This week's PubMed 5th – 11th November 2023: articles of interest n = 47

CPR AND COVID-19

No articles identified.

CPR/MECHANICAL CHEST COMPRESSION

No articles identified.

REGISTRIES, REVIEWS AND EDITORIALS

1. Eur Heart J Acute Cardiovasc Care. 2023 Nov 9:zuad132. doi: 10.1093/ehjacc/zuad132. Online ahead of print.
Clearing the air, saving lives: understanding air pollution's impact on out-of-hospital cardiac arrest.
Hahad O(1)(2), Daiber A(1)(2), Münzel T(1)(2).
NO ABSTRACT AVAILABLE

2. J Am Heart Assoc. 2023 Nov 10:e027746. doi: 10.1161/JAHA.123.027746. Online ahead of print.
Correction to: Association of Real-Time Feedback and Cardiopulmonary-Resuscitation Quality Delivered by Ambulance Personnel for Out-of-Hospital Cardiac Arrest.
[No authors listed]
NO ABSTRACT AVAILABLE

3. J Am Heart Assoc. 2023 Nov 7;12(21):e032052. doi: 10.1161/JAHA.123.032052. Epub 2023 Nov 6.
Reframing Our Approach to Disparities in Cardiac Arrest Outcomes: The Importance of Systems and Structures in Patient Outcomes.
Salhi RA(1), Zachrison KS(1).
NO ABSTRACT AVAILABLE

4. Resuscitation. 2023 Nov 3;193:110029. doi: 10.1016/j.resuscitation.2023.110029. Online ahead of print.
Looking into the heart of the problem of refractory cardiac arrest.
Scquizzato T(1), Sandroni C(2).
NO ABSTRACT AVAILABLE

5. Am J Emerg Med. 2023 Oct 21;75:65-71. doi: 10.1016/j.ajem.2023.10.025. Online ahead of print.
Association between institutional volume of out-of-hospital cardiac arrest cases and short term outcomes.
Kishihara Y(1), Kashiura M(2), Yasuda H(3), Kitamura N(4), Nomura T(5), Tagami T(6), Yasunaga H(7), Aso S(8), Takeda M(9), Moriya T(10); SOS-KANTO 2017 Study Group.
ABSTRACT
BACKGROUND: Out-of-hospital cardiac arrest (OHCA) is a serious condition. The volume-outcome relationship and various post-cardiac arrest care elements are believed to be associated with improved neurological outcomes. Although previous studies have investigated the volume-outcome relationship, adjusting for post-cardiac arrest care, intra-class correlation for each institution, and

other covariates may have been insufficient. OBJECTIVE: To investigate the volume-outcome relationships and favorable neurological outcomes among OHCA cases in each institution. METHODS: We conducted a prospective observational study of adult patients with non-traumatic OHCA using the OHCA registry in Japan. The primary outcome was 30-day favorable neurological outcomes, and the secondary outcome was 30-day survival. We set the cutoff values to trisect the number of patients as equally as possible and classified institutions into high-, middle-, and low-volume. Generalized estimating equations (GEE) were performed to adjust for covariates and within-hospital clustering. RESULTS: Among the 9909 registry patients, 7857 were included. These patients were transported to either low- (2679), middle- (2657), or high- (2521) volume institutions. The median number of eligible patients per institution in 19 months of study periods was 82 (range, 1-207), 252 (range, 210-353), and 463 (range, 390-701), respectively. After multivariable GEE using the low-volume institution as a reference, no significant difference in odds ratios and 95% confidence intervals were noted for 30-day favorable neurological outcomes for middle volume [1.22 (0.69-2.17)] and high volume [0.80 (0.47-1.37)] institutions. Moreover, there was no significant difference for 30-day survival for middle volume [1.02 (0.51-2.02)] and high volume [1.09 (0.53-2.23)] institutions. CONCLUSION: The patient volume of each institution was not associated with 30-day favorable neurological outcomes. Although this result needs to be evaluated more comprehensively, there may be no need to set strict requirements for the type of institution when selecting a destination for OHCA cases.

6. Resuscitation. 2023 Nov 1:110013. doi: 10.1016/j.resuscitation.2023.110013. Online ahead of print.
"Get trained. Save lives.": A CPR awareness campaign in football.
Lott C(1), van Goor S(2), Nikolaou N(3), Thilakasiri K(4), Bahtijarević Z(5).
NO ABSTRACT AVAILABLE

IN-HOSPITAL CARDIAC ARREST

1. Circ Cardiovasc Qual Outcomes. 2023 Nov 10:e010491. doi: 10.1161/CIRCOUTCOMES.123.010491. Online ahead of print.
Ten Steps Toward Improving In-Hospital Cardiac Arrest Quality of Care and Outcomes.
Nallamothu BK(1), Greif R(2), Anderson T(1), Atiq H(3), Couto TB(4), Considine J(5), De Caen AR(2), Djärv T(6), Doll A(7), Douma MJ(8), Edelson DP(9), Xu F(10), Finn JC(11), Firestone G(12), Girotra S(13), Lauridsen KG(14), Leong CK(15), Lim SH(15), Morley PT(16), Morrison LJ(17), Moskowitz A(18), Mullasari Sankardas A(19), Mohamed MTM(20), Myburgh MC(21), Nadkarni VM(22), Neumar RW(23), Nolan JP(24), Athieno Odakha J(25), Olasveengen TM(26), Orosz J(27), Perkins GD(24), Previdi JK(28), Vaillancourt C(29), Montgomery WH(30), Sasson C(31), Chan PS(32); International Liaison Committee on Resuscitation.
NO ABSTRACT AVAILABLE

2. Resuscitation. 2023 Nov 10:109996. doi: 10.1016/j.resuscitation.2023.109996. Online ahead of print.
Ten Steps Toward Improving In-Hospital Cardiac Arrest Quality of Care and Outcomes.
Nallamothu BK(1), Greif R(2), Anderson T(3), Atiq H(4), Bittencourt Couto T(5), Considine J(6), De Caen AR(7), Djärv T(8), Doll A(9), Douma MJ(10), Edelson DP(11), Xu F(12), Finn JC(13), Firestone G(14), Girotra S(15), Lauridsen KG(16), Kah-Lai Leong C(17), Lim SH(17), Morley PT(18), Morrison LJ(19), Moskowitz A(20), Mullasari Sankardas A(21), Mustafa Mohamed MT(22), Myburgh MC(23), Nadkarni VM(24), Neumar RW(25), Nolan JP(26), Odakha JA(27), Olasveengen TM(28), Orosz J(29),

Perkins GD(26), Previdi JK(30), Vaillancourt C(31), Montgomery WH(32), Sasson C(33), Chan PS(34); International Liaison Committee on Resuscitation.
NO ABSTRACT AVAILABLE

3. Am J Emerg Med. 2023 Oct 22;75:98-110. doi: 10.1016/j.ajem.2023.10.020. Online ahead of print.
Impact of pharmacists during in-hospital resuscitation or medical emergency response events: A systematic review.
Currey EM(1), Falconer N(2), Isoardi KZ(3), Barras M(4).
ABSTRACT
BACKGROUND: We sought to determine the impact of the presence of a pharmacist on medication and patient related outcomes during the emergency management of critically ill patients requiring resuscitation or medical emergency response team care in a hospital setting. METHODS: We conducted a systematic review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. A literature search of databases from January 1995 to April 2023 was conducted to identify studies of contemporary pharmacist practice. Results were extracted and analysed for included studies, those evaluating the impact of the presence of a pharmacist on medication and patient related outcomes during the emergency management of critically ill hospitalised patients requiring resuscitation or medical emergency response team care. To determine risk of bias, the Newcastle-Ottowa Quality Assessment scale was used for non-randomised studies and the Revised Cochrane risk-of-bias tool for randomised trials. RESULTS: Of 1345 studies identified, 54 were selected for full text review, and 30 were included in the final analysis. There were 29 cohort studies and one randomised controlled trial. The studies reported the impact of a pharmacist for a variety of patient presentations. The study team assigned each study to one of eight patient cohorts: acute stroke, cardiac arrest, rapid response calls, S-T segment elevation myocardial infarction, acute haemorrhage, major trauma resuscitation, sepsis and status epilepticus. The most frequently reported outcome, associated with a statistically significant benefit in 23 studies, was time to medication administration. Few studies reported a significant difference in patient outcome measures such as mortality. Only 8 of the 30 studies were assessed to have a low risk of bias. CONCLUSIONS: The results of this systematic review provide support for a beneficial impact of a pharmacist presence and intervention during resuscitation or medical emergency response team care, with significant improvements in outcomes such as time to initiation of time-critical medications, medication appropriateness and guideline compliance. However, studies were predominantly small and retrospective and were not powered to detect differences in patient related measures such as length of stay and mortality. Future research should investigate the clinical impacts of the pharmacist in ED resuscitation settings in controlled, prospective studies with robust sampling methods.

4. Minerva Anestesiol. 2023 Nov;89(11):1003-1012. doi: 10.23736/S0375-9393.23.17390-1. Epub 2023 Sep 5.
Efficacy of in-bed chest compressions depending on provider position during in-hospital cardiac arrest: a controlled manikin study.
Strototte LM(1), May TW(2), Laker S(3), Latka E(3), Thaemel D(3), Thies KC(4), Rehberg SW(4), Jansen G(3)(5)(6).
ABSTRACT
BACKGROUND: In contrast to the pre-hospital environment, patients with in-hospital cardiac arrest are usually lying in a hospital bed. Interestingly, there are no current recommendations for optimal provider positioning. The present study evaluates in bed chest compression quality in different provider positions during in-hospital-cardiac-arrest. METHODS: Paramedics conducted four resuscitation scenarios: manikin lying on the floor with provider position kneeling next to the manikin (control group), manikin lying in a hospital bed with the provider kneeling astride, kneeling

beside or standing next to the manikin. A resuscitation board was not used according to the current guideline recommendations. Quality of resuscitation, compression depth, compression rate and percentage of compressions with complete chest rebound were recorded. Afterwards, the paramedics were asked about subjective efficiency and fatigue. Data were analyzed using Generalized-Linear-Mixed-Models and, in addition, by non-parametric Friedman test. RESULTS: A total of 60 participants were recruited. The total quality of chest compressions was significantly higher in floor-based control position compared to the standing (P<.001) and both kneeling positions (P<.05). Also, the compression depth was significantly more guideline compliant in the control (P<.001) and the kneeling position (P<.05) compared to the standing position. The compression frequency as well as the complete chest wall recoil did not differ significantly. The standing position was rated as more fatiguing than the other positions (p≤0.001), kneeling beside as subjectively more efficient than the standing position (P<0.001). CONCLUSIONS: In case of an in-bed resuscitation, high quality chest compressions are possible. Kneeling astride or beside the patient should be preferred because these positions demonstrated a good chest compression quality and were more efficient and less exhausting.

