

This week's PubMed 25<sup>th</sup> September – 1<sup>st</sup> October 2022: articles of interest n = 43

### **CPR AND COVID-19**

1. Int J Gen Med. 2022 Sep 19;15:7395-7405. doi: 10.2147/IJGM.S384959. eCollection 2022.

#### **Tree-Based Algorithms and Association Rule Mining for Predicting Patients' Neurological Outcomes After First-Aid Treatment for an Out-of-Hospital Cardiac Arrest During COVID-19 Pandemic: Application of Data Mining.**

Lin WC(1)(2)(3), Huang CH(2)(3)(4), Chien LT(4)(5), Tseng HJ(6)(7), Ng CJ(2)(3)(8), Hsu KH(2)(3)(9)(10)(11)(12), Lin CC(2)(3)(13), Chien CY(2)(3)(4)(13)(14).

#### **ABSTRACT**

**OBJECTIVE:** The authors performed several tree-based algorithms and an association rules mining as data mining tools to find useful determinants for neurological outcomes in out-of-hospital cardiac arrest (OHCA) patients as well as to assess the effect of the first-aid and basic characteristics in the EMS system. **PATIENTS AND METHODS:** This was a retrospective cohort study. The outcome was Cerebral Performance Categories grading on OHCA patients at hospital discharge. Decision tree-based models inclusive of C4.5 algorithm, classification and regression tree and random forest were built to determine an OHCA patient's prognosis. Association rules mining was another data mining method which we used to find the combination of prognostic factors linked to the outcome.

**RESULTS:** The total of 3520 patients were included in the final analysis. The mean age was 67.53 ( $\pm 18.4$ ) year-old and 63.4% were men. To overcome the imbalance outcome issue in machine learning, the random forest has a better predictive ability for OHCA patients in overall accuracy (91.19%), weighted precision (88.76%), weighted recall (91.20%) and F1 score (0.9) by oversampling adjustment. Under association rules mining, patients who had any witness on the spot when encountering OHCA or who had ever ROSC during first-aid would be highly correlated with good CPC prognosis. **CONCLUSION:** The random forest has a better predictive ability for OHCA patients. This paper provides a role model applying several machine learning algorithms to the first-aid clinical assessment that will be promising combining with Artificial Intelligence for applying to emergency medical services.

### **CPR/MECHANICAL CHEST COMPRESSION**

1. Resusc Plus. 2022 Sep 15;11:100285. doi: 10.1016/j.resplu.2022.100285. eCollection 2022 Sep.

#### **Improving survival from mechanical chest compression resuscitation.**

Lederer W(1), Schwaiger D(1), Baubin MA(1).

**NO ABSTRACT AVAILABLE (Letter to the Editor)**

2. Resusc Plus. 2022 Sep 15;11:100296. doi: 10.1016/j.resplu.2022.100296. eCollection 2022 Sep.

#### **Reply to: Improving survival from mechanical chest compression resuscitation.**

Azeli Y(1)(2)(3), García-Vilana S(4).

**NO ABSTRACT AVAILABLE**

### **REGISTRIES, REVIEWS AND EDITORIALS**

1. Lancet Respir Med. 2022 Sep 26:S2213-2600(22)00248-X. doi: 10.1016/S2213-2600(22)00248-X. Online ahead of print.

**Incidence of death or disability at 6 months after extracorporeal membrane oxygenation in Australia: a prospective, multicentre, registry-embedded cohort study.**

Hodgson CL(1), Higgins AM(2), Bailey MJ(2), Anderson S(3), Bernard S(4), Fulcher BJ(2), Koe D(5), Linke NJ(2), Board JV(6), Brodie D(7), Buhr H(8), Burrell AJC(9), Cooper DJ(9), Fan E(10), Fraser JF(11), Gattas DJ(8), Hopper IK(5), Huckson S(12), Litton E(13), McGuinness SP(14), Nair P(15), Orford N(16), Parke RL(17), Pellegrino VA(6), Pilcher DV(18), Sheldrake J(6), Reddi BAJ(19), Stub D(4), Trapani TV(2), Udy AA(9), Serpa Neto A(20); EXCEL Study Investigators on behalf of the International ECMO Network and the Australian and New Zealand Intensive Care Society Clinical Trials Group.

**ABSTRACT**

**BACKGROUND:** Extracorporeal membrane oxygenation (ECMO) is an invasive procedure used to support critically ill patients with the most severe forms of cardiac or respiratory failure in the short term, but long-term effects on incidence of death and disability are unknown. We aimed to assess incidence of death or disability associated with ECMO up to 6 months (180 days) after treatment. **METHODS:** This prospective, multicentre, registry-embedded cohort study was done at 23 hospitals in Australia from Feb 15, 2019, to Dec 31, 2020. The EXCEL registry included all adults ( $\geq 18$  years) in Australia who were admitted to an intensive care unit (ICU) in a participating centre at the time of the study and who underwent ECMO. All patients who received ECMO support for respiratory failure, cardiac failure, or cardiac arrest during their ICU stay were eligible for this study. The primary outcome was death or moderate-to-severe disability (defined using the WHO Disability Assessment Schedule 2.0, 12-item survey) at 6 months after ECMO initiation. We used Fisher's exact test to compare categorical variables. This study is registered with ClinicalTrials.gov, NCT03793257. **FINDINGS:** Outcome data were available for 391 (88%) of 442 enrolled patients. The primary outcome of death or moderate-to-severe disability at 6 months was reported in 260 (66%) of 391 patients: 136 (67%) of 202 who received veno-arterial (VA)-ECMO, 60 (54%) of 111 who received veno-venous (VV)-ECMO, and 64 (82%) of 78 who received extracorporeal cardiopulmonary resuscitation (eCPR). After adjustment for age, comorbidities, Acute Physiology and Chronic Health Evaluation (APACHE) IV score, days between ICU admission and ECMO start, and use of vasopressors before ECMO, death or moderate-to-severe disability was higher in patients who received eCPR than in those who received VV-ECMO (VV-ECMO vs eCPR: risk difference [RD] -32% [95% CI -49 to -15];  $p < 0.001$ ) but not VA-ECMO (VA-ECMO vs eCPR -8% [-22 to 6];  $p = 0.27$ ). **INTERPRETATION:** In our study, only a third of patients were alive without moderate-to-severe disability at 6 months after initiation of ECMO. The finding that disability was common across all areas of functioning points to the need for long-term, multidisciplinary care and support for surviving patients who have had ECMO. Further studies are needed to understand the 180-day and longer-term prognosis of patients with different diagnoses receiving different modes of ECMO, which could have important implications for the selection of patients for ECMO and management strategies in the ICU.

2. BJOG. 2022 Sep 26. doi: 10.1111/1471-0528.17294. Online ahead of print.

**Maternal sudden death, a nationwide retrospective study.**

Braund S(1), Leviel J(1), Morau E(2), Deneux-Tharoux C(3), Verspyck E(1); ENCM study group.

**ABSTRACT**

**OBJECTIVE:** To determine the prevalence of maternal sudden deaths, and compare the characteristics of death between women with explained and unexplained sudden death. **DESIGN:** A national retrospective study in France **POPULATION:** Maternal deaths related to an unexpected sudden cardiac arrest were extracted from the French National Confidential Enquiry into Maternal Deaths database for the 2007-2012 period **METHODS:** Maternal, pregnancy, sudden death characteristics, and maternal investigations were compared between women with explained and unexplained cause of death **RESULTS:** 83 maternal sudden deaths and 4 949 890 live births occurred,

thus accounting for 16% of all maternal deaths (n= 510) over the period. Death was explained in 51 (61%) women and unexplained in 32 women (39%). Compared to women with unexplained death, women with explained death were more often found to have in hospital cardiac arrest (47% vs. 12%,  $p < 0.01$ ), witnessed cardiac arrest (86% vs. 62%,  $p=0.03$ ) and in hospital death (82% vs. 47%,  $p < 0.01$ ). Post-mortem investigations such as autopsy and/or CT-scan (65% vs 31%,  $p < 0.01$ ) were also more often carried out in women with explained death. The proportion of deaths for which the preventability factors could not be assessed was 58% among unexplained MSD and 7% among explained MSD. **CONCLUSION:** Maternal Sudden Death is a rare event, but accounts for a high proportion of all maternal deaths. This highlights the importance of providing training in diagnostic and management strategy for care providers. Systematic post-mortem investigations are required to help understand causes and improve practices.

3. Resuscitation. 2022 Sep 22:S0300-9572(22)00668-2. doi: 10.1016/j.resuscitation.2022.09.011. Online ahead of print.

**Race and Ethnicity Data in the Cardiac Arrest Registry to Enhance Survival: Insights from Medicare Self-Reported Data.**

Chan PS(1), Merritt R(2), Chang A(3), Girotra S(4), Kotini-Shah P(5), Al-Araji R(6), McNally B(7).

