RCP MECÀNICA

1. Am J Emerg Med. 2017 Jul 13. pii: S0735-6757(17)30570-3. doi: 10.1016/j.ajem.2017.07.041. [Epub ahead of print] The optimum chest compression site with regard to heart failure demonstrated by computed tomography.
Hwang K1, Chon SB2, Im JG3.
Abstract
BACKGROUND: To determine the optimum chest compression site during cardiopulmonary resuscitation (CPR) with regard to heart failure (HF) by applying three-dimensional (3D) coordinates on computed tomography (CT).
METHODS: This retrospective, cross-sectional study involved adults who underwent echocardiography and CT on the same day from 2007 to 2017. Incomplete CT images or information on HF, cardiac medication between echocardiography and CT, or thoracic abnormalities were excluded. Cases were checked whether they had HF through symptom/sign assessment, N-terminal pro-B type natriuretic peptide, and echocardiography. We set the xiphisternal joint's midpoint as the reference (0, 0, 0) to draw a 3D coordinate system, designating leftward, upward, and into-the-thorax directions as positive. The coordinate of the maximum LV diameter's midpoint (P_max.LV) was identified.
RESULTS: Enrolled were 148 patients (63.0±15.1 years) with 87 females and 76 HF cases. P_max.LV of HF cases was located more leftwards, lower, and deeper than non-HF cases (5.69±0.98, -1.51±1.67, 5.76±1.09 cm vs. 5.00±0.83, -0.99±1.36, 5.25±0.71 cm, all $p<0.05$). Fewer HF cases had their LV compressed than non-HF cases (59.2% vs. 77.8%, $p=0.025$) when being compressed according to the current guidelines. The aorta (vs. LV) was compressed in 85.5% and 81.9% of HF and non-HF cases, respectively, at 3 cm above the xiphisternal joint. At 6cm above the joint, the highest allowable position according to the current guidelines, all victims would have their aorta compressed directly during CPR rather than the LV.
CONCLUSIONS: The lowest possible sternum just above the xiphisternal joint should be compressed especially for HF patients during CPR.

REGISTRES, REVISIONS I EDITORIALS

1. Resuscitation. 2017 Oct 12;121:81-83. doi: 10.1016/j.resuscitation.2017.10.009. [Epub ahead of print] Ideal (i) CPR: Looking beyond shadows in a cave.
Segal N1, Youngquist S2, Lurie K3.
Abstract
Survival rates after cardiac arrest have shown minimal improvement in the last 60 years. However, in some forward-thinking cities and hospitals, out-of and in-hospital cardiac arrest survival rates exceed 20% and 40% respectively. These beacons of hope can enlighten us, providing a clearer vision of what it takes to provide Ideal cardiopulmonary resuscitation. To make progress in a field that has seemingly stagnated for too many decades, we must be open to new ideas and develop bundles of care that work in communities with varying EMS systems and various existing infrastructure to bring the best practices to the rest of the country..

2. Acad Emerg Med. 2017 Oct 16. doi: 10.1111/acem.13334. [Epub ahead of print] Hot Off the Press: Prehospital Advanced Cardiac Life Support for Out-of-hospital Cardiac Arrest.
Heitz C1, Morgenstern J2, Milne WK3.
Abstract
This retrospective cohort study examined the rate of survival to hospital discharge among adult patients with out of hospital cardiac arrest (OHCA), comparing patients who received care only from basic cardiac life support (BCLS) trained emergency medical service (EMS) crews to patients who had an advanced cardiac life support (ACLS) trained EMS crew on scene at some point during the resuscitation. There was no difference in the primary outcome of rate of survival to hospital discharge (10.9% with ACLS care and 10.6% with BCLS care, $p = 0.67$).

3. Eur Heart J Qual Care Clin Outcomes. 2017 Oct 1;3(4):264-273. doi: 10.1093/ehjqcco/qcx023.
Barriers and facilitators to public access defibrillation in out-of-hospital cardiac arrest: a systematic review.
Smith CM1,2, Lim Choi Keung SN3, Khan MO3, Arvanitis TN3, Fothergill R4, Hartley-Sharpe C4, Wilson MH5, Perkins GD1,2.