INJURIES AND CPR

No articles identified.

CAUSE OF THE ARREST

1. J Korean Med Sci. 2023 Nov 6;38(43):e331. doi: 10.3346/jkms.2023.38.e331.
Association Between Body Weight Changes and Subsequent Development of Out-of-Hospital Cardiac Arrest: A Population-Based Nested Case-Control Study.
Kim YJ(1), Kim MJ(2), Kim YJ(2), Kim WY(3).
ABSTRACT
BACKGROUND: Body weight is a modifiable demographic factor. Although the association of body mass index (BMI) categories with sudden cardiac death was reported, dynamic changes of BMI and the risk of cardiac arrest remain unknown. This study aimed to evaluate the association between the out-of-hospital cardiac arrest (OHCA) occurrence within a year and the percent changes of BMI preceding the OHCA. METHODS: This population-based nested case-control study used the National Health Insurance Service Data of Korea. In all, 24,465 patients with non-traumatic OHCA between 2010 and 2018, who underwent national health check-up twice (one within a year and the other within 2-4 years before OHCA) and 32,434 controls without OHCA, were matched for age and sex. The association between the risk of OHCA and BMI percent change stratified by sex was investigated. RESULTS: All the BMI percent changes of ≥ 5% significantly increased the OHCA occurrence with a reverse J-shaped association. Compared to individuals with a stable weight, those with severe (> 15%) BMI decrease had the highest odds ratio (OR) of 4.29 (95% confidence intervals [CIs], 3.72-4.95) for OHCA occurrence followed by those with moderate (10-15%) weight loss (OR, 2.80; 95% CI, 2.55-3.08) and those with severe (> 15%) weigh gain (OR, 2.24; 95% CI, 1.96-2.57), respectively. The impact of weight loss on the cardiac arrest occurrence was more prominent in men, while the impact of weight gain was more prominent in women. CONCLUSION: Significant weight changes increase the risk of OHCA within a year with a reverse J-shaped association. Significant weight loss might be a warning sign for OHCA especially for men.

2. JAMA Netw Open. 2023 Nov 1;6(11):e2341921. doi: 10.1001/jamanetworkopen.2023.41921.
Presentation and Outcomes of Adults With Overdose-Related Out-of-Hospital Cardiac Arrest.

Yogeswaran V(1), Drucker C(2), Kume K(2), Poel A(2), Yarid N(3), Leyde S(1), Rea TD(1)(2), Chatterjee NA(1).

ABSTRACT

IMPORTANCE: Drug overdose (OD) is a public health challenge and an important cause of out-of-hospital cardiac arrest (OHCA). Existing studies evaluating OD-related OHCA (OD-OHCA) either aggregate all drugs or focus on opioids. The epidemiology, presentation, and outcomes of drug-specific OHCA are largely unknown. OBJECTIVE: To evaluate the temporal pattern, clinical presentation, care, and outcomes of adult patients with OHCA overall and according to the drug-specific profile. DESIGN, SETTING, AND PARTICIPANTS: This cohort study of adults with OHCA in King County Washington was conducted between January 1, 2015, and December 31, 2021. Etiology of OHCA was determined using emergency medical service, hospital, and medical examiner records. Etiology was classified as non-OD OHCA or OD-OHCA, with drug-specific profiles categorized as (1) opioid without stimulant, (2) stimulant without opioid, (3) opioid and stimulant, or (4) all other nonstimulant, nonopioid drugs. Statistical analysis was performed on July 1, 2023. EXPOSURE: Out-of-hospital cardiac arrest. MAIN OUTCOMES AND MEASURES: The primary outcome was survival to hospital discharge. The secondary outcome was survival with favorable functional status defined by Cerebral Performance Category 1 or 2 based on review of the hospital record. RESULTS: In this cohort study, there were 6790 adult patients with emergency medical services-treated OHCA from a US metropolitan system. During the 7-year study period, there were 702 patients with OD-OHCA (median age, 41 years [IQR, 29-53 years]; 64% male [n = 450] and 36% female [n = 252]) and 6088 patients with non-OD OHCA (median age, 66 years [IQR, 56-77 years]; 65% male [n = 3944] and 35% female [n = 2144]). The incidence of OD-OHCA increased from 5.2 (95% CI, 3.8-6.6) per 100 000 person-years in 2015 to 13.0 (95% CI, 10.9-15.1) per 100 000 person-years in 2021 (P < .001 for trend), whereas there was no significant temporal change in the incidence of non-OD OHCA (P = .30). OD-OHCA were more likely to be unwitnessed (66% [460 of 702] vs 41% [2515 of 6088]) and less likely to be shockable (8% [56 of 702] vs 25% [1529 of 6088]) compared with non-OD OHCA. Unadjusted survival was not different (20% [138 of 702] for OD vs 18% [1095 of 6088] for non-OD). When stratified by drug profile, combined opioid-stimulant OHCA demonstrated the greatest relative increase in incidence. Presentation and outcomes differed by drug profile. Patients with stimulant-only OHCA were more likely to have a shockable rhythm (24% [31 of 129]) compared with patients with opioid-only OHCA (4% [11 of 295]) or patients with combined stimulant-opioid OHCA 5% [10 of 205]), and they were more likely to have a witnessed arrest (50% [64 of 129]) compared with patients with OHCA due to other drugs (19% [14 of 73]) or patients with combined stimulant-opioid OHCA (23% [48 of 205]). Patients with a combined opioid-stimulant OHCA had the lowest survival to hospital discharge (10% [21 of 205]) compared with patients with stimulant-only OHCA (22% [29 of 129]) or patients with OHCA due to other drugs (26% [19 of 73]), a difference that persisted after multivariable adjustment. CONCLUSIONS AND RELEVANCE: In a population-based cohort study, the incidence of OD-OHCA increased significantly from 2015 to 2021, with the greatest increase observed among patients with a combined stimulant-opioid OHCA. Presentation and outcome differed according to the drug-specific profile. The combination of increasing incidence and lower survival among among patients with a opioid-stimulant OHCA supports prevention and treatment initiatives that consider the drug-specific profile.

END-TIDAL CO_2

1. Circulation. 2023 Nov 6. doi: 10.1161/CIRCULATIONAHA.123.066659. Online ahead of print.
Associations Between End-Tidal Carbon Dioxide During Pediatric Cardiopulmonary Resuscitation, CPR Quality, and Survival.

Morgan RW(1), Reeder RW(2), Bender D(3), Cooper KK(1), Friess SH(4), Graham K(1), Meert KL(5), Mourani PM(6), Murray R(7), Nadkarni VM(1), Nataraj C(3), Palmer CA(2), Srivastava N(8), Tilford B(5), Wolfe HA(1), Yates AR(7), Berg RA(1), Sutton RM(1).

ABSTRACT

Background: Supported by laboratory and clinical investigations of adult cardiopulmonary arrest, resuscitation guidelines recommend monitoring end-tidal carbon dioxide (ETCO2) as an indicator of CPR quality but note that "specific values to guide therapy have not been established in children." Methods: This prospective observational cohort study was an NHLBI-funded ancillary study of children in the ICU-RESUScitation trial (NCT02837497). Hospitalized children (≤18 years of age and ≥37 weeks post-gestational age) who received chest compressions of any duration for cardiopulmonary arrest, had an endotracheal or tracheostomy tube at the start of CPR, and had evaluable intra-arrest ETCO2 data were included. The primary exposure was event-level average ETCO2 during the first 10 minutes of CPR (dichotomized as ≥20 mmHg vs. <20 mmHg based on adult literature). The primary outcome was survival to hospital discharge. Secondary outcomes were sustained return of spontaneous circulation (ROSC), survival to discharge with favorable neurologic outcome, and new morbidity among survivors. Poisson regression measured associations between ETCO2 and outcomes as well as the association between ETCO2 and other CPR characteristics: 1) invasively measured systolic and diastolic blood pressures and 2) CPR quality and chest compression mechanics metrics (i.e., time to CPR start; chest compression rate, depth, and fraction; ventilation rate). Results: Among 234 included patients, 133 (57%) had an event-level average ETCO2 ≥20 mmHg. After controlling for a priori covariates, average ETCO2 ≥20 mmHg was associated with higher incidence of survival to hospital discharge (86/133 (65%) versus 48/101 (48%); aRR 1.33, CI95 1.04 - 1.69, p=0.023) and ROSC (95/133 (71%) versus 59/101 (58%); aRR 1.22, CI95 1.00 - 1.49, p=0.046) compared with lower values. ETCO2 ≥20 mmHg was not associated with survival with favorable neurologic outcome or new morbidity among survivors. Average ETCO2 ≥20 mmHg was associated with higher systolic and diastolic blood pressures during CPR, lower CPR ventilation rates, and briefer pre-CPR arrest durations compared with lower values. Chest compression rate, depth, and fraction did not differ between ETCO2 groups. Conclusions: In this multicenter study of children with in-hospital cardiopulmonary arrest, ETCO2 ≥20 mmHg was associated with better outcomes and higher intra-arrest blood pressures, but not with chest compression quality metrics.

ORGAN DONATION

1. Resuscitation. 2023 Nov 7:110035. doi: 10.1016/j.resuscitation.2023.110035. Online ahead of print.

ECPR and Organ Donation: Emerging Clarity in Decision Making.

Manara A(1), Rubino A(2), Tisherman S(3).

NO ABSTRACT AVAILABLE

2. Resuscitation. 2023 Nov 3:110030. doi: 10.1016/j.resuscitation.2023.110030. Online ahead of print.

Reply to pre hospital interventions and organ donation in out of hospital cardiac arrest.

Rubio-Chacón C(1), Mateos-Rodríguez A(2), Neria-Serrano F(2), Del Rio-Gallegos F(3), Andrés-Belmonte A(4).

NO ABSTRACT AVAILABLE

FEEDBACK

No articles identified.

