Journal report – červenec 2024

OBSAH

PREHOSPITAL CARE

– clinical trials & RCT

1: Falla M, van Veelen MJ, Falk M, Weiss EM, Roveri G, Masè M, Weber B, Randi A, Brugger H, Hüfner K, Strapazzon G. **Effect of oxygen supplementation on cognitive performance among HEMS providers after acute exposure to altitude: the HEMS II randomized clinical trial.** Scand J Trauma Resusc Emerg Med. 2024 Jul 29;32(1):65. doi: 10.1186/s13049-024-01238-6. PMID: 39075543; PMCID: PMC11287850.

2: Nassal MMJ, Elola A, Aramendi E, Jaureguibeitia X, Powell JR, Idris A, Raya Krishnamoorthy BP, Daya MR, Aufderheide TP, Carlson JN, Stephens SW, Panchal AR, Wang HE. **Temporal Trends in End-Tidal Capnography and Outcomes in Out-of-Hospital Cardiac Arrest: A Secondary Analysis of a Randomized Clinical Trial.** JAMA Netw Open. 2024 Jul 1;7(7):e2419274. doi: 10.1001/jamanetworkopen.2024.19274. PMID: 38967927; PMCID: PMC11227078.

PREHOSPITAL CARE

– systematic review & meta-analysis

1: Messelu MA, Amlak BT, Mekonnen GB, Belayneh AG, Tamre S, Adal O, Demile TA, Tsehay YT, Belay AE, Netsere HB, Wondie WT, Abebe GK, Mulatu S, Ayenew T. **Mortality and its determinants among patients attending in emergency departments.** BMC Emerg Med. 2024 Jul 19;24(1):125. doi: 10.1186/s12873-024-01050-6. PMID: 39026180; PMCID: PMC11264723.

2: Friend TH, Thomas HM, Ordoobadi AJ, Bain PA, Jarman MP. **Community emergency medical services approaches to fall prevention: a systematic review.** Inj Prev. 2024 Jul 22:ip-2023-045110. doi: 10.1136/ip-2023-045110. Epub ahead of print. PMID: 39038943.

3: Wilkinson-Stokes M, Tew M, Yap CYL, Crellin D, Gerdtz M. **The Economic Impact of Community Paramedics Within Emergency Medical Services: A Systematic Review.** Appl Health Econ Health Policy. 2024 Jul 17. doi: 10.1007/s40258-024-00902-3. Epub ahead of print. PMID: 39017994.

4: Saadatmand V, Ahmadi Marzaleh M, Shokrpour N, Abbasi HR, Peyravi MR. **Designing a model of emergency medical services preparedness in response to mass casualty incidents: a mixed-method study.** BMC Emerg Med. 2024 Jul 24;24(1):127. doi: 10.1186/s12873-024-01055-1. PMID: 39048983; PMCID: PMC11267821.

5: McKimmie A, Keeves J, Gadowski A, Bagg MK, Antonic-Baker A, Hicks AJ, Hill R, Clarke N, Holland A, Veitch B, Fatovich D, Reeder S, Romero L, Ponsford JL, Lannin NA, O'Brien TJ, Cooper DJ, Rushworth N, Fitzgerald M, Gabbe BJ, Cameron PA; Australian Traumatic Brain Injury Initiative Investigators. **The Australian Traumatic Brain Injury Initiative: Systematic Review of Clinical Factors Associated with Outcomes in People with Moderate-Severe Traumatic Brain Injury.** Neurotrauma Rep. 2024 Jul 4;5(1):0. doi: 10.1089/neur.2023.0111. PMID: 39081663; PMCID: PMC11286001.

6: Hagrass AI, Elsayed SM, Doheim MF, Mostafa MA, Elfil M, Al-Kafarna M, Almaghary BK, Fayoud AM, Hamdallah A, Hasan MT, Ragab KM, Nourelden AZ, Zaazouee MS, Medicherla C, Lerario M, Czap AL, Chong J, Nour M, Al-Mufti F. **Mobile Stroke Units in Acute Ischemic Stroke: A Comprehensive Systematic Review and Meta-Analysis of 5 "T Letter" Domains.** Cardiol Rev. 2024 Jul-Aug 01;32(4):297-313. doi: 10.1097/CRD.0000000000000699. Epub 2024 Apr 11. PMID: 38602410.