Abstract
Public access defibrillation initiatives make automated external defibrillators available to the public. This facilitates earlier defibrillation of out-of-hospital cardiac arrest victims and could save many lives. It is currently only used for a minority of cases. The aim of this systematic review was to identify barriers and facilitators to public access defibrillation. A comprehensive literature review was undertaken defining formal search terms for a systematic review of the literature in March 2017. Studies were included if they considered reasons affecting the likelihood of public access defibrillation and presented original data. An electronic search strategy was devised searching MEDLINE and EMBASE, supplemented by bibliography and related-article searches. Given the low-quality and observational nature of the majority of articles, a narrative review was performed. Sixty-four articles were identified in the initial literature search. An additional four unique articles were identified from the electronic search strategies. The following themes were identified related to public access defibrillation: knowledge and awareness; willingness to use; acquisition and maintenance; availability and accessibility; training issues; registration and regulation; medicolegal issues; emergency medical services dispatch-assisted use of automated external defibrillators; automated external defibrillator-locator systems; demographic factors; other behavioural factors. In conclusion, several barriers and facilitators to public access defibrillation deployment were identified. However, the evidence is of very low quality and there is not enough information to inform changes in practice. This is an area in urgent need of further high-quality research if public access defibrillation is to be increased and more lives saved. PROSPERO registration number CRD42016035543

4. Syst Rev. 2017 Oct 17;6(1):205. doi: 10.1186/s13643-017-0599-z.
Costs related to cardiac arrest management: a systematic review protocol.
Geri G1,2, Gilgan J3, Ziegler C4, Isaranuwatchai W5,6, Morrison LJ3,7.
Abstract
BACKGROUND: Each year, about 500,000 people suffer a cardiac arrest (either out-of-hospital or in-hospital) in the USA. Although significant improvements in survival have occurred through the implementation of complex high-quality protocols of care, global costs related to such management are not clearly described.
METHODS: We will undertake a systematic review of the published literature on costs related to the acute phase of cardiac arrest management (from collapse to hospital discharge). The search will cover the period 1991 to present, and we will include studies written in English or in French involving patients with cardiac arrest of all ages, settings (in- and out-of-hospital arrest), countries, and etiology (including traumatic). The primary outcome will include estimates of costs related to cardiac arrest patients' management in various categories (e.g., resuscitation process, in-hospital management as well as rehabilitation and long-term care facilities) and perspectives (e.g., hospital, societal, or third-payer perspective). Study selection will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, and data quality will be assessed by questions adapted from the Drummond economic evaluation checklist.
DISCUSSION: This review will provide an estimate of costs related to cardiac arrest management according to the different components of such a management as well as total costs.
SYSTEMATIC REVIEW REGISTRATION: International Prospective Register of Systematic Reviews PROSPERO CRD42016046993.
Free Article

IN HOSPITAL CARDIAC ARREST (IHCA)

1. Shock. 2017 Oct 18. doi: 10.1097/SHK.0000000000001024. [Epub ahead of print] One-Year Survival After In-Hospital Cardiac Arrest- does Pre-Arrest Sepsis Matter?
Koivikko P1, Arola O, Inkinen O, Tallgren M.
Abstract
AIM: Cardiac arrest is not a common complication of sepsis, although sepsis has been recognized as one condition behind cardiac arrest. Our aim was to evaluate the prevalence of sepsis among patients with in-hospital cardiac arrest (IHCA), and to determine if sepsis is associated with inferior outcome after IHCA.
METHODS: All consecutive emergency team dispatches in Turku University Hospital in 2011-2014 (n = 607) were reviewed retrospectively to identify the patients undergoing cardiopulmonary resuscitation (CPR) for IHCA (n = 301). The patient records were reviewed for the criteria of severe sepsis, organ dysfunction and chronic comorbidities before IHCA. Outcome was followed for one year.

