Setmana del 23 al 29 de generde 2022: 41 articles d'interès

CPR AND COVID-19

1. Am J Emerg Med. 2022 Feb;52:128-131. doi: 10.1016/j.ajem.2021.12.009. Epub 2021 Dec 10.
Chest compression quality during CPR of potential contagious patients wearing personal protection equipment.
Cekmen B(1), Bildik B(2), Bozan O(3), Atis SE(2), Koksal M(2), Uzuncu HB(2), Akilli NB(4).
ABSTRACT
AIM OF THE STUDY: In this study we aimed to investigate whether changing rescuers wearing N95 masks every 1 min instead of the standard CPR change over time of 2 min would make a difference in effective chest compressions. METHODS: This study was a randomized controlled mannequin study. Participants were selected from healthcare staff. They were divided into two groups of two people in each group. The scenario was implemented on CPR mannequin representing patient with asystolic arrest, that measured compression depth, compression rate, recoil, and correct hand position. Two different scenarios were prepared. In Scenario 1, the rescuers were asked to change chest compression after 1 min. In Scenario 2, standard CPR was applied. The participants' vital parameters, mean compression rate, correct compression rate/ratio, total number of compressions, compression depth, correct recoil/ratio, correct hand position/ratio, mean no-flow time, and total CPR time were recorded. RESULTS: The study hence included 14 teams each for scenarios, with a total of 56 participants. In each scenario, 14 participants were physicians and 14 participants were women. Although there was no difference in the first minute of the cycles starting from the fourth cycle, a statistically significant difference was observed in the second minute in all cycles except the fifth cycle. CONCLUSION: Changing the rescuer every 1 min instead of every 2 min while performing CPR with full PPE may prevent the decrease in compression quality that may occur as the resuscitation time gets longer.

CPR/MECHANICAL CHEST COMPRESSION

No articles identified.

REGISTRIES, REVIEWS AND EDITORIALS

1. Resuscitation. 2022 Jan 25:S0300-9572(22)00020-X. doi: 10.1016/j.resuscitation.2022.01.020. Online ahead of print.
THE ASSOCIATION BETWEEN MODE OF TRANSPORT AND OUT-OF-HOSPITAL CARDIAC ARREST OUTCOMES IN SINGAPORE.
Sy Chua I(1), Mc Fook-Chong S(2), Shahidah N(3), Yng Ng Y(4), Yc Chia M(5), Mao DR(6), Sh Leong B(7), Oon Cheah S(8), Nee Gan H(9), Doctor NE(10), Peng Tham L(11), Eh Ong M(12); Singapore PAROS investigators.
ABSTRACT
OBJECTIVE: We aimed to examine the survival outcomes of out-of-hospital cardiac arrest (OHCA) patients, stratified by the transportation modes to the Emergency Department (ED). METHODS: This was a retrospective analysis of Singapore's Pan-Asian Resuscitation Outcomes Study registry from Apr 2010-Dec 2017. The primary outcome was survival to discharge or 30 days post-arrest. Secondary outcomes were the return of spontaneous circulation (ROSC) rate and neurological

outcomes. A subgroup analysis was performed for OHCA cases who collapsed enroute. RESULTS: A total of 15376 cases were analysed. 15129 (98.4%) were conveyed by Emergency Medical Services (EMS), 111 (0.72%) by private ambulance, 106 (0.69%) by own transport and 30 (0.2%) by public transport. 80% of patients brought by public transport arrested enroute, compared to 48.1% by own transport, 25.2% by private ambulance and 2.5% in the EMS group. 33/120 (27.5%) of paediatric OHCA cases were brought in by non-EMS transport to paediatric hospitals. The EMS group had the lowest survival rate at 4.5%, compared to 13.3% for public transport, 11.3% for own transport and 14.4% for private ambulance. ROSC rate was statistically significant but not for neurological outcomes. For the subgroup analysis, there was no statistical difference for primary and secondary outcomes across the groups. CONCLUSION: In Singapore, most OHCA patients are conveyed by EMS to the hospital, but some OHCA patients still arrive via alternative transport without prehospital interventions like bystander CPR. More can be done to educate the public to recognise an impending cardiac arrest and to activate EMS early for such cases.

2. Resuscitation. 2022 Jan 25:S0300-9572(22)00022-3. doi: 10.1016/j.resuscitation.2022.01.021. Online ahead of print.

Out-of-Hospital Cardiac Arrest related to exercise in the general population: Incidence, Survival and Bystander Response.

Amalie Wolthers S(1), Walther Jensen T(2), Nikolaj Blomberg S(3), Gelderman Holgersen M(4), Lippert F(2), Mikkelsen S(5), Mazur Hendriksen O(6), Torp-Pedersen C(7), Collatz Christensen H(8).

ABSTRACT

BACKGROUND: Regular exercise is known to prevent cardiovascular disorders, but it may also trigger acute cardiac events. This study examined the incidence, prognosis, and outcomes of out-of-hospital cardiac arrest (OHCA) related to exercise in the general population of Denmark. METHODS: This retrospective cohort study examined all the OHCAs in the Danish Cardiac Arrest Registry from 2016 to 2019. OHCA related to exercise was identified in a nationwide electronic database and coupled to the patient register. Descriptive statistics were used in combination with a multivariate logistic regression model to assess predefined factors. RESULTS: A total of 20,470 OHCAs were identified, of which 459 (2.2%) were related to exercise. Most were male (75.3%), with a median age of 61 years. Further, 95% of exercise-related OHCA received bystander cardiopulmonary resuscitation, compared to 77.4% in non-exercise-related OHCA ($p<0.001$), and 38.3% received defibrillation by bystanders versus 7.5% in the non-exercise group ($p<0.001$). Exercise-related OHCAs had a 30-day survival rate of 57.7% compared to 12.6% in the non-exercise group, yielding an adjusted odds ratio of 5.56. The 30-day survival rate of exercise-related subjects aged 15-35 years was 80.0%, compared to 25.0% in the non-exercise group. When comparing sports categories, team sports were associated with the greatest chance of survival (odds ratio of 18.5 versus a non-exercise odds ratio of 0.09). CONCLUSION: Exercise-related OHCA has a low incidence and is related to a significantly better prognosis when compared to non-exercise OHCA. Furthermore, many patients experiencing exercise-related OHCA received defibrillation and cardiopulmonary resuscitation by bystanders. These findings could help plan and execute campaigns and education.

3. Shock. 2022 Jan 25. doi: 10.1097/SHK.0000000000001909. Online ahead of print.

Association Between Vitamin D Deficiency and Neurologic Outcomes in Patients After Cardiopulmonary Resuscitation.

Chae B(1), Shin YS, Kim SM, Hong SI, Kim YJ, Ryoo SM, Kim WY.

ABSTRACT

AIM: We investigated the association between vitamin D deficiency and neurologic outcomes after cardiopulmonary resuscitation. METHOD: Data from the prospective cardiac arrest registry in the

emergency department between October 2019 and April 2021 were retrospectively analyzed. Blood samples were obtained during cardiopulmonary resuscitation wherein 25-hydroxyvitamin D serum levels were analyzed; deficiency was defined as levels <10 ng/mL. The primary outcome was neurologic outcomes at 3 months assessed using the modified Rankin Scale. RESULT: A total of 195 patients (mean age, 64.5 ± 16.1 years; 135 [69.2%] men) were included. A significantly greater proportion of patients with poor outcomes had vitamin D deficiency compared with those with good outcomes (49.4% vs. 18.2%, P = 0.001). The area under the curve for a sustained return of spontaneous circulation and 3-month poor neurologic outcomes was 0.595 (P = 0.031) and 0.704 (P < 0.001), respectively. In a multivariate analysis, vitamin D deficiency (odds ratio (OR): 10.22; 95% confidence interval (CI): 1.47-70.82, P = 0.019), initial shockable rhythm (OR: 0.03; 95% CI: 0.00-0.84, P = 0.040), low flow time (OR: 1.10; 95% CI: 1.03-1.16, P = 0.003), and thrombocytopenia (OR: 10.66; 95% CI: 1.13-100.41, P = 0.039) were significantly associated with 3-month poor neurologic outcomes. CONCLUSION: The prevalence of vitamin D deficiency in patients with cardiac arrest was 44% and was associated with poor neurological outcomes at 3 months.

4. Resuscitation. 2022 Jan 22:S0300-9572(22)00012-0. doi: 10.1016/j.resuscitation.2022.01.011. Online ahead of print.

The epidemiology of out-of-hospital cardiac arrest in Australia and New Zealand: A binational report from the Australasian Resuscitation Outcomes Consortium (Aus-ROC).

Bray J(1), Howell S(2), Ball S(3), Doan T(4), Bosley E(5), Smith K(6), Dicker B(7), Faddy S(8), Thorrowgood M(9), Swain A(10), Thomas A(11), Wilson A(12), Shipp C(13), Walker T(14), Bailey P(15), Finn J(16); Aus-ROC Epistry Management Committee.

