## Abstract
Objective. We examined whether or not teleconsultation from ambulances to a physician at an emergency medical communication center (EMCC) would increase the proportion of patients with non-urgent conditions being treated and released on site.

Methods: This research was a before-after pilot study. In the intervention period, the EMCC was manned 24/7 with physicians experienced in emergency care. Eligible participants included all patients with non-urgent conditions receiving an ambulance after a medical emergency call. Ambulance personnel assessed patients and subsequently performed a telephone consultation from the ambulance to the EMCC physician. The primary outcome was the proportion of patients treated and released on site. Secondary outcomes were the number of hospital admissions, mortality, and patient satisfaction. The intervention period was compared to a corresponding control period from the prior year.

Results: We observed an increase in the proportion of patients treated and released in the intervention period in 2014 compared to the control period in 2013, up from 21% (n=137) to 29% (n=221), OR = 1.46 [95%CI=1.14; 1.89], p=0.002. The follow-up rate was 100%. There was no observable increase in hospital admissions or mortality among patients treated and released from 2013 to 2014. A telephone survey of patients treated and released showed that 98.4% [95%CI=91.3; 99.9] were very satisfied or satisfied with their treatment.

Conclusions: Teleconsultation between EMCC-physician and ambulance personnel and non-critically ill 1-1-2 patients results in an increased rate of patients treated and released with high satisfaction. The approach does not seem to compromise patient...
Maaret Castrén, PhD  
Professor, University of Helsinki, Finland  
maaret.castren@helsinki.fi  
Maaret Castrén has deep insight into EMS, prehospital care and dispatch and has conducted a number of studies within this field.

Richard Lyon, MD, PhD  
Consultant in Emergency Medicine at The Royal Infirmary of Edinburgh, HEMS Consu, Royal Infirmary of Edinburgh  
richardlyon@doctors.org.uk  
Richard Lyon has extensive clinical and research experience within the prehospital field, including dispatch and EMS organization.
To Prof Colin A Graham  
Editor-in-Chief of European Journal of Emergency Medicine  

Dear Colin A. Graham  

Please find attached a manuscript entitled “Telemedicine-based physician consultation results in more patients treated and released by ambulance personnel” for consideration of publication in European Journal of Emergency Medicine.  

The demand for prehospital emergency care is increasing and will most likely continue to grow. However, in spite of criteria-based dispatch and medical priority dispatch systems, ambulances are dispatched to patients with no need for ambulance transportation and patients with non-urgent conditions still receive urgent hospital admission. Decreasing the number of patients transported to hospital could potentially reduce downstream workload and costs.  

In the present before-after study, we address these problems by examining whether or not teleconsultation from the ambulance to an Emergency Medical Communication Center-physician has the potential to increase the proportion of patients with non-urgent conditions treated and released on site. It is secondarily examined if this approach was safe in terms of the subsequent need for hospital admission and/or mortality outcomes.  

This was a pilot study to provide proof of concept prior to organizational changes in the EMS in Central Denmark Region. The study included the whole organization and patients were included consecutively. We believe that this study represents important findings, showing a new way to achieve more appropriate resource utilization in the EMS and secondarily addressing crowding problems in the emergency departments. We believe that our study demonstrates an uncomplicated method applicable in most EMS systems.  

I certify that all authors have approved submission to European Journal of Emergency Medicine and that the manuscript is not for consideration of publication elsewhere. We declare no conflicts of interest. The study has been approved by The Central Denmark Region Committee on Health Research Ethics.  

We hope that you will find our manuscript acceptable for publication European Journal of Emergency Medicine and look forward to your response.  

