with more traditional predictors of patient outcomes. Whether effects of resuscitation interventions like these can be assessed reliably by NIRS is not yet well understood.

DOI: 10.1111/aas.70161

PMCID: PMC12685386

PMID: 41359999 [Indexed for MEDLINE]

8. Scand J Trauma Resusc Emerg Med. 2026 Jan24;34(1):41.doi:10.1186/s13049-026-01560-1.

Medication administration errors in a Norwegian ambulance service: a quasi-experimental study on the impact of a team training program.

Myhr K(1)(2), Ballangrud R(3), Porthun J(3), Sollid SJM(4)(5), Vifladt A(3)(6).

BACKGROUND: Ambulance professionals operate in dynamic, time-pressured environments where patient safety is paramount, with medication administration errors (MAEs) being a particular concern. While pediatric-focused interventions have addressed dosing errors, few studies have explored strategies to reduce MAEs in prehospital settings. Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) is an evidence-based team training program that has demonstrated positive outcomes in various in-hospital contexts. This study aimed to evaluate the impact of a TeamSTEPPS intervention on MAE frequency in ambulance services.

METHODS: This quasi-experimental, pre-post study was conducted within a Norwegian ambulance service across seven ambulance stations split into two groups as part of the TEAM-AMB project. The intervention consisted of a nine-month TeamSTEPPS team training program. Two independent reviewers assessed randomly selected electronic patient journals from pre- and post-intervention periods for MAEs, defined as deviations from the "five rights" of medication administration according to ambulance service protocols. Statistical analysis included descriptive statistics, Chi-square/Fisher's exact tests, Mann-Whitney U tests, and multivariable logistic regression. Cohen's Kappa evaluated interrater reliability.

RESULTS: Overall, 30.6% of ambulance missions contained at least one MAE, with wrong dose (17.5%) and wrong drug (15.1%) being the most common error subcategories. There was no significant change, combined or for either group, in MAE frequency between pre-intervention (28.9%) and post-intervention (32.2%) periods ($p = 0.17$). Wrong drug errors significantly

increased from 11.2% to 19.1% post-intervention ($p < 0.01$). The number of different medications administered was the strongest predictor of errors, with each additional medication type increasing error odds by 47% ($p < 0.01$). Patient and mission characteristics showed no association with MAEs in multivariable analysis.

CONCLUSIONS: This Norwegian ambulance service study found MAEs in 30.6% of 1,499 missions. The TeamSTEPPS team training intervention did not reduce overall error frequency. The results suggest that team training alone is not sufficient to address the multifaceted causes of MAEs. Future interventions should focus on organizational improvements, particularly enhanced standard operating procedure adherence and electronic documentation systems, to improve accuracy and enable reliable medication error detection.

DOI: 10.1186/s13049-026-01560-1

PMCID: PMC12911085

PMID: 41580728 [Indexed for MEDLINE]

9. Eur Stroke J. 2026 Jan 1;11(1):23969873251360592. doi: 10.1093/esj/23969873251360592.

Presenting symptoms and diagnostic accuracy of prehospital stroke scales for patients with suspected mild minor stroke.

Fagerheim Bugge H(1)(2)(3), Guterud M(2), Larsen K(2)(3), Toft M(1)(3), Hov MR(2)(3)(4), Sandset EC(1)(2)(3).

INTRODUCTION: Identifying patients with minor stroke is challenging in the prehospital setting due to subtle symptoms. The majority of studies evaluating prehospital stroke scales include patients with high median NIHSS at admission. ParaNASPP, a stepped-wedge cluster-randomized controlled trial found that prehospital NIHSS identified more patients with minor symptoms. Further knowledge on presenting symptoms of patients with suspected minor stroke, and the accuracy of prehospital stroke scales on minor stroke is needed.

METHODS: A post-hoc analysis of data from the ParaNASPP trial describes prehospital presenting signs and symptoms of patients with suspected mild minor stroke. We defined mild minor stroke as NIHSS 0-2 at hospital admission. Furthermore, we reconstructed and evaluated nine prehospital stroke scales (NIHSS, FAST/CPSS, BE-FAST, LAPSS, MASS, MedPacs, PreHAST, and sNIHSS-EMS) in patients with mild minor stroke.

RESULTS: Four hundred and thirty-one patients in the ParaNASPP trial had NIHSS 0-2 at hospital admission. Of these, 152 (35%) were discharged from hospital with a stroke diagnosis. When

examined by paramedics, stroke patients presented with speech disturbance, facial palsy, and motor weakness in arm or leg, while stroke mimics presented with dizziness, headache, and nausea/vomiting. NIHSS had the highest sensitivity (95%) and lowest specificity (16%), while LAPSS had the lowest sensitivity (42%) and highest specificity (80%) in the patients with suspected mild minor stroke. The remaining scales had sensitivity between 67% and 93%, and specificity between 23% and 67%.

CONCLUSIONS: In patients with mild minor stroke, substantial overlap in presentation between stroke and stroke mimics makes triage challenging. Prehospital stroke scales provide either high sensitivity or specificity. Competence and training of paramedics in when and how to use, and interpret, these scales is key for recognizing and correctly triaging stroke patients.