**ABSTRACT**

**BACKGROUND:** For out-of-hospital cardiac arrest (OHCA), assignment of race/ethnicity data can be challenging. Validation of race/ethnicity in registry data with patients' self-reported race/ethnicity would provide insights regarding misclassification. **METHODS:** Using recently linked 2013-2019 Cardiac Arrest Registry to Enhance Survival (CARES) data with Medicare files, we examined the concordance of race/ethnicity in CARES with self-reported race/ethnicity in Medicare. Among patients with unknown race/ethnicity in CARES, race/ethnicity data from Medicare files were reported. **RESULTS:** Of 26,875 patients in the linked data, 5757 (21.4%) had unknown race/ethnicity in CARES. Of the remaining 21,118 patients, 14,284 (67.6%) were identified in CARES as non-Hispanic White, 4771 (22.6%) as non-Hispanic Black, 1213 (5.7%) as Hispanic, 760 (3.6%) as Asian or Pacific Islander, and 90 (0.4%) as American Indian or Alaskan Native. The concordance rate for race/ethnicity between CARES and Medicare was 93.4% for patients reported as non-Hispanic White in CARES, 89.1% for non-Hispanic Blacks, 74.6% for Hispanics, 69.6% for Asians and Pacific Islanders, and 37.8% for American Indian or Alaskan Natives. For the 5757 patients with unknown race/ethnicity in CARES, 3973 (69.0%) self-reported in Medicare as non-Hispanic White, 617 (10.7%) as non-Hispanic Black, 425 (7.4%) as Hispanic, 491 (8.5%) as Asian or Pacific Islander, and 52 (0.9%) as American Indian or Alaskan Native. Race/ethnicity remained unknown in 199 (3.5%) of patients. **CONCLUSION:** Race/ethnicity in CARES was highly concordant with self-reported race/ethnicity in Medicare, especially for non-Hispanic White and Black individuals. For patients with unknown race/ethnicity data in CARES, the vast majority were of White race.

4. Acad Emerg Med. 2022 Sep 25. doi: 10.1111/acem.14599. Online ahead of print.

**Individual socioeconomic status and risk of out-of-hospital cardiac arrest: A nationwide case-control analysis.**

Lee SY(1)(2)(3), Park JH(3)(4), Choi YH(3)(5), Lee J(3), Ro YS(3)(4), Hong KJ(3)(4), Song KJ(3), Shin SD(3)(4).

**ABSTRACT**

**OBJECTIVE:** Area-level socioeconomic status (SES) is associated with the incidence of out-of-hospital cardiac arrest (OHCA); however, the effects of individual-level SES on OHCA occurrence are unknown. This study investigated whether individual-level SES is associated with the occurrence of OHCA. **METHODS:** This case-control study used data from the nationwide OHCA registry and the

National Health Information Database (NHID) in Korea. All adult patients with OHCA of a medical etiology from 2013 to 2018 were included. Four controls were matched to each OHCA patient based on age and sex. The exposure was individual-level SES measured by insurance type and premium, which is based on income in Korea. National health insurance (NHI) beneficiaries were divided into four groups (Q1-Q4), and medical aid beneficiaries were separately classified as the lowest SES group. The adjusted odds ratios (aORs) and 95% confidence intervals (CIs) for the outcomes were calculated. Stratified analyses were conducted according to age and sex. RESULTS: 105,443 cases were matched with 421,772 controls. OHCA occurred more frequently in the lower SES groups. Compared with the highest SES group (Q1), the aORs for OHCA occurrence increased as the SES decreased (aORs [95% CI] were 1.21 [1.19-1.24] for Q2, 1.33 [1.31-1.36] for Q3, 1.32 [1.30-1.35] for Q4, and 2.08 [2.02-2.13] for medical aid). Disparity by individual-level SES was appeared to be greater in males than in females and greater in the young and middle-aged than in older adults. CONCLUSION: Low individual-level SES was associated with a higher probability of OHCA occurrence. Efforts are needed to reduce SES disparities in the occurrence of OHCA.

### **IN-HOSPITAL CARDIAC ARREST**

1. Circulation. 2022 Sep 28:101161CIRCULATIONAHA122060106. doi: 10.1161/CIRCULATIONAHA.122.060106. Online ahead of print.

#### **Temperature Control After In-Hospital Cardiac Arrest: A Randomized Clinical Trial.**

Wolfrum S(#)(1)(2), Roedl K(#)(3), Hanebutte A(1)(2), Pfeifer R(4), Kurowski V(2)(5), Riessen R(6), Daubmann A(7), Braune S(3), Söffker G(3), Bibiza-Freiwald E, Wegscheider K(7), Schunkert H(2)(8), Thiele H(#)(9), Kluge S(#)(3).

#### **ABSTRACT**

BACKGROUND: This study was conducted to determine the effect of hypothermic temperature control after in-hospital cardiac arrest (IHCA) on mortality and functional outcome as compared with normothermia. METHODS: An investigator initiated, open-label, blinded-outcome-assessor, multicenter, randomized controlled trial comparing hypothermic temperature control (32-34°C) for 24 h with normothermia after IHCA in 11 hospitals in Germany. The primary endpoint was all-cause mortality after 180 days. Secondary end points included in-hospital mortality and favorable functional outcome using the Cerebral Performance Category scale after 180 days. A Cerebral Performance Category score of 1 or 2 was defined as a favorable functional outcome. RESULTS: A total of 1055 patients were screened for eligibility and 249 patients were randomized: 126 were assigned to hypothermic temperature control and 123 to normothermia. The mean age of the cohort was 72.6±10.4 years, 64% (152 of 236) were male, 73% (166 of 227) of cardiac arrests were witnessed, 25% (57 of 231) had an initial shockable rhythm, and time to return of spontaneous circulation was 16.4±10.5 minutes. Target temperature was reached within 4.1 hours after IHCA in the hypothermic group and temperature was controlled for 48 hours at 37.0±0.9°C in the normothermia group. Mortality by day 180 was 72.5% (87 of 120) in hypothermic temperature control arm, compared with 71.2% (84 of 118) in the normothermia group (relative risk, 1.03 [95% CI, 0.79-1.40]; P=0.822). In-hospital mortality was 62.5% (75 of 120) in the hypothermic temperature control as compared with 57.6% (68 of 118) in the normothermia group (relative risk, 1.11 [95% CI, 0.86-1.46, P=0.443). Favorable functional outcome (Cerebral Performance Category 1 or 2) by day 180 was 22.5% (27 of 120) in the hypothermic temperature control, compared with 23.7% (28 of 118) in the normothermia group (relative risk, 1.04 [95% CI, 0.78-1.44]; P=0.822). The study was prematurely terminated because of futility. CONCLUSIONS: Hypothermic temperature control as compared with normothermia did not improve survival nor functional outcome at day 180 in patients presenting with coma after IHCA. The HACA-IHCA (Hypothermia After In-Hospital Cardiac Arrest) trial was underpowered and may have failed to detect clinically important differences between hypothermic temperature control and normothermia.

## **INJURIES AND CPR**

No articles identified.

## **CAUSE OF THE ARREST**

1. Circulation. 2022 Sep 27;146(13):976-979. doi: 10.1161/CIRCULATIONAHA.122.061356. Epub 2022 Sep 26.

### **Addressing the Risk of Ventricular Arrhythmias and Sudden Death in Patients With Cardiac Sarcoidosis.**

Patten RD(1), Shah SP(2).

**NO ABSTRACT AVAILABLE**

2. Circulation. 2022 Sep 27;146(13):964-975. doi: 10.1161/CIRCULATIONAHA.121.058120. Epub 2022 Aug 24.

### **Incidence of Sudden Cardiac Death and Life-Threatening Arrhythmias in Clinically Manifest Cardiac Sarcoidosis With and Without Current Indications for an Implantable Cardioverter Defibrillator.**

Nordenswan HK(1), Pöyhönen P(1)(2), Lehtonen J(1), Ekström K(1), Uusitalo V(2)(3), Niemelä M(1), Vihinen T(4), Kaikkonen K(5), Haataja P(6), Kerola T(7), Rissanen TT(8), Alatalo A(9), Pietilä-Effati P(10), Kupari M(1).

#### **ABSTRACT**

**BACKGROUND:** Cardiac sarcoidosis (CS) predisposes to sudden cardiac death (SCD). Guidelines for implantable cardioverter defibrillators (ICDs) in CS have been issued by the Heart Rhythm Society in 2014 and the American College of Cardiology/American Heart Association/Heart Rhythm Society consortium in 2017. How well they discriminate high from low risk remains unknown. **METHODS:** We analyzed the data of 398 patients with CS detected in Finland from 1988 through 2017. All had clinical cardiac manifestations. Histological diagnosis was myocardial in 193 patients (definite CS) and extracardiac in 205 (probable CS). Patients with and without Class I or IIa ICD indications at presentation were identified, and subsequent occurrences of SCD (fatal or aborted) and sustained ventricular tachycardia were recorded, as were ICD indications emerging first on follow-up. **RESULTS:** Over a median of 4.8 years, 41 patients (10.3%) had fatal (n=8) or aborted (n=33) SCD, and 98 (24.6%) experienced SCD or sustained ventricular tachycardia as the first event. By the Heart Rhythm Society guideline, Class I or IIa ICD indications were present in 339 patients (85%) and absent in 59 (15%), of whom 264 (78%) and 30 (51%), respectively, received an ICD. Cumulative 5-year incidence of SCD was 10.7% (95% CI, 7.4%-15.4%) in patients with ICD indications versus 4.8% (95% CI, 1.2%-19.1%) in those without ( $\chi^2=1.834$ ,  $P=0.176$ ). The corresponding rates of SCD were 13.8% (95% CI, 9.1%-21.0%) versus 6.3% (95% CI, 0.7%-54.0%;  $\chi^2=0.814$ ,  $P=0.367$ ) in definite CS and 7.6% (95% CI, 3.8%-15.1%) versus 3.3% (95% CI, 0.5%-22.9%;  $\chi^2=0.680$ ,  $P=0.410$ ) in probable CS. In multivariable regression analysis, SCD was predicted by definite histological diagnosis ( $P=0.033$ ) but not by Class I or IIa ICD indications ( $P=0.210$ ). In patients without ICD indications at presentation, 5-year incidence of SCD, sustained ventricular tachycardia, and emerging Class I or IIa indications was 53% (95% CI, 40%-71%). By the American College of Cardiology/American Heart Association/Heart Rhythm Society guideline, all patients with complete data (n=245) had Class I or IIa indications for ICD implantation. **CONCLUSIONS:** Current ICD guidelines fail to distinguish a truly low-risk group of patients with clinically manifest CS, the 5-year risk of SCD approaching 5% despite absent ICD indications. Further research is needed on prognostic factors, including the role of diagnostic histology. Meanwhile, all

patients with CS presenting with clinical cardiac manifestations should be considered for an ICD implantation.