ABSTRACT

INTRODUCTION: The Australasian Resuscitation Outcomes Consortium (Aus-ROC) out-of-hospital cardiac arrest (OHCA) Epistry (Epidemiological Registry) now covers 100% of Australia and New Zealand (NZ). This study reports and compares the Utstein demographics, arrest characteristics and outcomes of OHCA patients across our region. METHODS: We included all OHCA cases throughout 2019 as submitted to the Epistry by the eight Australian and two NZ emergency medical services (EMS). We calculated crude and age-standardised incidence rates and performed a national and EMS regional comparison. RESULTS: We obtained data for 31,778 OHCA cases for 2019: 26,637 in Australia and 5,141 in NZ. Crude incidence was 107.9 per 100,000 person-years in Australia and 103.2/100,000 in NZ. Overall, the majority of OHCAs occurred in adults (96%), males (66%), private residences (76%), were unwitnessed (63%), of presumed medical aetiology (83%), and had an initial monitored rhythm of asystole (64%). In non-EMS-witnessed cases, 38% received bystander CPR and 2% received public defibrillation. Wide variation was seen between EMS regions for all OHCA demographics, arrest characteristics and outcomes. In patients who received an EMS-attempted resuscitation (13,664/31,778): 28% (range across EMS=13.1% to 36.7%) had return of spontaneous circulation (ROSC) at hospital arrival and 13% (range across EMS=9.9% to 20.7%) survived to hospital discharge/30-days. Survival in the Utstein comparator group (bystander-witnessed in shockable rhythm) varied across the EMS regions between 27.4% to 42.0%. CONCLUSION: OHCA across Australia and NZ has varied incidence, characteristics and survival. Understanding the variation in survival and modifiable predictors is key to informing strategies to improve outcomes.

5. Resuscitation. 2022 Jan 22:S0300-9572(22)00016-8. doi: 10.1016/j.resuscitation.2022.01.015. Online ahead of print.

Resuscitation highlights in 2021.

Nolan JP(1), Ornato JP(2), Parr MJA(3), Perkins GD(4), Soar J(5).

ABSTRACT

BACKGROUND: This review is the latest in a series of regular annual reviews undertaken by the editors and aims to highlight some of the key papers published in Resuscitation during 2021. METHODS: Hand-searching by the editors of all papers published in Resuscitation during 2021. Papers were selected based on then general interest and novelty and were categorised into themes. RESULTS: 98 papers were selected for brief mention. CONCLUSIONS: Resuscitation science continues to evolve and incorporates all links in the chain of survival.

IN-HOSPITAL CARDIAC ARREST

1. Medicine (Baltimore). 2022 Jan 28;101(4):e28750. doi: 10.1097/MD.0000000000028750.
Associations between red cell distribution width and outcomes of adults with in-hospital cardiac arrest: A retrospective study.
Cheng Y(1), Peng H(1), Zhang J(1), Zhu J(1), Xu L(1), Cao X(2), Qin L(1).
ABSTRACT
Previous studies found that high red cell distribution width (RDW) value is associated with poor outcomes among out-of-hospital cardiac arrest survivors. The aim of this study was to investigate whether post-ROSC RDW value was associated with survival and neurological outcomes of in-hospital cardiac arrest (IHCA) patients achieving return of spontaneous circulation (ROSC) but remaining critically ill. This retrospective single-center observational study included IHCA adults with sustained ROSC between January 1, 2017 and January 1, 2021 at an academic medical center in China. PostROSC RDW values were measured within 1 hour after sustained ROSC. The primary outcome was survival to hospital discharge and the secondary outcome was favorable neurological outcome at hospital discharge. The associations between postROSC RDW value and outcomes among IHCA patients with ROSC were evaluated by using multivariate logistic regression.A total of 730 patients with sustained ROSC following IHCA were ultimately included in this study. Of whom 194 (26.6%) survived to hospital discharge and 116 (15.9%) had a favorable neurological outcome at hospital discharge. In multivariable logistic regression analysis, lower postROSC RDW value was independently associated with survival to hospital discharge (odds ratio 0.19, 95% confidence interval 0.15-0.63, P = .017, cut-off value: 15.5%) and favorable neurological outcome at hospital discharge (odds ratio 0.23, 95% confidence interval 0.07-0.87, P < .001, cut-off value: 14.6%). Other independent factors including younger age, initial shockable rhythm, shorter total cardiopulmonary resuscitation duration and post-ROSC percutaneous coronary intervention were also associated with survival to hospital discharge. Regarding favorable neurological outcome at hospital discharge, significant variables other than the aforementioned factors included postROSC targeted temperature management and absence of pre-existing neurological insufficiency. Low postROSC RDW value was associated with survival to hospital discharge and favorable neurological outcome at hospital discharge.

2. Acta Anaesthesiol Scand. 2022 Feb;66(2):273-281. doi: 10.1111/aas.14008. Epub 2021 Dec 10.
Hospital-level variation in outcomes after in-hospital cardiac arrest in Denmark.
Stankovic N(1)(2), Andersen LW(1)(2)(3)(4), Granfeldt A(3), Holmberg MJ(1)(2)(5).
ABSTRACT
BACKGROUND: We investigated hospital-level variation in outcomes after in-hospital cardiac arrest (IHCA) in Denmark, and assessed whether variation in outcomes could be explained by differences in patient characteristics. METHODS: Adult patients (≥18 years old) with IHCA in 2017 and 2018 were included from the Danish IHCA Registry (DANARREST). Data on patient characteristics and outcomes were obtained from population-based registries. Predicted probabilities, likelihood ratio tests, intraclass correlation coefficients (ICCs), and median odds ratios (ORs) were calculated for return of spontaneous circulation (ROSC), survival to 30 days, and survival to 1 year. RESULTS: A total of 3340 patients with IHCA from 24 hospitals were included. We found that hospital-level variation in

outcomes after IHCA existed across all measures of variation. The unadjusted median OR for ROSC, survival to 30 days, and survival to 1 year were 1.28 (95% confidence interval [CI]: 1.24, 1.45), 1.38 (95% CI: 1.33, 1.60), and 1.44 (95% CI: 1.39, 1.70), respectively. The unadjusted ICC suggest that 2.0% (95%: 1.6%, 4.4%), 3.3% (95%: 2.7%, 6.8%), and 4.3% (95%: 3.5%, 8.6%) of the total individual variation in ROSC, survival to 30 days, and survival to 1 year was attributable to hospital-level variation. These results decreased but persisted in the analyses adjusted for select patient characteristics. CONCLUSIONS: In this study, we found that outcomes after IHCA varied across hospitals in Denmark. However, only about 2%-4% of the total individual variation in outcomes after IHCA was attributable to differences between hospitals, suggesting that most of the individual variation in outcomes was attributable to patient-level variation.

INJURIES AND CPR

No articles identified.

CAUSE OF THE ARREST

1. Emerg Med J. 2022 Feb;39(2):106-110. doi: 10.1136/emermed-2020-210839. Epub 2021 Apr 30.
Out-of-hospital cardiac arrest due to hanging: a retrospective analysis.
Turner J(1)(2)(3), Brown A(2)(3), Boldy R(3), Lumley-Holmes J(3), Rosser A(3), James A(2)(3)(4)(5).
ABSTRACT
BACKGROUND: There has been little research into the prehospital management of cardiac arrest following hanging despite it being among the most prevalent methods of suicide worldwide. The aim of this study was to report the characteristics, resuscitative treatment and outcomes of patients managed in the prehospital environment for cardiac arrest secondary to hanging and compare these with all-cause out-of-hospital cardiac arrest (OHCA). METHODS: Data from a UK ambulance service cardiac arrest registry were extracted for all cases in which treatment was provided for OHCA due to hanging between 1 January 2013 and 30 June 2018. Cases were linked to outcome data obtained from the Trauma Audit and Research Network. Comparison of the cohort was made to previously published data from a UK study of all-cause OHCA with 95% CIs calculated for the proportional difference between the studies in selected presentation and outcome variables. RESULTS: 189 cases were identified. 95 patients were conveyed to hospital and four of these survived to discharge. 40 patients were conveyed despite absence of a spontaneous circulation and none of these patients survived. While only three patients were initially in a shockable rhythm, DC shocks were administered in 20 cases. There was one case of failed ventilation prompting front-of-neck access for oxygenation. By comparison with all-cause OHCA the proportion of patients with a spontaneous circulation at hospital handover was similar (27.0% vs 27.5%; 0.5% difference, 95% CI -5.9% to 6.8%, p=0.882) but survival to hospital discharge was significantly lower (2.2% vs 8.4%; 6.2% difference, 95% CI 4.1% to 8.3%, p=0.002). CONCLUSION: Clinical outcomes following OHCA due to hanging are poor, particularly when patients are transported while in cardiac arrest. Failure to ventilate was uncommon, and clinicians should be alert to the possibility of shockable rhythms developing during resuscitation.