DOI: 10.1093/esj/23969873251360592

PMID: 41614523 [Indexed for MEDLINE]

10. BMC Med Educ. 2026 Jan 28;26(1):325. doi: 10.1186/s12909-026-08646-5.

Skill retention of advanced airway techniques after simulation training - a randomized prospective study.

Stochlinski C(1)(2), Maleczek M(1)(2), Korn L(1), Gleiss A(3), Breckwoldt J(4), Roessler B(5)(6).

BACKGROUND: Airway management is an essential component of patient care for anaesthesiologists and emergency medical services. When conventional techniques fail and a 'can't intubate, can't oxygenate' situation occurs, the front of neck access (FONA) is the last option to restore the patient's oxygenation. Therefore, learning and maintaining this skill is crucial for all healthcare professionals working in acute care including airway management. Nevertheless, training is time-consuming and task-trainers are expensive to maintain. A low-cost, self-made model has been described previously. The aim of this study was to determine whether the skill retention of the FONA procedure after three months is non-inferior when training is carried out on a self-made model compared to a high-fidelity manikin.

METHODS: This study was designed as a randomized prospective trial conducted in a single tertiary care hospital, based on two groups (A and B), each consisting of 22 anaesthesiology residents. Group A trained on a self-made model according to the instructions of Varaday et al., while group B trained on a commercially available cricothyrotomy model (SimMan® 3G, Laerdal Medical, Norway). The skill retention after three months was analysed by a FONA checklist and the time to first successful ventilation.

RESULTS: A total of 44 participants were included in the study, however, three of them dropped out before the final evaluation. The observed mean difference of -0.56 points in the achieved FONA score between the two training models fell within the predefined margin, demonstrating the non-inferiority of the self-made model. The mean difference in the duration of the FONA procedure after three month was + 3.6 s for the self-made model compared to the conventional training model.

CONCLUSION: The results confirm that FONA skill training using a self-made model is non-inferior to training on a full-scale simulator with respect to 3-month skill retention. These findings suggest that short and simple training sessions can be effectively conducted using an easily accessible, low-cost model, even in institutions without access to a full-scale simulator.

DOI: 10.1186/s12909-026-08646-5

PMCID: PMC12924298

PMID: 41606573 [Indexed for MEDLINE]

11. 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.

DOI: 10.1161/STROKEAHA.125.054326

PMID: 41608799 [Indexed for MEDLINE]

12. Am Heart J. 2026 Jan;291:144-152. doi: 10.1016/j.ahj.2025.08.012. Epub 2025 Aug 22.

Association between conversion from an initial shockable rhythm to pulseless electrical activity before extracorporeal cardiopulmonary resuscitation and outcome: A secondary analysis of the SAVE-J II study.

Ijuin S(1), Inoue A(2), Hifumi T(3), Taira T(4), Moriyama T(2), Suga M(2), Nishimura T(2), Sakamoto T(5), Kuroda Y(4), Ishihara S(2); SAVE-J II Study Group.

AIM: Shockable rhythm on initial electrocardiogram is a predictor of favorable neurological outcomes of out-of-hospital cardiac arrest in patients undergoing extracorporeal cardiopulmonary resuscitation (ECPR). The present study evaluated the impact of conversion from shockable rhythm to pulseless electrical activity (PEA) before ECPR on patient outcomes.

METHODS: In this secondary analysis of the data from SAVE-J II, a retrospective multicenter registry including 36 participating institutions in Japan, patients with initial shockable rhythm were categorized into those with conversion to PEA and sustained shockable rhythm. The

primary outcome was favorable neurological outcome, defined as a cerebral performance category of 1-2 at hospital discharge.

RESULTS: The final cohort included 718 patients. The rate of favorable neurological outcomes was lower in patients who were converted to PEA than in those with sustained shockable rhythm (12.9 % vs 26.4 %, P < .01). By multivariable analysis, conversion to PEA was significantly associated with a lower rate of favorable neurological outcomes (odds ratio 0.42, 95% confidence interval 0.27-0.66; P < .01). The rates of favorable neurologic outcomes were 9.8%, 18.0%, and 21.4% (P = .06) in patients who converted to PEA, during emergency medical services transport, at hospital arrival, and before ECMO initiation, respectively. However, outcomes did not significantly differ between the patients who converted to PEA after hospital arrival and those with sustained shockable rhythm (19.6% vs 26.4%, P = .19).

CONCLUSIONS: Patients with conversion to PEA before ECPR were associated with a lower rate of favorable neurological outcomes in those with an initial shockable rhythm. Especially, early conversion to PEA, ie, during EMS transport, may be a factor for lower favorable neurological outcomes compared to those with sustained shockable rhythm.

DOI: 10.1016/j.ahj.2025.08.012

PMID: 40850602 [Indexed for MEDLINE]

Journal report – únor 2026

PREHOSPITAL CARE

– systematic review & meta-analysis & scoping review –

1. IISE Trans Occup Ergon Hum Factors. 2026 Jan-Mar;14(1):30-61. doi: 10.1080/24725838.2025.2572580. Epub 2025 Oct 31.

Mental Health Safety Challenges Among Pre-Hospital Emergency Medical Service Providers: A Scoping Review.

