This week's PubMed 22nd – 28th October 2023: articles of interest n = 57

CPR AND COVID-19

1. Curr Med Chem. 2024;31(1):2-6. doi: 10.2174/0929867330666230515145041.
Long COVID-19 Syndrome and Sudden Cardiac Death: The Phantom Menace.
Spartalis M(1), Zweiker D(2), Spartalis E(3), Iliopoulos DC(3), Siasos G(1)
NO ABSTRACT AVAILABLE

CPR/MECHANICAL CHEST COMPRESSION

No articles identified.

REGISTRIES, REVIEWS AND EDITORIALS

1. Curr Probl Cardiol. 2023 Oct 25:102165. doi: 10.1016/j.cpcardiol.2023.102165. Online ahead of print.
Commotio Cordis in Non-sports-related Injury: A Scoping Review.
Sohail S(1), Naeem A(1), Basham HA(1), Ashraf A(1), Bai R(1), Karim A(1), Faraz M(1), Malik J(2), Hayat A(1).
ABSTRACT
Commotio cordis is a rare but life-threatening condition characterized by sudden cardiac arrest resulting from a blunt chest impact. While commotio cordis has traditionally been associated with sports-related activities, a significant proportion of cases occur in non-sport-related settings, such as assaults, motor vehicle accidents (MVAs), and daily activities. This critical review examines the epidemiology, clinical characteristics, and outcomes of non-sports-related commotio cordis cases, highlighting the need for increased awareness and improved management in these contexts. The review analyzes existing literature, drawing attention to the demographics of non-sports-related cases, which predominantly affect adolescents and young adults, with males being the primary demographic. In contrast to sport-related cases, non-sports-related commotio cordis cases exhibit a wider age range and a higher proportion of female subjects. Mortality rates are significantly higher in non-sports-related commotio cordis cases, largely due to lower rates of cardiopulmonary resuscitation (CPR), limited access to automated external defibrillators (AEDs), and delayed initiation of resuscitative efforts compared to sport-related incidents. This underscores the critical importance of increasing awareness and preparedness in non-sport-related settings. To mitigate the risks associated with non-sports-related commotio cordis, efforts should focus on early recognition of the condition, timely administration of CPR, and the widespread availability and accessibility of AEDs in various environments. Enhanced awareness and education can potentially lead to a reduction in mortality and improved outcomes for individuals affected by commotio cordis outside of sports-related activities. In conclusion, commotio cordis is not exclusive to sports and presents a significant health risk in non-sport-related scenarios. This review emphasizes the urgent need for increased awareness, preparedness, and resuscitation measures in non-sports contexts to address the higher mortality associated with these cases.

2. J Am Coll Cardiol. 2023 Oct 31;82(18):1789-1791. doi: 10.1016/j.jacc.2023.09.798.
Resuscitation From Out-of-Hospital Cardiac Arrest: Location, Location, Location.

Rea TD(1).
NO ABSTRACT AVAILABLE

3. Scand J Trauma Resusc Emerg Med. 2023 Oct 23;31(1):57. doi: 10.1186/s13049-023-01103-y.
Cardiopulmonary resuscitation during hyperbaric oxygen therapy: a comprehensive review and recommendations for practice.
Schmitz J(1)(2)(3), Liebold F(3)(4), Hinkelbein J(3)(5), Nöhl S(6), Thal SC(6)(7), Sellmann T(8)(9).
ABSTRACT
BACKGROUND: Cardiopulmonary resuscitation (CPR) during hyperbaric oxygen therapy (HBOT) presents unique challenges due to limited access to patients in cardiac arrest (CA) and the distinct physiological conditions present during hyperbaric therapy. Despite these challenges, guidelines specifically addressing CPR during HBOT are lacking. This review aims to consolidate the available evidence and offer recommendations for clinical practice in this context. MATERIALS AND METHODS: A comprehensive literature search was conducted in PubMed, EMBASE, Cochrane Library, and CINAHL using the search string: "(pressure chamber OR decompression OR hyperbaric) AND (cardiac arrest OR cardiopulmonary resuscitation OR advanced life support OR ALS OR life support OR chest compression OR ventricular fibrillation OR heart arrest OR heart massage OR resuscitation)". Additionally, relevant publications and book chapters not identified through this search were included. RESULTS: The search yielded 10,223 publications, with 41 deemed relevant to the topic. Among these, 18 articles (primarily case reports) described CPR or defibrillation in 22 patients undergoing HBOT. The remaining 23 articles provided information or recommendations pertaining to CPR during HBOT. Given the unique physiological factors during HBOT, the limitations of current resuscitation guidelines are discussed.CONCLUSIONS: CPR in the context of HBOT is a rare, yet critical event requiring special considerations. Existing guidelines should be adapted to address these unique circumstances and integrated into regular training for HBOT practitioners. This review serves as a valuable contribution to the literature on "CPR under special circumstances".

4. Eur Heart J Acute Cardiovasc Care. 2023 Sep 25;12(9):648-649. doi: 10.1093/ehjacc/zuad094.
Resuscitation-surviving with good neurological outcome: an interview with Prof. Jerry Nolan.
Pöss J(1), Ahrens I(2)(3).
NO ABSTRACT AVAILABLE

5. Intern Med J. 2023 Oct;53(10):1776-1782. doi: 10.1111/imj.15918. Epub 2022 Sep 7.
Inconsistent discharge diagnoses for young cardiac arrest episodes: insights from a statewide registry.
Paratz ED(1)(2)(3), van Heusden A(1), Ball J(1)(4)(5), Smith K(4)(5)(6), Zentner D(7)(8), Morgan N(9), Parsons S(5)(8), Thompson T(7), James P(7), Connell V(10), Pflaumer A(10)(11)(12), Semsarian C(13), Ingles J(14), Stub D(1)(2)(4)(5), La Gerche A(1)(2)(3).
ABSTRACT
BACKGROUND: Administrative coding of out-of-hospital cardiac arrest (OHCA) is heterogeneous, with the prevalence of noninformative diagnoses uncertain. AIM: To characterize the prevalence and type of non-informative diagnoses in a young cardiac arrest population. METHODS: Hospital discharge diagnoses provided to a statewide OHCA registry were characterised as either 'informative' or 'noninformative.' Informative diagnoses stated an OHCA had occurred or defined OHCA as occurring due to coronary artery disease, cardiomyopathy, channelopathy, definite noncardiac cause, or no known cause. Noninformative diagnoses were blank, stated presenting cardiac rhythm only, provided irrelevant information or presented a complication of the OHCA as

the main diagnosis. Characteristics of patients receiving informative versus noninformative diagnoses were compared. RESULTS: Of 1479 patients with OHCA aged 1 to 50 years, 290 patients were admitted to 15 hospitals. Ninety diagnoses (31.0%) were noninformative (arrest rhythm = 50, blank = 21, complication = 10 and irrelevant = 9). Two hundred diagnoses (69.0%) were informative (cardiac arrest = 84, coronary artery disease = 54, noncardiac diagnosis = 48, cardiomyopathy = 8, arrhythmia disorder = 4 and unascertained = 2). Only 10 diagnoses (3.5%) included both OHCA and an underlying cause. Patients receiving a noninformative diagnosis were more likely to have survived OHCA or been referred for forensic assessment (P = 0.011) and had longer median length of stay (9 vs 5 days, P = 0.0019). CONCLUSION: Almost one third of diagnoses for young patients discharged after an OHCA included neither OHCA nor any underlying cause. Underestimating the burden of OHCA impacts ongoing patient and at-risk family care, data sampling strategies, international statistics and research funding.

6. Scand J Trauma Resusc Emerg Med. 2023 Oct 26;31(1):63. doi: 10.1186/s13049-023-01131-8.
Where do we need to improve resuscitation? Spatial analysis of out-of-hospital cardiac arrest incidence and mortality.
Buter R(1)(2), van Schuppen H(3), Koffijberg H(4), Hans EW(5)(6), Stieglis R(3), Demirtas D(5)(6).
NO ABSTRACT AVAILABLE

7. Resuscitation. 2023 Oct 24:110014. doi: 10.1016/j.resuscitation.2023.110014. Online ahead of print.
Reply to letter EXPLAINING DIFFERENCES IN EARLY POSTRESUSCITATION HEMODYNAMICS BETWEEN TRIALS OF VASOPRESSIN AND STEROIDS FOR IN-HOSPITAL CARDIAC ARREST.
Andersen LW(1), Holmberg MJ(2), Granfeldt A(3).
NO ABSTRACT AVAILABLE

IN-HOSPITAL CARDIAC ARREST

1. Sci Rep. 2023 Oct 23;13(1):18087. doi: 10.1038/s41598-023-44312-2.
Predicting in-hospital cardiac arrest outcomes: CASPRI and GO-FAR scores.
Jung J(1), Ryu JH(1)(2), Shon S(1), Min M(1)(2), Hyun TG(1), Chun M(1), Lee D(1), Lee M(3).
ABSTRACT
It is important to predict the neurological prognoses of in-hospital cardiac arrest (IHCA) patients immediately after recovery of spontaneous circulation (ROSC) to make further critical management. The aim of this study was to confirm the usefulness of the Cardiac Arrest Survival Post-Resuscitation In-hospital (CASPRI) and Good Outcome Following Attempted Resuscitation (GO-FAR) scores for predicting the IHCA immediately after the ROSC. This is a retrospective analysis of patient data from a tertiary general hospital located in South Korea. A total of 488 adult patients who had IHCA and achieved sustained ROSC from September 2016 to August 2021 were analyzed to compare effectiveness of the CASPRI and GO-FAR scores related to neurologic prognosis. The primary outcome was Cerebral Performance Category (CPC) score at discharge, defined as a CPC score of 1 or 2. The secondary outcomes were survival-to-discharge and normal neurological status or minimal neurological damage at discharge. Of the 488 included patients, 85 (20.8%) were discharged with good prognoses (CPC score of 1 or 2). The area under the receiver operating characteristic curve of CASPRI score for the prediction of a good neurological outcome was 0.75 (95% CI 0.69-0.81), whereas that of GO-FAR score was 0.67 (95% CI 0.60-0.73). The results of this study show that these scoring systems can be used for timely and satisfactory prediction of the neurological prognoses of IHCA patients after ROSC.

2. Resuscitation. 2023 Oct;191:109903. doi: 10.1016/j.resuscitation.2023.109903. Epub 2023 Jul 7.
AWAreness during REsuscitation - II: A multi-center study of consciousness and awareness in cardiac arrest.
Parnia S(1), Keshavarz Shirazi T(2), Patel J(3), Tran L(3), Sinha N(3), O'Neill C(2), Roellke E(2), Mengotto A(2), Findlay S(4), McBrine M(5), Spiegel R(6), Tarpey T(7), Huppert E(2), Jaffe I(2), Gonzales AM(2), Xu J(2), Koopman E(2), Perkins GD(8), Vuylsteke A(9), Bloom BM(10), Jarman H(11), Nam Tong H(12), Chan L(13), Lyaker M(14), Thomas M(15), Velchev V(16), Cairns CB(17), Sharma R(18), Kulstad E(19), Scherer E(20), O'Keeffe T(21), Foroozesh M(22), Abe O(23), Ogedegbe C(24), Girgis A(25), Pradhan D(2), Deakin CD(26).
ABSTRACT
INTRODUCTION: Cognitive activity and awareness during cardiac arrest (CA) are reported but ill understood. This first of a kind study examined consciousness and its underlying electrocortical biomarkers during cardiopulmonary resuscitation (CPR). METHODS: In a prospective 25-site in-hospital study, we incorporated a) independent audiovisual testing of awareness, including explicit and implicit learning using a computer and headphones, with b) continuous real-time electroencephalography(EEG) and cerebral oxygenation(rSO2) monitoring into CPR during in-hospital CA (IHCA). Survivors underwent interviews to examine for recall of awareness and cognitive experiences. A complementary cross-sectional community CA study provided added insights regarding survivors' experiences. RESULTS: Of 567 IHCA, 53(9.3%) survived, 28 of these (52.8%) completed interviews, and 11(39.3%) reported CA memories/perceptions suggestive of consciousness. Four categories of experiences emerged: 1) emergence from coma during CPR (CPR-induced consciousness [CPRIC]) 2/28(7.1%), or 2) in the post-resuscitation period 2/28(7.1%), 3) dream-like experiences 3/28(10.7%), 4) transcendent recalled experience of death (RED) 6/28(21.4%). In the cross-sectional arm, 126 community CA survivors' experiences reinforced these categories and identified another: delusions (misattribution of medical events). Low survival limited the ability to examine for implicit learning. Nobody identified the visual image, 1/28(3.5%) identified the auditory stimulus. Despite marked cerebral ischemia (Mean rSO2 = 43%) normal EEG activity (delta, theta and alpha) consistent with consciousness emerged as long as 35-60 minutes into CPR. CONCLUSIONS: Consciousness. awareness and cognitive processes may occur during CA. The emergence of normal EEG may reflect a resumption of a network-level of cognitive activity, and a biomarker of consciousness, lucidity and RED (authentic "near-death" experiences).

INJURIES AND CPR

No articles identified.