2. Sci Rep. 2022 Jan 25;12(1):1293. doi: 10.1038/s41598-022-05390-w.
Diagnostic and therapeutic characteristics of diabetes mellitus and risk of out-of-hospital cardiac arrest.
Park JH(1)(2), Ro YS(3)(4), Shin SD(1)(2), Cha KC(5), Song KJ(2)(6), Hwang SO(5); phase II Cardiac Arrest Pursuit Trial with Unique Registry and Epidemiologic Surveillance (CAPTURES-II) investigators.

ABSTRACT
This study aimed to evaluate the risks of diabetes mellitus (DM) on out-of-hospital cardiac arrest (OHCA) and to investigate whether the risks of DM on OHCA varied according to the diagnostic and therapeutic characteristics of diabetes. We conducted a multicenter prospective case-control study in 17 University hospitals in Korea from September 2017 to December 2020. Cases were EMS-treated OHCA patients aged 20 to 79 with a presumed cardiac etiology. Community-based controls were recruited at a 1:2 ratio after matching for age, sex, and urbanization level of residence. A structured questionnaire and laboratory findings were collected from cases and controls. Multivariable conditional logistic regression analyses were conducted to estimate the risk of DM on OHCA by characteristics. A total of 772 OHCA cases and 1544 community-based controls were analyzed. A total of 242 (31.3%) OHCAs and 292 (18.9%) controls were previously diagnosed with DM. The proportions of type I DM (10.7% vs. 2.1%) and insulin therapy (15.3% vs. 6.5%) were higher in OHCAs with DM than in controls with DM. The duration of DM was longer in OHCAs than in controls (median 12 vs. 7 years). DM was associated with an increased risk of OHCA (aOR (95% CI), 2.13 (1.64-2.75)). Compared to the no diabetes group, the risks of OHCA increased in the diabetes patients with type I DM (5.26 (1.72-16.08)) and type II DM group (1.63 (1.18-2.27)), a long duration of DM prevalence (1.04 (1.02-1.06) per 1-year prevalence duration), and a high HbA1c level (1.38 (1.19-1.60) per 1% increase). By treatment modality, the aOR (95% CI) was lowest in the oral hypoglycemic agent (1.47 (1.08-2.01)) and highest in the insulin (6.63 (3.04-14.44)) groups. DM was associated with an increased risk of OHCA, and the risk magnitudes varied according to the diagnostic and therapeutic characteristics.

END-TIDAL CO_2

No articles identified.

ORGAN DONATION

No articles identified.

FEEDBACK

No articles identified.

DRUGS

1. Yonsei Med J. 2022 Feb;63(2):187-194. doi: 10.3349/ymj.2022.63.2.187.
Effect of Prehospital Epinephrine on Out-of-Hospital Cardiac Arrest Outcomes: A Propensity Score-Matched Analysis.
Han E(1), Kong T(1), You JS(1), Park I(1), Park G(2), Lee S(2), Chung SP(3); Korean Cardiac Arrest Research Consortium (KoCARC) Investigators.
ABSTRACT
PURPOSE: A pilot project using epinephrine at the scene under medical control is currently underway in Korea. This study aimed to determine whether prehospital epinephrine administration is associated with improved survival and neurological outcomes in out-of-hospital cardiac arrest (OHCA) patients who received epinephrine during cardiopulmonary resuscitation (CPR) in the

emergency department. MATERIALS AND METHODS: This retrospective observational study used a nationwide multicenter OHCA registry. Patients were classified into two groups according to whether they received epinephrine at the scene or not. The associations between prehospital epinephrine use and outcomes were assessed using propensity score (PS)-matched analysis. Multivariable logistic regression analysis was performed using PS matching. The same analysis was repeated for the subgroup of patients with non-shockable rhythm. RESULTS: PS matching was performed for 1084 patients in each group. Survival to discharge was significantly decreased in the patients who received prehospital epinephrine [odds ratio (OR) 0.415, 95% confidence interval (CI) 0.250-0.670, p<0.001]. However, no statistical significance was observed for good neurological outcome (OR 0.548, 95% CI 0.258-1.123, p=0.105). For the patient subgroup with non-shockable rhythm, prehospital epinephrine was also associated with lower survival to discharge (OR 0.514, 95% CI 0.306-0.844, p=0.010), but not with neurological outcome (OR 0.709, 95% CI 0.323-1.529, p=0.382). CONCLUSION: Prehospital epinephrine administration was associated with decreased survival rates in OHCA patients but not statistically associated with neurological outcome in this PS-matched analysis. Further research is required to investigate the reason for the detrimental effect of epinephrine administered at the scene.

2. Arch Acad Emerg Med. 2022 Jan 1;10(1):e6. doi: 10.22037/aaem.v10i1.1425. eCollection 2022.
Nifekalant versus Amiodarone for Out-Of-Hospital Cardiac Arrest with Refractory Shockable Rhythms; a Post Hoc Analysis.
Funakoshi H(1)(2), Aso S(3), Homma Y(1), Onodera R(1), Tahara Y(4).
ABSTRACT
INTRODUCTION: It is still unclear that which anti-arrhythmics are adequate for treating refractory dysrhythmia. This study aimed to compare amiodarone and nifekalant in management of out-of-hospital cardiac arrest cases with refractory shockable rhythm. METHODS: This was a post hoc analysis of cases registered in a nationwide, multicentre, prospective registry that includes 288 critical care medical centres in Japan. From June 2014 to December 2017, we included all out-of-hospital cardiac arrest patients aged ≥18 years who presented with refractory arrhythmia (sustained ventricular fibrillation or ventricular tachycardia following delivery of at least two defibrillator shocks) and treated with nifekalant or amiodarone after arrival to hospital. Overlap weight was performed to address potential confounding factors. RESULTS: 1,317 out-of-hospital cardiac arrest patients with refractory arrhythmia were enrolled and categorized into amiodarone (n = 1,275) and nifekalant (n = 42) groups. After overlap weight was performed, there were no significant intergroup differences in increased the rate of admission after return of spontaneous circulation [-5.9% (95%CI: -7.1 to 22.4); p = 0.57], 30-day favourable neurological outcome [0.1% (95%CI: -14 to 13.9); p = 0.99], and 30-day survival [-3.9% (95% CI: -19.8 to 12.0); p = 0.63]. CONCLUSION: This nationwide study showed that nifekalant was not associated with improved outcomes regarding admission after return of spontaneous circulation, 30-day survival, and 30-day favourable neurological outcome compared with amiodarone.

TRAUMA

1. Scand J Trauma Resusc Emerg Med. 2022 Jan 26;30(1):8. doi: 10.1186/s13049-022-00997-4.
A 6-year case series of resuscitative thoracotomies performed by a helicopter emergency medical service in a mixed urban and rural area with a comparison of blunt versus penetrating trauma.
Almond P(1), Morton S(2), OMeara M(1), Durge N(1).
ABSTRACT

BACKGROUND: Resuscitative thoracotomy (RT) is an intervention that can be performed in the prehospital setting for relieving cardiac tamponade and/or obtaining vascular control of suspected sub-diaphragmatic haemorrhage in patients in traumatic cardiac arrest. The aim of this retrospective case study is to compare the rates of return of spontaneous circulation (ROSC) in RTs performed for both penetrating and blunt trauma over 6 years in a mixed urban and rural environment. METHODS: The electronic records of a single helicopter emergency medical service were reviewed between 1st June 2015 and 31st May 2021 for RTs. Anonymised data including demographics were extracted for relevant cases. Data were analysed with independent t-tests and X2 tests. A p value < 0.05 was considered statistically significant. RESULTS: Forty-four RTs were preformed within the 6 years (26 for blunt trauma). Eleven ROSCs were achieved (nine blunt, two penetrating) but no patient survived to discharge. In contrast to RTs for penetrating trauma, twelve of the RTs for blunt trauma had a cardiac output present on arrival of the prehospital team (p = 0.01). Two patients had an RT performed in a helicopter (one ROSC) and two on a helipad (both achieving ROSC), likely due to the longer transfer times seen in a more rural setting. Four of the RTs for blunt trauma (15%) were found to have a cardiac tamponade versus seven (39%) of the penetrating trauma RTs. CONCLUSION: Prehospital RT remains a procedure with low rates of survival but may facilitate a ROSC to allow patients to reach hospital and surgery, particularly when distances to hospitals are greater. A higher-than-expected rate of cardiac tamponade was seen in RTs for blunt trauma, although not caused by a right ventricular wound but instead due to underlying vessel damage.

VENTILATION

No articles identified.

CERERBRAL MONITORING

1. Resuscitation. 2022 Jan 20:S0300-9572(22)00011-9. doi: 10.1016/j.resuscitation.2022.01.010. Online ahead of print.
Screening for neurocognitive impairment following out-of-hospital cardiac arrest: anyone for a MoCA?
Parker C(1), Hodgson L(2).
NO ABSTRACT AVAILABLE

ULTRASOUND AND CPR

No articles identified.