7: Mbutiwi FIN, Yapo APJ, Toirambe SE, Rees E, Plouffe R, Carabin H. **Sensitivity and specificity of International Classification of Diseases algorithms (ICD-9 and ICD-10) used to identify opioid-related overdose cases: A systematic review and an example of estimation using Bayesian latent class models in the absence of gold standards.** Can J Public Health. 2024 Jul 31. doi: 10.17269/s41997-024-00915-4. Epub ahead of print. PMID: 39085747.

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PREHOSPITAL CARE

– clinical trials & RCT –

1. Scand J Trauma Resusc Emerg Med. 2024 Jul 29;32(1):65. doi: 10.1186/s13049-024-01238-6.

Effect of oxygen supplementation on cognitive performance among HEMS providers after acute exposure to altitude: the HEMS II randomized clinical trial.

Falla M(1)(2)(3)(4), van Veelen MJ(1)(5), Falk M(1), Weiss EM(6), Roveri G(1)(3)(7), Masè M(1)(8), Weber B(9), Randi A(4), Brugger H(1), Hüfner K(10), Strapazzon G(11).

IMPORTANCE: Emergency medical services (EMS) providers transiently ascend to high altitude for primary missions and secondary transports in mountainous areas in helicopters that are unpressurised and do not have facilities for oxygen supplementation. The decrease in cerebral oxygen saturation can lead to impairment in attention and reaction time as well as in quality of care during acute exposure to altitude.

OBJECTIVE: The primary aim of the current study was to investigate the effect of oxygen supplementation on cognitive performance in Helicopter EMS (HEMS) providers during acute exposure to altitude.

DESIGN, SETTING, AND PARTICIPANTS: This interventional, randomized, controlled, double-blind, cross-over clinical trial was conducted in October 2021. Each trial used a simulated altitude scenario equivalent to 4000 m, in which volunteers were exposed to hypobaric hypoxia with a constant rate of ascent of 4 m/s in an environmental chamber under controlled, replicable, and safe conditions. Trials could be voluntarily terminated at any time. Inclusion criteria were being members of emergency medical services and search and rescue services with an age between 18 and 60 years and an American Society of Anesthesiologists physical status class I.

EXPOSURES: Each participant conducted 2 trials, one in which they were exposed to altitude with oxygen supplementation (intervention trial) and the other in which they were exposed to altitude with ambient air supplementation (control trial).

MAIN OUTCOMES AND MEASURES: Measurements included peripheral oxygen saturation (SpO2), cerebral oxygenation (ScO2), breathing and heart rates, Psychomotor Vigilance Test (PVT), Digit-Symbol Substitution Test (DSST), n-Back test (2-BACK), the Grooved Pegboard test, and questionnaires on subjective performance, stress, workload, and positive and negative affect. Paired t-tests were used to compare conditions (intervention vs. control). Data were further analyzed using generalized estimating equations (GEE).

RESULTS: A total of 36 volunteers (30 men; mean [SD] age, 36 [9] years; mean [SD] education, 17 [4] years) were exposed to the intervention and control trials. The intervention trials, compared with the control trials, had higher values of SpO2 (mean [SD], 97.9 [1.6] % vs. 86 [2.3] %, t-test, p = 0.004) and ScO2 (mean [SD], 69.9 [5.8] % vs. 62.1 [5.2] %, paired t-test, p = 0.004). The intervention trials compared with the control trials had a shorter reaction time

(RT) on the PVT after 5 min (mean [SD], 277.8 [16.7] ms vs. 282.5 [15.3] ms, paired t-test, p = 0.006) and after 30 min (mean [SD], 276.9 [17.7] ms vs. 280.7 [15.0] ms, paired t-test, p = 0.054) at altitude. While controlling for other variables, there was a RT increase of 0.37 ms for each % of SpO2 decrease. The intervention trials showed significantly higher values for DSST number of correct responses (with a difference of mean [SD], 1.2 [3.2], paired t-test, p = 0.035). Variables in the intervention trials were otherwise similar to those in the control trials for DSST number of incorrect responses, 2-BACK, and the Grooved Pegboard test.

CONCLUSIONS AND RELEVANCE: This randomized clinical trial found that oxygen supplementation improves cognitive performance among HEMS providers during acute exposure to 4000 m altitude. The use of oxygen supplementation may allow to maintain attention and timely reaction in HEMS providers. The impact of repeated altitude ascents on the same day, sleep-deprivation, and additional stressors should be investigated. Trial registration NCT05073406, ClinicalTrials.gov trial registration.