CAUSE OF THE ARREST

1. JAMA Intern Med. 2023 Oct 23:e235475. doi: 10.1001/jamainternmed.2023.5475. Online ahead of print.
Homelessness and Incidence and Causes of Sudden Death: Data From the POST SCD Study.
Haghighat L(1), Ramakrishna S(2), Salazar JW(1), Feng J(3), Chiang J(4), Moffatt E(5)(6), Tseng ZH(7).
ABSTRACT
IMPORTANCE: Over 580 000 people in the US experience homelessness, with one of the largest concentrations residing in San Francisco, California. Unhoused individuals have a life expectancy of approximately 50 years, yet how sudden death contributes to this early mortality is unknown. OBJECTIVE: To compare incidence and causes of sudden death by autopsy among housed and unhoused individuals in San Francisco County. DESIGN, SETTING, AND PARTICIPANTS: This cohort study used data from the Postmortem Systematic Investigation of Sudden Cardiac Death (POST SCD)

study, a prospective cohort of consecutive out-of-hospital cardiac arrest deaths countywide among individuals aged 18 to 90 years. Cases meeting World Health Organization criteria for presumed SCD underwent autopsy, toxicologic analysis, and medical record review. For rate calculations, all 525 incident SCDs in the initial cohort were used (February 1, 2011, to March 1, 2014). For analysis of causes, 343 SCDs (incident cases approximately every third day) were added from the extended cohort (March 1, 2014, to December 16, 2018). Data analysis was performed from July 1, 2022, to July 1, 2023. MAIN OUTCOMES AND MEASURES: The main outcomes were incidence and causes of presumed SCD by housing status. Causes of sudden death were adjudicated as arrhythmic (potentially rescuable with implantable cardioverter-defibrillator), cardiac nonarrhythmic (eg, tamponade), or noncardiac (eg, overdose). RESULTS: A total of 868 presumed SCDs over 8 years were identified: 151 unhoused individuals (17.4%) and 717 housed individuals (82.6%). Unhoused individuals compared with housed individuals were younger (mean [SD] age, 56.7 [0.8] vs 61.0 [0.5] years, respectively) and more often male (132 [87.4%] vs 499 [69.6%]), with statistically significant racial differences. Paramedic response times were similar (mean [SD] time to arrival, unhoused individuals: 5.6 [0.4] minutes; housed individuals: 5.6 [0.2] minutes; P = .99), while proportion of witnessed sudden deaths was lower among unhoused individuals compared with housed individuals (27 [18.0%] vs 184 [25.7%], respectively, P = .04). Unhoused individuals had higher rates of sudden death (incidence rate ratio [IRR], 16.2; 95% CI, 5.1-51.2; P < .001) and arrhythmic death (IRR, 7.2; 95% CI, 1.3-40.1; P = .02). These associations remained statistically significant after adjustment for differences in age and sex. Noncardiac causes (96 [63.6%] vs 270 [37.7%], P < .001), including occult overdose (48 [31.8%] vs 90 [12.6%], P < .001), gastrointestinal causes (8 [5.3%] vs 15 [2.1%], P = .03), and infection (11 [7.3%] vs 20 [2.8%], P = .01), were more common among sudden deaths in unhoused individuals. A lower proportion of sudden deaths in unhoused individuals were due to arrhythmic causes (48 of 151 [31.8%] vs 420 of 717 [58.6%], P < .001), including acute and chronic coronary disease. CONCLUSIONS AND RELEVANCE: In this cohort study among individuals who experienced sudden death in San Francisco County, homelessness was associated with greater risk of sudden death from both noncardiac causes and arrhythmic causes potentially preventable with a defibrillator.

2. JACC Cardiovasc Interv. 2023 Sep 25;16(18):2277-2290. doi: 10.1016/j.jcin.2023.07.015.
Cardiac Death After Transcatheter Aortic Valve Replacement With Contemporary Devices.
Mesnier J(1), Ternacle J(2), Cheema AN(3), Campelo-Parada F(4), Urena M(5), Veiga-Fernandez G(6), Nombela-Franco L(7), Munoz-Garcia AJ(8), Vilalta V(9), Regueiro A(10), Del Val D(11), Asmarats L(12), Del Trigo M(13), Serra V(14), Bonnet G(2), Jonveaux M(2), Rezaei E(3), Matta A(4), Himbert D(5), de la Torre Hernandez JM(6), Tirado-Conte G(7), Fernandez-Nofrerias E(9), Vidal P(10), Alfonso F(11), Gutierrez-Alonso L(12), Oteo JF(13), Belahnech Y(14), Mohammadi S(1), Philippon F(1), Modine T(2), Rodés-Cabau J(15).

ABSTRACT
BACKGROUND: The burden of cardiac death after transcatheter aortic valve replacement (TAVR), particularly from advanced heart failure (HF) and sudden cardiac death (SCD), remains largely unknown. OBJECTIVES: This study sought to evaluate the incidence and predictors of SCD and HF-related death in TAVR recipients treated with newer-generation devices. METHODS: This study included a total of 5,421 consecutive patients who underwent TAVR with newer-generation devices using balloon (75.7%) or self-expandable (24.3%) valves. RESULTS: After a median follow-up of 2 (IQR: 1-3) years, 976 (18.0%) patients had died, 50.8% from cardiovascular causes. Advanced HF and SCD accounted for 11.6% and 7.5% of deaths, respectively. Independent predictors of HF-related death were atrial fibrillation (HR: 2.17; 95% CI: 1.47-3.22; P < 0.001), prior pacemaker (HR: 1.79; 95% CI: 1.10-2.92; P = 0.01), reduced left ventricular ejection fraction (HR: 1.08 per 5% decrease;

95% CI: 1.01-1.14; P = 0.02), transthoracic approach (HR: 2.50; 95% CI: 1.37-4.55; P = 0.003), and new-onset persistent left bundle branch block (HR: 1.85; 95% CI: 1.14-3.02; P = 0.01). Two baseline characteristics (diabetes, HR: 1.81; 95% CI: 1.13-2.89; P = 0.01; and chronic kidney disease, HR: 1.72; 95% CI: 1.02-2.90; P = 0.04) and 3 procedural findings (valve in valve, HR: 2.17; 95% CI: 1.01-4.64; P = 0.04; transarterial nontransfemoral approach, HR: 2.23; 95% CI: 1.23-4.48; P = 0.01; and periprocedural ventricular arrhythmia, HR: 7.19; 95% CI: 2.61-19.76; P < 0.001) were associated with an increased risk of SCD after TAVR. CONCLUSIONS: Advanced HF and SCD accounted for a fifth of deaths after TAVR in contemporary practice. Potentially treatable factors leading to increased risk of HF deaths and SCD were identified, such as arrhythmia/dyssynchrony factors for HF and valve-in-valve TAVR or periprocedural ventricular arrhythmias for SCD.

3. Int J Legal Med. 2023 Nov;137(6):1927-1937. doi: 10.1007/s00414-023-03037-7. Epub 2023 Jun 16.

Postmortem genetic analysis of 17 sudden cardiac deaths identified nonsense and frameshift variants in two cases of arrhythmogenic cardiomyopathy.

Takahashi Y(1)(2), Fukuda H(3), Hayakawa A(3), Sano R(3), Kubo R(3), Kawabata-Iwakawa R(4), Nakajima T(5), Ishige T(6), Tokue H(7), Asano K(8), Seki T(9), Hsiao YY(9), Ishizawa F(9), Takei H(8)(10), Kominato Y(3).

ABSTRACT

Sudden death, or unexpected natural death of a healthy individual, is a serious problem in all nations. Sudden cardiac death (SCD) mainly due to ischemic heart diseases is the top cause of sudden death. However, there are pathophysiological conditions, referred to as sudden arrhythmic death syndrome, in which no apparent lesion can be identified even after complete conventional or ordinary autopsy. While postmortem genetic analyses have accumulated evidence about underlying genetic abnormality in such cases, the precise relationships between genetic background and the phenotype have been largely elusive. In this study, a retrospective investigation of 17 autopsy cases in which lethal arrhythmia was suspected to be the cause of death was carried out. Genetic analysis focusing on 72 genes reported to be associated with cardiac dysfunctions was performed, in combination with detailed histopathological and postmortem imaging examination, and a family study. As a result, in two cases of suspected arrhythmogenic cardiomyopathy (ACM), we found a nonsense variant in PKP2 and frameshift variant in TRPM4 gene. In contrast, the other 15 cases showed no morphological changes in the heart despite the presence of a frameshift variant and several missense variants, leaving the clinical significance of these variants obscure. The findings of the present study suggest that nonsense and frameshift variants could be involved in the morphological abnormality in cases of SCD due to ACM, while missense variants alone rarely contribute to massive structural changes in the heart.

4. Eur J Prev Cardiol. 2023 Oct 10;30(14):1526-1534. doi: 10.1093/eurjpc/zwad086.

The impact of modifiable risk factors in the association between socioeconomic status and sudden cardiac death in a prospective cohort study: equal access to healthcare, unequal outcome.

Warming PE(1), Ågesen FN(1), Lynge TH(1), Garcia R(1)(2)(3), Banner J(4), Prescott E(5), Lange T(6), Jabbari R(1), Tfelt-Hansen J(1)(4).

ABSTRACT

AIMS: Low socioeconomic status is associated with all-cause mortality and cardiac risk factors. Furthermore, sudden cardiac death (SCD) is among the leading causes of death in the general population, and an identification of high-risk subgroups is needed. The aim of this study was to investigate the association between income and education level and incidence of SCD and to

calculate the impact of modifiable mediating risk factors. METHODS AND RESULTS: Participants in the Copenhagen City Heart Study were followed up from 1993 to 2016. Sudden cardiac death was identified using high-quality death certificates, autopsy reports, discharge summaries, and national registry data. Hazard ratios were calculated using Cox proportional hazards regression, and adjusted cumulative incidences were predicted using cause-specific Cox models. Mediation analyses were performed using a marginal structural model approach. During 24 years of follow-up, 10 006 people participated, whereof 5514 died during the study period with 822 SCDs. Compared with long education, persons with elementary school level education had an SCD incidence rate ratio (IRR) of 2.48 [95% confidence interval (CI) 1.86-3.31], and low income was likewise associated with an SCD IRR of 2.34 (95% CI 1.85-2.96) compared with high income. In the association between education and SCD, the combined mediating effect of smoking, physical activity, and body mass index accounted for ∼20% of the risk differences. CONCLUSION: We observed an inverse association between both income and education and the risk of SCD, which was only in part explained by common cardiac risk factors, implying that further research into the competing causes of SCD is needed and stressing the importance of targeted preventive measures.

5. Comput Biol Med. 2022 Nov;150:106154. doi: 10.1016/j.compbiomed.2022.106154. Epub 2022 Sep 29.
Potential prognostic biomarkers of sudden cardiac death discovered by machine learning.
Zhou K(1), Cai C(2), He Y(1), Chen Z(3).
ABSTRACT
OBJECTIVE: Sudden cardiac death (SCD) is a serious public health burden. This study aims to find prognostic biomarkers of SCD using machine learning. METHODS: The myocardial samples from 21 accidental death and 82 sudden death donors were compared to seek for differential genes. Enriched active genes were found according to the PPI interaction network. GSEA analyzed differences in function and pathway between control and experimental groups. Related diseases caused by active genes are mainly exhibited through DO enrichment. Prognostic biomarkers for SCD are identified via two machine learning algorithms. The CIBERSORT method was used to compare the immune microenvironment changes in patients with SCD. RESULTS: SCD was mainly associated with heart and kidney diseases caused by atherosclerosis. DEFA1B, BGN, SERPINE1, CCL2 and HBB are considered to be prognostic biomarkers for SCD after machine learning. And immune infiltration plays an important role in the process of SCD. CONCLUSION: We discovered 5 prognostic biomarkers for SCD. And immune microenvironment changes was also found in SCD. Moreover, atherosclerosis might be an important risk factor for SCD.

END-TIDAL CO_2

No articles identified.

ORGAN DONATION

1. J Clin Med. 2023 Oct 12;12(20):6492. doi: 10.3390/jcm12206492.
Uncontrolled Donation after Circulatory Death Only Lung Program: An Urgent Opportunity.
Lazzeri C(1), Bonizzoli M(1), Di Valvasone S(1), Peris A(1).
ABSTRACT
Uncontrolled donation after circulatory death (uDCD) represents a potential source of lungs, and since Steen's 2001 landmark case in Sweden, lungs have been recovered from uDCD donors and

transplanted to patients in other European countries (France, the Netherlands, Spain and Italy) with promising results. Disparities still exist among European countries and among regions in Italy due to logistical and organizational factors. The present manuscript focuses on the clinical experiences pertaining to uDCD lungs in North America and European countries and on different lung maintenance methods. Existing experiences (and protocols) are not uniform, especially with respect to the type of lung maintenance, the definition of warm ischemic time (WIT) and, finally, the use of ex vivo perfusion (available in the last several years in most centers). In situ lung cooling may be superior to protective ventilation, but this process may be difficult to perform in the uDCD setting and is also time-consuming. On the other hand, the "protective ventilation technique" is simpler and feasible in every hospital. It may lead to a broader use of uDCD lung donors. To date, the results of lung transplants performed after protective ventilation as a preservation technique are scarce but promising. All the protocols comprise, among the inclusion criteria, a witnessed cardiac arrest. The detectable differences included preservation time (240 vs. 180 min) and donor age (<55 years in Spanish protocols and <65 years in Toronto protocols). Overall, independently of the differences in protocols, lungs from uDCD donors show promising results, and the possibility of optimizing ex vivo lung perfusion may broaden the use of these organs.