McGlynn C(1), Choudhury A(2).

OCCUPATIONAL APPLICATIONS In this scoping review, we identified considerable mental health challenges among pre-hospital emergency medical service (EMS) providers, including post-traumatic stress disorder (PTSD) burnout, depression, anxiety, suicidality, and occupational stress. Among the 61 studies we analyzed, sleep disorders emerged as the most prominent contributing factor, frequently associated with PTSD, depression, generalized anxiety, and other poor mental health conditions. Other key risk factors included high workload, years of service, exposure to violence, and insufficient peer or social support. The cumulative toll of chronic stress was evident in increased prevalence rates of mental health disorders and burnout. Organizational and individual factors, such as emotional regulation, fatigue management, and availability of peer support, further shaped these outcomes. These findings emphasize the need for targeted interventions that address the root causes of mental health disorders and occupational stressors in EMS work environments.

Plain Language Summary

Background Pre-hospital emergency medical service (EMS) providers face considerable mental health challenges due to the high-pressure nature of their work. These challenges often manifest as post-traumatic stress disorder (PTSD), burnout, depression, anxiety, suicidality, and occupational stress. Despite increasing awareness, gaps remain in understanding the factors contributing to these conditions and the implications for workplace safety and performance.

Purpose This scoping review aimed to synthesize existing evidence on the mental health challenges faced by EMS providers and identify key occupational stressors contributing to conditions such as PTSD, burnout, and suicidality.

Methods A systematic search was conducted across IEEE Xplore, Web of Science, and PubMed for peer-reviewed articles published between September 2014 and September 2024. Eligible studies focused on primary research related to EMS provider mental health, with non-English articles, secondary research, and opinion pieces excluded. Data extraction captured study

objectives, methodology, key findings, country of origin, and publication year. Quality assessment was performed using the Mixed Methods Appraisal Tool (MMAT).

Results Sixty-one studies met our inclusion criteria. PTSD was the most frequently studied condition, followed by burnout, depression, anxiety, stress, and suicidality. Sleep disorders emerged as the most consistent contributing factor across multiple mental health outcomes. Other substantial contributing stressors included high workload, increased years of service, exposure to workplace violence, and limited peer support. Most studies were conducted in high-income countries, with the majority published between 2020 and 2024.

Conclusions EMS providers are at heightened risk for mental health challenges due to occupational stressors, irregular work schedules, and repeated trauma exposure. Addressing sleep-related issues, reducing workload, and improving access to peer support systems are critical for mitigating these risks. Further research is needed to understand additional contributing factors to mental health outcomes in the EMS workforce.

DOI: 10.1080/24725838.2025.2572580

PMID: 41173278 [Indexed for MEDLINE]

2. Prehosp Emerg Care. 2026;30(2):181-194. doi: 10.1080/10903127.2025.2468796. Epub 2025 Mar 4.

Social Determinants of Health and Emergency Medical Services: A Scoping Review.

Burnett SJ(1), Alianell T(2), Bitnun O(1), Ebersole K(1), Nuruddin B(1), Butler S(1), Lalos S(1), Clemency BM(1).

OBJECTIVES: Social determinants of health (SDOH) are the non-medical factors that affect people's health and quality of life. Emergency medical services (EMS) clinicians are in a unique position to recognize and respond to SDOH through their presence and responses in the communities they serve. The objective of this study was to generally explore the existing body of literature of SDOH within the context of EMS.

METHODS: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guided the analysis of peer-reviewed literature from PubMed, CINAHL, and Web of Science databases published between January 1960 and June 2024. Using Covidence software, titles and abstracts then, separately, full texts, were reviewed by two distinct researchers to include studies published in English that referenced SDOH and EMS. We later excluded articles that were published before 2010, when the SDOH term was made more

popular by its inclusion in the Healthy People 2020 project. Reviewers then performed data extraction for qualitative analysis using a grounded theory approach.

RESULTS: Of the 1,503 records imported from the databases (PubMed n = 779, Web of Science n = 687, CINAHL n = 37), 1,164 unique manuscripts were screened, and 62 full texts were assessed for eligibility. Forty-two articles met inclusion criteria; 39 were EMS patient-centric and three were illustrative of EMS clinicians' SDOH, thus excluded from this analysis. Patient-related impact levels included individual characteristics, community characteristics, EMS clinicians' recognition of and response to SDOH, healthcare system factors, and social and cultural considerations. Articles were on the topic areas of medical conditions, EMS practice, trauma, pediatrics, and mental health. More than half (n = 24) of the manuscripts were from studies conducted in North America and a majority (n = 32) of the papers were published since 2020.

CONCLUSIONS: Research in SDOH and their association with EMS is rapidly growing. A deeper understanding of how the EMS system and EMS clinicians affect, recognize, and manage patients' SDOH insecurities can improve efforts toward health equity and improve patients' health outcomes.

