Identifying Important Gaps in Randomized Controlled Trials of Adult Cardiac Arrest Treatments: A Systematic Review of the Published Literature

SUPPLEMENTAL MATERIAL

Supplemental Appendix A. Selected Characteristics of Included Studies of RCTs of Adult Cardiac Arrest Treatments
Supplemental Appendix B. Cochrane Collaboration Risk of Bias Assessment of Included Studies of RCTs of Adult Cardiac Arrest Treatments
Supplemental References. Bibliography of Included Studies of RCTs of Adult Cardiac Arrest Treatments
Supplemental Appendix C. Electronic Search Terms within the PubMed/EMBASE/Scopus Databases
Supplemental Appendix D. PRISMA Checklist

Supplemental Appendix A. Selected Characteristics of Included Studies of RCTs of Adult Cardiac Arrest Treatments

Study Author/ Publication Year	Journal	Location of Arrest	Intervention Studied	Initial Arrest Rhythm	Number of Subjects	Single/Multicenter	Geographic Location	Timing of Intervention
Abu-Laban 2002[1]	*New England Journal of Medicine*	OHCA	100 mg IV tissue plasminogen activator versus placebo	PEA	233	Multicenter	Outside U.S.	During Cardiac Arrest
Abu-Laban 2006[2]	*Lancet*	OHCA	250 mg IV aminophylline versus placebo	Asystole or PEA refractory to epinephrine and atropine	971	Multicenter	Outside U.S.	During Cardiac Arrest
Allegra 2001[3]	*Resuscitation*	OHCA	2g IV magnesium sulfate versus placebo	Refractory VF	116	Multicenter	U.S.	During Cardiac Arrest
Arntz 2001[4]	*Circulation*	OHCA	Phased chest and abdominal compression-decompression (Lifestick™) CPR versus standard CPR	VF/PEA/Asystole	50	Multicenter	Outside U.S.	During Cardiac Arrest
Aufderheide 2005[5]	*Critical Care Medicine*	OHCA	Active versus sham ITD	Pulseless VT/VF/PEA/Asystole	230	Multicenter	U.S.	During Cardiac Arrest
Aufderheide 2011[6]	*Lancet*	OHCA	ACD-CPR + ITD versus standard CPR	Pulseless VT/VF/PEA/Asystole	1653	Multicenter	U.S.	During Cardiac Arrest
Aufderheide 2011[7]	*New England Journal of Medicine*	OHCA	Active versus sham ITD	Shockable VT/VF/ PEA/Asystole	8718	Multicenter	Inside/Outside U.S.	During Cardiac Arrest
Axelsson 2006[8]	*Resuscitation*	OHCA	Mechanical chest compression (LUCAS™) versus standard CPR	Pulseless VT/VF/PEA/Asystole	328	Multicenter	Outside U.S.	During Cardiac Arrest
Axelsson 2009[9]	*Resuscitation*	OHCA	Mechanical ACD-CPR (LUCAS™) versus standard CPR	Pulseless VT/VF/PEA/Asystole	126	Single	Outside U.S.	During Cardiac Arrest
Baker 2008[10]	*Resuscitation*	OHCA	3 min of CPR before first defibrillation versus immediate defibrillation	VF	202	Multicenter	Outside U.S.	During Cardiac Arrest