DOI: 10.1186/s13049-024-01238-6

PMCID: PMC11287850

PMID: 39075543 [Indexed for MEDLINE]

2. JAMA Netw Open. 2024 Jul 1;7(7):e2419274. doi: 10.1001/jamanetworkopen.2024.19274.

Temporal Trends in End-Tidal Capnography and Outcomes in Out-of-Hospital Cardiac Arrest: A Secondary Analysis of a Randomized Clinical Trial.

Nassal MMJ(1), Elola A(2), Aramendi E(3), Jaureguibeitia X(3), Powell JR(1), Idris A(4), Raya Krishnamoorthy BP(1)(5), Daya MR(6), Aufderheide TP(7), Carlson JN(8), Stephens SW(9), Panchal AR(1), Wang HE(1).

IMPORTANCE: While widely measured, the time-varying association between exhaled end-tidal carbon dioxide (EtCO2) and out-of-hospital cardiac arrest (OHCA) outcomes is unclear.

OBJECTIVE: To evaluate temporal associations between EtCO2 and return of spontaneous circulation (ROSC) in the Pragmatic Airway Resuscitation Trial (PART).

DESIGN, SETTING, AND PARTICIPANTS: This study was a secondary analysis of a cluster randomized trial performed at multicenter emergency medical services agencies from the Resuscitation Outcomes Consortium. PART enrolled 3004 adults (aged ≥18 years) with nontraumatic OHCA from December 1, 2015, to November 4, 2017. EtCO2 was available in 1172 cases for this analysis performed in June 2023.

INTERVENTIONS: PART evaluated the effect of laryngeal tube vs endotracheal intubation on 72-hour survival. Emergency medical services agencies collected continuous EtCO2 recordings using standard monitors, and this secondary analysis identified maximal EtCO2 values per ventilation and determined mean EtCO2 in 1-minute epochs using previously validated

automated signal processing. All advanced airway cases with greater than 50% interpretable EtCO2 signal were included, and the slope of EtCO2 change over resuscitation was calculated.

MAIN OUTCOMES AND MEASURES: The primary outcome was ROSC determined by prehospital or emergency department palpable pulses. EtCO2 values were compared at discrete time points using Mann-Whitney test, and temporal trends in EtCO2 were compared using Cochran-Armitage test of trend. Multivariable logistic regression was performed, adjusting for Utstein criteria and EtCO2 slope.

RESULTS: Among 1113 patients included in the study, 694 (62.4%) were male; 285 (25.6%) were Black or African American, 592 (53.2%) were White, and 236 (21.2%) were another race; and the median (IQR) age was 64 (52-75) years. Cardiac arrest was most commonly unwitnessed (n = 579 [52.0%]), nonshockable (n = 941 [84.6%]), and nonpublic (n = 999 [89.8%]). There were 198 patients (17.8%) with ROSC and 915 (82.2%) without ROSC. Median EtCO2 values between ROSC and non-ROSC cases were significantly different at 10 minutes (39.8 [IQR, 27.1-56.4] mm Hg vs 26.1 [IQR, 14.9-39.0] mm Hg; P < .001) and 5 minutes (43.0 [IQR, 28.1-55.8] mm Hg vs 25.0 [IQR, 13.3-37.4] mm Hg; P < .001) prior to end of resuscitation. In ROSC cases, median EtCO2 increased from 30.5 (IQR, 22.4-54.2) mm HG to 43.0 (IQR, 28.1-55.8) mm Hg (P for trend < .001). In non-ROSC cases, EtCO2 declined from 30.8 (IQR, 18.2-43.8) mm Hg to 22.5 (IQR, 12.8-35.4) mm Hg (P for trend < .001). Using adjusted multivariable logistic regression with slope of EtCO2, the temporal change in EtCO2 was associated with ROSC (odds ratio, 1.45 [95% CI, 1.31-1.61]).

CONCLUSIONS AND RELEVANCE: In this secondary analysis of the PART trial, temporal increases in EtCO2 were associated with increased odds of ROSC. These results suggest value in leveraging continuous waveform capnography during OHCA resuscitation.

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Journal report – červenec 2024

PREHOSPITAL CARE

– systematic review & meta-analysis –

1. BMC Emerg Med. 2024 Jul 19;24(1):125. doi: 10.1186/s12873-024-01050-6.

Mortality and its determinants among patients attending in emergency departments.

