This week's PubMed 29th January – 4th February 2023: articles of interest n = 46

CPR AND COVID-19

No articles identified.

CPR/MECHANICAL CHEST COMPRESSION

1. PLoS One. 2023 Feb 3;18(2):e0279056. doi: 10.1371/journal.pone.0279056. eCollection 2023.
Using computed tomography to evaluate proper chest compression depth for cardiopulmonary resuscitation in Thai population: A retrospective cross-sectional study.
Atiksawedparit P(1), Sathapornthanasin T(2), Chalermdamrichai P(2), Sanguanwit P(2), Saksobhavivat N(3), Saelee R(4), Phattharapornjaroen P(2).

ABSTRACT
INTRODUCTION: The effectiveness of cardiopulmonary resuscitation is determined by appropriate chest compression depth and rate. The American Heart Association recommended CC depth at 5-6 cm to indicate proper cardiac output during cardiac arrest. However, many studies showed the differences in the body builds between Caucasians and Asians. Therefore, this study aimed to determine heart compression fraction (HCF) in the Thai population by using contrast-enhanced computed tomography (CT) scan of the chest and a mathematical model. MATERIALS AND METHODS: Consecutive contrast-enhanced CT scans of the chest performed at Ramathibodi Hospital were retrospectively reviewed from January to March 2018 by two independent radiologists. Patients' characteristics, including gender, age, weight, height, and pre-existing diseases, were recorded, and the chest parameters were measured from a CT scan. The heart compression fraction (HCF) was subsequently calculated. RESULTS: Of 306 subjects, there were 139 (45.4%) males, 148 (47.4%) lung diseases and 10 (3.3%) heart diseases. Mean age and BMI were 60.4 years old and 23.8 kg/m2, respectively. Chest diameter, heart diameter, and non-cardiac soft tissue were significantly smaller in females compared to males. Mean (SD) HCF proportional with 50 mm and 60 mm depth were 38.3% (13.3%) and 50% (14.3%), respectively. There were significant differences of HCF proportional by 50 mm and 60 mm depth between men and women (33.2% vs 42.6% and 44% vs 54.9%, respectively (P<0.001)). In addition, a decrease in HCF was significantly observed among higher BMI groups. CONCLUSION: The CT scan and mathematical model showed that 38% and 50% HCF proportions were generated by 50 mm and 60 mm CC depth. HCF proportions were significantly different between genders and among BMI groups. The recommended depth of 5-6 cm is likely to provide sufficient CC depth in the population of Thailand.

REGISTRIES, REVIEWS AND EDITORIALS

1. Am J Emerg Med. 2023 Jan 24;66:85-90. doi: 10.1016/j.ajem.2023.01.033. Online ahead of print.
Bystander cardiopulmonary resuscitation, automated external defibrillator use, and survival after out-of-hospital cardiac arrest.
Kim SH(1), Park JH(2), Jeong J(3), Ro YS(4), Hong KJ(4), Song KJ(5), Do Shin S(4).

ABSTRACT
INTRODUCTION: We aimed to investigate the association between bystander cardiopulmonary resuscitation (CPR) with and without automated external defibrillator (AED) use and neurological outcomes after out-of-hospital cardiac arrest (OHCA) in Korea. METHODS: This cross-sectional study

used a nationwide Korean OHCA registry between 2015 and 2019. Patients were categorised into no bystander CPR and bystander CPR with and without AED use groups. The primary outcome was good neurological recovery at discharge. We also analysed the interaction effects of place of arrest, response time, and whether the OHCA was witnessed. RESULTS: In total, 93,623 patients were included. Among them, 35,486 (37.9%) were in the no bystander CPR group, 56,187 (60.0%) were in the bystander CPR without AED use group, and 1950 (2.1%) were in the bystander CPR with AED use group. Good neurological recovery was demonstrated in 1286 (3.6%), 3877 (6.9%), and 208 (10.7%) patients in the no CPR, bystander CPR without AED use, and bystander CPR with AED use groups, respectively. Compared to the no bystander CPR group, the adjusted odds ratio (95% confidence intervals) for good neurological recovery was 1.54 (1.45-1.65) and 1.37 (1.15-1.63) in the bystander CPR without and with AED use groups, respectively. The effect of bystander CPR with AED use was more apparent in OHCAs with witnessed arrest and prolonged response time (≥8 min). CONCLUSION: Bystander CPR was associated with better neurological recovery compared to no bystander CPR; however, the benefits of AED use were not significant. Efforts to disseminate bystander AED availability and ensure proper utilisation are warranted.

2. Resuscitation. 2023 Feb 1:109719. doi: 10.1016/j.resuscitation.2023.109719. Online ahead of print.

Scoping Review of Echocardiographic Parameters Associated with Diagnosis and Prognosis After Resuscitated Sudden Cardiac Arrest.

Liu L(1), Karatasakis A(2), Kudenchuk PJ(3), Kirkpatrick JN(4), Sayre MR(5), Carlbom DJ(6), Johnson NJ(7), Probstfield JL(8), Counts C(9), R H Branch K(10).

ABSTRACT

AIM: Current international guidelines recommend early echocardiography after resuscitated sudden death despite limited data. Our aim was to analyze published data on early post-resuscitation echocardiography to identify cardiac causes of sudden death and prognostic implications. METHODS: We reviewed MEDLINE, EMBASE, and CENTRAL databases to December 2021 for echocardiographic studies of adult patients after resuscitation from non-traumatic sudden death. Studies were included if echocardiography was performed <48 hours after resuscitation and reported 1) diagnostic accuracy to detect cardiac etiologies of sudden death or 2) prognostic outcomes. Diagnostic endpoints were associations of regional wall motion abnormalities (RWMA), ventricular function, and structural abnormalities with cardiac etiologies of arrest. Prognostic endpoints were associations of echocardiographic findings with survival to hospital discharge and favorable neurological outcome. RESULTS: Of 2877 articles screened, 16 (0.6%) studies met inclusion criteria, comprising 2035 patients. Two of six studies formally reported diagnostic accuracy for echocardiography identifying cardiac etiology of arrest; RWMA (in 5 of 6 studies) were associated with presumed cardiac ischemia in 17-89% of cases. Among 12 prognostic studies, there was no association of reduced left ventricular ejection fraction with hospital survival (n=10) or favorable neurologic status (n=5). Echocardiographic high mitral E/e' ratio (n=1) and right ventricular systolic dysfunction (n=2) were associated with poor survival. CONCLUSION: This scoping review highlights the limited data on early echocardiography in providing etiology of arrest and prognostic information after resuscitated sudden death. Further research is needed to refine the clinical application of early echocardiographic findings in post arrest care.

3. Resuscitation. 2023 Feb 1:109715. doi: 10.1016/j.resuscitation.2023.109715. Online ahead of print.

Targeting interleukin-6 after cardiac arrest-let us not forget the brain.

Kochanek PM(1), Simon DW(2), Wagner AK(3).

NO ABSTRACT AVAILABLE

4. J Am Coll Cardiol. 2023 Feb 7;81(5):457-459. doi: 10.1016/j.jacc.2022.11.035.
Timely Reperfusion for Everyone…Except for Some Out-of-Hospital Cardiac Arrest Patients?
Kern KB(1).
NO ABSTRACT AVAILABLE

5. N Engl J Med. 2023 Feb 2;388(5):e11. doi: 10.1056/NEJMc2215238.
Racial and Ethnic Differences in Bystander CPR.
Lim HS(1), Farouque O(1), Sanders P(2).
NO ABSTRACT AVAILABLE

6. Resuscitation. 2023 Jan 27:109709. doi: 10.1016/j.resuscitation.2023.109709. Online ahead of print.
Is there benefit to video laryngoscopy in out-of-hospital cardiac arrest?
Neth MR(1), Lupton JR(1).
NO ABSTRACT AVAILABLE

7. Cureus. 2022 Dec 25;14(12):e32927. doi: 10.7759/cureus.32927. eCollection 2022 Dec.
Rehabilitation Outcomes of Cortical Blindness and Characteristics Secondary to Cardiac Arrest: A Review.
Ngankam DA(1), Crozier K(2), Vu AT(3).
ABSTRACT
We reviewed the published literature on rehabilitation outcomes in patients with cortical blindness (CB) and highlighted the characteristic features and prognosis of CB due to cardiac arrest. The studies excluded were those involving the pediatric population (<age 16), written in a language other than English, and studies with no mention of outcomes. The literature search was done by PubMed and EBSCOhost databases from the oldest available literature through November 2019. Due to the scarcity of published literature and a qualitative description of outcomes, a narrative review of the literature was deemed appropriate. Seven case reports and one retrospective cohort study met the inclusion criteria. Cognitive and visual impairments were significant barriers to rehabilitation in CB. Improvement of visual deficits occurred within one to two months. Those with complete blindness, cognitive impairments, and a delay in resuscitation were more likely to have poorer functional outcomes in the performance of activities of daily living and were less likely to be discharged home. This is the most comprehensive review of published literature to focus on the function of patients with cortical blindness. The limitations include the small number of published literature and the qualitative approach utilized. Despite the limitations, the findings of this review can inform future studies that would investigate the most efficient and comprehensive methods of CB rehabilitation.