Sincerely yours  
Nikolaj Raaber, MD
Telemedicine-based physician consultation results in more patients treated and released by ambulance personnel

Nikolaj RAABER1,2,4, Morten T BØTKER1,2, Ingunn S RIDDERVOLD1, Erika F CHRISTENSEN3, Niels-Christian EMMERTSEN5, Thorbjørn GRØFTE6, Hans KIRKEGAARD2

1Research Department, Prehospital Emergency Medical Services, Central Denmark Region, Olof Palmes Alle 34, Aarhus N, DK-8200 Denmark
2Research Center for Emergency Medicine, Aarhus University Hospital, Noerrebrogade 44, build. 30, Aarhus C, DK 8000 Denmark
3Clinical Institute, Aalborg University, Sdr. Skovvej 15, Aalborg, DK-9000 Denmark
4Emergency Department, Aarhus University Hospital, Norrebrogade 44, Aarhus C, DK-8000 Denmark
5Prehospital Emergency Medical Services, Central Denmark Region, Olof Palmes Alle 34, DK-8200, Denmark
6Department of Anesthesiology, Regional Hospital Randers, Skovlyvej 1, Randers, DK-8930 Denmark

Corresponding author:
Nikolaj Raaber
Telephone: +4561668493
Email: nikoraab@rm.dk

Running head: EMS, teleconsultation and treat and release

Key words: Emergency Medical Services, Remote Consultation, Telemedicine, Telephone, Triage.

Conflicts of interests: Non declared

Financial support: The study was partially funded by the Danish Ministry of Health

Authors’ contributions:
NR co-designed the study, collected the data, analyzed the data and wrote the article. MTB, IR, NCE, TG, EFC and HK contributed to the study design, interpreted data, revised the manuscript critically and approved the final manuscript.

Word count: 4239 (including tables)

Trial registration: ClinicalTrials.gov (NCT02228317)
Abstract

Objective. We examined whether or not teleconsultation from ambulances to a physician at an emergency medical communication center (EMCC) would increase the proportion of patients with non-urgent conditions being treated and released on site.

Methods: This research was a before-after pilot study. In the intervention period, the EMCC was manned 24/7 with physicians experienced in emergency care. Eligible participants included all patients with non-urgent conditions receiving an ambulance after a medical emergency call. Ambulance personnel assessed patients and subsequently performed a telephone consultation from the ambulance to the EMCC physician. The primary outcome was the proportion of patients treated and released on site. Secondary outcomes were the number of hospital admissions, mortality, and patient satisfaction. The intervention period was compared to a corresponding control period from the prior year.

Results: We observed an increase in the proportion of patients treated and released in the intervention period in 2014 compared to the control period in 2013, up from 21% (n=137) to 29% (n=221), OR = 1.46 [95%CI=1.14; 1.89], p=0.002. The follow-up rate was 100%. There was no observable increase in hospital admissions or mortality among patients treated and released from 2013 to 2014. A telephone survey of patients treated and released showed that 98.4% [95%CI=91.3; 99.9] were very satisfied or satisfied with their treatment.

Conclusions: Teleconsultation between EMCC-physician and ambulance personnel and non-critically ill 1-1-2 patients results in an increased rate of patients treated and released with high satisfaction. The approach does not seem to compromise patient safety.

Introduction

The demand for prehospital emergency care is increasing[1-3]. Meanwhile, optimal resource consumption is a prerequisite for efficient emergency medical services (EMS). Patients in need of urgent care should receive highly-qualified help with quick response times. To achieve this goal, it is essential to keep patients who will not benefit from emergency treatment out of ambulances while allowing only acutely-ill patients to receive urgent hospital admission. Emergency medical communication centers (EMCCs) play a pivotal role in the triage of acutely-ill patients in the prehospital setting. In spite of criteria-based dispatch and medical priority dispatch systems, ambulances are dispatched to patients with no need for ambulance transportation and patients with non-urgent conditions still receive urgent hospital admission[4, 5].