RESULTS: The criteria for pre-arrest severe sepsis were met by 83/301 (28%) of the patients, and 93/301 (31%) had multi-organ dysfunction (3 or more organ systems). The patients with severe sepsis had higher mortality than those without severe sepsis, increasing from 30-day-mortalities of 63/83 (76%) and 151/218 (69%), respectively (p = 0.256), to one-year-mortalities of 72/83 (87%) and 164/218 (75%), respectively (p = 0.030). Emergency admission, age, immunosuppression, DM, multi-organ dysfunction and a non-shockable rhythm were independent predictors of one-year-mortality by multivariate logistic regression analysis. Six out of 83 patients with severe sepsis before IHCA (7%) survived one year with good neurological outcome (CPC scale 1).
CONCLUSION: A high proportion of patients with IHCA have sepsis and multi-organ dysfunction, and their prognosis is worse than the prognosis of patients with IHCA in general.

2. J Intensive Care. 2017 Oct 11;5:59. doi: 10.1186/s40560-017-0253-9. eCollection 2017.
Hospital resuscitation teams: a review of the risks to the healthcare worker.
Vindigni SM1, Lessing JN2, Carlbom DJ3.
Abstract
BACKGROUND: "Code blue" events and related resuscitation efforts involve multidisciplinary bedside teams that implement specialized interventions aimed at patient revival. Activities include performing effective chest compressions, assessing and restoring a perfusing cardiac rhythm, stabilizing the airway, and treating the underlying cause of the arrest. While the existing critical care literature has appropriately focused on the patient, there has been a dearth of information discussing the various stresses to the healthcare team. This review summarizes the available literature regarding occupational risks to medical emergency teams, characterizes these risks, offers preventive strategies to healthcare workers, and highlights further research needs.
METHODS: We performed a literature search of PubMed for English articles of all types (randomized controlled trials, case-control and cohort studies, case reports and series, editorials and commentaries) through September 22, 2016, discussing potential occupational hazards during resuscitation scenarios. Of the 6266 articles reviewed, 73 relevant articles were included.
RESULTS: The literature search identified six potential occupational risk categories to members of the resuscitation team-infectious, electrical, musculoskeletal, chemical, irradiative, and psychological. Retrieved articles were reviewed in detail by the authors.
CONCLUSION: Overall, we found there is limited evidence detailing the risks to healthcare workers performing resuscitation. We identify these risks and offer potential solutions. There are clearly numerous opportunities for further study in this field.
Free Article

FÀRMACS

1. Acta Cardiol. 2017 Oct 12:1-3. doi: 10.1080/00015385.2017.1389803. [Epub ahead of print] Drugs in cardiac arrest: the rise and fall of antiarrhythmics.
Karlis G1, Afantenou S2.
Abstract
Since the publication of 2000 guidelines for resuscitation, amiodarone is considered the antiarrhythmic drug of choice for refractory ventricular fibrillation/pulseless ventricular tachycardia. However, to date there is no proven benefit in terms of neurologically intact survival to hospital discharge. A comprehensive search of the recent literature on amiodarone, nifekalant and lidocaine in cardiac arrest was performed. Amiodarone and nifekalant are superior to lidocaine with regards to the return of spontaneous circulation and survival to hospital admission. Nifekalant shows a trend towards quicker termination of ventricular fibrillation compared to amiodarone. There is great uncertainty about the efficacy of antiarrhythmics in cardiac arrest. Failure to show improvements regarding meaningful survival questions their current use and suggests the need for re-evaluating their place in cardiopulmonary resuscitation.

