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Selected Bibliography

LUCAS® Chest Compression System

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Randomized controlled clinical trials

LINC trial suite

Rubertsson S, Lindgren E, Smekal D, et al. Mechanical chest compressions and simultaneous defibrillation vs conventional cardiopulmonary resuscitation in out-of-hospital cardiac arrest. The LINC randomized trial. *JAMA*. 2013;311(1):53-61.

Hardig B, Lindgren E, Östlund O, et al. Outcome among VF/VT patients in the LINC (LUCAS IN cardiac arrest) trial - A randomised, controlled trial. *Resuscitation.* 2017;115:155-162.

Rubertsson S, Lindgren E, Smekal D, et al. Per protocol and pre-defined population analysis of the LINC study. *Resuscitation.* 2015;96:92–99.

Esibov A, Banville I, Chapman F, et al. Mechanical chest compressions improved aspects of CPR in the LINC trial. *Resuscitation*. 2015;91:116-121.

Rubertsson S, Silfverstolpe J, Rehn L, et al. The Study Protocol for the LINC (LUCAS in Cardiac Arrest) Study: A study comparing conventional adult out-of-hospital cardiopulmonary resuscitation with a concept with mechanical chest compressions and simultaneous defibrillation. *Scand J Trauma Resusc Emerg Med.* 2013;21:5.

PARAMEDIC trial suite

Perkins G, Lall R, Quinn T, et al. Mechanical versus manual chest compression for out-of-hospital cardiac arrest (PARAMEDIC): A pragmatic, cluster randomised controlled trial. *Lancet*. 2015;385(9972):947-955.

Gates S, Lall R, Quinn T, et al. Prehospital randomised assessment of a mechanical compression device in out-of-hospital cardiac arrest (PARAMEDIC): A pragmatic, cluster randomised trial and economic evaluation. *Health Technol Assess*. 2017;21(11):1-176.

Marti J, Hulme C, Ferreira Z, et al. The cost-effectiveness of a mechanical compression device in out of hospital cardiac arrest. *Resuscitation.* 2017;117:1-7.

Pocock H, Deakin C, Quinn T, et al. Human factors in prehospital research: Lessons from the PARAMEDIC trial. *Em Med J.* 2016;33(8):562-8.

Perkins G, Woollard M, Cooke M, et al. Prehospital randomised assessment of a mechanical compression device in cardiac arrest (PaRAMeDIC) trial protocol. *Scand J Trauma Resusc Emerg Med*. 2010;18:58.

Other randomized controlled trials

Anantharaman V, Ng B, Ang S, et al. Prompt use of mechanical cardiopulmonary resuscitation in out-of-hospital cardiac arrest: The MECCA study report. *Singapore Med J.* 2017;58(7):424-431.

Koster R, Beenen L, van der Boom E. Safety of mechanical chest compression devices AutoPulse and LUCAS in cardiac arrest: A randomized clinical trial for non-inferiority. *Eur Heart J.* 2017;0:1–8.

Belohlavek J, Smid O, Franek O, et al. Hyperinvasive approach prolongs the time window for favorable outcomes in refractory out-of-hospital cardiac arrest: A preliminary analysis of the “Prague OHCA Study”. *Resuscitation*. 2016;106S:e5–e21. Abstract.

Axelsson C, Karlsson T, Axelsson A, et al. Mechanical active compression-decompression cardiopulmonary resuscitation (ACD-CPR) versus manual CPR according to pressure of end tidal carbon dioxide (PETCO2) during CPR in out-of-hospital cardiac arrest (OHCA). *Resuscitation*. 2009;80(10):1099-1103.

Axelsson C, Nestin J, Svensson L, et al. Clinical consequences of the introduction of mechanical chest compression in the EMS system for treatment of out-of-hospital cardiac arrest – a pilot study. *Resuscitation*. 2006;71:47-55.

Pre-hospital studies with comparison groups

Sporer K, Jacobs M, Derevin L, et al. Continuous quality improvement efforts increase survival with favorable neurologic outcome after out-of-hospital cardiac arrest. *Prehosp Emerg Care.* 2016;14:1-6.

Pepe P, Scheppke K, Antevy P, et al. How would use of flow-focused adjuncts, passive ventilation and head-up CPR affect all-rhythm cardiac arrest resuscitation rates in a large, complex EMS system? *Circulation*. 2016;134:A15255. Abstract.

Tranberg T, Lassen J, Kaltoft A, et al. Quality of cardiopulmonary resuscitation in out-of-hospital cardiac arrest before and after introduction of a mechanical chest compression device, LUCAS-2; a prospective, observational study. *Scand J Trauma Resusc Emerg Med.* 2015;23:37.

Levy M, Yost D, Walker R, et al. A quality improvement initiative to optimize use of a mechanical chest compression device within a high-performance CPR approach to out-of-hospital cardiac arrest. *Resuscitation*. 2015;92:32-37.

Kamrud J, Boland L, Frazee C, et al. Use of transthoracic impedance data to evaluate intra-arrest chest compression quality before and after placement of a mechanical chest compression system. *Prehosp Emerg Care.* 2015;19(1):Abstract 131.

Villadiego Sanchez J, Borja Padilla J, del Valle Fernandez P, et al. Comparison of survival in cardiorespiratory arrest patients receiving conventional manual or external mechanical chest compression. *Resuscitation*. 2014;85S:S48. APO74.

Satterlee P, Boland L, Johnson P, et al. Implementation of a mechanical chest compression device as standard equipment in a large metropolitan ambulance service. *J Emerg Med.* 2013;45(4):562-569.

Axelsson C, Herrera M, Fredriksson M, et al. Implementation of mechanical chest compression in out-of-hospital cardiac arrest in an emergency medical service system. *Am J Emerg Med.* 2013;31(8):1196-1200.

Maule Y. The aid of mechanical CPR; better compressions, but more importantly – more compressions… (translated from French language; Assistance Cardiaque Externe; Masser mieux, mais surtout masser plus…). *Urgence Pratique.* 2011;106:47-48.

