This week's PubMed 20th – 26th August 2023: articles of interest n = 49

CPR AND COVID-19

1. BMC Emerg Med. 2023 Aug 21;23(1):94. doi: 10.1186/s12873-023-00860-4.
The outcomes of cardiopulmonary resuscitation and their predictors during the 2019 pandemic in Iran.
Goodarzi A(1), Abdi A(2), Ghasemi H(3), Darvishi N(3), Jalali R(4).
ABSTRACT
BACKGROUND: Coronavirus disease 2019 (COVID-19) can negatively affect different healthcare-related outcomes. Nonetheless, there is limited information about its effects on different healthcare-related outcomes. This study aimed at evaluating the outcomes of cardiopulmonary resuscitation (CPR) and their predictors during the COVID-19 pandemic in Iran. METHODS: This cross-sectional study was conducted on 1253 patients who had undergone CPR in the emergency wards of teaching hospitals in the west of Iran from the beginning of the first wave to the end of the third epidemic wave of COVID-19 in Iran, between February 20, 2020, and January 20, 2021. Data were collected using the National CPR Documentation Forms developed based on the Utstein Style and routinely used for all patients with cardiac arrest (CA). The SPSS (v. 20.0) program was used to analyze the data through the Chi-square, Fisher's exact, and Mann-Whitney U tests and logistic regression analysis. RESULTS: Participants' age mean was 64.62 ± 17.54 years. Age mean among participants with COVID-19 was eight years more than other participants. Most participants were male (64.09%) and had at least one underlying disease (64.99%). The total rates of the return of spontaneous circulation (ROSC) and CPR-discharge survival were respectively 15.3% and 3.8% among all participants, 20.25% and 5.17% among participants without COVID-19, and 8.96% and 2.04% among participants with COVID-19. The significant predictors of ROSC were age, affliction by COVID-19, affliction by underlying diseases, baseline rhythm, delay in epinephrine administration, and epinephrine administration time interval, while the significant predictors of CPR-discharge survival were age and baseline rhythm. CONCLUSIONS: The total rates of ROSC and CPR-discharge survival were respectively 15.3% and 3.8% among all participants. The rates of ROSC and CPR to discharge survival among patients without COVID-19 are respectively 2.26 and 2.53 times more than the rates among patients with COVID-19.

2. Intern Med. 2023 Aug 23. doi: 10.2169/internalmedicine.2298-23. Online ahead of print.
Lessons Learnt from Case Series of Out-of-hospital Cardiac Arrest and Unexpected Death after COVID-19 Vaccination.
Maruyama T(1)(2), Uesako H(3).
ABSTRACT
Vaccination against COVID-19 has raised concerns about myocarditis in young men, as out-of-hospital cardiac arrest (OHCA) or sudden death after vaccination has been reported sporadically. Common features of these cases are occurrence in young men, within a few weeks after vaccination, in patients with no structural heart diseases. Cases of unexplained nocturnal death showed fibrotic or hypertrophied myocardium, and one case of OHCA presented ventricular fibrillation (VF) triggered by a prominent J wave on an automated external defibrillator and histopathologic findings compatible with myocarditis. Both myocarditis and J waves are prevalent in young men, and these cases imply that myocarditis augments J waves, which trigger VFs, and primary electrical disorders are a leading cause of death. To prevent such issues, artificial intelligence (AI)-assisted interpretation of historical electrocardiogram findings may help predict future J wave formation leading to VF, as digital ECG findings are well suited for AI interpretation.

CPR/MECHANICAL CHEST COMPRESSION

1. J Pers Med. 2023 Jul 28;13(8):1202. doi: 10.3390/jpm13081202.

Manual Chest Compression versus Automated Chest Compression Device during Day-Time and Night-Time Resuscitation Following Out-of-Hospital Cardiac Arrest: A Retrospective Historical Control Study.

Takayama W(1)(2), Endo A(2)(3), Morishita K(1)(2), Otomo Y(1)(2).

ABSTRACT

OBJECTIVE: We assessed the effectiveness of automated chest compression devices depending on the time of admission based on the frequency of iatrogenic chest injuries, the duration of in-hospital resuscitation efforts, and clinical outcomes among out-of-hospital cardiac arrest (OHCA) patients. METHODS: We conducted a retrospective historical control study of OHCA patients in Japan between 2015-2022. The patients were divided according to time of admission, where day-time was considered 07:00-22:59 and night-time 23:00-06:59. These patients were then divided into two categories based on the in-hospital cardiopulmonary resuscitation (IHCPR) device: manual chest compression (mCC) group and automatic chest compression devices (ACCD) group. We used univariate and multivariate ordered logistic regression models adjusted for pre-hospital confounders to evaluate the impact of ACCD use during IHCPR on outcomes (IHCPR duration, CPR-related chest injuries, and clinical outcomes) in the day-time and night-time groups. RESULTS: Among 1101 patients with OHCA (day-time, 809; night-time, 292), including 215 patients who underwent ACCD during IHCPR in day-time (26.6%) and 104 patients in night-time group (35.6%), the multivariate model showed a significant association of ACCD use with the outcomes of in-hospital resuscitation and higher rates of return in spontaneous circulation, lower incidence of CPR-related chest injuries, longer in-hospital resuscitation durations, greater survival to Emergency Department and hospital discharge, and greater survival with good neurological outcome to hospital discharge, though only in the night-time group.CONCLUSIONS: Patients who underwent ACCD during in-hospital resuscitation at night had a significantly longer duration of in-hospital resuscitation, a lower incidence of CPR-related chest injuries, and better outcomes.

REGISTRIES, REVIEWS AND EDITORIALS

1. Medicine (Baltimore). 2023 Aug 18;102(33):e34783. doi: 10.1097/MD.0000000000034783.

Out-of-hospital cardiac arrest: A data-driven visualization of collaboration, frontier identification, and future trends.

Li Y(1), Li Z(2), Li C(2), Cai W(3), Liu T(4), Li J(4), Fan H(4)(5), Cao C(4).

ABSTRACT

One of the main causes of death is out-of-hospital cardiac arrest (OHCA), which has a poor prognosis and poor neurological outcomes. This phenomenon has attracted increasing attention. However, there is still no published bibliometric analysis of OHCA. This bibliometric analysis of publications on OHCA aimed to visualize the current status of research, determine the frontiers of research, and identify future trends. Publications on OHCA were downloaded from the web of science database. The data elements included year, countries/territories, institutions, authors, journals, research areas, citations of publications, etc. Joinpoint regression and exponential models were used to identify and predict the trend of publications, respectively. Knowledge domain maps were applied to conduct contribution and collaboration, cooccurrence, cocitation, and coupled analyses. Timeline and burst detection analysis were used to identify the frontiers in the field. A total of 3 219

publications on OHCA were found from 1998 to 2022 (average annual percentage change = 16.7; 95% CI 14.4, 19.1). It was estimated that 859 articles and reviews would be published in 2025. The following research hotpots were identified: statement, epidemiology, clinical care, factors influencing prognosis and emergency medical services. The research frontier identification revealed that 7 categories were classified, including therapeutic hypothermia, emergency medical services, airway management, myocardial infarction, extracorporeal cardiopulmonary resuscitation, stroke foundation and trial. The burst detection analysis revealed that percutaneous coronary intervention, neurologic outcome, COVID-19 and extracorporeal cardiopulmonary resuscitation are issues that should be given continual attention in the future. This bibliometric analysis may reflect the current status and future frontiers of OHCA research.

2. Resusc Plus. 2023 Aug 10;15:100446. doi: 10.1016/j.resplu.2023.100446. eCollection 2023 Sep.
No obesity paradox in out-of-hospital cardiac arrest: Data from the Swedish registry of cardiopulmonary resuscitation.
Hjalmarsson A(1), Rawshani A(1)(2), Råmunddal T(1), Rawshani A(1), Hjalmarsson C(1)(3), Myredal A(1), Höskuldsdottir G(1), Hessulf F(1)(4), Hirlekar G(1), Angerås O(1), Petursson P(1).
ABSTRACT
BACKGROUND: Although an "obesity paradox", which states an increased chance of survival for patients with obesity after myocardial infarction has been proposed, it is less clear whether this phenomenon even exists in patients suffering out-of-hospital cardiac arrest (OHCA) and if diabetes, which is often associated with obesity, implies an additional risk. OBJECTIVE: To investigate if and how obesity, with or without diabetes, affects the survival of patients with OHCA. METHODS: This study included 55,483 patients with OHCA reported to the Swedish Registry of Cardiopulmonary Resuscitation between 2010 and 2020. Patients were classified in five groups: obesity only (Ob), type 1 diabetes only (T1D), type 2 diabetes only (T2D), obesity and any diabetes (ObD), or belonging to the group other (OTH). Patient characteristics and outcomes were studied using descriptive statistics, logistic, and Cox proportional regression. RESULTS: Obesity only was found in 2.7% of the study cohort, while 3.2% had obesity and any type of diabetes. Ob patients were significantly younger than all other patients ($p \leq 0.001$); the 30 day-survival was 9.6% in Ob, and 10.6%, 7.3%, 6.9%, and 12.7% in T1D, T2D, ObD, and OTH, respectively, with OR (95% CI) of 0.69 (0.57-0.82), 0.78 (0.56-1.05), 0.65 (0.59-0.71), and 0.55 (0.45-0.66) for Ob, T1D, T2D, and ObD, respectively (reference group OTH). No time-related trends in 30-days survival were found. CONCLUSION: Obesity was present in 6% of the population and was associated with younger age and a 30% reduction in survival; a combination of obesity and diabetes further reduced the survival rate.