DRUGS

1. Am J Emerg Med. 2023 Nov 4;75:154-159. doi: 10.1016/j.ajem.2023.10.053. Online ahead of print.
Effect of no-flow period on the vasopressor effect of initial epinephrine administration in cardiac arrest.
Song NE(1), Kim KH(2), Hong KJ(3).
ABSTRACT
OBJECTIVES: Whether a longer no-flow (NF) interval affects the magnitude of response to epinephrine in the resuscitation has not been well studied. Therefore, this study aimed to evaluate the effect of NF interval on the vasopressor effect of initial epinephrine administration in a porcine model. METHODS: We enrolled 20 pigs from two randomized porcine experimental studies using a ventricular fibrillation (VF) cardiac arrest model. The first experiment subjects were resuscitated after 4 min of NF (Short NF group), followed by three cycles (6 min) of chest compression using a mechanical cardiopulmonary resuscitation device before epinephrine administration. Second experiment subjects received 6 min of NF (Long NF group), two cycles (4 min) of chest compressions, and administration of epinephrine. Defibrillation for VF was delivered 8 and 10 min after VF induction in the Short NF and Long NF groups, respectively. The mean arterial pressure (MAP) and cerebral perfusion pressure (CePP) in the 2-min resuscitation period after epinephrine administration were compared between the study groups using the Wilcoxon rank-sum test. The mean differences in the parameters between phases were also compared. RESULTS: Seven pigs in the Short NF group and 13 pigs in the Long NF group were included in the analysis. All 2-min resuscitation phases from 6 to 16 min after VF induction were compared between the study groups. The Short NF group showed higher MAP and CePP in all phases ($p < 0.01$). Change of mean MAP after the epinephrine administration was significantly different between the study groups: mean difference (95% confidence interval) of 16.6 (15.8-17.4) mmHg in the Short NF group and 4.2 (3.9-4.5) mmHg in the Long NF group. CONCLUSION: In the porcine VF cardiac arrest model, 6 min of NF before resuscitation may affect the vasopressor effect of the initial epinephrine administered compared to 4 min of NF. A short NF may play a role in maximizing the effect of epinephrine in advanced cardiovascular life support.

2. Intensive Care Med. 2023 Nov 9. doi: 10.1007/s00134-023-07247-w. Online ahead of print.
Prehospital high-dose methylprednisolone in resuscitated out-of-hospital cardiac arrest patients (STEROHCA): a randomized clinical trial.
Obling LER(1), Beske RP(2), Meyer MAS(2), Grand J(2), Wiberg S(2)(3), Nyholm B(2), Josiassen J(2), Søndergaard FT(2), Mohr T(4), Damm-Hejmdal A(5), Bjerre M(6), Frikke-Schmidt R(7)(8), Folke F(5)(8)(9), Møller JE(2)(8)(10), Kjaergaard J(2)(8), Hassager C(2)(8).
ABSTRACT
PURPOSE: Patients who are successfully resuscitated following out-of-hospital cardiac arrest (OHCA) are still at a high risk of neurological damage and death. Inflammation and brain injury are components of the post-cardiac arrest syndrome, and can be assessed by systemic interleukin 6 (IL-6) and neuron-specific enolase (NSE). Anti-inflammatory treatment with methylprednisolone may dampen inflammation, thereby improving outcome. This study aimed to determine if prehospital high-dose methylprednisolone could reduce IL-6 and NSE in comatose OHCA patients. METHODS: The STEROHCA trial was a randomized, blinded, placebo-controlled, phase II prehospital trial

performed at two cardiac arrest centers in Denmark. Resuscitated comatose patients with suspected cardiac etiology were randomly assigned 1:1 to a single intravenous injection of 250 mg methylprednisolone or placebo. The co-primary outcome was reduction of IL-6 and NSE-blood levels measured daily for 72 h from admission. The main secondary outcome was survival at 180 days follow-up. RESULTS: We randomized 137 patients to methylprednisolone (n = 68) or placebo (n = 69). We found reduced IL-6 levels ($p < 0.0001$) in the intervention group, with median (interquartile range, IQR) levels at 24 h of 2.1 pg/ml (1.0; 7.1) and 30.7 pg/ml (14.2; 59) in the placebo group. We observed no difference between groups in NSE levels ($p = 0.22$), with levels at 48 h of 18.8 ug/L (14.4; 24.6) and 14.8 ug/L (11.2; 19.4) in the intervention and placebo group, respectively. In the intervention group, 51 (75%) patients survived and 44 (64%) in the placebo group. CONCLUSION: Prehospital treatment with high-dose methylprednisolone to resuscitated comatose OHCA patients, resulted in reduced IL-6 levels after 24 h, but did not reduce NSE levels.

3. Am J Emerg Med. 2023 Oct 30;75:111-118. doi: 10.1016/j.ajem.2023.10.031. Online ahead of print.

Efficacy and safety of corticosteroid therapy in patients with cardiac arrest: A meta-analysis of randomized controlled trials.

Zhou FW(1), Liu C(2), Li DZ(3), Zhang Y(4), Zhou FC(5).

ABSTRACT

BACKGROUND: The clinical benefits of steroid therapy during cardiac arrest (CA) are unclear. Several recent clinical trials have shown that administering corticosteroid therapy during CA may improve patient outcomes. The purpose of the present study was to determine whether providing corticosteroids improves outcomes for patients following CA. METHODS: We searched the PubMed, Embase, Cochrane Library, Web of Science and CNKI databases for randomized controlled trials comparing corticosteroid therapy to placebo during CA. RESULTS: Eleven relevant studies involving a total of 2273 patients were included in the meta-analysis. The statistical analysis showed that corticosteroid treatment during CA was significantly associated with an increased rate of sustained return of spontaneous circulation (ROSC) (OR: 2.05, 95% CI: 1.24 to 3.37, $P < 0.01$). Corticosteroid treatment during CA did not show a significant benefit in favorable neurological outcomes (OR: 1.13, 95% CI: 0.81 to 1.58, $P = 0.49$) or overall survival rate at hospital discharge (OR: 1.29, 95% CI: 0.74 to 2.26, $P = 0.38$). However, in the subgroup analysis, we found that patients had a significantly increased survival rate and ROSC if the dose of corticosteroid therapy above 100 mg methylprednisolone. The statistical analysis revealed no significant differences in adverse events. CONCLUSION: High-dose corticosteroid treatment (above 100 mg methylprednisolone) is associated with better overall survival rate at hospital discharge and ROSC outcomes. However, there is uncertainty regarding whether this treatment results in a benefit or harm to the favorable neurological outcomes at hospital discharge.

4. Resuscitation. 2023 Nov 3;193:110031. doi: 10.1016/j.resuscitation.2023.110031. Online ahead of print.

The association of tibial vs. humeral intraosseous vascular access with patient outcomes in adult out-of-hospital cardiac arrests.

Brebner C(1), Asamoah-Boaheng M(2), Zaidel B(3), Yap J(4), Scheuermeyer F(5), Mok V(1), Christian M(6), Kawano T(7), Singh L(4), van Diepen S(8), Christenson J(5), Grunau B(9).

ABSTRACT

AIM: Humeral and tibial intraosseous (IO) vascular access can deliver resuscitative medications for out-of-hospital cardiac arrest (OHCA), however the optimal site is unclear. We examined the

association between IO tibia vs. humerus as the first-attempted vascular access site with OHCA outcomes. METHODS: We used prospectively-collected data from the British Columbia Cardiac Arrest registry, including adult OHCAs treated with IO humerus or IO tibia as the first-attempted intra-arrest vascular access. We fit logistic regression models on the full study cohort and a propensity-matched cohort, to estimate the association between IO site and both favorable neurological outcomes (Cerebral Performance Category 1-2) and survival at hospital discharge. RESULTS: We included 1041 (43%) and 1404 (57%) OHCAs for whom IO humerus and tibia, respectively, were the first-attempted intra-arrest vascular access. Among humerus and tibia cases, 1010 (97%) and 1369 (98%) had first-attempt success, and the median paramedic arrival-to-successful access interval was 6.7 minutes (IQR 4.4-9.4) and 6.1 minutes (IQR 4.1-8.9), respectively. In the propensity-matched cohort (n = 2052), 31 (3.0%) and 44 (4.3%) cases had favourable neurological outcomes in the IO humerus and IO tibia groups, respectively; compared to IO humerus, we did not detect an association between IO tibia with favorable neurological outcomes (OR 1.44; 95% CI 0.90-2.29) or survival to hospital discharge (OR 1.29; 95% CI 0.83-2.01). Results using the full cohort were similar. CONCLUSIONS: We did not detect an association between the first-attempted intra-arrest IO site (tibia vs. humerus) and clinical outcomes. Clinical trials are warranted to test differences between vascular access strategies.

TRAUMA

No articles identified.

VENTILATION

No articles identified.

CERERBRAL MONITORING

No articles identified.

ULTRASOUND AND CPR

No articles identified.

ORGANISATION AND TRAINING

1. BMC Emerg Med. 2023 Nov 10;23(1):134. doi: 10.1186/s12873-023-00907-6.
Evaluation of a newly developed first aid training programme adapted for older people.
Dolenc Šparovec E(1), Slabe D(2), Eržen I(2), Kovačič U(2).
ABSTRACT
BACKGROUND: Older people need to acquire knowledge and skills at first aid (FA) training tailored to them. Our research aimed to evaluate an FA training programme adapted for older people. We assumed that satisfaction with FA training, as well as knowledge of FA, would be higher among older people who received training according to an adapted programme compared to those who received training according to the existing programme for the general public. METHODS: We trained older people according to the existing FA programme for the general public and according to a new FA

training programme adapted for older people. The new training program is shorter and focuses on FA contents that are more relevant for older people. We evaluated participants with a general assessment questionnaire (consisting of items regarding satisfaction, comprehensibility, length, and physical difficulty), a test on theoretical FA knowledge, and a test on practical cardiopulmonary resuscitation (CPR) knowledge. To ensure the homogeneity of the groups and to verify the impact on the results of the test of practical CPR knowledge, we also tested the participants regarding their psychophysical capabilities. RESULTS: A total of 120 people completed the free FA training sessions. The general assessment questionnaire score of participants who were trained based on the new FA training program was 19.3 (out of 20), which was statistically significantly ($p < 0.05$) higher than that of those trained based on the old program (general assessment score of 17.1). Participants who were trained based on the new program scored an average of 8.6 points on the theoretical FA knowledge test, while those who were trained based on the old program scored an average of 7.1 points, which was statistically significantly ($p < 0.05$) lower. In both programs, the same average scores (7.5 out of 10 points) on the practical CPR knowledge test was achieved. However, participants who participated in the FA course adapted for the older people gained practical CPR knowledge in a shorter time. Older people with a greater psychophysical capacity were more successful in performing CPR, regardless of which FA training programme they received. CONCLUSIONS: The effectiveness of FA training is greater if older people are trained in accordance with a targeted programme adapted to the psychophysical limitations of the older people.