3. *Kidney Int.* 2022 Oct;102(4):894-903. doi: 10.1016/j.kint.2022.05.024. Epub 2022 Jun 23.

**Azithromycin use increases the risk of sudden cardiac death in patients with hemodialysis-dependent kidney failure.**

Assimon MM(1), Pun PH(2), Wang L(3), Al-Khatib SM(4), Brookhart MA(5), Weber DJ(6), Winkelmayr WC(7), Flythe JE(8).

**ABSTRACT**

Azithromycin is an antibiotic with QT-prolonging potential commonly prescribed to individuals receiving hemodialysis. Hemodialysis patients have a high prevalence of clinical conditions, such as structural heart disease, that can enhance the pro-arrhythmic effects azithromycin, but were excluded from prior investigations evaluating the cardiac safety of azithromycin. Using data from the United States Renal Data System (2007-2017), we conducted two cohort studies to examine the cardiac safety of azithromycin relative to amoxicillin-based antibiotics (amoxicillin, amoxicillin/clavulanic acid) and levofloxacin (a fluoroquinolone antibiotic known to prolong the QT-interval) in the hemodialysis population. The primary outcome was five-day sudden cardiac death. Using inverse probability of treatment weighted survival models, we estimated hazard ratios, risk differences, and 95% confidence intervals. The azithromycin vs. amoxicillin-based antibiotic cohort included 282,899 patients and 725,431 treatment episodes (381,306 azithromycin and 344,125 amoxicillin-based episodes). Azithromycin vs. amoxicillin-based antibiotic treatment was associated with higher relative and absolute risks of sudden cardiac death, weighted hazard ratio of 1.70 (95% Confidence Interval, 1.36 to 2.11) and weighted risk difference per 100,000 treatment episodes of 25.0 (15.5 to 36.5). The azithromycin vs. levofloxacin cohort included 245,143 patients and 554,557 treatment episodes (387,382 azithromycin and 167,175 levofloxacin episodes). Azithromycin vs. levofloxacin treatment was associated with lower relative and absolute risks of sudden cardiac death, weighted hazard ratio of 0.79 (0.64 to 0.96) and weighted risk difference per 100,000 treatment episodes of -18.9 (-35.5 to -3.8). Thus, when selecting among azithromycin, levofloxacin, and amoxicillin-based antibiotics, clinicians should weigh the relative antimicrobial benefits of these drugs against their potential cardiac risks.

**END-TIDAL CO<sub>2</sub>**

1. *J Am Coll Emerg Physicians Open.* 2022 Sep 10;3(5):e12791. doi: 10.1002/emp2.12791. eCollection 2022 Oct.

**Emergency department initiated resuscitative endovascular balloon occlusion of the aorta (REBOA) for out-of-hospital cardiac arrest is feasible and associated with improvements in end-tidal carbon dioxide.**

Daley J(1)(2), Buckley R(1)(2), Kiskan KC(2), Barber D(3), Ayyagari R(1)(4), Wira C(1)(2), Aydin A(1)(2), Latich I(1)(4), Lozada JCP(1)(4), Joseph D(1)(2), Marino A(1)(4), Mojibian H(1)(4), Pollak J(1)(4), Chaar CO(1)(5), Bonz J(1)(2), Belsky J(1)(2), Coughlin R(1)(2), Liu R(1)(2), Sather J(1)(2), Van Tonder R(1)(2), Beekman R(1)(6), Fults E(1)(2), Johnson A(7), Moore C(1)(2).

**ABSTRACT**

**OBJECTIVES:** Out-of-hospital cardiac arrest (OHCA) claims the lives of approximately 350,000 people in the United States each year. Resuscitative endovascular balloon occlusion of the aorta (REBOA) when used as an adjunct to advanced cardiac life support may improve cardio-cerebral perfusion. Our primary research objective was to determine the feasibility of emergency department (ED)-initiated REBOA for OHCA patients in an academic urban ED. **METHODS:** This was a single-center,

single-arm, early feasibility trial that used REBOA as an adjunct to advanced cardiac life support (ACLS) in OHCA. Subjects under 80 years with witnessed OHCA and who received cardiopulmonary resuscitation (CPR) within 6 minutes were eligible. RESULTS: Five patients were enrolled between February 2020 and April 2021. The procedure was successful in all patients and 4 of 5 (80%) patients had transient return of spontaneous circulation (ROSC) after aortic occlusion. Unfortunately, all patients re-arrested soon after intra-aortic balloon deflation and none survived to hospital admission. At 30 seconds post-aortic occlusion, investigators noted a statistically significant increase in end tidal carbon dioxide of 26% (95% confidence interval, 10%, 44%). CONCLUSION: Initiating REBOA for OHCA patients in an academic urban ED setting is feasible. Aortic occlusion during chest compressions is temporally associated with improvements in end tidal carbon dioxide 30 seconds after aortic occlusion. Four of 5 patients achieved ROSC after aortic occlusion; however, deflation of the intra-aortic balloon quickly led to re-arrest and death in all patients. Future research should focus on the utilization of partial-REBOA to prevent re-arrest after ROSC, as well as the optimal way to incorporate this technique with other endovascular reperfusion strategies.

2. Emerg Med J. 2022 Sep 28;emermed-2021-211951. doi: 10.1136/emered-2021-211951. Online ahead of print.

**Predefibrillation end-tidal CO<sub>2</sub> and defibrillation success in out-of-hospital cardiac arrest: an observational cohort study.**

Kwong JL(1), Drennan IR(2)(3), Turner L(4), Cheskes S(3)(4).

**ABSTRACT**

BACKGROUND: Predefibrillation end-tidal CO<sub>2</sub> (ETCO<sub>2</sub>) may predict defibrillation success and could guide defibrillation timing in ventricular fibrillation (VF) cardiac arrest. This relationship has only been studied using advanced airways. Our aim was to evaluate this relationship using both basic (bag-valve-mask (BVM)) and advanced airways (supraglottic airways and endotracheal tubes). METHODS: Prehospital patient records and defibrillator files were abstracted for patients with out-of-hospital cardiac arrest in Ontario, Canada, with initial VF cardiac rhythms between 1 January 2018, and 31 December 2019. Analyses assessed the relationship between each predefibrillation ETCO<sub>2</sub> reading and defibrillation outcomes at the subsequent 2 min pulse check (ie, VF, asystole, pulseless electrical activity (PEA) or return of spontaneous circulation (ROSC)), accounting for airway types used during resuscitation. Multivariable logistic regression evaluated the association between the first documented predefibrillation ETCO<sub>2</sub> and postshock VF termination or ROSC. RESULTS: Of 269 cases abstracted, 153 had predefibrillation ETCO<sub>2</sub> measurements and were included in the study. Among these cases, 904 shocks were delivered and 44.4% (n=401) had predefibrillation ETCO<sub>2</sub> measured. The first ETCO<sub>2</sub> reading was more often from BVM (n=134) than advanced airways (n=19). ETCO<sub>2</sub> readings were lower when measured through BVM versus advanced airways (30.5 mm Hg (4.06 kPa) (±14.4 mm Hg (1.92 kPa)) vs 42.1 mm Hg (5.61 kPa) (±22.5 mm Hg (3.00 kPa)), adjANOVA p<0.01). Of all shocks with ETCO<sub>2</sub> reading (n=401), no difference in preshock ETCO<sub>2</sub> was found for subsequent shocks that resulted in persistent VF (32.2 mm Hg (4.29 kPa) (±15.8 mm Hg (2.11 kPa))), PEA (32.8 mm Hg (4.37 kPa) (±17.1 mm Hg (2.30 kPa))), asystole (32.4 mm Hg (4.32 kPa) (±20.6 mm Hg (2.75 kPa))) or ROSC (32.5 mm Hg (4.33 kPa) (±15.3 mm Hg (2.04 kPa))), analysis of variance p=0.99. In the multivariate analysis using the initial predefibrillation ETCO<sub>2</sub>, there was no association with VF termination on the subsequent shock (adjusted OR (adjOR) 0.99, 95% CI 0.97 to 1.02, p=0.57) or ROSC (adjOR 1.00, 95% CI 0.97 to 1.03, p=0.94) when evaluated as a continuous or categorical variable. CONCLUSION: Predefibrillation ETCO<sub>2</sub> measurement is not associated with VF termination or ROSC when basic and advanced airways are included in the analysis. The role of predefibrillation ETCO<sub>2</sub> requires careful consideration of the type of airway used during resuscitation.

3. Resuscitation. 2022 Sep 23:S0300-9572(22)00672-4. doi: 10.1016/j.resuscitation.2022.09.015. Online ahead of print.

**End-tidal carbon dioxide (ETCO<sub>2</sub>) at intubation and its increase after 10 minutes resuscitation predicts survival with good neurological outcome in out-of-hospital cardiac arrest patients.**

Baldi E(1), Luce Caputo M(2), Klersy C(3), Benvenuti C(4), Contri E(5), Palo A(5), Primi R(6), Cresta R(4), Compagnoni S(7), Cianella R(8), Burkart R(4), Maria De Ferrari G(9), Auricchio A(2), Savastano S(6).