8. Resuscitation. 2023 Jan 26:109708. doi: 10.1016/j.resuscitation.2023.109708. Online ahead of print.
On-site Treatment of Avalanche Victims: Scoping Review and 2023 Recommendations of the International Commission for Mountain Emergency Medicine (ICAR MedCom).
Pasquier M(1), Strapazzon G(2), Kottmann A(3), Paal P(4), Zafren K(5), Oshiro K(6), Artoni C(7), Van Tilburg C(8), Sheets A(9), Ellerton J(10), McLaughlin K(11), Gordon L(12), Martin RW(13), Jacob M(14), Musi M(15), Blancher M(16), Jaques C(17), Brugger H(18).
ABSTRACT

INTRODUCTION: The International Commission for Mountain Emergency Medicine (ICAR MedCom) developed updated recommendations for the management of avalanche victims. METHODS: ICAR MedCom created Population Intervention Comparator Outcome (PICO) questions and conducted a scoping review of the literature. We evaluated and graded the evidence using the American College of Chest Physicians system. RESULTS: We included 120 studies including original data in the qualitative synthesis. There were 45 retrospective studies (38%), 44 case reports or case series (37%), and 18 prospective studies on volunteers (15%). The main cause of death from avalanche burial was asphyxia (range of all studies 65-100%). Trauma was the second most common cause of death (5-29%). Hypothermia accounted for few deaths (0-4%). CONCLUSIONS: and recommendations: For a victim with a burial time ≤60 minutes without signs of life, presume asphyxia and provide rescue breaths as soon as possible, regardless of airway patency. For a victim with a burial time >60 minutes, no signs of life but a patent airway or airway with unknown patency, presume that a primary hypothermic CA has occurred and initiate cardiopulmonary resuscitation (CPR) unless temperature can be measured to rule out hypothermic cardiac arrest. For a victim buried >60 minutes without signs of life and with an obstructed airway, if core temperature cannot be measured, rescuers can presume asphyxia-induced CA, and should not initiate CPR. If core temperature can be measured, for a victim without signs of life, with a patent airway, and with a core temperature <30°C attempt resuscitation, regardless of burial duration.

9. Rev Esp Cardiol (Engl Ed). 2023 Feb;76(2):80-82. doi: 10.1016/j.rec.2022.08.018. Epub 2022 Nov 4.
What is the role of coronary angiography in the management of postarrest syndrome?
[Article in English, Spanish]
López-de-Sá E(1)
NO ABSTRACT AVAILABLE

10. Am J Med. 2023 Jan 31:S0002-9343(23)00053-0. doi: 10.1016/j.amjmed.2023.01.007. Online ahead of print.
Commotio Cordis and The Triumph of Out of Hospital Cardiopulmonary Resuscitation.
Frishman WH(1), Alpert JS(2).
NO ABSTRACT AVAILABLE

11. Resuscitation. 2023 Jan 26;184:109707. doi: 10.1016/j.resuscitation.2023.109707. Online ahead of print.
The chainmail of survival: A modern concept of an adaptive approach towards cardiopulmonary resuscitation.
Schnaubelt S(1), Greif R(2), Monsieurs K(3).
NO ABSTRACT AVAILABLE

IN-HOSPITAL CARDIAC ARREST

1. Chin Med J (Engl). 2023 Jan 3. doi: 10.1097/CM9.0000000000002333. Online ahead of print.
Analysis of factors influencing cardiopulmonary resuscitation and survival outcome in adults after in-hospital cardiac arrest: a retrospective observational study.
Wang C(1), Gao Y, Liu Y, Yao Y, Li C, Li Q, Chai Y.
NO ABSTRACT AVAILABLE

INJURIES AND CPR

No articles identified.

CAUSE OF THE ARREST

No articles identified.

END-TIDAL CO_2

No articles identified.

ORGAN DONATION

No articles identified.

FEEDBACK

No articles identified.

DRUGS

1. Chest. 2023 Jan 31:S0012-3692(23)00165-4. doi: 10.1016/j.chest.2023.01.033. Online ahead of print.

Epinephrine in Out-of-Hospital Cardiac Arrest - A Network Meta-Analysis and Subgroup Analyses of Shockable and Non-Shockable Rhythms.

Fernando SM(1), Mathew R(2), Sadeghirad B(3), Rochwerg B(4), Hibbert B(5), Munshi L(6), Fan E(7), Brodie D(8), Di Santo P(9), Tran A(10), McLeod SL(11), Vaillancourt C(12), Cheskes S(13), Ferguson ND(7), Scales DC(14), Lin S(15), Sandroni C(16), Soar J(17), Dorian P(18), Perkins GD(19), Nolan JP(20).

ABSTRACT

BACKGROUND: Epinephrine is the most commonly used drug in out-of-hospital cardiac arrest (OHCA) resuscitation, but evidence supporting its efficacy is mixed. RESEARCH QUESTION: What is the comparative efficacy and safety of standard dose epinephrine, high dose epinephrine, epinephrine plus vasopressin, and placebo/no treatment in improving outcomes following OHCA? STUDY DESIGN AND METHODS: Systematic review and network meta-analysis of randomized controlled trials. We searched six databases from inception to June 2022 for randomized controlled trials evaluating epinephrine use during OHCA resuscitation. We performed frequentist random-effects network meta-analysis, and present odds ratios (OR) and 95% confidence intervals (CI). We used GRADE to rate the certainty of evidence. Outcomes included return of spontaneous circulation (ROSC), survival to hospital admission, survival to discharge, and survival with good functional outcome. RESULTS: We included 18 trials (21,594 patients). Compared with placebo/no treatment, high dose epinephrine (OR 4.27 [95% CI: 3.68-4.97]), standard dose epinephrine (OR 3.69 [95% CI: 3.32-4.10]), and epinephrine plus vasopressin (OR 3.54 [95% CI: 2.94-4.26]), all increased ROSC. High dose epinephrine (OR 3.53 [95% CI: 2.97-4.20]), standard dose epinephrine (OR 3.00 [95% CI: 2.66-3.38]), and epinephrine plus vasopressin (OR 2.79 [95% CI: 2.27-3.44) all increased survival to

hospital admission, as compared with placebo/no treatment. However, none of these agents may increase survival to discharge or survival with good functional outcome, as compared with placebo/no treatment. Compared with placebo/no treatment, standard dose epinephrine improved survival to discharge among patients with non-shockable rhythm (OR 2.10 [95% CI: 1.21-3.63]), but not those with shockable rhythm (OR 0.85 [95% CI: 0.39-1.85]). INTERPRETATION: Use of standard dose epinephrine, high dose epinephrine, and epinephrine plus vasopressin increases ROSC and survival to hospital admission, but may not improve survival to discharge or functional outcome. Standard dose epinephrine improved survival to discharge among patients with non-shockable rhythm, but not those with shockable rhythm.

TRAUMA

No articles identified.

VENTILATION

1. J Epidemiol. 2023 Jan 28. doi: 10.2188/jea.JE20220240. Online ahead of print.
Association between advanced airway management with adrenaline injection and prognosis in adult patients with asystole asphyxia out-of-hospital cardiac arrest.
Katabami K(1), Kimura T(2), Hirata T(2)(3), Tamakoshi A(2).
ABSTRACT
BACKGROUND: The neurological prognosis of asphyxia is poor and the effect of advanced airway management (AAM) in the prehospital setting remains unclear. This study aimed to evaluate the association between AAM with adrenaline injection and prognosis in adult patients with asystole asphyxia out-of-hospital cardiac arrest (OHCA). METHODS: This study assessed all-Japan Utstein cohort registry data between January 1, 2013 and December 31, 2019. We used propensity score matching analyses before logistic regression analysis to evaluate the effect of AAM on favorable neurological outcome. RESULTS: There were 879,057 OHCA cases, including 70,299 cases of asphyxia OHCAs. We extracted the data of 13,642 cases provided with adrenaline injection by emergency medical service. We divided 7,945 asphyxia OHCA cases in asystole into 5,592 and 2,353 with and without AAM, respectively. After 1:1 propensity score matching, 2,338 asphyxia OHCA cases with AAM were matched with 2,338 cases without AAM. Favorable neurological outcome was not significantly different between the AAM and no AAM groups (adjusted odds ratio: 1.1, 95% confidence interval (CI): 0.5-2.5). However, the return of spontaneous circulation (ROSC) (adjusted odds ratio: 1.7, 95% CI: 1.5-1.9) and 1-month survival were improved in the AAM groups (adjusted odds ratio: 1.5, 95% CI: 1.1-1.9). CONCLUSIONS: AAM with adrenaline injection for patients with asphyxia OHCA in asystole was associated with improved ROSC and 1-month survival rate but showed no differences in neurologically favorable outcome. Further prospective studies may comprehensively evaluate the effect of AAM for patients with asphyxia.