FEEDBACK

No articles identified.

DRUGS

No articles identified.

TRAUMA

No articles identified.

VENTILATION

1. Sci Rep. 2023 Oct 19;13(1):17836. doi: 10.1038/s41598-023-44991-x.

Association of prehospital advanced airway and epinephrine with survival in patients with out-of-hospital cardiac arrest.

Ahn S(1), Jin BY(2), Cho H(1), Moon S(1), Cho YD(3), Park JH(4).

ABSTRACT

Survival benefits of prehospital advanced airway and epinephrine in out-of-hospital cardiac arrest (OHCA) patients are controversial, but few studies evaluated this together. This study evaluated association of prehospital advanced airway and epinephrine with survival outcomes in OHCA patients. This was observational study using a prospective multicentre KoCARC registry. Adult OHCA patients between October 2015 and December 2021 were included. The variables of interest were prehospital managements, which was classified into basic life support (BLS)-only, BLS + advanced airway, and BLS + advanced airway + epinephrine. In total, 8217 patients were included in analysis. Survival to discharge and good neurological outcomes were lowest in the BLS + advanced airway + epinephrine group (22.1% in BLS-only vs 13.2% in BLS + advanced airway vs 7.5% in BLS + advanced airway + epinephrine, $P < 0.001$ and 17.1% in BLS-only vs 9.2% in BLS + advanced airway vs 4.3% in BLS + advanced airway + epinephrine, $P < 0.001$, respectively). BLS + advanced

airway + epinephrine group was less likely to survive to discharge and have good neurological outcomes (aOR 0.39, 95% CI 0.28-0.55, P < 0.001 and aOR 0.33, 95% CI 0.21-0.51, P < 0.001, respectively) than BLS-only group after adjusting for potential confounders. In prehospital settings with intermediate EMS providers and prehospital advanced airway insertion is performed followed by epinephrine administration, prehospital management with BLS + advanced airway + epinephrine in OHCA patients was associated with lower survival to discharge rate compared to BLS-only.

CERERBRAL MONITORING

1. Neuro Endocrinol Lett. 2023 Oct 23;44(7):482-488. Online ahead of print.
Cerebral Performance Category score in patients after out-of-hospital cardiac arrest.
Šín R(1)(2), Čechurová L(1)(3), Růžička J(1)(4), Štruncová D(1)(5), Handl L(1)(6), Urban M(1), Prcín I(1), Kruba Vidunová J(1), Hrdlička P(1).
ABSTRACT
OBJECTIVE: Reporting epidemiological data on prehospital cardiac arrest in the Pilsen Region in 2022. Expression of cardiopulmonary resuscitation success using the Cerebral Performance Category (CPC) score. MATERIALS AND METHODS: The study looked at the survival rate of out-of-hospital sudden cardiac arrest in all patients in whom emergency medical services performed cardiopulmonary resuscitation (CPR). The study covered the period from 1 January 2022 to 31 December 2022. Both electronic and paper medical records were used to obtain data. All cases were evaluated according to Utstein-style guidelines. RESULTS: During the studied period, emergency response teams in the Pilsen Region carried out CPR in 499 cases. The incidence of prehospital CPR was 88.43 cases per 100,000 population. A total of 146 patients (29.26%) were referred to the hospital with spontaneous circulation, and results indicating survival with a good neurological outcome of CPC 1 or 2 were recorded in 48 cases (9.62%). The first monitored rhythm was shockable in 119 cases (23.85%). In this subgroup, ROSC was achieved in 71 cases (59.66%) and 61 of them (51.26%) were referred to hospital. In this study subgroup, a total of 36 patients (30.25%) achieved a good neurological outcome with a CPC score of 1 or 2. CONCLUSION: The study presented epidemiological data on OHCA and prehospital CPR in the Pilsen region in 2022. The data obtained shows a survival rate with good neurological outcome in 9.62% of cases.

2. Sci Rep. 2023 Oct 28;13(1):18531. doi: 10.1038/s41598-023-45818-5.
Hemoglobin as a prognostic marker for neurological outcomes in post-cardiac arrest patients: a meta-analysis.
Hou H(1), Pang L(1), Zhao L(2), Liu Z(1), Xing JH(3).
ABSTRACT
The aim of this study was to investigate the relationship between serum level of hemoglobin and neurological outcomes following cardiac arrest. Relevant studies were identified by searching electronic databases including PubMed, Web of Science, Cochrane Library, and Embase from June 2012 through April 2023. Articles were rigorously reviewed for their study inclusion and exclusion criteria. Pooled effect date was determined using the standardized mean difference (SMD) and 95% confidence intervals (CI). The Newcastle-Ottawa Scale was used to evaluate study quality. Subgroup analyses were conducted to determine confounding factors affecting patient outcomes. Study heterogeneity, sensitivity, and publication bias were also determined.This meta-analysis included 11 studies involving 2519 patients. Our results suggest that high serum level of hemoglobin may improve neurological prognosis(SMD = 0.60, 95%CI = 0.49-0.71, I2 = 10.85). The findings of this study indicate that serum level of hemoglobin may be associated with better neurological prognosis,

perhaps an appropriate increase in serum haemoglobin levels can improve the neurological prognosis of patients in cardiac arrest.

3. Crit Care. 2023 Oct 25;27(1):407. doi: 10.1186/s13054-023-04696-z.
Quantitative analysis of early apparent diffusion coefficient values from MRIs for predicting neurological prognosis in survivors of out-of-hospital cardiac arrest: an observational study.
Yoon JA(#)(1), Kang C(#)(1)(2), Park JS(3)(4), You Y(1)(2), Min JH(2)(5), In YN(2)(5), Jeong W(1)(2), Ahn HJ(1)(2), Lee IH(6), Jeong HS(7), Lee BK(8), Lee JK(9).
ABSTRACT
BACKGROUND: This study aimed to quantitatively analyse ultra-early brain diffusion-weighted magnetic resonance imaging (DW-MRI) findings to determine the apparent diffusion coefficient (ADC) threshold associated with neurological outcomes in comatose survivors of out-of-hospital cardiac arrest (OHCA). METHODS: This retrospective study included adult survivors of comatose OHCA who underwent DW-MRI imaging scans using a 3-T MRI scanner within 6 h of the return of spontaneous circulation (ROSC). We investigated the association between neurological outcomes and ADC values obtained through voxel-based analysis on DW-MRI. Additionally, we constructed multivariable logistic regression models with pupillary light reflex (PLR), serum neuron-specific enolase (NSE), and ADC values as independent variables to predict poor neurological outcomes. The primary outcome was poor neurological outcome 6 months after ROSC, determined by the Cerebral Performance Category 3-5. RESULTS: Overall, 131 patients (26% female) were analysed, of whom 74 (57%) showed poor neurological outcomes. The group with a poor neurological outcome had lower mean whole brain ADC values (739.1 vs. 787.1 × 10-6 mm/s) and higher percentages of voxels with ADC below threshold in all ranges (250-1150) (all $P < 0.001$). The mean whole brain ADC values (area under the receiver operating characteristic curve [AUC] 0.83) and the percentage of voxels with ADC below 600 (AUC 0.81) had the highest sensitivity of 51% (95% confidence interval [CI] 39.4-63.1; cut-off value ≤ 739.2 × 10-6 mm2/s and > 17.2%, respectively) when the false positive rate (FPR) was 0%. In the multivariable model, which also included PLR, NSE, and mean whole brain ADC values, poor neurological outcome was predicted with the highest accuracy (AUC 0.91; 51% sensitivity). This model showed more accurate prediction and sensitivity at an FPR of 0% than did the combination of PLR and NSE (AUC 0.86; 30% sensitivity; $P = 0.03$). CONCLUSIONS: In this cohort study, early voxel-based quantitative ADC analysis after ROSC was associated with poor neurological outcomes 6 months after cardiac arrest. The mean whole brain ADC value demonstrated the highest sensitivity when the FPR was 0%, and including it in the multivariable model improved the prediction of poor neurological outcomes.

ULTRASOUND AND CPR

No articles identified.

ORGANISATION AND TRAINING

1. Medicina (Kaunas). 2023 Sep 26;59(10):1717. doi: 10.3390/medicina59101717.
Prehospital Predictors of Survival in Patients with Out-of-Hospital Cardiac Arrest.
Strnad M(1)(2)(3), Borovnik Lesjak V(1), Jerot P(4), Esih M(2)(3).
ABSTRACT
Background and Objectives: Despite advances in the treatment of heart diseases, the outcome of patients experiencing sudden cardiac arrest remains poor. The aim of our study was to determine

the prehospital variables as predictors of survival outcomes in out-of-hospital cardiac arrest (OHCA) victims. Materials and Methods: This was a retrospective observational cohort study of OHCA cases. EMS protocols created in accordance with the Utstein style reporting for OHCA, first responder intervention reports, medical dispatch center dispatch protocols and hospital medical reports were all reviewed. Multivariate logistic regression was performed with the following variables: age, gender, witnessed status, location, bystander CPR, first rhythm, and etiology. Results: A total of 381 interventions with resuscitation attempts were analyzed. In more than half (55%) of them, bystander CPR was performed. Thirty percent of all patients achieved return of spontaneous circulation (ROSC), 22% of those achieved 30-day survival (7% of all OHCA victims), and 73% of those survived with Cerebral Performance Score 1 or 2. The logistic regression model of adjustment confirms that shockable initial rhythm was a predictor of ROSC [OR: 4.5 (95% CI: 2.5-8.1)] and 30-day survival [OR: 9.3 (95% CI: 2.9-29.2)]. Age was also associated (≤67 years) [OR: 3.9 (95% CI: 1.3-11.9)] with better survival. Conclusions: Elderly patients have a lower survival rate. The occurrence of bystander CPR in cardiac arrest remains alarmingly low. Shockable initial rhythm is associated with a better survival rate and neurological outcome compared with non-shockable rhythm.

2. Medicina (Kaunas). 2023 Sep 24;59(10):1708. doi: 10.3390/medicina59101708.
A Motorcycle Paramedic Increases the Survival Rate of Patients after OHCA.
Škufca Sterle M(1)(2), Podbregar M(1)(3).
ABSTRACT
Background and Objectives: Despite advancements in modern medicine, the survival rate of patients after out-of-hospital cardiac arrest (OHCA) remains low. The proportion of OHCA patients who could be saved under ideal circumstances is unknown. A significant portion of patients experience cardiac arrest due to irreversible conditions. The survival of patients with reversible causes depends on the prompt initiation of basic life support (BLS) and early defibrillation. In order to increase the chances of survival, the motorcycle paramedic (MP) project was implemented in Ljubljana in 2003. The MP is equipped with an AED. In the case of OHCA with a shockable rhythm, he performs defibrillation before the arrival of the emergency medical team (EMT). The aim of this study was to evaluate whether the MP, by reducing response times to OHCA patients, increases the survival and outcome of these patients compared to the EMT. Materials and Methods: A retrospective analysis of OHCA cases within the area covered by Ljubljana Emergency Medical Service (EMS) was conducted for the period from January 2003 to December 2022. Instances where the MP arrived at the scene before the EMT were considered MP interventions and classified as the MP group; all other interventions were classified as the EMT group. Results: Between January 2003 and December 2022, the EMT performed resuscitation on 3352 patients. In 316 cases, the MP was simultaneously activated and arrived at the scene before the EMT. The response time in the MP group was shorter compared to the EMT group (7.7 ± 4.1 min vs. 9.9 ± 6.5 min, $p < 0.001$). In 16 patients, return of spontaneous circulation (ROSC) was achieved before the arrival of the EMT. The MP group had a higher ROSC rate, a larger proportion of patients were discharged from the hospital and there were more patients with a good neurological outcome compared to the EMT group (44.3% vs. 36.9%, $p = 0.009$; 18.7% vs. 13.0%, $p = 0.005$; 15.9% vs. 10.6%, $p = 0.004$, respectively). Conclusion: This study has demonstrated that the implementation of the MP into the EMS in Ljubljana has resulted in shorter response times, an increased survival rate and improved neurological outcome for OHCA patients.

3. Resusc Plus. 2023 Oct 20;16:100487. doi: 10.1016/j.resplu.2023.100487. eCollection 2023 Dec.
Comparison of instructor-led compression-only cardiopulmonary resuscitation and automated external defibrillator training for secondary school students: A multicenter noninferiority randomized trial.

Yeung CY(1), So KY(1), Cheung HHT(2), Hou PY(2), Ko HF(1)(2), Lee A(2); Hong Kong CO-CPRAED Instructors and Assessors Group.

