previous studies we found 5 injuries to be potentially life-threatening had the patient otherwise survived. All of these patients were <55 years old, had no known prior disease which could explain the injuries and were not in anticoagulant therapy. In one case, a potentially life-saving procedure, Extra-Corporal Membrane Oxygenation, was withheld because of massive haemorrhage.

Conclusion Visceral injuries are not uncommon after mech-CPR. We found lung and heart contusions to be most common. Contrary to what previous studies have described, we found that potentially life-threatening injuries can occur as a result of mech-CPR.

Conflict of interest None to declare.

Funding None to declare.

9 QUALITY INDICATORS IN THE PREHOSPITAL EMERGENCY MEDICAL SERVICE: A SCOPING REVIEW

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Background Quality indicators (QI) in the prehospital emergency medical service (EMS) have primarily focused on response-time and other time-interval targets. With implementation of the electronic prehospital patient medical record it is now possible to retrieve patient data, why there is a need to redefine the QI. The aim of the study was to identify QI developed for the EMS.

Method A scoping review was used. The inclusion criteria were defined in accordance with scoping reviews: Participants – patients in all age groups, Concept – indicators that measure performance and/or quality, Context – prehospital EMS. A search of literature was performed in September 2018 and performed in the databases: PubMed, the Cochrane Library, Embase, CINAHL and Web of Science. Two searches were conducted: 1) reviews from 2008–2018 and 2) primary literature from 2016–2018.

Results We identified 2828 articles and included 15. We retrieved 743 QI and it was possible to categorise 723 QI. There was an almost even distribution between Clinical QI n=372 (51.5%) and Non-clinical QI n=351 (48.5%). The largest sub-categories amongst Clinical QI were Trauma (20,1%), Cardiac arrest (16,1%) and Chest pain (11,8%). Within the Non-clinical QI category, the most frequent sub-categories were Time intervals (25,6%), Resources (16,5%) and Adverse events (11,4%).

Conclusion There are many prehospital quality indicators, but most are based on time intervals or the large disease specific groups. The growth in articles suggests an increasing interest in measuring quality in EMS. There is a need for validation of the existing QI.

Conflict of interest None declared.

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10 EPIDEMIOLOGY OF POPULATION MORTALITY RELATED TO FALLS IN CALIFORNIA 2000–2016: AN INCREASING CHALLENGE FOR EMS

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Background Falls mortality increases with age and the U.S. population is aging steadily. This study examined the epidemiology of mortality in California this century due to unintentional falls.

Method Deaths caused by falls were extracted from California Department of Public Health data. Yearly Californian population estimates from the California Department of Finance were used to calculate the incidence of falls mortality.

Results There were 32 276 deaths attributed to falls, out of 618,589,117 person-years. Deaths at age ≥60 years accounted for 26 669 (83%). There were 15% more deaths during winter months, compared with summer. From age 70 mortality approximately doubled every five additional years of age. The age-adjusted falls mortality rate per 1 00 000 person-years (against the 2000 U.S. Standard Population) increased over 2000–2016 from 3.0 to 4.5 in females and from 8.9 to 9.8 in males. The number of falls deaths increased by a mean 77 per year, (95% CI 72, 83, R²=0.98, p<0.0001), doubling from 1251 in 2000 to 2582 in 2016.

Conclusion It may be prudent for EMS in California to anticipate continued increases in falls mortality. If the annual number of falls-related deaths continues to climb by an average of 77 deaths per year, then California will experience more than 3000 falls deaths per year sometime between 2025 and 2030. Recent increases were partly driven by a combination of increasing population and changes in the age distribution, however, age-adjusted mortality rates also increased, especially in females and older age groups.

Conflict of interest None.

Funding None.

11 VALIDATION OF THE FAST-ED SCORE FOR PREHOSPITAL IDENTIFICATION OF STROKE PATIENTS WITH LARGE-VESEL OCCLUSION AND A COMPARISON WITH THE CLINICIAN'S JUDGMENT

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Background Endovascular thrombectomy (EVT) is a highly effective treatment for acute ischemic stroke patients with large-vessel occlusion (LVO). However, few comprehensive stroke centers are capable of providing EVT 24/7 and their geographical position is not necessarily ideal. We aimed to validate FAST-ED scale as a tool for LVO identification and

hospital selection in the field and to compare it with the clinician's judgment.

