

association between night shifts and OSCE scores while adjusting for gender and PGY. **Results:** A total of 136 OSCE scores were collected from 56 residents. PGY-5 residents had 37.1% (31.3 to 34.0%; $p < 0.01$) higher OSCE scores than those in PGY-1 with an average increase of 8.8% (7.5 to 10.1%; $p < 0.01$) per year. Working one or more night shifts in the three days before an OSCE reduced the total and communication scores by an average of 3.8% ($p = 0.04$) and 4.5% ($p = 0.04$) respectively. We observed a significant gender difference in the effects of acute shift work ($p = 0.03$). Working a night shift one night prior to an OSCE was not associated with total score among male residents ($p = 0.33$) but was associated with a 6.1% (-11.9 to -0.2; $p = 0.04$) decrease in total score among female residents. This difference was consistent across PGY and was primarily due to an 8.5% (-15.5 to -1.6%; $p = 0.02$) decrease in communication scores and a 6.7% (-13.1 to -0.3%; $p = 0.04$) reduction in GAS. **Conclusion:** Proximity to night shifts significantly impaired the performance of EM trainees in simulated resuscitation scenarios, particularly in the domain of communication. For female residents, the magnitude of difference in total scores after working such shifts one night prior to a resuscitation OSCE was approximately equal to the difference seen between residents one year apart in training.

Keywords: shiftwork, simulation, sleep deprivation

LO70

Do automatic external defibrillators improve rates of return of spontaneous circulation, survival to hospital discharge and favourable neurological survival in Canada?

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Introduction: Survival for victims of out-of-hospital cardiac arrest (OHCA) is typically 8-12%. Recent evidence has shown that public access automatic external defibrillators (AED) may improve survival. The objectives of this study were to determine whether AEDs improve rates of return of spontaneous circulation (ROSC), overall survival, and favourable neurological survival (FNS) in Canada. **Methods:** The BC Resuscitation Outcomes Consortium prospectively collected detailed prehospital and hospital data on consecutive non-traumatic OHCA from 2011-2015 within BC's four metropolitan areas. We included all EMS-treated adult patients. Data were collected in accordance with recognized Utstein criteria. We described frequencies with counts, means and medians where appropriate, and the Z-test was used to compare population proportions. **Results:** We examined 7577 OHCA from 2011-2015. AEDs were deployed on 223 patients in this period (mean age 60.4 yrs [95% CI 45.7-75.1] and 83.9% male; non-AED OHCA mean age 66.2 yrs [48.4-83.8] and 67.3% male). Seventy seven percent of AED deployments occurred in public locations, 69.1% were witnessed by bystanders and CPR was initiated in 98.7% of these cases. Fifteen percent of non-AED OHCA occurred in public locations, 38.3% were bystander witnessed, and 45.4% received bystander CPR. AEDs delivered shocks to 61.4% of patients, and EMS crews found an initial shockable rhythm upon scene arrival in 60.5% of AED deployments (22.9% for non-AED cases). AED OHCA patients had higher rates of ROSC at any time (67.2% vs 47.6%; difference of 19.6% [12.9-26.2 $p < 0.01$]), and ROSC at ED arrival (61% vs 35.4%; difference of 25.6% [19.2-32.0 $p < 0.01$]). AED OHCA patients had higher rates of survival to hospital discharge (23.8% vs 8.5%; difference 15.3% [11.5-19.1 $p < 0.01$]). Detailed neurologic outcome data was not available for all patients, yet for those which it was available AED OHCA patients had improved outcomes (modified Rankin score < 2) compared to non-AED OHCA patients (9.0% vs 5.4%; difference 3.6% [0.6-6.6 $p < 0.02$]).

Conclusion: Automatic external defibrillators markedly improve rates of ROSC at any time, sustained ROSC at ED arrival, survival to hospital discharge, and FNS in Canada. Continued support for public access AED programs is essential to improve patient outcomes.

Keywords: cardiac arrest, automatic external defibrillator, survival

LO71

For patients suffering from out-of-hospital cardiac arrest, is survival influenced by the capabilities of the receiving hospital?