DOI: 10.1080/10903127.2025.2468796

PMID: 39969484 [Indexed for MEDLINE]

3. Cureus. 2026 Jan 1;18(1):e100559. doi: 10.7759/cureus.100559. eCollection 2026 Jan.

Prehospital Point-of-Care Lactate as a Predictor of Early Operative and Emergency Interventions in Trauma Patients: A Systematic Review.

Alabas MA(1), Hakami NM(1), Azyabi FY(1), Alsayed HY(2), Idris MA(3), Alshanbari NF(4), Althagafi NN(5), Alabdele AH(5), Alfaidi MM(5), Alabdulrahman AA(6), Aljerayed JK(7).

Early identification of trauma patients requiring immediate operative or emergency intervention remains a major challenge in the prehospital setting. Traditional physiological parameters, such as systolic blood pressure and shock index, may fail to detect occult hypoperfusion, particularly in patients with normal blood pressure (normotensive). Prehospital point-of-care (POC) lactate measurement, which allows rapid bedside assessment of blood lactate levels, has emerged as a potential biomarker to improve early risk stratification and guide timely surgical preparedness. Evidence from observational studies suggests that elevated prehospital lactate is consistently associated with an increased likelihood of early invasive management, including emergency surgery, interventional radiology, and

resuscitative care. Lactate appears to offer superior or complementary predictive performance compared with traditional physiological measures, particularly in normotensive trauma patients, and is most strongly correlated with immediate operative intervention within six hours of injury. Despite these promising findings, a small number of studies and the absence of prospective lactate-guided interventional trials limit the current evidence. Integrating prehospital lactate measurement into trauma triage and decision-making algorithms may enhance early recognition of patients requiring urgent operative care, but further research is needed to determine whether this approach improves operative timing and clinical outcomes.

DOI: 10.7759/cureus.100559

PMCID: PMC12860213

PMID: 41625023

4. Int J Biometeorol. 2026 Jan 21;70(2):35. doi: 10.1007/s00484-025-03076-2.

City characteristics and heat vulnerability: insights from emergency medical services in Bavaria, Germany.

Brammer M(1)(2)(3), Gerstner D(4), Heinze S(4)(5), Grümme L(4), Kneißl K(6), Trentzsch H(6), Birk A(6), Prückner S(6), Weilnhammer V(4), Quartucci C(4)(5).

Heat events pose a significant risk to public health. Cities are particularly at risk due to the urban heat island effect. The evidence for modifying effects of city characteristics on morbidity outcomes is weak. This research investigates the impact of heat on emergency medical services (EMS) utilization across 25 Bavarian (Germany) cities from 2018 to 2020, as well as the modifying influences of various city characteristics. Using the EMS data linked to the corresponding weather records, we quantified the impact of heat utilizing negative binomial modelling for each city individually. Overall estimates, expressed as the Population Attributable Fraction (PAF), were derived by fixed-effects meta-analysis. We evaluated the potential effect modification of city characteristics such as demographic factors, land use proportions and air pollution, using extended meta-analysis and meta-regression procedures. Datasets from government agencies were used for the indicators. Our dataset included 302,353 EMS operations across 25 cities. We identified a pooled PAF of 9.34% (95% Confidence interval [CI]: 7.72%, 10.96%). In meta-regression, indicators representing a high proportion of elderly people, people in need of care and people with ischemic heart disease, significantly increased the heat effect. Among the air pollutants, nitrogen dioxide (NO_2) was found to be a significant amplifying effect modifier. In this study, we found that heat significantly increases

the number of EMS operations, with some city characteristics modifying the effects. These insights can guide targeted mitigation measures and improve EMS planning under future sociodemographic and climate change scenarios.

DOI: 10.1007/s00484-025-03076-2

PMID: 41563511 [Indexed for MEDLINE]

5. J Emerg Med. 2026 Jan;80:8-19. doi: 10.1016/j.jemermed.2025.10.013. Epub 2025 Oct 10.

Comparative Clinical Outcomes of Trauma Transport: Emergency Medical Services vs. Police Transport, A Systematic Review and Meta-Analysis.

Shapovalov V(1), Tran QK(2), Sarani B(3), Zohery M(4), Caggiula A(4), Ashraf R(4), Pourmand A(5).

BACKGROUND: In many urban settings, police transport (PT) is increasingly used as an alternative to traditional Emergency Medical Services (EMS). PT follows a "scoop and run" strategy, aiming to minimize prehospital interventions to rapidly deliver patients to the nearest trauma center. Conversely, EMS teams typically provide stabilizing medical care on site before transport.

OBJECTIVES: This study aimed to compare outcomes, specifically rates of surgical intervention and mortality, for patients transported by police vs. EMS.

METHODS: PubMed, Scopus, and Cochrane databases were searched from inception to January 1, 2025 for studies meeting inclusion criteria. A random-effects meta-analysis was performed to assess the primary outcome of mortality for PT vs. EMS, and the secondary outcome of surgical intervention in penetrating injuries. Study quality was evaluated using the Newcastle-Ottawa Scale; heterogeneity was assessed with Q-statistics and I^2 values.