2. PLoS One. 2023 Nov 10;18(11):e0293965. doi: 10.1371/journal.pone.0293965. eCollection 2023.
Early modelling of the effects and healthcare costs of the Dutch citizen-rescuer system for out-of-hospital cardiac arrests.
Ahmed A(1), Mewes JC(1), Lepage-Nefkens I(1), Tan HL(2)(3), Vrijhoef HJM(1); ESCAPE-NET Investigators.
ABSTRACT
OBJECTIVES: 1) to analyse the total average healthcare costs of a patient with an out-of-hospital cardiac arrest (OHCA), as well as estimating the operational costs of the citizen-rescuer system (CRS); 2) to conduct an early modelling of the effects and healthcare costs of the Dutch CRS in comparison to no CRS. METHODS: A health economic modelling study was conducted. Adult patients with OHCA from cardiac causes in the province of Limburg (the Netherlands) were included. The time horizon was from OHCA occurrence up to one year after hospital discharge. First, the total average healthcare costs of OHCA patients were analysed as well as the yearly operating costs of the CRS. Second, an early modelling was conducted to compare from the healthcare perspective the healthcare costs of OHCA patients with the CRS being activated but no responders attended (CRS-NV) versus the CRS being activated with attendance of ≥1 responder(s) (CRS-V). RESULTS: The total average healthcare costs per patient are €42,533. The yearly operating costs for the CRS are approximately €1.5 million per year in the Netherlands. The early modelling of costs and effects showed that the incremental healthcare costs per patient thus were €4,131 in the CRS-V versus the CRS-NV group (€25,184 in the CRS-V group and €21,053 in the CRS-NV group). Incremental quality-adjusted life years (QALYs) was 5 per 100 patients (16 per 100 patients in the CRS-V group versus 11 per 100 patients in the CRS-NV group). The incremental cost-effectiveness ratio (ICER) was €79,662 per QALY for the CRS-V group. CONCLUSION: This study shows that patients in the CSR-V group had additional health care costs of €4,131 per patient compared to patients in the CRS-NV group. This increase is caused by patients surviving more often, who then continue to utilise health services, which results in a (logic) increase in healthcare costs. For future research, accurate and up-to-date data on effectiveness and costs of the CRS needs to be collected.

3. Health Commun. 2023 Nov 10:1-10. doi: 10.1080/10410236.2023.2276587. Online ahead of print.
Introducing "A Question That Might, Perhaps, Scare you": How Geriatric Physicians Approach the Discussion About Cardiopulmonary Resuscitation with Hospitalized Patients.
Sterie AC(1)(2), Weber O(3)(4), Jox RJ(1)(5), Rubli Truchard E(1)(6).
ABSTRACT
Decisions about the relevance of life-sustaining treatment, such as cardiopulmonary resuscitation (CPR), are commonly made when a patient is admitted to the hospital. This article aims to refine our understanding of how discussions about CPR are introduced, to identify and classify the components frequently occurring in these introductions, and discuss their implications within the overarching activity (discussing CPR). We recorded 43 discussions about CPR between physicians and patients, taking place during the admission interview. We applied an inductive qualitative content analysis and thematic analysis to all the encounter content from the launch of the conversation on CPR to the point at which the physician formulated a question or the patient an answer. We identified this part of the encounter as the "introduction." This systematic method allowed us to code the material, develop and assign themes and subthemes, and quantify it. We identified four major themes in the introductions: (i) agenda setting; (ii) circumstances leading to CPR (subthemes: types of circumstances, personal prognostics of cardiac arrest); (iii) the activity of addressing CPR with the patient (subthemes: routine, constrain, precedence, sensitivity); and (iv) mentioning advance directives. Our findings reveal the elaborate effort that physicians deploy by appealing to combinations of these themes to account for the need to launch conversations about CPR, and highlight how CPR emerges as a sensitive topic.

4. BMC Nurs. 2023 Nov 9;22(1):420. doi: 10.1186/s12912-023-01588-z.
The effect of simulation-based advanced cardiac life support training on nursing students' self-efficacy, attitudes, and anxiety in Palestine: a quasi-experimental study.
Kassabry MF(1).
ABSTRACT
BACKGROUND: Cardiac Arrest (CA) is one of the leading causes of death, either inside or outside hospitals. Recently, the use of creative teaching strategies, such as simulation, has gained popularity in Cardio Pulmonary Resuscitation (CPR) instruction. This study aimed to assess the effect of High-Fidelity Simulation (HFS) training on nursing students' self-efficacy, attitude, and anxiety in the context of Advanced Cardiac Life Support (ACLS). METHODOLOGY: The study design is quasi-experimental employing a pre-test and post-test approach during April and May 2023. A convenient sample of 60 undergraduate nursing students in a 4-year class from a nursing college at the Arab American University/ Palestine (AAUP) participated in this study. The data were analyzed using a paired sample t-test in SPSS program version 26. Three data collection tools were used pre- and post-intervention; the Resuscitation Self-Efficacy Scale (RSES), The Attitudinal instrument, and the State Anxiety Inventory (SAI). RESULTS: The total number of nursing students was 60, out of them (56.7%) were female, while the mean age was (22.2) years. Improvements were seen in all four domains of self-efficacy following HFS training: recognition, debriefing, recording, responding and rescuing, and reporting. ($t(59) = 26.80$, $p < 0.001$, confidence interval [29.32, 34.05]). After receiving HFS training on ACLS, the post-intervention for the same group attitude scores significantly increased from 32.83 (SD = 15.35) to 54.58 (SD = 8.540) for emotion, from 6.72 (SD = 2.44) to 10.40 (SD = 1.40) for behavior, and from 7.03 (SD = 2.03) to 10.33 (SD = 1.42) for cognitive. The anxiety level decreased post-simulation from 3.53 (SD = 0.3) to 2.14 (SD = 0.65), which was found to be statistically significant ($t(59) = 16.68$, $p < 0.001$, 95% CI [1.22 to 1.55]). Female students (M = 73.18), students who observed a real resuscitation (M = 71.16), and who were satisfied with their nursing major (M = 72.17) had significantly higher self-efficacy scores post-simulation. CONCLUSION: The

HFS can be recommended as an effective training strategy among nursing students. The ACLS training-based HFS was effective in improving the students' self-efficacy and attitudes and decreasing their anxiety.

5. BMC Health Serv Res. 2023 Nov 7;23(1):1220. doi: 10.1186/s12913-023-10274-4.
Economic burden of Cardiac Arrest in Spain: analyzing healthcare costs drivers and treatment strategies cost-effectiveness.
Matilla-García M(1), Ubeda Molla P(2), Sánchez Martínez F(2), Ariza-Solé A(3), Gómez-López R(4), López de Sá E(5), Ferrer R(6)(7).
ABSTRACT
BACKGROUND: Cardiac arrest is a major public health issue in Europe. Cardiac arrest seems to be associated with a large socioeconomic burden in terms of resource utilization and health care costs. The aim of this study is the analysis of the economic burden of cardiac arrest in Spain and a cost-effectiveness analysis of the key intervention identified, especially in relation to neurological outcome at discharge. METHODS: The data comes from the information provided by 115 intensive care and cardiology units from Spain, including information on the care of patients with out-of-hospital cardiac arrest who had a return of spontaneous circulation. The information reported by theses 115 units was collected by a nationwide survey conducted between March and September 2020. Along with number of patients (2631), we also collect information about the structure of the units, temperature management, and prognostication assessments. In this study we analyze the potential association of several factors with neurological outcome at discharge, and the cost associated with the different factors. The cost-effectiveness of using servo-control for temperature management is analyzed by means of a decision model, based on the results of the survey and data collected in the literature, for a one-year and a lifetime time horizon. RESULTS: A total of 109 cardiology units provided results on neurological outcome at discharge as evaluated with the cerebral performance category (CPC). The most relevant factor associated with neurological outcome at discharge was 'servo-control use', showing a 12.8% decrease in patients with unfavorable neurological outcomes (i.e., CPC3-4 vs. CPC1-2). The total cost per patient (2020 Euros) was €73,502. Only "servo-control use" was associated with an increased mean total cost per hospital. Patients treated with servo-control for temperature management gained in the short term (1 year) an average of 0.039 QALYs over those who were treated with other methods at an increased cost of €70.8, leading to an incremental cost-effectiveness ratio of 1,808 euros. For a lifetime time horizon, the use of servo-control is both more effective and less costly than the alternative. CONCLUSIONS: Our results suggest the implementation of servo-control techniques in all the units that are involved in managing the cardiac arrest patient from admission until discharge from hospital to minimize the neurological damage to patients and to reduce costs to the health and social security system.

6. J Am Heart Assoc. 2023 Nov 7;12(21):e031005. doi: 10.1161/JAHA.123.031005. Epub 2023 Nov 6.
Impact of Receiving Hospital on Out-of-Hospital Cardiac Arrest Outcome: Racial and Ethnic Disparities in Texas.
Huebinger R(1)(2), Del Rios M(3), Abella BS(4), McNally B(5), Bakunas C(1)(2), Witkov R(1)(2), Panczyk M(1)(2), Boerwinkle E(6), Bobrow B(1)(2).
ABSTRACT
Background Factors associated with out-of-hospital cardiac arrest (OHCA) outcome disparities remain poorly understood. We evaluated the role of receiving hospital on OHCA outcome disparities. Methods and Results We studied people with OHCA who survived to hospital admission from TX-CARES (Texas Cardiac Arrest Registry to Enhance Survival), 2014 to 2021. Using census data,

we stratified OHCAs into majority (>50%) strata: non-Hispanic White race and ethnicity, non-Hispanic Black race and ethnicity, and Hispanic or Latino ethnicity. We stratified hospitals into performance quartiles based on the primary outcome, survival with good neurologic outcome. We evaluated the association between race and ethnicity and care at higher-performance hospitals. We compared 3 models evaluating the association between race and ethnicity and outcome: (1) ignoring hospital, (2) adjusting for hospital as a random intercept, and (3) adjusting for hospital performance quartile. We adjusted models for possible confounders. We included 10 434 OHCAs. Hospital performance quartile outcome rates ranged from 11.3% (fourth) to 37.1% (first). Compared with OHCAs in neighborhoods of majority White race, those in neighborhoods of majority Black race (odds ratio [OR], 0.1 [95% CI, 0.1-0.1]) and Hispanic or Latino ethnicity (OR, 0.2 [95% CI, 0.2-0.2]) were less likely to be cared for at higher-performing hospitals. Compared with White neighborhoods (30.1%) and ignoring hospital, outcomes were worse in Black neighborhoods (15.4%; adjusted OR [aOR], 0.5 [95% CI, 0.4-0.5]) and Hispanic or Latino neighborhoods (19.2%; aOR, 0.6 [95% CI, 0.5-0.7]). Adjusting for hospital as a random intercept, outcomes improved for Black neighborhoods (aOR, 0.9 [95% CI, 0.7-1.05]) and Hispanic or Latino neighborhoods (aOR, 0.9 [95% CI, 0.8-0.99]). Adjusting for hospital performance quartile, outcomes improved for Black neighborhoods (aOR, 0.8 [95% CI, 0.7-1.01]) and Hispanic or Latino neighborhoods (aOR, 0.9 [95% CI, 0.8-0.996]). Conclusions In Black and Hispanic or Latino communities, OHCAs were less likely to be cared for at higher-performing hospitals, and adjusting for receiving hospital improved OHCA outcome disparities.