Messelu MA(1), Amlak BT(2), Mekonnen GB(3), Belayneh AG(4), Tamre S(4), Adal O(4), Demile TA(5), Tsehay YT(6), Belay AE(6), Netsere HB(7), Wondie WT(8), Abebe GK(9), Mulatu S(10), Ayenew T(2).

BACKGROUND: Due to the high burden of mortality from acute communicable and non-communicable diseases, emergency department's mortality has become one of the major health indices in Ethiopia that should be evaluated regularly in every health institution. However, there are inconsistencies between studies, and there is no systematic review or meta-analysis study about the prevalence of mortality in the emergency department. Therefore, this study aimed to determine the pooled prevalence of mortality and identify its determinants in the emergency departments of Ethiopian hospitals.

METHODS: This systematic review was conducted according to the guidelines of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) and has been registered with PROSPERO. A structured search of databases (Medline/PubMed, Google Scholar, CINAHL, EMBASE, HINARI, and Web of Science) was undertaken. All observational studies reporting the prevalence of mortality of patients in emergency departments of Ethiopian hospitals, and published in English up to December 16, 2023, were considered for this review. Two reviewers

independently assess the quality of the studies using the Joanna Briggs Institute (JBI) critical appraisal tool. A meta-analysis using a random-effects model was performed to estimate the pooled prevalence. The heterogeneity of studies was assessed using I2 statistics, and to identify the possible causes of heterogeneity, subgroup analysis and meta-regression were used. Egger's test and funnel plots were used to assess publication bias. STATA version 17.0 software was used for all the statistical analyses. A p-value less than 0.05 was used to declare statistical significance.

RESULTS: A total of 1363 articles were retrieved through electronic search databases. Subsequently, eighteen studies comprised 21,582 study participants were included for analysis. The pooled prevalence of mortality among patients in the Emergency Department (ED) was 7.71% (95% CI: 3.62, 11.80). Regional subgroup analysis showed that the pooled prevalence of mortality was 16.7%, 12.89%, 10.28%, and 4.35% in Dire Dawa, Amhara, Oromia, and Addis Ababa, respectively. Moreover, subgroup analysis based on patients' age revealed that the pooled prevalence of mortality among adults and children was 8.23% (95% CI: 3.51,

12.94) and 4.48% (95% CI: 2.88, 6.08), respectively. Being a rural resident (OR; 2.30, 95% CI: 1.48, 3.58), unconsciousness (OR; 3.86, 95% CI: 1.35, 11.04), comorbidity (OR; 2.82, 95% CI: 1.56, 5.09), and time to reach a nearby health facility (OR; 4.73, 95% CI: 2.19, 10.21) were determinants of mortality for patients in the emergency departments.

CONCLUSION AND RECOMMENDATIONS: This study found that the overall prevalence of mortality among patients in emergency departments of Ethiopian hospitals was high, which requires collaboration between all stakeholders to improve outcomes. Being a rural resident, unconsciousness, comorbidity, and time elapsed to reach health facilities were determinants of mortality. Improving pre-hospital care, training healthcare providers, early referral, and improving first-line management at referral hospitals will help to reduce the high mortality in our country.

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PMCID: PMC11264723

PMID: 39026180 [Indexed for MEDLINE]

2. Inj Prev. 2024 Jul 22:ip-2023-045110. doi: 10.1136/ip-2023-045110. Online ahead of print.

Community emergency medical services approaches to fall prevention: a systematic review.

Friend TH(1)(2), Thomas HM(3)(4), Ordoobadi AJ(2), Bain PA(5), Jarman MP(2)(6).

BACKGROUND: Falls are a leading cause of morbidity and mortality among older adults in the USA. Current approaches to fall prevention often rely on referral by primary care providers or enrolment during inpatient admissions. Community emergency medical services (CEMS) present a unique opportunity to rapidly identify older adults at risk for falls and provide fall prevention interventions in the home. In this systematic review, we seek to assess the efficacy and qualitative factors determining success of these programs.

METHODS: Studies reporting the outcomes of fall prevention interventions delivered by EMS were identified by searching the electronic databases PubMed, Embase, Web of Science Core Collection, CINAHL and the Cochrane Central Register of Controlled Trials through 11 July 2023.