2. Resuscitation. 2017 Oct 13. pii: S0300-9572(17)30666-4. doi: 10.1016/j.resuscitation.2017.10.012. [Epub ahead of print] Comparative effectiveness of antiarrhythmics for out-of-hospital cardiac arrest: A systematic review and network meta-analysis.
McLeod SL1, Brignardello-Petersen R2, Worster A3, You J3, Iansavichene A4, Guyatt G3, Cheskes S5.
Abstract

BACKGROUND: Despite their wide use in the prehospital setting, randomized control trials (RCTs) have failed to demonstrate that any antiarrhythmic agent improves survival to hospital discharge following out-of-hospital cardiac arrest.
OBJECTIVE: To assess the use of antiarrhythmic drugs for patients experiencing out-of-hospital cardiac arrest (OHCA).
METHODS: Electronic searches of Medline, EMBASE and Cochrane Central Register of Controlled Trials were conducted and reference lists were hand-searched. Randomized controlled trials (RCTs) investigating the use of antiarrhythmic agents administered during resuscitation for adult (≥18years) patients suffering non-traumatic OHCA were included. Direct and indirect evidence were combined in a network meta-analysis (NMA) using a frequentist approach with fixed-effects models and reported as relative risks (RR) with 95% confidence intervals (CIs). For each pairwise comparison, the certainty of direct, indirect, and network evidence was assessed using the GRADE approach.
RESULTS: 8 RCTs involving 4,464 patients were combined to compare the effectiveness of 5 antiarrhythmic agents and placebo administered during resuscitation following OHCA. Lidocaine was associated with a statistically significant increase in ROSC compared to placebo (1.15; 95% CI: 1.03 to 1.28) and was also superior to bretylium (1.61; 95% CI: 1.00 to 2.60) for ROSC. When compared to placebo, both amiodarone (1.18; 95% CI: 1.08 to 1.30) and lidocaine (1.18; 95% CI: 1.07 to 1.30) were associated with a statistically significant increase in survival to hospital admission. However, no antiarrhythmic was statistically more effective than placebo for survival to hospital discharge or neurologically intact survival, and no antiarrhythmic was convincingly superior to any other for any outcome.
CONCLUSIONS: Amiodarone and lidocaine were the only agents associated with improved survival to hospital admission in the NMA. For the outcomes most important to patients, survival to hospital discharge and neurologically intact survival, no antiarrhythmic was convincingly superior to any other or to placebo.

3. Resuscitation. 2017 Oct 11. pii: S0300-9572(17)30656-1. doi: 10.1016/j.resuscitation.2017.10.007. [Epub ahead of print] Association of antiplatelet therapy with patient outcomes after out-of-hospital cardiac arrest.
Gianforcaro A1, Kurz M2, Guyette FX3, Callaway CW 3, Rittenberger JC3, Elmer J4; Pittsburgh Post-Cardiac Arrest Service.
Abstract
BACKGROUND: Cessation of blood flow during out-of-hospital cardiac arrest (OHCA) results in microvascular thrombosis, protracted hypoperfusion after return of spontaneous circulation and damage to vital organs. We tested the hypothesis that pre-arrest antiplatelet and anticoagulant medication use would be associated with less post-arrest organ dysfunction and better outcomes.
METHODS: We included OHCA patients treated from January 2005 to October 2014 at a single academic medical center. We combined our prospective OHCA registry of clinical and demographic data with a structured chart review to abstract home antiplatelet and anticoagulant medications. We fit unadjusted and adjusted regression models to test the association of antiplatelet and anticoagulant medication use with early post-arrest illness severity, survival and functionally favorable recovery.
RESULTS: Of 1054 subjects, 295 (28%) were prescribed an antiplatelet agent and 147 (14%) were prescribed an anticoagulant prior to arrest. In adjusted models, antiplatelet agents were associated with lower post-arrest illness severity (adjusted OR 0.50 95% CI 0.33-0.77), greater odds of survival to discharge (adjusted OR 1.74 95% CI 1.08-2.80) and greater odds favorable functional outcome (adjusted OR 2.11 95% CI 1.17-3.79). By contrast, anticoagulation via any agent was not associated with illness severity, survival to discharge or favorable outcome.
CONCLUSION: Preventing intra-arrest and post-arrest microvascular thrombosis via antiplatelet agents could represent a novel therapeutic target to improve outcomes after OHCA.