3. Resuscitation. 2023 Sep;190:109892. doi: 10.1016/j.resuscitation.2023.109892. Epub 2023 Aug 15.
Potential problems with concomitant therapy with Impella® and veno-arterial extracorporeal membrane oxygenation in patients with cardiac arrest.
Izumida T(1), Imamura T(2).
NO ABSTRACT AVAILABLE

4. Heart. 2023 Aug 24;109(18):1341-1343. doi: 10.1136/heartjnl-2023-323314.
Heartbeat: improving outcomes after out-of-hospital cardiac arrest.
Otto CM(1).
NO ABSTRACT AVAILABLE

5. Hong Kong Med J. 2023 Aug 23. doi: 10.12809/hkmj219365. Online ahead of print.

Survival of out-of-hospital cardiac arrest following a return of spontaneous circulation beyond 30 minutes.
Hon KL(1), Leung KKY(1), Chan KL(1), Hui WF(1), Chau KT(1), Qian SY(2).
NO ABSTRACT AVAILABLE

6. Arch Dis Child Fetal Neonatal Ed. 2023 Sep;108(5):442-450. doi: 10.1136/archdischild-2022-324529. Epub 2022 Dec 1.
Chest compressions in newborn infants: a scoping review.
Ramachandran S(1), Bruckner M(2), Wyckoff MH(3), Schmölzer GM(4).
ABSTRACT
AIM: The International Liaison Committee on Resuscitation Neonatal Life Support Task Force undertook a scoping review of the literature to identify evidence relating to neonatal cardiopulmonary resuscitation. METHODS: MEDLINE complete, EMBASE and Cochrane database of Systematic reviews were searched from inception to November 2021. Two authors screened titles and abstracts and full text reviewed. Studies were eligible for inclusion if they were peer-reviewed and assessed one of five aspects of chest compression in the newborn infant including: (1) heart rate thresholds to start chest compressions (CC), (2) compression to ventilation ratio (C:V ratio), (3) CC technique, (4) oxygen use during CC and 5) feedback devices to optimise CC. RESULTS: Seventy-four studies were included (n=46 simulation, n=24 animal and n=4 clinical studies); 22/74 were related to compression to ventilation ratios, 29/74 examined optimal technique to perform CC, 7/74 examined oxygen delivery and 15/74 described feedback devices during neonatal CC. CONCLUSION: There were very few clinical studies and mostly manikin and animal studies. The findings either reinforced or were insufficient to change previous recommendations which included to start CC if heart rate remains <60/min despite adequate ventilation, using a 3:1 C:V ratio, the two-thumb encircling technique and 100% oxygen during CC.

7. Arch Dis Child Fetal Neonatal Ed. 2023 Sep;108(5):438-439. doi: 10.1136/archdischild-2022-325064. Epub 2023 Jun 16.
'Keeping the beat': What is the best way to perform neonatal chest compressions?
Cusack J(1)(2).
NO ABSTRACT AVAILABLE

IN-HOSPITAL CARDIAC ARREST

No articles identified.

INJURIES AND CPR

No articles identified.

CAUSE OF THE ARREST

1. Am J Emerg Med. 2023 Aug 15;73:55-62. doi: 10.1016/j.ajem.2023.08.024. Online ahead of print.
Danish Drowning Formula for identification of out-of-hospital cardiac arrest from drowning.
Breindahl N(1), Wolthers SA(2), Jensen TW(3), Holgersen MG(4), Blomberg SNF(5), Steinmetz J(6), Christensen HC(7); Danish Cardiac Arrest Group(8).
ABSTRACT

BACKGROUND: Accurate, reliable, and sufficient data is required to reduce the burden of drowning by targeting preventive measures and improving treatment. Today's drowning statistics are informed by various methods sometimes based on data sources with questionable reliability. These methods are likely responsible for a systematic and significant underreporting of drowning. This study's aim was to assess the 30-day survival of patients with out-of-hospital cardiac arrest (OHCA) identified in the Danish Cardiac Arrest Registry (DCAR) after applying the Danish Drowning Formula. METHODS: This nationwide, cohort, registry-based study with 30-day follow-up used the Danish Drowning Formula to identify drowning-related OHCA with a resuscitation attempt from the DCAR from January 1st, 2016, through December 31st, 2021. The Danish Drowning Formula is a text-search algorithm constructed for this study based on trigger-words identified from the prehospital medical records of validated drowning cases. The primary outcome was 30-day survival from OHCA. Data were analyzed using multiple logistic regression. RESULTS: Drowning-related OHCA occurred in 374 (1%) patients registered in the DCAR compared to 29,882 patients with OHCA from other causes. Drowning-related OHCA more frequently occurred at a public location (87% vs 25%, $p < 0.001$) and were more frequently witnessed by bystanders (80% vs 55%, $p < 0.001$). Both 30-day and 1-year survival for patients with drowning-related OHCA were significantly higher compared to OHCA from other causes (33% vs 14% and 32% vs 13%, respectively, $p < 0.001$). The adjusted odds ratio for 30-day survival for drowning-related OHCA and other causes of OHCA was 2.3 [1.7-3.2], $p < 0.001$. Increased 30-day survival was observed for drowning-related OHCA occurring at swimming pools compared to public location OHCA from other causes with an OR of 11.6 [6.0-22.6], $p < 0.001$. CONCLUSIONS: This study found higher 30-day survival among drowning-related OHCA compared to OHCA from other causes. This study proposed that a text-search algorithm (Danish Drowning Formula) could explore unstructured text fields to identify drowning persons. This method may present a low-resource solution to inform the drowning statistics in the future.

2. J Korean Med Sci. 2023 Aug 21;38(33):e260. doi: 10.3346/jkms.2023.38.e260.

Circulating Vitamin D Level and Risk of Sudden Cardiac Death and Cardiovascular Mortality: A Dose-Response Meta-Analysis of Prospective Studies.

Kong SY(1), Jung E(1)(2), Hwang SS(3), Ro YS(1), Shin SD(1), Cha KC(4), Hwang SO(4).

ABSTRACT

BACKGROUND: We conducted a comprehensive meta-analysis of prospective cohort studies to analyze the effect of circulating vitamin D level on the risk of sudden cardiac death (SCD) and cardiovascular disease (CVD) mortality. METHODS: Prospective cohort studies evaluating the association between circulating vitamin D and risk of SCD and CVD mortality were systematically searched in the PubMed and Embase. Extracted data were analyzed using a random effects model and results were expressed in terms of hazard ratio (HR) and 95% confidence interval (CI). Restricted cubic spline analysis was used to estimate the dose-response relationships. RESULTS: Of the 1,321 records identified using the search strategy, a total of 19 cohort studies were included in the final meta-analysis. The pooled estimate of HR (95% CI) for low vs. high circulating vitamin D level was 1.75 (1.49-2.06) with I^2 value of 30.4%. In subgroup analysis, strong effects of circulating vitamin D were observed in healthy general population (pooled HR, 1.84; 95% CI, 1.43-2.38) and the clinical endpoint of SCD (pooled HRs, 2.68; 95% CI, 1.48-4.83). The dose-response analysis at the reference level of < 50 nmol/L showed a significant negative association between circulating vitamin D and risk of SCD and CVD mortality. CONCLUSION: Our meta-analysis of prospective cohort studies showed that lower circulating vitamin D level significantly increased the risk of SCD and CVD mortality.

END-TIDAL CO_2

No articles identified.

ORGAN DONATION

No articles identified.

FEEDBACK

No articles identified.

DRUGS

1. Acad Emerg Med. 2023 Sep;30(9):906-917. doi: 10.1111/acem.14716. Epub 2023 Apr 5.
Survival by time-to-administration of amiodarone, lidocaine, or placebo in shock-refractory out-of-hospital cardiac arrest.
Lupton JR(1), Neth MR(1), Sahni R(1), Jui J(1), Wittwer L(1), Newgard CD(1), Daya MR(1).
ABSTRACT
BACKGROUND: Amiodarone and lidocaine have not been shown to have a clear survival benefit compared to placebo for out-of-hospital cardiac arrest (OHCA). However, randomized trials may have been impacted by delayed administration of the study drugs. We sought to evaluate how timing from emergency medical services (EMS) arrival on scene to drug administration affects the efficacy of amiodarone and lidocaine compared to placebo. METHOD: This is a secondary analysis of the 10-site, 55-EMS-agency double-blind randomized controlled amiodarone, lidocaine, or placebo in OHCA study. We included patients with initial shockable rhythms who received the study drugs of amiodarone, lidocaine, or placebo before achieving return of spontaneous circulation. We performed logistic regression analyses evaluating survival to hospital discharge and secondary outcomes of survival to admission and functional survival (modified Rankin scale score ≤ 3). We evaluated the samples stratified by early (<8 min) and late administration groups (≥8 min). We compared outcomes for amiodarone and lidocaine compared to placebo and adjust for potential confounders. RESULTS: There were 2802 patients meeting inclusion criteria, with 879 (31.4%) in the early (<8 min) and 1923 (68.6%) in the late (≥8 min) groups. In the early group, patients receiving amiodarone, compared to placebo, had significantly higher survival to admission (62.0% vs. 48.5%, p = 0.001; adjusted OR [95% CI] 1.76 [1.24-2.50]), survival to discharge (37.1% vs. 28.0%, p = 0.021; 1.56 [1.07-2.29]), and functional survival (31.6% vs. 23.3%, p = 0.029; 1.55 [1.04-2.32]). There were no significant differences with early lidocaine compared to early placebo (p > 0.05). Patients in the late group who received amiodarone or lidocaine had no significant differences in outcomes at discharge compared to placebo (p > 0.05). CONCLUSIONS: The early administration of amiodarone, particularly within 8 min, is associated with greater survival to admission, survival to discharge, and functional survival compared to placebo in patients with an initial shockable rhythm.