Carmona Jimenez F, Palma P, Soto G, et al. Cerebral flow improvement during CPR with LUCAS, measured by Doppler. *Resuscitation*. 2011;82S1:30. APO90. (This study is also published in a longer version, in Spanish language with English abstract, in *Emergencias* 2012;24:47-49.)

Saussy J, Elder J, Flores C, et al. Optimization of cardiopulmonary resuscitation with an impedance threshold device, automated compression cardiopulmonary resuscitation and post-resuscitation in-the-field hypothermia improved short-term outcomes following cardiac arrest. *Circulation*. 2010;122:A256. (Poster on file at Physio-Control.)

Olasveengen T, Wik L, Steen P. Quality of cardiopulmonary resuscitation before and during transport in out-of-hospital cardiac arrest. *Resuscitation*. 2008;76:185-190.

Maule Y. Mechanical external chest compression: A new adjuvant technology in cardiopulmonary *Resuscitation*. (Translated from French language: L'assistance cardiaque externe: nouvelle approche dans la RCP.) *Urgences & Accueil.* 2007;29:4-7.

Pre-hospital patient series

Adabag S, Hodgson L, Garcia S, et al. Outcomes of sudden cardiac arrest in a state-wide integrated resuscitation program: Results from the Minnesota Resuscitation Consortium. *Resuscitation*. 2017;110:95–100.

Schober A, Sterz F, Herkner H, et al. Emergency extracorporeal life support and ongoing resuscitation: A retrospective comparison for refractory out-of-hospital cardiac arrest. *Emerg Med J.* 2017;34(5):277-281.

Darocha T, Kosinski S, Jarosz A, et al. The chain of survival in hypothermic circulatory arrest: Encouraging preliminary results when using early identification, risk stratification and extracorporeal rewarming. *Scand J Trauma Resusc Emerg Med.* 2016;24:85.

Maurin O, Frattini B, Jost D, et al. Hands-off time during automated chest compression device application on out-of-hospital cardiac arrest. *Prehosp Emerg Care.* 2016;20(5):637-642.

Winther K, Bleeg R. LUCAS™ 2 in Danish Search and Rescue Helicopters. *Air Med J.* 2016;35:79-83.

Beesems S, Hardig B, Nilsson A, et al. Force and depth of mechanical chest compressions and their relation to chest height and gender in an out-of-hospital setting. *Resuscitation.* 2015;91:67-72.

Pietsch U, Lischke V, Pietsch C. Benefit of mechanical chest compression devices in mountain HEMS: lessons learned from 1 year of experience and evaluation. *Air Med J.* 2014;33(6):299-301.

Boyce L, Vliet Vlieland T, Bosch J, et al. High survival rate of 43% in out-of-hospital cardiac arrest patients in an optimised chain of survival. *Neth Heart J.* 2015;23(1):20-25.

Walker R, Esibov A, Chapman F. Impact of shock timing during mechanical CPR on defibrillation efficacy. *Circulation.* 2014;130. Abstract 152.

Escott M, Traynor K, Jenks S, et al. A case series: hemodynamics of LUCAS device plus an ITD in cardiac arrest. *Prehosp Emerg Care.* 2014;18(1):156. AP144.

Frattini B, Jost D, Lanoe V, et al. How to minimize "hands-off times" during mechanical chest compression device installation. *Resuscitation.* 2014;85S:S87. AP.

Fagnoul D, Taccone F, Belhaj A, et al. Extracorporeal life support associated with hypothermia and normoxemia in refractory cardiac arrest. *Resuscitation.* 2013;84:1519-1524.

Belohlavek J, Smid O, Franek O, et al. Hyperinvasive approach prolongs the time window for favorable outcomes in refractory out-of-hospital cardiac arrest: A preliminary analysis of the "Prague OHCA Study". *Resuscitation*. 2016;106S:e5–e21.

Belohlavek J, Skalicka H, Smid O, et al. Implementation of hyperinvasive approach to out-of hospital cardiac management: results from presimulation and simulation phases of the "Prague OHCA Study". *Resuscitation.* 2013;84S:S68. AP150.

Iordache D, Dinga V, Grasu C. CPR of OHCAs in Bucharest Romania: a comparative study of different crew types. *Resuscitation*. 2012;83:e49. AP067.

Yost D, Phillips R, Gonzales L, et al. Assessment of CPR interruptions from transthoracic impedance during use of the LUCAS mechanical chest compression system. *Resuscitation.* 2012;83(8):961-965.

Van Gerven E, Keirens A, Muysoms W, et al. Combination of a mechanical active compression-decompression cardiopulmonary resuscitation mechanism (LUCAS 1 and the Boussignac tube) during CPR in out-of-hospital cardiac arrest. *Resuscitation.* 2011;81(S1):S31. AP094.

Yost D, Gonzales L, Lick C, et al. Abstract 38: North American LUCAS Evaluation: prehospital use of a mechanical chest compression system. *Circulation.* 2010;122. A38. (Poster on file at Physio-Control.)

Steen S, Sjöberg T, Olsson P, et al. Treatment of out-of-hospital cardiac arrest with LUCAS, a new device for automatic mechanical compressions and active decompression. *Resuscitation.* 2005;67:25-30.

In-hospital studies with comparison groups

Chandler P, Ibrahim M. AS099. Manual chest compressions versus LUCAS 2© – A comparative study of End-tidal carbon dioxide levels during in-hospital resuscitation. *Resuscitation*. 2017;118(suppl 1):e41. Oral presentation.

Chandler P, Ibrahim M, Walker L, et al. Is there an elephant in the room?! A study to assess the chest compression ability of staff at a London acute hospital trust. *Resuscitation*. 2017;118(suppl 1):e31-e32. AS076.

Gutteridge D, Talluri S, Bangalore B, et al. Measuring survival-to-discharge rates for in-hospital cardiac arrest with the use of the LUCAS-CPR cardiopulmonary resuscitation (CPR) assist device. *J Gen Intern Med.* 2012;27(Suppl 2):S99-574. Abstract.