RESULTS: Ten studies met criteria, totaling 112,570 patients: 100,716 (89%) transported via EMS and 11,854 (11%) by police. All-cause mortality was 13% (12,742/100,716) for EMS patients vs. 25% (2922/11,854) for PT patients. Police transport was associated with a 1.5-fold higher mortality rate (odds ratio 1.50, 95% confidence interval 1.34-1.69, $p < 0.001$). No statistically significant difference was found in surgical intervention rates for penetrating injuries (odds ratio 1.19, 95% confidence interval 0.98-1.45, $p = 0.082$). Heterogeneity was significant for both mortality (I2 = 66%) and surgical interventions (I2 = 74%).

CONCLUSION: Police transport was associated with higher odds of all-cause mortality compared with EMS, with no difference in surgical intervention rates. Prospective, methodologically robust studies are needed to guide future practice.

DOI: 10.1016/j.jemermed.2025.10.013

PMID: 41265133 [Indexed for MEDLINE]

6. Scand J Trauma Resusc Emerg Med. 2026 Jan26;34(1):42.doi:10.1186/s13049-026-01567-8.

Turnover intention and its predictors among Emergency Medical Services (EMS) professionals: a systematic review and meta-analysis.

Zarei E(1), Safari M(2), Zamani Z(3), Kakemam E(4).

BACKGROUND: High turnover intention among pre-hospital Emergency Medical Services (EMS) professionals threatens the sustainability of these vital health services. This study aimed to determine the global prevalence of turnover intention and identify its predictive factors to inform effective retention strategies.

METHODS: This systematic review and meta-analysis followed the PRISMA 2020 guidelines. The PubMed, Web of Science, and Scopus databases were comprehensively searched up to August 31, 2025. Observational studies reporting on turnover intention and its associated factors were included. The pooled prevalence was calculated using a random-effects model, and influencing factors were analyzed within the expanded Job Demands-Resources (JD-R) framework.

RESULTS: From 2,077 identified records, 27 studies with an overall sample size of 129,580 participants were eligible for the systematic review. A meta-analysis of 19 studies revealed a global pooled prevalence of turnover intention of 23.5% (95% CI: 16.6%-32.1%). The prevalence was significantly higher in studies with small sample sizes (36.4%) compared to those with large sample sizes (11.7%) ($p < 0.001$). The pooled prevalence also differed significantly across North America (13.4%), Europe (31.6%), and other regions (45.7%) ($p < 0.001$). Job dissatisfaction and job stress were the most frequently reported predictors, followed by burnout, high workload, inadequate compensation, and poor physical and mental health.

CONCLUSION: Approximately one in four EMS professionals worldwide intend to leave their job. This phenomenon is a response to the imbalance between high job demands and inadequate resources. Retaining this critical workforce requires a dual approach:

strengthening resources at the organizational level and implementing structural reforms at the macro-policy level.

DOI: 10.1186/s13049-026-01567-8

PMCID: PMC12918125

PMID: 41588459 [Indexed for MEDLINE]

7. Prehosp Emerg Care. 2026;30(1):78-86. doi: 10.1080/10903127.2025.2465712. Epub 2025 Feb 21.

Interventions Targeting Resistance and Resilience Among Emergency Medical Service Clinicians: A Systematic Review.

Saldanha IJ(1), Zhang A(2), Everly GS Jr(3), Roemer EC(4), Hsu EB(5), Han G(2), Sharma R(2), Asenso E Jr(6), Bidmead D(7), Bass EB(7), Jenkins JL(5).

OBJECTIVES: To systematically review the effectiveness and harms of interventions to promote resistance and resilience regarding mental health and occupational stress issues among emergency medical service (EMS) clinicians.

METHODS: We registered the systematic review prospectively on PROSPERO (CRD42023465325). We searched Medline, Embase, CENTRAL, CINAHL, ClinicalTrials.gov, journals, and websites for studies published from January 1, 2001, through June 30, 2024. We conducted duplicate screening of titles and abstracts followed by full texts of potentially relevant abstracts. We included studies of EMS clinicians in high-income countries that evaluated interventions targeting resistance or resilience regarding mental health or occupational stress issues. We assessed the risk of bias and evaluated strength of evidence (SoE) using standard methods.

RESULTS: We included seven studies (one randomized controlled trial, one controlled trial with a waitlist control, four pre-post studies, and one prospective cohort [single group] study) that evaluated a total of 425 EMS clinicians. We deemed five of the seven studies to have high risk of bias, one moderate risk, and one low risk. No meta-analysis was feasible because of heterogeneity in the interventions evaluated across studies. Mindfulness-building interventions targeting resistance and resilience among EMS clinicians were associated with reduced burnout at up to 6 months of follow-up (low SoE). The evidence was insufficient regarding the impacts of interventions targeting both resistance and resilience on anxiety and depression. No conclusions are possible for resistance-only or resilience-only interventions. No studies reported on the effectiveness of any interventions in reducing hospitalizations,

post-traumatic stress disorder, substance use, suicidality, or withdrawals from the workforce. No studies reported on unintended harms of interventions.