**ABSTRACT**

AIM: To evaluate whether end-tidal carbon dioxide (ETCO<sub>2</sub>) value at intubation and its early increase (10minutes) after intubation predict both the survival to hospital admission and the survival at hospital discharge, including good neurological outcome (CPC 1-2), in patients with out-of-hospital cardiac arrest (OHCA). METHODS: All consecutive OHCA patients of any etiology between 2015 and 2018 in Pavia Province (Italy) and Ticino Region (Switzerland) were considered. Patients died before ambulance arrival, with a "do-not-resuscitate" order, without ETCO<sub>2</sub> value or with incomplete data were excluded. RESULTS: The study population consisted of 668 patients. An ETCO<sub>2</sub> value at intubation > 20 mmHg and its increase 10 minutes after intubation were independent predictors (after correction for known predictors of OHCA outcome) of survival to hospital admission and survival at hospital discharge. Relative to hospital discharge with good neurological outcome, ETCO<sub>2</sub> at intubation and its 10-minute change were confirmed predictors both individually and in a bivariable analysis (OR 1.83, 95%CI 1.02-3.3; p=0.04 and OR 3.9, 95%CI 1.97-7.74; p<0.001, respectively). This was confirmed also when accounting for gender, age, etiology and location. After further adjustment for bystander and CPR status, presenting rhythm and EMS arrival time, the ETCO<sub>2</sub> change remained an independent predictor. CONCLUSIONS: ETCO<sub>2</sub> value > 20 mmHg at intubation and its increase during resuscitation improve the prediction of survival at hospital discharge with good neurological outcome of OHCA patients. ETCO<sub>2</sub> increase during resuscitation is a more powerful predictor than ETCO<sub>2</sub> at intubation. A larger prospective study to confirm this finding appears warranted.

**ORGAN DONATION**

No articles identified.

**FEEDBACK**

No articles identified.

**DRUGS**

No articles identified.

**TRAUMA**

1. Acute Med Surg. 2022 Sep 16;9(1):e786. doi: 10.1002/ams2.786. eCollection 2022 Jan-Dec.

**Prehospital advanced airway management of emergency medical service-witnessed traumatic out-of-hospital cardiac arrest patients: analysis of nationwide trauma registry.**



Nishimura T(1)(2), Suga M(1)(2), Nakao A(1), Ishihara S(2), Naito H(1).

#### **ABSTRACT**

**AIM:** Survival of traumatic out-of-hospital cardiac arrest (OHCA) is poor. Early use of advanced airway management (AAM) techniques, including endotracheal intubation and supraglottic devices, are expected to contribute to the improved survival of these patients. The aim of this study was to determine whether prehospital use of AAM improves the outcomes for emergency medical service (EMS)-witnessed traumatic OHCA. **METHODS:** A nationwide retrospective study was carried out. Trauma patients with EMS-witnessed cardiac arrest who received cardiopulmonary resuscitation during transport were included. Patients younger than 16 years and those with missing data were excluded. We compared two groups using propensity score matching. The primary outcome was survival to discharge. The secondary outcome was return of spontaneous circulation (ROSC) on hospital arrival. A logistic regression model was used to calculate odds ratios (OR) and confidence intervals (CI). **RESULTS:** After propensity score matching, 1,346 patients were enrolled (AAM 673 versus non-AAM 673). Forty-four AAM cases (6.5%) and 39 non-AAM cases (5.8%) survived. Logistic regression analysis did not show a contribution of AAM for survival to discharge (AAM 44/673 (6.5%), non-AAM 39/673 (5.8%); OR 1.12; 95% CI, 0.70-1.76; P = 0.64). However, AAM improved ROSC on admission (AAM 141/673 (21.0%), non-AAM 77/673 (11.4%); OR 2.05; 95% CI, 1.51-2.78; P < 0.001). This tendency was consistent throughout our subgroup analysis categorized by body region of the severe injury (head trauma, torso trauma, and extremity/spine trauma). **CONCLUSIONS:** Prehospital AAM among EMS-witnessed traumatic OHCA patients was not associated with survival to discharge; however, ROSC on hospital admission improved for the AAM patients.

#### **VENTILATION**

1. Intensive Care Med. 2022 Sep 29:1-4. doi: 10.1007/s00134-022-06888-7. Online ahead of print. **Airway management in cardiac arrest and outcomes. Author's reply.**

Robba C(1)(2), Battaglini D(3)(4), Badenes R(5), Nielsen N(6), Pelosi P(3)(4).

**NO ABSTRACT AVAILABLE**

2. Intensive Care Med. 2022 Sep 29. doi: 10.1007/s00134-022-06878-9. Online ahead of print.

**Airway management in cardiac arrest and outcomes.**

Milne B(1).

**NO ABSTRACT AVAILABLE**

#### **CEREBRAL MONITORING**

No articles identified.

#### **ULTRASOUND AND CPR**

No articles identified.

#### **ORGANISATION AND TRAINING**

1. Resuscitation. 2022 Sep 26:S0300-9572(22)00664-5. doi: 10.1016/j.resuscitation.2022.08.022. Online ahead of print.

**Determinants of Change in Code Status among Patients with Cardiopulmonary Arrest Admitted to the Intensive Care Unit.**

Ploch M(1), Ahmed T(2), Reyes S(1), Irizarry-Caro JA(1), Fossas-Espinosa JE(1), Shoar S(2), Amatullah A(1), Jogimahanti A(1), Antonioli M(1), Iliescu CA(3), Balan P(4), Safavi Naeini P(5), Madjid M(6).

**ABSTRACT**

**BACKGROUND:** Patients with cardiopulmonary arrest often have a poor prognosis, prompting discussion with families about code status. The impact of socioeconomic factors, demographics, medical comorbidities and medical interventions on code status changes is not well understood. **METHODS:** This retrospective study included adult patients presenting with cardiac arrest to the intensive care unit of a hospital group between 5/1/2010 - 5/1/2020. We extracted chart data on socioeconomic factors, demographics, and medical comorbidities. **RESULTS:** We identified 1,254 patients, of which 57.5% were males. Age was different across the groups with (61.2±15.5 years) and without (61.2±15.5 years) code status change ( $p < 0.0001$ ). Code status was changed in 583 patients (46.5%). Among patients with code status change, the highest prevalence was White patients (34.8%), followed by African Americans (30.9%), and Hispanics (25.4%). Compared to patients who did not have a code status change, those with a change in code status were older (66.7±14.8 years vs 61.2±15.5 years). They were also more likely to receive vasopressor/inotropic support (74.6% vs 58.5%), and broad-spectrum antibiotics (70.3% vs 57.7%). Insurance status, ethnicity, religion, education, and salary did not lead to statistically significant changes in code status. **CONCLUSIONS:** In patients with cardiopulmonary arrest, code status change was more likely to be influenced by the presence of medical comorbidities and medical interventions during hospitalization rather than by socioeconomic factors.

2. J Am Heart Assoc. 2022 Sep 29:e026191. doi: 10.1161/JAHA.122.026191. Online ahead of print.

**Latest in Resuscitation Research: Highlights From the 2021 American Heart Association's Resuscitation Science Symposium.**

Owyang CG(1)(2), Abualsaud R(2), Agarwal S(3), Del Rios M(4), Grossestreuer AV(5), Horowitz JM(6), Johnson NJ(7), Kotini-Shah P(8), Mitchell OJL(9), Morgan RW(10), Moskowitz A(11), Perman SM(12), Rittenberger JC(13), Sawyer KN(14), Yuriditsky E(6), Abella BS(15), Teran F(2).

**NO ABSTRACT AVAILABLE**

3. Resuscitation. 2022 Sep 23:S0300-9572(22)00669-4. doi: 10.1016/j.resuscitation.2022.09.012.

Online ahead of print.

**ARE FIRST RESPONDERS FIRST? THE RALLY TO THE SUSPECTED OUT-OF-HOSPITAL CARDIAC ARREST.**

Berglund E(1), Byrsell F(2), Forsberg S(2), Nord A(2), Jonsson M(2).

**ABSTRACT**

**BACKGROUND:** Time is the crucial factor in the "chain of survival" treatment concept for out-of-hospital cardiac arrest (OHCA). We aimed to measure different response time intervals by comparing emergency medical system (EMS), fire fighters and smartphone aided volunteer responders. **METHODS:** In two large Swedish regions, volunteer responders were timed from the alert until they arrived at the scene of the suspected OHCA. The first arriving volunteer responders who tried to fetch an automated external defibrillator (AED-responder) and who ran to perform bystander cardiopulmonary resuscitation (CPR-responder) were compared to both the first arriving EMS and fire fighters. Three-time intervals were measured, from call to dispatch, the unit response time (from dispatch to arrival) and the total response time. **RESULTS:** During 22 months, 2631 suspected OHCA were included. The median time from call to dispatch was in minutes 1.8 (95% CI=1.7-1.8) for EMS, 2.9 (95% CI=2.8-3.0) for fire-fighters and 3.0 (95% CI=2.9-3.1) for volunteer responders. The median

unit response time was 8.3 (95% CI=8.1-8.5) for EMS, 6.8 (95% CI=6.7-6.9) for fire fighters and 6.0 (95% CI=5.7-6.2) for AED-responders and 4.6 (95% CI=4.5-4.8) for CPR-responders. The total response time was 10.4 (95% CI=10.1-10.6) for EMS, 10.2 (95% CI=9.9-10.4) for fire fighters, 9.6 (95% CI=9.1-9.8) for AED-responders and 8.2 (95% CI= 8.0-8.3) for CPR-responders. CONCLUSION: First arriving volunteer responders had the shortest unit response time when compared to both fire fighters and EMS, however this advantage was reduced by delays introduced at the dispatch center. Earlier automatic dispatch should be considered in further studies.

4. Front Med (Lausanne). 2022 Sep 8;9:930226. doi: 10.3389/fmed.2022.930226. eCollection 2022.

**External validation of the Survival After ROSC in Cardiac Arrest (SARICA) score for predicting survival after return of spontaneous circulation using multinational pan-asian cohorts.**

Rajendram MF(1), Zarisfi F(1), Xie F(2), Shahidah N(1), Pek PP(1)(3), Yeo JW(4), Tan BY(5), Ma M(6), Do Shin S(7), Tanaka H(8), Ong MEH(1)(9), Liu N(2)(10), Ho AFW(1)(3).