Verstraete S, De Knock J, Muller N, et al. Does the use of LUCAS influence survival for in-hospital cardiac arrest patients? ERC congress. 2008. (Poster 240 on file at Physio-Control.)

In-hospital patient series

Cloin J, van Berkom P, Venema A, et al. In-hospital implementation of the LUCAS-2: Early, one-time right, is essential. *Resuscitation*. 2012;83(S1)e120-121. AP252 (Poster on file at Physio-Control).

Bonnemeier H, Simonis G, Olivecrona G, et al. Continuous mechanical chest compression during in-hospital cardiopulmonary resuscitation of patients with pulseless electrical activity. *Resuscitation*. 2011;82:155-9.

PCI/ECMO studies with comparison groups

Venturini J, Retzer E, Estrada J, et al. Mechanical chest compressions improve rate of return of spontaneous circulation and allow for initiation of percutaneous circulatory support during cardiac arrest in the cardiac catheterization laboratory. *Resuscitation*. 2017;115:56-60.

Wagner H, Hardig B, Rundgren M, et al. Mechanical chest compressions in the coronary catheterization laboratory to facilitate coronary intervention and survival in patients requiring prolonged resuscitation efforts. *Scand J Trauma Resusc Emerg Med.* 2016;24(1):4.

PCI/ECMO patient series

Dennis M, Mc Canny P, D'Souza M, et al. Extracorporeal cardiopulmonary resuscitation for refractory cardiac arrest: A multicentre experience. *Int J Cardiol.* 2017;231:131-136.

Vase H, Christensen S, Christiansen A. The Impella CP device for acute mechanical circulatory support in refractory cardiac arrest. *Resuscitation*. 2017;112:70-74.

Yannopoulos D, Bartos J, Martin C, et al. Minnesota Resuscitation Consortium's advanced perfusion and reperfusion cardiac life support strategy for out-of-hospital refractory ventricular fibrillation. *J Am Heart Assoc.* 2016:13;5(6).

Hryniewicz K, Sandoval Y, Samara M, et al. Percutaneous venoarterial extracorporeal membrane oxygenation for refractory cardiogenic shock is associated with improved short- and long-term survival. *ASAIO J.* 2016;62(4):397-402.

Goslar T, Knafelj R, Radsel P, et al. Emergency percutaneous implantation of veno-arterial extracorporeal membrane oxygenation in the catheterisation laboratory. *EuroIntervention.* 2016;12(12):1465-1472.

Balevski I, Markota A, Purg D, et al. Intra-arrest percutaneous coronary intervention: A case series. *Wiener klinische Wochenschrif.* 2015;1-4.

Koyalakonda S, Nair S, Patel B, et al. Cardiac arrest in the catheter laboratory: Feasibility and outcomes of mechanical chest compression device. *Catheterization and Cardiovascular Intervention.* 2014;83,(S1):S1-S247. A-061.

Kalra A, Maharaj V, Johannsen R, et al. Catheterization laboratory activation during mechanical cardiopulmonary resuscitation: When should we say "No?". *Catheterization and Cardiovascular Interventions.* 2014;83(1):58-64.

Wagner H, Rundgren M, Hardig B, et al. (2013) A structured approach for treatment of prolonged cardiac arrest cases in the coronary catheterization laboratory using mechanical chest compressions. *Int J Cardiovasc Res.* 2013;2:4.

Mooney M, Hildebrandt D, Feldman D, et al. Level 1 shock team—early experience in ECMO use as a rescue device in cardiac arrest from STEMI in the cardiac catheterization laboratory. *JACC.* 2013;(61);10:E17.

Wagner H, Madsen Hardig B, Rundgren M, et al. Cerebral oximetry during prolonged cardiac arrest and percutaneous coronary intervention. *ICU Director.* 2013;4(1):22-32.

Azadi N, Niemann J, Thomas J. Coronary imaging and intervention during cardiovascular collapse: Use of the LUCAS mechanical CPR device in the cardiac catheterization laboratory. *Invasive Cardiol.* 2012;24:79-83.

Wagner H, Hardig B, Harnek J, et al. Monitoring possibilities of resuscitation efforts during cath lab. *Resuscitation*. 2010;81:S50. (Poster on file at Physio-Control.)

Wagner H, Madsen Hardig B, Gotberg M, et al. Abstract 91: Aspects on resuscitation in the coronary interventional catheter laboratory. *Circulation*. 2010;122:A91. (Poster on file at Physio-Control.)

Larsen A, Hjornevik A, Bonarjee V, et al. Coronary blood flow and perfusion pressure during coronary angiography in patients with ongoing mechanical chest compression: A report on 6 cases. *Resuscitation*. 2010;81:493–497.

Wagner H, Terkelsen C, Friberg H, et al. Cardiac arrest in the catheterisation laboratory: A 5-year experience of using mechanical chest compressions to facilitate PCI during prolonged resuscitation efforts. *Resuscitation*. 2010;81(4):383-387.

Larsen A, Hjornevik A, Ellingsen C, et al. Cardiac arrest with continuous mechanical chest compression during percutaneous coronary intervention. A report on the use of the LUCAS device. *Resuscitation*. 2007;75.

Grogaard H, Wik L, Eriksen M, et al. Continuous mechanical chest compressions during cardiac arrest to facilitate restoration of coronary circulation with percutaneous coronary intervention. *J Am Coll Cardiol.* 2007;50:1093-1094.

Case reports

Lamhaut L, Hutin A, Deutsch J, et al. Extracorporeal cardiopulmonary resuscitation (ECPR) in the prehospital setting: An illustrative case of ECPR performed in the Louvre museum. *Prehosp Emerg Care.* 2017;21(3):386-389.

Fjolner J, Greisen J, Jorgensen M, et al. Extracorporeal cardiopulmonary resuscitation after out-of-hospital cardiac arrest in a Danish health region. *Acta Anaesthesiol Scand.* 2017;61(2):176-185.