ORGANISATION AND TRAINING

1. MedEdPORTAL. 2022 Jan 14;18:11213. doi: 10.15766/mep_2374-8265.11213. eCollection 2022.
Airborne Isolation Cardiac Arrest: A Simulation Program for Interdisciplinary Code Blue Team Training.
Collis AC(1), Wescott AP(2), Greco S(3), Solvang N(4), Lee J(5), Morris AE(6).
ABSTRACT
INTRODUCTION: In-hospital cardiac arrest in patients with COVID-19 presents significant challenges to health care teams. Airborne precautions can delay patient care, place providers at high risk of

virus exposure, and exacerbate an already stressful environment. Within the constraints of an ongoing pandemic, an efficient educational program is required to prepare health care teams for airborne isolation code blue. METHODS: This simulation was conducted in a room on the target unit using a CPR manikin to represent the patient. A "talk-through walk-through" scripted simulation directed learners (internal medicine residents, unit nurses, and other code blue responders) through a resuscitation using an airborne isolation code blue protocol. Key scripted events prompted role identification, communication, and item transfer. Learners self-assessed their airborne isolation code blue knowledge and skills and their confidence in providing quality care while maintaining safety using a pre-/posttraining 5-point Likert-scale survey. RESULTS: We trained 100 participants over a 5-month period, with 65 participants surveyed (43 respondents; 16 residents, 22 nurses). Following training, participants had a statistically significant ($p < .001$) increase in percentage selecting agree/strongly agree for all statements related to knowledge and skills specific to airborne isolation code blue protocol, as well as confidence in providing care while keeping themselves and their colleagues safe. DISCUSSION: Our simulation program allowed a small number of educators to feasibly train a large number of learners, let learners practice required skills, and improved learners' self-assessed knowledge, skills, and confidence regarding quality and safety of care.

2. Ann Med Surg (Lond). 2022 Jan 5;73:103241. doi: 10.1016/j.amsu.2022.103241. eCollection 2022 Jan.

Comparison of a virtual reality compression-only Cardiopulmonary Resuscitation (CPR) course to the traditional course with content validation of the VR course - A randomized control pilot study.

Hubail D(1), Mondal A(1), Al Jabir A(1), Patel B(1)(2).

ABSTRACT

INTRODUCTION: Technology has been a major contributor to recent changes in education, where simulation plays a huge role by providing a unique safe environment, especially with the recent incorporation of immersive virtual reality (VR) training. Cardiopulmonary Resuscitation (CPR) is said to double, even triple survival from cardiac arrest, and hence it is crucial to ensure optimal acquisition and retention of these skills. In this study, we aim to compare a VR CPR teaching program to current teaching methods with content validation of the VR course. METHODS: A randomized single-blinded simulation-based pilot study where 26 participants underwent baseline assessment of their CPR skills using a validated checklist and Laerdal QCPR®. Participants were randomly allocated and underwent their respective courses. This was followed by a final assessment and a questionnaire for content validation, knowledge and confidence. The data was analysed using STATA 16.2 to determine the standardized mean difference using paired and unpaired t-test. RESULTS: Subjective assessment using the checklist showed statistically significant improvement in the overall scores of both groups (traditional group mean improved from 6.92 to 9.61 p-value 0.0005, VR group from 6.61 to 8.53 p-value 0.0016). However, no statistically significant difference was noted between the final scores in both the subjective and objective assessments. As for the questionnaire, knowledge and confidence seemed to improve equally. Finally, the content validation showed statistically significant improvement in ease of use (mean score 3 to 4.23 p-value of 0.0144), while for content, positivity of experience, usefulness and appropriateness participants showed similar satisfaction before and after use. CONCLUSION: This pilot study suggests that VR teaching could deliver CPR skills in an attractive manner, with no inferiority in acquisition of these skills compared to traditional methods. To corroborate these findings, we suggest a follow-up study with a larger sample size after adding ventilation and Automated External Defibrillator (AED) skills to the VR course with re-examination after 3-6 months to test retention of the skills.

3. J Cardiovasc Nurs. 2022 Jan 27. doi: 10.1097/JCN.0000000000000893. Online ahead of print.

With Fearful Eyes: Exploring Relatives' Experiences With Out-of-Hospital Cardiac Arrest: A Qualitative Study.

Larsen MK(1), Mikkelsen R, Budin SH, Lamberg DN, Thrysoe L, Borregaard B.

ABSTRACT

BACKGROUND: Out-of-hospital cardiac arrest (OHCA) imposes significant consequences for a family, but little is known about relatives' experiences. OBJECTIVE: Our aim was to explore relatives' experiences with the OHCA and the following months after. METHOD: A qualitative approach using phenomenological-hermeneutic methodology was applied. Data consisted of semistructured interviews with 12 relatives of OHCA survivors. We analyzed data based on Paul Ricoeur's theory of interpretation. RESULTS: Relatives experienced OHCA as an abrupt and stressful event filled with imposing concerns for the cardiac arrest survivor. Relatives were fellow sufferers confronted with the possibility of bereavement, watching from the sideline with fearful eyes. After the OHCA, relatives experienced a troubled time with anxiety and edginess, monitoring the survivor for signs of a new cardiac arrest and trying to adapt to a new normality. Relatives' previous identities and positions within their families were disrupted. CONCLUSION: Relatives were challenged with the OHCA and the trajectory after it, experiencing a high level of distress and anxiety. Relatives took on an immense responsibility, always watching the survivor for potential symptoms of a new cardiac arrest. The cardiac arrest and the survivor's possible cognitive impairments gave rise to assuming a new authority as a relative. We advocate for a new family approach to relatives, acknowledging relatives' stress and central role in supporting cardiac arrest survivors.

4. Acta Anaesthesiol Scand. 2022 Jan 28. doi: 10.1111/aas.14027. Online ahead of print.

The 2022 Finnish Current Care Guidelines for Cardiopulmonary Resuscitation recommend avoiding fever and not mild therapeutic hypothermia in unconscious patients after cardiac arrest.

Skrifvars MB(1), Kurola J(2).

NO ABSTRACT AVAILABLE

5. BMC Med Inform Decis Mak. 2022 Jan 25;22(1):21. doi: 10.1186/s12911-021-01730-4.

A machine learning approach for modeling decisions in the out of hospital cardiac arrest care workflow.

Harford S(1), Del Rios M(2), Heinert S(3), Weber J(4), Markul E(5), Tataris K(6), Campbell T(7), Vanden Hoek T(7), Darabi H(1).

ABSTRACT

BACKGROUND: A growing body of research has shown that machine learning (ML) can be a useful tool to predict how different variable combinations affect out-of-hospital cardiac arrest (OHCA) survival outcomes. However, there remain significant research gaps on the utilization of ML models for decision-making and their impact on survival outcomes. The purpose of this study was to develop ML models that effectively predict hospital's practice to perform coronary angiography (CA) in adult patients after OHCA and subsequent neurologic outcomes. METHODS: We utilized all (N = 2398) patients treated by the Chicago Fire Department Emergency Medical Services included in the Cardiac Arrest Registry to Enhance Survival (CARES) between 2013 and 2018 who survived to hospital admission to develop, test, and analyze ML models for decisions after return of spontaneous circulation (ROSC) and patient survival. ML classification models, including the Embedded Fully Convolutional Network (EFCN) model, were compared based on their ability to predict post-ROSC decisions and survival. RESULTS: The EFCN classification model achieved the best results across tested ML algorithms. The area under the receiver operating characteristic curve (AUROC) for CA and Survival were 0.908 and 0.896 respectively. Through cohort analyses, our model predicts that 18.3% (CI 16.4-20.2) of patients should receive a CA that did not originally, and 30.1% (CI 28.5-31.7)

of these would experience improved survival outcomes. CONCLUSION: ML modeling effectively predicted hospital decisions and neurologic outcomes. ML modeling may serve as a quality improvement tool to inform system level OHCA policies and treatment protocols.

6. Resuscitation. 2022 Jan 22:S0300-9572(22)00015-6. doi: 10.1016/j.resuscitation.2022.01.014. Online ahead of print.
Cardiac Arrest Systems of Care; Shining in the Spotlight.
Huebinger R(1), Wang HE(2).
NO ABSTRACT AVAILABLE

7. Resuscitation. 2022 Jan 22:S0300-9572(22)00014-4. doi: 10.1016/j.resuscitation.2022.01.013. Online ahead of print.
Out-of-Hospital Cardiac Arrests Terminated without full Resuscitation Attempts: Characteristics and Regional Variability.
Hutton G(1), Kawano T(2), Scheuermeyer FX(3), Panchal AR(4), Asamoah-Boaheng M(5), Christenson J(3), Grunau B(6).
ABSTRACT
BACKGROUND: Out-of-hospital cardiac arrest (OHCA) investigations may elect to exclude cases with resuscitation terminated for reasons other than a full resuscitative attempt. We sought to examine characteristics of these cases and regional variability in classification. METHODS: Using the North American Resuscitation Outcomes Consortium Epistry, we included adult emergency medical services (EMS)-treated cases, examining the rationale ("futility", do-not resuscitate (DNR) order, "verbal directive", or "obvious death") and timing of resuscitation termination, and the timing of ROSC among hospital-discharge survivors. We tested regional variability in EMS patient arrival-to-termination intervals with one-way ANOVA. RESULTS: Of 63,554 included cases, 27,232 were declared dead in the prehospital setting: (1) 23,009 (36%) for futility (after a median of 24 minutes (IQR 19-31) of professional resuscitation); (2) 1622 (2.6%) for a DNR order (at 6.3 minutes [IQR 3.0-11]); (3) 1018 (1.6%) for a verbal directive (at 12 minutes [IQR 7.0-17]); and, (4) 1583 (2.5%) for obvious death (at 5.4 minutes [IQR 3.0-9.0]). The EMS patient arrival-to-ROSC interval among hospital-discharge survivors was 7.7 (3.8 - 13) minutes. Among regions, 0.20-12% and 0.20-5.3% were terminated to due to obvious death or verbal directives, respectively. There were significant regional differences in the EMS patient arrival-to-termination interval for futility ($p<0.010$) and obvious death ($p<0.010$). CONCLUSION: There is significant variation in the rationale and interval until termination of resuscitation between regions. Cases terminated due to obvious death or DNR orders/verbal directives often are treated with similar durations of resuscitation as survivors. These data highlight a considerable risk of bias in between-region comparisons or observational analyses.