CONCLUSIONS: Given the sparse evidence identified in this systematic review, evidence-based options to improve mental health outcomes for EMS clinicians are very limited. Future research is urgently needed to inform strategies to address the many mental health and occupational stress issues that face the EMS clinician workforce.

DOI: 10.1080/10903127.2025.2465712

PMID: 39937104 [Indexed for MEDLINE]

8. Prehosp Emerg Care. 2026;30(2):309-322. doi: 10.1080/10903127.2025.2483978. Epub 2025 Apr 1.

Effectiveness of Prehospital Critical Care Scene Response for Major Trauma: A Systematic Review.

Penn J(1), McAleer R(2)(3), Ziegler C(4), Cheskes S(5)(6), Nolan B(6)(7), von Vopelius-Feldt J(6)(7).

OBJECTIVES: Major trauma is a leading cause of morbidity and mortality worldwide. It is unclear if the addition of a critical care response unit (CCRU) with capabilities comparable to hospital emergency departments might improve outcomes following major trauma, when added to Basic or Advanced Life Support (BLS/ALS) prehospital care. This systematic review describes the evidence for a CCRU scene response model for major trauma.

METHODS: We searched Medline (Ovid), Embase (Ovid), Cochrane Central Register of Controlled Trials (Ovid), CINAHL (EBSCOhost), Science Citation Index Expanded (Web of Science), Conference Proceedings Citation Index - Science (Web of Science), LILACS (Latin American and Caribbean Health Sciences Literature) for relevant publications from 2003 to 2024. We included any study that compared CCRU and BLS/ALS care at the scene of major trauma, reported patient-focused outcomes, and utilized statistical methods to reduce bias and confounding. The risk of bias was assessed by two independent reviewers, using the ROBINS-I tool. Based on our a priori knowledge of the literature, a narrative analysis was chosen. The review was prospectively registered (PROSPERO ID CRD42023490668).

RESULTS: The search yielded 5243 unique records, of which 26 retrospective cohort studies and one randomized controlled trial met inclusion criteria. Sample sizes ranged from 308 to 153,729 patients. Eighteen of the 27 included studies showed associations between CCRUs and improved survival following trauma, which appear to be more consistently found in more

critically injured and adult patients, as well as those suffering traumatic cardiac arrest. The remaining nine studies showed no significant difference in outcomes between CCRU and BLS/ALS care. Most studies demonstrated critical or severe risks of bias.

CONCLUSIONS: Current evidence examining CCRU scene response for major trauma suggests potential benefits in severely injury patients but is limited by overall low quality. Further high-quality research is required to confirm the benefits from CCRU scene response for major trauma.

DOI: 10.1080/10903127.2025.2483978

PMID: 40131291 [Indexed for MEDLINE]

9. Front Public Health. 2026 Jan 13;13:1726280. doi: 10.3389/fpubh.2025.1726280. eCollection 2025.

The role, challenges, and solutions of laboratories in disaster medicine: a systematic review.

Tran KT(1), Nguyen KD(1), Nguyen TN(1), Pham LT(1), Nguyen LM(1), Nguyen PH(1), Tran NH(2), Le CTK(1)(3).

OBJECTIVES: Laboratory systems play a critical role in disaster response, yet evidence remains fragmented. This systematic review aimed to describe the roles of clinical, public health, and veterinary laboratories, specifically characterizing Point-of-Care Testing (POCT) and Mobile Laboratories (ML) as flexible operational extensions of the central laboratory system across disaster phases; identify and compare laboratory-related challenges by disaster type; and synthesize documented solutions and their effectiveness.

METHODS: 4,323 studies published between 2000 and 2025 were identified through searches in PubMed, Embase, Scopus, grey literature, and snowballing. Study screening, data extraction, and methodological quality appraisal were conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement. Risk of bias was assessed using the critical appraisal checklist for qualitative research developed by the Joanna Briggs Institute (JBI).

RESULTS: Fifty-two studies were included. While clinical, public health, and veterinary laboratories form the "National Core Layer," POCT and rapid response mobile laboratory were identified as the "Surge Capacity Layer," functioning as flexible extended arms. Instead of random barriers, laboratory challenges were found to align along three operational axes: (1) Scarcity (infrastructure fragility and workforce shortages), predominantly in low-resource settings; (2) Complexity (data fragmentation and quality assurance variability), driven by

technological heterogeneity in high-income settings; and (3) Security (regulatory barriers and cybersecurity risks), characterizing conflict and bio-risk environments. Documented solutions showed mixed effectiveness.

CONCLUSION: Building on these insights, we propose a structured framework to guide scalable strategies that enhance laboratory system resilience for disaster preparedness and response.

DOI: 10.3389/fpubh.2025.1726280

PMCID: PMC12834775

PMID: 41607900 [Indexed for MEDLINE]

10. Public Health. 2026 Jan;250:106049. doi: 10.1016/j.puhe.2025.106049. Epub 2025 Nov 21.

The impacts of extreme weather events on health services and systems: A systematic review of reviews.

Valente M(1), Del Prete C(2), Facci G(3), Musso F(4), Cenati S(5), Calligaro S(6), Ragazzoni L(2), Barone-Adesi F(3).