Wengenmayer T, Rombach S, Ramshorn F, et al. Influence of low-flow time on survival after extracorporeal cardiopulmonary resuscitation (eCPR). *Crit Care.* 2017;21(1):157. Abstract.

Hoyer D, Kaiser G, Paul A, et al. Two and a half hours of cardiopulmonary resuscitation in a deceased brain dead donor before liver transplantation - A good Idea to accept? *Chirurgia*. 2017;112(1):46-49. Abstract.

Varpula M, Simonen P, Nurmi J, et al. Mekaaniset elvytyslaitteet sydanpysahdyspotilaan kuljetuksessa ja sepelvaltimotoimenpiteessa (English title: Mechanical compression devices for cardiac arrest: Report of three cases). *Duodecim*. 2017;133(10):945-950.

Patel S, Reynolds J, Judge B. Successful treatment of prolonged digoxin-induced cardiac arrest with mechanical chest compressions and digoxin-specific antibody fragments. *Resuscitation*. 2017;17:30152-1.

Horer T, Cajander P, Jans P, et al. A case of partial aortic balloon occlusion in an unstable multi-trauma patient. *Trauma*. 2016;18(2):150–154.

Kosinski S, Darocha T, Jarosz A, et al. The longest persisting ventricular fibrillation with an excellent outcome–6 h 45 min cardiac arrest. *Resuscitation*. 2016;105:e21–e22. Letter to the editor.

Cingi E, McMahon L, Prielipp R, et al. Novel resuscitation devices facilitate complete neurologic recovery after prolonged cardiac arrest in postanesthesia care unit. *J Clin Anes.* 2016:35:530–535.

Nass P, Engeseth K, Grotta O, et al. Minimal invasive treatment of life-threatening bleeding caused by cardiopulmonary resuscitation-associated liver injury: A case report. *J Med Case Reports.* 2016;10:132.

Gazmuri R, Patel D, Stevens R, et al. Circulatory collapse, right ventricular dilatation, and alveolar dead space: A triad for the rapid diagnosis of massive pulmonary embolism. *Am J Emerg Med.* 2016;16:936.e1-936.e4. Case report.

Zhang Z-P, Su X, Liu C-W, et al. Continuous mechanical chest compression-assisted percutaneous coronary intervention in a patient with cardiac arrest complicating acute myocardial infarction. *Chinese Med J.* 2015;128(6):846-848.

Darocha T, Kosinski S, Moskwa M, et al. The role of hypothermia coordinator: A case of hypothermic cardiac arrest treated with ECMO. *High Alt Biol Med.* 2015;00(00):1-4.

Stechovsky C, Hajek P, Cipro S, et al. Mechanical chest compressions in prolonged cardiac arrest due to ST elevation myocardial infarction can cause myocardial contusion. *Int J Cardiol.* 2015;182:50-51.

Langwieser N, Sinnecker D, Rischpler C, et al. Treatment of acute left main occlusion by early revascularization combined with extracorporeal circulation achieves substantial myocardial salvage as assessed by simultaneous positron emission tomography/ magnetic resonance imaging. *Resuscitation*. 2014.85;10:e171-e173.

Forti A, Zilio G, Zanatta P, et al. Full recovery after prolonged cardiac arrest and resuscitation with mechanical chest compression device during helicopter transportation and percutaneous coronary intervention. *J Emerg Med.* 2014.47;6:632-634.

Putzer G, Mair B, Hangler H, et al. Emergency extracorporeal life support after prolonged out-of-hospital cardiac arrest. *J Cardiothoracic and Vascular Anesthesia*. 2014.28;4:1024-1026.

Giraud R, Siegenthaler N, Schussler O, et al. The LUCAS 2 chest compression device is not always efficient: An echographic confirmation. *Ann Emerg Med*. 2015.65;1:23-26.

Fidler R, Hirsch J, Stechert M, et al. Three modes of cardiac compressions in a single patient: A comparison of usual manual compressions, automated compressions, and open cardiac massage. *Resuscitation*. 2014.85;5:e75-e76.

Michalski T, Gottardi R, Dunser M. Extensive soft tissue trauma due to prolonged cardiopulmonary resuscitation using an automated chest compression (ACC) device. *Emerg Med J.* 2014;31:431.

Platenkamp M, Otterspoor L. Complications of mechanical chest compression devices. *Neth Heart J*. 2014;22:404-407.

Pietsch U, Lischke V, Pietsch C, et al. Mechanical chest compressions in an avalanche victim with cardiac arrest: An option for extreme mountain rescue operations. *Wilderness & Environmental Medicine*. 2014.25;2:190-193.

Veien K, Terkelsen C, Ilkjar L. Kombinationen af hjertestop og cerberla infarkt behandlet med ekstrakoporal cirkulation (English title: A combination of cardiac arrest and cerebral haemorrhage treated with extracorporeal membrane oxygenation). *Ugeskr Læger*. 2014;176:72-7.

Libungan B, Dworeck C, Omerovic E. Successful percutaneous coronary intervention during cardiac arrest with use of an automated chest compression device: A case report. *Therapeutics and Clinical Risk Management*. 2014;10:255-257.

Psaltis P, Meredith I, Ahmar W. Survival with good neurological outcome in a patient with prolonged ischemic cardiac arrest – utility of automated chest compression systems in the cardiac catheterization laboratory. *Catheterization and Cardiovascular Interventions*. 2014;84(6):987-991.

Zimmermann S, Rohde D, Marwan M, et al. Complete recovery after out-of-hospital cardiac arrest with prolonged (59 min) mechanical cardiopulmonary resuscitation, mild therapeutic hypothermia and complex percutaneous coronary intervention for ST-elevation myocardial infarction. *Heart & Lung*. 2014;43(1):62-65.

Ali A, Hothi S, Cox D. Coronary intervention on a moving target: A case report and procedural considerations. *J Invasive Cardiol.* 2013;25(8):E178-E179.