Researchers and practitioners have addressed possible solutions to inappropriate resource utilization at different levels of the EMS. Nonetheless, developing guidelines enabling EMS dispatchers to refer callers to alternative resources has proven difficult[6]. It is safe and effective to allow secondary nurses and paramedic triage to identify emergency callers with non-serious problems and patients in no need of ambulance and/or to refer them to alternative health services[7, 8]. In fact, this practice is already standard in many countries, including Denmark. In the field, the paramedic’s ability to identify patients who do not require hospital care is limited and entails serious undertriage[9-11]. Dispatching specially-trained
paramedics or nurse response teams for non-urgent, non-life threatening cases is safe and effective, but resource intensive[12-16]. Clearly, many questions regarding the ultimate setup for a safe and efficient EMS remain unresolved. Meanwhile, the field has yet to realize the full potential of diminishing ambulance dispatch and transportation for patients in no need of hospital care.

We hypothesize that the introduction of a physician at the EMCC (EMCC-physician) to provide telephone consultation to ambulance personnel and patients with non-urgent conditions (teleconsultation) could increase the number of patients treated and released on site.

Goals of this Investigation
This study primarily aimed to evaluate whether or not teleconsultation from the ambulance to an EMCC-physician has the potential to increase the proportion of patients with non-urgent conditions treated and released on site. It secondarily examined if this approach was safe in terms of the subsequent need for hospital admission and/or mortality outcomes. Finally, it considered the level of patient satisfaction.

Methods
Study Design and Setting
This research was conducted as a before-after pilot study in the Central Denmark Region, which covers 13000 km² and has a total population of 1.260.000. One regional EMS service coordinates all prehospital EMS through the EMCC located in Aarhus. Specially-trained nurses or Emergency Medical Technicians (EMTs) handle all medical emergency calls to the EMCC, whereas emergency medical dispatchers perform the actual ambulance dispatch.

The EMCC in the Central Denmark Region handles around 49.000 emergency calls per year. In Denmark, the emergency call phone number is 1-1-2. The nurse or paramedic handling the emergency call decides on the appropriate EMS response, including referral to alternative options. This decision making is supported by the Danish Index for Emergency Care, a criteria-based dispatch protocol defining five categories of emergency: A: potentially life-threatening; B: urgent but not life-threatening; C: non-urgent; D: non-urgent transport without need of treatment or observation; and E: no ambulance response.

Ambulance personnel in Denmark are not authorized health care personnel but trained according to national requirements. Generally, a physician’s involvement or consultation is mandatory to treat and release patients. In the Central Denmark Region prehospital critical care team physicians treat and release patients on site in some cases. Furthermore, the ambulance personnel can consult a critical care team physician by telephone for advice and/or in order to treat and release. Annually, 3000-3500 patients are treated and released in the Central Denmark Region after critical care team physician involvement.

Selection of Participants
The study included all non-critically ill patients in the Central Denmark Region receiving a category B, C or D ambulance after a medical emergency call. We only included patients in their first emergency call contact during the study or control period.
For safety reasons patients assessed by ambulance personnel as being threatened in terms of airway, breathing, circulation, disability, or exposure were defined as critically ill and excluded.

Interventions
In a two-week period from September 15th 2014 to September 28th 2014, the EMCC Aarhus was manned with a physician 24/7. Ten physicians participated, all experienced in assessment and treatment of acutely-ill patients. After primary assessment by the ambulance personnel, EMCC-physician teleconsultation was performed. The teleconsultation focused on whether or not hospital admittance was required. Ambulance personnel conveyed their systematic clinical evaluation of the patient to the EMCC physician, including vital signs: respiratory frequency, peripheral capillary oxygen saturation, blood pressure, pulse, Glasgow coma scale score, blood glucose, temperature, and pain numeric ranking scale score. Whenever possible and relevant, the EMCC-physician performed a teleconsultation directly with the patient. When teleconsultation was performed, it was registered in the ambulance patient record. In case of a telephone queue to access the EMCC-physician, the ambulance staff was to wait one minute and then make a new attempt to call. If a second attempt failed, the normal procedure was to be followed (i.e., hospital admission or critical care team physician consultation).

We identified all category B, C and D patients from September 16th 2013 to September 29th 2013 as controls. At this time, ambulance personnel could only treat and release patients without assistance if the patient was assessed to be competent and refused to travel or denied care. Ambulance personnel were to consult a critical care team physician if patients were to be treated and released under any other circumstance.