Baubin 1999[11]	*Resuscitation*	OHCA	Standard CPR followed by ACD-CPR versus ACD-CPR only versus standard CPR	Pulseless VT/VF	90	Single	Outside U.S.	During Cardiac Arrest
Bender 2007[12]	*Resuscitation*	OHCA	2 ml/kg/10 min IV hypertonic saline with HES versus IV HES alone	Pulseless VT/VF/PEA/Asystole	66	Single	Outside U.S.	During Cardiac Arrest
Berdowski 2010[13]	*Circulation: Arrhythmia and Electrophysiology*	OHCA	Use AEDs to perform postshock analysis and prompt pulse check versus resume CPR immediately after defibrillation	Pulseless VT/VF	136	Single	Outside U.S.	During Cardiac Arrest
Bernard 2002[14]	*New England Journal of Medicine*	OHCA	Therapeutic hypothermia (33°C) versus normothermia	VF	77	Multicenter	Outside U.S.	Post Cardiac Arrest
Bernard 2010[15]	*Circulation*	OHCA	Pre-hospital cooling versus cooling after hospital admission	VF	234	Multicenter	Outside U.S.	Post Cardiac Arrest
Bernard 2012[16]	*Critical Care Medicine*	OHCA	Pre-hospital cooling versus cooling after hospital admission	Asystole or PEA	163	Multicenter	Outside U.S.	Post Cardiac Arrest
Bertrand 2006[17]	*Intensive Care Medicine*	OHCA	Constant flow insufflation of oxygen versus mechanical ventilation	VF/PEA/Asystole	696	Multicenter	Outside U.S.	During/Post Cardiac Arrest
Bjelland 2012[18]	*Intensive Care Medicine*	OHCA	Propofol + remifentanil versus midazolam + fentanyl during therapeutic hypothermia (33-34°C for 24 hours)	Pulseless VT/VF/PEA/Asystole	59	Multicenter	Outside U.S.	Post Cardiac Arrest
Bohn 2011[19]	*Resuscitation*	OHCA	Extended feedback (addition of voice prompts during CPR) versus limited feedback (visual feedback + metronome only)	Pulseless VT/VF/PEA/Asystole	300	Single	Outside U.S.	During Cardiac Arrest
Bottiger 2008[20]	*New England Journal of Medicine*	OHCA	IV tenecteplase (weight-based dosing) versus placebo	Pulseless VT/VF/PEA/Asystole	1050	Multicenter	Outside U.S.	During Cardiac Arrest

Breil 2012[21]	*Resuscitation*	OHCA	2 ml/kg/10 min IV hypertonic saline with HES versus IV HES alone	Pulseless VT/VF/PEA/Asystole	203	Multicenter	Outside U.S.	During Cardiac Arrest
Callaway 2006[22]	*American Journal of Cardiology*	OHCA	40 IU Vasopressin versus placebo	VF/PEA/Asystole	325	Single	U.S.	During Cardiac Arrest
Castren 2010[23]	*Circulation*	OHCA	Intra-arrest, pre-hospital transnasal evaporative cooling (RhinoChill™) versus standard of care	VF/PEA/Asystole	194	Multicenter	Outside U.S.	Post Cardiac Arrest
Chardoli 2012[24]	*Chinese Journal of Traumatology - English Edition*	IHCA/OHCA	Echocardiography-integrated CPR versus standard CPR	PEA	100	Multicenter	Outside U.S.	During Cardiac Arrest
Choux 1995[25]	*Resuscitation*	OHCA	Repeated standard dose (1 mg IV) versus high dose (5 mg IV) of epinephrine	VF/EMD/Asystole	536	Single	Outside U.S.	During Cardiac Arrest
Debaty 2014[26]	*Intensive Care Med*	OHCA	Intra-arrest therapeutic hypothermia versus TH after hospital admission	Pulseless VT/VF/PEA/Asystole	245	Multicenter	Outside U.S.	During Cardiac Arrest
Dorian 2002[27]	*New England Journal of Medicine*	OHCA	5 mg/kg IV amiodarone + lidocaine placebo versus 1.5 mg/kg IV lidocaine + amiodarone placebo	Shock-resistant VF	347	Multicenter	Outside U.S.	During Cardiac Arrest
Dybvik 1995[28]	*Resuscitation*	OHCA	250 ml IV Tribonat™ (buffer solution) versus 250 ml of 0.9% IV normal saline	VF after first defibrillation attempt or Asystole	502	Single	Outside U.S.	During Cardiac Arrest
Fatovich 1997[29]	*Resuscitation*	OHCA	High dose (5 g) IV magnesium sulfate versus placebo	Pulseless VT/VF/Asystole	67	Single	Outside U.S.	During/Post Cardiac Arrest
Freese 2013[30]	*Circulation*	OHCA	Using AEDs with a VF waveform analysis algorithm versus standard shock-first protocol	VF	987	Multicenter	Inside/Outside U.S.	During Cardiac Arrest
Gueugniaud 1998[31]	*New England Journal of Medicine*	OHCA	Repeated (up to 15) high doses (5 mg IV each) versus standard doses (1 mg each) of epinephrine	VF/PEA/Asystole	3327	Multicenter	Outside U.S.	During Cardiac Arrest