7. Prehosp Disaster Med. 2023 Nov 6:1-7. doi: 10.1017/S1049023X23006568. Online ahead of print.
Large Language Model (LLM)-Powered Chatbots Fail to Generate Guideline-Consistent Content on Resuscitation and May Provide Potentially Harmful Advice.
Birkun AA(1), Gautam A(2).
ABSTRACT
INTRODUCTION: Innovative large language model (LLM)-powered chatbots, which are extremely popular nowadays, represent potential sources of information on resuscitation for the general public. For instance, the chatbot-generated advice could be used for purposes of community resuscitation education or for just-in-time informational support of untrained lay rescuers in a real-life emergency. STUDY OBJECTIVE: This study focused on assessing performance of two prominent LLM-based chatbots, particularly in terms of quality of the chatbot-generated advice on how to give help to a non-breathing victim. METHODS: In May 2023, the new Bing (Microsoft Corporation, USA) and Bard (Google LLC, USA) chatbots were inquired (n = 20 each): "What to do if someone is not breathing?" Content of the chatbots' responses was evaluated for compliance with the 2021 Resuscitation Council United Kingdom guidelines using a pre-developed checklist. RESULTS: Both chatbots provided context-dependent textual responses to the query. However, coverage of the guideline-consistent instructions on help to a non-breathing victim within the responses was poor: mean percentage of the responses completely satisfying the checklist criteria was 9.5% for Bing and 11.4% for Bard (P >.05). Essential elements of the bystander action, including early start and uninterrupted performance of chest compressions with adequate depth, rate, and chest recoil, as well as request for and use of an automated external defibrillator (AED), were missing as a rule. Moreover, 55.0% of Bard's responses contained plausible sounding, but nonsensical guidance, called artificial hallucinations, that create risk for inadequate care and harm to a victim. CONCLUSION: The LLM-powered chatbots' advice on help to a non-breathing victim omits essential details of resuscitation technique and occasionally contains deceptive, potentially harmful directives. Further research and regulatory measures are required to mitigate risks related to the chatbot-generated misinformation of public on resuscitation.

8. Med Intensiva (Engl Ed). 2023 Nov 1:S2173-5727(23)00179-0. doi: 10.1016/j.medine. 2023. 10.011. Online ahead of print.

New communication tool for basic life support training: smart glasses. A quasi-experimental study.

Aranda-García S(1), Otero-Agra M(2), Berlanga-Macías C(3), Rodríguez-Núñez A(4), Barcala-Furelos R(5), Domingo J(6), Seijas-Vijande A(7), Fernández-Méndez F(8).

ABSTRACT

AIM: To analyze the effectiveness of a teaching-learning methodology for teletraining in basic life support (BLS) based on communication through smart glasses. DESIGN: Pilot quasi-experimental non-inferiority study. PARTICIPANTS: Sixty college students. INTERVENTIONS: Randomization of the participants in: tele-training through smart glasses (SG) and traditional training (C) groups. Both training sessions were very brief (less than 8 min) and included the same BLS content. In SG, the instructor trained through a video call with smart glasses. MAIN VARIABLES OF INTEREST: The BLS protocol, the use of AED, the quality of resuscitation and the response times were evaluated. RESULTS: In most of the BLS protocol variables, the resuscitation quality and performance times, there were no statistically significant differences between groups. There were significant differences (in favor of the SG) in the assessment of breathing (SG: 100%, C: 81%; p = 0.013), the not-to-touch warning before applying the shock (SG: 79%, C: 52%; p = 0.025) and compressions with correct recoil (SG: 85%, C: 32%; p = 0.008). CONCLUSIONS: Laypeople BLS-AED brief tele-training through smart glasses could potentially be, at least, as effective as traditional training methods. In addition, smart glasses could be more advantageous than traditional teaching for certain points of the BLS protocol and chest compressions quality, probably due to the capability of real-time visualization of images which supports the BLS sequence. Augmented reality supported teaching should be considered for BLS training, although caution is required in extrapolating findings, and further in-depth studies are needed to confirm its potential role depending on concrete target populations and environments.

9. Circulation. 2023 Nov 9. doi: 10.1161/CIR.0000000000001179. Online ahead of print.

2023 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.

Berg KM, Bray JE, Ng KC, Liley HG, Greif R, Carlson JN, Morley PT, Drennan IR, Smyth M, Scholefield BR, Weiner GM, Cheng A, Djärv T, Abelairas-Gómez C, Acworth J, Andersen LW, Atkins DL, Berry DC, Bhanji F, Bierens J, Bittencourt Couto T, et al

ABSTRACT

The International Liaison Committee on Resuscitation engages in a continuous review of new, peer-reviewed, published cardiopulmonary resuscitation and first aid science. Draft Consensus on Science With Treatment Recommendations are posted online throughout the year, and this annual summary provides more concise versions of the final Consensus on Science With Treatment Recommendations from all task forces for the year. Topics addressed by systematic reviews this year include resuscitation of cardiac arrest from drowning, extracorporeal cardiopulmonary resuscitation for adults and children, calcium during cardiac arrest, double sequential defibrillation, neuroprognostication after cardiac arrest for adults and children, maintaining normal temperature after preterm birth, heart rate monitoring methods for diagnostics in neonates, detection of exhaled carbon dioxide in neonates, family presence during resuscitation of adults, and a stepwise approach to resuscitation skills training. Members from 6 International Liaison Committee on Resuscitation task forces have assessed, discussed, and debated the quality of the evidence, using Grading of Recommendations Assessment, Development, and Evaluation criteria, and their statements include consensus treatment recommendations. Insights into the deliberations of the task forces are

provided in the Justification and Evidence-to-Decision Framework Highlights sections. In addition, the task forces list priority knowledge gaps for further research. Additional topics are addressed with scoping reviews and evidence updates.

10. Resuscitation. 2023 Nov 7:109992. doi: 10.1016/j.resuscitation.2023.109992. Online ahead of print.

2023 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.

Berg KM, Bray JE, Ng KC, Liley HG, Greif R, Carlson JN, Morley PT, Drennan IR, Smyth M, Scholefield BR, Weiner GM, Cheng A, Djärv T, Abelairas-Gómez C, Acworth J, Andersen LW, Atkins DL, Berry DC, Bhanji F, Bierens J, Bittencourt Couto T, et al

ABSTRACT

The International Liaison Committee on Resuscitation engages in a continuous review of new, peer-reviewed, published cardiopulmonary resuscitation and first aid science. Draft Consensus on Science With Treatment Recommendations are posted online throughout the year, and this annual summary provides more concise versions of the final Consensus on Science With Treatment Recommendations from all task forces for the year. Topics addressed by systematic reviews this year include resuscitation of cardiac arrest from drowning, extracorporeal cardiopulmonary resuscitation for adults and children, calcium during cardiac arrest, double sequential defibrillation, neuroprognostication after cardiac arrest for adults and children, maintaining normal temperature after preterm birth, heart rate monitoring methods for diagnostics in neonates, detection of exhaled carbon dioxide in neonates, family presence during resuscitation of adults, and a stepwise approach to resuscitation skills training. Members from 6 International Liaison Committee on Resuscitation task forces have assessed, discussed, and debated the quality of the evidence, using Grading of Recommendations Assessment, Development, and Evaluation criteria, and their statements include consensus treatment recommendations. Insights into the deliberations of the task forces are provided in the Justification and Evidence-to-Decision Framework Highlights sections. In addition, the task forces list priority knowledge gaps for further research. Additional topics are addressed with scoping reviews and evidence updates.

11. PLoS One. 2023 Nov 9;18(11):e0293323. doi: 10.1371/journal.pone.0293323. eCollection 2023.

"Knowledge regarding cardiopulmonary resuscitation among health assistants in Nepal: A cross-sectional study".

Singh B(1)(2), Shankar PR(3).

ABSTRACT

BACKGROUND: Health assistants play a crucial role in healthcare delivery, particularly in remote and rural areas of Nepal. They should have adequate lifesaving and resuscitation skills. Therefore, assessing their cardiopulmonary resuscitation (CPR) knowledge is essential. OBJECTIVE: To evaluate the knowledge of CPR among health assistants (HAs) in Nepal and explore if there were variations in knowledge scores based on the demographic characteristics of the participants. METHODS: A quantitative cross-sectional research design was used. The study population included HAs registered with the Nepal Health Professional Council (NHPC) who completed three years of training. Non-probability convenience sampling was employed. Data was collected using an online survey based on the 2020 American Heart Association guidelines. Demographic information and participants' knowledge levels were noted. RESULTS: The study involved 500 HAs, with the majority being male and working in government hospitals. Most participants were from Madhesh Province, and the

median age was 26 years. Only a fraction of the participants had received training in CPR, and none of them had ever performed CPR. The median knowledge scores were higher among males and among respondents from Madhesh, Lumbini, Karnali, and Sudhurpaschim provinces. The HA's knowledge of the correct depth of CPR compression for children (21%) and infants (17.4%) was limited. CPR scores were different according to variables like training, theory understanding, and practice duration, among others. The findings highlighted the need for more practical training and regular refresher courses to enhance HAs ability to provide life-saving interventions. CONCLUSION: The study revealed less CPR knowledge and a lack of practical training among HAs in Nepal. To improve healthcare outcomes, providing practical training and ongoing education on CPR is crucial. The findings can contribute to curriculum development and policy changes in healthcare delivery.

12. Wilderness Environ Med. 2023 Nov 7:S1080-6032(23)00188-6. doi: 10.1016/j.wem. 2023.05.014. Online ahead of print.

Wilderness Medical Society Clinical Practice Guidelines for Prevention and Management of Avalanche and Nonavalanche Snow Burial Accidents: 2024 Update.