2. Am J Emerg Med. 2023 Aug 13;73:40-46. doi: 10.1016/j.ajem.2023.08.020. Online ahead of print.
The effect of sodium bicarbonate on OHCA patients: A systematic review and meta-analysis of RCT and propensity score studies.
Xu T(1), Wu C(1), Shen Q(1), Xu H(2), Huang H(3).
ABSTRACT

BACKGROUND: Evidence on the efficacy of sodium bicarbonate (SB) in out-of-hospital cardiac arrest (OHCA) is controversial and generally of low quality. A systematic review and meta-analysis was performed to evaluate the effect of SB in OHCA patients based on randomized controlled trial (RCT) and propensity score matching (PSM) cohort studies. METHODS: We searched the PubMed, Cochrane, and Embase databases for RCTs and PSM cohort studies from inception to July 15, 2023. We included studies involving adult (>16 years) no-trauma OHCA patients with clear comparisons between the Bicarbonate group and Control group. All studies reported our primary outcome of short-term survival rate included ROSC and survival to emergency department or hospital admission or secondary outcome of long-term survival rate included survival at hospital discharge and good neurologic survival at 1 month. Results were expressed as odds ratio (OR) with accompanying 95% confidence interval (CI). To reduce bias, we performed a subgroup analysis of RCTs and PSM cohort studies. Also, we performed sensitivity analysis to resolve the heterogeneity. RESULTS: Six studies (3 RCTs and 3 PSMs) comprising 21,402 patients were included. The primary outcome of this meta-analysis showed that short-term survival rate between the two groups was no difference (OR = 1.04; 95% CI, 0.98 to 1.12; P = 0.21; $\chi 2$ = 6.68; I2 = 25%). Secondary outcome demonstrated that long - term survival rate between the two groups was no difference (OR = 0.82; 95% CI, 0.50 to 1.34; P = 0.43; $\chi 2$ = 14.96; I2 = 80%). A sensitive analysis was performed by removing one study showed long-term survival rate of the Bicarbonate group was lower than that of the Control group. CONCLUSIONS: In patients with OHCA, sodium bicarbonate administration was associated neither with short-term survival rate nor with long-term survival rate, it may even worsen the long-term survival.

TRAUMA

No articles identified.

VENTILATION

No articles identified.

CERERBRAL MONITORING

1. BMC Anesthesiol. 2023 Aug 24;23(1):289. doi: 10.1186/s12871-023-02251-5.

The development and validation of a nomogram to determine neurological outcomes in cardiac arrest patients.

Zhang X(#)(1), Zheng X(#)(2), Dai Z(1), Zheng H(3).

ABSTRACT

OBJECTIVES: This study aimed to investigate the variables that influence neurological functional restoration in cardiac arrest patients and construct a nomogram to predict neurofunctional prognosis. PATIENTS AND METHODS: We extracted the data from the Dryad database. Associations between patient variables and neurological outcomes were examined by logistic regression models. On the basis of these predictors, a prognostic nomogram was constructed. The identification and calibration of the prognostic nomogram were evaluated through the receiver operating characteristic (ROC) curve, the calibration curve, and the concordance index (C-index). RESULTS: A total of 374 cardiac arrest individuals were recruited in the research. Sixty percent of the participants had an adverse neurological result. The multivariable logistic regression analysis for poor neurological recovery, which showed patient age ≥ 65 years, previous neurological disease,

witnessed arrest, bystander cardio-pulmonary resuscitation (CPR), cardiac arrest presenting with a non-shockable rhythm, total epinephrine dose ≥ 2.5 mg at the time of resuscitation and acute kidney injury(AKI) remained independent predictors for neurological outcomes. CONCLUSIONS: The novel nomogram based on clinical characteristics is an efficient tool to predict neurological outcomes in cardiac arrest patients, which may help clinicians identifying high-risk patients and tailoring personalized treatment regimens.

ULTRASOUND AND CPR

No articles identified.

ORGANISATION AND TRAINING

1. Resuscitation. 2023 Aug 23:109939. doi: 10.1016/j.resuscitation.2023.109939. Online ahead of print.

Association of CPR Simulation Program Characteristics with Simulated and Actual Performance during Paediatric In-Hospital Cardiac Arrest.

Cashen K(1), Sutton RM(2), Reeder RW(3), Ahmed T(4), Bell MJ(5), Berg RA(2), Bishop R(6), Bochkoris M(7), Burns C(8), Carcillo JA(7), Carpenter TC(6), Wesley Diddle J(5), Federman M(9), Fink EL(7), Franzon D(10), Frazier AH(11), Friess SH(12), Graham K(2), Hall M(13), Hehir DA(2), Horvat CM(7), Huard LL(9), Maa T(13), Manga A(12), McQuillen PS(10), Morgan RW(2), Mourani PM(14), Nadkarni VM(2), Naim MY(2), Notterman D(15), Palmer CA(3), Pollack MM(5), Sapru A(9), Schneiter C(6), Sharron MP(5), Srivastava N(9), Viteri S(11), Wolfe HA(2), Yates AR(13), Zuppa AF(2), Meert KL(16).

ABSTRACT

AIM: To evaluate associations between characteristics of simulated point-of-care cardiopulmonary resuscitation (CPR) training with simulated and actual intensive care unit (ICU) CPR performance, and with outcomes of children after in-hospital cardiac arrest. METHODS: This is a pre-specified secondary analysis of the ICU-RESUScitation Project; a prospective, multicentre cluster randomized interventional trial conducted in 18 ICUs from October 2016-March 2021. Point-of-care bedside simulations with real-time feedback to allow multidisciplinary ICU staff to practice CPR on a portable manikin were performed and quality metrics (rate, depth, release velocity, chest compression fraction) were recorded. Actual CPR performance was recorded for children 37 weeks post-conceptual age to 18 years who received chest compressions of any duration, and included intra-arrest haemodynamics and CPR mechanics. Outcomes included survival to hospital discharge with favourable neurologic status. RESULTS: Overall, 18,912 point-of-care simulations were included. Simulation characteristics associated with both simulation and actual performance included site, participant discipline, and timing of simulation training. Simulation characteristics were not associated with survival with favourable neurologic outcome. However, participants in the top 3 sites for improvement in survival with favourable neurologic outcome were more likely to have participated in a simulation in the past month, on a weekday day, to be nurses, and to achieve targeted depth of compression and chest compression fraction goals during simulations than the bottom 3 sites. CONCLUSIONS: Point-of-care simulation characteristics were associated with both simulated and actual CPR performance. More recent simulation, increased nursing participation, and simulation training during daytime hours may improve CPR performance.

2. Clin Exp Emerg Med. 2023 Aug 25. doi: 10.15441/ceem.23.049. Online ahead of print.

An expert consensus-based checklist for quality appraisal of educational resources on adult Basic Life Support: a Delphi study.

Birkun AA(1), Gautam A(2), Böttiger BW(3); Delphi study investigators(4).

ABSTRACT

OBJECTIVE: Considering the lack of a unified tool for appraisal of quality of educational resources on lay rescuer adult Basic Life Support (BLS), this study aimed to develop corresponding evaluation checklist based on international expert consensus. METHODS: In a two-round Delphi study, participating experts completed questionnaires to rate each item of the pre-developed 72-item checklist indicating a level of agreement that an item should be utilized for evaluating conformance of an adult BLS educational resource with resuscitation guidelines. Consensus for item inclusion was defined as the rating of ≥7 points received from ≥75% of experts. Experts were encouraged to add anonymous suggestions for modifying or adding new items. RESULTS: Of the 46 participants, 42 (91.3%) completed the first round (representatives of 25 countries with a median of 16 years of professional experience in resuscitation) and 40 (87.0%) completed the second round. Thirteen of 72 baseline items were excluded, 55 were included unchanged, four were modified. Besides, four new items were added. The final checklist comprises 63 items under the subsections "Safety" (1 item), "Recognition" (9), "Call for help" (4), "Chest compressions" (12), "Rescue breathing" (12), "Defibrillation" (9), "Continuation of CPR" (2), "Choking" (10) and "Miscellaneous" (4). CONCLUSIONS: The produced checklist represents the ready-to-use expert consensus-based tool for appraisal of quality of educational content on lay rescuer adult BLS. The checklist is suggested for the content developers to ensure compliance of educational resources with current resuscitation knowledge, and may serve as a constituent element of a prospective standardized international framework for quality assurance in resuscitation education.

3. Clin Exp Emerg Med. 2023 Aug 25. doi: 10.15441/ceem.23.102. Online ahead of print.

Expert opinion on evidence after 2020 Korean cardiopulmonary resuscitation guidelines.

Chung SP(1), Sohn Y(2), Lee J(3), Cho Y(2), Cha KC(4), Heo JS(5)(6), Kim AE(7), Kim JG(8), Kim HS(9), Shin H(10), Ahn C(11), Woo HG(12), Lee BK(13), Jang YS(8), Choi YH(14), Hwang SO(4); Guideline Committee of Korean Association of Cardiopulmonary Resuscitation (KACPR).

ABSTRACT

Considerable evidence has been published since the 2020 Korean cardiopulmonary resuscitation (CPR) guidelines. The International Liaison Committee on Resuscitation (ILCOR) publishes the Consensus on CPR and Emergency Cardiovascular Care Science with Treatment Recommendations (CoSTR) summary annually. This review provides expert opinions by reviewing the recent evidence on CPR and ILCOR treatment recommendations. The authors reviewed the CoSTR summary published by ILCOR in 2021 and 2022. PICO (population, intervention, comparator, outcome) questions for each topic were reviewed using a systemic or scoping review methodology. Two experts were appointed for each question and reviewed the topic independently. Topics suggested by the reviewers for revision or additional description of the guidelines were discussed at a consensus conference. Forty-three questions were reviewed, including 15 on basic life support, seven on advanced life support, two on pediatric life support, 11 on neonatal life support, six on education, and teams, one on first aid, and one related to coronavirus disease 2019. Finally, the Guidelines Committee decided to maintain the current guidelines for 28 topics without change and suggested expert opinions on 15 topics.

4. Arch Acad Emerg Med. 2023 Jul 11;11(1):e47. doi: 10.22037/aaem.v11i1.1975. eCollection 2023.

Basic Life Support (BLS) Knowledge Among General Population; a Multinational Study in Nine Arab Countries.

Shaheen N(1), Shaheen A(1), Diab RA(2)(3), Mohmmed A(1), Ramadan A(4), Swed S(5), Wael M(6), Kundu M(7), Soliman S(8), Elmasry M(1), Shoib S(9)(10)(11)(12).