ENTRENAMENT I ORGANITZACIÓ

1. J Med Syst. 2017 Oct 17;41(12):186. doi: 10.1007/s10916-017-0829-x.
Supporting Emergency Medical Care Teams with an Integrated Status Display Providing Real-Time Access to Medical Best Practices, Workflow Tracking, and Patient Data.
Wu P1, Nam MY2, Choi J2, Kirlik A2, Sha L2, Berlin RB Jr3.
Abstract

The work of a hospital's medical staff is safety critical and often occurs under severe time constraints. To provide timely and effective cognitive support to medical teams working in such contexts, guidelines in the form of best practice workflows for healthcare have been developed by medical organizations. However, the high cognitive load imposed in such stressful and rapidly changing environments poses significant challenges to the medical staff or team in adhering to these workflows. In collaboration with physicians and nurses from Carle Foundation Hospital, we first studied and modeled medical team's individual responsibilities and interactions in cardiac arrest resuscitation and decomposed their overall task into a set of distinct cognitive tasks that must be specifically supported to achieve successful human-centered system design. We then developed a medical Best Practice Guidance (BPG) system for reducing medical teams' cognitive load, thus fostering real-time adherence to best practices. We evaluated the resulting system with physicians and nurses using a professional patient simulator used for medical training and certification. The evaluation results point to a reduction of cognitive load and enhanced adherence to medical best practices.

CURES POST-RCE

1. Rev Cardiovasc Med. 2017;18(2):67-72.
Timing of Percutaneous Coronary Intervention and Therapeutic Hypothermia in Patients With ST-Elevation Myocardial Infarction and Out-of-hospital Cardiac Arrest.
Basman C1, Kim MC1, Coplan NL1.
Abstract
The American College of Cardiology/American Heart Association guidelines include a Class 1 recommendation to initiate therapeutic hypothermia (TH) in comatose patients with out-of-hospital cardiac arrest (OHCA) with an initial shockable rhythm who have achieved return of spontaneous circulation. There is also a Class 1 recommendation for immediate angiography in these patients whose initial electrocardiography shows ST-elevation myocardial infarction (STEMI). However, due to a lack of clinical trials evaluating these patients who have received both percutaneous coronary intervention (PCI) and TH, controversy remains regarding whether the two can be safely combined. Furthermore, in patients who receive TH and PCI, another question to address is which therapy to initiate first. This article focuses on how best to manage comatose OHCA survivors who have an initial shockable rhythm and STEMI.

2. Ann Cardiol Angeiol (Paris). 2017 Oct 10. pii: S0003-3928(17)30105-1. doi: 10.1016/j.ancard.2017.09.008. [Epub ahead of print] Immediate coronary angiography in survivors of out-of-hospital cardiac arrest without obvious extracardiac cause: Who benefits?
Moutacalli Z1, Georges JL2, Ajlani B1, Cherif G1, El Beainy E1, Gibault-Genty G1, Blicq E1, Charbonnel C1, Convers-Domart R1, Boutot F3, Caussanel JM3, Lemaire B4, Legriel S5, Livarek B1.
Abstract
BACKGROUND: Immediate coronary angiography (iCA) and primary percutaneous coronary angioplasty (pPCI) in patients successfully resuscitated after out-of-hospital cardiac arrest (OHCA) of suspected cardiac cause is controversial. Our aims were to assess the results of iCA, the prognostic impact of pPCI after OHCA, and to identify subgroups most likely to benefit from this strategy.
METHODS: In this single-centre retrospective study, patients aged ≥18 years with sustained return of spontaneous circulation after OHCA and no evidence of a non-cardiac cause underwent routine iCA at admission, with pPCI if indicated. Results of iCA, and factors associated with in-hospital survival were analysed.
RESULTS: Between 2006 and 2013, 160 survivors from OHCA presumed of cardiac origin were included (median age, 60 years; 85% males). iCA showed significant coronary-artery lesions in 75% of patients, and acute occlusion or unstable lesion in only 41%. pPCI was performed in 34% of patients and was not associated with survival by univariate or multivariate analysis (P=0.67). ST-segment elevation predicted acute coronary occlusion in 40%. An initial shockable rhythm was associated with higher in-hospital survival (52% vs. 19%; P<0.001). After initial defibrillation, the first rhythm recorded by 12-lead electrocardiography was highly associated with prognosis: secondary asystole had a very low survival rate (5%, 1/21) despite PCI in 43% of patients, compared to sustained ventricular tachycardia/fibrillation (42%, 15/36) and supraventricular rhythm (71%, 50/70) (P<0.001).
CONCLUSIONS: In our experience, the prevalence of acute coronary occlusion or unstable lesion immediately after OHCA of likely cardiac cause is only 41%. Immediate CA in OHCA survivors, with pPCI if indicated, should be restricted to highly selected patients.