Van Tilburg C(1), Paal P(2), Strapazzon G(3), Grissom CK(4), Haegeli P(5), Hölzl N(6), McIntosh S(7), Radwin M, Smith WWR(8), Thomas S(9), Tremper B(10), Weber D(11), Wheeler AR(12), Zafren K(13), Brugger H(3).

ABSTRACT

To provide guidance to the general public, clinicians, and avalanche professionals about best practices, the Wilderness Medical Society convened an expert panel to revise the evidence-based guidelines for the prevention, rescue, and resuscitation of avalanche and nonavalanche snow burial victims. The original panel authored the Wilderness Medical Society Practice Guidelines for Prevention and Management of Avalanche and Nonavalanche Snow Burial Accidents in 2017. A second panel was convened to update these guidelines and make recommendations based on quality of supporting evidence.

13. Omega (Westport). 2023 Nov 7:302228231212650. doi: 10.1177/00302228231212650. Online ahead of print.

Nurses' Perceptions Towards Resuscitated Patients: A Qualitative Study.

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

ABSTRACT

Nurses' perceptions of resuscitated patients may affect their care, and this has not been investigated in previous literature. The aim of this study was to explore nurses' perceptions towards resuscitated patients. In this descriptive-qualitative study seventeen clinical nurses participated using purposive sampling. In-depth, semi-structured interviews were conducted and data were analyzed by conventional content analysis. Four main categories emerged: Injured, undervalued, problematic, and destroyer of resources. Participants considered resuscitated patients to have multiple physical injuries, which are an important source of legal problems and workplace violence, and they believed that these patients will eventually die. Resuscitated patients are considered forgotten and educational cases. Iranian nurses have a strong negative perception towards resuscitated patients. Improving the quality of cardiopulmonary resuscitation, improving the knowledge and skills of personnel in performing resuscitation, and supporting managers and doctors to nurses in the post-resuscitation period can change the attitude of nurses and improve post-resuscitation care.

POST-CARDIAC ARREST TREATMENTS

1. J Crit Care. 2023 Nov 7;79:154464. doi: 10.1016/j.jcrc.2023.154464. Online ahead of print.
Optic Nerve Sheath Diameter for Assessing Prognosis after Out-of-Hospital Cardiac Arrest.
Hohmann C(1), Doulis AE(2), Gietzen CH(3), Adler C(4), Wienemann H(5), von Stein P(6), Hoerster R(7), Koch KR(8), Michels G(9).

ABSTRACT
PURPOSE: Evaluate optic nerve sheath and pial diameters (ONSD, ONPD) via sonography and computed tomography (CT) after out-of-hospital cardiac arrest (CA) and to compare their prognostic significance with other imaging and laboratory biomarkers. MATERIALS AND METHODS: A prospective observational study enrolling patients after successful resuscitation between December 2017 and August 2021. ONSD and ONPD were measured with sonography. Additionally, ONSD, and also grey-to-white ratio at basal ganglia (GWRBG) and cerebrum (GWRCBR), were assessed using CT. Lactate and neuron specific enolase (NSE) blood levels were measured. RESULTS: Sonographically measured ONSD and ONPD yielded no significant difference between survival and non-survival (p values ≥0.4). Meanwhile, CT assessed ONSD, GWRBG, GWRCBR, and NSE levels significantly differed regarding both, survival (p values ≤0.005) and neurological outcome groups (p values ≤0.04). For survival prognosis, GWRBG, GWRCBR, and NSE levels appeared as excellent predictors; in predicting a good neurological outcome, NSE had the highest accuracy. CONCLUSIONS: CT diagnostics, in particular GWRBG and GWRCBR, as well as NSE as laboratory biomarker, appear as excellent outcome predictors. Meanwhile, our data lead us to recommend caution in utilizing sonography assessed ONSD and ONPD for prognostic decision-making post-CA.

TARGETED TEMPERATURE MANAGEMENT

No articles identified.

ELECTROPHYSIOLOGY AND DEFIBRILLATION

No articles identified.

PEDIATRICS AND CHILDREN

1. Resuscitation. 2023 Nov 8:110040. doi: 10.1016/j.resuscitation.2023.110040. Online ahead of print.
First Documented Rhythm and Clinical Outcome in Children Who Undergo Extracorporeal Cardiopulmonary Resuscitation for In-Hospital Cardiac Arrest: A Report from the American Heart Association Get With The Guidelines® - Resuscitation Registry (GWTG-R).
Perry T(1), Bakar A(2), Bembea MM(3), Fishbein J(4), Sweberg T(5); American Heart Association's Get With The Guidelines®-Resuscitation Investigators.

ABSTRACT
INTRODUCTION: Outcomes of conventional cardiopulmonary resuscitation are improved when the initial rhythm is shockable (ventricular fibrillation or pulseless ventricular tachycardia). In children, the first documented rhythm is typically asystole or pulseless electrical activity. We evaluate the role the initial rhythm plays in outcomes for children undergoing extracorporeal cardiopulmonary resuscitation (ECPR) for in-hospital cardiac arrest. METHODS: Consecutive patients <18 years with in-hospital ECPR events ≥ 10 minutes reported to the American Heart Association Get With The Guidelines® - Resuscitation registry from 2014 to 2019 were included. Primary outcome was survival

to hospital discharge. Logistic regression modeling was used to compute propensity score matching based on patient, cardiac arrest event and hospital characteristics; patients with initial shockable rhythm were matched to patients with initial non-shockable rhythm. RESULTS: The final cohort included 466 patients, of which 82 (18%) had a shockable, and 384 (82%) had a non-shockable initial rhythm. After propensity score matching of 287 (62%) patients, there was no difference in survival to hospital discharge (risk ratio [RR] 1.2, 95% CI, 0.95-1.53, p=0.13) or favorable neurologic outcome, defined as Pediatric Cerebral Performance Category (PCPC) of 1 or 2, or no decline from baseline (RR 1.28, 95% CI, 0.84-1.96, p=0.25) between patients with and without shockable initial rhythm. CONCLUSIONS: In children with in-hospital cardiac arrest undergoing ECPR, there was no significant difference in survival or favorable neurologic outcome between those with initial shockable rhythm compared to non-shockable rhythm. Further investigation to evaluate ECPR patient characteristics and outcomes is warranted to help guide eligibility and ECMO deployment practices.

2. J Am Heart Assoc. 2023 Nov 6:e9018. doi: 10.1161/JAHA.123.032718. Online ahead of print.
Sociodemographic Factors and the Risk of Pediatric Out-of-Hospital Cardiac Arrest in Ontario, Canada: A Province-Wide Case-Control Study.
Idrees S(1)(2)(3), Anderson KK(1)(2)(3)(4), Choi YH(1), Tijssen JA(1)(2)(4)(5).
ABSTRACT
Background Pediatric out-of-hospital cardiac arrest (POHCA) is associated with significant mortality and poor neurological outcomes. We aimed to describe the association between sociodemographic factors and POHCA risk in Ontario, Canada. Methods and Results We conducted a province-wide case-control study at ICES, where patient records are linked across administrative databases. The case group included children (1 day to 17 years of age) who experienced an OHCA between 2004 and 2020. Controls were matched up to 1:4 on age, sex, index date, and key comorbidities. We used conditional logistic regression to measure the association between sociodemographic indicators and POHCA risk. The case and control groups included 1,826 and 7,254 children, respectively. Children living in areas with the highest levels of material deprivation (adjusted odds ratio [aOR]: 2.35, 95% CI: 1.94, 2.85) and dependency (aOR: 1.22, 95% CI: 1.01, 1.48) had a higher odds of POHCA, relative to children living in regions with the lowest levels of material deprivation and dependency, respectively. Children living in neighborhoods with the lowest levels of ethnic diversity had a higher odds of POHCA (aOR: 1.62, 95% CI: 1.30, 2.01), relative to children living in neighborhoods with the highest levels of ethnic diversity. The odds of POHCA were lower in immigrants (aOR: 0.67, 95% CI: 0.47, 0.95), relative to the general population. Northern urban residence (aOR: 1.45, 95% CI: 1.13, 1.87) was associated with a higher odds of POHCA, relative to southern urban residence. Conclusions Children living in neighborhoods with high levels of marginalization may have an elevated risk of experiencing POHCA. These findings highlight the importance of addressing disparities through targeted prevention and intervention efforts.

3. J Cereb Blood Flow Metab. 2023 Nov;43(11):1842-1856. doi: 10.1177/0271678X231189463. Epub 2023 Jul 19.
Rapid, selective and homogeneous brain cooling with transnasal flow of ambient air for pediatric resuscitation.
Koehler RC(1), Reyes M(1), Hopkins CD(1), Armstrong JS(1), Cao S(1), Kulikowicz E(1), Lee JK(1), Tandri H(2).
ABSTRACT
Neurologic outcome from out-of-hospital pediatric cardiac arrest remains poor. Although therapeutic hypothermia has been attempted in this patient population, a beneficial effect has yet to be demonstrated, possibly because of the delay in achieving target temperature. To minimize this

delay, we developed a simple technique of transnasal cooling. Air at ambient temperature is passed through standard nasal cannula with an open mouth to produce evaporative cooling of the nasal passages. We evaluated efficacy of brain cooling with different airflows in different size piglets. Brain temperature decreased by 3°C within 25 minutes with nasal airflow rates of 16, 32, and 16 L/min in 1.8-, 4-, and 15-kg piglets, respectively, whereas rectal temperature lagged brain temperature. No substantial spatial temperature gradients were seen along the neuroaxis, suggesting that heat transfer is via blood convection. The evaporative cooling did not reduce nasal turbinate blood flow or sagittal sinus oxygenation. The rapid and selective brain cooling indicates a high humidifying capacity of the nasal turbinates is present early in life. Because of its simplicity, portability, and low cost, transnasal cooling potentially could be deployed in the field for early initiation of brain cooling prior to maintenance with standard surface cooling after pediatric cardiac arrest.