Park C, Roffi M, Bendjelid K, et al. Percutaneous noncoronary interventions during continuous mechanical chest compression with the LUCAS-2 device. *Am J Emerg Med.* 2013;31(2):456.e1-456.e3.

Jensen P, Andersen C, Nissen H. Transcatheter aortic valve implantation in a patient with circulatory collapse, using the LUCAS chest compression system. *Catheterization and Cardiovascular Interventions*. 2013;81(6):1084-1086.

Tranberg T, Vagner N, Christensen A, et al. Acute pulmonary embolism and cardiac arrest treated with thrombolysis and an automatic chest compression device. [Article in Danish]. *Ugeskr Laeger*. 2013;175(36):2043-2044.

Trivedi K, Borovnik-Lesjak V, Raul J, et al. LUCAS 2 device, compression depth, and the 2010 cardiopulmonary resuscitation guidelines. *Am J Emerg Med*. 2013;31(7):1154.e1-1154.e2.

Protasiewicz M, Szymkiewicz P, Sciborski K, et al. Cardiac arrest during percutaneous coronary intervention in a patient 'resistant' to clopidogrel - successful 50-minute mechanical chest compression. *Postep Kardiol Inter*. 2013;9(4):394-396.

Tambe S, Rasmussen V, Modrau I. Continuous mechanical chest compression using the LUCAS-2 device as a bridge to emergency aortic valve surgery. *J Cardiothoracic and Vascular Anesthesia.* 2012;26(5):e50-e52.

Dembeck A, Sonntag J, Liechti B, et al. Reanimation in alpinem Gelande – der etwas andere Einsatz (Resuscitation in the alpine terrain –a slightly different ambulance mission - Article in German language and abstract in English). *Notfall Rettungsmed*. 2012;15:51-57.

Chenaitia H, Fournier M, Brun J, et al. Association of mechanical chest compression and prehospital thrombolysis. *Am J Emerg Med*. 2012.30;6:1015.e1-1015.e2.

Rudolph S, Barnung S. Case Report: Survival after drowning with cardiac arrest and mild hypothermia. *ISRN Cardiology*. 2011; ID 895625.

Gottignies P, Devriendt J, Ngoc E, et al. Thrombolysis associated with LUCAS (Lund University Cardiopulmonary Assist System) as treatment of valve thrombosis resulting in cardiac arrest. *Am J Emerg Med.* 2011; 29:476.e3-5.

Kyrval H, Ahmad K. Automatic mechanical chest compression during helicopter transportation. (Article in Danish, Abstract in English.) *Ugeskr Laeger*. 2010;172:3190-3191.

Greisen J, Golbakdal K, Mathiassen O, et al. Prolonged mechanical cardiopulmonary resuscitation. (Article in Danish and abstract in English). *Ugeskr Laeger*. 2010;172:3191-3192.

Lassnig E, Maurer E, Nomeyer R, et al. Osborn waves and incessant ventricular fibrillation during therapeutic hypothermia. *Resuscitation*. 2010;81:500-501.

Matevossian E, Doll D, Sackl J, et al. Prolonged closed cardiac massage using LUCAS device in out-of-hospital cardiac arrest with prolonged transport time. *Emerg Med*. 2009;1:1-4. Open Access. www.Dovepress.com

Riemann U, Munz S, Maier J, et al. P06: Life-threatening accidental hypothermia in a 55 year old patient (translated from German language: Lebensbedrohliche akzidentelle Hypothermie bei einer 55jahrigen Patientin). *Intensivmedizin und Notfallmedizin*. 2009;46:261-262.

Weise M, Lutzner J. Heineck J. P14: Thrombolysis therapy at fulminant pulmonary embolism and a high risk of bleeding – what therapy makes sense? (Translated from German language: Lysetherapie bei fulminanter Lungenembolie und hohem Blutungsrisiko – sinnvolle Therapieentscheidung?) *Intensivmedizin und Notfallmedizin*. 2009;46:264:P14.

Friberg H, Rundgren M. Submersion, accidental hypothermia and cardiac arrest, mechanical chest compressions as a bridge to final treatment: A case report. *Scand J Trauma, Resusc Emerg Med*. 2009;17:7.

Hodl R, Maier R, Stoschitzky G, et al. A case of complicated transcatheter aortic valve implantation (TAVI). *Journal für Kardiologie*. 2009;16:189. Abstract 167. (Austrian Journal of Cardiology: available at www.kup.at/kup/pdf/7899.pdf)

Schafer K, Flemming K. Resuscitation with LUCAS – a case report. (Translated from German language Reanimationsbehandlung mittels LUCAS – ein Fallbericht.) *Clin Res Cardiol*. 2007:96(Suppl 1)P961.

Agostoni P, Cornelis K, Vermeersch P. Successful percutaneous treatment of an intraprocedural left main stent thrombosis with the support of an automatic mechanical chest compression device. *Int J Cardiol*. 2008;124:e19-e21.

Vatsgar T, Ingebrigtsen O, Fjosea L, et al. Cardiac arrest and resuscitation with an automatic mechanical chest compression device (LUCAS) due to anaphylaxis of a woman receiving caesarean section because of pre-eclampsia. *Resuscitation*. 2006;68:155-159.

Wik L, Kiil S. Use of an automatic chest compression device (LUCAS) as a bridge to establishing cardiopulmonary bypass for a patient with hypothermic cardiac arrest. *Resuscitation*. 2005;66:391-394.

Safety studies with comparison group

Koster R, Beenen L, van der Boom E. Safety of mechanical chest compression devices AutoPulse and LUCAS in cardiac arrest: A randomized clinical trial for non-inferiority. *Eur Heart J*. 2017;0:1–8.

Baumeister R, Held U, Thali M, et al. Forensic imaging findings by post-mortem computed tomography after manual versus mechanical chest compression. *J Forensic Radiology and Imaging*. 2015;3(3):167-173.

Lardi C, Egger C, Larribau R, et al. Traumatic injuries after mechanical cardiopulmonary resuscitation (LUCAS 2): A forensic autopsy study. *Intl J Legal Med.* 2015;129(5):1035-1042.

