

expressed reluctance to compress deeply for fear of harming the victims.

**Conclusion** Training compressions were better quality. The results show the quality of chest compressions delivered by lay bystanders in actual cases, and highlights depth as an area of concern that could improve with training enhancement.

**Conflict of interest** None

**Funding** Ministry of Health grant

## 12 EXPLAINING VARIATION IN RATES OF NON-TRANSPORT BETWEEN EMERGENCY AMBULANCE SERVICES

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**Aim** In England in 2017 ambulance services responded to around 11 million calls. Half of patients were not transported to hospital. 11% received telephone advice only and 38% were discharged at scene. For the ten large regional ambulance services, rates of calls ending in telephone advice varied between 5% and 17%. Rates of discharge at scene varied between 23% and 51%. The aim was to explain variation in non-conveyance rates between ambulance services

**Method** A sequential mixed methods study: a qualitative interview study of managers and paramedics (totalling 49 interviews) followed by analysis of one month of routine data from each ambulance service (6 15 618 calls).

**Results** Interviewees identified factors they perceived affected non-transport. Rates of discharge at scene were associated with patient-level factors e.g. age, deprivation and skill level of attending crew. However, variation between ambulance services remained after adjustment for patient-level factors. Variation was explained by ambulance service-level factors: % of calls attended by paramedics with extended skills (odds ratio 1.05 (95% CI: 1.04 to 1.07)), the perception of ambulance service staff that paramedics with extended skills were established and valued within the workforce (odds ratio 1.84 (1.45, 2.33)), and the perception of ambulance service staff that senior management was risk averse regarding non-conveyance within an ambulance service (odds ratio 0.78 (0.63, 0.98)).

**Conclusion** Ambulance service management can take actions to reduce a variation in practice.

**Conflict of interest** None

**Funding** National Institute of Health Research.

## 13 A NOVEL APPROACH TO HIGH PERFORMANCE CARDIOPULMONARY RESUSCITATION EDUCATION IN A DANISH AMBULANCE SERVICE

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**Aim** Out of hospital cardiac arrest (OHCA) is a medical emergency where immediate treatment with cardiopulmonary resuscitation (CPR) are known to be paramount for survival. For professionals, international guidelines recommend high-performance CPR (HP-CPR) along with advanced life support. Currently, HP-CPR is not formally taught nor implemented in Denmark. This study evaluates a novel approach to HP-CPR education in a Danish ambulance service.

**Method** A two-day intensive course consisting of theoretical presentations and practical supervised workshops was planned and completed. Pre- and post-course, all participants completed a CPR cycle on a mannequin measuring data on CPR performance followed by a multiple-choice test and a self-efficacy questionnaire. The primary outcome was before and after evaluation of individual non-technical skills within resuscitation, the secondary outcome was before and after evaluation of technical skills through CPR performance.

**Results** In total, 23 EMS providers completed the course. Individual self-efficacy in resuscitation capabilities increased from a mean (SD) 8,09 (0,80) to 9,3 (0,59) ( $p<0,001$ ) on a 0–10 score with 0 being inadequate. Resuscitation knowledge improved from a mean (SD) of 76,77% (14,4) to 90,89% (4,9) ( $p<0,002$ ). CPR performance improved from a mean (SD) 85,52% (23,7) to 92,70% (13) ( $p=0,126$ ).

**Conclusion** This study suggests that our novel approach to HP-CPR education is advantageous as we found a significant increase in self-efficacy and CPR knowledge along with a non-significant increase in CPR performance. Future studies should investigate whether Danish HP-CPR trained EMS providers improve 30 day survival in real-life OHCA.

**Conflict of interest** None

**Funding** None

## 14 THE USE OF PREHOSPITAL 12-LEAD ELECTROCARDIOGRAMS IN ACUTE STROKE PATIENTS

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**AIM** Emergency medical services (EMS) play a vital role in the recognition, management and transportation of acute stroke patients. UK guidelines recommend clinicians consider performing a prehospital 12-lead electrocardiogram (PHECG) in patients with suspected stroke, but this recommendation is based on expert consensus, rather than robust evidence. The aim of this study was to investigate the association between PHECG and modified Rankin scale (mRS). Secondary outcomes included in-hospital mortality, EMS and in-hospital time intervals and rates of thrombolysis received.

**Method** A multicentre retrospective cohort study was undertaken. The data collection period spanned from 29/12/2013 – 30/01/2017. Participants were identified through secondary analysis of hospital data routinely collected as part of the Sentinel Stroke National Audit Programme (SSNAP) and linked to EMS clinical records (PCRs) via EMS incident number.

**Results** PHECG was performed in 558 (48%) of study patients. PHECG was associated with an increase in mRS (aOR 1.44, 95% CI: 1.14 to 1.82,  $p=0.002$ ) and in-hospital mortality (aOR 2.07, 95% CI: 1.42 to 3.00,  $p=0.0001$ ). There was no association between PHECG and administration of thrombolysis (aOR 0.92, 95% CI: 0.65 to 1.30,  $p=0.63$ ). Patients who had a PHECG recorded spent longer under the care of EMS (median 49 vs 43 min,  $p=0.007$ ). No difference in times to receiving brain scan (Median 28 with PHECG vs 29 min no PHECG,  $p=0.14$ ) or thrombolysis (median 46 min vs 48 min,  $p=0.82$ ) were observed.