EXTRACORPOREAL LIFE SUPPORT

1. Crit Care Med. 2023 Nov 8. doi: 10.1097/CCM.0000000000006103. Online ahead of print.
Higher Survival With the Use of Extracorporeal Cardiopulmonary Resuscitation Compared With Conventional Cardiopulmonary Resuscitation in Children Following Cardiac Surgery: Results of an Analysis of the Get With The Guidelines-Resuscitation Registry.
Kobayashi RL(1), Gauvreau K(1), Alexander PMA(1), Teele SA(1), Fynn-Thompson F(2), Lasa JJ(3), Bembea M(4), Thiagarajan RR(1); American Heart Association's (AHA) Get With The Guidelines-Resuscitation (GWTG-R) Investigators.
ABSTRACT
OBJECTIVES: Extracorporeal membrane oxygenation to support cardiopulmonary resuscitation (CPR) is increasingly used in children suffering cardiac arrest after cardiac surgery. However, its efficacy in promoting survival has not been evaluated. We compared survival of pediatric cardiac surgery patients suffering in-hospital cardiac arrest who were resuscitated with extracorporeal CPR (E-CPR) to those resuscitated with conventional CPR (C-CPR) using propensity matching. DESIGN: Retrospective study using multicenter data from the American Heart Association Get With The Guidelines-Resuscitation registry (2008-2020). SETTING: Multicenter cardiac arrest database containing cardiac arrest and CPR data from U.S. hospitals. PATIENTS: Cardiac surgical patients younger than 18 years old who suffered in-hospital cardiac arrest and received greater than or equal to 10 minutes of CPR. INTERVENTIONS: None. MEASUREMENTS AND MAIN RESULTS: Among 1223 patients, 741 (60.6%) received C-CPR and 482 (39.4%) received E-CPR. E-CPR utilization increased over the study period ($p < 0.001$). Duration of CPR was longer in E-CPR compared with C-CPR recipients (42 vs. 26 min; $p < 0.001$). In a propensity score matched cohort (382 E-CPR recipients, 382 C-CPR recipients), E-CPR recipients had survival to discharge (odds ratio [OR], 2.22; 95% CI, 1.7-2.9; $p < 0.001$). E-CPR survival was only higher when CPR duration was greater than 18 minutes. Propensity matched analysis using patients from institutions contributing at least one E-CPR case (n = 35 centers; 353 E-CPR recipients, 353 C-CPR recipients) similarly demonstrated improved survival in E-CPR recipients compared with those who received C-CPR alone (OR, 2.08; 95% CI, 1.6-2.8; $p < 0.001$). CONCLUSIONS: E-CPR compared with C-CPR improved survival in children suffering cardiac arrest after cardiac surgery requiring CPR greater than or equal to 10 minutes.

2. PLoS One. 2023 Nov 7;18(11):e0289054. doi: 10.1371/journal.pone.0289054. eCollection 2023.
How effective is extracorporeal life support for patients with out-of-hospital cardiac arrest initiated at the emergency department? A systematic review and meta-analysis.
Wongtanasarasin W(1)(2), Krintratun S(1), Techasatian W(3), Nishijima DK(2).
ABSTRACT
BACKGROUND: Extracorporeal cardiopulmonary resuscitation (ECPR) is commonly initiated for adults experiencing cardiac arrest within the cardiac catheterization lab or the intensive care unit.

However, the potential benefit of ECPR for these patients in the emergency department (ED) remains undocumented. This study aims to assess the benefit of ECPR initiated in the ED for patients with out-of-hospital cardiac arrest (OHCA). METHODS: We conducted a systematic review and meta-analysis of studies comparing ECPR initiated in the ED versus conventional CPR. Relevant articles were identified by searching several databases including PubMed, EMBASE, Web of Science, and Cochrane collaborations up to July 31, 2022. Pooled estimates were calculated using the inverse variance heterogeneity method, while heterogeneity was evaluated using Q and I2 statistics. The risk of bias in included studies was evaluated using validated bias assessment tools. The primary outcome was a favorable neurological outcome at hospital discharge, and the secondary outcome was survival to hospital discharge or 30-day survival. Sensitivity analyses were performed to explore the benefits of ED-initiated ECPR in studies utilizing propensity score (PPS) analysis. Publication bias was assessed using Doi plots and the Luis Furuya-Kanamori (LFK) index. RESULTS: The meta-analysis included a total of eight studies comprising 51,173 patients. ED-initiated ECPR may not be associated with a significant increase in favorable neurological outcomes (odds ratio [OR] 1.43, 95% confidence interval [CI] 0.30-6.70, I2 = 96%). However, this intervention may be linked to improved survival to hospital discharge (OR 3.34, 95% CI 2.23-5.01, I2 = 17%). Notably, when analyzing only PPS data, ED-initiated ECPR demonstrated efficacy for both favorable neurological outcomes (OR 1.89, 95% CI 1.26-2.83, I2 = 21%) and survival to hospital discharge (OR 3.37, 95% CI 1.52-7.49, I2 = 57%). Publication bias was detected for primary (LFK index 2.50) and secondary (LFK index 2.14) outcomes. CONCLUSION: The results of this study indicate that ED-initiated ECPR may not offer significant benefits in terms of favorable neurological outcomes for OHCA patients. However, it may be associated with increased survival to hospital discharge. Future studies should prioritize randomized trials with larger sample sizes and strive for homogeneity in patient populations to obtain more robust evidence in this area.

3. Resuscitation. 2023 Nov 3:110033. doi: 10.1016/j.resuscitation.2023.110033. Online ahead of print.

Early extracorporeal CPR for refractory out-of-hospital cardiac arrest - A pre-planned per-protocol analysis of the INCEPTION-trial.

Ubben JFH(1), Suverein MM(2), Delnoij TSR(2), Heuts S(3), Winkens B(4), Gabrio A(4), van der Horst ICC(5), Maessen JG(3), Lorusso R(3), van de Poll MCG(6); INCEPTION-investigators.

ABSTRACT

BACKGROUND: Evidence for extracorporeal cardiopulmonary resuscitation (CPR) in refractory out-of-hospital cardiac arrest (OHCA) remains inconclusive. Recently, the INCEPTION-trial, comparing extracorporeal with conventional CPR, found no statistically significant difference in neurologically favorable survival. Since protocol deviations were anticipated, a pre-specified per-protocol analysis was foreseen. METHODS: The per-protocol analysis of the INCEPTION trial excluded patients not meeting inclusion or exclusion criteria, amongst which time-to-cannulation of >60 minutes, and achieving a return of spontaneous circulation before hospital arrival. Crossovers were excluded as well. The primary outcome (30-day survival in a neurologically favorable condition; cerebral performance category [CPC] 1-2) was primarily analyzed under a frequentist statistical framework. In addition, Bayesian analysis under a minimally informative prior was performed. RESULTS: Eighty-one patients were included in the per-protocol analysis (extracorporeal CPR n = 33, conventional CPR n = 48). Thirty-day survival with CPC1-2 was 15% in the extracorporeal CPR group versus 9% in the conventional CPR group (adjusted OR 1.9; 95% CI 0.4-9.3; p-value 0.393). Bayesian analysis showed an 84% posterior probability of any ECPR benefit and a 61% posterior probability of a 5% absolute risk reduction for the primary outcome. CONCLUSION: A pre-planned, pre-specified per-protocol analysis of the INCEPTION-trial, found a higher survival with favorable neurological in patients undergoing ECPR versus CCPR for refractory shockable OHCA. This difference did not reach statistical significance, but results should be interpreted with care, in the light of the small remaining sample size.

4. Perfusion. 2023 Nov 7:2676591231212997. doi: 10.1177/02676591231212997. Online ahead of print.

Mortality on extracorporeal membrane oxygenation: Evaluation of independent risk factors and causes of death during venoarterial and venovenous support.

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ABSTRACT

INTRODUCTION: Most patients on extracorporeal membrane oxygenation (ECMO) decease during therapy on the system. However, the actual causes of death have not been studied sufficiently. This study analyses the etiology, prevalence, and risk factors for the outcome variable death during ongoing ECMO for all patients and divided according to venoarterial (VA) or venovenous (VV) support. METHODS: We retrospectively analysed all patients receiving ECMO support at our institution between March 2006 to January 2021. Only the patients deceased during ongoing support were included. RESULTS: 2016 patients were placed on VA (n = 1168; 58%) or VV (n = 848; 42%) ECMO; 759 patients (37.7%) deceased on support. The causes of death differed between the support types: VA ECMO patients mostly died from cerebral ischemia (34%), low-cardiac output (LCO; 24.1%) and multi-organ failure (MOF; 21.6%), whereas in VV ECMO cases, refractory respiratory failure (28.2%), and sepsis (20.4%) dominated. Multivariate regression analysis revealed cardiopulmonary resuscitation (CPR) and acidosis prior to ECMO as risk factors for dying on VA ECMO, while high inotropic doses pre-ECMO, a high fraction of inspired oxygen on day 1, elevated lactate dehydrogenase, and international normalized ratio levels lead to an unfavourable outcome in VV ECMO patients. CONCLUSION: Even in highly experienced centers, ECMO mortality remains high and occurs mainly on support or 24 h after its termination. The causes of death differ between VV and VA ECMO, depending on the underlying diseases responsible for the need of extracorporeal support.

5. Resuscitation. 2023 Nov;192:109972. doi: 10.1016/j.resuscitation.2023.109972. Epub 2023 Sep 19.

How confidently can we prognosticate survival when starting ECPR?

Tonna JE(1).

NO ABSTRACT AVAILBLE

EXPERIMENTAL RESEARCH

1. Pediatr Res. 2023 Nov 8. doi: 10.1038/s41390-023-02858-x. Online ahead of print.

Comparison of various vasopressin doses to epinephrine during cardiopulmonary resuscitation in asphyxiated neonatal piglets.

Ramsie M(1)(2), Cheung PY(1)(2), Lee TF(1)(2), O'Reilly M(1)(2), Schmölzer GM(3)(4).

ABSTRACT

BACKGROUND: Current neonatal resuscitation guidelines recommend epinephrine for cardiac arrest. Vasopressin might be an alternative during asphyxial cardiac arrest. We aimed to compare vasopressin and epinephrine on incidence and time to return of spontaneous circulation (ROSC) in asphyxiated newborn piglets. DESIGN/METHODS: Newborn piglets (n = 8/group) were anesthetized, intubated, instrumented, and exposed to 30 min of normocapnic hypoxia, followed by asphyxia and asystolic cardiac arrest. Piglets were randomized to 0.2, 0.4, or 0.8IU/kg vasopressin, or 0.02 mg/kg epinephrine. Hemodynamic parameters were continuously measured. RESULTS: Median (IQR) time to ROSC was 172(103-418)s, 157(100-413)s, 122(93-289)s, and 276(117-480)s for 0.2, 0.4, 0.8IU/kg vasopressin, and 0.02 mg/kg epinephrine groups, respectively (p = 0.59). The number of piglets that achieved ROSC was 6(75%), 6(75%), 7(88%), and 5(63%) for 0.2, 0.4, 0.8IU/kg vasopressin, and

0.02 mg/kg epinephrine, respectively (p = 0.94). The epinephrine group had a 60% (3/5) rate of post-ROSC survival compared to 83% (5/6), 83% (5/6), and 57% (4/7) in the 0.2, 0.4, and 0.8IU/kg vasopressin groups, respectively (p = 0.61). CONCLUSION: Time to and incidence of ROSC were not different between all vasopressin dosages and epinephrine. However, non-significantly lower time to ROSC and higher post-ROSC survival in vasopressin groups warrant further investigation. IMPACT: Time to and incidence of ROSC were not statistically different between all vasopressin dosages and epinephrine. Non-significantly lower time to ROSC and higher post-ROSC survival in vasopressin-treated piglets. Overall poorer hemodynamic recovery following ROSC in epinephrine piglets compared to vasopressin groups. Human neonatal clinical trials examining the efficacy of vasopressin during asphyxial cardiac arrest will begin recruitment soon.

