Quality improvement and organization

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Background Quality measurements in the prehospital emergency medical service (EMS) have focused mainly on response-time. Net promoter score (NPS) is a simple, one-question method widely used in business and health care to assess patient satisfaction. The aim of this study was to analyze feasibility and primary results of customized NPS in the EMS.

Method In August 2021, EMS providers asked a permission on every mission for a latter, text message based patient satisfaction survey. The patients graded their general experience on scale from 0 to 10. They had a chance to further assess their experience on eight subquestions and write down a free comment. The research group validated all answers.

Results There were 6610 EMS missions during study time. We sent 3010 text messages to the patients and got 629 answers. The total NPS score was 59 after validation. People living in low-density communities (NPS 68) intended to give higher NPS score than people in medium-density (NPS 64) or in high-density communities (NPS 54); P=0.02. Higher NPS was associated to missions of higher priority (A priority being the highest and D the lowest; A 71; B 64; C 58 and D 47; P=0.02).

Conclusion There is an increasing interest in measuring quality in EMS. NPS is easy to commence but needs proper implementation to achieve more answers. The NPS 59 achieved in this cohort was good, compared to NPS results in general and gives a comparison point for future patient satisfaction surveys in EMS.

Conflict of interest None.

Funding Nothing to declare.

Cardiac arrest

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Background Out-of-hospital cardiac arrest (OHCA) survival remains poor worldwide, especially for patients with non-shockable rhythms. A physiologically-distinct neuroprotective (NP) cardiopulmonary resuscitation (CPR) strategy combining automated head-up positioning (AHUP), an impedance threshold device (ITD), and manual active compression-decompression (ACD) and/or an automated suction-cup based compression device was recently shown in animal models to increase cerebral blood flow[1] and neurologically-intact survival[2]. We assessed the effectiveness of NP-CPR on overall survival and favorable neurological survival after OHCA.

Method This Institutional Review Board-approved observational study from a prospective NP-CPR registry compared patients treated with NP-CPR (n=227) from 6 United States pre-hospital systems with individual conventional (C) CPR control subjects (n=5,352) with data obtained from three large published North American OHCA randomized controlled trials. The primary endpoint was hospital survival. Favorable neurological function was a secondary endpoint. Multivariate logistic regression analyses (MLRA) and propensity-score 4:1 (C-CPR:NP-CPR) matching analyses (PSMA) were performed.

Results Regardless of the presenting rhythm, faster initiation of NP-CPR was associated with higher adjusted odds ratios (ORs)[95% confidence interval(CI)] of survival and favorable neurological survival, using MLRA and PSMA. Specifically when NP-CPR was initiated <10 and <15 minutes after the emergency call for help, the ORs[CI] for survival were 4.0 [1.7–9.6] and 2.0[1.1–3.8], respectively, with PSMA. When NP-CPR was initiated <12 minutes after the emergency call, the ORs[CI] for survival with favorable neurological function were 2.29[1.04–5.04] and 3.35[1.42–7.89] with MLRA and PSMA, respectively.

Conclusion Compared with matched C-CPR controls rapid NP-CPR application was associated with a significantly higher probability of overall survival and favorable neurological survival after OHCA.

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Conflict of interest No authors have a conflict of interest except for Keith Lurie, who is a co-inventor of the automated head up positioning device used in the study and a co-founder of AdvancedCPR Solutions LLC that funded the study.

Miscellaneous

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Background The COVID-19 pandemic has created challenges and led to the massive closure of in-person CPR trainings

globally. We developed a mobile application-based real-time CPR training solution named HEROS-Remote, which combines instructors, learners, training contents, and CPR feedback in just one app. In this study, we investigated the usability, acceptability, and feasibility of the HEROS-Remote CPR training solution among community lay people.

Method From August to November 2021, HEROS Remote pilot study was conducted in Seoul, Korea. During the study period, 164 learners participated in 22 HEROS-Remote sessions. Before the training, CPR training material, including Little Anne QCPR manikin, was delivered to the individual learner. After one-hour chest compression-only HEROS Remote online training, the learners participated in-depth survey on their experiences of HEROS Remote online training.