ELECTROFISIOLOGIA I DESFIBRIL·LACIÓ

1. Ann Noninvasive Electrocardiol. 2017 Oct 19. doi: 10.1111/anec.12512. [Epub ahead of print] Catecholaminergic polymorphic ventricular tachycardia, an update.
Pérez-Riera AR1, Barbosa-Barros R2, de Rezende Barbosa MPC1, Daminello-Raimundo R1, de Lucca AA Jr1, de Abreu LC1.
Abstract
Catecholaminergic polymorphic ventricular tachycardia is a rare devastating lethal inherited disorder or sporadic cardiac ion channelopathy characterized by unexplained syncopal episodes, and/or sudden cardiac death (SCD), aborted SCD (ASCD), or sudden cardiac arrest (SCA) observed in children, adolescents, and young adults without structural heart disease, consequence of adrenergically mediated arrhythmias: exercise-induced, by acute emotional stress, atrial pacing, or β-stimulant infusion, even when the electrocardiogram is normal. The entity is difficult to diagnose in the emergency department, given the range of presentations; thus, a familiarity with and high index of suspicion for this pathology are crucial. Furthermore, recognition of the characteristic findings and knowledge of the management of symptomatic patients are necessary, given the risk of arrhythmia recurrence and SCA. In this review, we will discuss the concept, epidemiology, genetic background, genetic subtypes, clinical presentation, electrocardiographic features, diagnosis criteria, differential diagnosis, and management.

ECMO

1. PLoS One. 2017 Oct 19;12(10):e0184995. doi: 10.1371/journal.pone.0184995. eCollection 2017.
Impact of dynamic changes of elevated bilirubin on survival in patients on veno-arterial extracorporeal life support for acute circulatory failure.
Freundt M1, Lunz D2, Philipp A1, Panholzer B3, Lubnow M4, Friedrich C3, Rupprecht L1, Hirt S1, Haneya A1,3.
Abstract
AIMS: Veno-arterial extracorporeal life support (ECLS) is an established method to stabilize acute circulatory failure. Parameters and data on when to ideally wean circulatory support are limited. Bilirubin is a marker of end-organ damage. Therefore, the purpose of this large study was to evaluate the impact of dynamic changes of elevated bilirubin levels on survival in patients on ECLS.
METHODS AND RESULTS: We reviewed 502 consecutive cases of ECLS from 2007 to 2015. Bilirubin levels were recorded before implantation and until six days after explantation. Dynamic bilirubin changes, and hemodynamic and laboratory outcome parameters were compared in survivors and nonsurvivors. Reason for ECLS implantation was cardiac arrest with ongoing resuscitation in 230 (45.8%), low cardiac output in 174 (34.7%) and inability to wean off cardiopulmonary bypass in 98 (19.5%) patients. 307 (61.2%) patients were weaned off ECLS, however, 206 (41.0%) survived. Mean duration of ECLS was 3 (2-6) days, and survivors received significantly longer ECLS (5 vs 3 days, $p < 0.001$). Survivors had significantly lower baseline bilirubin levels ($p = 0.003$). Bilirubin started to rise from day 2 in all patients. In survivors, bilirubin levels had trended down on the day of ECLS explantation and stayed at an acceptable level. However, in weaned patients who did not survive and patients who died on ECLS bilirubin levels continued to rise during the recorded period.
CONCLUSION: ECLS support improves survival in patients with acute circulatory failure. Down trending bilirubin levels on veno-arterial ECLS indicate improved chances of successful weaning and survival in hemodynamically stable patients.
Free Article