Gueugniaud 2008[32]	*New England Journal of Medicine*	OHCA	1 mg IV epinephrine + 40 IU of IV vasopressin versus 1 mg IV epinephrine + saline placebo	VF after 3 failed defibrillation attempts/ PEA/Asystole	2894	Multicenter	Outside U.S.	During Cardiac Arrest
Hallstrom 2000[33]	*New England Journal of Medicine*	OHCA	Dispatcher-instructed bystander CPR by chest compression alone versus CPR by chest compression + mouth-to-mouth ventilation	Pulseless VT/VF/PEA/Asystole	520	Single	U.S.	During Cardiac Arrest
Hallstrom 2006[34]	*Journal of the American Medical Association*	OHCA	Automated load-distributing band (LDB-CPR) chest compression device versus manual CPR	Pulseless VT/VF/PEA/Asystole	767	Multicenter	Inside/Outside U.S.	During Cardiac Arrest
Hassan 2002[35]	*Emergency Medicine Journal*	OHCA	2 g IV magnesium sulfate versus placebo	VF/EMD/Asystole	105	Multicenter	Outside U.S.	Post Cardiac Arrest
Heard 2010[36]	*Resuscitation*	OHCA	Mechanical device for temperature management (Arctic Sun™) versus surface cooling with standard blankets + ice packs	Pulseless VT/VF/PEA/Asystole	64	Multicenter	U.S.	Post Cardiac Arrest
Holzer 2002 (HACA)[37]	*New England Journal of Medicine*	OHCA	Therapeutic hypothermia (32-34°C for 24 hours) versus normothermia	Pulseless VT/VF	275	Multicenter	Outside U.S.	Post Cardiac Arrest
Hostler 2011[38]	*British Medical Journal*	OHCA	Real-time audio and visual feedback during CPR versus standard CPR	Pulseless VT/VF/PEA/Asystole	1586	Multicenter	Inside/Outside U.S.	During Cardiac Arrest
Jacobs 2005[39]	*Emergency Medicine Australasia*	OHCA	90 seconds of CPR before defibrillation versus immediate defibrillation	Pulseless VT/VF	256	Single	Outside U.S.	During Cardiac Arrest
Jacobs 2011[40]	*Resuscitation*	OHCA	1 mg IV adrenaline versus saline placebo	Pulseless VT/VF/PEA/Asystole	534	Multicenter	Outside U.S.	During Cardiac Arrest
Jaffe 2004[41]	*American Journal of Cardiology*	OHCA	200 micrograms IV isoproterenol versus no isoproterenol	Asystole	79	Multicenter	Outside U.S.	During Cardiac Arrest

Jost 2010[42]	*Circulation*	OHCA	AED CPR protocol (1 minute CPR before 1st shock, shorter CPR interruptions, no stacked shocks) versus control protocol	VF	845	Single	Outside U.S.	During Cardiac Arrest
Kim 2007[43]	*Circulation*	OHCA	In-field cooling (up to 2 L of 4°C normal saline) versus standard care	VF/PEA/Asystole	125	Multicenter	U.S.	Post Cardiac Arrest
Kim 2014[44]	*Journal of the American Medical Association*	OHCA	Pre-hospital cooling (up to 2 L of 4°C normal saline) versus standard care	Pulseless VT/VF/PEA/Asystole	1359	Multicenter	U.S.	Post Cardiac Arrest
Knor 2011[45]	*Signa Vitae*	OHCA	10,000 units of intra-arrest IV heparin administration versus standard of care (no heparin)	Pulseless VT/VF/PEA/Asystole	63	Multicenter	Outside U.S.	During Cardiac Arrest
Kovoor 2005[46]	*Internal Medicine Journal*	OHCA	100 mg IV sotalol versus 100 mg IV lignocaine	VF and ≥ 4 defibrillatory monophasic shocks	129	Single	Outside U.S.	During Cardiac Arrest
Kudenchuk 1999[47]	*New England Journal of Medicine*	OHCA	300 mg IV amiodarone versus placebo	Pulseless VT/VF/PEA/Asystole	504	Multicenter	U.S.	During Cardiac Arrest
Kudenchuk 2006[48]	*Circulation*	OHCA	Transthoracic Incremental Monophasic versus Biphasic Defibrillation by Emergency Responders (TIMBER)	Pulseless VT/VF	168	Single	U.S.	During Cardiac Arrest
Laurent 2005[49]	*Journal of the American College of Cardiology*	OHCA	Isovolumic high-volume hemofiltration (200 mL/kg/hr over 8 hrs) +/-mild TH (32°C for 24 hrs) versus standard care	Pulseless VT/VF/PEA/Asystole	61	Multicenter	Outside U.S.	Post Cardiac Arrest
Longstreth 2002[50]	*Neurology*	OHCA	2g IV Mg sulfate or 10mg IV diazepam or both versus placebo	Pulseless VT/VF/PEA/Asystole	300	Single	U.S.	During Cardiac Arrest