**ABSTRACT**

AIM: Accurate and timely prognostication of patients with out-of-hospital cardiac arrest (OHCA) who attain return of spontaneous circulation (ROSC) is crucial in clinical decision-making, resource allocation, and communication with family. A clinical decision tool, Survival After ROSC in Cardiac Arrest (SARICA), was recently developed, showing excellent performance on internal validation. We aimed to externally validate SARICA in multinational cohorts within the Pan-Asian Resuscitation Outcomes Study. MATERIALS AND METHODS: This was an international, retrospective cohort study of patients who attained ROSC after OHCA in the Asia Pacific between January 2009 and August 2018. Pediatric (age <18 years) and traumatic arrests were excluded. The SARICA score was calculated for each patient. The primary outcome was survival. We used receiver operating characteristics (ROC) analysis to calculate the model performance of the SARICA score in predicting survival. A calibration belt plot was used to assess calibration. RESULTS: Out of 207,450 cases of OHCA, 24,897 cases from Taiwan, Japan and South Korea were eligible for inclusion. Of this validation cohort, 30.4% survived. The median SARICA score was 4. Area under the ROC curve (AUC) was 0.759 (95% confidence interval, CI 0.753-0.766) for the total population. A higher AUC was observed in subgroups that received bystander CPR (AUC 0.791, 95% CI 0.782-0.801) and of presumed cardiac etiology (AUC 0.790, 95% CI 0.782-0.797). The model was well-calibrated. CONCLUSION: This external validation study of SARICA demonstrated high model performance in a multinational Pan-Asian cohort. Further modification and validation in other populations can be performed to assess its readiness for clinical translation.

5. Resuscitation. 2022 Oct;179:243-244. doi: 10.1016/j.resuscitation.2022.07.019.

**Factors influencing prehospital physicians' decision to initiate advanced life support for asystolic out-of-hospital cardiac arrest patients: The need to define experience.**

Cazes N(1), Renard A(2), Galant J(2), Boutillier du Retail C(2).

**NO ABSTRACT AVAILABLE**

6. Resuscitation. 2022 Sep 23:S0300-9572(22)00673-6. doi: 10.1016/j.resuscitation.2022.09.016.

Online ahead of print.

**Sex Differences in the Association Between Bystander CPR and Survival for Out-of-Hospital Cardiac Arrest.**

Ok Ahn K(1), McNally B(2), Al-Araji R(3), Cisneros C(4), Chan PS(5).

**ABSTRACT**

**BACKGROUND:** Prior studies have identified socio-cultural barriers in laypersons performing high-quality cardiopulmonary resuscitation (CPR) in women. Whether the effect of layperson bystander CPR on survival from out-of-hospital cardiac arrest (OHCA) differs by patients' sex is unknown. **METHODS:** Using data during 2013–2020 from an OHCA registry in the U.S., we identified adult patients with non-traumatic OHCA. The primary outcome was favorable neurological survival and the secondary outcome was survival to discharge. Multivariable logistic regression models evaluated the interaction between patients' sex and bystander CPR with survival, adjusted for patient and cardiac arrest characteristics. **RESULTS:** Of 420,671 patients with OHCA, 151,145 (35.9%) occurred in women and 269,526 (64.1%) in men. Rates of layperson bystander CPR were similar between women (38.3%) and men (40.0%). Rates of favorable neurological survival were 11.4% in those with bystander CPR and 5.6% in those without, but the association between bystander CPR and favorable neurological survival was weaker for women than men (women: adjusted OR, 1.33 [95% CI: 1.27–1.39]; men: adjusted OR, 1.55 [95% CI: 1.51–1.61]; interaction  $p < 0.001$ ). Rates of survival to discharge were 13.1% and 7.3% in those with and without layperson bystander CPR, and the association between bystander CPR was weaker for women than men (women: adjusted OR, 1.21 [95% CI: 1.16–1.26]; men: adjusted OR, 1.43 [95% CI: 1.39–1.47]; interaction  $p < 0.001$ ). **CONCLUSIONS:** For OHCA, bystander CPR was associated with higher survival in women and men. However, as currently practiced, the association between bystander CPR and higher survival was weaker for women as compared with men.

7. Am J Emerg Med. 2022 Sep 16;61:169-174. doi: 10.1016/j.ajem.2022.09.013. Online ahead of print.

**Can a voice assistant help bystanders save lives? A feasibility pilot study chatbot in beta version to assist OHCA bystanders.**

Otero-Agra M(1), Jorge-Soto C(2), Cosido-Cobos ÓJ(3), Blanco-Prieto J(4), Alfaya-Fernández C(5), García-Ordóñez E(5), Barcala-Furelos R(6).

**ABSTRACT**

**OBJECTIVE:** Evaluating the usefulness of a chat bot as an assistant during CPR care by laypersons. **METHODS:** Twenty-one university graduates and university students naive in basic life support participated in this quasi-experimental simulation pilot trial. A version beta chatbot was designed to guide potential bystanders who need help in caring for cardiac arrest victims. Through a Question-Answering (Q&A) flowchart, the chatbot uses Voice Recognition Techniques to transform the user's audio into text. After the transformation, it generates the answer to provide the necessary help through machine and deep learning algorithms. A simulation test with a Laerdal Little Anne manikin was performed. Participants initiated the chatbot, which guided them through the recognition of a cardiac arrest event. After recognizing the cardiac arrest, the chatbot indicated the start of chest compressions for 2 min. Evaluation of the cardiac arrest recognition sequence was done via a checklist and the quality of CPR was collected with the Laerdal Instructor App. **RESULTS:** 91% of participants were able to perform the entire sequence correctly. All participants checked the safety of the scene and made sure to call 112. 62% place their hands on the correct compression point. A media time of 158 s (IQR: 146–189) was needed for the whole process. 33% of participants achieved high-quality CPR with a median of 60% in QCPR (IQR: 9–86). Compression depth had a median of 42 mm (IQR: 33–53) and compression rate had a median of 100 compressions/min (IQR: 97–100). **CONCLUSION:** The use of a voice assistant could be useful for people with no previous training to perform de out-of-hospital cardiac arrest recognition sequence. Chatbot was able to guide all participants to call 112 and to perform continuous chest compressions. The first version of the chatbot for potential bystanders naive in basic life support needs to be further developed to reduce response times and be more effective in giving feedback on chest compressions.

8. Ther Umsch. 2022;79(8):387-392. doi: 10.1024/0040-5930/a001379.

**[Decision Making in Code Status Discussions].**

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

Becker C(1)(2), Hunziker S(1).

**ABSTRACT**

Decision Making in Code Status Discussions Abstract. The decision process regarding possible resuscitation measures in case of a cardiac arrest is a typical example of a shared decision-making in which patients and physicians contribute equally. To be able to make informed decisions, patients require information regarding possible advantages and disadvantages of the respective decision options. That is why physicians should discuss the consequences of resuscitation attempts versus focusing on palliative measures. What are patients' preferences and needs? These are important factors that can be very individual and therefore have to be incorporated in the decision-making process accordingly. Prolonging life and preventing death is fundamental for many people, however in some settings alleviating discomfort is a more appropriate goal. Especially in polymorbid patients with life-limiting, palliative diseases resuscitation measures often may not show any benefit but rather prolong suffering. In these settings it is particularly important to discuss the limited therapeutic but palliative options with patients.

**POST-CARDIAC ARREST TREATMENTS**

1. Prehosp Emerg Care. 2022 Sep 26:1-12. doi: 10.1080/10903127.2022.2128126. Online ahead of print.

**Disparities in Out-of-Hospital Cardiac Arrest Treatment and Outcomes of Males and Females.**

Gramm ER(1), Salcido DD(2), Menegazzi J(2).

**ABSTRACT**

Background: Previous studies comparing the treatment of males and females during out-of-hospital cardiac arrests (OHCA) have been contradictory. Understanding differences in treatment and outcomes is important to assuring appropriate care to both sexes. Hypothesis: Females with OHCA receive fewer interventions and have lower rates of survival to hospital discharge when compared to males with OHCA. Methods: We conducted a secondary analysis of the Resuscitation Outcomes Consortium (ROC) Cardiac Arrest Epistry 3 data collected from April 2011 to June 2015. We included all OHCA cases treated by emergency medical services (EMS) who had sex recorded. We analyzed 36 treatment and outcome variables. We calculated descriptive statistics and compared treatment and outcomes between males and females using chi-square and t-tests. We performed multivariate regressions adjusting for baseline characteristics. Results: Of 120,306 total subjects, 65,241 were included (23,924 female, 41,317 male). Females were 9.9% less likely to have OHCA in public, 10.9% less likely to have a shockable rhythm, and were a median of 5 years older. In the unadjusted analysis, females were defibrillated by EMS less often (OR 1.81, 95% CI [1.74, 1.88]), received epinephrine less often (OR 1.15, 95% CI [1.10, 1.19]), took an average of 67 seconds longer to achieve first return of spontaneous circulation (ROSC) (coefficient -66.75, 95% CI [-83.98, -49.52]), and had 2.2% lower survival to emergency department (ED) arrival (OR 1.09, 95% CI [1.06, 1.13]). After adjusting for age, bystander CPR, witness status, episode location, and initial rhythm, the odds of surviving to hospital discharge were higher in males (OR 1.12, 95% CI [1.05, 1.21]), and the odds of surviving to ED arrival favored females (OR 0.87, 95% CI [0.84-0.90]). Additionally, odds of receiving epinephrine (OR 1.22, 95% CI [1.16, 1.27]) and odds of receiving defibrillation (OR 1.36, 95% CI [1.29, 1.44]) were both higher in males, and time to achieve first ROSC was no longer associated with sex

( $p = 0.114$ , 95% CI [-3.32, 31.11]). Conclusions: After adjusting for case characteristics, females were less likely to receive some key treatments, including epinephrine and defibrillation. Females also had poorer survival to hospital discharge but had higher odds of surviving to ED arrival.