Results A total 152 learners (92.7%) responded to the survey. Overall, 88.1% of the learners were satisfied with the HEROS Remote training and 85.5% responded that they would recommend online training to others. Majority of the learners (37.3% strongly agree; 41.3% agree) also agreed with the easiness of using the HEROS Remote app. Manikin delivery service was highly satisfactory (97%). However, major challenge for this online solution was that the quality of the training highly depended on internet connectivity.

Conclusion This study provides evidence of the feasibility and acceptability of a novel online, real-time CPR training solution. Further research is needed to investigate the effectiveness of online CPR training versus face-to-face training.

Conflict of interest SYJK, HM, TSB are employees of Laerdal Medical.

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Interventions and diagnostics

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Background There is no reliable, minimally invasive, and fast method to measure core temperature in a pre-hospital-care. Nasopharyngeal temperature probe (NPTP) would allow continuous temperature monitoring while treating a patient, but its reliability on spontaneously breathing patients remains unclear.

The study aims to evaluate, whether NPTP monitoring for core temperature is reliable with spontaneously breathing patients, in different environments.

Method 47 healthy, ambulatory volunteers were recruited for the study. We measured ear and nasopharynx temperatures using a standard ear thermometer and nasopharyngeal temperature probe. Ear temperature was used as a reference due to its practicality and noninvasiveness. Ear and nasopharyngeal temperatures were measured in 5 different scenarios: room temperature (+22 °C), cold environment (-5 °C) after 5, 10 and 15 minutes of exposure and in a hot environment (+65 °C) after 15 minutes of exposure.

We used Bland-Altman-analysis to compare measurements.

Results We gathered a total of 235 ear temperature values and 235 nasopharynx temperature values. Due to a thermometer malfunction, 7 (3.0%) ear temperature values were excluded, leaving a total of 228 temperature value pairs for final analysis.

Bland-Altman-analysis showed a clinically significant positive bias between ear thermometer and NPTP, in all the environments. In room temperature mean difference was 1.90 with limits of agreement -0,00 to 3.81, in cold 3.20 (-0.62 to 7.03), and in hot 1.81 (0.55 to 3.07).

Conclusion According to our findings, nasopharynx temperature is not a reliable method to measure core temperature in spontaneous breathing patients.

Conflict of interest None declared.

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Quality improvement and organization

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Background Specialist Practitioners were introduced to East Midlands Ambulance Service in September 2020. Three Cohorts of SP's have been introduced who have undertaken additional training and education in order to assess minor illness and injuries which may reduce the need for a visit to accident and emergency department.

Method Analysis of the clinical analytics data suite matched to the Call data sets and compared with wider cohorts of paramedics to understand the impact of each of the three cohorts since their introduction to the Trust.

Results Specialist Practitioner(SP) n=37 have attended (n=16,557) conveyed 36.73% (n=6082) EMAS 44.41% SP variance -7.68%, cohort 1 (CH1) commencement date 28/09/20 n=12 (n=7731) conveyed 33.07% CH1 variance -11.34%, Category 1 calls 48.93% (EMAS 56.88% Variance -7.95%) Category 2 calls 38.66% (EMAS 57.95 Variance -19.29) Category 3 calls 22.41% (EMAS 32.31% Variance -9.90) Cohort 2(CH2) commencement date 19/10/20 n=12 have attended (n=6103) conveyed 42.08% (n=2568) SP variance -2.33, Category 1 calls 57.22% (Variance +0.32) Category 2 calls 50.16% (EMAS 57.95 variance -7.79) Category 3 calls 30.12% (EMAS 32.31 variance -2.19). Cohort 3(CH3) commencement date 20/07/21 n=13 have attended (n=2716) conveyed 35.20% (EMAS 44.41 variance -9.21) Category 1 calls 52.97% (Variance -3.91) Category 2 calls 39.51% (Variance -18.44) Category 3 calls 22.99% (variance -9.32). SP Cohort all category variance (33.07 – 42.08).

Conclusion The initial three cohorts have all provided significant impact on the conveyance rate of the patient's seen. As this role becomes more embedded the true benefits will be seen through reduced conveyance and support for other crews on the front line.

Conflict of interest None.

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