Method All thrombolysis candidates transported by the emergency medical services from January to June 2017 were evaluated for FAST-ED scale items by two investigators (TP, DS). A neuroradiologist (PV) evaluated the presence of vessel occlusion on the admission CT angiography in a blinded manner. To compare two independent raters (TP, DS), interclass correlation coefficient was calculated based on a sub-cohort of 100 patients.

Results The sample consisted of 610 thrombolysis candidates. LVO was diagnosed in 39 cases (6.4%). Majority of the patients (81.8%) scored 0–3 on FAST-ED scale. Sensitivity of FAST-ED ≥ 4 to predict LVO was 58%, whereas the specificity 87% and the negative predictive value 94%. For more experienced clinician, it was 79.4%, 88% and 97%, respectively. For less experienced clinician the corresponding numbers were 50%, 89%, and 92%. Interclass correlation coefficient for both raters for the whole range of FAST-ED was 0.92 (0.88–0.94).

Conclusion The higher the FAST-ED score, the higher the probability of correctly identifying LVO in the field. However, with the most commonly used cut-off of ≥ 4 points, only 28% of the thrombolysis candidates had LVO.

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Conflict of interest None.

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12 ASSOCIATION BETWEEN USE OF PREHOSPITAL MECHANICAL CPR DEVICE FOR OUT-OF-HOSPITAL CARDIAC ARREST AND OUTCOME BY PATIENT TRANSPORT INTERVAL: PILOT STUDY

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Background In this study, we aimed to investigate effect of mechanical CPR device (MechCPR) on OHCA by patient transport interval (PTI). We hypothesized MCPR is effective on survival with prolonged PTI (P-PTI).

Method This is an observational study using Korean Cardiac Arrest Research Consortium (KoCARC) data from October 2015 to Jun 2018. EMS treated OHCA presumed of cardiac etiology without field return of spontaneous circulation (ROSC) was included. Patients with less than 15 years old, with unknown information of MechCPR, PTI and outcome were excluded. Exposure was prehospital MCPR use and outcome was survival to admission. PTI was defined as time interval between scene to hospital. P-PTI was defined if PTI longer than 9 min and NP-PTI if less. Multivariable logistic regression by PTI group (reference=manual CPR) was performed to calculate adjusted odds ratios (AORs) with 95% confidence intervals (95% CIs) for outcome.

Results From total 2,214 OHCA patients, in rate difference of survival to admission in NP-PTI group comparing no-MCPR to MCPR was -3.44% (-11.95% – 5.08%) and in P-PTI -4.34% (-11.14% – 2.46%). In multivariable logistic analysis, aOR was 1.63 (0.94–2.85) in NP-PTI group and 1.74 (1.14–2.67) in P-PTI group.

Conclusion For OHCA with PTI 9 min or longer, MechCPR was associated with survival to admission for patients failed to be restored in field. Based on this pilot study, further study in larger population is needed to investigate optimized use of MechCPR for survival benefit.

Conflict of interest No conflict of interest.

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13 VALIDATING THE HEART RATE VARIABILITY RISK PREDICTION MODEL AND ACCELERATED DIAGNOSTIC PROTOCOL (HRVPM-ADP) FOR CHEST PAIN PATIENTS AT THE ED

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Background Patients presenting to the emergency department (ED) with chest pain can have varying etiologies from benign musculoskeletal pain to life-threatening acute myocardial infarction. HRVPM-ADP¹ was previously derived as a non-invasive risk stratification tool for chest pain. We aimed to validate this novel triage method and compare it against the HEART score.

Method This study retrospectively analysed 545 chest pain patients presenting to Singapore General Hospital between January 2014 and June 2016. The primary outcome was 30 day major adverse cardiac events (MACE). HRV prediction model (HRVPM) was previously derived with 6 HRV and 3 ECG variables. Troponin results were then added to develop an accelerated diagnostic protocol (HRVPM-ADP). Performance of the HRVPM-ADP was validated and compared against the HEART score.

Results HRVPM had an AUC of 0.711 (95% CI 0.659, 0.763). This outperforms HEART with AUC 0.708 (95%CI 0.658, 0.758). HRVPM-ADP identified low risk chest pain with sensitivity of 98.5% (95%CI 96, 100) and negative predictive value (NPV) of 96.0% (95% CI 89, 100). In comparison, a low risk HEART score (0–3) had sensitivity of 94.8% (95%CI 89, 98) and NPV of 92.7% (95%CI 85, 97).

Conclusion HRVPM is a non-invasive risk stratification tool which has demonstrated comparable performance with the HEART and can be used as an ADP to identify low-risk chest pain patients in the ED who are safe for early discharge.

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