2. Am J Emerg Med. 2022 Sep 24:S0735-6757(22)00598-8. doi: 10.1016/j.ajem.2022.09.026. Online ahead of print.

**Be careful regarding the interpretation of shock index and modified shock index in out-of-hospital cardiac arrest survivors.**

Jouffroy R(1), Vivien B(2).

**NO ABSTRACT AVAILABLE**

3. Nurs Crit Care. 2022 Sep 27. doi: 10.1111/nicc.12843. Online ahead of print.

**"Sleep in cardiac arrest survivors".**

Hellström A(1), Bremer A(1), Gunnarsson LL(1), Hjelm C(2).

**ABSTRACT**

**BACKGROUND:** Insomnia, sleep apnoea and sleep loss are risk factors for the development of cardiovascular diseases. Most research on sleep disturbances includes patients with heart failure, while the role of sleep in sudden cardiac arrest survivors (SCA) has been only partially investigated and understood. Sleep-related breathing disorders and obstructive sleep apnoea increase illness and mortality in the aftermath of SCA. Also, post-traumatic stress is evident in SCA survivors, where sleep disruptions are some of the main symptoms of the condition. Consequently, it is important to identify sleep problems in SCA survivors at an early stage to avoid unnecessary suffering. **PURPOSE:** The aim of this study was to investigate registered nurses' perceptions of SCA survivors' sleep, both in hospital and after discharge. **METHODS:** This was an explorative interview study with a phenomenographic approach. Nineteen registered nurses (RNs) varying in age, sex and years in the profession participated. **FINDINGS:** The nurses' perceptions of SCA survivors' sleep were categorized as: "The observer - noticing behaviours, emotions and habits of the patient that affect sleep", "The oblivious witness - attitudes that hinder the ability to recognise sleep behaviours", and "The practitioner - advising and medicating for sleep". The outcome space showed that the nurses detected both obvious and subtle signs relating to patients' sleep. However, attitudes hindering the recognition of sleep behaviours were independent of acting as an observer or practitioner. If nothing unforeseen was observed, or if the patient did not spontaneously raise the subject, sleep was considered less important than other health problems in SCA survivors. **CONCLUSIONS:** Although the nurses knew that SCA survivors suffered from poor sleep, they failed to reflect on the consequences for the patient. Nurses' feelings of insufficient knowledge about sleep, as well as their omission of sleep in the follow-up documentation could leave sleep issues unaddressed and cause unnecessary patient suffering. **RELEVANCE TO CLINICAL PRACTICE:** Nurses need increased knowledge and training to enable them to detect subtle signs of sleep problems in SCA survivors.

## **TARGETED TEMPERATURE MANAGEMENT**

1. J Int Med Res. 2022 Sep;50(9):3000605221126880. doi: 10.1177/03000605221126880.

**Target temperature management versus normothermia without temperature feedback systems for out-of-hospital cardiac arrest survivors.**

Lee HJ(1)(2), Shin J(1)(2), You KM(1)(2), Kwon WY(2)(3), Kim KS(2)(3), Jo YH(2)(4), Park SM(2)(4).

**ABSTRACT**

**OBJECTIVE:** The clinical benefit of automatic temperature control devices remains unclear. We investigated the outcomes of out-of-hospital cardiac arrest (OHCA) survivors who had undergone either target temperature management (TTM) with a temperature feedback system (TFS) or maintenance of normothermia without a TFS during post-resuscitation care. **METHODS:** This study

was a retrospective analysis of a multicenter prospective cohort of OHCA survivors who had received postcardiac arrest care from August 2014 to December 2018. The overlap propensity score weighting method was applied for adjustment between groups. RESULTS: A total of 405 OHCA survivors were included. TTM with a TFS and normothermia without a TFS were applied to 318 and 87 patients, respectively. Fever events were more common in patients with normothermia without a TFS. After propensity score matching, no statistically significant differences were observed in the 1-month good neurologic outcome (odds ratio 0.99, 95% confidence interval [CI] 0.56-1.25) or survival rate (odds ratio 1.25, 95% CI 0.88-1.78). CONCLUSION: No significant differences in the 1-month neurologic outcome were observed between patients receiving TTM with a TFS and those undergoing normothermia without a TFS.

## **ELECTROPHYSIOLOGY AND DEFIBRILLATION**

1. Am J Emerg Med. 2022 Sep 23;61:192-198. doi: 10.1016/j.ajem.2022.09.025. Online ahead of print.

**Prognostic value of early and late spontaneous conversion into a shockable rhythm for patients with out-of-hospital cardiac arrest.**

Tsai MF(1), Yu SH(2), Sie JS(3), Huang FW(3), Shih HM(4).

### **ABSTRACT**

BACKGROUND: The prognostic significance of conversion into a shockable rhythm in patients who experienced out-of-hospital cardiac arrest (OHCA) with an initially nonshockable rhythm is controversial, perhaps due to the timing of rhythm conversion not being considered previously. We aimed to compare the different prognoses of patients with OHCA and early and late conversion of their rhythm into a shockable rhythm. METHODS: This was a single-centre retrospective cohort study. We enrolled patients with OHCA who were sent to a medical centre in central Taiwan from 2016 to 2020. Patients <18 years old, those with cardiac arrest due to trauma or a circumstantial cause, and those for whom resuscitation was not attempted were excluded. Patients were divided into two groups in accordance with presentation with an initially shockable rhythm. Those with an initially nonshockable rhythm were divided into three subgroups: early-conversion, late-conversion, and nonconversion groups. The primary outcome was the neurological functional status upon discharge from hospital. RESULTS: A total of 1645 patients with OHCA were included: initially shockable rhythm group, 339; early conversion group, 68; late-conversion group, 166; and nonconversion group, 1072. After adjustment, multivariate logistic regression revealed that a favourable neurological outcome was more common in the early conversion group than the nonconversion group (odds ratio [OR] 2.4; 95% confidence interval [CI], 1.1-5.3;  $p = 0.035$ ), whereas the late-conversion group did not significantly differ from the nonconversion group (OR 0.5; 95% CI, 0.1-1.5;  $p = 0.211$ ). The proportions of sustained return of spontaneous circulation and survival to discharge were also higher in the early conversion group than the late-conversion group (OR 2.9 95% CI 1.6-5.5,  $p = 0.001$  and OR 4.5, 1.8-11.0,  $p = 0.001$ , respectively). CONCLUSION: In patients who experience OHCA and have an initially nonshockable rhythm, early conversion into a shockable rhythm resulted in a better prognosis, whereas late conversion was not significantly different from nonconversion.

2. Anaesthesiologie. 2022 Sep 27. doi: 10.1007/s00101-022-01204-w. Online ahead of print.

**[AED drones on the rise? : Use of drones to improve public access**

**defibrillation].** [Article in German; Abstract available in German from the publisher]

Thies KC(1), Jansen G(2), Wähnert D(3).

### **ABSTRACT**

**BACKGROUND:** The poor availability of automatic external defibrillators (AED) and the modest knowledge of lay persons in handling these devices has led to an insufficient spread of public access defibrillation in Germany. **OBJECTIVE:** This article examines whether the automated deployment of AED drones to out-of-hospital cardiac arrest can help to remedy this situation. **METHODS:** Narrative literature review, evaluation of statistics, analysis of relevant media reports, and discussion of key research. **RESULTS:** The present investigations are mainly located in the experimental field and demonstrate the feasibility and safety of drone use, as well as shorter times to first defibrillation, which is confirmed by initial clinical studies. Mathematical models also indicate cost-effectiveness of airborne AED delivery compared to ground dispatch. Integration into the chain of survival appears to be possible but adaptations to existing emergency medical service structures and close cooperation with regional first responder and AED schemes as well as local authorities is required to optimise patient benefit and efficiency. **CONCLUSION:** The use of AED drones could probably contribute to improving public access defibrillation in Germany. This applies to both rural and urban regions. The technological requirements are met but flight regulations still have to be amended. In order to explore the full potential of this novel technology, further field trials are required to achieve smooth integration into existing emergency medical services.

## **PEDIATRICS AND CHILDREN**

1. Resuscitation. 2022 Sep 19;180:38-44. doi: 10.1016/j.resuscitation.2022.09.007. Online ahead of print.

### **Effect of life-sustaining treatment decision law on pediatric in-hospital cardiopulmonary resuscitation rate: A Korean population-based study.**

Choi J(1), Choi AY(2), Park E(3), Son MH(4), Cho J(5).

#### **ABSTRACT**

**AIM:** The 2018 life-sustaining treatment (LST) decision law is expected to improve end-of-life quality in Korea. This study evaluated the national effect of the LST decision law on the cardiopulmonary resuscitation (CPR) rate among pediatric patients who died during hospital admission. **METHODS:** This retrospective cohort study was based on the Korean National Health Insurance database. Pediatric admissions within 12 months before or after implementation of the LST decision law were compared, allowing a 1-month transition period (February 2018). The changes in mortality, CPR, and documentation of LST decision were evaluated. **RESULTS:** The CPR rate of patients who died in hospital decreased after establishment of the LST decision law (49.6 vs 43.4 %,  $P = 0.04$ ), without change of in-hospital mortality between pre/post-LST decision law activation (0.83 vs 0.81 per 1000 admissions,  $P = 0.67$ ). In addition, in-hospital CPR (0.73 vs 0.67 per 1000 admissions,  $P = 0.15$ ) and survival to discharge after in-hospital CPR (43.6 vs 47.2 %,  $P = 0.27$ ) were slightly improved, although there was no statistical significance. Patients with LST decision documentation were less frequently mechanically ventilated (69.8 % vs 80.4 %,  $P < 0.01$ ) and used fewer inotropes (76.5 % vs 90.1 %,  $P < 0.01$ ) and more frequent opioids (67.1 % vs 57.4 %,  $P = 0.04$ ). **CONCLUSIONS:** The legally guided process of LST decision can decrease the CPR rate of children who die in hospitals. This result highlights the possibility of improving end-of-life quality by reducing non-beneficial in-hospital CPR.