Methods and Measurements
We obtained the number of category B, C and D patients receiving an ambulance as result of a 1-1-2 call from the EMCC Aarhus database. At the time of patient contact, ambulance personnel registered the following information in the ambulance patient record: if the patient was treated and released, physician teleconsultation, vital signs, clinical evaluation, and executed treatments. For both the control and intervention period, data was retrieved by audit of all ambulance patient records in the Central Denmark Region. Two research assistants independently performed the audits to determine if the patient was treated and released on site, and whether or not an EMCC-physician consultation had occurred. We retrieved data on hospital admissions from the Danish National Patient Register and data on 30-day mortality from the Danish Civil Registration System[17, 18]. We examined patient satisfaction for all patients treated and released by the EMCC-physician within 14 days of the emergency call using a structured telephone survey (Appendix 1). The first author conducted the interviews. If a patient’s telephone number was available, we made at least three attempts to conduct the interview. The study was registered at ClinicalTrials.gov (NCT02228317).

Outcome Measures
The primary outcome was the proportion of patients treated and released according to ambulance patient records. Secondary endpoints included the cumulative hospital admissions at days 1, 3, and 30; cumulative mortality at days 1, 3, and 30; and patient satisfaction evaluated by telephone survey among patients treated and released within 14 days of an emergency call.
Analysis
We used Mann-Whitney U test to compare continuous non-parametric data and Chi2 and Fisher’s test for binomial data. We applied two-sample t-test with equal variance for parametric data and used STATA13 (StataCorp LP, Texas, USA) for data analysis. The level of significance was p<0.05.

Ethics
The Danish Data Protection Agency (ref. no. 1-16-02-369-14) approved our study. The Central Denmark Region Committee on Health Research Ethics categorized the research as a method study, thereby exempting it from the need for informed consent (inquiry 166/2014).

Results
Characteristics of Study Subjects
In the intervention period, 774 emergency call patients received a category B,C or D ambulance (Figure 1). In the control period of 2013, 641 emergency call patients received a category B, C or D ambulance. Table 1 depicts the baseline characteristics of included patients, including those treated and released after EMCC-physician teleconsultation. Patients treated and released in the intervention period were significantly younger than patients treated and released in 2013 (47.3 vs 53.3 years, p=0.046). Table 2 illustrates the cause of contact to the EMCC Aarhus according to the ambulance patient record. Calls to the EMCC-physician showed no systematic day of week variation, but there were significantly fewer calls late at night than during daytime (Figure 2).

Main Results
We observed a significant increase in the proportion of patients treated and released in 2014 compared to 2013, up from 21% (n=137) to 29% (n=221) with an OR of 1.46 [95%CI =1.14; 1.89], p=0.002. The follow-up rate was 100%. As Table 3 indicates, there was no increase in hospital admissions or mortality among patients treated and released from 2013 to 2014. A telephone survey of patients treated and released showed that 98.4% [95%CI = 91.3; 99.9] were very satisfied or satisfied with their treatment (Figure 3). A survey concerning patients’ overall feeling of safety showed that 96.8 [95%CI = 88.8; 99.6] felt very safe or safe (Figure 3). The survey response rate was 65% (Appendix 1).

Discussion
In this study, teleconsultation between the EMCC-physician and ambulance personnel handling non-critically ill emergency call patients resulted in more patients being treated and released compared to a control period with no EMCC-physician. The patients responded to the procedure with high satisfaction and a sense of safety. No additional subsequent hospital admissions or patient fatalities were found.

Prior to this study, we had no good estimation of the extent to which it would be possible to increase the proportion of patients treated and released. Consequently, the study was planned as a pilot study. The high number of patients we were able to treat and release in this context was a surprising finding. Patients
treated and released by the EMCC-physicians were significantly younger than those treated and released in the control period. This finding is not surprising given that our study population was defined as non-critical, and morbidity increases with age. It further highlights that some patients receiving ambulances after their emergency calls do not need hospital care.