2. J Crit Care. 2017 Oct 12;44:31-38. doi: 10.1016/j.jcrc.2017.10.011. [Epub ahead of print] Veno-arterial extracorporeal membrane oxygenation (VA-ECMO) for emergency cardiac support.
Sun T1, Guy A2, Sidhu A3, Finlayson G4, Grunau B5, Ding L6, Harle S6, Dewar L7, Cook R7, Kanji HD8.
Abstract
PURPOSE: Veno-arterial extracorporeal membrane oxygenation (VA-ECMO) may provide benefit to patients in refractory cardiac arrest and cardiogenic shock. We aim to summarize our center's 6-year experience with resuscitative VA-ECMO.
MATERIALS AND METHODS:

A retrospective medical record review (April 2009 to 2015) was performed on consecutive non-cardiotomy patients who were managed with VA-ECMO due to refractory in- or out-of-hospital cardiac (IHCA/OHCA) arrest (E-CPR) or refractory cardiogenic shock (E-CS) with or without preceding cardiac arrest. Our primary outcome was survival to hospital discharge and good neurological status (Cerebral Performance Category 1-2).
RESULTS: There were a total of 22 patients who met inclusion criteria of whom 9 received E-CPR (8 IHCA, 1 OHCA) and 13 received E-CS. The median age for E-CPR patients was 52 [IQR 45, 58] years, and 54 [IQR 38, 64] years for E-CS patients. Cardiac arrest duration was 70.33 (SD 39.56) min for the E-CPR patients, and 24.67 (SD 26.73) min for the 9 patients treated with E-CS who had previously arrested. Initial cardiac arrest rhythms were pulseless electrical activity (39%), ventricular fibrillation (33%), or ventricular tachycardia (28%). A total of 18/22 patients were successfully weaned from VA-ECMO (78%); 16 patients survived to hospital discharge (73%) with 15 in good neurological condition.
CONCLUSION: The initiation of VA-ECMO at our center for treatment of refractory cardiac arrest and cardiogenic shock yielded a high proportion of survivors and favorable neurological outcomes.

PEDIATRIA

1. Eur Heart J Cardiovasc Pharmacother. 2017 Jul 11. doi: 10.1093/ehjcvp/pvx023. [Epub ahead of print] Time to epinephrine and survival after paediatric out-of-hospital cardiac arrest.
Fukuda T1,2, Kondo Y1,3, Hayashida K4,5, Sekiguchi H 1, Kukita I1.
Abstract
Aims: Delay in administration of epinephrine is associated with decreased survival among children with in-hospital cardiac arrest with an initial non-shockable rhythm. Whether this association is applicable to paediatric out-of-hospital cardiac arrest (OHCA) population remains unknown. We aimed to determine whether time to epinephrine administration is associated with outcomes in paediatric OHCA.
Methods and results: This was a nation-wide population-based study of paediatric OHCA in Japan from 2005 to 2012 based on data from the All-Japan Utstein Registry. We included paediatric OHCA patients (aged between 1 and 17 years) who received at least one dose of epinephrine. The primary outcome was 30-day survival. A total of 225 patients were included in the final cohort. Among the 225 patients, 23 (10.2%) survived 30 days after OHCA. The median time from emergency call to first epinephrine administration was 26 min [interquartile range, 20-32; range, 9-128; mean (standard deviation), 28.7 (15.5) min]. Longer time to epinephrine administration was associated with decreased chance of survival: 50.0, 41.2, 13.0, 11.6, 3.9, and 3.1%, respectively, when time to epinephrine was treated as a categorical variable categorized into ≤10, 11-15, 16-20, 21-25, 26-30, or > 30 min (P for trend <0.0001), and adjusted odds ratio 0.90 (95% confidence interval 0.82-0.96, P = 0.0011) when time to epinephrine was treated as a linear and continuous variable in a multivariable logistic regression model. Similar trends were observed for prehospital return of spontaneous circulation (P = 0.0032) and neurologically favourable survival (P = 0.0014).
Conclusions: Among paediatric OHCA patients, delayed administration of epinephrine was associated with a decreased chance of favourable outcomes.