2. Pediatr Emerg Care. 2022 Oct 1;38(10):521-525. doi: 10.1097/PEC.0000000000002673. Epub 2022 Mar 16.

### **Measuring the Quality of Cardiopulmonary Resuscitation in the Emergency Department at a Quaternary Children's Hospital.**

Falco L(1), Timmons Z(2), Swing T(1), Luciano W(1), Bulloch B(1).

#### **ABSTRACT**



AIM OF STUDY: The aim of this study was to evaluate the quality of cardiopulmonary resuscitation (CPR) as it relates to American Heart Association (AHA) guidelines during cardiac arrests in a pediatric emergency department at a quaternary children's hospital. BACKGROUND AND OBJECTIVES: High-quality CPR increases the likelihood of survival from pediatric out-of-hospital cardiac arrest. However, optimal performance of high-quality CPR during transition of care between prehospital and pediatric emergency department providers is challenging, and survival without comorbidities remains extremely low for out-of-hospital cardiac arrest. METHODS: This was a retrospective study of data collected from a free-standing children's hospital emergency department and level 1 trauma center. RESULTS: There were 23 pediatric CPR events for subjects younger than 18 years in the emergency department during the time of the study. Median chest compression (CC) fraction was 85% overall with the AHA goal of 80%. Compliance with this recommendation was achieved in all age groups. The CC rate averaged 112 for the entire sample. Median depth was 2.06 cm in subjects younger than 1 year, 3.95 cm in subjects 1 year old to younger than 8 years, and 5.33 cm in subjects 8 years old to younger than 18 years. These compression depth rates fell below the AHA recommendations, with the exception of those 8 years and older. CONCLUSIONS: In our study, CC fraction and CC rate were found to meet AHA targets for all age groups, whereas CC depth only met AHA targets for the 8- to 18-year-old group. The most difficult parameter was CC depth for the group of subjects younger than 1 year.

3. J Pediatr (Rio J). 2022 Sep-Oct;98(5):477-483. doi: 10.1016/j.jpeds.2021.12.008. Epub 2022 Feb 6.

**Analysis of death in children not submitted to cardiopulmonary resuscitation.**

Leite MM(1), Bello FPS(2), Sakano TMS(2), Schwartsman C(2), da Costa Reis AGA(2).

**ABSTRACT**

OBJECTIVE: Describe the epidemiology of deaths in children not submitted to CPR, compare to a CPR group and evaluate patients' medical records of those not submitted to CPR. METHODS: Observational cross-sectional study assessing deaths between 2015 and 2018 in a pediatric tertiary hospital, divided into two groups: CPR and no-CPR. The source of data included the cardio-respiratory arrest register, based on Utstein style. Children's medical records in no-CPR group were researched by hand. RESULTS: 241 deaths were included, 162 in CPR group and 79 in the no-CPR group. Preexisting diseases were observed in 98.3% of patients and prior advanced intervention in 78%. Of the 241 deaths, 212 (88%) occurred in the PICU, being 138/162 (85.2%) in CPR group and 74/79 (93.7%) in no-CPR group ( $p = 0.018$ ). Bradycardia as the initial rhythm was five times more frequent in the CPR group (OR 5.06, 95% CI 1.94-13.19). There was no statistically significant difference regarding age, gender, preexisting diseases, and period of the day of the occurrence of death. Medical records revealed factors related to the family decision-making process or the suitability of therapeutic effort. Discrepancies between the practice of CPR and medical records were identified in 9/79 (11.4%) records allocated to the no-CPR group. CONCLUSION: Most deaths with CPR and with the no-CPR occurred in the PICU. Bradycardia as the initial rhythm was five times more frequent in the CPR group. Medical records reflected the complexity of the decision not to perform CPR. Discrepancies were identified between practice and medical records in the no-CPR group.

**EXTRACORPOREAL LIFE SUPPORT**

1. Medicine (Baltimore). 2022 Sep 30;101(39):e30860. doi: 10.1097/MD.00000000000030860.

**Predictors of survival for pediatric extracorporeal cardiopulmonary resuscitation: A systematic review and meta-analysis.**

Sood N(1), Sangari A(1), Goyal A(1), Conway JAS(2).

## **ABSTRACT**

**BACKGROUND:** The use of extracorporeal cardiopulmonary resuscitation (ECPR) has improved survival in patients with cardiac arrest; however, factors predicting survival remain poorly characterized. A systematic review and meta-analysis was conducted to examine the predictors of survival of ECPR in pediatric patients. **METHODS:** We searched EMBASE, PubMed, SCOPUS, and the Cochrane Library from 2010 to 2021 for pediatric ECPR studies comparing survivors and non-survivors. Thirty outcomes were analyzed and classified into 5 categories: demographics, pre-ECPR laboratory measurements, pre-ECPR co-morbidities, intra-ECPR characteristics, and post-ECPR complications. **RESULTS:** Thirty studies (n = 3794) were included. Pooled survival to hospital discharge (SHD) was 44% (95% CI: 40%-47%, I<sup>2</sup> = 67%). Significant predictors of survival for pediatric ECPR include the pre-ECPR lab measurements of PaO<sub>2</sub>, pH, lactate, PaCO<sub>2</sub>, and creatinine, pre-ECPR comorbidities of single ventricle (SV) physiology, renal failure, sepsis, ECPR characteristics of extracorporeal membrane oxygenation (ECMO) duration, ECMO flow rate at 24 hours, cardiopulmonary resuscitation (CPR) duration, shockable rhythm, intra-ECPR neurological complications, and post-ECPR complications of pulmonary hemorrhage, renal failure, and sepsis. **CONCLUSION:** Prior to ECPR initiation, increased CPR duration and lactate levels had among the highest associations with mortality, followed by pH. After ECPR initiation, pulmonary hemorrhage and neurological complications were most predictive for survival. Clinicians should focus on these factors to better inform potential prognosis of patients, advise appropriate patient selection, and improve ECPR program effectiveness.

2. Resusc Plus. 2022 Sep 19;12:100300. doi: 10.1016/j.resplu.2022.100300. eCollection 2022 Dec.

### **Transient return of spontaneous circulation related to favourable outcomes in out-of-hospital cardiac arrest patients resuscitated with extracorporeal cardiopulmonary resuscitation: A secondary analysis of the SAVE-J II study.**

Otani T(1), Hifumi T(2), Inoue A(3), Abe T(4)(5), Sakamoto T(6), Kuroda Y(7); SAVE-J II study group.

## **ABSTRACT**

**AIM:** This study aimed to investigate the relationship between transient return of spontaneous circulation (ROSC) before extracorporeal membrane oxygenation (ECMO) initiation and outcomes in out-of-hospital cardiac arrest (OHCA) patients, who were resuscitated with extracorporeal cardiopulmonary resuscitation (ECPR). **METHODS:** This study was a secondary analysis of the SAVE-J II study, which was a retrospective multicentre registry study involving 36 participating institutions in Japan. We classified patients into two groups according to the presence or absence of transient ROSC before ECMO initiation. Transient ROSC was defined as any palpable pulse of  $\geq 1$  min before ECMO initiation. The primary outcome was favourable neurological outcomes (cerebral performance categories 1-2). **RESULTS:** Of 2,157 patients registered in the SAVE-J II study, 1,501 met the study inclusion criteria; 328 (22%) experienced transient ROSC before ECMO initiation. Patients with transient ROSC had better outcomes than those without ROSC (favourable neurological outcome, 26% vs 12%,  $P < 0.001$ ; survival to hospital discharge, 46% vs 24%, respectively;  $P < 0.001$ ). A Kaplan-Meier plot showed better survival in the transient ROSC group (log-rank test,  $P < 0.001$ ). In multiple logistic analyses, transient ROSC was significantly associated with favourable neurological outcomes and survival (favourable neurological outcomes, adjusted odds ratio, 3.34 [95% confidence interval, 2.35-4.73]; survival, adjusted odds ratio, 3.99 [95% confidence interval, 2.95-5.40]). **CONCLUSIONS:** In OHCA patients resuscitated with ECPR, transient ROSC before ECMO initiation was associated with favourable outcomes. Hence, transient ROSC is a predictor of improved outcomes after ECPR.

## **EXPERIMENTAL RESEARCH**

1. Shock. 2022 Sep 26. doi: 10.1097/SHK.0000000000002003. Online ahead of print.

### **ALDA-1 TREATMENT ALLEVIATES LUNG INJURY AFTER CARDIAC ARREST AND RESUSCITATION IN SWINE.**

Wu H, Xu S, Diao M(1), Wang J(2), Zhang G(3), Xu J.