The finding of significantly lower 30-day mortality in the group assessed by an EMCC-physician (Table 3) most likely reflects differences between the patients treated and released after EMCC-physician teleconsultation and the critical care team physician. The EMCC-physician assessed patients with non-urgent conditions only, while critical care team physicians treat and release chronically and terminally ill patients at home.

Prior treat and release studies on patients with non-urgent conditions have focused on treat and release procedures for paramedics or EMTs trained in handling a single problem, such as falls[19], hypoglycemia[20, 21], minor wounds[22], atrial fibrillation[23], or a very limited number of non-urgent conditions[16, 14]. Other studies focusing on non-urgent conditions in general included prehospital patient assessments performed by dedicated emergency response crews consisting of specially-trained nurses or paramedics[12-16]. The outcomes of these studies have been positive in terms of increasing the proportion of patients being treated in the prehospital setting while maintaining patient safety. The ambulance personnel in our study received no additional training. Our study population included all category B, C and D 1-1-2 patients assessed as non-critically ill. To our knowledge, this research is the first treat and release study including patients with diverse non-urgent conditions, where EMCC-physicians play a pivotal role: a single physician supervised ambulance personnel in a region with a population of 1.2 million inhabitants.

Some have questioned the ability of ambulance crews without additional training to identify patients in no need of hospital care due to studies reporting the undertriage of serious conditions[24, 11]. The method in our clinical prospective study appears to be safe. Both hospital admission rates and mortality were consistently, but not significantly, lower in the intervention period than in the control period. However, this finding most likely relates to patients’ baseline characteristics.

Future research is needed in order to address safety issues as well as collateral effects in the health care system, such as contact with general practitioners and community services. There has been scarce research into the clinical potential of advanced telemedical solutions in the communication between ambulance personnel and EMCC-physicians, such as video transmission, streaming of vital signs, and ECG transmission. Likewise, it is necessary to clarify the cost effectiveness of such methods.

Conclusions
We have demonstrated that teleconsultation between an EMCC-physician and ambulance personnel and non-critically ill 1-1-2 patients results in an increased rate of patients being treated and released—all while maintaining high patient satisfaction. The approach does not seem to compromise patient safety, but this question requires further examination. This study indicates a central role for the EMCC-physician in terms of prehospital patient treatment and the prioritization of healthcare resources.
Limitations
As this research was a pilot study, the study period was relatively short. We included a sufficient number of patients to reach a valid estimation of the proportion of patients that can be treated and released. Although our results suggest that the approach is safe, a larger sample size is needed for definite validation of patient safety parameters, including subsequent death, hospital admissions, and/or emergency department contacts.

An uncontrolled before-after study has inherent downsides. Selection bias and changes over time is a relevant concern. In the Central Denmark Region the number of emergency calls increased from 2013 to 2014 as did the number of calls from non-critically ill patients in the intervention period compared to the control period. This may represent a threshold lowering for making emergency calls, thereby increasing the proportion of patients potentially to be treated and released. We believe to have avoided important selection bias by investigating the total EMS organization in Central Denmark Region and by reviewing all ambulance records in both the intervention and control period for treat and release. Likewise all non-critically ill emergency call patients were included in both periods. Nevertheless, in both periods ambulance personnel had the possibility to deviate from protocol and decide whether to consult a physician, thereby introducing selection of patients potentially to be treated and released. In the intervention period protocol stated that EMCC-physician was to be contacted in all cases of non-critically ill patients, whereas in the control period contact was made at the ambulance personnel’s discretion. With consideration to both threshold lowering and selection of patients, both may have increased the proportion of patients treated and released resulting in an overestimation of the effect of EMCC-physician teleconsultation. Still, this highlights problems with inappropriate resource utilization in the EMS and an unexploited potential in treating and releasing non-critically ill patients

The organization of EMS systems differs around the world [25]. Differences in EMCC organization, prehospital care, the staff’s educational level, and authorization for independent decision-making means that external validity would be highest for locations with similar demographics and EMS.