2. Intensive Care Med Exp. 2023 Nov 8;11(1):75. doi: 10.1186/s40635-023-00559-7.
Continuous chest compressions are associated with higher peak inspiratory pressures when compared to 30:2 in an experimental cardiac arrest model.
Mälberg J(1), Marchesi S(2), Spangler D(3), Hadziosmanovic N(4), Smekal D(3), Rubertsson S(3).
ABSTRACT
BACKGROUND: Ventilation during cardiopulmonary resuscitation (CPR) has long been a part of the standard treatment during cardiac arrests. Ventilation is usually given either during continuous chest compressions (CCC) or during a short pause after every 30 chest compressions (30:2). There is limited knowledge of how ventilation is delivered if it effects the hemodynamics and if it plays a role in the occurrence of lung injuries. The aim of this study was to compare ventilation parameters, hemodynamics, blood gases and lung injuries during experimental CPR given with CCC and 30:2 in a porcine model. METHODS: Sixteen pigs weighing approximately 33 kg were randomized to either receive CPR with CCC or 30:2. Ventricular fibrillation was induced by passing an electrical current through the heart. CPR was started after 3 min and given for 20 min. Chest compressions were provided mechanically with a chest compression device and ventilations were delivered manually with a self-inflating bag and 12 l/min of oxygen. During the experiment, ventilation parameters and hemodynamics were sampled continuously, and arterial blood gases were taken every five minutes. After euthanasia and cessation of CPR, the lungs and heart were removed in block and visually examined followed by sampling of lung tissue which were examined using microscopy. RESULTS: In the CCC group and the 30:2 group, peak inspiratory pressure (PIP) was 58.6 and 35.1 cmH2O ($p < 0.001$), minute volume (MV) 2189.6 and 1267.1 ml ($p < 0.001$), peak expired carbon dioxide (PECO2) 28.6 and 39.4 mmHg (p = 0.020), partial pressure of carbon dioxide (PaCO2) 50.2 and 61.1 mmHg (p = 0.013) and pH 7.3 and 7.2 (p = 0.029), respectively. Central venous pressure (CVP) decreased more over time in the 30:2 group (p = 0.023). All lungs were injured, but there were no differences between the groups. CONCLUSIONS: Ventilation during CCC resulted in a higher PIP, MV and pH and lower PECO2 and PaCO2, showing that ventilation mode during CPR can affect ventilation parameters and blood gases.

3. Braz J Anesthesiol. 2023 Nov 4:S0104-0014(23)00115-X. doi: 10.1016/j.bjane.2023.10.003. Online ahead of print.
Methylene blue as an adjuvant during cardiopulmonary resuscitation: an experimental study in rats.
Xavier MS(1), Vane MF(1), Vieira RF(1), Oliveira CC(1), Maia DRR(1), de Castro LUC(1), Carmona MJC(1), Costa Auler JO Jr(1), Otsuki DA(2).
ABSTRACT
INTRODUCTION: Methylene Blue (MB) has been shown to attenuate oxidative, inflammatory, myocardial, and neurological lesions during ischemia-reperfusion and has great potential during

cardiac arrest. This study aimed to determine the effects of MB combined with epinephrine during cardiac arrest on myocardial and cerebral lesions. METHOD: Thirty-eight male Wistar rats were randomly assigned to four groups: the sham group (SH, n = 5), and three groups subjected to cardiac arrest (n = 11/group) and treated with EPI 20 µg.kg-1 (EPI), EPI 20 µg.kg-1 + MB 2 mg.kg-1 (EPI + MB), or saline 0.9% 0.2 ml (CTL). Ventricular fibrillation was induced by direct electrical stimulation in the right ventricle for 3 minutes, and anoxia was maintained for 5 minutes. Cardiopulmonary Resuscitation (CPR) consisted of medications, ventilation, chest compressions, and defibrillation. After returning to spontaneous circulation, animals were observed for four hours. Blood gas, troponin, oxidative stress, histology, and TUNEL staining measurements were analyzed. Groups were compared using generalized estimating equations. RESULTS: No differences in the Returning of Spontaneous Circulation (ROSC) rate were observed among the groups (EPI: 63%, EPI + MB: 45%, CTL: 40%, p = 0.672). The mean arterial pressure immediately after ROSC was higher in the EPI+MB group than in the CTRL group (CTL: 30.5 [5.8], EPI: 63 [25.5], EPI+MB: 123 [31] mmHg, p = 0.007). Serum troponin levels were high in the CTL group (CTL: 130.1 [333.8], EPI: 3.70 [36.0], EPI + MB: 43.7 [116.31] ng/mL, p < 0.05). CONCLUSION: The coadministration of MB and epinephrine failed to yield enhancements in cardiac or brain lesions in a rodent model of cardiac arrest.

CASE REPORTS

1. JA Clin Rep. 2023 Nov 9;9(1):77. doi: 10.1186/s40981-023-00667-z.

Intraoperative cardiac arrest caused by unexpected vasospastic angina requiring prolonged resuscitation using extracorporeal membrane oxygenation: a case report.

Sugita S(#)(1), Obata M(#)(2), Hasunuma F(2), Sakamoto A(3).

ABSTRACT

BACKGROUND: Vasospastic angina (VSA) occurring during surgery is rare but can lead to sudden intraoperative cardiac arrest. CASE PRESENTATION: A 77-year-old man with hypertension, and no history of coronary artery disease, displayed an abrupt ST-segment elevation on the electro-cardiogram (ECG) during laparoscopic inguinal hernia surgery under general anesthesia. Subsequently, ventricular fibrillation (VF) occurred, with a finding suggesting ischemic myocardial contracture by transesophageal echocardiography. VF was refractory to cardiopulmonary resuscitation (CPR), and veno-arterial extracorporeal membrane oxygenation (VA ECMO) was introduced. Spontaneous circulation resumed 77 min post-cardiac arrest. VSA was confirmed through the patient's clinical course and coronary angiography. Subsequently, VA ECMO was terminated, and the patient was discharged uneventfully. CONCLUSIONS: Extracorporeal CPR may be a valuable alternative to extended resuscitation for refractory ventricular arrhythmias by VSA.

2. Front Cardiovasc Med. 2023 Oct 23;10:1271227. doi: 10.3389/fcvm.2023.1271227. eCollection 2023.

Case Report: Correlation between pulmonary capillary wedge pressure and left-ventricular diastolic pressure during treatment with veno-arterial extracorporeal membrane oxygenation.

Kalra R(#)(1)(2), Gaisendrees C(#)(1)(2)(3), Alexy T(1)(2), Kosmopoulos M(1)(2), Jaeger D(1)(2)(4), Schlachtenberger G(3), Raveendran G(1)(2), Bartos JA(1)(2), Gutierrez Bernal A(1)(2), John R(5), Wahlers T(3), Yannopoulos D(1)(2).

ABSTRACT

BACKGROUND: Pulmonary capillary wedge pressure (PCWP) is often used as a surrogate for left-ventricular end-diastolic pressure in patients (LVEDP) who are on veno-arterial extracorporeal membrane oxygenation (V-A ECMO) support for cardiogenic shock and cardiac arrest. However, the correlation between PCWP and LVEDP is not clear in the setting of V-A ECMO usage. We sought to

evaluate this correlation in this case series. METHODS: Patients were referred to our cardiac catheterization laboratory for invasive hemodynamic studies to assess their readiness for VA-ECMO decannulation. All patients underwent simultaneous left and right heart catheterization. Using standard techniques, we measured PCWP and LVEDP simultaneously. Continuous variables were reported as medians with interquartile ranges. The correlation between PCWP and LVEDP was evaluated using simple linear regression and reported as R2. RESULTS: Four patients underwent invasive hemodynamic studies 4 (2.5, 7) days after VA-ECMO cannulation. All four patients had suffered in-hospital cardiac arrest and had been put on VA-ECMO. At the baseline level of VA-ECMO flow of 4.1 (3.8, 4.4) L/min, the median LVEDP and PCWP were 6 (4, 7.5) mmHg and 12 (6.5, 16) mmHg, respectively. At the lowest level of VA-ECMO flow of 1.9 (1.6, 2.0) L/min, the median LVEDP and PCWP was 13.5 (8.5, 16) mmHg and 15 (13, 18) mmHg, respectively. There was a poor correlation between the simultaneously measured PCWP and LVEDP (R2 = 0.03, p = 0.66). CONCLUSIONS: The PCWP may not correlate well with LVEDP in patients treated with VA-ECMO, particularly at high levels of VA-ECMO support.

3. Cureus. 2023 Oct 3;15(10):e46445. doi: 10.7759/cureus.46445. eCollection 2023 Oct.
Germ Cell Tumor Complicated by Mediastinal Mass Syndrome: A Report of Cardiac Arrest to Full Recovery.
Odeh R(1), Dweekat M(2), Shakhshir A(3).
ABSTRACT
Germ cell tumors (GCTs) are the most common malignancies in men aged 15-35 years. Five percent of malignant GCTs are of extragonadal origin, and the most common extragonadal location for GCTs in adults is the mediastinum. Like other mediastinal tumors, mediastinal GCTs may cause compression or invasion of vital mediastinal structures, resulting in respiratory or hemodynamic compromise. Right ventricular failure following positive pressure ventilation of such patients is called mediastinal mass syndrome (MMS). This report presents a case of a GCT complicated by cardiac arrest shortly after starting positive pressure ventilation, which was successfully resuscitated. Few previous reports demonstrated a successful outcome of MMS. This report highlights the importance of a multidisciplinary approach for such scenarios in light of the scanty literature and lack of clear guidance and the significance of starting chemotherapy in a timely manner.