ABSTRACT

INTRODUCTION: Basic Life Support (BLS) is a medical treatment used in life-threatening emergencies until the sufferer can be properly cared for by a team of paramedics or in a hospital. This study aimed to assess the level of knowledge regarding BLS and the contributing factors among the Arab non-medical population. METHODS: An online survey-based cross-sectional study was conducted among non-medical populations in nine Arab countries between April 13, 2022, and June 30, 2022. The utilized questionnaire consisted of two parts: part one included socio-demographic characteristics and part two measured knowledge of BLS through an online survey. RESULTS: The research included a total of 4465 participants. 2540 (56.89%) of the participants were knowledgeable about BLS. The mean basic life support knowledge scores of participants who received training were higher than those who had not (20.11 ± 4.20 vs. 16.96 ± 5.27; p< 0.01). According to the nations, Yemen scored the highest, while Morocco had the lowest levels of BLS knowledge (19.86 ± 4.71 vs. 14.15 ± 5.10, respectively; p< 0.01). Additionally, individuals who resided in urban areas scored on average higher than those who did in rural areas (17.86 ± 5.19 vs. 17.13 ± 5.24, p= 0.032) in understanding basic life support. Age, information sources, and previous training with theoretical and practical classes were significant predictors of BLS knowledge. CONCLUSION: The level of BLS knowledge among non-medical people in Arab nations is moderate but insufficient to handle the urgent crises that we face everywhere. In addition to physicians being required to learn the BLS principles, non-medical people should also be knowledgeable of the necessary actions to take in emergency events.

5. Nurs Open. 2023 Aug 22. doi: 10.1002/nop2.1974. Online ahead of print.

Nurses' experiences of provision family-centred care in the postresuscitation period: A qualitative study.

Zali M(1), Rahmani A(2), Powers K(3), Hassankhani H(1), Namdar-Areshtanab H(4), Gilani N(5).

ABSTRACT

AIM: This study aimed to explore nurses' experiences of providing family-centred care in the postresuscitation period. DESIGN: An exploratory-descriptive qualitative design was used. METHODS: In this qualitative study, in-depth, semi-structured interviews were conducted with 22 nurses in three educational hospitals. There were six participants who completed follow-up interviews to resolve questions generated during initial interviews. Data were analysed using conventional content analysis. RESULTS: Five main categories were extracted: continuous monitoring, facilitation of attendance, involvement in care, informing and emotional support. Despite the lack of organizational policies and guidelines, nurses explained how they work to provide family-centred care for families, especially those they assessed as having less possibility of aggressive behaviour and those with a better understanding of their loved one's condition. To provide postresuscitation family-centred care, nurses facilitated family attendance, involved them in some basic nursing care, and provided information and emotional support to the family members. CONCLUSION: Nurses attempted to follow the basic principles of family-centred care in the postresuscitation period. However, to improve the provision of care by nurses, it is necessary to embed family-centred care principles in institutional policies and guidelines and to conduct training for nurses. IMPLICATIONS FOR THE PROFESSION: Iranian nurses are interested in engaged families in the postresuscitation period. Correct implementations of such care that include all families need institutional policies and guidelines.

6. Eur Rev Med Pharmacol Sci. 2023 Aug;27(15):7081-7091. doi: 10.26355/eurrev_202308_33281.

Evaluation of the self-assessment knowledge regarding cardiopulmonary resuscitation in medical students at the University of Belgrade.

Milenkovic M(1), Tesic M, Hadzibegovic A, Palibrk I, Djukanovic M, Rovic I, Sijan D, Stanisavljevic J, Tvrtkovic M, Petrovic K, Jovanovic V, Stevanovic P.

ABSTRACT

OBJECTIVE: Cardiopulmonary resuscitation (CPR) is a vital skill that can improve the outcome of patients with sudden cardiac arrest. To raise awareness about CPR some countries have introduced an obligatory First Aid Course (FAC), usually done parallelly to a driver's license (DL). While expected of doctors to know CPR, the curriculum of some medical schools does not seem to have enforced measures to improve that knowledge. The aim was to have students self-evaluate their current knowledge of CPR, comparing it before university and whether it improved during their studies. SUBJECTS AND METHODS: A cross-sectional study was conducted in October 2020 using an anonymous questionnaire among students at the Faculty of Medicine in Belgrade (studies in English). RESULTS: A total of 172 (66.7%) students possessed a DL, of which 39.8% felt they were ready, 45.8% felt neutral, and 14.4% felt unable to perform CPR. The total number of students that completed a FAC during their studies was 165. Analysis was performed on the ability assessment data after the first FAC during studies, comparing it to FAC for DL and assessments at the end of studies. No statistically significant difference was observed in the level of self-reported ability to perform CPR, while a statistically significant difference was found in ability assessments when comparing only the FAC for the DL, and the one after the first FAC during medical studies, with students feeling more prepared after the FAC for DL. Across the sample, 90.2% of the students wished they had more CPR training during their medical studies. CONCLUSIONS: From this study, it may conclude that students wish and need more CPR training in their curriculum.

7. Intern Emerg Med. 2023 Aug 21. doi: 10.1007/s11739-023-03399-1. Online ahead of print.

Performance of an artificial intelligence-based chatbot when acting as EMS dispatcher in a cardiac arrest scenario.

Birkun A(1).

NO ABSTRACT AVAILABLE

8. Resusc Plus. 2023 Aug 14;15:100436. doi: 10.1016/j.resplu.2023.100436. eCollection 2023 Sep.

Bilingual resuscitation training does not affect adherence to resuscitation guidelines but reduces leadership skills and overall team performance. An observational study with cross-border German-Polish training.

Ruebsam ML(1), Metelmann B(1), Hofmann C(1), Orsson D(1), Hahnenkamp K(1), Metelmann C(1).

ABSTRACT

AIM OF STUDY: This study aims to investigate feasibility and quality of a bilingual cardiopulmonary resuscitation training with interprofessional emergency teams from Germany and Poland. METHODS: As part of a cross-border European Territorial Cooperation (Interreg-VA) funded project a combined communication and simulation training was organised. Teams of German and Polish emergency medicine personnel jointly practised resuscitation. The course was held in both languages with consecutive translation. Quality of chest compression was assessed using a simulator with feedback application. Learning objectives (quality of cardiopulmonary resuscitation, adherence to guidelines, closed loop communication), and team performance were assessed by an external observer. Coopeŕs Team Emergency Assessment Measure questionnaire was used. RESULTS: Twenty-one scenarios with 17 participants were analysed. In all scenarios, defibrillation and medication were delivered with correct dosage and at the right time. Mean fraction of correct hand position was 85.7% ± 25.7 [95%-CI 74.0; 97.4], mean fraction of compression depth 75.1% ± 21.0

[95%-CI 65.6; 84.7], compression rate 117.7 min-1 ± 7.1 [95%-CI 114.4; 120.9], and chest compression fraction 83.3% ± 3.8 [95%-CI 81.6; 85.0].Quality of cardiopulmonary resuscitation was rated as "fair" to "good", adherence to guidelines as "good", and closed loop communication as "fair". Bilingual teams demonstrated good situational awareness, but lack of leadership and suboptimal overall team performance. CONCLUSION: Bilingual and interprofessional cross-border resuscitation training in German and Polish tandem teams is feasible. It does not affect quality of technical skills such as high-quality chest compression but does affect performance of non-technical skills (e.g. closed loop communication and leadership).

9. Resusc Plus. 2023 Aug 9;15:100438. doi: 10.1016/j.resplu.2023.100438. eCollection 2023 Sep.
Association between bystander intervention and emergency medical services and the return of spontaneous circulation in out-of-hospital cardiac arrests occurring at a train station in the Tokyo metropolitan area: A retrospective cohort study.
Miyako J(1), Nakagawa K(2), Sagisaka R(1)(2)(3)(4), Tanaka S(1), Takeuchi H(2), Takyu H(2), Tanaka H(1)(2).
ABSTRACT
AIM: The purpose of this study was to stratify patients who achieved return of spontaneous circulation (ROSC) after out-of-hospital cardiac arrest (OHCA) with bystander procedures pre-emergency medical service (EMS) arrival and those who achieved ROSC with procedures post-EMS arrival, compare outcomes at 1-month, and identify factors associated with pre-EMS-arrival-ROSC. METHODS: A retrospective cohort analysis of OHCAs occurring at stations in the Tokyo metropolitan area between 2014 and 2018 was conducted. Subjects were stratified by ROSC phase (categorized as pre- and post-EMS arrival and non-ROSC). Survival at 1-month post-OHCA and the percentage of favourable neurological function in each ROSC phase were analysed. In addition, factors associated with Pre-EMS-arrival-ROSC were identified using multivariable logistic regression analysis. The time of occurrence of OHCA was classified into four-time categories as follows. Rush hour on morning [7:00-9:00], Rush hour on evening [17:00-21:00], Daytime [9:00-17:00], and Night or Early morning [21:00-7:00]. RESULTS: Among the 63,089 OHCA in the dataset, 702 were analysed. At 1-month after OHCA occurrence, Pre-EMS-arrival ROSC had higher survival rates than post-EMS-arrival ROSC (86.8% vs. 54.1%) and CPC1-2 rates (73.6% vs. 38.5%). Pre-EMS-arrival ROSC was associated (adjusted odds ratio [95% confidence interval]) with non-older-adult patients (1.59 [1.05-2.43]), witnessed OHCA (1.82 [1.03-3.31]), evening rush-hour (17:00-21:00; 2.08 [1.05-4.11]), conventional CPR (33.42 [7.82-868.44]), hands-only CPR (17.06 [4.30-436.48]), bystander defibrillation performed once (3.31 [1.59-6.99]). CONCLUSIONS: In an OHCA at a station in Tokyo, ROSC achieved with bystander treatment alone had a better outcome at 1-month compared to ROSC with EMS intervention.

10. Heliyon. 2023 Aug 6;9(8):e18970. doi: 10.1016/j.heliyon.2023.e18970. eCollection 2023 Aug.
Physiological effects of N95 respirators on rescuers during cardiopulmonary resuscitation.
Yang SC(1), Lee CW(2).
ABSTRACT
OBJECTIVES: There is a lack of evidence in the medical literature reporting the physiological stress imposed by the wearing of N95 respirators during cardiopulmonary resuscitation (CPR) in healthcare providers. The aim of this study is to monitor the changes in hemodynamics and blood gas profiles in rescuers during the performance of CPR while wearing N95 respirators. METHODS: Thirty-two healthy healthcare workers performed standard CPR on manikins, each participant conducted 2 min of chest compression followed by 2 min of rest for 3 cycles. A non-invasive blood gas measuring device via a fingertip detector was used to collect arterial blood gas and hemodynamic data. Student

t-test was used for comparison of various physiologic parameters before and after each session of chest compression. RESULTS: There were no significant differences in arterial blood gas profiles including partial pressure of arterial carbon dioxide and partial pressure of arterial oxygen before and after each session of chest compression ($p > 0.05$ for all). Heart rate and cardiac output were significantly higher after CPR ($p < 0.05$ for all), but no significant changes were found on blood pressure. CONCLUSIONS: Our data suggest that healthcare providers wearing N95 respirators during provision of CPR in a short period of time does not cause any significant abnormalities in blood gas profiles and blood pressure. This may provide evidence to reassure the safe use of N95 respirator during performance of CPR.