RECERCA EXPERIMENTAL

1. Am J Emerg Med. 2017 Aug;35(8):1082-1089. doi: 10.1016/j.ajem.2017.02.051. Epub 2017 Mar 6.
Cardioprotective effect of nicorandil against myocardial injury following cardiac arrest in swine.
Liang LN1, Zhong X1, Zhou Y1, Hou ZQ1, Hu HR1, Zhu FF1, Chen JB1, Ji XF2, Shang DY3.
Abstract
INTRODUCTION: Nicorandil, a vasodilatory drug used to treat angina, was reported to protect against myocardial ischemia-reperfusion injury in various animal models. However, its cardioprotective action following cardiac arrest is unknown. We examined the cardioprotective effects of nicorandil in a porcine model of cardiac arrest and resuscitation.
METHODS: Ventricular fibrillation was induced electrically for 4min in anesthetized domestic swine, followed by cardiopulmonary resuscitation. Sixteen successfully resuscitated animals were randomized to saline control (n=8) or nicorandil (n=8) groups. Nicorandil (150μg/kg) was administered by central intravenous injection at onset of restoration of spontaneous circulation (ROSC), followed by 3μg/kg/min infusion until reperfusion end. Sham-operated animals received surgery only (n=4). Hemodynamic parameters were monitored continuously. Blood samples were taken at baseline, 5, 30, 180, and 360min

after ROSC. Left ventricular ejection fraction was assessed by echocardiography at baseline and 6h after ROSC. The animals were euthanized 6h after ROSC, and the cardiac tissue was removed for analysis.
RESULTS: 6 h after ROSC, nicorandil had significantly improved all hemodynamic variables (all $P<0.05$) except the maximum rate of left ventricular pressure decline and heart rate ($P>0.05$) compared with the control group. Control animals showed elevated cardiac troponin I and lactate levels compared with sham animals, which were significantly decreased following nicorandil treatment ($P<0.05$). In the saline control group, the adenosine triphosphate (ATP) content was largely reduced but subsequently rescued by nicorandil ($P<0.05$). Histopathologic injury was reduced with nicorandil treatment. Nicorandil reduced cardiomyocyte apoptosis as evidenced by reduced terminal deoxynucleotidyl transferase dUTP nick-end labeling (TUNEL)-positive cells, decreased Bax and caspase-3 expression, and increased Bcl-2 expression in the myocardium (all $P<0.05$).
CONCLUSION: Nicorandil exhibited cardioprotective effects on myocardial injury following cardiac arrest via improvement in post-resuscitation myocardial dysfunction and energy metabolism, reduction in myocardial histopathologic injury, and antiapoptotic effects.

CASE REPORTS

1. J Community Hosp Intern Med Perspect. 2017 Sep 19;7(4):222-226. doi: 10.1080/20009666.2017.1351290. eCollection 2017 Oct.
Ventricular fibrillation due to overdose of loperamide, the "poor man's methadone".
Salama A1, Levin Y1, Jha P1, Alweis R1,2, 3.
Abstract
Loperamide is an over-the-counter antidiarrheal agent that is considered by many patients to be safe, but has been used as a drug of abuse due to its opioid properties. However, cardiotoxicity has been reported, prompting the FDA to release a warning regarding the arrhythmogenic potential of loperamide. We present a case of a 38-year-old female presenting with cardiac arrest thought to be secondary to abuse of the loperamide that she was using to alleviate the heroin withdrawal symptoms. Cardiac ischemia and other drug toxicities were ruled out. Loperamide induces QTc prolongation and cardiac dysrhythmias. She had recurrent ventricular arrhythmias with multiple cardiac arrests. The persistence of the cardiotoxicity for a longer duration than previously reported in the literature is unique in this clinical presentation. We also highlight the potential mechanisms for loperamide cardiotoxicity and its challenging management.