CERERBRAL MONITORING

1. J Rehabil Med. 2023 Jan 30;55:jrm00368. doi: 10.2340/jrm.v55.3497.
Predicting Long-Term Cognitive Impairments in Survivors after Cardiac Arrest: A Systematic Review.
Glimmerveen A(1), Verhulst M(2), Verbunt J(3), Van Heugten C(4), Hofmeijer J(2).
ABSTRACT

OBJECTIVE: International guidelines recommend early screening for identification of patients who are at risk of long-term cognitive impairments after cardiac arrest. However, information about predictors is not provided. A systematic review of the literature was performed to identify early predictors of long-term cognitive outcome after cardiac arrest. METHODS: Scopus and PubMed were systematically searched to identify studies on early predictors of long-term cognitive outcome in patients after cardiac arrest. The population included adult cardiac arrest survivors and potential early predictors were demographics, early cognitive screening scores, imaging measures, electroencephalographic measures, and levels of blood biomarkers. Two investigators reviewed studies for relevance, extracted data and assessed risk of bias. RESULTS: Five articles were included. Risk of bias was assessed as low or moderate. Most detected longterm cognitive impairments were in the domain of memory. Coma duration (2 studies), early cognitive impairments by the self-developed clinical Bedside Neuropsychological Test Battery (BNTB) screener (2 studies), and high S-100B levels on day 3 (2 studies) were the most prominent identified determinants of cognitive impairment on the group level. On the individual patient level, a score on the BNTB of ≤ 94.5 predicted cognitive impairments at 6 months after cardiac arrest (1 study without external validation). Studies on brain imaging and electroencephalography are lacking. CONCLUSION: Early bedside cognitive screening can contribute to prediction of long-term cognitive impairment after cardiac arrest. Evidence is scarce for S-100B levels and coma duration and absent for measures derived from brain imaging and electroencephalography.

2. J Intensive Care. 2023 Feb 2;11(1):3. doi: 10.1186/s40560-023-00653-8.

Predictive value of soluble CD59 for poor 28-day neurological prognosis and all-cause mortality in patients after cardiopulmonary resuscitation: a prospective observatory study.

Wang L(#)(1)(2), Li RF(#)(3), Guan XL(2), Liang SS(2), Gong P(4).

ABSTRACT

BACKGROUND: sCD59, as a soluble form of CD59, is observed in multiple types of body fluids and correlated with the cell damage after ischemia/reperfusion injury. This study aims to observe the dynamic changes of serum sCD59 in patients after restoration of spontaneous circulation (ROSC) and explore the association of serum sCD59 with neurological prognosis and all-cause mortality in patients after ROSC. METHODS: A total of 68 patients after ROSC were prospectively recruited and divided into survivors (n = 23) and non-survivors (n = 45) groups on the basis of 28-day survival. Twenty healthy volunteers were enrolled as controls. Serum sCD59 and other serum complement components, including sC5b-9, C5a, C3a, C3b, C1q, MBL, Bb, and pro-inflammatory mediators tumor necrosis factor (TNF)-α, interleukin-6 (IL-6), neurological damage biomarkers neuron-specific enolase (NSE) and soluble protein 100β (S100β) were measured by enzyme linked immunosorbent assay on day 1, 3, and 7 after ROSC. Neurologic outcome was assessed using cerebral performance category scores, with poor neurologic outcome defined as 3-5 points. RESULTS: In the first week after ROSC, serum levels of sCD59, sC5b-9, C5a, C3a, C3b, C1q, MBL, Bb, TNF-α, IL-6, NSE and S100β were significantly elevated in patients after ROSC compared to healthy volunteers, with a significant elevation in the non-survivors compared to survivors except serum C1q and MBL. Serum sCD59 levels were positively correlated with serum sC5b-9, TNF-α, IL-6, NSE, S100β, SOFA score and APACHE II score. Moreover, serum sCD59 on day 1, 3, and 7 after ROSC could be used for predicting poor 28-day neurological prognosis and all-cause mortality. Serum sCD59 on day 3 had highest AUCs for predicting poor 28-day neurological prognosis [0.862 (95% CI 0.678-0.960)] and 28-day all-cause mortality [0.891 (95% CI 0.769-0.962)]. In multivariate logistic regression analysis, the serum level of sCD59D1 was independently associated with poor 28-day neurological prognosis and all-cause mortality. CONCLUSIONS: The elevated serum level of sCD59 was positively correlated with disease

severity after ROSC. Moreover, serum sCD59 could have good predictive values for the poor 28-day neurological prognosis and all-cause mortality in patients after ROSC.

ULTRASOUND AND CPR

No articles identified.

ORGANISATION AND TRAINING

1. J Nurs Care Qual. 2022 Dec 3. doi: 10.1097/NCQ.0000000000000680. Online ahead of print.
Use of the Modified Early Warning Score by Medical-Surgical Nurses to Initiate the Rapid Response Team: Impact on Patient Outcomes.
Miles I(1), Anderson M, Ren D, Coker T, Fennimore L.
ABSTRACT
BACKGROUND: Cardiac arrests are often preceded by several hours of physiological deterioration that may go undetected. LOCAL PROBLEM: Cardiac arrests frequently occurred on medical-surgical units without prior rapid response team intervention. METHODS: A pre/postintervention design was used to evaluate a protocol to guide the use of the Modified Early Warning Score (MEWS) by medical-surgical nurses to escalate the care of deteriorating adult patients. INTERVENTIONS: Following staff education, the MEWS protocol was implemented across 8 medical-surgical units. RESULTS: There was a significant increase in patients experiencing a rapid response prior to a cardiac arrest after implementing the MEWS protocol ($P < .0001$). CONCLUSION: Implementing a consistent review of MEWS values allows medical-surgical nurses to initiate assistance from a rapid response team that may prevent an inpatient cardiac arrest.

2. JMIR Res Protoc. 2023 Feb 1;12:e40699. doi: 10.2196/40699.
The Integration of Live Video Tools to Help Bystanders During an Emergency Call: Protocol for a Mixed Methods Simulation Study.
Morand O(#)(1), Larribau R(#)(2), Safin S(1), Pages R(3), Soichet H(4), Rizza C(1).
ABSTRACT
BACKGROUND: Early action by bystanders is particularly important for the survival of individuals in need of emergency care, especially those experiencing a cardiac arrest or an airway obstruction. However, only a few bystanders are willing to perform cardiopulmonary resuscitation. The use of a live video during emergency calls appears to have a positive effect on the number of cardiopulmonary resuscitations performed by bystanders. OBJECTIVE: The objective of this study is to propose and evaluate the relevance of a living lab methodology involving video calls in simulated life-threatening emergency situations. METHODS: The first study aimed at analyzing the process of dealing with out-of-hospital cardiac arrest at a dispatch center and identifying the needs of the dispatchers. The second study is a pretest of a living lab. The third study focuses on a living lab in which 16 situations of cardiac arrest and airway obstruction are simulated. The simulation includes both a live video and transmission of a video demonstration of emergency procedures. The measures focus on 3 areas: the impact of video tools, development of collaboration within the community, and evaluation of the method. RESULTS: The results of the first study show that dispatchers have an interest in visualizing the scene with live video and in broadcasting a live demonstration video when possible. The initial results also show that collaboration within the community is enhanced by the shared simulation and debriefing experiences, clarifying regulation procedures, and improving communication. Finally, an iterative development based on the lessons

learned, expectations, and constraints of each previous study promotes the existence of a living lab that aims to determine the place of live video tools in the sequence of care performed by dispatchers. CONCLUSIONS: Living labs offer the opportunity to grasp previously undetected insights and refine the use of the applications while potentially developing a sense of community among the stakeholders.

3. Wilderness Environ Med. 2023 Jan 27:S1080-6032(22)00214-9. doi: 10.1016/j.wem.2022.11.005. Online ahead of print.

Sudden Cardiac Arrests in the Polish Tatra Mountains: A Retrospective Study.

Mikiewicz M(1), Polok K(2), Szczeklik PW(2), Górka A(3), Kosiński S(4).