11. Health Sci Rep. 2023 Aug 17;6(8):e1493. doi: 10.1002/hsr2.1493. eCollection 2023 Aug.
Investigating the outcomes of cardiopulmonary resuscitation and factors affecting it: A cross-sectional study at Dr. Moaven Hospital, Sahneh City from 2014 to 2021.
Ziapour A(1), Hatami Garosi V(2), Tamri Y(3), Ghazvineh S(3), Azizi A(4).
ABSTRACT
BACKGROUND AND AIMS: Cardiopulmonary resuscitation (CPR) is referred to an attempt to maintain the respiratory system and blood circulation active to oxygenate the body's important organs until the heart and blood circulation system return to normal. CPR results are influenced by a variety of circumstances and factors. The purpose of this study was to look into the outcomes of CPR and the factors that influence them at the Dr. Moaven Hospital in Sahneh. METHODS: This cross-sectional descriptive study was carried out retrospectively from the start of 2014 to the start of 2021. Kermanshah University of Medical Sciences provides hospitals with a two-page form for data collection. After entering the data into SPSS24, descriptive and inferential statistical tests were applied to analyze the results. RESULTS: Out of 497 patients who referred to Dr. Moaven Hospital in Sahne City, 280 were men and 217 were women, with a resuscitation success rate of 22.5% in men and 23.5% in women. CPR was conducted on 63.2% of patients in the emergency department, with 22.2% of them having successful CPR. The existence of the underlying disease had a statistically significant link with the outcomes of CPR ($p = 0.007$). The most prevalent cause for visit was cardiorespiratory arrest (30.6%), and there was no statistically significant difference between the diagnostic and reason for visit and the outcome of resuscitation, according to the χ 2 test. CONCLUSION: According to the findings of this study, increasing age and duration of CPR, the existence of underlying diseases, and the absence of shockable rhythms all reduce the likelihood of success in CPR.

12. J Pers Med. 2023 Jul 26;13(8):1191. doi: 10.3390/jpm13081191.
Characteristics and Treatment Outcomes of Out-of-Hospital Cardiac Arrests Occurring in Public Places: A National Population-Based Observational Study.
Oh YT(1), Ahn C(2).
ABSTRACT
Sudden cardiac arrest, particularly out-of-hospital cardiac arrest (OHCA), is a global public health concern. However, limited research exists on the epidemiology of OHCAs occurring in public places, trends and impact of bystander intervention, and influence of extraordinary circumstances. This study investigated the epidemiological factors, bystander characteristics, and outcomes of OHCAs that occurred in public places in South Korea from 2016 to 2021 and analyzed the impact of the coronavirus disease 2019 (COVID-19) pandemic. A retrospective analysis was conducted using an Out-of-Hospital Cardiac Arrest Surveillance database, including 33,206 cases of OHCA that occurred in public places. Cases with do-not-resuscitate orders or insufficient data were excluded. A steady increase in bystander-performed cardiopulmonary resuscitation over the years and a constant

decrease in bystander automated external defibrillator (AED) use were observed. Survival-to-discharge rates for OHCAs remained relatively steady until a marginal decrease was observed during the pandemic (pandemic, 13.1%; pre-pandemic, 14.4%). Factors affecting survival included the presence of a shockable rhythm, witnessed arrest, cardiac arrest due to disease, use of bystander AED, and period relative to the COVID-19 pandemic. These findings emphasize the critical role of bystanders in outcomes of OHCAs and inform public health strategies on better management of OHCAs in public places.

13. Resuscitation. 2023 Aug 23:109943. doi: 10.1016/j.resuscitation.2023.109943. Online ahead of print.

Comparing strategies for prehospital transport to specialty care after cardiac arrest.

Elmer J(1), Dougherty M(2), Guyette FX(3), Martin-Gill C(3), Drake CD(4), Callaway CW(3), Wallace DJ(5).

ABSTRACT

Outcomes are better when patients resuscitated from out-of-hospital cardiac arrest (OHCA) are treated at specialty centers. The best strategy to transport patients from the scene of resuscitation to specialty care is unknown. METHODS: We performed a retrospective cohort study. We identified patients treated at a single specialty center after OHCA from 2010 to 2021 and used OHCA geolocations to develop a catchment area using a convex hull. Within this area, we identified short term acute care hospitals, OHCA receiving centers, adult population by census block group, and helicopter landing zones. We determined population-level times to specialty care via: 1) direct ground transport; 2) transport to the nearest hospital followed by air interfacility transfer; and 3) ground transport to air ambulance. We used an instrumental variable (IV) adjusted probit regression to estimate the causal effect of transport strategy on functionally favorable survival to hospital discharge. RESULTS: Direct transport to specialty care by ground to air ambulance had the shortest population-level times from OHCA to specialty care (median 56 [IQR 47 - 66] minutes). There were 1,861 patients included in IV regression of whom 395 (21%) had functionally favorable survival. Most (n=1,221, 66%) were transported to the nearest hospital by ground EMS then to specialty care by air. Patient outcomes did not differ across transport strategies in our IV analysis. DISCUSSION: We did not find strong evidence in favor of a particular strategy for transport to specialty care after OHCA. Population level time to specialty care was shortest with ground ambulance transport to the nearest helicopter landing zone.

14. J Pers Med. 2023 Aug 16;13(8):1265. doi: 10.3390/jpm13081265.

The Influence of Cardiac Arrest Floor-Level Location within a Building on Survival Outcomes.

Ahn C(1), Oh YT(2), Park Y(3)(4), Kim JH(1), Hwang S(1), Won M(1).

ABSTRACT

This nationwide, population-based observational study investigated the association between the floor level of out-of-hospital cardiac arrest (OHCA) incidence and survival outcomes in South Korea, notable for its significant high-rise apartment living. Data were collected retrospectively from OHCA patients through the South Korean Out-of-Hospital Cardiac Arrest Surveillance database. The study incorporated cases that included the OHCA's building floor information. The primary outcome assessed was survival to discharge, analyzed using multivariate logistic regression, and the secondary outcome was favorable neurological outcome. Among 36,977 patients, a total of 29,729 patients were included, and 1680 patients were survivors. A weak yet significant correlation between floor level and hospital arrival time was observed. Interestingly, elevated survival rates were noted among patients from higher floors despite extended emergency medical service response times. Multivariate analysis identified age, witnessed OHCA, shockable rhythm, and prehospital return of

spontaneous circulation (ROSC) as primary determinants of survival to discharge. The floor level's impact on survival was less substantial than anticipated, suggesting residential emergency response enhancements should prioritize witness interventions, shockable rhythm management, and prehospital ROSC rates. The study underscores the importance of bespoke emergency response strategies in high-rise buildings, particularly in urban areas, and the potential of digital technologies to optimize response times and survival outcomes.

15. Children (Basel). 2023 Aug 4;10(8):1348. doi: 10.3390/children10081348.
Trained Lifeguards Performing Pediatric Cardiopulmonary Resuscitation While Running: A Pilot Simulation Study.
Santos-Folgar M(1)(2)(3), Rodriguez-Nunez A(4)(5)(6)(7)(8), Barcala-Furelos R(1)(4)(5)(8), Otero-Agra M(1)(2), Martínez-Isasi S(4)(5)(6)(8), Fernández-Méndez F(1)(2)(4).
ABSTRACT
The aim of this study was to compare the quality of standard infant CPR with CPR in motion (i.e., walking and running) via performing maneuvers and evacuating the infant from a beach. Thirteen trained lifeguards participated in a randomized crossover study. Each rescuer individually performed three tests of 2 min each. Five rescue breaths and cycles of 30 chest compressions followed by two breaths were performed. Mouth-to-mouth-and-nose ventilation was carried out, and chest compressions were performed using the two-fingers technique. The manikin was carried on the rescuer's forearm with the head in the distal position. The analysis variables included compression, ventilation, and CPR quality variables, as well as physiological and effort parameters. Significantly lower compression quality values were obtained in running CPR versus standard CPR (53% ± 14% versus 63% ± 15%; p = 0.045). No significant differences were observed in ventilation or CPR quality. In conclusion, lifeguards in good physical condition can perform simulated infant CPR of a similar quality to that of CPR carried out on a victim who is lying down in a fixed position.

POST-CARDIAC ARREST TREATMENTS

1. J Cardiovasc Med (Hagerstown). 2023 Sep 1;24(9):637-641. doi: 10.2459/ JCM. 0000000000001510.
Urgent coronary angiography in out-of-hospital cardiac arrest: a retrospective single centre investigation.
Caniato F(1), Lazzeri C(2), Bonizzoli M(2), Mattesini A(1), Batacchi S(2), Cappelli F(1), Di Mario C(1), Peris A(2).
ABSTRACT
AIMS: The role of immediate coronary angiography (CAG) with percutaneous coronary intervention (PCI) in patients who present with ST-segment elevation myocardial infarction (STEMI) and cardiac arrest is well recognized. However, the role of immediate angiography in patients after cardiac arrest without STEMI is less clear. We assessed whether urgent (<6 h) CAG and PCI (whenever needed) was associated with improved early survival in out-of-hospital cardiac arrest (OHCA). METHODS: In our single-centre, retrospective, observational study, we included all consecutive OHCA patients admitted to the A&E of the Careggi University Hospital between 1 June 2016 and 31 July 2020. One hundred and forty-four OHCA patients were submitted to CAG and constituted our study population. RESULTS: Among the 221 consecutive OHCA patients, 69 (31%) had refractory cardiac arrest treated with extracorporeal cardiopulmonary resuscitation (eCPR) in 37 (37/69, 56%) patients. The mortality rate was significantly higher in the no CAG subgroup (P < 0.00001). In the CAG subgroup, coronary artery disease was detected in the 70% (92 patients), among whom the left main coronary artery was involved in 10 patients (10.8%). At multivariable regression analysis (CAG subgroup, outcome ICU survival), witnessed cardiac arrest was independently associated with survival. CONCLUSION: A

high incidence of coronary artery disease was observed at CAG in the real-world of OHCA patients. Better planning of revascularization and treatment in patients studied with CAG may explain, at least in part, their lower mortality rate.