8. Acta Anaesthesiol Scand. 2022 Jan 24. doi: 10.1111/aas.14028. Online ahead of print.
To what extent do cardiopulmonary resuscitation outcomes vary between hospitals?
Skogvoll E(1), Skrifvars MB(2).
NO ABSTRACT AVAILABLE

9. J Emerg Med. 2022 Jan 19:S0736-4679(21)00769-1. doi: 10.1016/j.jemermed.2021.10.032. Online ahead of print.
A Multicenter, Prospective Study Comparing Subxiphoid and Parasternal Views During Brief Echocardiography: Effect on Image Quality, Acquisition Time, and Visualized Anatomy.
Gaspari RJ(1), Gleeson T(2), Alerhand S(3), Caputo W(4), Damewood S(5), Dicroce C(2), Dwyer K(6), Gibbons R(7), Greenstein J(4), Harvey J(2), Hill M(2), Hoffman B(8), Jordan MK(9), Karfunkle B(10),

Kropf C(11), Lindsay R(2), Luo S(12), Lusiak M(13), Nalbandian A(2), Naraghi L(14), Nelson B(15), Nickels LC(16), Nolting L(17), Nordberg A(2), Panicker A(18), Pare J(19), Peach M(20), Pinto D(21), Graham P(2), Rose G(22), Russell F(23), Schafer J(8), Scheatzle M(24), Schnittke N(25), Shpilko M(26), Soucy Z(27), Stowell JR(28), Vryhof D(29), Gottlieb M(30).

ABSTRACT

BACKGROUND: Recent literature has suggested echocardiography (echo) may prolong pauses in chest compressions during cardiac arrest. OBJECTVES: We sought to determine the impact of the sonographic approach (subxiphoid [SX] vs. parasternal long [PSL]) on time to image completion, image quality, and visualization of cardiac anatomy during echo, as performed during Advanced Cardiac Life Support. METHODS: This was a multicenter, randomized controlled trial conducted at 29 emergency departments (EDs) assessing the time to image acquisition and image quality between SX and PSL views for echo. Patients were enrolled in the ED and imaged in a simulated cardiac arrest scenario. Clinicians experienced in echo performed both SX and PSL views, first view in random order. Image quality and time to image acquisition were recorded. Echos were evaluated for identification of cardiac landmarks. Data are presented as percentages or medians with interquartile ranges (IQRs). RESULTS: We obtained 6247 echo images, comprising 3124 SX views and 3123 PSL. Overall time to image acquisition was 9.0 s (IQR 6.7-14.1 s). Image acquisition was shorter using PSL (8.8 s, IQR 6.5-13.5 s) compared with SX (9.3 s, IQR 6.7-15.0 s). The image quality was better with the PSL view (3.86 vs. 3.54; $p < 0.0001$), twice as many SX images scoring in the worst quality category compared with PSL (8.6% vs. 3.7%). Imaging of the pericardium, cardiac chambers, and other anatomic landmarks was superior with PSL imaging. CONCLUSIONS: Echo was performed in < 10 s in > 50% of patients using either imaging technique. Imaging using PSL demonstrated improved image quality and improved identification of cardiac landmarks.

10. Int Dent J. 2022 Feb;72(1):14-15. doi: 10.1016/j.identj.2021.11.009.

Basic Life Support (BLS) and Cardiopulmonary Resuscitation (CPR) in the Dental Practice: Adopted by the FDI General Assembly: 27-29 September 2021, Sydney, Australia.

[No authors listed]

NO ABSTRACT AVAILABLE

POST-CARDIAC ARREST TREATMENTS

1. Rambam Maimonides Med J. 2022 Jan 27;13(1):e0001. doi: 10.5041/RMMJ.10458.

Eosinophil Cell Count Predicts Mortality in the Intensive Care Unit after Return of Spontaneous Circulation.

Korkmaz İ(1), Tekin YK(1), Tekin G(2), Demirtaş E(3), Yurtbay S(1), Nur N(4).

ABSTRACT

BACKGROUND: Eosinophils constitute 1%-5% of peripheral blood leukocytes, less in the presence of acute infections (referred to as eosinopenia). Studies indicate that eosinopenia can be used as a prognostic predictor for chronic obstructive pulmonary disease exacerbation, sepsis, or acute myocardial infarction disease. There are only a few studies about predicting mortality in emergency departments and intensive care units (ICUs). Prognostic studies about patients in ICUs are generally carried out using different scoring systems. We aimed to analyze if the eosinophil count can estimate the prognosis among non-traumatic patients who underwent cardiopulmonary resuscitation and were hospitalized in ICU thereafter. METHODS: The data were evaluated of 865 non-traumatic adult patients (>18 years of age) who were admitted with cardiopulmonary arrest or developed cardiopulmonary arrest during clinical follow-ups. Admission venous blood sample tests, complete blood count, and biochemical laboratory results were recorded. Arterial blood gas results were also evaluated. The mean results of the recorded laboratory results were compared between

the surviving and non-surviving patients groups. RESULTS: There was a significant difference between the two groups in regard to platelet, eosinophil count, pH, PaO2, SaO2, and HCO3- (P<0.001 for all). In the multiple linear regression analysis, eosinophil counts were found to be an independent factor (odds ratio=0.03, 95% confidence interval 0.33-0.56, P<0.001) associated with the mortality after cardiopulmonary resuscitation. CONCLUSION: Because admission eosinophil counts can be measured easily, they are inexpensive biomarkers that can be used for predicting the prognosis among the patients who have return of spontaneous circulation and are treated in ICUs.

2. Am J Emerg Med. 2022 Feb;52:143-147. doi: 10.1016/j.ajem.2021.12.008. Epub 2021 Dec 10.
The Role of Brain CT in Patients with Out-of-Hospital Cardiac Arrest with Return of Spontaneous Circulation.
Çankaya Gökdere D(1), Emektar E(2), Çorbacıoğlu ŞK(3), Yüzbaşıoğlu Y(3), Öztürk C(4), Çevik Y(1).
ABSTRACT
BACKGROUND AND AIM: The diagnosis and treatment process after resuscitation of patients with spontaneous return of circulation (ROSC) after cardiac arrest is important. There is no clear recommendation on utilization of computerized tomography (CT) of the brain in patients with ROSC. In this study, it was aimed to diagnosis the pathology detection rates in the brain tomography of out-of-hospital cardiac arrest (OHCA) patients with ROSC after resuscitation in the emergency department and the effect of these pathologies on treatment management. MATERIALS AND METHODS: 131 patients who were admitted to the Emergency Medicine Clinic with cardiac arrest between 08.05.2019 and 07.12.2020, had ROSC after resuscitation and underwent brain CT in the first 24 h were included in the study. The patients were divided into two groups; those with clinically significant pathology in brain CT who underwent treatment changes and those without clinically significant pathology. All data recorded in the study form were analyzed using IBM SPSS 20.0 (Chicago, IL, USA) statistics program. P < 0.005 value was considered statistically significant. RESULTS: 51.1% (67) of the patients were women. The age median value was 73 (IQR25-IQR75;63-83). The most common comorbidity in patients was hypertension with 42% (55). Patients with clinically significant pathology observed in brain tomography studied after ROSC were 12.2% (16) of all patients. The most common management changes were requesting a consultation from the neurology department (n = 9) and adding a new drug to the treatment (n= 5) The 30-day and 1-year mortality rates showed no significant difference between the two groups (p > 0.05). CONCLUSION: We have seen that the data obtained from the CT studied in the early period after the ROSC was achieved, did not change the management of our patients x in the early and late periods after resuscitation. We conclude that it is not necessary to have a brain CT scan in the emergency department in the early period.