RESULTS: 35 studies including randomised and non-randomised experimental trials, systematic reviews and qualitative research primarily from Western Europe, the USA, Australia and Canada were included in our analysis. Current fall prevention efforts focus heavily on postfall referral of at-risk community members. CEMS fall prevention interventions reduced all-cause and fall-related emergency department encounters, subsequent falls and EMS calls for lift assist. These interventions also improved patient health-related quality of life, independence with activities of daily living, and secondary health outcomes.

CONCLUSIONS: CEMS programmes provide an opportunity for direct, proactive fall prevention on the individual level. Addressing barriers to implementation in the context of current emergency medical systems in the USA is the next step toward widespread implementation of these novel fall prevention interventions.

DOI: 10.1136/ip-2023-045110

PMID: 39038943

3. Appl Health Econ Health Policy. 2024 Jul 17. doi: 10.1007/s40258-024-00902-3.

The Economic Impact of Community Paramedics Within Emergency Medical Services: A Systematic Review.

Wilkinson-Stokes M(1), Tew M(2), Yap CYL(3), Crellin D(3), Gerdtz M(3).

BACKGROUND AND OBJECTIVE: Globally, emergency medical services (EMSs) report that their demand is dominated by non-emergency (such as urgent and primary care) requests. Appropriately managing these is a major challenge for EMSs, with one mechanism employed being specialist community paramedics. This review guides policy by evaluating the economic impact of specialist community paramedic models from a healthcare system perspective.

METHODS: A multidisciplinary team (health economics, emergency care, paramedicine, nursing) was formed, and a protocol registered on PROSPERO (CRD42023397840) and published open access. Eligible studies included experimental and analytical observational study designs of economic evaluation outcomes of patients requesting EMSs via an emergency telephone line ('000', '111', '999', '911' or equivalent) responded to by specialist community paramedics, compared to patients attended by usual care (i.e. standard paramedics). A three-stage systematic search was performed, including Peer Review of Electronic Search Strategies (PRESS) and Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA). Two independent reviewers extracted and verified 51 unique characteristics from 11 studies, costs were inflated and converted, and outcomes were synthesised with comparisons by model, population, education and reliability of findings.

RESULTS: Eleven studies (n = 7136 intervention group) met the criteria. These included one cost-utility analysis (measuring both costs and consequences), four costing studies (measuring cost only) and six cohort studies (measuring consequences only). Quality was measured using Joanna Briggs Institute tools, and was moderate for ten studies, and low for one. Models included autonomous paramedics (six studies, n = 4132 intervention), physician oversight (three studies, n = 932 intervention) and/or special populations (five studies, n = 3004 intervention). Twenty-one outcomes were reported. Models unanimously reduced emergency department (ED) transportation by 14-78% (higher quality studies reduced emergency department transportation by 50-54%, n = 2639 intervention, $p < 0.001$), and costs were reduced by AU$338-1227 per attendance in four studies (n = 2962). One study performed an economic evaluation (n = 1549), finding both that the costs were reduced by AU$454 per attendance (although not statistically significant), and consequently that the intervention dominated with a > 95% chance of the model being cost effective at the UK incremental cost-effectiveness ratio threshold.

CONCLUSIONS: Community paramedic roles within EMSs reduced ED transportation by approximately half. However, the rate was highly variable owing to structural (such as local policies) and stochastic (such as the patient's medical condition) factors. As models unanimously reduced ED transportation-a major contributor to costs-they in turn lead to net healthcare system savings, provided there is sufficient demand to outweigh model costs and generate net savings. However, all models shift costs from EDs to EMSs, and therefore

appropriate redistribution of benefits may be necessary to incentivise EMS investment. Policymakers for EMSs could consider negotiating with their health department, local ED or insurers to introduce a rebate for successful community paramedic non-ED-transportations. Following this, geographical areas with suitable non-emergency demand could be identified, and community paramedic models introduced and tested with a prospective economic evaluation or, where this is not feasible, with sufficient data collection to enable a post hoc analysis.

DOI: 10.1007/s40258-024-00902-3

PMID: 39017994

4. BMC Emerg Med. 2024 Jul 24;24(1):127. doi: 10.1186/s12873-024-01055-1.

Designing a model of emergency medical services preparedness in response to mass casualty incidents: a mixed-method study.

Saadatmand V(1), Ahmadi Marzaleh M(2), Shokrpour N(3), Abbasi HR(4), Peyravi MR(5).