ABSTRACT

BACKGROUND: Many barriers exist to the wider and sustainable implementation of basic life support (BLS) training in secondary schools. Whether trained teacher instructors are not worse than healthcare instructors by 20% (noninferiority margin) of simulated BLS skills for secondary school students is unclear. METHODS: We conducted a two-armed, parallel, noninferiority, blinded, randomized controlled trial at four secondary schools in Hong Kong after teachers had undergone BLS training. Students were randomized to either the trained teacher or healthcare instructor group for the 2-hour compression-only cardiopulmonary resuscitation and automated external defibrillator (CO-CPRAED) course. The assessors for the students' BLS skill performance six months after the CO-CPRAED course were blinded. RESULTS: Of the 33 trained teachers, 13 (39.4%) volunteered to be instructors for the CO-CPRAED course. Three hundred and eleven students (median age: 15 years, 67% males) were randomized to either the teacher (n = 161) or healthcare (n = 150) instructor group. The BLS skill performance passing rate (%) at six months was high in both instructor groups (teacher: 88% versus healthcare: 91%; mean difference: -3%, 95% CI: -11% to 5%; P = 0.22). The students' knowledge levels remained high (>90%) and were similar between instructor groups at six months (P = 0.91). The teachers' willingness to teach BLS to students was mildly positive. However, the students were extremely positive towards learning and performing BLS. CONCLUSIONS: A brief 2-hour CO-CPRAED intervention by trained teachers was noninferior to healthcare instructors and it was associated with students' very positive attitudes towards CPR, and retention of knowledge and BLS skills.

4. J Am Coll Cardiol. 2023 Oct 31;82(18):1777-1788. doi: 10.1016/j.jacc.2023.08.036.

Public Out-of-Hospital Cardiac Arrest in Residential Neighborhoods.

Juul Grabmayr A(1), Folke F(2), Tofte Gregers MC(3), Kollander L(3), Bo N(3), Andelius L(4), Jensen TW(4), Ettl F(5), Krammel M(6), Sulzgruber P(7), Krychtiuk KA(8), Torp-Pedersen C(9), Kjær Ersbøll A(10), Malta Hansen C(11).

ABSTRACT

BACKGROUND: Although one-half of all public out-of-hospital cardiac arrests (OHCAs) occur outside private homes in residential neighborhoods, their characteristics and outcomes remain unexplored. OBJECTIVES: The authors assessed interventions before ambulance arrival and survival for public OHCA patients in residential neighborhoods. METHODS: Public OHCAs from Vienna (2018-2021) and Copenhagen (2016-2020) were designated residential neighborhoods or nonresidential areas. Interventions (cardiopulmonary resuscitation [CPR], automated external defibrillator [AED] attached, and defibrillation) and 30-day survival were compared using a generalized estimation equation model adjusted for age and time of day and presented as ORs. RESULTS: We included 1,052 and 654 public OHCAs from Vienna and Copenhagen, respectively, and 68% and 55% occurred in residential neighborhoods, respectively. The likelihood of CPR, defibrillation, and survival in residential neighborhoods vs nonresidential areas (reference) were as follows: CPR Vienna, 73% vs 78%, OR: 0.78 (95% CI: 0.57-1.06), CPR Copenhagen, 83% vs 90%, OR: 0.54 (95% CI: 0.34-0.88), and CPR combined, 76% vs 84%, OR: 0.70 (95% CI: 0.53-0.90); AED attached Vienna, 36% vs 44%, OR: 0.69 (95% CI: 0.53-0.90), AED attached Copenhagen, 21% vs 43%, OR: 0.33 (95% CI: 0.24-0.48), and AED attached combined, 31% vs 44%, OR: 0.53 (95% CI: 0.42-0.65); defibrillation Vienna, 14% vs 20%, OR: 0.61 (95% CI: 0.43-0.87), defibrillation Copenhagen, 16% vs 36%, OR: 0.35 (95% CI: 0.24-0.51), and defibrillation combined, 15% vs 27%, OR: 0.46 (95% CI: 0.36-0.61); and 30-day survival rate Vienna, 21% vs 26%, OR: 0.84 (95% CI: 0.58-1.20), 30-day survival rate Copenhagen, 33% vs 44%, OR: 0.65 (95% CI: 0.47-0.90), and 30-day survival rate combined, 25% vs 36%, OR: 0.73 (95% CI: 0.58-0.93).

CONCLUSIONS: Two-thirds of public OHCAs occurred in residential neighborhoods with fewer resuscitative efforts before ambulance arrival and lower survival than in nonresidential areas. Targeted efforts to improve early CPR and defibrillation for public OHCA patients in residential neighborhoods are needed.

5. Heliyon. 2023 Oct 12;9(10):e20908. doi: 10.1016/j.heliyon.2023.e20908. eCollection 2023 Oct.
Effectiveness of rescue Me CPR! smartphone app providing real-time guidance to untrained bystanders performing CPR.
Marsh-Armstrong BP(1), Seng E(1), Ting-Wei F(1), Saka S(1), Greenberg M(1).
ABSTRACT
BACKGROUND: Out-of-hospital cardiac arrest (OHCA) is a persistent global health challenge, owing, in part, to low rates of population CPR training. Smartphone applications have the potential to widely disseminate CPR basic training to a populace, but other studies have found multiple limitations in previously developed CPR guidance applications (CPR-GA). This study aims to use medical simulation to assess the relative CPR performance of novices using the 'Rescue Me CPR!' (RMC) app, a custom CPR-GA designed by this research team, to novices using 'PG-CPR!' (PGC), the most downloaded CPR-GA available in the USA, and to CPR certified medical personnel. METHODS: In a prospective randomized experimental trial of 60 individuals, subjects were either given the RMC app, the PGC app, or had active CPR certification. They were presented a cardio-pulmonary arrest scenario and were observed while performing CPR on a high-fidelity manikin. Data was collected through four cycles of CPR, during which time 24 pertinent performance metrics and CPR steps were timed and recorded. These metrics were assessed on their own and used to calculate average time to compressions, average chest compression fraction, and rate of high-quality CPR for each study group. RESULTS: CPR certified subjects called 911 in 100 % of simulation cases, started compressions 34 ± 10 s after first seeing the simulated patient, had an average chest compression fraction of 0.52, and performed high-quality CPR in 25 % of aggregate compression cycles. PGC app users called 911 in 70 % of simulation cases, started compressions 86 ± 17 s after first seeing the simulated patient, had an average chest compression fraction that could not be assessed due to inconsistent pauses during CPR, and performed high-quality CPR in 2.5 % of aggregate compression cycles. RMC app users called 911 in 100 % of simulation cases, started compressions 55 ± 6 s after first seeing the simulated patient, had an average chest compression fraction of 0.48, and performed high-quality CPR in 50 % of aggregate compression cycles. CONCLUSION: The results of this study demonstrate that in all studied metrics, except time-to-first-compression, CPR provided by individuals using the RMC app is statistically equivalent or superior to CPR performed by a CPR certified individual and, in almost every metric, superior to CPR performed by users of the most downloaded android CPR guidance application, PG-CPR.

6. Am Heart J. 2023 Oct 21:S0002-8703(23)00295-8. doi: 10.1016/j.ahj.2023.10.003. Online ahead of print.
A randomized trial of expedited intra-arrest transfer versus more extended on-scene resuscitation for refractory Out of Hospital Cardiac Arrest: Rationale and design of the EVIDENCE trial.
Burns B(1), Marschner I(2), Eggins R(3), Buscher H(4), Morton RL(5), Bendall J(6), Keech A(7), Dennis M(8); EVIDENCE Investigators.
ABSTRACT
BACKGROUND: Refractory Out of Hospital Cardiac Arrest (r-OHCA) is common and the benefit versus harm of intra-arrest transport of patients to hospital is not clear. OBJECTIVE: To assess the rate of survival to hospital discharge in adult patients with r-OHCA, initial rhythm pulseless ventricular tachycardia (VT)/ventricular fibrillation (VF) or Pulseless Electrical Activity (PEA) treated with 1 of 2

locally accepted standards of care: (1) expedited transport from scene; or (2) ongoing advanced life support (ALS) resuscitation on-scene. HYPOTHESIS: We hypothesize that expedited transport from scene in r-OHCA improves survival with favourable neurological status/outcome. METHODS/DESIGN: Phase III, multi-center, partially blinded, prospective, intention-to-treat, safety and efficacy clinical trial with contemporaneous registry of patient ineligible for the clinical trial. Eligible patients for inclusion are adults with witnessed r-OHCA; estimated age 18-70, assumed medical cause with immediate bystander cardiopulmonary resuscitation (CPR); initial rhythm of VF/pulseless VT, or PEA; no return of spontaneous circulation following 3 shocks and/or 15 minutes of professional on-scene resuscitation; with mechanical CPR available. Two hundred patients will be randomized in a 1:1 ratio to either expedited transport from scene or ongoing ALS at the scene of cardiac arrest. SETTING: Two urban regions in NSW Australia. OUTCOMES: Primary: survival to hospital discharge with cerebral performance category (CPC) 1 or 2. Secondary: safety, survival, prognostic factors, use of ECMO supported CPR and functional assessment at hospital discharge and 4 weeks and 6 months, quality of life, healthcare use and cost-effectiveness. CONCLUSIONS: The EVIDENCE trial will determine the potential risks and benefits of an expedited transport from scene of cardiac arrest.

7. J Saudi Heart Assoc. 2023 Oct 25;35(3):244-253. doi: 10.37616/2212-5043.1353. eCollection 2023.
Evaluation of Telephone Cardiopulmonary Resuscitation Performance in Current Practice in Saudi Arabia.
Binhotan M(1)(2)(3), Turnbull J(1), Petley G(1), Aljerian N(4)(5), Altuwaijri M(6).
ABSTRACT
OBJECTIVES: Out-of-hospital cardiac arrest (OHCA) is a global health problem with a low survival rate. Telephone cardiopulmonary resuscitation (T-CPR) guidance by emergency medical services (EMS) dispatchers can improve CPR performance and, consequently, survival rates. Accordingly, the American Heart Association (AHA) has released performance standards for T-CPR in current practice to improve its quality. However, no study has examined T-CPR performance in Saudi Arabia. Therefore, this study aims to evaluate T-CPR performance in the Saudi Arabian EMS system. METHODS: A retrospective observation of OHCA calls in current practice was conducted in Riyadh, Saudi Arabia. OHCA calls were reviewed to identify those that met the selection criteria. Variables collected included return of spontaneous circulation (ROSC), OHCA recognition rate, time from EMS call receipt to location acquisition, to OHCA recognition and to commencement of CPR. RESULTS: A total of 308 OHCA cases were reviewed, and 100 calls were included. ROSC was identified in 10% of the included calls. OHCA was correctly recognized in 62% of the calls. The time to OHCA identification and CPR performance from EMS call receipt were found to be 303 s and 367 s, respectively. CONCLUSION: T-CPR performance in Saudi Arabia is below AHA standards. However, this is similar to what has been reported in the literature. Avoiding any unnecessary call transfer during OHCA calls and prompt identification of callers' locations could improve T-CPR performance.

8. BMC Emerg Med. 2023 Oct 26;23(1):125. doi: 10.1186/s12873-023-00899-3.
Prehospital factors associated with out-of-hospital cardiac arrest outcomes in a metropolitan city: a 4-year multicenter study.
Ahn JY(1), Ryoo HW(2), Moon S(1), Jung H(1), Park J(1), Lee WK(3), Kim JY(4), Lee DE(5), Kim JH(6), Lee SH(7).
ABSTRACT
BACKGROUND: Prehospital factors play a vital role in out-of-hospital cardiac arrest (OHCA) survivability, and they vary between countries and regions. We investigated the prehospital factors associated with OHCA outcomes in a single metropolitan city in the Republic of Korea. METHODS: This study included adult medical OHCA patients enrolled prospectively, using data from the

citywide OHCA registry for patients registered between 2018 and 2021. The primary outcome was survival to hospital discharge. Multivariable logistic regression analysis was conducted to determine the factors associated with the study population's clinical outcomes, adjusting for covariates. We performed a sensitivity analysis for clinical outcomes only for patients without prehospital return of spontaneous circulation prior to emergency medical service departure from the scene. RESULTS: In multivariable logistic regression analysis, older age (odds ratio [OR] 0.96; 95% confidence interval [CI] 0.95-0.97), endotracheal intubation (adjusted odds ratio [aOR] 0.29; 95% [CIs] 0.17-0.51), supraglottic airway (aOR 0.29; 95% CI 0.17-0.51), prehospital mechanical chest compression device use (OR 0.13; 95% CI 0.08-0.18), and longer scene time interval (OR 0.96; 95% CI 0.93-1.00) were negatively associated with survival. Shockable rhythm (OR 24.54; 95% CI 12.99-42.00), pulseless electrical activity (OR 3.11; 95% CI 1.74-5.67), and witnessed cardiac arrest (OR 1.59; 95% CI 1.07-2.38) were positively associated with survival. In the sensitivity analysis, endotracheal intubation, supraglottic airway, prehospital mechanical chest compression device use, and longer scene time intervals were associated with significantly lower survival to hospital discharge. CONCLUSIONS: Regional resuscitation protocol should be revised based on the results of this study, and modifiable prehospital factors associated with lower survival of OHCA should be improved.