TARGETED TEMPERATURE MANAGEMENT

1. Shock. 2022 Jan 20. doi: 10.1097/SHK.0000000000001904. Online ahead of print.
The Differences of CPR Duration Between Shockable and Non-shockable Rhythms in Predicting The Benefit of Target Temperature Management.
Lin JJ(1), Huang CH, Chien YS, Hsu CH, Chiu WT, Wu CH, Wang CH, Tsai MS.
ABSTRACT
BACKGROUND: Among cardiac arrest (CA) survivors, whether the combination of duration of cardiopulmonary resuscitation (CPR) and shockable/nonshockable rhythms during resuscitation can help predict the benefit of targeted temperature management (TTM) remains un-investigated. MATERIALS AND METHODS: This multicenter retrospective cohort study enrolled 479 nontraumatic adult CA survivors with TTM and CPR duration <60 min during January 2014 to June 2019 from the TaIwan network of targeted temperature ManagEment for CARDiac arrest (TIMECARD) registry. The differences of CPR duration between shockable and nonshockable rhythms in predicting outcomes in

the studied population was evaluated. RESULTS: We observed that 205 patients (42.8%) survived to hospital discharge and 100 patients (20.9%) presented favorable neurological outcomes at discharge. The enrolled patients were further re-classified into four groups according to shockable/ nonshockable rhythms and CPR duration. Patients with shockable rhythms and shorter CPR duration had better survival-to-discharge (adjusted odds ratio [OR] = 2.729, 95% confidence interval [CI] = 1.384-5.383, P = 0.004) and neurological recovery (adjusted OR = 9.029, 95%CI = 3.263-24.983, P < 0.001) than did those with nonshockable rhythms and longer CPR duration. CONCLUSION: The CPR duration for predicting outcomes differs between CA patients with shockable and nonshockable rhythms. The combination of shockable/nonshockable rhythms and CPR duration may help predict the prognosis in CA survivors undergoing TTM.

2. Crit Care Med. 2022 Jan 31. doi: 10.1097/CCM.0000000000005463. Online ahead of print.
Intravascular Versus Surface Cooling in Patients Resuscitated From Cardiac Arrest: A Systematic Review and Network Meta-Analysis With Focus on Temperature Feedback.
Ramadanov N(1), Arrich J, Klein R, Herkner H, Behringer W.
ABSTRACT
OBJECTIVE: The aim of the study was to compare the effect of intravascular cooling (IC), surface cooling with temperature feedback (SCF), and surface cooling without temperature feedback (SCnoF) on neurologic outcome and survival in patients successfully resuscitated from cardiac arrest (CA) and treated with targeted temperature management (TTM) at 32-34°C. DATA SOURCES: We performed a systematic review on Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, MEDLINE, SCOPUS, CINAHL, Web of Science, and Clinical Trials up to June 30, 2021. STUDY SELECTION: We included randomized and nonrandomized studies on IC, SCF, and SCnoF in adult humans resuscitated from CA undergoing TTM, reporting neurologic outcome or survival. DATA EXTRACTION: We performed a network meta-analysis to assess the comparative effects of IC, SCF, and SCnoF. The overall effect between two cooling methods included the effect of direct and indirect comparisons. Results are given as odds ratios (OR) and 95% CIs. Rankograms estimated the probability of TTM methods being ranked first, second, and third best interventions. DATA SYNTHESIS: A total of 14 studies involving 4,062 patients met the inclusion criteria. Four studies were randomized controlled studies, and 10 studies were nonrandomized observational studies. IC compared with SCnoF was significantly associated with better neurologic outcome (OR, 0.6; 95% CI, 0.49-0.74) and survival (OR, 0.8; 95% CI, 0.66-0.96). IC compared with SCF, and SCF compared with SCnoF did not show significant differences in neurologic outcome and survival. The rankogram showed that IC had the highest probability to be the most beneficial cooling method, followed by SCF and SCnoF. CONCLUSIONS: Our results suggest that in patients resuscitated from CA and treated with TTM at 32-34°C, IC has the highest probability of being the most beneficial cooling method for survival and neurologic outcome.

3. Intensive Care Med. 2022 Jan 28. doi: 10.1007/s00134-022-06620-5. Online ahead of print.
ERC-ESICM guidelines on temperature control after cardiac arrest in adults.
Sandroni C(#)(1)(2), Nolan JP(#)(3)(4), Andersen LW(5)(6)(7), Böttiger BW(8), Cariou A(9), Cronberg T(10), Friberg H(11), Genbrugge C(12)(13), Lilja G(10), Morley PT(14), Nikolaou N(15), Olasveengen TM(16), Skrifvars MB(17), Taccone FS(18), Soar J(19).
ABSTRACT
The aim of these guidelines is to provide evidence-based guidance for temperature control in adults who are comatose after resuscitation from either in-hospital or out-of-hospital cardiac arrest, regardless of the underlying cardiac rhythm. These guidelines replace the recommendations on temperature management after cardiac arrest included in the 2021 post-resuscitation care

guidelines co-issued by the European Resuscitation Council (ERC) and the European Society of Intensive Care Medicine (ESICM). The guideline panel included thirteen international clinical experts who authored the 2021 ERC-ESICM guidelines and two methodologists who participated in the evidence review completed on behalf of the International Liaison Committee on Resuscitation (ILCOR) of whom ERC is a member society. We followed the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach to assess the certainty of evidence and grade recommendations. The panel provided suggestions on guideline implementation and identified priorities for future research. The certainty of evidence ranged from moderate to low. In patients who remain comatose after cardiac arrest, we recommend continuous monitoring of core temperature and actively preventing fever (defined as a temperature > 37.7 °C) for at least 72 h. There was insufficient evidence to recommend for or against temperature control at 32-36 °C or early cooling after cardiac arrest. We recommend not actively rewarming comatose patients with mild hypothermia after return of spontaneous circulation (ROSC) to achieve normothermia. We recommend not using prehospital cooling with rapid infusion of large volumes of cold intravenous fluids immediately after ROSC.

4. Front Cardiovasc Med. 2022 Jan 7;8:784917. doi: 10.3389/fcvm.2021.784917. eCollection 2021.
Optimal Time of Collapse to Return of Spontaneous Circulation to Apply Targeted Temperature Management for Cardiac Arrest: A Bayesian Network Meta-Analysis.
Duan J(1), Zhai Q(1), Shi Y(2), Ge H(1), Zheng K(1), Du L(1), Duan B(3), Yu J(4)(5)(6), Ma Q(1).
ABSTRACT
Background: Both the American Heart Association (AHA) and European Resuscitation Council (ERC) have strongly recommended targeted temperature management (TTM) for patients who remain in coma after return of spontaneous circulation (ROSC). However, the role of TTM, especially hypothermia, in cardiac arrest patients after TTM2 trials has become much uncertain. Methods: We searched four online databases (PubMed, Embase, CENTRAL, and Web of Science) and conducted a Bayesian network meta-analysis. Based on the time of collapse to ROSC and whether the patient received TTM or not, we divided this analysis into eight groups (<20 min + TTM, <20 min, 20-39 min + TTM, 20-39 min, 40-59 min + TTM, 40-59 min, ≥60 min + TTM and ≥60 min) to compare their 30-day and at-discharge survival and neurologic outcomes. Results: From an initial search of 3,023 articles, a total of 9,005 patients from 42 trials were eligible and were included in this network meta-analysis. Compared with other groups, patients in the <20 min + TTM group were more likely to have better survival and good neurologic outcomes (probability = 46.1 and 52.5%, respectively). In comparing the same time groups with and without TTM, only the survival and neurologic outcome of the 20-39 min + TTM group was significantly better than that of the 20-39 min group [odds ratio = 1.41, 95% confidence interval (1.04-1.91); OR = 1.46, 95% CI (1.07-2.00) respectively]. Applying TTM with <20 min or more than 40 min of collapse to ROSC did not improve survival or neurologic outcome [<20 min vs. <20 min + TTM: OR = 1.02, 95% CI (0.61-1.71)/OR = 1.03, 95% CI (0.61-1.75); 40-59 min vs. 40-59 min + TTM: OR = 1.50, 95% CI (0.97-2.32)/OR = 1.40, 95% CI (0.81-2.44); ≧60 min vs. ≧60 min + TTM: OR = 2.09, 95% CI (0.70-6.24)/OR = 4.14, 95% CI (0.91-18.74), respectively]. Both survival and good neurologic outcome were closely related to the time from collapse to ROSC. Conclusion: Survival and good neurologic outcome are closely associated with the time of collapse to ROSC. These findings supported that 20-40 min of collapse to ROSC should be a more suitable indication for TTM for cardiac arrest patients. Moreover, the future trials should pay more attention to these patients who suffer from moderate injury.