BACKGROUND: Emergency medical services preparedness in mass casualty incidents is one of the most important concerns in emergency systems. A mass casualty incident is a sudden event with several injured individuals that overwhelms the local health care system. This study aimed to identify and validate the components of emergency medical services readiness in mass casualty incidents which ultimately led to designing a conceptual model.

METHODS: This research was an explanatory mixed-method study conducted in five consecutive stages in Iran between November 2021 and September 2023. First, a systematic review was carried out to extract the components of emergency medical services preparedness in mass casualty incidents based on the PRISMA guideline. Second, a qualitative study was designed to explore the preparedness components through in-depth semi-structured interviews and analyzed using the content analysis approach. Third, the integration of the components extracted from the two stages of the systematic review and qualitative study was done by an expert panel. Fourth, the obtained components were validated using the Delphi technique. Two rounds were done in the Delphi phase. Finally, the conceptual model of emergency medical services preparedness in mass casualty incidents was designed by a panel of experts.

RESULTS: 10 articles were included in the systematic review stage and sixteen main components were extracted and classified into four categories. In the second stage, thirteen components were extracted from the qualitative study and classified into five categories. Then, the components of the previous two phases were integrated into the panel of experts and 23 components were identified. After validation with the Delphi technique, 22 components were extracted. Lastly, the final components were examined by the panel of experts, and the conceptual schematic of the model was drawn.

CONCLUSIONS: It is necessary to have an integrated framework and model of emergency medical service readiness in the planning and management of mass casualty incidents. The components and the final model of this research were obtained after the systematic scientific steps, which can be used as a scheme to improve emergency medical service preparedness in response to mass casualty incidents.

DOI: 10.1186/s12873-024-01055-1

PMCID: PMC11267821

PMID: 39048983 [Indexed for MEDLINE]

5. Neurotrauma Rep. 2024 Jul 4;5(1):0. doi: 10.1089/neur.2023.0111. eCollection 2024.

The Australian Traumatic Brain Injury Initiative: Systematic Review of Clinical Factors Associated with Outcomes in People with Moderate-Severe Traumatic Brain Injury.

McKimmie A(1), Keeves J(1)(2)(3), Gadowski A(1), Bagg MK(2)(3)(4)(5), Antonic-Baker A(6), Hicks AJ(7)(8), Hill R(9), Clarke N(1), Holland A(10), Veitch B(1), Fatovich D(11)(12), Reeder S(1)(6), Romero L(13), Ponsford JL(7)(8), Lannin NA(6)(13), O'Brien TJ(6), Cooper DJ(14)(15), Rushworth N(16), Fitzgerald M(2)(3), Gabbe BJ(1)(17), Cameron PA(1)(18)(19); Australian Traumatic Brain Injury Initiative Investigators**; Australian Traumatic Brain Injury Initiative Investigators.

The aim of the Australian Traumatic Brain Injury Initiative (AUS-TBI) is to design a data dictionary to inform data collection and facilitate prediction of outcomes for moderate-severe traumatic brain injury (TBI) across Australia. The process has engaged diverse stakeholders across six areas: social, health, clinical, biological, acute interventions, and long-term outcomes. Here, we report the results of the clinical review. Standardized searches were implemented across databases to April 2022. English-language reports of studies evaluating an association between a clinical factor and any clinical outcome in at least 100 patients with moderate-severe TBI were included. Abstracts, and full-text records, were independently screened by at least two reviewers in Covidence. The findings were assessed through a consensus process to determine inclusion in the AUS-TBI data resource. The searches retrieved 22,441 records, of which 1137 were screened at full text and 313 papers were included. The clinical outcomes identified were predominantly measures of survival and disability. The clinical predictors most frequently associated with these outcomes were the Glasgow Coma Scale, pupil reactivity, and blood pressure measures. Following discussion with an expert consensus group, 15 were recommended for inclusion in the data dictionary. This review identified numerous studies evaluating associations between clinical factors and outcomes in patients with moderate-severe TBI. A small number of factors were reported consistently, however, how and when these factors were assessed varied. The findings of this review and the subsequent consensus process have informed the development of an evidence-informed data dictionary for moderate-severe TBI in Australia.

DOI: 10.1089/neur.2023.0111

PMCID: PMC11286001

PMID: 39081663

6. Cardiol Rev. 2024 Jul-Aug 01;32(4):297-313. doi: 10.1097/CRD.0000000000000699.

Mobile Stroke Units in Acute Ischemic Stroke: A Comprehensive Systematic Review and Meta-Analysis of 5 "T Letter" Domains.