9. Healthcare (Basel). 2023 Oct 13;11(20):2729. doi: 10.3390/healthcare11202729.
Predictors, Prevalence, and Clinical Outcomes of Out-of-Hospital Cardiac Arrests in Croatia: A Nationwide Study.
Vazanic D(1)(2)(3), Kurtovic B(3)(4), Balija S(1), Milosevic M(5), Brborovic O(5).
ABSTRACT
BACKGROUND: Out-of-hospital cardiac arrest (OHCA) remains a pivotal health challenge globally. In Croatia, there has been a knowledge gap regarding the prevalence, predictors, and outcomes of OHCA patients. This study aims to determine the prevalence, prediction, and outcomes of OHCA patients in Croatia. METHODS: An extensive one-year analysis was performed on all OHCA treated by the Emergency Medical Service in Croatia, based on the Utstein recommendations. Data were extracted from Croatian Institute of Emergency Medicine databases, focusing on adult individuals who experienced sudden cardiac arrest in out-of-hospital settings in Croatia. RESULTS: From 7773 OHCA cases, 9.5% achieved spontaneous circulation pre-hospital. Optimal outcomes corresponded to EMS intervention within ≤13 min post-arrest onset AUC = 0.577 (95% CI: 0.56-0.59; $p < 0.001$) and female gender OR = 1.81 (95% CI: 1.49-2.19; $p < 0.001$). Northern Croatia witnessed lower success rates relative to the capital city Zagreb OR = 0.68 (95% CI: 0.50-0.93; $p = 0.015$). CONCLUSIONS: Early intervention by EMS, specifically within a 13-min period following the onset of a cardiac arrest, significantly enhances the probability of achieving successful OHCA outcomes. Gender differences and specific initial heart rhythms further influenced the likelihood of successful outcomes. Regional disparities, with reduced success rates in northern Croatia compared to the City of Zagreb, were evident.

10. Resuscitation. 2023 Oct 25:110017. doi: 10.1016/j.resuscitation.2023.110017. Online ahead of print.
Ethnic Differences of the care pathway following an Out-of-Hospital Cardiac Event: a Systematic Review.
Newport R(1), Grey C(2), Dicker B(3), Ameratunga S(4), Harwood M(4).
ABSTRACT
AIM: This systematic review aimed to determine to what extent and why the care pathways for acute cardiac events in the community might differ for minoritised ethnic populations compared to non-minoritised populations. It also sought to identify the barriers and enablers that could influence

variations in access to care for minoritised populations. METHODS: A multi-database search was conducted for articles published between 1 January 2000 and 1 January 2023. A combination of MeSH terms and keywords was used. Inclusion criteria for papers were published in English, adult population, the primary health condition was an acute cardiac event, and the primary outcomes were disaggregated by ethnicity or race. A narrative review of extracted data was performed, and findings were reported according to the PRISMA 2020 guidelines. RESULTS: Of the 3552 articles identified using the search strategy, 40 were deemed eligible for the review. Studies identified a range of variables in the care pathway that differed by ethnicity or race. These could be grouped as time to care, transportation, event related-variables, EMS interactions and symptoms. A meta-analysis was not performed due to heterogeneity across the studies. CONCLUSION: The extent and reasons for differences in cardiac care pathways are considerable. There are several remediable barriers and enablers that require attention to achieve equitable access to care for minoritised populations.

11. Sci Rep. 2023 Oct 23;13(1):18065. doi: 10.1038/s41598-023-44963-1.
Telephone-based evaluation of cognitive impairment and mood disorders in cardiac arrest survivors with good neurologic outcomes: a retrospective cohort study.
Kim JS(1), Kim YJ(1), Ryoo SM(1), Ahn S(1), Kim WY(2).
ABSTRACT
This study determined the occurrence of cognitive impairment and mood disorders in out-of-hospital cardiac arrest (OHCA) survivors with good neurologic outcomes. We performed a retrospective, cross-sectional, single-center study with a total of 97 patients. We evaluated cognitive dysfunction via the Montreal Cognitive Assessment and Alzheimer's disease-8 mood disorders via the Patient Health Questionnaire-9 and the Hospital Anxiety and Depression Scale. We measured quality of life with the European Quality of Life 5-Dimension 5-Levels questionnaire. Cognitive impairment and mood disorders were common among patients with good neurologic recovery. There were 23 patients who experienced cognitive impairments (23.7%) and 28 who suffered from mood disorders (28.9%). Age (adjusted OR 1.07, 95% CI 1.02-1.12), mood disorders (adjusted OR 22.80, 95% CI 4.84-107.49) and hospital length of stay (adjusted OR 1.05, 95% CI 1.02-1.09) were independent risk factors for cognitive impairment. The occurrence of cognitive impairments (adjusted OR 9.94, 95% CI 2.83-35.97) and non-cardiac causes of cardiac arrest (adjusted OR 11.51, 95% CI 3.15-42.15) were risk factors for mood disorders. Quality of life was significantly lower in the OHCA survivors with each disorder than the healthy individuals. Routine screening and intervention are needed for OHCA survivors.

12. Br Dent J. 2023 Oct;235(8):607-612. doi: 10.1038/s41415-023-6388-2. Epub 2023 Oct 27.
Dental students' attitudes on cardiopulmonary resuscitation training via virtual reality: an exploratory study.
Bjelovucic R(1), Bak J(2), Wolff J(3), Taneja P(4).
ABSTRACT
Purpose Resuscitation guidelines have advocated the use of virtual learning as a form of pre-course e-learning. Virtual reality (VR) has been identified to provide a method of constructive learning with instant feedback. There are increasing publications of VR use in cardiopulmonary resuscitation (CPR) training; however, there is a dearth from the dental profession. Therefore, the aim of this exploratory study was to investigate dental students' opinions in CPR training using VR.Methods In total, 120 dental students undertook both conventional (manikin) and VR CPR training in a cross-over design. The VR scenario was in a hospital setting. Following, students completed a questionnaire evaluating their experiences.Results The majority of students (n = 88) reported that

this was the first time that they had utilised VR. The experience of using VR in CPR training was rated as very good. Most students felt that the inclusion of VR in CPR training created a better learning experience and had a high learning potential. However, the hospital setting was not entirely relevant.Conclusion Dental students recommended that VR CPR training should be used as an adjunct to conventional training in dental education, but the VR scenario would benefit being a virtual dental environment.

13. Scand J Trauma Resusc Emerg Med. 2023 Oct 24;31(1):59. doi: 10.1186/s13049-023-01132-7.
Influence of high altitude after a prior ascent on physical exhaustion during cardiopulmonary resuscitation: a randomised crossover alpine field experiment.
Niederer M(1)(2)(3), Tscherny K(1)(3), Burger J(2)(4), Wandl B(3)(5), Fuhrmann V(3), Kienbacher CL(3), Schreiber W(3), Herkner H(3), Roth D(6), Egger A(1)(2).
ABSTRACT
BACKGROUND: Performing cardiopulmonary resuscitation (CPR) inevitably causes significant physical, as well as psychological stress for rescuers. Physical activity at high altitude, a hypobaric and hypoxic environment, similarly adds to the level of stress and causes multiple physiological changes. Continuous measurement of pulse rate serves as an objective measure of fatigue during CPR. We therefore aimed to investigate rescuers' heart rates as a measure of physical strain during CPR in a high-altitude alpine environment to provide a better understanding of the physiological changes under these very special conditions. METHODS: Twenty experienced mountaineers performed basic life support (BLS) on a manikin for 16 min, both at baseline altitude and at high altitude (3454 m) following a quick and exhausting ascent over 1200 m. Sequence of scenarios was randomised for analysis. Heart rate was continuously measured and compared between baseline and high altitude by absolute differences and robust confidence intervals. RESULTS: During CPR at baseline, the average heart rate increased from 87 bpm (SD 16 bpm) to 104 bpm [increase 17 bpm (95% CI 8.24-24.76)], compared to an increase from 119 bpm (SD 12 bpm) to 124 bpm [increase 5 bpm (95% CI - 1.59 to 12.19)] at high altitude [difference between two groups 32 bpm (95% CI 25-39)]. Differences between periods of chest compressions and ventilations were very similar at baseline [19 bpm (95%CI 16.98-20.27)] and at high altitude [20 bpm 95% CI 18.56-21.44)], despite starting from a much higher level at high altitude. The average heart rates of rescuers at high altitude at any point were higher than those at baseline at any other point. CONCLUSION: Performing BLS CPR causes exhaustion both at base level and at a high altitude. A further increase during CPR might imply a physiological reserve for adapting to additional physical exertion at high altitude. Phases of ventilation are much needed recovery-periods, but heart rates remain very high. Subjective measures of exhaustion, such as the BORG-scale, might lead to rescuers' overestimation of their own performance.

POST-CARDIAC ARREST TREATMENTS

1. Curr Cardiol Rep. 2023 Oct 24. doi: 10.1007/s11886-023-01980-w. Online ahead of print.
Indications for Cardiac Catheterization and Percutaneous Coronary Intervention in Patients with Resuscitated Out-of-Hospital Cardiac Arrest.
Sarma D(1), Jentzer JC(2).
ABSTRACT
PURPOSE OF REVIEW: The role of emergent cardiac catheterization after resuscitated out-of-hospital cardiac arrest (OHCA) has evolved based on recent randomized evidence. This review aims to discuss the latest evidence and current indications for emergent coronary angiography (CAG) andmechanical circulatory support (MCS) use following OHCA. RECENT FINDINGS: In contrast to previous

observational data, recent RCTs evaluating early CAG in resuscitated OHCA patients without ST elevation have uniformly demonstrated a lack of benefit in terms of survival or neurological outcome. There is currently no randomized evidence supporting MCS use specifically in patients with resuscitated OHCA and cardiogenic shock. Urgent CAG should be considered in all patients with ST elevation, recurrent electrical or hemodynamic instability, those who are awake following resuscitated OHCA, and those receiving extracorporeal cardiopulmonary resuscitation (ECPR). Recent evidence suggests that CAG may be safely delayed in hemodynamically stable patients without ST-segment elevation following resuscitated OHCA.

2. Crit Care. 2023 Oct 27;27(1):410. doi: 10.1186/s13054-023-04704-2.
Serial assessments of cardiac output and mixed venous oxygen saturation in comatose patients after out-of-hospital cardiac arrest.
Grand J(1)(2), Hassager C(3)(4), Schmidt H(5), Mølstrøm S(5), Nyholm B(3), Høigaard HF(5), Dahl JS(6)(7), Meyer M(3), Beske RP(3), Obling L(3), Kjaergaard J(3)(4), Møller JE(3)(6)(7).
ABSTRACT
AIM: To assess the association with outcomes of cardiac index (CI) and mixed venous oxygen saturation (SvO2) in comatose patients resuscitated from out-of-hospital cardiac arrest (OHCA). METHODS: In the cohort study of 789 patients included in the "BOX"-trial, 565 (77%) patients were included in this hemodynamic substudy (age 62 ± 13 years, male sex 81%). Pulmonary artery catheters were inserted shortly after ICU admission. CI and SvO2 were measured as soon as possible in the ICU and until awakening or death. The endpoints were all-cause mortality at 1 year and renal failure defined as need for renal replacement therapy. RESULTS: First measured CI was median 1.7 (1.4-2.1) l/min/m2, and first measured SvO2 was median 67 (61-73) %. CI < median with SvO2 > median was present in 222 (39%), and low SvO2 with CI < median was present in 59 (11%). Spline analysis indicated that SvO2 value < 55% was associated with poor outcome. Low CI at admission was not significantly associated with mortality in multivariable analysis (p = 0.14). SvO2 was significantly inversely associated with mortality (hazard ratioadjusted: 0.91 (0.84-0.98) per 5% increase in SvO2, p = 0.01). SvO2 was significantly inversely associated with renal failure after adjusting for confounders (ORadjusted: 0.73 [0.62-0.86] per 5% increase in SvO2, p = 0.001). The combination of lower CI and lower SvO2 was associated with higher risk of mortality (hazard ratio adjusted: 1.54 (1.06-2.23) and renal failure (ORadjusted: 5.87 [2.34-14.73]. CONCLUSION: First measured SvO2 after resuscitation from OHCA was inversely associated with mortality and renal failure. If SvO2 and CI were below median, the risk of poor outcomes increased significantly.

3. Acta Anaesthesiol Scand. 2023 Oct 24. doi: 10.1111/aas.14337. Online ahead of print.
Outcome prediction in comatose cardiac arrest patients with initial shockable and non-shockable rhythms.
Wimmer H(1)(2), Stensønes SH(3), Benth JŠ(2)(4), Lundqvist C(2)(4)(5), Andersen GØ(6), Draegni T(7), Sunde K(2)(8), Nakstad ER(1).
ABSTRACT
BACKGROUND: Prognosis after out-of-hospital cardiac arrest (OHCA) is presumed poorer in patients with non-shockable than shockable rhythms, frequently leading to treatment withdrawal. Multimodal outcome prediction is recommended 72 h post-arrest in still comatose patients, not considering initial rhythms. We investigated accuracy of outcome predictors in all comatose OHCA survivors, with a particular focus on shockable vs. non-shockable rhythms. METHODS: In this observational NORCAST sub-study, patients still comatose 72 h post-arrest were stratified by shockable vs. non-shockable rhythms for outcome prediction analyzes. Good outcome was defined as cerebral performance category 1-2 within 6 months. False positive rate (FPR) was used for poor and sensitivity for good outcome prediction accuracy. RESULTS: Overall, 72/128 (56%) patients with shockable and 12/50 (24%) with non-shockable rhythms had good outcome (p < .001). For poor outcome prediction, absent pupillary light reflexes (PLR) and corneal reflexes (clinical predictors)

72 h after sedation withdrawal, PLR 96 h post-arrest, and somatosensory evoked potentials (SSEP), all had FPR <0.1% in both groups. Unreactive EEG and neuron-specific enolase (NSE) >60 μg/L 24-72 h post-arrest had better precision in shockable patients. For good outcome, the clinical predictors, SSEP and CT, had 86%-100% sensitivity in both groups. For NSE, sensitivity varied from 22% to 69% 24-72 h post-arrest. The outcome predictors indicated severe brain injury proportionally more often in patients with non-shockable than with shockable rhythms. For all patients, clinical predictors, CT, and SSEP, predicted poor and good outcome with high accuracy. CONCLUSION: Outcome prediction accuracy was comparable for shockable and non-shockable rhythms. PLR and corneal reflexes had best precision 72 h after sedation withdrawal and 96 h post-arrest.