Kralj E, Podbregar M, Kejžar N, et al. Frequency and number of resuscitation related rib and sternum fractures are higher than generally considered. *Resuscitation*. 2015;93:136-141.

Smekal D, Lindgren E, Sandler H, et al. CPR-related injuries after manual or mechanical chest compressions with the LUCAS device: A multicentre study of victims after unsuccessful resuscitation. *Resuscitation*. 2010;85(12):1708-1712.

Fontanals J, Carretero M, Arguis M, et al. Lung injury secondary to resuscitation using mechanical external chest compression devices (LUCAS vs AUTOPULSE). Histopathology study: 13AP2-4. *European J Anaesthesiology.* 2010;27(47):191.

Menzies D, Barton D, Nolan N. Does the LUCAS device increase injury during CPR? *Resuscitation*. 2010; 81S:S20,AS076. Abstract.

Truhlar A, Hejna P, Zabka L, et al. Injuries caused by the AutoPulse and the LUCAS II resuscitation systems compared to manual chest compressions. *Resuscitation*. 2010;81S:S62, AP110.

Smekal D, Johansson J, Huzevka T, et al. No difference in autopsy detected injuries in cardiac arrest patients treated with manual chest compressions compared with mechanical compressions with the LUCAS device – a pilot study. *Resuscitation*. 2009;80:1104-1107.

Safety patient series

Boland L, Satterlee P, Hokanson J, et al. Chest compression injuries detected via routine post-arrest care in patients who survive to admission after out-of-hospital cardiac arrest. *Prehosp Emerg Care.* 2015;19(1):23-30.

Kůdela M, Grossova I, Strejc P. Traumatic changes of intrathoracic organs due to external mechanical cardiopulmonary resuscitation. Case reports. [Article in Czech]. *Soud Lek*. 2013;58(3):42-44.

Mateos Rodriguez A, Navalpotro Pascual J, Peinado Vallejo F, et al. Lung injuries secondary to mechanical chest compressions. *Resuscitation*. 2012;83(10):e203.

Oberladstaetter D, Braun P, Freund M, et al. Autopsy is more sensitive than computed tomography in detection of LUCAS-CPR related nondislocated chest fractures. *Resuscitation*. 2012;83:e89-e90.

Englund E, Silfverstolpe J, Halvarsson B. Injuries after cardiopulmonary resuscitation: A comparison between LUCAS mechanical CPR and standard CPR. *Resuscitation*. 2008;77S:S13, AS-036. Abstract.

Bonnemeier H, Gerling I, Barantke M, et al. Necropsy findings of non-survivors of CPR after mechanical and conventional chest compression. ERC congress 2008. (Poster 470 on file at Physio-Control).

Organ donation studies

Casadio M, Coppo A, Vargiolu A, et al. Organ donation in cardiac arrest patients treated with extracorporeal CPR: A single centre observational study. *Resuscitation*. 2017;118:133-139.

Mateos-Rodriguez A, Navalpotro-Pascual J, Amado-Belmonte A, et al. Mechanical chest compression devices improve survival of liver grafts from donors after cardiac death. *Resuscitation*. 2016;106:e11-e12. Letter to the editor.

Minambres E, Suberviola B, Guerra C, et al. Experience of a Maastrich type II non heart beating donor program in a small city: Preliminary results. *Med Intensiva*. 2015;39(7):433-41.

Mateos A, Navalpotro J, Andres A, et al. Mechanical CPR devices in donors after cardiac death. *Resuscitation*. 2014;85:S88. Abstract.

Palma P, Ruiz A, Carmona F, et al. How LUCAS® device affects kidney transplant rate in a "donors after circulatory death" program. *Resuscitation*. 2013;84:S73.

Mateos-Rodriguez A, Navalpotro-Pascual J, Andres-Belmonte A. Donor after cardiac death kidney graft under mechanical cardiac compression evolution. *Resuscitation*. 2013;84(9):e117.

Mateos-Rodriguez A, Navalpotro-Pascual J, Del Rio Gallegos F, et al. A. Research Paper: Out-hospital donors after cardiac death in Madrid, Spain: A 5-year review. *Australasian Emerg Nurs J*. 2012;15:164-169.

Carmona F, Ruiz A, Palma P, et al. Use of the Lucas mechanical chest compression device in an asystolic organ donation program: Effect on kidney perfusion and organ procurement and transplantation rate. *Emergencias*. 2012;24:366-371.

Mateos-Rodriguez A, Pardillos-Ferrer L, Navalpotro-Pascual J, et al. Short communication: Kidney transplant function using organs from nonheart-beating donors maintained by mechanical chest compressions. *Resuscitation*. 2010;81:904-907.

Experimental studies

Casado M, Fontanals J, Arguis M, et al. Reanimacion con cardiocompresores: Comparacion de los efectos hemodinamicos entre LUCAS y AutoPulse en un modelo porcino. (English title: Resuscitation with the LUCAS and AutoPulse automated chest compression devices: Comparison of hemodynamic variables in a porcine model. *Emergencias*. 2014;26(6):459-463.

Debaty G, Segal N, Matsuura T, et al. Hemodynamic improvement of a LUCAS 2 automated device by addition of an impedance threshold device in a pig model of cardiac arrest. *Resuscitation*. 2014;85(12):1704-1707.

Reynolds J, Salcido D, Sundermann M, et al. Extracorporeal life support during cardiac arrest resuscitation in a porcine model of ventricular fibrillation. *J Extracorporeal Tech*. 2013;45(1):33-39.

Wagner H, Madsen Hardig B, Steen S, et al. Evaluation of coronary blood flow velocity during cardiac arrest with circulation maintained through mechanical chest compressions in a porcine model. *BMC Cardiovasc Disord*. 2011;11:73.

Menegazzi J, Salcido D, Housler G, et al. Feasibility of initiating extracorporeal life support during mechanical chest compression CPR: A porcine pilot study. *Resuscitation*. 2012;83:130-133.