The study protocol represented a notable organizational change throughout the EMS system of the entire Central Denmark Region. Despite this feature, there was no run-in period prior to the study, which may have decreased the number of patients treated and released.

Declaration of interest
The authors report no conflicts of interest.
References


Figure legends

Figure 1.
Title: Flowchart of patients included and excluded

Abbreviations and explanations: EMCC: Emergency Medical Communication Center

Figure 2.
Title: Distribution of calls to the EMCC-physician in the intervention period on days of the week and around the clock.

Abbreviations and explanations: EMCC: Emergency Medical Communication Centre

Figure 3.
Title: Survey among patients treated and released and after EMCC-physician teleconsultation concerning overall patient satisfaction and feeling of safety (response rate = 65%).

Abbreviations and explanations:

Survey concerning overall patient satisfaction

Survey concerning patients feeling of safety
Control period 2013
Non-Critically ill 1-1-2 patients

Conveyed to hospital
n=479 (75%)

Patients treated and released
n=162 (25%)

- ≥ 2 EMCC contacts (n=8)
- Unknown patient ID (n=8)
- Dead before ambulance arrival (n=7)

Patients treated and released
Analyzed n=137 (21%)

Intervention period 2014
Non-Critically ill 1-1-2 patients

Conveyed to hospital
n=527 (68%)

Patients treated and released
n=247 (32%)

- ≥ 2 EMCC contacts (n=9)
- Unknown patient ID (n=9)
- Dead before ambulance arrival (n=8)

Patients treated and released
Analyzed n=221 (29%)
Table 1. Baseline characteristics, vital signs and received treatments for patients treated and released during control period (2013) and intervention period (2014).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD), years</td>
<td>49.7 (25.7)</td>
<td>47.3 (26.6)*</td>
<td>49.7 (25.7)</td>
<td>47.3 (26.6)*</td>
</tr>
<tr>
<td>No. female, (%)</td>
<td>96 (43)</td>
<td>40 (42.1)</td>
<td>96 (43)</td>
<td>40 (42.1)</td>
</tr>
<tr>
<td>No. male, (%)</td>
<td>69 (50.4)</td>
<td>125 (57)</td>
<td>69 (50.4)</td>
<td>125 (57)</td>
</tr>
<tr>
<td>Pulse, mean (SD)</td>
<td>85 (10)</td>
<td>87 (10)</td>
<td>85 (10)</td>
<td>87 (10)</td>
</tr>
<tr>
<td>Blood pressure, mean (SD), mmHg</td>
<td>122 (18)</td>
<td>122 (18)</td>
<td>122 (18)</td>
<td>122 (18)</td>
</tr>
<tr>
<td>Oxygen Saturation, median (IQR), %</td>
<td>98 (96-99)</td>
<td>98 (96-99)</td>
<td>98 (96-99)</td>
<td>98 (96-99)</td>
</tr>
<tr>
<td>Respiratory Frequency, mean (SD)</td>
<td>18 (9)</td>
<td>18 (9)</td>
<td>18 (9)</td>
<td>18 (9)</td>
</tr>
<tr>
<td>Temperature, mean (SD), °C</td>
<td>36.8 (1.4)</td>
<td>36.8 (1.4)</td>
<td>36.8 (1.4)</td>
<td>36.8 (1.4)</td>
</tr>
<tr>
<td>Received treatment, (%)</td>
<td>15 (11)</td>
<td>23 (10)</td>
<td>6 (6)</td>
<td>15 (11)</td>
</tr>
</tbody>
</table>

PCCT: Physician staffed prehospital Critical Care Team; EMCC: Emergency Medical Communication Center. PCCT only: All patients treated and released only by PCCT; PCCT & EMCC: All patients treated released by PCCT and after EMCC-physician telecommunication; EMCC: All patients treated and released after EMCC-physician teleconsultation. No. treatment: Number of patients with registered data. §p=0.038 (2014 vs 2013) *p=0.046 (2014 EMCC vs 2013).
Table 2

Main cause of emergency call among patients treated and released, according to ambulance patient record. Causes categorized according to main dispatch criteria (Danish Index for Emergency Care).