2. Neth Heart J. 2023 Aug 24. doi: 10.1007/s12471-023-01807-x. Online ahead of print.
The value of computed tomography for head trauma in patients presenting with out-of-hospital cardiac arrest before emergency percutaneous coronary intervention.
Bosch L(1), Rittersma SZH(2), van der Worp BH(3), Kraaijeveld AO(2), Vlachojannis G(2), van der Harst P(2), Voskuil M(2).
ABSTRACT
INTRODUCTION: Out-of-hospital cardiac arrest (OHCA) caused by an ST-elevation myocardial infarction (STEMI) is often accompanied by a sudden loss of consciousness that may cause the patient to collapse with resulting head trauma, leading to a suspicion of possible intracranial haemorrhage. To rule out intracranial haemorrhage before emergency percutaneous coronary intervention (PCI), emergency computed tomography (CT) of the head might be useful but also causes a delay in percutaneous STEMI treatment. METHODS: The medical records of all adult patients that presented with OHCA to the emergency department (ED) of the University Medical Centre Utrecht (UMCU), the Netherlands between 16 February 2020 and 16 February 2022 were reviewed. RESULTS: A total of 263 patients presented to the ED with an OHCA; 50 presented with a STEMI requiring emergency PCI. Thirty-nine (78%) patients with a STEMI were immediately referred to the catheterisation laboratory and 11 (22%) STEMI patients underwent a CT scan prior to emergency angiography; in no case was PCI deferred on the basis of the CT findings. The dominant indication for CT of the head was collapse, reported by 10 patients and resulting in a visible traumatic head injury in 7 patients. In none of the patients was intracranial haemorrhage detected. However, there was a delay between presentation to the ED and arrival at the catheterisation laboratory in patients who underwent CT of the head (mean 63 ± 25 min) before emergency PCI compared to patients without a CT scan (mean 37 ± 21 min). CONCLUSION: CT of the head did not result in a diagnosis of intracranial haemorrhage or deferral of PCI but did delay PCI treatment for STEMI in patients presenting with OHCA.

3. JACC Cardiovasc Interv. 2023 Aug 9:S1936-8798(23)01154-8. doi: 10.1016/j.jcin.2023.08.010. Online ahead of print.
MIRACLE2 Score Compared with Downtime and Current Selection Criterion for Invasive Cardiovascular Therapies after Out-of-Hospital-Cardiac Arrest.
Aldous R(1), Roy R(1), Cannata A(2), Abdrazak M(2), Mohanan S(3), Beckley-Hoelscher N(3), Stahl D(3), Kanyal R(4), Kordis P(5), Sunderland N(6), Parczewska A(7), Kirresh A(8), Nevett J(9), Fothergill R(9), Webb I(2), Dworakowski R(2), Melikian N(2), Kalra S(8), Johnson TW(6), Sinagra G(10), Rakar S(10), Noc M(5), Patel S(11), Auzinger G(11), Gruchala M(7), Shah AM(2), Byrne J(2), MacCarthy P(2), Pareek N(12).
ABSTRACT
OBJECTIVE/BACKGROUND: We compared the discrimination performance of the MIRACLE2 score, downtime and current randomized control trial (RCT) recruitment criteria in predicting poor neurological outcome after out-of-hospital cardiac arrest (OHCA). METHODS: We used the European Cardiac Arrest Registry (EUCAR), a retrospective cohort from 6 centres (May 2012-September 2022). The primary outcome was poor neurological outcome on hospital discharge (Cerebral Performance Category 3-5). RESULTS: 1259 patients (total downtime 25, IQR 15-36 minutes) were included in the study. Poor outcome occurred in 41.8% with downtime <30 minutes, and in 79.3% for those >30 minutes. In a multivariable logistic regression analysis, MIRACLE2 had a stronger association with outcome (OR 2.23 [CI 1.98-2.51] p<0.0001) than zero-flow (OR 1.07 [CI 1.01-1.13], p=0.013), low-flow (OR 1.04 [CI 0.99-1.09], p=0.054) and total downtime (OR 0.99 [CI 0.95-1.03], p=0.52). MIRACLE2 had substantially superior discrimination for the primary end-point [AUC 0.877 (95% CI

0.854 to 0.897)] than zero-flow [AUC 0.610 (95% CI 0.577-0.642)], low-flow [AUC 0.725 (95% CI 0.695-0.754)] and total downtime [AUC 0.732 (95% CI 0.701-0.760)]. For those modelled for exclusion from study recruitment, the positive predictive value of MIRACLE2 ≥5 for poor outcome was significantly higher (0.92) than CULPRIT-SHOCK (0.80), EUROSHOCK (0.74) and ECLS-SHOCK criteria (0.81) ($p<0.001$). CONCLUSIONS: The MIRACLE2 score has superior prediction of outcome after OHCA than downtime and higher discrimination of poor outcome than current RCT recruitment criteria. The potential for the MIRACLE2 score to improve selection of OHCA patients should be evaluated formally in future RCTs.

TARGETED TEMPERATURE MANAGEMENT

1. Dtsch Med Wochenschr. 2023 Sep;148(17):1113-1117. doi: 10.1055/a-1940-0405. Epub 2023 Aug 23.

[Targeted temperature management after cardiac arrest].

[Article in German; Abstract available in German from the publisher]

Finkbeiner S(1), Fink K(1), Busch HJ(1).

ABSTRACT

Actively avoiding fever is the only possibility to improve neurological outcome after cardiac arrest. It is uncertain if and which patients benefit from a lower target temperature. The ERC Guidelines in 2021 recommended targeted temperature management (TTM) for all patients after in- and out-of-hospital cardiac arrest with a target temperature of 32-36 °C for at least 24 hours. These recommendations were updated in 2022 by the ERC/ESICM Guidelines suggesting to avoid fever only within the first 72 hours after the event. Divergent results of recent trials lead to these guideline changes. The large TTM2 Trial in 2021 did not show a benefit neither in survival nor in neurological outcome in the group of hypothermia at 33°C compared to normothermia. Although leading to the updated guidelines, applying these study results to the German population is restricted as the rate of bystander cardiopulmonary resuscitation (CPR) or shockable rhythms is much lower in Germany. Further studies are needed to allow a better differentiation of subpopulations and to implement a more individual classification und therapy.

2. Crit Care. 2023 Aug 26;27(1):328. doi: 10.1186/s13054-023-04617-0.

Neuropsychological outcome after cardiac arrest: results from a sub-study of the targeted hypothermia versus targeted normothermia after out-of-hospital cardiac arrest (TTM2) trial.

Blennow Nordström E(1), Vestberg S(2), Evald L(3), Mion M(4)(5), Segerström M(6), Ullén S(7), Bro-Jeppesen J(8), Friberg H(9), Heimburg K(10), Grejs AM(11), Keeble TR(4)(5), Kirkegaard H(12), Ljung H(10), Rose S(13), Wise MP(14), Rylander C(15), Undén J(9)(16), Nielsen N(17), Cronberg T(10), Lilja G(10).

ABSTRACT

BACKGROUND: Cognitive impairment is common following out-of-hospital cardiac arrest (OHCA), but the nature of the impairment is poorly understood. Our objective was to describe cognitive impairment in OHCA survivors, with the hypothesis that OHCA survivors would perform significantly worse on neuropsychological tests of cognition than controls with acute myocardial infarction (MI). Another aim was to investigate the relationship between cognitive performance and the associated factors of emotional problems, fatigue, insomnia, and cardiovascular risk factors following OHCA. METHODS: This was a prospective case-control sub-study of The Targeted Hypothermia versus Targeted Normothermia after Out-of-Hospital Cardiac Arrest (TTM2) trial. Eight of 61 TTM2-sites in Sweden, Denmark, and the United Kingdom included adults with OHCA of presumed cardiac or unknown cause. A matched non-arrest control group with acute MI was recruited. At approximately

7 months post-event, we administered an extensive neuropsychological test battery and questionnaires on anxiety, depression, fatigue, and insomnia, and collected information on the cardiovascular risk factors hypertension and diabetes. RESULTS: Of 184 eligible OHCA survivors, 108 were included, with 92 MI controls enrolled. Amongst OHCA survivors, 29% performed z-score ≤ - 1 (at least borderline-mild impairment) in ≥ 2 cognitive domains, 14% performed z-score ≤ - 2 (major impairment) in ≥ 1 cognitive domain while 54% performed without impairment in any domain. Impairment was most pronounced in episodic memory, executive functions, and processing speed. OHCA survivors performed significantly worse than MI controls in episodic memory (mean difference, MD = - 0.37, 95% confidence intervals [- 0.61, - 0.12]), verbal (MD = - 0.34 [- 0.62, - 0.07]), and visual/constructive functions (MD = - 0.26 [- 0.47, - 0.04]) on linear regressions adjusted for educational attainment and sex. When additionally adjusting for anxiety, depression, fatigue, insomnia, hypertension, and diabetes, executive functions (MD = - 0.44 [- 0.82, - 0.06]) were also worse following OHCA. Diabetes, symptoms of anxiety, depression, and fatigue were significantly associated with worse cognitive performance. CONCLUSIONS: In our study population, cognitive impairment was generally mild following OHCA. OHCA survivors performed worse than MI controls in 3 of 6 domains. These results support current guidelines that a post-OHCA follow-up service should screen for cognitive impairment, emotional problems, and fatigue.