Xhantos T, Pantazopoulos I, Roumelioti H, et al. A comparison of autopsy detected injuries in a porcine model of cardiac arrest treated with either manual or mechanical chest compressions. *Eur J Emerg Med*. 2011;18:108-110.

Liao Q, Sjoberg T, Paskevicius A, et al. Manual versus mechanical cardiopulmonary resuscitation. An experimental study in pigs. *BMC Cardiovas Disord*. 2010;10:53. (open access: www.biomedcentral.com/1471-2261/10/53).

Fontanals J, Carretero M, Arguis M, et al. Lung injury secondary to resuscitation using mechanical external chest compression devices (LUCAS vs. AutoPulse). Histopathology study: 13AP2-4. *Eur J of Anaesthesiol*. 2010;47:191. (open access;http://journals.lww.com/ejanaesthesiology/Fulltext/2010/06121/Lung_injury_secondary_to_resuscitation_using.611.aspx)

Carretero M, Fontanals J, Agusti M, et al. Monitoring in resuscitation: Comparison of cardiac output measurement between pulmonary artery catheter and NICO. *Resuscitation*. 2010;81:404-409.

Matsuura T, McKnite S, Metzger A, et al. An impedance threshold compression-decompression combined with an automated active compression decompression CPR device (LUCAS) improves the chances for survival in pigs in cardiac arrest. *Circulation*. 2008;118:S1449-S1450.

Walcott P, Melnick S, Banville I, et al. Pauses for defibrillation not necessary during mechanical chest compressions during pre-hospital cardiac arrest. *Circulation*. 2007;116:II386. Abstract 1811.

Ristagno G, Tang W, Wang H, et al. Comparison between mechanical active chest compression/decompression and standard mechanical chest compression. *Circulation*. 2007;116:II929-II930. Abstract 31.

Rubertsson S, Karlsten R. Increased cortical cerebral blood flow with LUCAS, a new device for mechanical chest compressions compared to standard external compressions during experimental cardiopulmonary resuscitation. *Resuscitation*. 2005;65:357-363.

Steen S, Liao Q, Pierre L, et al. The critical importance of minimal delay between chest compressions and subsequent defibrillations: A haemodynamic explanation. *Resuscitation*. 2003;58:249-258.

Steen S, Liao Q, Pierre L, et al. Evaluation of LUCAS, a new device for automatic mechanical chest compression and active decompression for cardiopulmonary resuscitation. *Resuscitation*. 2002;55:289-299.

Manikin studies

Szarpak L, Smereka J, Ladny J. AP025 Improvement of the quality of chest compression performed by novice physicians using a LUCAS-3 device: A randomized crossover manikin trial. *Resuscitation*. 2017;118S:e43-e90. Abstract.

Gyory R, Buchle S, Rodgers D, et al. The efficacy of LUCAS in prehospital cardiac arrest scenarios: A crossover mannequin study. *West J Emerg Med*. 2017;18(3):437-445.

Gittinger M, Brolliar S, Grand J, et al. Using Simulation as an investigational methodology to explore the impact of technology on team communication and patient management: A pilot evaluation of the effect of an automated compression device. *Simulation in Healthcare*. 2017;12(3):139-147.

Kim T, Hong K, Sang Do S, et al. Quality between mechanical compressions on reducible stretcher versus manual compression on standard stretcher in small elevator. *Am J Emerg Med*. 2016;34(8):1604-9.

Putzer G, Fiala A, Braun, P, et al. Manual versus mechanical chest compressions on surfaces of varying softness with or without backboards: A randomized, crossover manikin study. *J Emerg Med*. 2016;50(4):594-600.

Rehatschek G, Muench M, Schenk I, et al. Mechanical LUCAS resuscitation is effective, reduces physical workload and improves mental performance of helicopter emergency teams. *Minerva Anestesiologica*. 2016;82(4):429-37.

Gassler H, Kummerle S, Ventzke M, et al. Mechanical chest compression: An alternative in helicopter emergency medical services? *Internal and Emergency Medicine*. 2015;10(6):715-720.

Szarpak L, Karczewska K, Evrin T, et al. Comparison of intubation through the McGrath MAC, GlideScope, AirTraq, and Miller Laryngoscope by paramedics during child CPR: A randomized crossover manikin trial. *Am J Emerg Med*. 2015;33(7):946-950.

Winkler B, Hartig F, DuCanto J, et al. Helicopter-based in-water resuscitation with chest compressions: A pilot study. *Emerg Med J.* 2015;32(7):553-558.

Barcala-Furelos R, Abelairas-Gomez C, Romo-Perez V, et al. Influence of automatic compression device and water rescue equipment in quality lifesaving and cardiopulmonary resuscitation. *Hong Kong J Emerg Med.* 2014;21(5):291-299.

Palacios-Aguilar J, Bores-Cerezal A, Navarro-Paton R. The automatic compression devices: An alternative to improve the quality of chest compressions. *Resuscitation*. 2013;84S:S26.

Caruana E, Gauss T, Josseaume J, et al. Hands-up to set up two different mechanical chest compression devices. *Ann Emerg Med*. 2013;62(4):S143.

Ventzke M, Gassler H, Lampl L, et al. Cardio pump reloaded: In-hospital resuscitation during transport. *Internal and Emergency Medicine*. 2013;8(7):621-626.

Abelairas-Gomez C, Barcala-Furelos R, Garcia-Soidan J, et al. The use of automatic compression device on the cardiopulmonary resuscitation by lifeguards. *European Journal of Human Movement*. 2012;29:17-28.

Figgis D, Carlin B, O'Donnell C, et al. Paramedic perceptions of mechanical chest compression devices for use in adult out-of-hospital cardiac arrest. *Resuscitation*. 2012;83(S1):e78-e79. AP143.

Putzer G, Braun P, Zimmerman A, et al. LUCAS compared to manual cardiopulmonary resuscitation is more effective during helicopter rescue—a prospective, randomized, cross-over manikin study. *Am J of Emerg Med*. 2013;31(2):384-389.