<table>
<thead>
<tr>
<th>Cause of emergency call</th>
<th>2013 PCCT only</th>
<th>N (%)</th>
<th>2014 PCCT &amp; EMCC</th>
<th>N (%)</th>
<th>2014 EMC C</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest pain</td>
<td>22 (15)</td>
<td>0</td>
<td>43 (19)</td>
<td>0</td>
<td>6 (6.3)</td>
<td>0</td>
</tr>
<tr>
<td>Seizure</td>
<td>20 (14)</td>
<td>0</td>
<td>15 (6.6)</td>
<td>0</td>
<td>8 (10)</td>
<td>0</td>
</tr>
<tr>
<td>Respiratory problems</td>
<td>13 (9.0)</td>
<td>0</td>
<td>20 (3.9)</td>
<td>0</td>
<td>8 (10)</td>
<td>0</td>
</tr>
<tr>
<td>Wound, fracture, minor injuries</td>
<td>11 (7.6)</td>
<td>0</td>
<td>33 (14)</td>
<td>0</td>
<td>20 (21)</td>
<td>0</td>
</tr>
<tr>
<td>Impaired consciousness, paresis</td>
<td>11 (7.6)</td>
<td>0</td>
<td>23 (10)</td>
<td>0</td>
<td>10 (10)</td>
<td>0</td>
</tr>
<tr>
<td>Traffic accident</td>
<td>10 (6.9)</td>
<td>0</td>
<td>12 (5.2)</td>
<td>0</td>
<td>2 (2.1)</td>
<td>0</td>
</tr>
<tr>
<td>Alcohol, poisoning, overdose</td>
<td>9 (6.4)</td>
<td>0</td>
<td>12 (5.2)</td>
<td>0</td>
<td>8 (10)</td>
<td>0</td>
</tr>
<tr>
<td>Allergic reaction</td>
<td>4 (2.8)</td>
<td>0</td>
<td>7 (3.1)</td>
<td>0</td>
<td>4 (4.2)</td>
<td>0</td>
</tr>
<tr>
<td>Physical, suicidal</td>
<td>4 (2.8)</td>
<td>0</td>
<td>7 (3.1)</td>
<td>0</td>
<td>4 (4.2)</td>
<td>0</td>
</tr>
<tr>
<td>Foreign body injuries</td>
<td>4 (2.8)</td>
<td>0</td>
<td>7 (3.1)</td>
<td>0</td>
<td>4 (4.2)</td>
<td>0</td>
</tr>
<tr>
<td>Undetermined problem</td>
<td>4 (2.8)</td>
<td>0</td>
<td>7 (3.1)</td>
<td>0</td>
<td>4 (4.2)</td>
<td>0</td>
</tr>
<tr>
<td>Abdominal – back pain</td>
<td>14 (6.1)</td>
<td>0</td>
<td>28 (6.1)</td>
<td>0</td>
<td>20 (21)</td>
<td>0</td>
</tr>
<tr>
<td>Ill Child</td>
<td>7 (4.6)</td>
<td>0</td>
<td>14 (6.1)</td>
<td>0</td>
<td>20 (21)</td>
<td>0</td>
</tr>
<tr>
<td>Possible death, SIDS</td>
<td>7 (4.6)</td>
<td>0</td>
<td>14 (6.1)</td>
<td>0</td>
<td>20 (21)</td>
<td>0</td>
</tr>
<tr>
<td>Liocconusus duct</td>
<td>8 (5.5)</td>
<td>0</td>
<td>16 (7.2)</td>
<td>0</td>
<td>20 (21)</td>
<td>0</td>
</tr>
<tr>
<td>Drowning</td>
<td>8 (5.5)</td>
<td>0</td>
<td>16 (7.2)</td>
<td>0</td>
<td>20 (21)</td>
<td>0</td>
</tr>
<tr>
<td>Akoulophobia, overdose</td>
<td>4 (2.8)</td>
<td>0</td>
<td>7 (3.1)</td>
<td>0</td>
<td>4 (4.2)</td>
<td>0</td>
</tr>
<tr>
<td>Tragic accident</td>
<td>10 (6.9)</td>
<td>0</td>
<td>12 (5.2)</td>
<td>0</td>
<td>2 (2.1)</td>
<td>0</td>
</tr>
<tr>
<td>Traffic accident</td>
<td>10 (7.6)</td>
<td>0</td>
<td>12 (5.2)</td>
<td>0</td>
<td>2 (2.1)</td>
<td>0</td>
</tr>
<tr>
<td>Impaired consciousness, paresis</td>
<td>11 (7.6)</td>
<td>0</td>
<td>12 (5.2)</td>
<td>0</td>
<td>2 (2.1)</td>
<td>0</td>
</tr>
<tr>
<td>Wound, fracture, minor injuries</td>
<td>11 (7.6)</td>
<td>0</td>
<td>12 (5.2)</td>
<td>0</td>
<td>2 (2.1)</td>
<td>0</td>
</tr>
<tr>
<td>Repetitive problems</td>
<td>10 (7.6)</td>
<td>0</td>
<td>12 (5.2)</td>
<td>0</td>
<td>2 (2.1)</td>
<td>0</td>
</tr>
<tr>
<td>Seizure</td>
<td>8 (5.5)</td>
<td>0</td>
<td>16 (7.2)</td>
<td>0</td>
<td>20 (21)</td>
<td>0</td>
</tr>
<tr>
<td>Chest pain</td>
<td>6 (3.9)</td>
<td>0</td>
<td>12 (5.2)</td>
<td>0</td>
<td>2 (2.1)</td>
<td>0</td>
</tr>
</tbody>
</table>