ELECTROPHYSIOLOGY AND DEFIBRILLATION

1. Phys Sportsmed. 2022 Jan 28. doi: 10.1080/00913847.2022.2036079. Online ahead of print.
Automated External Defibrillator and Emergency Action Plan Preparedness Amongst Masters Athletes.
Yeung P(1), Phulka J(1), Morrison B(2), Moulson N(3), McKinney J(3)(4).
ABSTRACT
OBJECTIVES: Sudden cardiac arrest/death (SCA/D) is the leading medical cause of death in athletes. Masters athletes (≥35 years old) are increasing in numbers and are responsible for the vast majority of sport-related SCDs. Automated external defibrillators (AEDs) and emergency action plans (EAPs) have been shown to unequivocally reduce SCD, however, their prevalence in masters athletics remains unknown. We sought to identify the perceived AED accessibility and EAP preparedness amongst a group of masters athletes. METHODS: A 40-item survey was sent to 735 master athletes identified through the Masters Athlete Screening Study. Participants were athletes with no known significant cardiac history. The survey inquired on the availability and location of AEDs within exercise settings, the presence of EAPs, and participants' cardiac concerns. RESULTS: Sixty-eight percent of athletes completed the survey. Ninety-seven percent and 99% of athletes believed CPR and AEDs were effective at saving lives, respectively. Thirty-eight percent of athletes were aware of an AED in proximity to where they exercise, with 40% aware of one available during competition events, and 28% during training events. Only 10% of athletes were aware of an EAP active in their place of exercise. Half of the athletes perceive their risk of cardiac arrest during exercise to be ≤0.5 in 100,000. CONCLUSIONS: These findings indicate that nearly all athletes believe CPR and AED are effective at saving lives, but only a minority are aware of an AED near their place of exercise, with even fewer aware of an active EAP. Master athletes underestimate their own risk for exercise-related cardiac events, affirming the importance of educating masters athletes on their increased cardiac risk and the importance of EAPs.

2. Resuscitation. 2022 Jan 25:S0300-9572(22)00021-1. doi: 10.1016/j.resuscitation.2022.01.019. Online ahead of print.
Defibrillation for out-of-hospital cardiac arrest. Year of the drone?
Smith CM(1).
NO ABSTRACT AVAILABLE

PEDIATRICS AND CHILDREN

1. Resusc Plus. 2022 Jan 14;9:100200. doi: 10.1016/j.resplu.2021.100200. eCollection 2022 Mar.
Peri-arrest bolus epinephrine practices amongst pediatric resuscitation experts.
Ross CE(1)(2), Hayes MM(3), Kleinman ME(4), Donnino MW(2)(3), Sullivan AM(5).
ABSTRACT
AIM: To describe current practices of peri-arrest bolus epinephrine use amongst pediatric resuscitation experts in a multinational survey. METHODS: A 9-question survey was developed and electronically distributed to pediatric critical care physicians who are site investigators for the Pediatric Resuscitation Quality Collaborative (pediRES-Q) network. Institutional demographics were collected through the American Hospital Association 2018 Annual Survey and linked to responses. Descriptive statistics were used to characterize closed-ended responses, and qualitative content analysis to analyze open-ended responses. RESULTS: Of the 63 collaborative members invited to participate, 49 (78%) responded, representing 35 institutions in 9 countries. Forty-six of the 49

respondents (94%) reported that they would consider using peri-arrest bolus epinephrine during critical situations in patients not requiring cardiopulmonary resuscitation. Initial dosing strategies ranged from 0.1mcg/kg to 10mcg/kg, with the most commonly reported initial dose of 1mcg/kg by 25 of the 37 (68%) respondents who answered this question. Three of the 49 (6%) participants indicated that they would generally avoid using peri-arrest bolus epinephrine, citing lack of evidence to support its use. CONCLUSIONS: In this multinational survey of pediatric resuscitation experts, endorsement of peri-arrest bolus epinephrine use was nearly universal, though a few clinicians cited lack of evidence to support this practice. There was a 100-fold difference in the range of initial weight-based doses reported, as well as a minority of clinicians who reported using non-weight-based dosing. Further research is needed to determine best practices, standardization of initial dosing, clinical factors that may warrant dosing modifications and associations with clinically important outcomes.

2. Resuscitation. 2022 Jan 22:S0300-9572(22)00013-2. doi: 10.1016/j.resuscitation.2022.01.012. Online ahead of print.

Dispatcher-assisted CPR for cardiac arrest in children - conventional versus compression-only CPR.

Maconochie I(1), Thompson N(1).

ABSTRACT

This study should that conventional CPR outcomes in Cerebral Performance Category was achieved at 1 month post resuscitation. There was no difference in those with an initial shockable rhythm, requiring CPR for 20 minutes before hospital arrival, public defibrillation, advanced airway care or epinephrine administration. However, survival rates in paediatric CPR is low. Ways in which to improve the outcomes are suggested which included bystander CPR, teaching and training of dispatchers and additional technologies.

3. Pediatr Qual Saf. 2022 Jan 21;7(1):e525. doi: 10.1097/pq9.0000000000000525. eCollection 2022 Jan-Feb.

Shifting the Paradigm: A Quality Improvement Approach to Proactive Cardiac Arrest Reduction in the Pediatric Cardiac Intensive Care Unit.

Riley CM(1)(2)(3)(4)(5)(6)(7)(8)(9), Diddle JW(1)(2)(3)(4)(5)(6)(7)(8)(9), Harlow A(2), Klem K(3), Patregnani J(4), Hochberg E(5), Cheng JJ(6), Bhattarai S(7), Hom L(8), Fortkiewicz JM(2), Klugman D(9).

ABSTRACT

INTRODUCTION: Children with cardiac conditions are at higher risk of in-hospital pediatric cardiopulmonary arrest (CA), resulting in significant morbidity and mortality. Despite the elevated risk, proactive cardiac arrest prevention programs in the cardiac intensive care unit (CICU) remain underdeveloped. Our team developed a multidisciplinary program centered on developing a quality improvement (QI) bundle for patients at high risk of CA. METHODS: This project occurred in a 26-bed pediatric CICU of a tertiary care children's hospital. Statistical process control methodology tracked changes in CA rates over time. The global aim was to reduce CICU mortality; the smart aim was to reduce the CA rate by 50% over 12 months. Interprofessional development and implementation of a QI bundle included visual cues to identify high-risk patients, risk mitigation strategies, a new rounding paradigm, and defined escalation algorithms. Additionally, weekly event and long-term data reviews, arrest debriefs, and weekly unit-wide dissemination of key findings supported a culture change. RESULTS: After bundle implementation, CA rates decreased by 68% compared to baseline and 45% from the historical baseline. Major complications decreased from 17.1% to 12.6% ($P < 0.001$) and mortality decreased from 5.7% to 5.0% ($P = 0.048$). These results were sustained for 30 months. CONCLUSIONS: Cardiac arrest is a modifiable, rather than inevitable,

metric in the CICU. Reduction is achievable through the interprofessional implementation of bundled interventions targeting proactive CA prevention. Once incorporated into widespread efforts to engage multidisciplinary CICU stakeholders, these patient-focused interventions resulted in sustained improvement.

EXTRACORPOREAL LIFE SUPPORT

1. Pediatr Qual Saf. 2022 Jan 21;7(1):e510. doi: 10.1097/pq9.0000000000000510. eCollection 2022 Jan-Feb.

Simulation-Based System Analysis: Testing Preparedness for Extracorporeal Membrane Oxygenation Cannulation in Pediatric COVID-19 Patients.

Stoner AC(1), Schremmer RD(2), Miller MA(3), Davidson KL(4), Pedigo RL(5), Parson JS(5), Kennedy CS(2), Pallotto EK(6), Miller JO(1).

ABSTRACT

INTRODUCTION: Coronavirus Disease-2019 presents risk to both patients and medical teams. Staff-intensive, complex procedures such as extracorporeal membrane oxygenation (ECMO) or extracorporeal cardiopulmonary resuscitation (eCPR) may increase chances of exposure and spread. This investigation aimed to rapidly deploy an in situ Simulation-based Clinical Systems Testing (SbCST) framework to identify Latent Safety Threats (LSTs) related to ECMO/eCPR initiation during a pandemic. METHODS: The adapted SbCST framework tested systems related to ECMO/eCPR initiation in the Neonatal and Pediatric Intensive Care Units. Systems were evaluated in six domains (Resources, Processes/Systems, Facilities, Clinical Performance, Infection Control, and Communication). We conducted three high-fidelity simulations with members from the Neonatal Intensive Care Unit General Surgery, Pediatric Intensive Care Unit Cardiovascular Surgery (CV), and Pediatric Intensive Care Unit General Surgery teams. Content experts evaluated systems issues during simulation, and LSTs were identified during debriefing. Data were analyzed for frequency of LSTs and trends in process gaps. RESULTS: Sixty-six LSTs were identified across three scenarios. Resource issues comprised the largest category (26%), followed by Process/System issues (24%), Infection Control issues (24%), Communication issues (17%), and Facility and Clinical Performance issues (5% each). LSTs informed new team strategies such as the use of a "door/PPE monitor" and "inside/outside" team configuration. CONCLUSIONS: The adapted SbCST framework identified multiple LSTs related to ECMO/eCPR cannulation and infection control guidelines in the setting of Coronavirus Disease-2019. Through SbCSTs, we developed guidelines to conserve PPE and develop optimal workflows to reduce patient/staff exposure in a high-risk procedure. This project may guide other hospitals to adapt SbCSTs strategies to test/adjust rapidly changing guidelines.