ABSTRACT

INTRODUCTION: Achieving the optimal survival rate for sudden cardiac arrest in mountains is challenging. The odds of surviving are influenced mainly by distance, response time, and organization of the emergency medical system. The aim of this study was to analyze the epidemiology and outcomes of patients with out-of-hospital cardiac arrest in whom cardio-pulmonary resuscitation was performed in the Polish Tatra Mountains. METHODS: This was a retrospective analysis of data on sudden cardiac arrest collected from the database of the Tatra Mountain Rescue Service and local emergency medical system from 2001 to 2021. RESULTS: A total of 74 cases of sudden cardiac arrest were recorded. The mortality rate was 88% (65/74). Return of spontaneous circulation was achieved in 22 (30%) patients. A group of survivors was characterized by more frequent use of an automated external defibrillator (AED) (56% vs 14%, P=0.011), a shorter interval between cardiac arrest and emergency team arrival (12 vs 20 min, P=0.005), and a shorter time to initiation of advanced life support (ALS) (12 vs 22 min, P=0.004). All survivors had a shockable initial rhythm. The majority of survivors (8/9, 89%) had a good or moderate neurological outcome. CONCLUSIONS: This study confirms poor survival rate after sudden cardiac arrest in the mountain area. The use of AED, shockable initial rhythm, and shorter time interval to emergency team arrival and ALS initiation are associated with better outcomes.

4. Eur Heart J Acute Cardiovasc Care. 2023 Jan 27;12(1):62-68. doi: 10.1093/ehjacc/zuac149.

What acute cardiac care physicians need to know from the latest 2022 ESC Guidelines for ventricular tachycardia and sudden cardiac death.

Goette A(1)(2), Lip GYH(3)(4), Gorenek B(2)(5).

ABSTRACT

The present paper summarizes and comments on the latest 2022 ESC guidelines on ventricular tachycardia and sudden cardiac death. Most relevant recommendations for acute cardiovascular care physicians are addressed, particularly, in the fields of coronary artery disease, dilated cardiomyopathy, and inflammatory diseases. New recommendations encompass the implantation of a defibrillator (ICD) in the setting of acute myocarditis. Furthermore, the pathophysiology of the electrical storm including involved molecular pathways as well as the angry Purkinje fibre syndrome is presented and discussed.

5. Cardiovasc Pathol. 2023 Mar-Apr;63:107497. doi: 10.1016/j.carpath.2022.107497. Epub 2022 Nov 12.

Sudden cardiac death in the young: A consensus statement on recommended practices for cardiac examination by pathologists from the Society for Cardiovascular Pathology.

Kelly KL(1), Lin PT(2), Basso C(3), Bois M(2), Buja LM(4), Cohle SD(5), d'Amati G(6), Duncanson E(7), Fallon JT(8), Firchau D(9), Fishbein G(10), Giordano C(6), Leduc C(11), Litovsky SH(12), Mackey-Bojack S(7), Maleszewski JJ(2), Michaud K(13), Padera RF(14), Papadodima SA(15), Parsons S(16), Radio

SJ(17), Rizzo S(3), Roe SJ(18), Romero M(19), Sheppard MN(20), Stone JR(21), Tan CD(22), Thiene G(3), van der Wal AC(23), Veinot JP(24).

ABSTRACT

Sudden cardiac death is, by definition, an unexpected, untimely death caused by a cardiac condition in a person with known or unknown heart disease. This major international public health problem accounts for approximately 15-20% of all deaths. Typically more common in older adults with acquired heart disease, SCD also can occur in the young where the cause is more likely to be a genetically transmitted process. As these inherited disease processes can affect multiple family members, it is critical that these deaths are appropriately and thoroughly investigated. Across the United States, SCD cases in those less than 40 years of age will often fall under medical examiner/coroner jurisdiction resulting in scene investigation, review of available medical records and a complete autopsy including toxicological and histological studies. To date, there have not been consistent or uniform guidelines for cardiac examination in these cases. In addition, many medical examiner/coroner offices are understaffed and/or underfunded, both of which may hamper specialized examinations or studies (e.g., molecular testing). Use of such guidelines by pathologists in cases of SCD in decedents aged 1-39 years of age could result in life-saving medical intervention for other family members. These recommendations also may provide support for underfunded offices to argue for the significance of this specialized testing. As cardiac examinations in the setting of SCD in the young fall under ME/C jurisdiction, this consensus paper has been developed with members of the Society of Cardiovascular Pathology working with cardiovascular pathology-trained, practicing forensic pathologists.

6. Sci Rep. 2023 Jan 31;13(1):1800. doi: 10.1038/s41598-023-28408-3.

Accuracy of breathing and radial pulse assessment by non-medical persons: an observational cross-sectional study.

Suzuki K(1), Sakaniwa R(2), Endo N(3), Kubota M(3), Nakazawa M(4), Narikawa K(4), Ogawa S(4), Yokota H(4).

ABSTRACT

Early recognition of cardiopulmonary arrest (CPA) expedites emergency calls and resuscitation and improves the survival rate of unresponsive individuals. However, the accuracy of breathing and radial artery pulse assessment by non-medical persons is poorly understood. The aim of this study was to determine the accuracy of breathing assessment and radial pulse palpation among 450 non-medical personnel using a high-fidelity simulator. We examined the accuracy of 10 second's assessment for breathing and radial pulse using a high-fidelity mannequin simulator, included 496 non-medical participants (school teachers) between 2016-2018. For a primary results, the sensitivity for the detection of the presence of the breathing and radial pulse was 96.2% (97.5% for sensitivity and 92.0% for specificity) and 91.7% (99.1% for sensitivity and 56.8% for specificity), respectively. Futher, breathing rate and radial pulse rate were strongly correlated with the assessments, with Spearman's correlation coefficients of 0.813 ($P < 0.001$) and 0.719 ($P < 0.001$), respectively. In contrast, radial pulse strength was weakly correlated with the assessment (coefficient of 0.288, $P < 0.001$). Our results suggested that non-medical persons would show high accuracy in detecting and measuring respiration and radial pulse, although they did not accurately determine radial pulse strength for the early recognition of CPA.

7. Am J Emerg Med. 2023 Jan 21;66:67-72. doi: 10.1016/j.ajem.2023.01.026. Online ahead of print.

Efficacy of distance training program for cardiopulmonary resuscitation utilizing smartphone application and home delivery system.

Lee SGW(1), Hong KJ(2), Lee SY(3), Do Shin S(4), Song KJ(5), Park JH(4), Choi S(6), Lee G(6), Pak J(1), Park YJ(6).

ABSTRACT

AIM OF THE STUDY: Community cardiopulmonary resuscitation (CPR) education is important for laypersons. However, during the COVID-19 pandemic, with social distancing, conventional face-to-face CPR training was unavailable. We developed a distance learning CPR training course (HEROS-Remote) using a smartphone application that monitors real-time chest compression quality and a home delivery collection system for mannikins. This study aimed to evaluate the efficacy of the HEROS-Remote course by comparing chest compression quality with that of conventional CPR training. METHODS: We applied layperson CPR education with HEROS-Remote and conventional education in Seoul during the COVID-19 pandemic. Both groups underwent a 2-min post-training chest compression test, and we tested non-inferiority. Chest compression depth, rate, complete recoil, and composite chest compression score was measured. Trainees completed a satisfaction survey on CPR education and delivery. The primary outcome was the mean chest compression depth. RESULTS: A total of 180 trainees were enrolled, with 90 assigned to each training group. Chest compression depth of HEROS-Remote training showed non-inferiority to that of conventional training (67.4 vs. 67.8, p = 0.78), as well as composite chest compression score (92.7 vs. 95.5, p = 0.16). The proportions of adequate chest compression depth, chest compression rate, and chest compressions with complete chest recoil were similar in both training sessions. In the HEROS-Remote training, 90% of the trainees were satisfied with CPR training, and 96% were satisfied with the delivery and found it convenient. CONCLUSION: HEROS-Remote training was non-inferior to conventional CPR training in terms of chest compression quality. Distance learning CPR training using a smartphone application and mannikin delivery had high user satisfaction and was logistically feasible.

8. Pediatrics. 2023 Feb 1;151(2):e2022060463. doi: 10.1542/peds.2022-060463.

2022 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations: Summary From the Basic Life Support; Advanced Life Support; Pediatric Life Support; Neonatal Life Support; Education, Implementation, and Teams; and First Aid Task Forces.