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Introduction: Patients suffering from out-of-hospital cardiac arrest (OHCA) are frequently transported to the closest hospital after return of spontaneous circulation (ROSC). Percutaneous coronary intervention (PCI) is often indicated as a diagnostic and therapeutic procedure following OHCA. This study aimed to determine the association between the type of destination hospital (PCI-capable or not) and survival to discharge for patients with OHCA and prehospital ROSC. We hypothesized that being transported to a PCI-capable hospital would be associated with a higher survival to discharge. **Methods:** The present study used a registry of adult OHCA between 2010 and 2015 in Montréal, Canada. We included adult patients with non-traumatic OHCA and prehospital ROSC. The association of interest was evaluated with a multivariate logistic regression model to control for demographic and clinical variables (age, gender, time of day, initial rhythm, witnessed arrest, bystander CPR, presence of first responders or advanced care paramedics, prehospital supraglottic airway placement, delay before paramedics' arrival). Assuming a survival rate of 40% and 75% of the variability explained by other factors included in the model, more than 1200 patients needed to be included to detect an absolute difference of 10% in survival between both groups with a power of more than 90%. **Results:** A total of 1691 patients (1140 men and 551 women) with a mean age of 64 years (standard deviation 17) were included, of which 1071 (63%) were transported to a PCI-capable hospital. Among all patients, 704 patients (42%) survived to hospital discharge. We observed a significant independent association between survival to discharge and being transported to a PCI-capable hospital (adjusted odds ratio [AOR] 1.46 [95% confidence interval 1.09-1.96]) after controlling for confounding variables. Having an initial shockable rhythm and presence of first responders also increased survival to discharge (AORs 3.67 [95% confidence interval 2.75-4.88] and 1.53 [95% confidence interval 1.12-2.09], respectively). **Conclusion:** Patients experiencing ROSC after OHCA could benefit from a direct transport to a PCI-capable hospital. This benefit might also be related to unmeasured interventions other than PCI these hospitals can provide (e.g. high-level intensive care or cardiovascular surgery).

Keywords: out-of-hospital cardiac arrest, percutaneous coronary intervention, survival

LO72

Implementation of an educational program to improve the cardiac arrest diagnostic accuracy of ambulance communication officers: a concurrent control before-after study

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Introduction: Most ambulance communication officers receive minimal education on agonal breathing, often leading to unrecognized out-of-hospital cardiac arrest (OHCA). We sought to evaluate the impact of an educational program on cardiac arrest recognition, and on bystander CPR and survival rates. **Methods:** Ambulance communication officers in Ottawa, Canada received additional training on agonal breathing, while the control site (Windsor, Canada) did not. Sites were compared to their pre-study performance (before-after design), and to each other (concurrent control). Trained investigators used a piloted-standardized data collection tool when reviewing the recordings for all potential OHCA cases submitted. OHCA was confirmed using our local OHCA registry, and we requested 9-1-1 recordings for OHCA cases not initially suspected. Two independent investigators reviewed medical records for non-OHCA cases receiving telephone-assisted CPR in Ottawa. We present descriptive and chi-square statistics. **Results:** There were 988 confirmed and suspected OHCA in the “before” (540 Ottawa; 448 Windsor), and 1,076 in the “after” group (689 Ottawa; 387 Windsor). Characteristics of “after” group OHCA patients were: mean age (68.1 Ottawa, 68.2 Windsor); Male (68.5% Ottawa, 64.8% Windsor); witnessed (45.0% Ottawa, 41.9% Windsor); and initial rhythm VF/VT (Ottawa 28.9, Windsor 22.5%). Before-after comparisons were: for cardiac arrest recognition (from 65.4% to 71.9% in Ottawa $p = 0.03$; from 70.9% to 74.1% in Windsor $p = 0.37$); for bystander CPR rates (from 23.0% to 35.9% in Ottawa $p = 0.0001$; from 28.2% to 39.4% in Windsor $p = 0.001$); and for survival to hospital discharge (from 4.1% to 12.5% in Ottawa $p = 0.001$; from 3.9% to 6.9% in Windsor $p = 0.03$). “After” group comparisons between Ottawa and Windsor (control) were not statistically different, except survival ($p = 0.02$). Agonal breathing was common (25.6% Ottawa, 22.4% Windsor) and present in 18.5% of missed cases (15.8% Ottawa, 22.2% Windsor $p = 0.27$). In Ottawa, 31 patients not in OHCA received chest compressions resulting from telephone-assisted CPR instructions. None suffered injury or adverse effects. **Conclusion:** While all OHCA outcomes improved over time, the educational intervention significantly improved OHCA recognition in Ottawa, and appeared to mitigate the impact of agonal breathing.