4. Zhonghua Wei Zhong Bing Ji Jiu Yi Xue. 2023 Oct;35(10):1009-1025. doi: 10.3760/cma. j.cn121430-20230806-00582.

[Expert consensus for diagnosis and treatment of post-cardiac arrest syndrome in adults by combining traditional Chinese and Western medicine in China (2023)].

[Article in Chinese]

Emergency Medicine Professional Committee Of The Chinese Society Of Integrated Chinese And Western Medicine(1), Key Laboratory Of Critical Illness Emergency Medicine Of The National Health Commission, Li H, Li Y, Chen M, Fu R, Ding B.

ABSTRACT

Reperfusion injury occurs after return of spontaneous circulation (ROSC) in patients with cardiac arrest (CA), which leads to multiple organ dysfunction, called post-cardiac arrest syndrome (PCAS). PCAS is closely related to the prognosis of CA patients, and is an independent risk factor of survival. Integrated traditional Chinese and Western medicine diagnosis and treatment is critical for improving prognosis of PCAS. In order to guide and standardize integrated traditional Chinese and Western medicine diagnosis and treatment in PCAS among clinicians, nurses and research personnel in China, the Emergency Medicine Professional Committee of the Chinese Society of Integrated Chinese and Western Medicine has established an expert group to determine 14 clinical issues related to the diagnosis and treatment of PCAS with integrated traditional Chinese and Western medicine through clinical survey. The working group formulates a search strategy for each clinical issue according to the PICO principle. Chinese and English literature were searched from CNKI, Wanfang, VIP, SinoMed, PubMed, Embase, and Cochrane Library. The grade of recommendations assessment, development and evaluation (GRADE) were used to form the level of evidence and recommendation. When the literature evidence was insufficient, the recommendations and level of recommendation were formed after expert discussion. Combined with the aspects of generalizability, suitability, and resource utilization, the expert consensus developed 28 recommendations around the 14 aspects of three stages of PCAS, including early circulation, respiratory support and reversible cause relief, mid-term neuroprotection, improvement of coagulation, prevention and treatment of infection, kidney and gastrointestinal protection and blood sugar control, post rehabilitation treatment, providing references for the integrated traditional Chinese and Western medicine of the diagnosis and treatment for PCAS.

5. Clin Cardiol. 2023 Oct 24. doi: 10.1002/clc.24175. Online ahead of print.

The impacts of anemia burden on clinical outcomes in patients with out-of-hospital cardiac arrest.

Ho IW(1), Kuo MJ(1)(2), Hsu PF(1)(2)(3), Lee IH(4), Hsu TF(4), Lin YJ(1)(2)(5), Huang CC(1)(2)(6).

ABSTRACT

BACKGROUND: Out-of-hospital cardiac arrest (OHCA) has low survival rates, and few patients achieve a desirable neurological outcome. Anemia is common among OHCA patients and has been linked to worse outcomes, but its impact following the return of spontaneous circulation (ROSC) is unclear. This study examines the relationship between anemia burden and clinical outcomes in OHCA patients.HYPOTHESIS: Higher anemia burden after ROSC may be related to higher mortality

and worse neurologic outcomes. METHODS: Patients who experienced OHCA and had ROSC were enrolled retrospectively. Anemia burden was defined as the area under curve from the target hemoglobin level over a 72-h period after OHCA. Hemoglobin level was measured at 12-h intervals. The clinical outcomes of the study included mortality and neurological outcomes at Day 30. RESULTS: The study enrolled 258 nontraumatic OHCA patients who achieved ROSC between January 2017 and December 2021. Among the 162 patients who survived more than 72 h, a higher anemia burden, specifically target hemoglobin levels below 7 (hazard ratio [HR]: 1.129, 95% confidence interval [CI]: 1.013-1.259, p = .029), 8 (HR: 1.099, 95% CI: 1.014-1.191, p = .021), and 9 g/dL (HR: 1.066, 95% CI: 1.001-1.134, p = .046) was associated with higher 30-day mortality. Additionally, anemia burden with target hemoglobin levels below 7 (HR: 1.129, 95% CI: 1.016-1.248; p = .024) and 8 g/dL (HR: 1.088; 95% CI: 1.008-1.174, p = .031) was linked to worse neurological outcomes. CONCLUSIONS: Anemia burden predicts 30-day mortality and neurological outcomes in OHCA patients who survive more than 72 h. Maintaining higher hemoglobin levels within the first 72 h after ROSC may improve short-term outcomes.

TARGETED TEMPERATURE MANAGEMENT

1. Brain Sci. 2023 Sep 26;13(10):1373. doi: 10.3390/brainsci13101373.

Differences in Cerebral Metabolism between Moderate- and High-Severity Groups of Patients with Out-of-Hospital Cardiac Arrest Undergoing Target Temperature Management.

You Y(1)(2), Kang C(1)(2), Jeong W(1)(2), Ahn HJ(1)(2), Park JS(1)(2), Min JH(2)(3), In YN(2)(3), Lee JK(4), Jeon SY(1)(2).

ABSTRACT

The aim of this study was to investigate the differences in cerebral metabolism and the prognostic value of cerebrospinal fluid (CSF) lactate 24 h after the return of spontaneous circulation (ROSC) in patients with out-of-hospital cardiac arrest (OHCA). CSF lactate and pyruvate levels were measured immediately and every 2 h for 24 h after the ROSC. The distribution of cerebral mitochondrial dysfunction (MD) and cerebral ischemia was also evaluated. In the moderate-severity group, the absence of cerebral MD or ischemia was observed in six patients (40.0%) immediately after ROSC and in nine patients (60.0%) 24 h after the ROSC. In the high-severity group, the absence of cerebral MD or ischemia was observed in four patients (30.8%) immediately after ROSC and in three patients (23.1%) 24 h after the ROSC. The distribution of cerebral metabolism over time varied depending on the severity of the OHCA. The predictive value of CSF lactate levels for a poor neurological prognosis was better for patients in the moderate-severity group than for the overall patient cohort. Therefore, the severity in the patients with OHCA should be considered when studying cerebral metabolism or using CSF lactate as a prognostic tool.

2. Resuscitation. 2023 Oct 25:110018. doi: 10.1016/j.resuscitation.2023.110018. Online ahead of print.

Effect of adjuvant Thiamine and Ascorbic acid administration on the neurologic outcomes of out-of-hospital cardiac arrest patients: a before-and-after study.

Kim YJ(1), Jin Lee Y(2), Hwan Kim Y(3), Young Kim W(4).

ABSTRACT

AIM: This study aimed to evaluate the impact of early thiamine and ascorbic acid administration on the neurologic outcome in out-of-hospital cardiac arrest (OHCA) patients treated with targeted temperature management (TTM). METHODS: This before-and-after cohort study used data extracted from two hospitals of the Korean Hypothermia Network prospective registry. The treatment group incorporated patients enrolled from December 2019 to May 2021, that received intravenous thiamine (200 mg) and ascorbic acid (3 g) at 12-hour intervals for a total of six doses. The control

group incorporated those enrolled from May 2018 to November 2019. The one-month good neurologic outcome, defined as a Cerebral Performance Category score ≤ 2, between the groups was evaluated using inverse probability of treatment weighting (IPTW). RESULTS: Among the 234 OHCA survivors with TTM, 102 were included in the treatment group and 132 were included in the control group. The one-month (31.4% vs. 29.5%, respectively; P = 0.76) good neurologic outcome rates did not differ between the treatment and control groups. After adjusting using the IPTW, vitamin supplementation was not associated with good neurologic outcome (odds ratio [OR], 1.134; 95% confidence interval [CI], 0.644-1.999; P = 0.66). In subgroup analysis, vitamin administration was significantly associated with a good neurologic outcome in older (≥65 years) patients (adjusted OR, 5.53; 95% CI, 1.21-25.23; P = 0.03). CONCLUSION: Adjuvant thiamine and ascorbic acid administration in OHCA survivors with TTM did not improve their neurologic outcome after one month. Further clinical trials are warranted.

ELECTROPHYSIOLOGY AND DEFIBRILLATION

No articles identified.

PEDIATRICS AND CHILDREN

1. Perfusion. 2023 Oct 24:2676591231210452. doi: 10.1177/02676591231210452. Online ahead of print.

Pediatric extracorporeal cardiopulmonary resuscitation for yew cardiotoxicity.

Daniels Z(1), Hays H(2), Carrillo S(1), Kamp A(1), Gauntt J(1).

ABSTRACT

INTRODUCTION: English yew is an evergreen conifer frequently planted in household gardens and, when ingested in large doses, results in severe cardiotoxicity characterized by difficult to control ventricular arrhythmias with high rates of mortality. CASE REPORT: A previously healthy teenage female presented as an out-of-hospital cardiac arrest with refractory ventricular arrhythmias and severe biventricular dysfunction. Due to rapid deterioration in her clinical status, she was cannulated onto venoarterial extracorporeal membrane oxygenation (ECMO) which resulted in rapid normalization of her rhythm and ventricular function. DISCUSSION: Our case highlights the importance of keeping a broad differential diagnosis when considering etiologies of ventricular arrhythmias in the pediatric population. The final diagnosis was not made until after discharge and implantable cardiac defibrillator (ICD) placement. CONCLUSION: The delayed diagnosis of this intentional English yew ingestion ultimately resulted subsequent ICD removal. Early ECMO activation in cases of English yew toxicity can be essential for patient survival.

2. Eur J Pediatr. 2023 Oct 27. doi: 10.1007/s00431-023-05301-9. Online ahead of print.

Sudden cardiac arrest in infants and children: proposal for a diagnostic workup to identify the etiology. An 18-year multicenter evaluation in the Netherlands.

Bakker AM(1), Albrecht M(#)(2), Verkaik BJ(3), de Jonge RCJ(2), Buysse CMP(2), Blom NA(4)(5), Rammeloo LAJ(4)(5), Verhagen JMA(6), Riedijk MA(7), Yap SC(8), Tan HL(3)(9), Kammeraad JAE(10).

ABSTRACT

Sudden cardiac arrest (SCA) studies are often population-based, limited to sudden cardiac death, and excluding infants. To guide prevention opportunities, it is essential to be informed of pediatric SCA etiologies. Unfortunately, etiologies frequently remain unresolved. The objectives of this study were to determine paediatric SCA etiology, and to evaluate the extent of post-SCA investigations and

to assess the performance of previous cardiac evaluation in detecting conditions predisposing to SCA. In a retrospective cohort (2002-2019), all children 0-18 years with out-of-hospital cardiac arrest (OHCA) referred to Erasmus MC Sophia Children's Hospital or the Amsterdam UMC (tertiary-care university hospitals), with cardiac or unresolved etiologies were eligible for inclusion. SCA etiologies, cardiac and family history and etiologic investigations in unresolved cases were assessed. The etiology of arrest could be determined in 52% of 172 cases. Predominant etiologies in children ≥ 1 year (n = 99) were primary arrhythmogenic disorders (34%), cardiomyopathies (22%) and unresolved (32%). Events in children < 1 year (n = 73) were largely unresolved (70%) or caused by cardiomyopathy (8%), congenital heart anomaly (8%) or myocarditis (7%). Of 83 children with unresolved etiology a family history was performed in 51%, an autopsy in 51% and genetic testing in 15%. Pre-existing cardiac conditions presumably causative for SCA were diagnosed in 9%, and remained unrecognized despite prior evaluation in 13%. CONCLUSION: SCA etiology remained unresolved in 83 of 172 cases (48%) and essential diagnostic investigations were often not performed. Over one-fifth of SCA patients underwent prior cardiac evaluation, which did not lead to recognition of a cardiac condition predisposing to SCA in all of them. The diagnostic post-SCA approach should be improved and the proposed standardized pediatric post-SCA diagnostics protocol may ensure a consistent and systematic evaluation process increasing the diagnostic yield. WHAT IS KNOWN: • Arrests in infants remain unresolved in most cases. In children > 1 year, predominant etiologies are primary arrhythmia disorders, cardiomyopathy and myocarditis. • Studies investigating sudden cardiac arrest are often limited to sudden cardiac death (SCD) in 1 to 40 year old persons, excluding infants and successfully resuscitated children. WHAT IS NEW: • In patients with unresolved SCA events, the diagnostic work up was often incompletely performed. • Over one fifth of victims had prior cardiac evaluation before the arrest, with either a diagnosed cardiac condition (9%) or an unrecognized cardiac condition (13%).