Wyckoff MH, Greif R, Morley PT, et al

ABSTRACT

This is the sixth annual summary of the International Liaison Committee on Resuscitation International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. This summary addresses the most recently published resuscitation evidence reviewed by International Liaison Committee on Resuscitation Task Force science experts. Topics covered by systematic reviews include cardiopulmonary resuscitation during transport; approach to resuscitation after drowning; passive ventilation; minimizing pauses during cardiopulmonary resuscitation; temperature management after cardiac arrest; use of diagnostic point-of-care ultrasound during cardiac arrest; use of vasopressin and corticosteroids during cardiac arrest; coronary angiography after cardiac arrest; public-access defibrillation devices for children; pediatric early warning systems; maintaining normal temperature immediately after birth; suctioning of amniotic fluid at birth; tactile stimulation for resuscitation immediately after birth; use of continuous positive airway pressure for respiratory distress at term birth; respiratory and heart rate monitoring in the delivery room; supraglottic airway use in neonates; prearrest prediction of in-hospital cardiac arrest mortality; basic life support training for likely rescuers of high-risk populations; effect of resuscitation team training; blended learning for life support training; training and recertification for resuscitation instructors; and recovery position for maintenance of breathing

and prevention of cardiac arrest. Members from 6 task forces have assessed, discussed, and debated the quality of the evidence using Grading of Recommendations Assessment, Development, and Evaluation criteria and generated consensus treatment recommendations. Insights into the deliberations of the task forces are provided in the Justification and Evidence-to-Decision Framework Highlights sections, and priority knowledge gaps for future research are listed.

POST-CARDIAC ARREST TREATMENTS

1. Eur Heart J Acute Cardiovasc Care. 2023 Feb 4:zuad006. doi: 10.1093/ehjacc/zuad006. Online ahead of print.

Quality indicators for post-resuscitation care after out-of-hospital cardiac arrest: A Joint statement from the Association for Acute CardioVascular Care (ACVC) of the European Society of Cardiology, the European Resuscitation Council (ERC), the European Society of Intensive Care Medicine (ESICM), and the European Society for Emergency Medicine (EUSEM).

Grand J(1)(2), Schiele F(3), Hassager C(2), Nolan JP(4)(5), Khoury A(6)(7), Sionis A(8)(9), Nikolaou N(10), Donadello K(11), Behringer W(12), Böttiger BW(13), Combes A(14)(15), Quinn T(16), Price S(17)(18), Jorge-Perez P(19).

ABSTRACT

Quality of care (QoC) is a fundamental tenet of modern healthcare and has become an important assessment-tool for healthcare authorities, stakeholders and the public. However, QoC is difficult to measure and quantify because it is a multifactorial and multidimensional concept. Comparison of clinical institutions can be challenging when QoC is estimated solely based on clinical outcomes. Thus, measuring quality through quality indicators (QIs) can provide a foundation for quality assessment and has become widely used in this context. QIs for the evaluation of QoC in acute myocardial infarction are now well-established, but no such indicators exist for the process from resuscitation of cardiac arrest and post-resuscitation care in Europe. In this context, the Association of Acute Cardiovascular Care of the European Society Cardiology, the European Resuscitation Council, European Society of Intensive Care Medicine and the European Society for Emergency Medicine, have reflected on the measurement of QoC in cardiac arrest. A set of QIs have been proposed, with the scope to unify and evolve QoC for the management of cardiac arrest across Europe. We present here the list of QIs (6 primary QIs and 12 secondary Qis), with descriptions of the methodology used, scientific justification and motives for the choice for each measure with the aim that this set of QIs will enable assessment of the quality of post-out-of-hospital cardiac arrest management across Europe.

2. J Am Coll Cardiol. 2023 Feb 7;81(5):446-456. doi: 10.1016/j.jacc.2022.10.039.

Acute Coronary Occlusion in Patients With Non-ST-Segment Elevation Out-of-Hospital Cardiac Arrest.

Spirito A(1), Vaisnora L(2), Papadis A(2), Iacovelli F(3), Sardu C(4), Selberg A(5), Bär S(2), Kavaliauskaite R(2), Temperli F(2), Asatryan B(2), Pilgrim T(2), Hunziker L(2), Heg D(6), Valgimigli M(7), Windecker S(2), Räber L(8).

ABSTRACT

BACKGROUND: According to current guidelines, hemodynamic status should guide the decision between immediate and delayed coronary angiography (CAG) in out-of-hospital cardiac arrest (OHCA) patients without ST-segment elevation. A delayed strategy is advised in hemodynamically stable patients, and an immediate approach is recommended in unstable patients. OBJECTIVES: This study sought to assess the frequency, predictors, and clinical impact of acute coronary occlusion in hemodynamically stable and unstable OHCA patients without ST-segment elevation. METHODS: Consecutive unconscious OHCA patients without ST-segment elevation who were undergoing CAG at Bern University Hospital (Bern, Switzerland) between 2011 and 2019 were included. Frequency and

predictors of acute coronary artery occlusions and their impact on all-cause and cardiovascular mortality at 1 year were assessed. RESULTS: Among the 386 patients, 169 (43.8%) were hemodynamically stable. Acute coronary occlusions were found in 19.5% of stable and 24.0% of unstable OHCA patients (P = 0.407), and the presence of these occlusions was predicted by initial chest pain and shockable rhythm, but not by hemodynamic status. Acute coronary occlusion was associated with an increased risk of cardiovascular death (adjusted HR: 2.74; 95% CI: 1.22-6.15) but not of all-cause death (adjusted HR: 0.72; 95% CI: 0.44-1.18). Hemodynamic instability was not predictive of fatal outcomes. CONCLUSIONS: Acute coronary artery occlusions were found in 1 in 5 OHCA patients without ST-segment elevation. The frequency of these occlusions did not differ between stable and unstable patients, and the occlusions were associated with a higher risk of cardiovascular death. In OHCA patients without ST-segment elevation, chest pain or shockable rhythm rather than hemodynamic status identifies patients with acute coronary occlusion.

TARGETED TEMPERATURE MANAGEMENT

1. J Formos Med Assoc. 2023 Feb 2:S0929-6646(23)00005-0. doi: 10.1016/j.jfma.2023.01.005. Online ahead of print.

Prognostic value of neutrophil-lymphocyte ratio in out-of-hospital cardiac arrest patients receiving targeted temperature management: An observational cohort study.

Huang YH(1), Lin YS(2), Wu CH(3), How CK(4), Chen CT(5).

ABSTRACT

BACKGROUND: Out-hospital cardiac arrest (OHCA) is a major cause of mortality and morbidity worldwide. The magnitude of the post-resuscitation inflammatory response is closely related to the severity of the circulatory dysfunction. Currently, targeted temperature management (TTM) has become an essential part of the post-resuscitation care for unconscious OHCA survivors. Some novel prognostic inflammatory markers may help predict outcomes of OHCA patients after TTM. METHODS: A retrospective observational cohort study of 65 OHCA patients treated with TTM was conducted in a tertiary hospital in Taiwan. The primary outcome measure was in-hospital mortality. Baseline and post-TTM neutrophil to lymphocyte ratio (NLR), platelet to lymphocyte (PLR), and the systemic immune inflammation index (SII) were identified as potential predictors. RESULTS: These patients had a mean age of 62.2 ± 17.0 years. Among the total sample, 53.8% had an initial shockable rhythm and 61.5% had a presumed cardiac etiology. The median resuscitation duration was 20 min (IQR 13.5-28.5) and 60% received subsequent percutaneous coronary intervention. The mean baseline NLR, PLR and SII were 7.5 ± 16.7, 118 ± 207, 1395 ± 3004, and the mean post-TTM NLR, PLR and SII were 15.0 ± 11.6, 206 ± 124, 2369 ± 2569, respectively. Using multiple logistic regression analysis, post-TTM NLR was one of the independent factors which predicted in-hospital mortality (adjusted odds ratio (aOR): 1.249, 95% confidence interval (CI): 1.040-1.501, p = 0.017). CONCLUSION: Post-TTM NLR is a predictor of in-hospital mortality in OHCA patients who underwent TTM.

2. Curr Probl Cardiol. 2023 Mar;48(3):101046. doi: 10.1016/j.cpcardiol.2021.101046. Epub 2021 Nov 12.

Therapeutic Hypothermia Following Cardiac Arrest After the TTM2 trial - More Questions Raised Than Answered.

Schäfer A(1), Bauersachs J(2), Akin M(2).

ABSTRACT

For almost 20 years, therapeutic hypothermia has been a cornerstone of modern post-cardiac arrest care lowering mortality, and improvin neurologic outcome compared to conventional therapy. This was challenged by the first TTM-trial in 2013, which did not show a benefit for hypothermia at 33°C

compared to controlled normothermia at 36°C. Now, the TTM2 trial showed no benefit of hypothermia compared to fever prevention alone. While TTM1 and TTM2 suggest that hypothermia might not be helpful, a deep dive into the trials reveals that this conclusion does not hold true. Here, we focus on patient selection, suboptimal application of hypothermia, interaction of standard sedation with hypothermia, high incidence of post-arrest fever, and withdrawal of life support based on per-protocol neurologic prognostication in the TTM2-trial. Of particular interest, contemporary trials and registries using intravascular cooling in TTM-like patients repeatedly reported much lower mortality rates than those described in both TTM1 and TTM2.