Hagrass AI(1), Elsayed SM(2), Doheim MF(3), Mostafa MA(4), Elfil M(5), Al-Kafarna M(6), Almaghary BK(6), Fayoud AM(7), Hamdallah A(8), Hasan MT(1), Ragab KM(9), Nourelden AZ(1), Zaazouee MS(10), Medicherla C(11), Lerario M(12), Czap AL(4), Chong J(11), Nour M(13), Al-Mufti F(14).

Intravenous thrombolysis (IVT) may be administered to stroke patients requiring immediate treatment more quickly than emergency medical services if certain conditions are met. These conditions include the presence of mobile stroke units (MSUs) with on-site treatment teams and a computed tomography scanner. We compared clinical outcomes of MSU conventional therapy by emergency medical services through a systematic review and meta-analysis. We searched key electronic databases from inception till September 2021. The primary outcomes were mortality at 7 and 90 days. The secondary outcomes included the modified Rankin Scale score at 90 days, alarm to IVT or intra-arterial recanalization, and time from symptom onset or last known well to thrombolysis. We included 19 controlled trials and cohort studies to conduct our final analysis. Our comparison revealed that 90-day mortality significantly decreased in the MSU group compared with the conventional care group [risk ratio = 0.82; 95% confidence interval (CI), 0.71-0.95], while there was no significant difference at 7 days (risk ratio = 0.89; 95% CI, 0.69-1.15). MSU achieved greater functional independence (modified Rankin Scale = 0-2) at 90 days (risk ratio = 1.08; 95% CI, 1.01-1.16). MSU was associated with shorter alarm to IVT or intra-arterial recanalization time (mean difference = -29.69; 95% CI, -34.46 to -24.92), treating patients in an earlier time window, as shown through symptom onset or last known well to thrombolysis (mean difference = -36.79; 95% CI, -47.48 to -26.10). MSU-treated patients had a lower rate of 90-day mortality and better 90-day functional outcomes by earlier initiation of IVT compared with conventional care.

DOI: 10.1097/CRD.0000000000000699

PMID: 38602410 [Indexed for MEDLINE]

7. Can J Public Health. 2024 Jul 31. doi: 10.17269/s41997-024-00915-4.

Sensitivity and specificity of International Classification of Diseases algorithms (ICD-9 and ICD-10) used to identify opioid-related overdose cases: A systematic review and an example of estimation using Bayesian latent class models in the absence of gold standards.

Mbutiwi FIN(1)(2)(3)(4)(5), Yapo APJ(2), Toirambe SE(2), Rees E(1)(6)(7)(4), Plouffe R(7), Carabin H(8)(9)(10)(11).

OBJECTIVES: This study aimed to summarize validity estimates of International Classification of Diseases (ICD) codes in identifying opioid overdose (OOD) among patient data from emergency rooms, emergency medical services, inpatient, outpatient, administrative, medical claims, and mortality, and estimate the sensitivity and specificity of the algorithms in the absence of a perfect reference standard.

METHODS: We systematically reviewed studies published before December 8, 2023, and identified with Medline and Embase. Studies reporting sufficient details to recreate a 2 × 2 table comparing the ICD algorithms to a reference standard in diagnosing OOD-related events were included. We used Bayesian latent class models (BLCM) to estimate the posterior sensitivity and specificity distributions of five ICD-10 algorithms and of the imperfect coroner's report review (CRR) in detecting prescription opioid-related deaths (POD) using one included study.

RESULTS: Of a total of 1990 studies reviewed, three were included. The reported sensitivity estimates of ICD algorithms for OOD were low (range from 25.0% to 56.8%) for ICD-9 in diagnosing non-fatal OOD-related events and moderate (72% to 89%) for ICD-10 in diagnosing POD. The last included study used ICD-9 for non-fatal and fatal and ICD-10 for fatal OOD-related events and showed high sensitivity (i.e. above 97%). The specificity estimates of ICD algorithms were good to excellent in the three included studies. The misclassification-adjusted ICD-10 algorithm sensitivity estimates for POD from BLCM were consistently higher than reported sensitivity estimates that assumed CRR was perfect.

CONCLUSION: Evidence on the performance of ICD algorithms in detecting OOD events is scarce, and the absence of bias correction for imperfect tests leads to an underestimation of the sensitivity of ICD code estimates.

DOI: 10.17269/s41997-024-00915-4

PMID: 39085747