Keywords: dispatch communications, cardiac arrest, agonal breathing

LO73

Long-term functional outcome and health-related quality of life of elderly out-of-hospital cardiac arrest survivors

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Introduction: This study aims to describe the long-term functional outcome and health-related quality of life of elderly (≥ 65 years old) out-of-hospital cardiac arrest (OHCA) survivors in Victoria, Australia. **Methods:** Elderly OHCA patients who arrested between January 1st, 2010 and December 31st, 2014 were identified from the Victorian Ambulance Cardiac Arrest Registry (VACAR). Living status, Glasgow Outcome Scale-Extended (GOS-E), Euro-QoL (EQ-5D) and Twelve-item Short Form (SF-12) Health Survey were collected by telephone 12 months following the OHCA. **Results:** Emergency medical services attended on 14,678 elderly OHCA during the study period, 6,851 (46.7%) of which received a resuscitation attempt. Of these, 668 patients (9.8%) survived to hospital discharge. The mean age of the survivors was 75 (standard deviation (SD) 7.4) years and 504 (75.4%) were male. Eighty-five patients subsequently died within 12 months of their OHCA. A total of 483 patients were interviewed (response rate

82.9%). At 12 months, 313 responders (64.9%) were living at home without care. Most responders ($n = 324$ (67.2%)) had a good long-term functional recovery with a GOS-E ≥ 7 . The proportion of patients with a GOS-E ≥ 7 progressively decreased with increasing age (65-74 years: 66.1%, 75-84 years: 53.0%, ≥ 85 years: 27.3%). On the EQ-5D, the majority of survivors reported no problem with mobility ($n = 266$ (55.1%)), self-care ($n = 403$ (83.4%)), activity ($n = 293$ (60.6%)), pain ($n = 335$ (69.3%)) and anxiety ($n = 358$ (74.1%)). On the SF-12, the mean mental component summary was 56.3 (SD 6.6) while the mean physical component summary was 44.7 (SD 11.4) (both measures range from 0-100). Among the 1,951 patients who arrested in a supported accommodation, 849 (43.5%) had a resuscitation attempt, and of these, 21 survived to hospital discharge (2.5%). Only eight (1.0%) of these patients were still alive 12 months after the OHCA and one survivor (0.12%) had a good functional outcome (GOS-E ≥ 7). **Conclusion:** Most elderly OHCA survivors have an adequate long-term functional status and health-related quality of life. However, the likelihood of having a good functional recovery decreases with increasing age, and is rare for patients arresting in a supported accommodation.

Keywords: cardiac arrest, geriatric, quality of life

LO74

Prehospital sodium bicarbonate use was associated with worse neurological outcomes among patients with out-of-hospital non-traumatic cardiac arrest

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Introduction: Sodium bicarbonate (SB) is still widely used for resuscitation in out-of-hospital cardiac arrest (OHCA) despite limited clinical indications but the effect on neurological recovery is unclear. **Methods:** From 2006 to 2016, we prospectively conducted a province-wide population-based observational study of adult non-traumatic OHCA patients managed by EMS. According to provincial guidelines, paramedics administered SB to OHCA patients based on their clinical assessment. Outcome of interest was favorable neurological outcome at hospital discharge, defined as CPC of 1 and 2 or modified Rankin scale of 3 or less. We performed multivariable logistic regression, comparing the proportion of outcome between SB and non-SB groups, further stratified by the median of the length of resuscitation. We also applied propensity score matching technique adjusting for baseline characters to the same model to reduce potential selection bias. **Results:** Of 13,008 OHCA patients, 4,699 (36.1%) were managed with SB. In the SB treated group, 64 / 4,699 (1.3%) patients had favorable neurological outcomes, compared to 823 / 8,309 (9.9%) in the non-SB treated group (crude odds ratio [OR] 0.12, 95% CI 0.09 to 0.16). In logistic regression model, SB was associated with decreased probability of favorable outcomes (adjusted OR 0.63, 95% CI 0.45 to 0.89). Similarly, with stratification by length of resuscitation, the SB group had a lower probability of favorable outcomes (≤ 24 min: adjusted OR 0.68, 95% CI 0.46 to 1.02, >24 min: adjusted OR 0.47, 95% CI 0.23 to 0.97). In 1:1 propensity matched cohort including 5,126 OHCA patients, the adjusted association also persisted (adjusted OR 0.59, 95% CI 0.39 to 0.89). **Conclusion:** Prehospital administration of SB to OHCA patients was associated with worse neurological outcomes and the trend persisted even after stratification by resuscitation length.

Keywords: cardiac arrest, out-of-hospital, sodium bicarbonate