ELECTROPHYSIOLOGY AND DEFIBRILLATION

No articles identified.

PEDIATRICS AND CHILDREN

1. Circ Genom Precis Med. 2023 Jan 30. doi: 10.1161/CIRCGEN.122.003792. Online ahead of print.
Proactive Variant Effect Mapping Aids Diagnosis in Pediatric Cardiac Arrest.
Floyd BJ(#)(1), Weile J(#)(2)(3)(4), Kannankeril PJ(5), Glazer AM(6), Reuter CM(7), MacRae CA(8), Ashley EA(#)(7)(9), Roden DM(#)(6)(10)(11)(12)(9), Roth FP(#)(2)(3)(4), Parikh VN(#)(7).
NO ABSTRACT AVAILABLE

2. Pediatrics. 2023 Feb 1;151(2):e2022059631. doi: 10.1542/peds.2022-059631.
Recommended Guideline for Uniform Reporting of Neonatal Resuscitation: The Neonatal Utstein Style.
Foglia EE(1), Davis PG(2), Guinsburg R(3), Kapadia V(4), Liley HG(5), Rüdiger M(6)(7), Schmölzer GM(8), Strand ML(9), Wyckoff MH(4), Wyllie J(10), Weiner GM(11); International Liaison Committee on Resuscitation Neonatal Life Support Task Force.
ABSTRACT
Clinical research on neonatal resuscitation has accelerated over recent decades. However, an important methodologic limitation is that there are no standardized definitions or reporting guidelines for neonatal resuscitation clinical studies. To address this, the International Liaison Committee on Resuscitation Neonatal Life Support Task Force established a working group to develop the first Utstein-style reporting guideline for neonatal resuscitation. The working group modeled this approach on previous Utstein-style guidelines for other populations. This reporting guideline focuses on resuscitation of newborns immediately after birth for respiratory failure, bradycardia, severe bradycardia, or cardiac arrest. We identified 7 relevant domains: setting, patient, antepartum, birth/preresuscitation, resuscitation process, postresuscitation process, and outcomes. Within each domain, relevant data elements were identified as core versus supplemental. Core data elements should be collected and reported for all neonatal resuscitation studies, while supplemental data elements may be collected and reported using standard definitions when possible. The Neonatal Utstein template includes both core and supplemental elements across the 7 domains, and the associated Data Table provides detailed information and reporting standards for each data element. The Neonatal Utstein reporting guideline is anticipated to assist investigators engaged in neonatal resuscitation research by standardizing data definitions. The guideline will facilitate data pooling in meta-analyses, enhancing the strength of neonatal resuscitation treatment recommendations and subsequent guidelines.

EXTRACORPOREAL LIFE SUPPORT

1. Ann Card Anaesth. 2023 Jan-Mar;26(1):4-11. doi: 10.4103/aca.aca_79_22.
Multiparameters associated to successful weaning from VA ECMO in adult patients with cardiogenic shock or cardiac arrest: Systematic review and meta-analysis.
Burgos LM(1), Seoane L(2), Diez M(1), Baro Vila RC(1), Furmento JF(2), Vrancic M(3), Aissaoui N(4).
ABSTRACT
Venoarterial extracorporeal membrane oxygenation (VA ECMO) is a form of temporary mechanical circulatory support and simultaneous extracorporeal gas exchange for acute cardiorespiratory failure, including refractory cardiogenic shock (CS) and cardiac arrest (CA). Few studies have assessed predictors of successful weaning (SW) from VA ECMO. This systematic review and meta-analysis aimed to identify a multiparameter strategy associated with SW from VA ECMO. PubMed and the Cochrane Library and the International Clinical Trials Registry Platform were searched. Studies reporting adult patients with CS or CA treated with VA ECMO published from the year 2000 onwards were included. Primary outcomes were hemodynamic, laboratory, and echocardiography parameters associated with a VA ECMO SW. A total of 11 studies (n=653) were included in this review. Pooled VA ECMO SW was 45% (95%CI: 39-50%, I2 7%) and in-hospital mortality rate was 46.6% (95%CI: 33-60%; I2 36%). In the SW group, pulse pressure [MD 12.7 (95%CI: 7.3-18) I2 = 0%] and mean blood pressure [MD 20.15 (95%CI: 13.8-26.4 I2 = 0) were higher. They also had lower values of creatinine [MD -0.59 (95%CI: -0.9 to -0.2) I2 = 7%], lactate [MD -3.1 (95%CI: -5.4 to -0.7) I2 = 89%], and creatine kinase [-2779.5 (95%CI: -5387 to -171) I2 = 38%]. And higher left and right ventricular ejection fraction, MD 17.9% (95%CI: -0.2-36.2) I2 = 91%, and MD 15.9% (95%CI 11.9-20) I2 = 0%, respectively. Different hemodynamic, laboratory, and echocardiographic parameters were associated with successful device removal. This systematic review demonstrated the relationship of multiparametric assessment on VA ECMO SW.

2. N Engl J Med. 2023 Jan 26;388(4):299-309. doi: 10.1056/NEJMoa2204511.
Early Extracorporeal CPR for Refractory Out-of-Hospital Cardiac Arrest.
Suverein MM(1), Delnoij TSR(1), Lorusso R(1), Brandon Bravo Bruinsma GJ(1), Otterspoor L(1), Elzo Kraemer CV(1), Vlaar APJ(1), van der Heijden JJ(1), Scholten E(1), den Uil C(1), Jansen T(1), van den Bogaard B(1), Kuijpers M(1), Lam KY(1), Montero Cabezas JM(1), Driessen AHG(1), Rittersma SZH(1), Heijnen BG(1), Dos Reis Miranda D(1), Bleeker G(1), de Metz J(1), Hermanides RS(1), Lopez Matta J(1), Eberl S(1), Donker DW(1), van Thiel RJ(1), Akin S(1), van Meer O(1), Henriques J(1), Bokhoven KC(1), Mandigers L(1), Bunge JJH(1), Bol ME(1), Winkens B(1), Essers B(1), Weerwind PW(1), Maessen JG(1), van de Poll MCG(1).
ABSTRACT
BACKGROUND: Extracorporeal cardiopulmonary resuscitation (CPR) restores perfusion and oxygenation in a patient who does not have spontaneous circulation. The evidence with regard to the effect of extracorporeal CPR on survival with a favorable neurologic outcome in refractory out-of-hospital cardiac arrest is inconclusive. METHODS: In this multicenter, randomized, controlled trial conducted in the Netherlands, we assigned patients with an out-of-hospital cardiac arrest to receive extracorporeal CPR or conventional CPR (standard advanced cardiac life support). Eligible patients were between 18 and 70 years of age, had received bystander CPR, had an initial ventricular arrhythmia, and did not have a return of spontaneous circulation within 15 minutes after CPR had been initiated. The primary outcome was survival with a favorable neurologic outcome, defined as a Cerebral Performance Category score of 1 or 2 (range, 1 to 5, with higher scores indicating more severe disability) at 30 days. Analyses were performed on an intention-to-treat basis. RESULTS: Of the 160 patients who underwent randomization, 70 were assigned to receive extracorporeal CPR and 64 to receive conventional CPR; 26 patients who did not meet the inclusion criteria at hospital admission were excluded. At 30 days, 14 patients (20%) in the extracorporeal-CPR group were alive with a favorable neurologic outcome, as compared with 10 patients (16%) in the conventional-CPR

group (odds ratio, 1.4; 95% confidence interval, 0.5 to 3.5; P = 0.52). The number of serious adverse events per patient was similar in the two groups. CONCLUSIONS: In patients with refractory out-of-hospital cardiac arrest, extracorporeal CPR and conventional CPR had similar effects on survival with a favorable neurologic outcome.

3. ASAIO J. 2023 Feb 1;69(2):191-197. doi: 10.1097/MAT.0000000000001741. Epub 2022 Apr 13.
The Effects of Extracorporeal Cardiopulmonary Resuscitation According to Covariate Adjustment.
Ko K(1), Kim YH(1), Lee JH(1), Lee KY(2), Hwang SY(1), Jin MH(3).