OBJECTIVES: Beyond health impacts, Extreme Weather Events (EWEs) disrupt health services and systems, an aspect often overlooked in favour of individual health outcomes. This systematic review of reviews aimed to systematically map the diverse impacts of EWEs on health services and systems, offering essential information to enhance disaster preparedness across different healthcare delivery settings.

STUDY DESIGN: A systematic review of reviews was chosen as the best method to achieve the study objective, following PRISMA guidelines for conduct and reporting.

METHODS: PubMed, Scopus, and Web of Science were searched for narrative or systematic reviews, with or without a meta-analysis, published in the past 10 years. We evaluated the impact of floods, storms, heatwaves, cold spells, and wildfires on different components, from pre-hospital care to primary care and pharmacies. Results were thematically analysed to categorise impacts by hazard type, affected component, and impact type.

RESULTS: A total of 114 reviews were included, detailing EWEs' consequences on health services and systems, and showcasing the heterogeneity of impacts across different healthcare delivery settings and hazard types. Floods and storms disrupt hospital and pre-hospital services through infrastructure damage and road closures. Heatwaves increase ambulance dispatches, emergency department visits, hospitalisations, and primary care use, due to heat

exposure and chronic disease exacerbation. Increased particulate matter levels during wildfires was also associated with increased healthcare use.

CONCLUSIONS: These findings highlight the significant impact of EWEs on health services and systems, and underscore the need for appropriate adaptation measures. They offer practical evidence to enhance health system preparedness and reduce the impact of EWEs.

DOI: 10.1016/j.puhe.2025.106049

PMID: 41274098 [Indexed for MEDLINE]

11. J Emerg Nurs. 2026 Jan;52(1):218-238.e5. doi: 10.1016/j.jen.2025.08.014.Epub2025 Oct 3.

Sources of Discomfort and Treatment Strategies for Trauma Patients in the Pre-Hospital Setting: A Scoping Review.

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INTRODUCTION: Trauma remains a leading cause of mortality and long-term disability worldwide, often causing significant discomfort during prehospital care. Addressing these discomforts effectively is crucial for improving patient outcomes. This scoping review aimed to identify and categorize the types of discomforts experienced by adult trauma victims in prehospital settings and map the pharmacologic and nonpharmacologic interventions used to mitigate them.

METHODS: This scoping review followed the Joanna Briggs Institute framework and Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines. A comprehensive search was performed in databases including MEDLINE, CINAHL, Scopus, Embase, PsycINFO, Joanna Briggs Institute Evidence Synthesis, Cochrane Database, and relevant gray literature sources. Studies involving adult trauma patients (≥18 years) in prehospital care that reported on discomfort and interventions were included without restrictions on publication date.

RESULTS: Seventeen studies met the inclusion criteria, covering various international contexts. Acute pain was the most frequently reported discomfort, followed by anxiety, fear, cold-induced discomfort, and discomfort caused by immobilization. Pharmacologic interventions predominantly included opioids, nonsteroidal anti-inflammatory drugs, paracetamol, ketamine, and methoxyflurane, whereas nonpharmacologic interventions comprised acupressure, transcutaneous electrical nerve stimulation, cryotherapy, warming measures, communication strategies, and emotional support. Nonpharmacologic interventions,

especially acupressure and communication techniques, showed promising results in reducing pain and anxiety.

DISCUSSION: The findings underline the multidimensional nature of discomfort in prehospital trauma care and highlight effective interventions, including pharmacologic and complementary nonpharmacologic strategies. However, significant gaps remain regarding standardized assessment tools for non-pain-related discomforts and combined interventions. This review underscores the necessity for comprehensive management protocols and further research to optimize patient comfort and care outcomes in trauma settings.

DOI: 10.1016/j.jen.2025.08.014

PMID: 41045286 [Indexed for MEDLINE]

12. J Trauma Acute Care Surg. 2026 Jan 1;100(1):136-146. doi: 10.1097/TA.0000000000004796. Epub 2025 Sep 19.

Mode of transport and prehospital interventions in urban penetrating trauma: A systematic review and practice management guideline from the Eastern Association for the Surgery of Trauma.

Taghavi S(1), Chang G, Maher Z, Tatum D, Levy MJ, Raja AS, Tatebe L, Jacovides CL, Park S, Seamon MJ, Haut ER, Goldberg AJ, Freeman J.

BACKGROUND: Prehospital procedures in urban penetrating trauma (UPT) are controversial. In certain locales, modes of immediate transport, such as police and private vehicle transport, are used with varying frequencies. We performed a systematic review and meta-analysis and developed evidence-based recommendations on whether UPT patients should receive police or private vehicle transport over waiting for emergency medical services (EMS) transport.

METHODS: Published literature was searched through MEDLINE (via PubMed), Embase (via Elsevier), Web of Science (via Clarivate), and CINAHL Complete (via EBSCO) databases by a professional librarian. The date ranges for our literature search were January 1900 to July 2023. A systematic review and meta-analysis of currently available evidence were performed using the Grading of Recommendations Assessment, Development and Evaluation methodology.