Rodriguez Venegas J, Carmona Jimenez F, Nieto Cenzual A, et al. Effect of a mechanical chest compressor (LUCAS®) over hands off and good quality chest compression time. *Resuscitation*. 2012;83:e24–e123. AP141.

Fox J, Fiechter R, Gerstl P, et al. Mechanical versus manual chest compression CPR underground ambulance transport conditions. *Acute Cardiac Care*. 2013;15(1):1–6.

Gassler H, Ventzke M, Lampl L, et al. Transport with ongoing resuscitation: A comparison between manual and mechanical compression. *Emerg Med J*. 2013;30(7):589-92.

Blomberg H, Gedeborg R, Berglund L, et al. Poor chest compression quality with mechanical compressions in simulated cardiopulmonary resuscitation: A randomized, cross-over manikin study. 2011;82:1332-1337.

Munch M, Rehatscheck G, Strohm M, et al. Resuscitation in Rescue Helicopter (RTH) – the feasibility and efficacy of a mechanical CPR device in an RTH simulator. (Translated from German language.) *Intenziv und Notfallmedizin*. 2010:4;295.

Wyss C, Fox J, Franzeck F, et al. Mechanical versus manual chest compression during CPR in a cardiac catherisation settting. *Cardiovascular Medicine*. 2010;13:92-96. (http://www.cardiovascular-medicine.ch/pdf/2010/2010-03/2010-03-005.PDF).

Reviews and miscellaneous articles

Jarosz A, Darocha T, Kosiůski S, et al. Profound accidental hypothermia - systematic approach to active recognition and treatment. *ASAIO J*. 2017; 63(3):e26-e30.

Tonna J, Johnson N, Greenwood J, et al. Practice characteristics of Emergency Department extracorporeal cardiopulmonary resuscitation (eCPR) programs in the United States: The current state of the art of Emergency Department extracorporeal membrane oxygenation (ED ECMO). *Resuscitation*. 2017;107:38–46.

Belohlavek J, Kovarnik T. Mechanical chest compressions in the coronary catheterization laboratory – do not hesitate to go step further! *Scand J Trauma Resusc Emerg Med*. 2016;24:102. Letter to the editor.

Paal P, Gordon L, Strapazzon G, et al. Accidental hypothermia–an update. The content of this review is endorsed by the International Commission for Mountain Emergency Medicine (ICAR MEDCOM). *Scand J Trauma Resusc Emerg Med*. 2016;24:111.

William P, Rao P, Kanakadandi U, et al. Mechanical cardiopulmonary resuscitation in and on the way to the cardiac catheterization laboratory. *Circ J*. 2016:25;80(6):1292-1299.

Rice D, Nudell N, Habrat D, et al. CPR induced consciousness - it's time for sedation protocols for this growing population. *Resuscitation*. 2016;103:e15-e16. Letter to the editor.

Olaussen A, Shepherd M, Nehme Z, et al. Return of consciousness during ongoing cardiopulmonary resuscitation: A systematic review. *Resuscitation*. 2015;86:44-48.

Ong M, Anantharaman V. Out-of-hospital cardiac arrest: Manual or mechanical CPR? *The Lancet*. 2015;385(9972):920-922.

Ong M, Shin S, Sung S, et al. Recommendations on ambulance cardiopulmonary resuscitation in basic life support systems. *Prehosp Emerg Care*. 2013;(4):491-500.

Dissertations

Luxen J. Doctoral thesis (title translated from German language): The significance of mechanical chest compression devices in the context of pre-hospital cardiopulmonary resuscitation and their dissemination and application in the Bavarian Rescue Service. Medical Faculty of the Ludwig Maximilian University of Munich. 2016.

Beesems S. Doctoral thesis: Quality and outcome of cardiopulmonary resuscitation. Amsterdam University, Amsterdam, the Netherlands, 2015. http://hdl.handle.net/11245/1.484928.

Wagner H. Doctoral thesis: Clinical and experimental insights into the use of mechanical chest compressions during prolonged resuscitation in the coronary catheterization laboratory. Lund University, Lund, Sweden, 2015. http://www.lunduniversity.lu.se/lup/publication/5323084.

Blomberg H. Doctoral thesis: Influence of The education and Training of Prehospital Medical Crews on Measures of Performance and Patient Outcomes. Uppsala University, Uppsala, Sweden, 2013. http://uu.diva portal.org/smash/record.jsf?pid=diva2%3A601321&dswid=-9295.

Smekal D. Doctoral thesis: Safety with Mechanical Chest Compressions in CPR - Clinical studies with the LUCAS™ device Uppsala Univerisity, Uppsala, Sweden, 2013. http://uu.diva portal.org/smash/record.jsf?searchId=1&pid=diva2:63936.

Liao Q. Doctoral thesis: Safety with Mechanical Chest Compressions in CPR - Clinical studies with the LUCAS™ device Lund University, Lund, Sweden, 2011. http://www.lu.se/lup/publication/1883004.

Axelsson C. Doctoral thesis. Safety with Mechanical Chest Compressions in CPR - Clinical studies with the LUCAS™ device. Goteborgs Universitet, Goteborg, Sweden, 2010. http://gupea.ub.gu.se/handle/2077/23078.

Jaschkowitz T. Doctoral thesis: Kontrastmittelgestutzte Notfall-Computertomographie unter Reanimationsbedingungen mit. Medizinischen Fakultat der Ludwig-Maximilians-Universitat zu Munchen, Germany, 2008. https://edoc.ub.unimuenchen.de/9415/1/Jaschkowitz_Thomas_H.pdf.

There are different generations (i.e. versions) of the LUCAS Chest Compression System. The first generation was driven by compressed air, whereas the later generations are driven by battery. Although all LUCAS versions are similar in most respects and deliver chest compressions according to the AHA and ERC guidelines, they differ somewhat in mechanical design and usability. The differences need to be considered when extrapolating clinical and animal data from the different versions.

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