ABSTRACT

This study compared the effects of extracorporeal cardiopulmonary resuscitation (ECPR) using propensity-score matching (PSM) analyses. A nationwide registry of out-of-hospital cardiac arrest (OHCA) patients in Korea between 2013 and 2016 was used. Patients with OHCA aged ≥15 years with cardiac etiology and resuscitation time >30 minutes were enrolled. Resuscitation-related variables before the initiation of ECPR were included. Two PSM analyses were performed separately, with and without post-ECPR variables. The primary outcome (PO) was a favorable neurologic outcome at hospital discharge. The rate of PO was 8.1% (13/161) in the ECPR group and 1.5% (247/16,489) in the conventional CPR (CCPR) group. In the matched cohort with post-ECPR variables, there was no significant difference in the rate of PO between the ECPR and CCPR groups (7.9% vs. 7.9%; p = 0.982). In the matched cohort without post-ECPR variables, the rate of PO was higher in the ECPR group than that in the CCPR group (8.3% vs. 3.6%; p = 0.012). PSM analysis without post-ECPR variables compared outcomes of all patients experiencing OHCA and treated with ECPR versus CCPR, which showed better neurologic outcomes for ECPR. PSM analysis with post-ECPR variables compared outcomes between ECPR survivors and CCPR survivors, which exhibited similar neurologic outcomes.

4. Resuscitation. 2023 Jan 28:109711. doi: 10.1016/j.resuscitation.2023.109711. Online ahead of print.
Implementation of a Regional Extracorporeal Membrane Oxygenation Program for Refractory Ventricular Fibrillation Out-of-Hospital Cardiac Arrest.
Bosson N(1), Kazan C(2), Sanko S(3), Abramson T(4), Eckstein M(4), Eisner D(5), Geiderman J(6), Ghurabi W(7), Gudzenko V(8), Mehra A(4), Torbati S(9), Uner A(8), Gausche-Hill M(10), Shavelle D(11).

ABSTRACT

BACKGROUND: eCPR, the modality of extracorporeal membrane oxygenation (ECMO) applied in the setting of cardiac arrest, has emerged as a novel therapy which may improve outcomes in select patients with out-of-hospital cardiac arrest (OHCA). To date, implementation has been mainly limited to single academic centres. Our objective is to describe the feasibility and challenges with implementation of a regional protocol for eCPR. METHODS: The Los Angeles County Emergency Medical Services (EMS) Agency implemented a regional eCPR protocol in July 2020, which included coordination across multiple EMS provider agencies and hospitals to route patients with refractory ventricular fibrillation (rVF) OHCA to eCPR-capable centres (ECCs). Data were entered on consecutive patients with rVF with suspected cardiac aetiology into a centralized database including time intervals, field and in-hospital care, survival and neurologic outcome. RESULTS: From July 27, 2020 through July 31, 2022, 35 patients (median age 57 years, 6 (17%) female) were routed to ECCs, of whom 11 (31%) received eCPR and 3 (27%) treated with eCPR survived, all of whom had a full neurologic recovery. Challenges encountered during implementation included cost to EMS provider agencies for training, implementation, and purchase of automatic chest compression devices, maintenance of system awareness, hospital administrative support for staffing and equipment for the ECMO program, and interdepartmental coordination at ECCs. CONCLUSION: We describe the successful implementation of a regional eCPR program with ongoing patient enrolment and data

collection. These preliminary findings can serve as a model for other EMS systems who seek to implement regional eCPR programs.

5. N Engl J Med. 2023 Jan 26;388(4):370-371. doi: 10.1056/NEJMe2214116.
Extracorporeal CPR in Out-of-Hospital Cardiac Arrest - Still on Life Support?
Keaney JF Jr(1), Münzel T(1).
NO ABSTRACT AVAILABLE

EXPERIMENTAL RESEARCH

1. J Vis Exp. 2023 Jan 13;(191). doi: 10.3791/64788.
A Piglet Perinatal Asphyxia Model to Study Cardiac Injury and Hemodynamics after Cardiac Arrest, Resuscitation, and the Return of Spontaneous Circulation.
Stenersen EO(1), Olsen A(2), Melheim M(3), Solberg R(4), Dannevig I(5), Schmölzer G(6), Cheung PY(6), Nakstad B(7), Saugstad OD(8), Rønnestad A(1), Solevåg AL(9).
ABSTRACT
Neonatal piglets have been extensively used as translational models for perinatal asphyxia. In 2007, we adapted a well-established piglet asphyxia model by introducing cardiac arrest. This enabled us to study the impact of severe asphyxia on key outcomes, including the time taken for the return of spontaneous circulation (ROSC), as well as the effect of chest compressions according to alternative protocols for cardiopulmonary resuscitation. Due to the anatomical and physiological similarities between piglets and human neonates, piglets serve as good models in studies of cardiopulmonary resuscitation and hemodynamic monitoring. In fact, this cardiac arrest model has provided evidence for guideline development through research on resuscitation protocols, pathophysiology, biomarkers, and novel methods for hemodynamic monitoring. Notably, the incidental finding that a substantial fraction of piglets have pulseless electrical activity (PEA) during cardiac arrest may increase the applicability of the model (i.e., it may be used to study pathophysiology extending beyond the perinatal period). However, the model generation is technically challenging and requires various skill sets, dedicated personnel, and a fine balance of the measures, including the surgical protocols and the use of sedatives/analgesics, to ensure a reasonable rate of survival. In this paper, the protocol is described in detail, as well as experiences with adaptations to the protocol over the years.

2. Resuscitation. 2023 Feb 1:109716. doi: 10.1016/j.resuscitation.2023.109716. Online ahead of print.
High Central Venous Pressure Amplitude Predicts Successful Defibrillation in a Porcine Model of Cardiac Arrest.
Balzer C(1), Eagle SS(1), Yannopoulos D(2), Aufderheide TP(3), Riess ML(4).
ABSTRACT
AIM: Increasing venous return during cardiopulmonary resuscitation (CPR) has been shown to improve hemodynamics during CPR and outcomes following cardiac arrest (CA). We hypothesized that a high central venous pressure amplitude (CVP-A), the difference between the maximum and minimum central venous pressure during chest compressions, could serve as a robust predictor of return of spontaneous circulation (ROSC) in addition to traditional measurements of coronary perfusion pressure (CPP) and end-tidal CO2 (etCO2) in a porcine model of CA. METHODS: After 10 minutes of ventricular fibrillation, 9 anesthetized and intubated female pigs received mechanical chest compressions with active compression/decompression (ACD) and an impedance threshold device (ITD). CPP, CVP-A and etCO2 were measured continuously. All groups received biphasic

defibrillation (200J) at minute 4 of CPR and were classified into two groups (ROSC, NO ROSC). Mean values were analyzed over 3 minutes before defibrillation by repeated-measures Analysis of Variance and receiver operating characteristic (ROC). RESULTS: Five animals out of 9 experienced ROSC. CVP-A showed a statistically significant difference (p=0.003) between the two groups during 3 minutes of CPR before defibrillation compared to CPP (p=0.056) and etCO2 (p=0.064). Areas-under-the-curve in ROC analysis for CVP-A, CPP and etCO2 were 0.94 (95% Confidence Interval 0.86, 1.00), 0.74 (0.54, 0.95) and 0.78 (0.50, 1.00), respectively. CONCLUSION: In our study, CVP-A was a potentially useful predictor of successful defibrillation and return of spontaneous circulation. Overall, CVP-A could serve as a marker for prediction of ROSC with increased venous return and thereby monitoring the beneficial effects of ACD and ITD. Institutional protocol number 1810-36421A.

CASE REPORTS

1. Clin Neurol Neurosurg. 2023 Jan 20;226:107608. doi: 10.1016/j.clineuro.2023.107608. Online ahead of print.
Effect of CPR in maintaining brain tissue oxygen (PbtO2) during a cardiac arrest.
Craven CL(1), Al-Ahmad S(2), Valetopoulou A(3), Reddy U(4), Toma AK(5).
NO ABSTRACT AVAILABLE

2. Ther Hypothermia Temp Manag. 2023 Feb 3. doi: 10.1089/ther.2022.0064. Online ahead of print.
A Case of Sudden Cardiac Arrest After Brainstem Infarction.
Suzuki T(1), Hifumi T(1), Goto M(1), Isokawa S(1), Otani N(1).
ABSTRACT
Research on the causes of sudden cardiac arrest (CA) after ischemic stroke, especially disruption of the autonomic nervous system's central control, has recently focused more on the widespread cortical and subcortical network than on autonomic circuits at the spinal and brainstem level. However, no clinical case of sudden CA requiring cardiopulmonary resuscitation (CPR) after brainstem infarction has been reported. We report a case of a 78-year-old woman who died suddenly from a brainstem infarction. Her husband heard a falling sound and found her unresponsive and lying with agonal breathing. The initial cardiac rhythm was pulseless electrical activity confirmed by emergency medical technicians. Recovery of spontaneous circulation was achieved after CPR. Basilar artery occlusion was shown on computed tomography, but no other findings that could have caused CA were found. Targeted temperature management was initiated, but she died on hospital day 22. Brainstem infarction may cause sudden CA; therefore, definitive treatment may achieve better outcomes.