3. Children (Basel). 2023 Sep 28;10(10):1621. doi: 10.3390/children10101621.

A Simulation Competition on Neonatal Resuscitation as a New Educational Tool for Pediatric Residents.

Zanetto L(1), Cavallin F(2), Doglioni N(1), Bua B(1), Savino S(3), Bernardo G(4), Pratesi S(5), Villani PE(6), Weiner GM(7), Trevisanuto D(1), On Behalf Of The Task Force On Neonatal Resuscitation Of The Italian Society Of Neonatology.

ABSTRACT

BACKGROUND: Training programs on resuscitation have been developed using simulation-based learning to build skills, strengthen cognitive strategies, and improve team performance. This is especially important for residency programs where reduced working hours and high numbers of residents can reduce the educational opportunities during the residency, with lower exposure to practical procedures and prolonged length of training. Within this context, gamification has gained popularity in teaching and learning activities. This report describes the implementation of a competition format in the context of newborn resuscitation and participants' perceptions of the educational experience. METHODS: Thirty-one teams of three Italian pediatric residents participated in a 3-day simulation competition on neonatal resuscitation. The event included an introductory lecture, familiarization time, and competition time in a tournament-like structure using high-fidelity simulation stations. Each match was evaluated by experts in neonatal resuscitation and followed by a debriefing. The scenarios and debriefings of simulation station #1 were live broadcasted in the central auditorium where teams not currently competing could observe. At the end of the event, participants received an online survey regarding their perceptions of the educational experience. RESULTS: 81/93 (87%) participants completed the survey. Training before the event mostly included reviewing protocols and textbooks. Low-fidelity manikins were the most available simulation tools at

the residency programs. Overall, the participants were satisfied with the event and appreciated the live broadcast of scenarios and debriefings in the auditorium. Most participants felt that the event improved their knowledge and self-confidence and stimulated them to be more involved in high-fidelity simulations. Suggested areas of improvement included more time for familiarization and improved communication between judges and participants during the debriefing. CONCLUSIONS: Participants appreciated the simulation competition. They self-perceived the educational impact of the event and felt that it improved their knowledge and self-confidence. Our findings suggest areas of improvements for further editions and may serve as an educational model for other institutions.

EXTRACORPOREAL LIFE SUPPORT

1. Eur Heart J Acute Cardiovasc Care. 2023 Oct 24:zuad130. doi: 10.1093/ehjacc/zuad130. Online ahead of print.

A Bayesian re-analysis of the INCEPTION-trial.

Heuts S(1)(2), van de Koolwijk AF(3), Gabrio A(4), Ubben JFH(3)(5), van der Horst ICC(2)(3), Delnoij TSR(3), Suverein MM(3), Maessen JG(1)(2), Lorusso R(1)(2), van de Poll MCG(3)(6).

ABSTRACT

BACKGROUND: Previously, we performed the multicenter INCEPTION-trial, randomizing patients with refractory out-of-hospital cardiac arrest to extracorporeal CPR (ECPR) or conventional CPR (CCPR). Frequentist analysis showed no statistically significant treatment effect for the primary outcome; 30-day survival with favorable neurologic outcome (Cerebral Performance Category score 1-2). To facilitate a probabilistic interpretation of the results, we present a Bayesian re-analysis of the INCEPTION-trial. METHODS: We analyzed survival with favorable neurologic outcome at 30 days and 6 months under a minimally informative prior in the intention-to-treat population. Effect sizes are presented as absolute risk differences (ARD) and relative risks (RR), with 95% credible intervals (CrI). We estimated posterior probabilities at various thresholds, including the minimal clinically important difference (5% ARD), based on expert consensus, and performed sensitivity analyses under a skeptical and literature-based priors. RESULTS: The mean ARD for 30-day survival with favorable neurologic outcome was 3.6% (95% CrI -9.5-16.7%), favoring ECPR, with a median RR of 1.22 (95% CrI 0.59-2.51). The posterior probability of a minimal clinically important difference was 42% at 30 days and 42% at 6 months, in favor of ECPR. The probability of any harm at 30 days was 29% and 35% under a minimally-informative and skeptical prior, and <6% under both informative priors. CONCLUSION: Bayesian re-analysis of the INCEPTION-trial estimated a 42% probability of a minimal clinically important difference between ECPR and CCPR in refractory OHCA in terms of 30-day survival with favorable neurologic outcome.

2. Am J Emerg Med. 2023 Oct 21;75:37-41. doi: 10.1016/j.ajem.2023.10.024. Online ahead of print.

Low-flow time and outcomes in out-of-hospital cardiac arrest patients treated with extracorporeal cardiopulmonary resuscitation.

Shoji K(1), Ohbe H(2), Kudo D(1), Tanikawa A(1), Kobayashi M(1), Aoki M(3), Hamaguchi T(4), Nagashima F(5), Inoue A(6), Hifumi T(7), Sakamoto T(8), Kuroda Y(9), Kushimoto S(1); SAVE-J II study group.

ABSTRACT

INTRODUCTION: In out-of-hospital cardiac arrest (OHCA) patients with extracorporeal cardio-pulmonary resuscitation (ECPR), the association between low-flow time, the duration between the initiation of conventional cardiopulmonary resuscitation and the establishment of ECPR, and outcomes has not been clearly determined. METHODS: This was a secondary analysis of the retrospective multicenter registry in Japan. This study registered patients ≥18 years old who were admitted to the emergency department for OHCA and underwent ECPR between January, 2013 and

December, 2018. Low-flow time was defined as the time from initiation of conventional cardiopulmonary resuscitation to the establishment of ECPR, and patients were categorized into two groups according to the visualized association of the restricted cubic spline curve. The primary outcome was survival discharge. Cubic spline analyses and multivariable logistic regression analyses were performed to assess the nonlinear associations between low-flow time and outcomes. RESULTS: A total of 1,524 patients were included. The median age was 60 years, and the median low-flow time was 52 (42-53) mins. The overall survival at hospital discharge and favorable neurological outcomes were 27.8% and 14.2%, respectively. The cubic spline analysis showed a decreased trend of survival discharge rates and favorable neurological outcomes with shorter low-flow time between 20 and 60 mins, with little change between the following 60 and 80 mins. The multivariable logistic regression analyses showed that patients with long low-flow time (>40 mins) compared to those with short low-flow time (0-40 mins) had significantly worse survival (adjusted odds ratio 0.42; 95% confidence intervals, 0.31-0.57) and neurological outcomes (0.65; 0.45-0.95, respectively). CONCLUSIONS: The survival discharge and neurological outcomes of patients with low-flow time shorter than 40 min are better than those of patients with longer low-flow time.

3. Chest. 2023 Oct 23:S0012-3692(23)05667-2. doi: 10.1016/j.chest.2023.10.022. Online ahead of print.

Etiology-based Prognosis of Extracorporeal Cardiopulmonary Resuscitation Recipients After Out-of-hospital Cardiac Arrest: A Retrospective Multicenter Cohort Study.

Takiguchi T(1), Tominaga N(2), Hamaguchi T(2), Seki T(3), Nakata J(4), Yamamoto T(4), Tagami T(5), Inoue A(6), Hifumi T(7), Sakamoto T(8), Kuroda Y(9), Yokobori S(2); SAVE-J II study group(2).

ABSTRACT

BACKGROUND: A better understanding of the relative contributions of various factors to patient outcomes is essential for optimal patient selection for extracorporeal cardiopulmonary resuscitation (ECPR) therapy for patients with out-of-hospital cardiac arrest (OHCA). However, evidence on the prognostic comparison based on the etiologies of cardiac arrest is limited. RESEARCH QUESTION: What is the etiology-based prognosis of patients undergoing ECPR for OHCA? STUDY DESIGN AND METHODS: This retrospective multicenter registry study involved 36 institutions in Japan and included all adult patients with OHCA who underwent ECPR between January 2013 and December 2018. The primary etiology for OHCA was determined retrospectively from all hospital-based data at each institution. We performed a multivariable logistic regression model to determine the association between etiology of cardiac arrest and two outcomes: favorable neurological outcomes and survival at hospital discharge. RESULTS: We identified 1,781 eligible patients, of whom 1,405 (78.9%) had cardiac arrest due to the cardiac causes. Multivariable logistic regression analysis for favorable neurological outcomes showed that accidental hypothermia (adjusted OR = 5.12; 95% CI = 2.98-8.80, P < 0.001) was associated with a significantly higher rate of favorable neurological outcomes than cardiac causes. Multivariable logistic regression analysis for survival showed that accidental hypothermia (adjusted OR = 5.19; 95% CI = 3.15-8.56, P < 0.001) had significantly higher rates of survival than cardiac causes. Acute aortic dissection/aneurysm (adjusted OR = 0.07, 95% CI = 0.02-0.28, P < 0.001) and primary cerebral disorders (adjusted OR = 0.12, 95% CI = 0.03-0.50, P = 0.004) had significantly lower rates of survival than cardiac causes. INTERPRETATION: In this retrospective multicenter cohort study, although most OHCA patients underwent ECPR for cardiac causes, accidental hypothermia was associated with favorable neurological outcomes and survival; in contrast, acute aortic dissection/aneurysm and primary cerebral disorders were associated with non-survival than cardiac causes.

4. Med J Aust. 2023 Oct 23. doi: 10.5694/mja2.52130. Online ahead of print.

Extracorporeal cardiopulmonary resuscitation for refractory cardiac arrest in Australia: a narrative review.

Dennis M(1)(2), Shekar K(3)(4), Burrell AJ(5)(6); National ECPR Working Group.

ABSTRACT
Extracorporeal cardiopulmonary resuscitation (ECPR) in patients with prolonged or refractory out-of-hospital cardiac arrest (OHCA) is likely to be beneficial when used as part of a well developed emergency service system. ECPR is technically challenging to initiate and resource-intensive, but it has been found to be cost-effective in hospital-based ECPR programs. ECPR expansion within Australia has thus far been reactive and does not provide broad coverage or equity of access for patients. Newer delivery strategies that improve access to ECPR for patients with OHCA are being trialled, including networked hospital-based ECPR and pre-hospital ECPR programs. The efficacy, scalability, sustainability and cost-effectiveness of these programs need to be assessed. There is a need for national collaboration to determine the most cost-effective delivery strategies for ECPR provision along with its place in the OHCA survival chain.

5. Anaesthesiologie. 2023 Oct 23. doi: 10.1007/s00101-023-01342-9. Online ahead of print.
[Extracorporeal cardiopulmonary resuscitation-An orientation].
[Article in German; Abstract available in German from the publisher]
Rand A(1), Spieth PM(2).
ABSTRACT
Both in-hospital and out-of-hospital cardiac arrests are associated with a high mortality. In the past survival advantages for patients could be achieved by optimizing the chain of rescue and postresuscitation treatment; however, for patients with refractory cardiac arrest, there have so far been few promising treatment options. For selected patients with refractory cardiac arrest who do not achieve return of spontaneous circulation with conventional cardiopulmonary resuscitation (CPR), extracorporeal (e)CPR using venoarterial extracorporeal membrane oxygenation is an option to improve the probability of survival. This article describes the technical features, important aspects of treatment, and the current data situation on eCPR in patients with in-hospital or out-of-hospital cardiac arrest.

6. Artif Organs. 2023 Sep;47(9):1479-1489. doi: 10.1111/aor.14548. Epub 2023 Apr 28.
Higher mean cerebral oxygen saturation shortly after extracorporeal cardiopulmonary resuscitation in patients who regain consciousness.
Mandigers L(1)(2), den Uil CA(1)(2)(3), Belliato M(4), Raemen H(5), Rossi E(6), van Rosmalen J(7)(8), Rietdijk WJR(9), Melis JR(10), Gommers D(1), van Thiel RJ(1), Dos Reis Miranda D(1).
ABSTRACT
INTRODUCTION: In cardiac arrest, cerebral ischemia and reperfusion injury mainly determine the neurological outcome. The aim of this study was to investigate the relation between the course of cerebral oxygenation and regain of consciousness in patients treated with extracorporeal cardiopulmonary resuscitation (ECPR). We hypothesized that rapid cerebral oxygenation increase causes unfavorable outcomes. METHODS: This prospective observational study was conducted in three European hospitals. We included adult ECPR patients between October 2018 and March 2020, in whom cerebral regional oxygen saturation (rSO2) measurements were started minutes before ECPR initiation until 3 h after. The primary outcome was regain of consciousness, defined as following commands, analyzed using binary logistic regression. RESULTS: The sample consisted of 26 ECPR patients (23% women, Agemean 46 years). We found no significant differences in rSO2 values at baseline (49.1% versus 49.3% for regain versus no regain of consciousness). Mean cerebral rSO2 values in the first 30 min after ECPR initiation were higher in patients who regained consciousness (38%) than in patients who did not regain consciousness (62%, odds ratio 1.23, 95% confidence interval 1.01-1.50). CONCLUSION: Higher mean cerebral rSO2 values in the first 30 min after initiation of ECPR were found in patients who regained consciousness.

