

Background It has been suggested that prehospital providers need to be situationally aware in order to reduce human error. By reducing human error, patient outcomes may be improved. Research during the COVID19 pandemic has been difficult and while many projects were put on hold, the authors created a novel manner in which to complete this study and measure SA – through online simulation.

Method This was a mixed-methods explanatory sequential study where prehospital providers participated in an online simulation. The situational awareness global assessment technique (SAGAT) was utilized during periodic freezes in the simulation where the participants would answer questions related to the environments of the patient and the scene. Questions were focused on perception, interpretation, and prediction. Following the simulation, participants provided feedback during interviews.

Results The providers did not possess high levels of SA. Overall SA was 45% (p-value, .162), where participants performed best at perception with a steady decline to interpretation and then prediction. Those with higher levels of education did perform better, although this was not statistically significant, (p-value, .09). Those with more experience initially had higher SA but then tended to decrease with more experience (p-value, .24). Participants did feel satisfied with the online simulation and also felt that the simulation and SAGAT were beneficial to their continuing education and improving their care in the field.

Conclusion Prehospital providers are not situationally aware during online simulation. They focused on the surroundings at first, but did not focus as much on the patient. The SAGAT can be utilized in an online format and may possibly enhance overall performance. Further research is needed to determine if higher levels of education and experience play a role in prehospital SA.

Conflict of interest None.

Funding None.

Miscellaneous

246 ARE PARAMEDICS SITUATIONALLY AWARE? A CROSS-SECTIONAL STUDY DURING EMERGENCY CALLS FOR SERVICE

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Background Previous studies have suggested that paramedics are not situationally aware during their initial prehospital education nor during online simulation. No known research has measured situational awareness (SA) of paramedics during actual emergency calls for service.

Method An observational cross section study of paramedics in a busy 911 system during emergency calls for service. Utilizing the situational awareness global assessment technique (SAGAT) paramedics were asked a short series of questions during periodic stops during the emergency calls by trained

observers. The questions were based on a previously proven theoretical framework of SA for paramedicine focusing on the paramedic's ability to properly recognize events, interpret their meaning, and then predict how they may unfold in the future.

Results While observing 10 licensed paramedics, a total of 67 emergency calls for service were observed over a 4-week period. During those calls, 387 queries were asked of the paramedics during the actual emergency. Paramedics successfully answer 24% of the recognition questions, 32% of the interpretation questions, and 45% of the prediction questions. Overall SA was 34%.

Conclusion Paramedics were not situationally aware. They struggled the most with recognition questions, possibly due to high levels of stress and tunnel vision while on scene with patients. Of the events that they were able to recognize, they performed better at properly interpreting what those events meant and how those events may unfold in the future. Future studies are needed to determine if a targeted educational approach may improve SA and then, possibly, patient outcomes.

Conflict of interest None.

Funding None.

Cardiac arrest

249 THE ASSOCIATION OF COMORBIDITIES AND SURVIVAL AFTER OUT-OF-HOSPITAL CARDIAC ARREST IN DENMARK

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Background An increase has been observed in 30-day survival of out-of-hospital cardiac arrest (OHCA) in the past 18 years from 4% to 14% in Denmark, but OHCA survival remains low. We investigated how pre-existing comorbidities affected 30-day survival and time-to-death of OHCA patients.

Method This is a retrospective registry-based study with use of nationwide registries. Data on OHCA (2001–2015) were obtained from the Danish Cardiac Arrest Registry, data on the most clinically relevant comorbidities were collected from the Danish National Patient Registry and the Danish National Prescription Registry for up to 10 years prior to their arrest. Data on time-to-death was collected from the Danish Cause of Death Registry. Analysis was performed with use of several generalised linear models.

Results OHCA patients with AMI, ischemic heart disease (IHD), arrhythmia, hyperlipidemia, and heart failure, had a 30-day survival of 7.39[6.87;7.95], 5.43[4.90;6.02], 2.87 [2.66;3.09], 1.76[1.60;1.93] and 1.51[1.39;1.65], respectively, presented as odds ratios (OR). Patients with the co-existing conditions i) AMI and arrhythmia or ii) arrhythmia and IHD

had an OR of 12.51[11.12;14.08] and 3.68 [3.30;4.09], respectively. In a time-to-death analysis presented as incidence rate ratios, Mental disorders due to use of alcohol 2.63 [2.39;2.88], COPD and respiratory failure 2.58[2.42;2.74], stroke 1.96[1.82;2.11], cancer 1.76[1.61;1.91], infection 1.71 [1.58;1.85], or diabetes 1.52[1.41;1.63] were important.