RESULTS: A total of six relevant studies were analyzed for police transport, with all being retrospective or prospective, observational studies. The pooled data found that EMS transport did not improve survival to admission (odds ratio [OR], 1.06; 95% confidence interval [CI], 0.83-1.35) or discharge (OR, 1.06; 95% CI, 0.84-1.35) over police transport. A total of two relevant studies were analyzed for private vehicle transport, with both being retrospective studies. The

pooled data found that private vehicle transport improved survival (OR, 0.31; 95% CI, 0.11-0.85) to admission over waiting for EMS transport.

CONCLUSION: In UPT patients, we conditionally recommend police or private vehicle transport over waiting for EMS transport as adjuncts to traditional prehospital care.

DOI: 10.1097/TA.0000000000004796

PMID: 41114708 [Indexed for MEDLINE]

13. Emerg Med J. 2026 Jan 27:emermed-2025-215389. doi: 10.1136/emermed-2025-215389.

Haemodynamic monitoring during cardiac arrest: a systematic review of diastolic blood pressure and coronary perfusion pressure.

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OBJECTIVE: To evaluate whether intra-arrest diastolic blood pressure (DBP) and coronary perfusion pressure (CPP) are associated with improved return of spontaneous circulation (ROSC) in cardiac arrest.

METHODS: A systematic search (PROSPERO registration: CRD420251042344) was conducted in English on EMBASE, MEDLINE, CINAHL and the Cochrane Library from inception to 1 May 2025. Grey literature sources (trial registries, conference abstracts, Google Scholar) were searched. Key resuscitation experts were contacted to identify unpublished or ongoing studies. The search strategy was peer-reviewed using the Peer Review of Electronic Search Strategies checklist. Eligible studies included randomised controlled trials (RCTs) contributing cohort data, observational studies and case series (≥10 patients) monitoring intra-arrest DBP or CPP in adult patients with cardiac arrest managed in prehospital or emergency department settings. Study selection involved two reviewers independently screening titles and abstracts, and full-text articles. Risk of bias was assessed using the Risk of Bias 2 and Risk of Bias in Non-randomised Studies of Interventions tools. This research received no funding.

RESULTS: 15 studies (n=970 patients) across seven countries were included: 3 RCT-based prospective cohort studies and 12 observational studies. Meta-analysis was not performed due to heterogeneity in study designs. Aziz et al identified a DBP threshold of 35 mm Hg associated with ROSC (p<0.001), reporting a 5% increase in ROSC odds for every 1 mm Hg rise in DBP. This finding was supported by other observational studies reporting significantly higher maximum DBP values in patients with ROSC (34-56.5 mm Hg) compared with those without ROSC. Interventional studies aimed at augmenting DBP or CPP-including resuscitative

endovascular balloon occlusion of the aorta-generally reported increases in ROSC, though studies were underpowered and at high risk of bias.

CONCLUSIONS: This review demonstrates an association between intra-arrest DBP and CPP and ROSC. DBP may provide a feasible clinical target, but definitive thresholds and their impact on survival to hospital discharge remain undefined.

DOI: 10.1136/emermed-2025-215389

PMID: 41592949

14. Glob Heart. 2026 Feb 17;21(1):11. doi: 10.5334/gh.1524. eCollection 2026.

ST-Elevation Myocardial Infarction Systems of Care in Africa: A Scoping Review.

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BACKGROUND: ST-elevation myocardial infarction (STEMI) is a life-threatening, time-sensitive emergency. Cardiovascular diseases, including STEMI, are increasing on the African continent. Improving optimal outcomes for these patients requires a system-wide approach as the existing literature is unclear.

OBJECTIVES: To describe and summarise the African literature on STEMI Systems of Care (STEMI SOC).

METHODS: This scoping review was designed following the PRISMA-ScR guidelines. An a priori search strategy was applied to EbscoHost, PubMed, and Google Scholar databases.

RESULTS: A total of 671 articles were identified. Following the exclusion of 619 articles, 52 articles were eligible for inclusion. STEMI patients in Africa are generally younger than their Western counterparts, present late to healthcare facilities, have insufficient healthcare insurance, and are non-adherent to discharge medication. Emergency medical services are lacking, there is a shortage of percutaneous coronary intervention (PCI) facilities, and emergency departments are disorganised. STEMI reperfusion times are delayed, data collection and quality assurance initiatives are inadequate, and STEMI referral networks and registries are underdeveloped. In addition, there is a deficiency of ECG and telemetry, a shortage of healthcare workers, a lack of adherence to guideline-recommended therapy, and a perceived hesitancy of medical personnel to administer fibrinolytics. These findings suggest a need for more clinical education.

CONCLUSION: A myriad of barriers, as well as potential facilitators in the implementation of these networks, have been reported in this scoping review. The coordination and introduction

of a STEMI SOC in African settings potentially holds great advantages, as has been witnessed in other low- and middle-income countries (LMICs) and high-income countries (HICs).

DOI: 10.5334/gh.1524

PMCID: PMC12922679

PMID: 41726855 [Indexed for MEDLINE]