Luiz 1996[51]	*Journal of Cardiothoracic and Vascular Anesthesia*	OHCA	ACD-CPR versus standard CPR	Pulseless VT/VF/PEA/Asystole	56	Single	Outside U.S.	During Cardiac Arrest
Ma 2012[52]	*Resuscitation*	OHCA	CPR first versus rhythm analysis for defibrillation first strategy	Pulseless VT/VF/PEA/Asystole	289	Single	Outside U.S.	During Cardiac Arrest
Mader 1999[53]	*Resuscitation*	OHCA	250 mg IV aminophylline versus placebo	Asystole	82	Single	U.S.	During Cardiac Arrest
Mader 2003[54]	*Academic Emergency Medicine*	OHCA	250 mg IV Aminophylline versus placebo	Atropine-resistant asystole	111	Multicenter	U.S.	During Cardiac Arrest
Mauer 1996[55]	*Resuscitation*	OHCA	ACD-CPR versus standard CPR	Pulseless VT/VF/PEA/Asystole	220	Single	Outside U.S.	During Cardiac Arrest
Mauer 1998[56]	*Resuscitation*	OHCA	Measuring end tidal CO_2 with ACD-CPR versus standard CPR	Pulseless VT/VF/PEA/Asystole	120	Single	Outside U.S.	During Cardiac Arrest
Mentzelopoulos 2009[57]	*Archives of Internal Medicine*	IHCA	120 IU IV vasopressin + 1 mg IV epinephrine + 40 mg IV methyl prednisolone versus 1 mg IV epinephrine + placebo during CPR and post-resuscitation hydrocortisone 300 mg IV for 7 days versus placebo	Pulseless VT/VF/PEA/Asystole	100	Single	Outside U.S.	During/Post Cardiac Arrest
Mentzelopoulos 2013[58]	*Journal of the American Medical Association*	IHCA	120 IU IV vasopressin + 1 mg IV epinephrine + 40 mg IV methyl prednisolone versus 1 mg IV epinephrine	Pulseless VT/VF/PEA/Asystole	268	Multicenter	Outside U.S.	During/Post Cardiac Arrest

			+ placebo during CPR and post-resuscitation hydrocortisone 300 mg IV for 7 days versus placebo					
Morrison 2005[59]	*Resuscitation*	OHCA	Rectilinear biphasic versus monophasic damped sine defibrillation waveforms (ORBIT)	Pulseless VT/VF	169	Multicenter	Outside U.S.	During Cardiac Arrest
Mukoyama 2009[60]	*Resuscitation*	OHCA	Maximum of 4 injections of either 40 IU IV vasopressin versus 1mg IV epinephrine immediately after ER arrival	Pulseless VT/VF/PEA/Asystole	336	Single	Outside U.S.	During Cardiac Arrest
Nielsen 2013[61]	*New England Journal of Medicine*	OHCA	Targeted temperature management at either 33°C versus 36°C	Pulseless VT/VF/PEA/Asystole	939	Multicenter	Outside U.S.	Post Cardiac Arrest
Oksanen 2007[62]	*Intensive Care Med*	OHCA	Strict (72-108 mg/dl) versus moderate (108-144 mg/dl) glucose control during first 48 hrs of ICU treatment	Pulseless VF	90	Multicenter	Outside U.S.	Post Cardiac Arrest
Olasveengen 2009[63]	*Journal of the American Medical Association*	OHCA	ACLS with IV drug administration versus ACLS without IV drug administration	Pulseless VT/VF/PEA/Asystole	851	Single	Outside U.S.	During Cardiac Arrest
Ong 2012[64]	*Resuscitation*	IHCA/OHCA	1mg IV adrenaline versus 40 IU IV vasopressin	Pulseless VT/VF/PEA/Asystole	727	Multicenter	Outside U.S.	During Cardiac Arrest