PCCT: Physician staffed prehospital Critical Care Team; EMCC: Emergency Medical Communication Center; PCCT only: All patients treated and released by PCCT only; PCCT & EMCC: All patients treated and released by PCCT and after EMCC-physician teleconsultation; EMC C: All patients treated and released after EMCC-physician teleconsultation.

* p=0.015
# p=0.027
§ p=0.018
<table>
<thead>
<tr>
<th>Variables</th>
<th>2013 N</th>
<th>2013 (%)</th>
<th>2014 N</th>
<th>2014 (%)</th>
<th>OR [95% CI]</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. treated and released</td>
<td>137 (21)</td>
<td>221 (29)</td>
<td>1.46 [1.14;1.89]</td>
<td>0.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. hospital admissions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 1 day</td>
<td>5 (3.7)</td>
<td>4 (1.8)</td>
<td>0.49 [0.10;2.35]</td>
<td>0.316</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 3 days</td>
<td>5 (3.7)</td>
<td>4 (1.8)</td>
<td>0.49 [0.10;2.35]</td>
<td>0.316</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 30 days</td>
<td>6 (4.4)</td>
<td>6 (2.7)</td>
<td>0.61 [0.16;2.33]</td>
<td>0.410</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. fatalities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 1 day</td>
<td>7 (5.1)</td>
<td>6 (0.3)</td>
<td>0.52 [0.14;1.85]</td>
<td>0.239</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 3 days</td>
<td>7 (5.1)</td>
<td>7 (3.1)</td>
<td>0.61 [0.18;2.08]</td>
<td>0.356</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 30 days</td>
<td>10 (7.3)</td>
<td>8 (3.6)</td>
<td>0.47 [0.16;1.38]</td>
<td>0.122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013 EMCC: Patients treated and released after EMCC-physician teleconsultation; Hospital admission: Patients admitted to hospital after being treated and released (cumulative numbers) within the stated calendar days; Fatalities: Number of patients fatalities after being treated and released (cumulative numbers) within the stated calendar days; OR: Odds Ratio; CI: Confidence Interval</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>