

700 Emergency Medical Service Providers' Perspectives on Telemedicine in the Ambulance: A Survey-Based Study

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Background: Emergency Medical Services (EMS) telemedicine can increase patient satisfaction and quality of care when implemented in specialized settings. Concerns remain about its safety, efficiency, and practicality. EMS provider insight is essential to understanding potential uses of and barriers to successful telemedicine implementation.

Methods: We surveyed 177 licensed Marin County paramedics in 2017 to assess awareness of and attitudes towards EMS telemedicine. Marin County's fire-based EMS averages 15,000 patient transports annually with no current telemedicine capability. We captured respondent demographics, EMS experience, and 5-point Likert scale perspectives on possible benefits, challenges, and situation-specific utility of pre-hospital telemedicine. To assess how experience affects providers' views of telemedicine, we stratified by years of experience (≤ 7 vs > 7) and average patient contacts per month (≤ 15 vs > 15), comparing answer patterns with Whitney-Mann U tests.

Results: Of 100 respondents (response rate 56%), 95% were male, 97% currently providing care, and 87% averaging > 15 contacts a month, with 11.6 years average time as a paramedic, and 44% aware of EMS telemedicine. The majority of providers agreed or were neutral that telemedicine can improve pre-hospital diagnosis (35% agree, 49% neutral), destination decisions (41%, 33%), and patient satisfaction (38%, 43%). However, providers also agreed with statements regarding potential technological (57%) and workflow (66%) concerns. Respondents were statistically significantly more likely to favor telemedicine use in situations when early hospital notification criteria for acute stroke, trauma, or ST-elevation myocardial infarction are unclear. Less experienced and lower-volume paramedics were more likely than experienced paramedics to agree with the utility of telemedicine for patients requesting release against medical advice and meeting trauma criteria, respectively ($p < 0.03$; no other significant differences).

Conclusion: In surveys, we found that many paramedics see EMS telemedicine as potentially beneficial but concerns about workflow disruption must be addressed for successful EMS implementation. Specifically, expansion of telemedicine to support EMS providers when treating a patient with unclear diagnostic criteria can help improve patient care.

701 Prehospital 9-1-1 Physician Telehealth Triage of Low-Acuity Pediatric Patients

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Background: The Institute of Medicine reports that the emergency care system is overwhelmed, yet EMS often continues to transport pediatric patients to emergency rooms regardless of injury or illness. The National Association of EMS Physicians believes that not all patients require ALS, and in these encounters alternate transportation/destination may be appropriate. We aim to measure the number of Emergency Telehealth and Navigation (ETHAN) pediatric patients that were triaged for non-traditional prehospital transportation and destination. Presently, a paucity of literature exists regarding pediatric telehealth in EMS. **Methods** A retrospective study from December 2014 to May 2017 was conducted on consecutive 911 EMS patients triaged by telehealth emergency physicians and paramedics in a large urban EMS fire-based system, reporting on the reduction of ambulance transports and efficiency. Subsequently, a subgroup data analysis was performed solely on pediatric patients, examining the determined telehealth disposition of each patient after real-time video/voice conferencing, which is available on every fire and EMS unit. Patients transported to an emergency room (ER) via an EMS ambulance, patients transported to an ER via taxi or self-transport, and patients transported to primary care or home care were recorded. Descriptive statistics were utilized to describe study characteristics and a 95% confidence interval was calculated for patients'; non-ambulance transport and non-ED destination. **Results** During the study period, all 10,042 patients met the ETHAN inclusion criteria, of these 1057(11%) were pediatric patients. Among this group 88% (95% confidence interval 86% to 90%) of these pediatric patients were triaged by emergency physician telehealth technology and transported via non-ambulance methods. Furthermore, of all the ETHAN diverted pediatric patients, 22% (95% confidence interval 20% to 25%) were dispositioned to non-ED destinations. The mean study age was 14 years (range 1-20 years), 60% of pediatric patients were female and no adverse events were reported. **Conclusions:** This analysis demonstrates that the emergency physician-led ETHAN program was safe, significantly reduced low-acuity pediatric transports and successfully decreased ED visits. Further studies are warranted to evaluate 911 telehealth triage on this sizeable patient group.

702 Look Before You Leap: Mathematical Decision Modeling for Acute Stroke Thrombectomy Transport

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Background: Patients with suspected acute ischemic stroke (AIS) require rapid treatment. Delays to reperfusion therapy (tPA or endovascular thrombectomy [EVT]) reduce the odds of functional independence. Prehospital routing algorithms for patients with suspected large vessel occlusions (LVO) should account for likelihood of benefit from EVT, risk of delay to tPA, and time to access an appropriate facility. We built a probabilistic, cost-effectiveness model to provide a real-time, location-based optimal EMS routing location depending on local resources, transport times and patient characteristics.

Methods: Using onset time, age, sex, and pre-hospital stroke severity, we calculated odds of a favorable outcome for a patient with suspected LVO under 2 scenarios: direct to EVT-capable hospital (EVT site) vs. transport to the nearest tPA-capable hospital with transfer to an EVT-capable hospital if appropriate. We incorporated disability, utility, and cost to project lifetime outcomes. Multiple parameter sets of center-specific times (e.g., door-to-needle) were randomly selected to account for the sensitivity to these estimates; at each iteration, the optimal strategy was defined as the most cost-effective outcome using a threshold of \$100,000 per QALY gained. After 1000 simulations, the most frequently occurring optimal strategy was selected as the final recommendation, with its strength measured as the proportion of runs for which it was optimal.

Results: The routing recommendations were highly sensitive to small changes in input parameters. Under many scenarios, the recommendations for direct transfer to the EVT site increased with increasing stroke severity and geographic proximity, but did not vary substantially with respect to gender, age < 80 , or onset time. For example, for a 70 year old female 31 minutes from a tPA site and 48 to EVT site, the recommendation is very weakly in favor of direct transport to EVT site for moderate stroke (NIHSS 10) but the strength of the recommendation increases rapidly for severe stroke (NIHSS 18), (53% [50%, 56%] vs. 74% [71%, 77%], $p < 0.001$).