EXPERIMENTAL RESEARCH

1. Sci Rep. 2023 Oct 25;13(1):18269. doi: 10.1038/s41598-023-45568-4.

Effect of AT1 receptor blockade on cardiovascular outcome after cardiac arrest: an experimental study in rats.

Araújo Filho EAF(1), Carmona MJC(2), Otsuki DA(3), Maia DRR(3), Lima LGCA(4), Vane MF(3).

ABSTRACT

Angiotensin II receptor 1(AT1) antagonists are beneficial in focal ischemia/reperfusion (I/R). However, in cases of global I/R, such as cardiac arrest (CA), AT1 blocker's potential benefits are still unknown. Wistar male rats were allocated into four groups: Control group (CG)-animals submitted to CA by ventricular fibrillation induced by direct electrical stimulation for 3 min, and anoxia for 5 min; Group AT1 (GAT1)-animals subjected to CA and treated with 0.2 mg/kg of candesartan diluted in dimethylsulfoxide (DMSO) (0.1%); Vehicle Group (VG): animals subjected to CA and treated with 0.2 ml/kg of DMSO and Sham group (SG)-animals submitted to surgical interventions, without CA. Cardiopulmonary resuscitation consisted of group medications, chest compressions, ventilation, epinephrine (20 mcg/kg) and defibrillation. The animals were observed up to 4 h after spontaneous circulation (ROSC) return, and survival rates, hemodynamic variables, histopathology, and markers of tissue injury were analyzed. GAT1 group had a higher rate of ROSC (62.5% vs. 42.1%, $p < 0.0001$), survival (100% vs. 62.5%, $p = 0.027$), lower incidence of arrhythmia after 10 min of ROSC (10% vs. 62.5%, $p = 0.000$), and lower neuronal and cardiac injury scores on histology evaluation ($p = 0.025$ and $p = 0.0052$, respectively) than GC group. The groups did not differ regarding CA duration, number of adrenaline doses, or number of defibrillations. AT1 receptor blockade with candesartan yielded higher rates of ROSC and survival, in addition to neuronal and myocardial protection.

2. Biomedicines. 2023 Sep 23;11(10):2612. doi: 10.3390/biomedicines11102612.

Effects of Prolonged Serum Calcium Suppression during Extracorporeal Cardiopulmonary Resuscitation in Pigs.

Pooth JS(1), Liu Y(2), Petzold R(1), Scherer C(2), Benning L(1), Kreibich M(2), Czerny M(2), Beyersdorf F(2), Benk C(2), Trummer G(2), Brixius SJ(2).

ABSTRACT

Controlled reperfusion by monitoring the blood pressure, blood flow, and specific blood parameters during extracorporeal reperfusion after cardiac arrest has the potential to limit ischemia-reperfusion injury. The intracellular calcium overload as part of the ischemia-reperfusion injury provides the possibility for the injury to be counteracted by the early suppression of serum calcium with the aim of improving survival and the neurological outcome. We investigated the effects of prolonged serum calcium suppression via sodium citrate during extracorporeal resuscitation using the CARL protocol (CARL-controlled automated reperfusion of the whole body) compared to a single-dose approach in a porcine model after prolonged cardiac arrest. A control group (N = 10) was resuscitated after a 20 min cardiac arrest, initially lowering the intravascular calcium with the help of a single dose of sodium citrate as part of the priming solution. Animals in the intervention group (N = 13) received additional sodium citrate for the first 15 min of reperfusion. In the control group, 9/10 (90.0%) animals survived until day 7 and 7/13 (53.8%) survived in the intervention group ($p = 0.09$). A favorable neurological outcome on day 7 after the cardiac arrest was observed in all the surviving animals using a species-specific neurological deficit score. The coronary perfusion pressure was significantly lower with a tendency towards more cardiac arrhythmias in the intervention group. In conclusion, a prolonged reduction in serum calcium levels over the first 15 min of reperfusion after

prolonged cardiac arrest tended to be unfavorable regarding survival and hemodynamic variables compared to a single-dose approach in this animal model.

3. Resuscitation. 2023 Oct 24:110010. doi: 10.1016/j.resuscitation.2023.110010. Online ahead of print.

Effect of percutaneous ventricular assisted device on post-cardiac arrest myocardial dysfunction in swine model with prolonged cardiac arrest.

Nakashima T(1), Hakam Tiba M(2), McCracken BM(3), Hsu CH(2), Gottula AL(4), Greer NL(2), Cramer TA(2), Sutton NR(5), Ward KR(2), Neumar RW(2).

ABSTRACT

BACKGROUND: It remains unclear if percutaneous left ventricular assist device (pLVAD) reduces post-cardiac arrest myocardial dysfunction. METHODS: This is a prespecified analysis of a subset of swine that achieved return of spontaneous circulation (ROSC) in a study comparing pLVAD, transient aortic occlusion (AO), or both during cardiopulmonary resuscitation (CPR). Devices were initiated after 24 minutes of ventricular fibrillation cardiac arrest (8 min no-flow and 16 min mechanical CPR). AO was discontinued post-ROSC, and pLVAD support or standard care were continued. Beginning 60 minutes post-ROSC, pLVAD support was weaned to <1.0 L/min and subsequently removed at 240 minutes. The primary outcome was cardiac index (CI), stroke volume index (SVI), and left ventricular ejection fraction (LVEF) at 240 minutes post-ROSC. Data are shown as mean (standard error). RESULTS: Seventeen swine achieved ROSC without complication and were included in this analysis (pLVAD group, n = 11 and standard care group, n = 6). For the primary outcomes, the pLVAD group had significantly higher CI of 4.2(0.3) vs. 3.1(0.4) L/min/m2 (p=0.043) and LVEF 60(3) vs. 49(4) % (p=0.029) at 240 minutes after ROSC when compared with the standard care group, while SVI was not statistically significantly different (32[3] vs. 23[4] mL/min/m2, p=0.054). During the first 60 minutes post-ROSC, the pLVAD group had significantly higher coronary perfusion pressure, lower LV stroke work index, and total pulmonary resistance index. CONCLUSION: These results suggest that early pLVAD support after ROSC is associated with better recovery myocardial function compared to standard care after prolonged cardiac arrest.

CASE REPORTS

1. J Emerg Med. 2023 Aug 25:S0736-4679(23)00434-1. doi: 10.1016/j.jemermed.2023.08.006. Online ahead of print.

Bilateral Fracture-Dislocation of the Shoulder After Defibrillation.

Akpınar MN(1), Çim K(1), Özbek MR(1), Ayvacı BM(1), Kalkan A(1).

ABSTRACT

BACKGROUND: There are multiple reported injuries associated with cardiopulmonary resuscitation, most of them caused by the force of compressions, like sternal and rib fractures, abdominal organ injuries like splenic rupture, liver lacerations, and injuries to the upper airway and skin. Injuries related to defibrillation and cardioversion are rare, mostly related to skin and muscle injuries on where the defibrillation paddles were placed. CASE REPORT: A 52-year-old man presented to the Emergency Department with crushing chest pain. The patient was suffering from a myocardial infarction, and during percutaneous coronary intervention, had to be defibrillated on the angioplasty table. This resulted in fracture-dislocations on both shoulders. The patient was transferred to our orthopedics clinic and was operated on within 5 days of angioplasty. WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?: Early diagnosis and treatment are important, and can prevent long-term morbidity. However, cardiopulmonary resuscitation and defibrillation are acts that are most

commonly performed in the emergency department. Injury prevention by controlling the patient's position, in this case, positions of the shoulders, is an important factor that emergency physicians can control and effect.

2. Scand J Trauma Resusc Emerg Med. 2023 Oct 26;31(1):62. doi: 10.1186/s13049-023-01137-2.
Do we need standardized management after termination-of-resuscitation attempts? Autoresuscitation in a 67-year-old woman.
Pasierski J(1)(2), Kleger GR(3)(4), Imboden P(5)(6).
ABSTRACT
BACKGROUND: Autoresuscitation is the phenomenon of spontaneous return of circulation after cessation of CPR, also known as the Lazarus phenomenon. Most of the evidence is based on case reports and a few systematic reviews. The occurrence of autoresuscitation may lead to self-reproach and dismay in affected emergency personnel and may rise questions about the correct procedure after terminating resuscitative efforts. In contrast to existing cardiac arrest guidelines there is no standardized approach to terminating resuscitative attempts. CASE: We report a case of out of hospital autoresuscitation in a 67-year-old female after 60 min of advanced cardiac life support. After shock refractory shockable rhythm, we recorded pulseless electrical activity and fixed pupils, consequently resuscitation was terminated. About 50 min later the patient surprisingly showed signs of life. Due to the suggestive history a coronary angiography was performed, showing severe coronary heart disease which necessitated surgical intervention. After ACBP surgery and intensive care followed by treatment on the cardiological ward, she was finally discharged to neurological rehabilitation. CONCLUSION: As already proposed by existing literature, there should be at least a 10-min interval of close monitoring after abandoning CPR. Transport of a deceased patient should only take place after secure signs of death can be detected. Further investigation is needed to determine which patients are most likely to benefit from an extended observation period. Our case reports highlights the difficulties in death declaration and the importance of close monitoring after abandoning CPR.

3. Toxicon. 2023 Oct 21:107326. doi: 10.1016/j.toxicon.2023.107326. Online ahead of print.
Food-borne botulism from homemade sauce leading to cardiac arrest: A family case series with literature review.
Yang W(1), Jiang D(2), Li R(3), Sun L(4).
ABSTRACT
Food-borne botulism is a rare but potentially fatal illness. Its management depends on rapid diagnosis and prompt antitoxin administration. However, diagnosing food-borne botulism can be challenging at an early stage. Here, we report a 62-year-old male with food-borne botulism. The patient presented with extremity muscle weakness, dyspnea, bilateral droopy eyelids (more significant on the right side), dysarthria, and progressive dysphagia. The electromyography indicated presynaptic membrane abnormalities. The toxicology screen reported a positive result for botulinum toxin type A. He received plasma exchange, botulism antitoxin, and supportive care. However, he had a cardiac arrest six days later. Spontaneous circulation was restored after immediate cardiopulmonary resuscitation. The patient gradually recovered his muscle strength and could have complete eyelid elevation. A detailed interview revealed that six family members developed similar symptoms. All of them consumed a homemade sauce prepared three years ago. They all tested positive for botulinum toxin type A. Two of them had cardiac arrests. Therefore, family aggregation could happen to botulism. Careful interviews, early diagnosis, and timely administration of botulism antitoxin are the keys to saving lives. Special attentions should be given to the cardiac evaluations since botulism can cause cardiac arrest and death.

4. Eur Heart J Case Rep. 2023 Oct 4;7(10):ytad490. doi: 10.1093/ehjcr/ytad490. eCollection 2023 Oct.

Broad and narrow complex tachycardia resulting in cardiorespiratory arrest in a child: what is the optimal treatment strategy?

Sadagopan SN(1), Yue AM(1).

ABSTRACT

BACKGROUND: We describe a child with a broad and narrow complex tachycardia causing haemodynamic collapse. CASE SUMMARY: A 9-year-old girl (weight 26 kg, height 114 cm) with a 5-year history of refractory 'epilepsy' presented with cardiorespiratory arrest and tonic-clonic seizure, witnessed by her mother. Electrocardiogram documented recurrent episodes of simultaneous broad and narrow tachycardias associated with haemodynamic compromise. Diagnostic electrophysiologic study (EPS) confirmed a dual tachycardia mechanism. The challenge in selecting the optimal treatment strategy is discussed. A diagnosis of dual tachycardia was made with catecholaminergic polymorphic ventricular tachycardia (CPVT) and simultaneous focal atrial tachycardia. DISCUSSION: Bidirectional ventricular tachycardia (VT) induced by isoproterenol in this clinical scenario is strongly suggestive of CPVT. Diagnostic EPS can be useful in challenging clinical situations to understand the mechanism of arrhythmias and to tailor the most appropriate treatment strategy. Combination therapy with nadolol and flecainide is highly effective in ventricular arrhythmia control. Implantable cardioverter defibrillator implantation is not without risk in CPVT as there is a potential of electrical storm driven by shock therapy that increases adrenergic drive. Cervical sympathectomy may be considered if further VTs occur in future despite optimum medical therapy.

5. J Community Hosp Intern Med Perspect. 2023 Sep 2;13(5):97-100. doi: 10.55729/2000-9666.1242. eCollection 2023.

A Case of Grave's Thyrotoxicosis-Induced Takotsubo Cardiomyopathy Presenting with Cardiac Arrest After Winning the Lottery.

Philippides D(1), Hong A(1), Eukovich A(2), Chaudhry A(3).

ABSTRACT

Takotsubo syndrome (TTS) is a nonischemic cardiomyopathy with transient apical ballooning of the left ventricle and reduced ejection fraction that can be caused by severe emotional or physical stress, with diverse clinical presentations. This case describes a patient who went into cardiac arrest at a casino after winning the lottery. She was found to have Takotsubo cardiomyopathy, in the setting of uncontrolled hyperthyroidism. This is a very unique case of TTS presenting with cardiac arrest, and is also an uncommon example of TTS triggered by a positive rather than negative emotional life event.