3. Ann Noninvasive Electrocardiol. 2023 Feb 3:e13039. doi: 10.1111/anec.13039. Online ahead of print.
A case report of gadopentetate dimeglumine-induced cardiac arrest: Resuscitation using extracorporeal membrane oxygenation.
Fang H(1), Chen J(2), Luo J(1), Li Z(3), Zhang W(1).
ABSTRACT
Gadopentetate dimeglumine (Gd-DTPA) is commonly used for enhancement in magnetic resonance imaging, but rarely causes serious adverse reactions. The patient presented in this report had a cardiac arrest and multiple organ dysfunction syndrome within a short time after administration of Gd-DTPA. Immediately after receiving an intravenous injection of Gd-DTPA, the patient felt nausea and chest tightness, and developed systemic erythema. He was successfully treated using veno-

arterial extracorporeal membrane oxygenation (ECMO) combined with continuous renal replacement therapy without any serious complications or neurological deficits. We report a patient who was successfully treated for Gd-DTPA-induced cardiac arrest with ECMO. Thus, ECMO may be an effective treatment for cardiac arrest secondary to anaphylaxis.

4. Front Pediatr. 2023 Jan 16;10:993165. doi: 10.3389/fped.2022.993165. eCollection 2022.
Case report: Fatal infantile hypertonic myofibrillar myopathy with compound heterozygous mutations in the CRYAB gene.
Zhang SS(1), Gu LN(2), Zhang T(3), Xu L(4), Wei X(1), Chen SH(1), Shi SJ(1), Sun DQ(1), Zhou SH(1), Zhao QY(1).
ABSTRACT
BACKGROUND: Fatal infantile hypertonic myofibrillar myopathy (FIHMM) is an autosomal recessive hereditary disease characterized by amyotrophy, progressive flexion contracture and ankylosis of the trunk and limb muscles, apnea and respiratory failure, and increased creatine phosphate levels. It is caused by mutations in the CRYAB gene, and only around 18 cases including genetic mutations have been reported worldwide. All patients with FIHMM develop respiratory distress, progressive stiffness of the limbs, and have a poor prognosis. However, no effective treatment for CRYAB-associated respiratory failure has been reported. Here, we report a case of FIHMM with a novel heterozygous missense mutation. CASE PRESENTATION: A 2-year-old female developed scoliosis of the lumbar spine and restrictive ventilatory dysfunction in infancy. She was admitted to the hospital with labored breathing on the third day after the second injection of inactivated poliomyelitis vaccine. Acute respiratory failure, pneumothorax, and cardiac arrest arose in the patient during hospitalization, and progressive stiffness of the trunk and limb muscles appeared, accompanied by obvious abdominal distension and an increase in phosphocreatine kinase levels. Screenings for genetic metabolic diseases in the blood and urine were normal. Electromyography revealed mild myogenic damage. A muscle biopsy indicated the accumulation of desmin, α-crystallin, and myotilin in the musculus biceps brachii, and dense granules were observed in muscle fibers using electron microscopy. Mutation analysis of CRYAB revealed a novel heterozygous missense mutation in the proband, c.302A > C (p.His101Pro) and c.3G > A (p.Met1Ile), which inherited from her asymptomatic, heterozygous carrier parents, respectively. The proband was finally diagnosed as FIHMM. One month after the FIHMM diagnosis, the child died of respiratory failure. CONCLUSION: We report a case of FIHMM with a novel heterozygous missense mutation of CRYAB. This finding might improve our understanding of FIHMM and highlight a novel mutation in the Chinese population.

5. Cureus. 2022 Dec 29;14(12):e33089. doi: 10.7759/cureus.33089. eCollection 2022 Dec.
Resistant Polymorphic Ventricular Tachycardia in a Patient Taking Raspberry Ketones Weight Loss Supplement.
Ansari SA(1), Patel F(1), Ashouri D(1), Dhaliwal JSS(1), Desai A(1).
ABSTRACT
A 32-year-old female with no cardiac risk factors was admitted for treatment of a perianal abscess. During her hospital stay, she had a pulseless electrical activity arrest with a return of spontaneous circulation after one round of cardiopulmonary resuscitation (CPR). After transfer to the Intensive Care Unit (ICU), the patient had polymorphic ventricular tachycardia (PVT) requiring defibrillation shock. Her PVT was resistant to medical interventions. She was shocked a total of 33 times before her arrhythmia was terminated by passing a temporary transvenous pacemaker with overdrive pacing. After an extensive review of her history and presentation, no clear cause of her resistant arrhythmia was identified, however, she was found to have recently started taking over-the-counter weight loss supplements containing raspberry ketones which is a potentially cardiotoxic ingredient.

6. J Asthma Allergy. 2023 Jan 25;16:195-200. doi: 10.2147/JAA.S386811. eCollection 2023.
Anaphylaxis Following Contrast-Enhanced CT with Iodixanol: A Case Report and Literature Review.
Qiu L(1), Cui Q(1), Gong X(1), Zhou H(1).

ABSTRACT
BACKGROUND: Iodixanol-induced anaphylactic reaction is a well-known adverse event of contrast agents, which are generally well-tolerated and reversible. Serious and fatal reactions such as anaphylactic shock after computed tomography (CT) enhancement have been described. However, there is no data on these events in the literature. OBJECTIVE: This report describes a case of a serious anaphylactic reaction, possibly related to iodixanol and provides an overview of case reports. CASE SUMMARY: A 47-year-old women who experienced persistent abdominal pain for more than one month, was proposed of hiatal hernia with CT images taken two weeks previously and was admitted to the gastrointestinal surgery department. The patient underwent contrast-enhanced abdominal CT for the evaluation of multiple intraperitoneal hemodynamic features. A few minutes after abdominal enhanced CT scan, the patient was pale, sweating, had muscle tension and trembling, even coma and profound hypotension with 90/43 mm Hg. Immediately she was supported with oxygen inhalation, was treated with adrenaline subcutaneously, dexamethasone intravenously, and rapid intravenous drip of compound sodium chloride. Ten minutes later, the patient was in respiratory and cardiac arrest and the pupils were dilated. CPR and intermittant static push of 1 mg adrenaline were immediately carried. After endotracheal intubation, the patient's spontaneous heart rate and pupils recovered, and her blood pressure recovered to 105/53 mm Hg. It was suggested that the patient was suffering from iodixanol-induced anaphylactic shock and nephropathy, and she was transferred to the intensive care unit. Despite immediate treatment, the patient died. CONCLUSION: A 47-year-old female patient with no history of allergies developed severe fatal anaphylactic shock after receiving iodixanol. Although contrast agents induced anaphylactoid/anaphylactic reactions do not often occur, clinicians should be conscious of the potentially serious anaphylactic reaction, which could lead to a life-threatening or fatal event.

7. World J Emerg Med. 2023;14(1):72-74. doi: 10.5847/wjem.j.1920-8642.2023.001.
Cardiogenic shock and asphyxial cardiac arrest due to glutaric aciduria type II.
Xie HP(1)(2), Zeng WJ(1)(2)(3), Chen LX(1)(2)(3), Xie ZX(1)(2)(3), Wang XP(1)(2)(3), Zhao S(4).
NO ABSTRACT AVAILABLE

8. Cureus. 2022 Dec 26;14(12):e32947. doi: 10.7759/cureus.32947. eCollection 2022 Dec.
A Rare Initial Presentation of Aortic Intramural Hematoma: A Case Report and Literature Review.
Coombes K(1), Moin K(1), Ahmed-Khan MA(2), Vargas J(3).

ABSTRACT
Aortic intramural hematoma (AIH) is a life-threatening emergency that involves aortic wall integrity and is characterized by either a direct rupture of the vasa vasorum or spontaneous bleeding of an arterial plaque located in the tunica media of the aortic wall. A notable difference between AIH and acute aortic dissection is the absence of an intimal flap, a finding discernable on computed tomography angiography (CTA). Follow-up imaging allows for the monitoring of disease progression or early findings of impending complications. While some patients may require surgical intervention, medical management with blood pressure control remains the mainstay in treatment. Our case describes a patient who was found to be in cardiac arrest secondary to ventricular fibrillation and was then found to have presumed Stanford Type A aortic dissection on CTA. After reviewing the scans, the diagnosis was reclassified to AIH due to the absence of an intimal flap, the patient was then managed medically for AIH with antihypertensive medications.