2. Curr Opin Anaesthesiol. 2022 Jan 21. doi: 10.1097/ACO.0000000000001097. Online ahead of print.

Extracorporeal cardiopulmonary resuscitation: is it futile?

Kim C(1), Vigneshwar M, Nicolato P.

ABSTRACT

PURPOSE OF REVIEW: Extracorporeal cardiopulmonary resuscitation (ECPR) is a treatment modality used to restore end-organ perfusion in the setting of refractory cardiac arrest in patients receiving cardiopulmonary resuscitation (CPR). Despite advances in medicine, survival from cardiac arrest remains low with conventional CPR. The body of literature relating to ECPR is limited to retrospective studies and case series, with data that are inconsistent. Routine use of ECPR is not currently endorsed by the American Heart Association. RECENT FINDINGS: In several single-center retrospective studies, ECPR was associated with a higher level of return of spontaneous circulation and survival to hospital discharge, when compared with conventional CPR. However, data from

larger population-based registry studies have not reproduced these findings. Implementation of ECPR is a complex endeavor that requires specialized, multidisciplinary expertise to be successful. SUMMARY: ECPR may be considered as an adjunct to CPR in cases of refractory cardiac arrest. The success of ECPR relies on specialized expertise, thoughtful patient selection, and timely initiation.

EXPERIMENTAL RESEARCH

1. Front Immunol. 2022 Jan 11;12:790750. doi: 10.3389/fimmu.2021.790750. eCollection 2021.
LncRNA GAS5/miR-137 Is a Hypoxia-Responsive Axis Involved in Cardiac Arrest and Cardiopulmonary Cerebral Resuscitation.
Jing W(1), Tuxiu X(1)(2), Xiaobing L(1), Guijun J(1)(3), Lulu K(1), Jie J(1), Lu Y(1), Liying Z(3), Xiaoxing X(4), Jingjun L(1).

ABSTRACT

BACKGROUND: Cardiac arrest/cardiopulmonary resuscitation (CA/CPR) represents one of the devastating medical emergencies and is associated with high mortality and neuro-disability. Post-cardiac arrest syndrome (PCAS) is mechanistically ascribed to acute systemic ischemia/reperfusion(I/R) injury. The lncRNA/microRNA/mRNA networks have been found to play crucial roles in the pathogenesis of the hypoxia-responsive diseases. Nonetheless, the precise molecular mechanisms by which lncRNA/miRNA/mRNA axes are involved in the astrocyte-microglia crosstalk in CA/CPR have not been fully elucidated. METHODS: We collected and purified the exosomes from the blood of CA/CPR patients and supernatant of OGD/R-stimulated astrocytes. On the basis of microarray analysis, bioinformatic study, and luciferase activity determination, we speculated that lncRNA GAS5/miR-137 is implicated in the astrocyte-microglia crosstalk under the insult of systemic I/R injury. The regulation of lncRNA GAS5/miR-137 on INPP4B was examined by cellular transfection in OGD/R cell culture and by lateral ventricle injection with miR-137 agomir in CA/CPR mice model. Flow cytometry and immunofluorescence staining were performed to detect the microglial apoptosis, M1/M2 phenotype transformation, and neuroinflammation. Neurological scoring and behavior tests were conducted in CA/CPR group, with miR-137 agomir lateral-ventricle infusion and in their controls. RESULTS: In all the micRNAs, miR-137 was among the top 10 micRNAs that experienced greatest changes, in both the blood of CA/CPR patients and supernatant of OGD/R-stimulated astrocytes. Bioinformatic analysis revealed that miR-137 was sponged by lncRNA GAS5, targeting INPP4B, and the result was confirmed by Luciferase activity assay. qRT-PCR and Western blotting showed that lncRNA GAS5 and INPP4B were over-expressed whereas miR-137 was downregulated in the blood of CA/CPR patients, OGD/R-stimulated astrocytes, and brain tissue of CA/CPR mice. Silencing lncRNA GAS5 suppressed INPP4B expression, but over-expression of miR-137 negatively modulated its expression. Western blotting exhibited that PI3K and Akt phosphorylation was increased when lncRNA GAS5 was silenced or miR-137 was over-expressed. However, PI3K and Akt phosphorylation was notably suppressed in the absence of miR-137, almost reversing their phosphorylation in the silencing lncRNA GAS5 group. Then we found that GAS5 siRNA or miR-137 mimic significantly increased cell viability and alleviated apoptosis after OGD/R injury. Furthermore, over-expression of miR-137 attenuated microglial apoptosis and neuroinflammation in CA/CPR mice model, exhibiting significantly better behavioral tests after CA/CPR. CONCLUSION: LncRNA

GAS5/miR-137 may be involved in the astrocyte-microglia communication that inhibits PI3K/Akt signaling activation via regulation of INPP4B during CA/CPR.

2. Neurocrit Care. 2022 Jan 24. doi: 10.1007/s12028-021-01432-9. Online ahead of print.
Early Thalamocortical Reperfusion Leads to Neurologic Recovery in a Rodent Cardiac Arrest Model.
Guo Y(#)(1), Cho SM(#)(2), Wei Z(3), Wang Q(1), Modi HR(1), Gharibani P(4), Lu H(1)(3), Thakor NV(1), Geocadin RG(5).

ABSTRACT
BACKGROUND: Cerebral blood flow (CBF) plays an important role in neurological recovery after cardiac arrest (CA) resuscitation. However, the variations of CBF recovery in distinct brain regions and its correlation with neurologic recovery after return of spontaneous circulation (ROSC) have not been characterized. This study aimed to investigate the characteristics of regional cerebral reperfusion following resuscitation in predicting neurological recovery. METHODS: Twelve adult male Wistar rats were studied, ten resuscitated from 7-min asphyxial CA and two uninjured rats, which were designated as healthy controls (HCs). Dynamic changes in CBF in the cerebral cortex, hippocampus, thalamus, brainstem, and cerebellum were assessed by pseudocontinuous arterial spin labeling magnetic resonance imaging, starting at 60 min after ROSC to 156 min (or time to spontaneous arousal). Neurologic outcomes were evaluated by the neurologic deficit scale at 24 h post-ROSC in a blinded manner. Correlations between regional CBF (rCBF) and neurological recovery were undertaken. RESULTS: All post-CA animals were found to be nonresponsive during the 60-156 min post ROSC, with reductions in rCBF by 24-42% compared with HC. Analyses of rCBF during the post-ROSC time window from 60 to 156 min showed the rCBF recovery of hippocampus and thalamus were positively associated with better neurological outcomes ($r_s = 0.82$, $p = 0.004$ and $r_s = 0.73$, $p < 0.001$, respectively). During 96 min before arousal, thalamic and cortical rCBF exhibited positive correlations with neurological recovery ($r_s = 0.80$, $p < 0.001$ and $r_s = 0.65$, $p < 0.001$, respectively); for predicting a favorable neurological outcome, the thalamic rCBF threshold was above 50.84 ml/100 g/min (34% of HC) (area under the curve of 0.96), whereas the cortical rCBF threshold was above 60.43 ml/100 g/min (38% of HC) (area under the curve of 0.88). CONCLUSIONS: Early magnetic resonance imaging analyses showed early rCBF recovery in thalamus, hippocampus, and cortex post ROSC was positively correlated with neurological outcomes at 24 h. Our findings suggest new translational insights into the regional reperfusion and the time window that may be critical in neurological recovery and warrant further validation.

CASE REPORTS

1. AANA J. 2022 Feb;91(1):46-49.
Asystole During Elective Cervical Spine Surgery: A Case Study.
Wren KR(1), Wren TL(2).

ABSTRACT
A 52-year-old, ASA class II patient was scheduled for anterior cervical discectomy and fusion at the C3 - C4 level. During the surgery when the surgeon was placing retractors the patient developed an instant onset of asystole. This case review will discuss potential reasons for asystole during cervical spinal surgery, as well as anatomical considerations when confronted with asystole during surgical dissection and retraction. Many complications resulting from asystole have poor prognosis. This case study will review what was done in a timely manner to recognize and treat this life-threatening event.

2. Ann Card Anaesth. 2022 Jan-Mar;25(1):73-76. doi: 10.4103/aca.aca_308_20.

Extracorporeal cardiopulmonary resuscitation for an out-of-hospital cardiac arrest.

Nair SG(1), Abraham J(1), Varghese J(2), Nair MP(3), Varma RS(4).

ABSTRACT

Extra corporeal membrane oxygenation (ECMO) for refractory out-of-hospital cardiac arrest (OHCA) has been shown to improve outcome in many Western countries. There are no reports of ECMO being used to support OHCA in India till date. We report a case of a young man who developed cardiac arrest (CA) while driving and was given bystander cardiac massage. He was brought to tertiary care center where an ECMO was utilized for refractory CA. The patient subsequently underwent emergency coronary artery stenting and was weaned off ECMO and ventilation. We discuss the case and highlight the role of bystander cardiopulmonary resuscitation.