3. J Clin Med. 2023 Aug 14;12(16):5297. doi: 10.3390/jcm12165297.
Sex Difference on Neurological Outcomes and Post-Cardiac Arrest Care in Out-of-Hospital Cardiac Arrest Patients Treated with Targeted Temperature Management: Post-Hoc Study of a Prospective, Multicenter, Observational Cohort Study.
Park SY(1), Oh SH(2), Park SH(1), Oh JH(3), Kim SH(3); Korean Hypothermia Network Investigators.
ABSTRACT
Conflicting results regarding sex-based differences in the outcomes of out-of-hospital cardiac arrest (OHCA) patients have been reported. We aimed to evaluate the association between sex and neurological outcome as well as various in-hospital process in OHCA patients treated with targeted temperature management. We retrospectively analyzed a prospective registry data collected between October 2015 and December 2018. To evaluate the effect of sex on patient outcomes, we created various multivariable logistic regression models. When the results were adjusted using resuscitation variables and in-hospital variables, there was no significant difference (OR = 1.22, 95% CI: 0.85-1.74; OR = 1.13, 95 CI: 0.76-1.68, respectively). Regarding the in-hospital course, the daily total SOFA score was similar in both sexes, whereas cardiovascular scores were higher in women on days 2 and 3. The adjusted effect of sex was not associated with the clinician's decision to perform early cardiac interventions, except for those men that had more extracorporeal membrane oxygenation (OR = 2.51, 95% CI: 1.11-5.66). The findings seems that men had more favorable 6-month neurological outcomes. However, after adjusting for confounders, there was no difference between the sexes. The results regarding in-hospital course were similar in men and women.

ELECTROPHYSIOLOGY AND DEFIBRILLATION

1. Resuscitation. 2023 Aug 23:109941. doi: 10.1016/j.resuscitation.2023.109941. Online ahead of print.
Amplitude Spectrum Area Measured in Real-Time during Cardiopulmonary Resuscitation - How Does This Technology Work?
Ruggeri L(1), Fumagalli F(1), Merigo G(2), Magliocca A(3), Ristagno G(4).
ABSTRACT

Amplitude spectrum area (AMSA) is one of the most accurate predictors of defibrillation outcome. Details on functioning and use of the available technology to measure AMSA during cardio-pulmonary resuscitation (CPR) in the real clinical scenario are described. During chest compression (CC) pauses for ventilations, AMSA is promptly calculated and values displayed through a modified defibrillator. In addition, real-time AMSA analysis has the additional promise to monitor CPR quality, being AMSA threshold values contingent on CC depth. Future larger studies employing this new technology are now needed to demonstrate the impact of AMSA on survival of cardiac arrest.

2. Med J Aust. 2023 Aug 21;219(4):146-148. doi: 10.5694/mja2.52041. Epub 2023 Jul 30.
Defibrillator access across Australia: the first step in avoiding a chain of fatality.
Paratz E(1), Page GJ(2), Jennings GL(1)(3).
NO ABSTRACT AVAILABLE

PEDIATRICS AND CHILDREN

1. Resuscitation. 2023 Aug 23:109942. doi: 10.1016/j.resuscitation.2023.109942. Online ahead of print.
Annual patterns in the outcomes and post-arrest care for pediatric out-of-hospital cardiac arrest: a nationwide multicenter prospective registry in Japan.
Matsui S(1), Kurosawa H(2), Hayashi T(3), Takei H(3), Tanizawa N(3), Ohnishi Y(3), Murata S(3), Ohnishi M(3), Henry Yoshii T(3), Miyawaki K(3), Matsumoto T(3), Tanaka R(3), Kiyohara K(4), Zha L(5), Kitamura T(5), Sobue T(5), Nitta M(6).
ABSTRACT
AIM: Out-of-hospital cardiac arrest (OHCA) has a poor prognosis in children; however, the annual patterns of prognosis and treatment have not been fully investigated. METHODS: From the Japanese Association for Acute Medicine OHCA registry, a multicenter prospective observational registry in Japan, we identified pediatric patients (zero to 17 years old) between June 2014 and December 2019. The primary outcome was one-month survival. We investigated the annual patterns in patient characteristics, treatment, and one-month prognosis. RESULTS: During the study period, 1,188 patients were eligible for analysis. For all years, the zero-year-old group accounted for a large percentage of the total population (between 30% and 40%). There were significant increases in the rates of bystander-initiated cardiopulmonary resuscitation (CPR; from 50.6% to 62.3%, p=0.003), dispatcher instructions (from 44.7% to 65.7%, p=0.001), and adrenaline administration (from 2.4% to 6.9%, p=0.014) over time, whereas the rate of advanced airway management decreased significantly (from 17.7% to 8.8%, p=0.003). The odds ratios for one-month survival adjusted for potential resuscitation factors also did not change significantly (from 7.1% to 10.3%, adjusted odds ratio for one-year increment=0.98, confidence interval: 0.86-1.11). CONCLUSION: Despite an increase in the rate of bystander-initiated CPR and pre-hospital adrenaline administration, there was no significant change in one-month survival.

EXTRACORPOREAL LIFE SUPPORT

1. Perfusion. 2023 Aug 24:2676591231195691. doi: 10.1177/02676591231195691. Online ahead of print.
Year in review: Highlights in ECLS Innovation and Technology, Anno 2022-2023.
Vercaemst L(1).
ABSTRACT

BACKGROUND: In the field of extracorporeal life support (ECLS), the rapid influx of novel technologies and innovative techniques presents an ongoing challenge for professionals to stay informed about these advancements. To address this issue and ensure the ECLS community remains up-to-date, we have compiled a concise overview of recent technological innovations in ECLS. PURPOSE: This overview focuses primarily on academically investigated and reported advancements in the ECLS domain. It underscores the importance of transparent communication regarding technological limitations in healthcare and advocates for collaboration between medical professionals and engineers to elevate patient care. RESEARCH DESIGN: This manuscript presents a compilation of recent technological advancements in ECLS, with an emphasis on innovations that have been academically explored and documented. The research approach involves gathering information from scholarly sources, reports, and studies to provide a comprehensive overview. STUDY SAMPLE: The study sample comprises a diverse range of recent technological innovations in the field of extracorporeal life support (ECLS). These innovations span various aspects of ECLS technology and have been investigated and reported on within the academic literature. ANALYSIS: Data collection involved systematically reviewing academic literature, reports, and studies related to recent technological advancements in ECLS. The collected information was then analyzed to identify common trends, notable developments, and the impact of these innovations on patient care. RESULTS: The compilation highlights several significant technological innovations within the ECLS domain. Notable advancements include the development of new dual lumen cannulae, innovative devices for left ventricular (LV) unloading, lightweight ECMO transport systems, streamlined driving consoles to facilitate patient mobility, intricate systems for extracorporeal cardiopulmonary resuscitation (ECPR), standardized driving consoles for networking, and non-invasive circuit pressure monitoring. Some of these innovations have obtained regulatory approvals for distribution in the United States and/or authorization for the European market. CONCLUSIONS: The manuscript underscores the critical role of collaboration between clinicians, researchers, and industry in driving recent technological innovations within the ECLS field. It emphasizes the necessity of open communication about technological limitations and the potential for repurposing established technologies in novel ways. However, the resourcefulness of physicians in repurposing devices requires validation through comprehensive scientific and technical investigation. Thus, fostering broader collaboration among stakeholders is recommended to ensure the rigorous evaluation and validation of new applications for established ECLS devices.

2. Resuscitation. 2023 Aug 23:109940. doi: 10.1016/j.resuscitation.2023.109940. Online ahead of print.

Extracorporeal Membrane Oxygenation for the Treatment of Massive Pulmonary Embolism. An Analysis of the ELSO Database.

Rivers J(1), Pilcher D(2), Kim J(3), Bartos JA(4), Burrell A(5).

ABSTRACT

AIM: Extracorporeal membrane oxygenation (ECMO) may be beneficial in treatment of massive pulmonary embolus (PE), however the current evidence to guide its use is limited. We aimed to compare the incidence, characteristics, treatments, and outcomes of patients with massive PE by mode of ECMO from a large international registry. METHODS: Retrospective observational study of the Extracorporeal Life Support Organization (ELSO) database. RESULTS: A total of 821 patients underwent 833 ECMO episodes for PE. Mean age was 49 (±15) years, 408 (50.1%) were female, and 450 (54.7%) had a cardiac arrest prior to ECMO initiation. Venoarterial (VA) ECMO was the most common mode in 489 (58.7%), followed by extracorporeal cardiopulmonary resuscitation (ECPR) in 229 (27.4%) and venovenous (VV) ECMO in 85 (10.2%). The number of episodes per year increased over the study period, predominantly driven by an increase in ECPR. In-hospital mortality was the highest for ECPR 156/229 (68.1%), followed by VA ECMO 209/498 (42.7%) and VV ECMO 24/85 (28.2%) P<0.001. After controlling for univariate and clinically significant variables at the time of ECMO initiation, increasing age (OR 1.02 (1.00-1.03), lower pH (OR 0.18 (0.03-0.44), lower diastolic

blood pressure (OR 0.99 (0.97-1.00) and ECPR mode (OR 3.67 (1.46-9.230) were independently associated with in-hospital mortality. CONCLUSION: ECMO use for massive PE is increasing globally, and overall mortality rates compare favorably with other indications of ECMO. The use of ECPR and worsening metabolic status at initiation were associated with higher in-hospital mortality, suggesting delays in initiating ECMO should be avoided.

3. Zhonghua Yi Xue Za Zhi. 2023 Aug 22;103(31):2355-2360. doi: 10.3760/cma.j.cn112137-20230120-00120.
[Problems and puzzles in current extracorporeal cardiopulmonary resuscitation].
[Article in Chinese; Abstract available in Chinese from the publisher]
Guo QH(1), Zhou GJ(1).
ABSTRACT
Extracorporeal cardiopulmonary resuscitation (ECPR) refers to the use of extracorporeal membrane oxygenation (ECMO) to ensure the perfusion of important organs after the traditional cardio-pulmonary resuscitation (CCPR) has not obtained the return of spontaneous circulation (ROSC). Such cardiopulmonary resuscitation (CPR) is called ECPR. ECPR can benefit some patients with cardiac arrest, however, there are still some problems and puzzles in the implementation of ECPR, such as the implementation location of ECPR patients? Select mechanical press or manual press before ECPR start? Can ECPR be used in special patients, such as traumatic cardiac arrest (TCA), aortic dissection and immunosuppressed patients? The age limit of ECPR and the ethical issues related to ECPR. Based on the research status at home and abroad, this paper analyzes and expounds these problems, hoping to provide new ideas for the research and application of ECPR by the majority of domestic colleagues engaged in cardiopulmonary resuscitation.