**Conclusion** This is the first study of its kind to investigate the association between PHECG and functional outcome in stroke patients attended by EMS. Although there are limitations in

regard to the retrospective study design, the findings challenge current guideline recommendations regarding PHECG in patients with acute stroke.

**Conflict of interest** None

**Funding** University of Surrey School of Health Sciences PhD scholarship.

## 15 PARENTS' EXPERIENCES OF THE CARING ENCOUNTER IN THE AMBULANCE SERVICE- A QUALITATIVE INTERVIEW STUDY

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**Aim** Care provided by the ambulance service is often associated with emergency medicine, traumatology and disaster medicine this leaving a rather scant volume of research on children and their parents' perspective on the care received. Aim: To explore parents' experience of caring encounter in the ambulance service.

**Method** A qualitative design with interviews and an inductive qualitative content analysis was used.

**Results** 14 parents described 16 encounters' with ambulance personnel. Overall they expressed satisfaction with the care their children received. The parents described the significance when the personnel gave the family enough time, created a safe environment and involved the parents in the care. The parents felt unsafe when there were lack of communication and sensitivity, the equipment was not adaptable for children, and the parents was not invited to participate in the care.

**Conclusion** In order to improve the care in the ambulance it is imperative that we understand what parents want and value. Overall, parents' experiences was positive, but there is a need to strengthen the family-centred care in the ambulance service. Not inviting the parents to participate in the care, using not adaptable equipment caused a sense of uncertainty, lack of trust and increased level of stress among the parents. This may be caused by a lack of training or knowledge on caring of children among the personnel, managers need to acknowledge this in the ambulance personnel's continues medical education. Further intervention studies aiming to develop the family-centred care in the ambulance service is needed.

**Conflict of interest** None

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## 16 EMERGENCY MEDICAL SERVICES PHYSICIANS' PERCEPTIONS OF AMBULANCE NURSES' RESPONSIBILITY FOR REFERRING PATIENTS TO PRIMARY CARE AND SELF-CARE – A SWEDISH NATIONAL SURVEY

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**Aim** Based on guidelines developed by EMS physicians, registered nurses in the Swedish ambulance services sometimes by-pass the emergency department and refer non-urgent patients to primary care and self-care. However, these referrals are associated with problems that may jeopardise patient safety and patient participation. The aim was to identify the EMS physicians' perceptions of ambulance nurses' responsibilities and prerequisites to refer patients to primary care and self-care.

**Method** A national survey of all EMS physicians (n=51) using study specific questions with close-ended and open response options, analysed with descriptive statistics and thematic analysis.

**Results** The response rate was 78% (n=40). The majority of the physicians (95%) perceived that nurses should be able to refer patients to primary care and self-care. One fourth (25%) perceived specialist nurses in ambulance care as the most appropriate professionals. The majority of the physicians (65%) perceived that referral to primary care maintain patient safety, whereas fewer (50%) assessed the referral as safe for the patient. All perceived that feedback should be given to nurses when the referral was incorrect. The majority perceived it important to extend the nurses' authority to refer to primary care (63%) and self-care (55%).

**Conclusion** There is no consensus among the EMS physicians regarding responsibilities and conditions for nurses' referral of patients. Registered nurses with basic education are expected to be able to refer, while there is varying opinion regarding requirements of specialist trained ambulance nurses to refer patients. Professional experience as a nurse is perceived more important than formal education.

**Conflict of interest** None

**Funding** Division of Emergency Medical Services, Helsingborg County Hospital, Helsingborg, Sweden.

## 17 SUDDEN CARDIAC DEATH: AS SUDDEN AS COMMONLY THOUGHT OR DO WE KNOW OUR PATIENTS BEFORE?

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**Aim** About 100.000 people per year suffer from sudden cardiac death in Germany.<sup>1</sup> In most of the cases (75%) this is cardiac-associated.<sup>2</sup> According to this it appears to be probable that many patients did already have pre-existing cardiac diseases and might have been under medical treatment before. The aim of this study was to evaluate how many patients, who suffered from out-of-hospital cardiac arrest (OHCA), had documented diagnoses in the appropriate CA centre before.

**Method** In this retrospective, observational study data was analysed based on the local documentation in the German Resuscitation Registry of the Emergency Medical Service of the city of Aachen. This data was matched with documentation of the local CA centre concerning pre-existing conditions and diagnoses for a five-year period (2012 to 2016).

**Results** Overall 904 patients (Mean age 70±18 years) suffered from OHCA. Among these 41,9% (n=379) have been under medical treatment in the university hospital of Aachen during the last 3,7±4,5 years. 50,9% (n=193) of these had cardiopulmonary issues and 42,5% (n=161) were under medical treatment because of cardiac problems.

**Conclusion** The analysis shows that more than 40% of these patients, who were resuscitated during the years of 2012 to