Conclusion Comorbidities significantly influence survival of OHCA patients. Cardiovascular comorbidities constitute the major part of the disease burden. The influence of comorbidity should be included in future treatment guidelines of OHCA patients.

Conflict of interest None.

Funding None.

Cardiac arrest

255 CAN MOBILISING AEDS BY INSTALLING THEM IN TAXIS IMPROVE ROSC?

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Background The automated external defibrillator (AED) can restore normal heart rhythm in cardiac arrest victims. Early defibrillation correlates with increased rate of out-of-hospital cardiac arrest (OHCA) survival. However, AED availability remains a challenge. We aimed to measure key time intervals and observe impact of mobilizing the taxi's AEDs on pre-hospital return of spontaneous circulation (ROSC).

Method One-hundred and twenty taxi drivers were CPR and AED trained. They were then assigned to taxis equipped with AEDs, and thereafter alerted to OHCA cases via phone app. A retrospective analysis of this intervention was conducted.

Results From November 2015 to December 2017, 4088 phone alerts were sent out to taxis, 374 accepted the cases, and 127 arrived at scene. Of those who arrived on scene, 18 walked 198.6 metres on average, while 104 drove an average of 891.8 metres; 5 are missing data. Average time for drivers to accept a case when activated was 1 minute, 4 seconds (fastest=0, slowest=13 minutes); from activation to arrival at scene was 6 minutes, 22 seconds (fastest=1, slowest=31 minutes), and from acceptance to arrival at scene was 5 minutes, 19 seconds (fastest=0, slowest=30 minutes). Only two cases resulted in pre-hospital ROSC.

Conclusion Our data shows that taxis with AEDs arrived on scene within 7 minutes on average, which is faster than the average for EMS ambulances. Taxis can get AEDs on scene before an ambulance arrives, however further exploration into reason(s) and solutions for low response is needed.

Conflict of interest None.

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Cardiac arrest

257 REDUCTION IN EMS RESPONSE TIMES FOR OUT-OF-HOSPITAL CARDIAC ARREST USING DRONE-LIKE FLYING AMBULANCES IN LARGE URBAN AREAS IN FRANCE AND CANADA: AN INTERNATIONAL, QUASI-EXPERIMENTAL STUDY

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Background Shortening EMS response times lead to better outcomes after out-of-hospital cardiac arrest (OHCA). To overcome constraints encountered by ground ambulances, vertical take-off and landing (VTOL) capable flying ambulances are currently being developed. We compared simulated VTOL response to historical ground ambulance response for OHCA in two large metropolitan areas in Europe and North America.

Method We conducted an international, multicenter, quasi-experimental study on adult, non-traumatic, EMS-assessed, non-EMS witnessed OHCA occurring in the greater Paris (France) and Vancouver (Canada) metropolitan areas, over a 2-year span (2018–2020). Data were drawn from Utstein-style, population-based OHCA registries. VTOL response times were simulated based on prototype specifications. Response times were defined from call reception to arrival at scene. Simulation models considered 1–5 VTOL vehicles placed in optimized locations. We determined the proportion of OHCA for which VTOL response times were at least 1-min shorter than historical response from ground-based units.

Results In total, 13,933 cases were included (6,616 in Paris; 7,317 in Vancouver). Simulated VTOL response times were substantially shorter than those of ground-based units, varying from 59% (1 VTOL) to 76% (5 VTOL) in Paris, and 17% (1 VTOL) to 40% (5 VTOL) in Vancouver. In both locations, median response times were reduced by 1–3 minutes, and 90th percentile response times by 1–5 minutes, varying upon model configuration. For OHCA with improved response, the median improvement was 3–4 minutes, and 90th percentile improvement was 8–10 minutes in both areas.

Conclusion Simulation models of VTOL-capable flying ambulances show major theoretical reduction in EMS response times for OHCA in two large European and North American metropolitan areas.

Conflict of interest None.

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