4. J Cardiovasc Med (Hagerstown). 2023 Sep 1;24(9):602-603. doi: 10.2459/JCM.0000000000001535.
Overcoming limitations in out-of-hospital cardiac arrest extracorporeal cardiopulmonary resuscitation: optimizing assessment and patient selection for future clinical trials.
Lansiaux E(1), Playe V(1), Jain N(2).
NO ABSTRACT AVAILABLE

EXPERIMENTAL RESEARCH

1. J Clin Med. 2023 Aug 16;12(16):5333. doi: 10.3390/jcm12165333.
Efficacy of Cardiopulmonary Resuscitation Using Automatic Compression-Defibrillation Apparatus: An Animal Study and A Manikin-Based Simulation Study.
Jung WJ(1)(2), Roh YI(1)(2), Im H(1)(2), Lee Y(1)(2), Im D(1)(2), Cha KC(1)(2), Hwang SO(1)(2).
ABSTRACT
BACKGROUND: Chest compression and defibrillation are essential components of cardiac arrest treatment. Mechanical chest compression devices (MCCD) and automated external defibrillators (AED) are used separately in clinical practice. We developed an automated compression-defibrillation apparatus (ACDA) that performs mechanical chest compression and automated defibrillation. We investigated the performance of cardiopulmonary resuscitation (CPR) with automatic CPR (A-CPR) compared to that with MCCD and AED (conventional CPR: C-CPR). METHODS: Pigs were randomized into A-CPR or C-CPR groups: The A-CPR group received CPR+ACDA, and the C-CPR group received CPR+MCCD+AED. Hemodynamic parameters, outcomes, and time variables were measured. During a simulation study, healthcare providers performed a basic life support scenario for manikins with an ACDA, MCCD, and AED, and time variables and chest compression parameters were measured. RESULTS: The animals showed no significant in

hemodynamic effects, including aortic pressures, coronary perfusion pressure, carotid blood flow, and end-tidal CO2, and resuscitation outcomes between the two groups. In both animal and simulation studies, the time to defibrillation, time to chest compression, and hands-off time were significantly shorter in the A-CPR group than those in the C-CPR group. CONCLUSIONS: CPR using ACDA showed similar hemodynamic effects and resuscitation outcomes as CPR using AED and MCCD separately, with the advantages of a reduction in the time to compression, time to defibrillation, and hands-off time.

CASE REPORTS

1. Trauma Case Rep. 2023 Aug 16;47:100899. doi: 10.1016/j.tcr.2023.100899. eCollection 2023 Oct.
Cardiac arrest with retropharyngeal hematoma caused by minor facial injuries from a ground level fall.
Nishimura T(1), Nakatani Y(1), Suga M(1), Kikuta S(1), Tada K(1), Ishihara S(1).
ABSTRACT
BACKGROUND: Traumatic retropharyngeal hematoma followed by airway obstruction is extremely rare. In this report, we show unique images from two cases of out-of-hospital cardiac arrest due to airway obstruction caused by massive retropharyngeal hematoma after a minor facial injury. CASE PRESENTATION: Case 1: A 78-year-old man was transferred to our emergency department due to cardiac arrest. He presented with respiratory insufficiency after a ground level fall. His neck was swollen, and the attending physician performed an emergent cricothyroidotomy to secure his airway and administered intravenous adrenaline. Computed tomography revealed a massive retropharyngeal hematoma and severe hypoxic encephalopathy. Despite a temporary return of spontaneous circulation (ROSC), the patient died on the admission day.Case 2: A 68-year-old woman presented with dyspnea, prompting her family to call an ambulance. On the way to the hospital, the ambulance crew determined the patient was in cardiac arrest. The patient's history revealed a ground level fall in which she hit her face. Computed tomography revealed a massive retropharyngeal hematoma compressing her upper airway. Although ROSC was obtained, the patient died on the 12th day of hospitalization due to hypoxic encephalopathy. Extension views of cervical spine images identified angular instability without cervical bone fracture in both cases, suggesting that possible injuries of the anterior longitudinal ligament contributed to the retropharyngeal hematoma. CONCLUSIONS: Patients presenting with asphyxia after a simple ground level fall accompanied by minor facial injuries should be assessed by emergency physicians for the possibility of a retropharyngeal hematoma. In both cases presented here, unique images indicate possible injuries of the anterior longitudinal ligament.

2. Cureus. 2023 Jul 20;15(7):e42190. doi: 10.7759/cureus.42190. eCollection 2023 Jul.
Cardiac Arrest From Undiagnosed Catecholaminergic Polymorphic Ventricular Tachycardia: A Case Report.
Kuganeswaran NT(1), Smith M(1), Chan D(2).
ABSTRACT
Catecholaminergic polymorphic ventricular tachycardia (CPVT) is a rare inherited heart disease in which exercise or acute emotional stress can cause potentially fatal tachyarrhythmias. We present the case of a 16-year-old female patient with a history of unexplained palpitations and syncope who suddenly collapsed in her high school cafeteria following an impassioned debate. In cardiac arrest consisting of coarse ventricular fibrillation, she was resuscitated on-scene by the school nurse via automated external defibrillation. Months later, after substantial investigation, a diagnosis of CPVT

was reached. The patient made a full neurological recovery, and one year post-arrest, she was event-free on β-blocker therapy. This case demonstrates the importance of clinician awareness of CPVT, an unusual but treatable cause of cardiac arrest. Because catecholamine administration is directly contraindicated for patients with CPVT, resuscitative and post-arrest care are unique. These patients tend to be previously healthy, with normal resting electrocardiograms and no cardiac structural abnormalities, making diagnosis quite challenging.

3. Trauma Case Rep. 2023 Aug 10;47:100898. doi: 10.1016/j.tcr.2023.100898. eCollection 2023 Oct.
Intact survival from a blunt trauma cardiac arrest using intraoperative automated CPR.
Frascone R(1), Blee T(2), Dries D(2).

ABSTRACT

Survival following a blunt traumatic cardiac arrest is rare. Current guidelines suggest that a resuscitative thoracotomy may be performed under specific circumstances. This approach is almost always futile. Technology such as reliable point of care ultrasound and automated compression devices may allow surgeons to consider a damage control laparotomy as the initial surgical approach in blunt trauma cardiac arrest when the point of care ultrasound is positive for intraabdominal injury and there is low suspicion of an unstable intrathoracic injury. Here we present what we believe to be the first reported successful resuscitation of a patient who suffered a blunt trauma cardiac arrest utilizing an automated CPR device before and during an exploratory damage control laparotomy. Despite severe trauma this patient was discharged home, neurologically intact. We believe this case may support the use of automated CPR in the setting of blunt trauma cardiac arrest in patients, assuming the patient has a negative point of care ultrasound for intrathoracic injury, a positive point of care ultrasound for intraperitoneal hemorrhage, and is receiving vigorous blood product administration.

4. J Clin Med. 2023 Aug 16;12(16):5318. doi: 10.3390/jcm12165318.
Cardiac Arrest as an Uncommon Manifestation of Late Type A Aortic Dissection Associated with Transcatheter Aortic Valve Replacement.
Naar J(1), Vondrakova D(1), Kruger A(1), Janotka M(1), Zemanova I(2), Syrucek M(2), Neuzil P(1), Ostadal P(1).

ABSTRACT

Transcatheter aortic valve replacement (TAVR) is a minimally invasive therapeutic procedure with a consistent, linear increase in the number of implantations worldwide. Recently, TAVR has been rapidly expanding into lower-risk populations. Sporadic cases of late prosthesis-related Stanford type A dissection have been documented in self-expanding, as well as balloon-expandable TAVR valves, manifested primarily as acute aortic syndrome. We present the case of a 76-year-old male, who experienced refractory in-hospital cardiac arrest with non-shockable rhythm due to the obstruction of coronary flow caused by aortic dissection type A, with entry directly adjacent to the aortic prosthesis according to autopsy. The patient died despite the engagement of extracorporeal cardiopulmonary resuscitation. Aortic dissection developed one year after a transfemoral TAVR procedure using an Edwards SAPIEN 3 29 mm self-expanding valve. TAVR-associated late aortic dissection type A represents a rare, life-threatening condition with various clinical manifestations. The risk factors have not been well described and the differential diagnosis may be challenging. As the number of TAVR recipients and their life expectancy is increasing, we may face this complication more often in future.

5. Front Neurol. 2023 Aug 3;14:1195008. doi: 10.3389/fneur.2023.1195008. eCollection 2023.
Case report: Central alveolar hypoventilation in a survivor of cardiopulmonary arrest.

Wang F(1)(2), Darby J(1).

ABSTRACT

INTRODUCTION: Ondine's curse is a rare respiratory disorder that is characterized by central alveolar hypoventilation (CAH) during sleep. It is most commonly congenital. However, it can also be acquired very rarely. Herein, we report a young survivor who developed CAH following cardiopulmonary arrest. CASE PRESENTATION: A 35-year-old man was admitted to the Intensive Care Unit following unwitnessed cardiopulmonary arrest. Following resuscitative interventions, he remained comatose. Early diagnostic testing showed elevated neuronal specific enolase (28.7 ng/ml), absent cortical responses on evoked potential testing and MRI evidence of restricted diffusion in the cerebellum, hippocampi, juxtacortical white matter, superior cerebellar peduncles, dorsal pons, dorsolateral medulla, and upper cervical spinal cord. Ten days following admission, the patient remained comatose and underwent tracheostomy. He subsequently began to emerge from coma but had persistent unexplained hypotension and bradypnea necessitating ongoing vasopressor and respiratory support. Repeat MRI on hospital day 40 revealed residual FLAIR hyperintensities in the medulla within the nucleus tractus solitarius (NTS). After being discharged to long-term acute care facility, he was successfully liberated from mechanical ventilation 70 days post arrest. CONCLUSION: We report the first survivor of cardiopulmonary arrest who was complicated by CAH and hypotension with MRI verified ischemic injury to the bilateral NTS regions. Despite this injury, ventilator and vasopressor dependency resolved over a period of 10 weeks. Our case highlighted the essential functions of NTS in regulating the respiratory and cardiovascular systems.