#### **ABSTRACT**

**INTRODUCTION:** Alda-1, an aldehyde dehydrogenase 2 (ALDH2) activator, has been shown to protect the lung against a variety of diseases including regional ischemia reperfusion injury, severe hemorrhagic shock, hyperoxia and so on. The present study was designed to investigate the effectiveness of Alda-1 treatment in alleviating lung injury after cardiac arrest (CA) and cardiopulmonary resuscitation (CPR) in swine. **METHODS:** A total of 24 swine were randomized into three groups: 1) Sham (n = 6), 2) CA/CPR (n = 10), and 3) CA/CPR + Alda-1 (n = 8). The swine model was established by 8 min of electrically induced and untreated CA, and then 8 min of manual CPR. A dose of 0.88 mg/kg of Alda-1 was intravenously injected at 5 min after CA/CPR. After CA/CPR, extravascular lung water index (ELWI), pulmonary vascular permeability index (PVPI), and oxygenation index (OI) were regularly evaluated for 4 h. At 24 h after resuscitation, lung ALDH2 activity was detected, and its injury score, apoptosis, and ferroptosis were measured. **RESULTS:** After experiencing the same procedure of CA and CPR, five swine in the CA/CPR group and six swine in the CA/CPR + Alda-1 group restored spontaneous circulation. Subsequently, significantly increased ELWI and PVPI, and markedly decreased OI were observed in these two groups compared with the Sham group. However, all of them were gradually improved and significantly better in the swine treated with the Alda-1 compared to the CA/CPR group. Tissue analysis indicated that lung ALDH2 activity was significantly decreased in those swine experiencing the CA/CPR procedure compared with the Sham group; nevertheless, its activity was significantly greater in the CA/CPR + Alda-1 group than in the CA/CPR group. Additionally, lung injury score, and its apoptosis and ferroptosis were significantly increased in the CA/CPR and CA/CPR + Alda-1 groups compared with the Sham group. Likewise, Alda-1 treatment significantly decreased these pathological damages in lung tissue when compared to the CA/CPR group. **CONCLUSIONS:** Alda-1 treatment was effective to alleviate lung injury after CA/CPR in a swine model, in which the protective role was possibly related to the inhibition of cell apoptosis and ferroptosis. It might provide a novel therapeutic target, and also a feasible therapeutic drug for lung protection after CA/CPR.

2. Anesthesiology. 2022 Sep 28. doi: 10.1097/ALN.0000000000004390. Online ahead of print.

### **Post-cardiac Arrest Sedation Promotes Electroencephalographic Slow-wave Activity and Improves Survival in a Mouse Model of Cardiac Arrest.**

Ikeda T(1), Amorim E(2)(3), Miyazaki Y(1), Kato R(1)(4), Marutani E(1), Silverman MG(5), Malhotra R(5), Solt K(1), Ichinose F(1).

#### **ABSTRACT**

**BACKGROUND:** Patients resuscitated from cardiac arrest are routinely sedated during targeted temperature management, while the effects of sedation on cerebral physiology and outcomes after cardiac arrest remain to be determined. We hypothesized that sedation would improve survival and neurological outcomes in mice after cardiac arrest. **METHODS:** Adult C57BL/6J mice of both sexes were subjected to potassium chloride-induced cardiac arrest and cardiopulmonary resuscitation. Starting at return of spontaneous circulation or at 60 minutes after return of spontaneous circulation, mice received intravenous infusion of propofol at 40 mg · kg<sup>-1</sup> · h<sup>-1</sup>, dexmedetomidine at

1  $\mu\text{g} \cdot \text{kg}^{-1} \cdot \text{h}^{-1}$ , or normal saline for 2 hours. Body temperature was lowered and maintained at 33°C during sedation. Cerebral blood flow was measured for 4 hours post-resuscitation. Telemetric electroencephalogram (EEG) was recorded in freely moving mice from 3 days before up to 7 days after cardiac arrest. RESULTS: Sedation with propofol or dexmedetomidine starting at return of spontaneous circulation improved survival in hypothermia-treated mice (propofol [13/16, 81%] vs. no sedation [4/16, 25%],  $P = 0.008$ ; dexmedetomidine [14/16, 88%] vs. no sedation [4/16, 25%],  $P = 0.002$ ). Mice receiving no sedation exhibited cerebral hyperemia immediately after resuscitation and EEG power remained less than 30% of the baseline in the first 6 hours post-resuscitation. Administration of propofol or dexmedetomidine starting at return of spontaneous circulation attenuated cerebral hyperemia and increased EEG slow oscillation power during and early after sedation (40 to 80% of the baseline). In contrast, delayed sedation failed to improve outcomes, without attenuating cerebral hyperemia and inducing slow-wave activity. CONCLUSIONS: Early administration of sedation with propofol or dexmedetomidine improved survival and neurological outcomes in mice resuscitated from cardiac arrest and treated with hypothermia. The beneficial effects of sedation were accompanied by attenuation of the cerebral hyperemic response and enhancement of electroencephalographic slow-wave activity.

## **CASE REPORTS**

1. Wilderness Environ Med. 2022 Sep 27:S1080-6032(22)00141-7. doi: 10.1016/j.wem.2022.07.009. Online ahead of print.

### **Successful Nonextracorporeal Life Support Resuscitation and Rewarming of a Patient with Hypothermia in Cardiac Arrest.**

Bhatnagar A(1), Mackman S(2).

#### **ABSTRACT**

We report full recovery of a patient with hypothermia in cardiac arrest following continuous and prolonged cardiopulmonary resuscitation (CPR) and conventional, nonextracorporeal life support (non-ECLS) methods. A 57-y-old man presented with unwitnessed cardiac arrest and a core temperature of 23°C (73°F). The presenting cardiac rhythm was ventricular fibrillation. The team administered epinephrine and performed defibrillation and CPR. Because ECLS was unavailable at the facility, the medical team externally and internally rewarmed the patient using heated blankets, forced warmed air, thoracic lavage, and warmed IV fluids. The patient achieved return of spontaneous circulation after 4 h 56 min of continuous CPR and rewarming. The medical team admitted the patient to the intensive care unit. He achieved full neurologic recovery the following day. When ECLS is not available and transfer is not appropriate because of patient instability or hospital location, conventional rewarming methods and continuous, prolonged CPR can lead to successful outcomes in patients with hypothermia in cardiac arrest. This case demonstrates that CPR in patients with hypothermia-associated cardiac arrest can lead to full recovery.

2. Clin Med Insights Case Rep. 2022 Sep 23;15:11795476221126981. doi: 10.1177/11795476221126981. eCollection 2022.

### **Seizures and Irreversible Cardiogenic Shock Following Propranolol Poisoning: Report of 2 Cases and Literature Review.**

Sharifpour A(1)(2), Sadeghi M(3), Zakariae Z(2)(4), Soleymani M(2).

#### **ABSTRACT**

Propranolol, a  $\beta$ -blocker (BB), is one of the drugs that can be misused for suicide. The clinical manifestations of overdose can range from asymptomatic to neurological symptoms such as seizures and loss of consciousness, cardiac shock, and even death. Herein, we describe 2 cases that were

referred to our hospital's emergency department in northern Iran: The first case was a 37-year-old woman who suffered from a decreased level of consciousness, bradycardia, and hypotension after ingesting 4 g of propranolol tablets. In the second case, a 32-year-old woman was admitted with complete cardiac arrest and a suspected history of ingesting 4.8 g of propranolol pills a few hours before admission. Therefore, the time interval between pill intake and treatment initiation seems to be one of the most important factors in prognosis, in addition to the number and dosage of pills ingested.

3. World J Crit Care Med. 2022 Sep 9;11(5):335-341. doi: 10.5492/wjccm.v11.i5.335. eCollection 2022 Sep 9.

**Cardiac arrest due to massive aspiration from a broncho-esophageal fistula: A case report.**

Lagrotta G(1), Ayad M(2), Butt I(3), Danckers M(4).

**ABSTRACT**

BACKGROUND: Tracheo and broncho esophageal fistulas and their potential complications in adults are seldom encountered in clinical practice but carries a significant morbidity and mortality. CASE SUMMARY: We present a case of a 39-year-old otherwise healthy man who presented to our hospital after ingestion of drain cleaner substance during a suicidal attempt. He unexpectedly suffered from cardiac arrest during his stay in the intensive care unit. The patient had developed extensive segmental trachea-broncho-esophageal fistulous tracks that led to a sudden and significant aspiration event of gastric and duodenal contents with subsequent cardiopulmonary arrest. Endoscopic evaluation of extension of fistulous track proved a slow and delayed progression of disease despite initial management with esophageal stenting for his caustic injury. CONCLUSION: The aim of this case presentation is to share with the reader the dire natural history of trachea-broncho-esophageal fistulas and its delayed progression. We aim to illustrate pitfalls in the endoscopic examination and provide further awareness on critical care monitoring and management strategies to reduce its morbidity and mortality.

4. Med Intensiva (Engl Ed). 2022 Oct;46(10):603-604. doi: 10.1016/j.medine.2020.04.017.

**Early brain magnetic resonance imaging findings after an episode of out-of-hospital cardiac arrest.**

Jiménez-Ruiz A(1), García-Grimshaw M(2), Reyes-Melo I(1).

**NO ABSTRACT AVAILABLE**

5. Clin Exp Emerg Med. 2022 Sep 27. doi: 10.15441/ceem.22.302. Online ahead of print.

**Successful full-term delivery after out-of-hospital cardiac arrest during the second trimester of pregnancy: a case report.**

Kim BR(1), Kim MY(1), Kang HS(1), Shim SS(1), Kim R(1).

**ABSTRACT**

Out-of-hospital cardiac arrest in pregnancy is extremely rare. In this case report, a 43-year-old female patient at 24.0 weeks of gestation collapsed outside her home after cardiac arrest. The paramedics performed cardiopulmonary resuscitation with defibrillation for ventricular fibrillation. Spontaneous circulation was achieved after 19 minutes. The fetus was stable during postarrest care. The patient exhibited high blood pressure with seizure-like symptoms for 2 days afterwards, which resolved with magnesium sulfate. She gradually recovered and returned to her daily activities while on treatment with beta blockers for cardiomyopathy and premature ventricular contractions until delivery. At 37.2 weeks of gestation, she underwent elective Cesarean section under spinal anesthesia. The baby weighed 2.55 kg and did not present with any complications. Here, we report a case of successful full-term delivery in a patient who underwent cardiopulmonary resuscitation for sudden cardiac arrest during the second trimester of pregnancy.