Patrick 1995[65]	*American Journal of Respiratory and Critical Care Medicine*	IHCA/OHCA	40 mg IV methoxamine versus 2mg IV epinephrine	Pulseless VT/VF/PEA/Asystole	145	Single	Outside U.S.	During Cardiac Arrest
Pittl 2013[66]	*Clinical Research in Cardiology*	IHCA/OHCA	Invasive cooling (Coolgard™) versus non-invasive surface cooling (Artic Sun ™)	Pulseless VT/VF/PEA/Asystole	80	Single	Outside U.S.	Post Cardiac Arrest
Plaisance 1997[67]	*Circulation*	OHCA	ACD-CPR versus standard CPR	Pulseless VT/VF/PEA/Asystole	512	Multicenter	Outside U.S.	During Cardiac Arrest
Plaisance 1999[68]	*New England Journal of Medicine*	OHCA	ACD-CPR versus standard CPR	Pulseless VT/VF/PEA/Asystole	750	Multicenter	Outside U.S.	During Cardiac Arrest
Plaisance 2004[69]	*Resuscitation*	OHCA	ACD-CPR + active ITD versus ACD-CPR + sham ITD	Pulseless VT/VF/PEA/Asystole	400	Multicenter	Outside U.S.	During Cardiac Arrest
Reades 2011[70]	*Annals of Emergency Medicine*	OHCA	Tibial intraosseous versus humoral intraosseous versus versus peripheral intravenous	Pulseless VT/VF/PEA/Asystole	182	Single	U.S.	During Cardiac Arrest
Rubertsson 2014[71]	*Journal of the American Medical Association*	OHCA	Mechanical chest compression and simultaneous defibrillation versus standard CPR (LINC)	Pulseless VT/VF/PEA/Asystole	2589	Multicenter	Outside U.S.	During Cardiac Arrest
Saissy 2000[72]	*Anesthesiology*	OHCA	Continuous insufflation of O2 versus IPPV in ACD-CPR	Pulseless VT/VF/PEA/Asystole	95	Multicenter	Outside U.S.	During Cardiac Arrest
Schmidbauer 2000[73]	*Resuscitation*	OHCA	High dose (5mg) versus standard dose (2.5mg) of endobronchial epinephrine	Pulseless VT/VF/PEA/Asystole	57	Single	Outside U.S.	During Cardiac Arrest

Schneider 2000[74]	*Circulation*	OHCA	AED with 150 J biphasic shocks versus 200-to-360 J monophasic shocks	VF	115	Multicenter	Outside U.S.	During Cardiac Arrest
Schwab 1995[75]	*Journal of the American Medical Association*	OHCA	ACD-CPR versus Standard CPR	VF/PEA/Asystole	860	Multicenter	U.S.	During Cardiac Arrest
Sherman 1997[76]	*Pharmacotherapy*	OHCA	High-dose (0.1 mg/kg) IV epinephrine versus standard-dose (0.01 mg/kg) IV epinephrine	VF or Asystole	140	Multicenter	U.S.	During Cardiac Arrest
Skogvoll 1999[77]	*Resuscitation*	OHCA	ACD-CPR versus Standard CPR	Pulseless VT/VF/PEA/Asystole	302	Single	Outside U.S.	During Cardiac Arrest
Smekal 2011[78]	*Resuscitation*	OHCA	Mechanical chest compressions (LUCAS™) versus Standard CPR	Pulseless VT/VF/PEA/Asystole	148	Multicenter	Outside U.S.	During Cardiac Arrest
Stiell 1996[79]	*Journal of the American Medical Association*	IHCA/OHCA	ACD-CPR versus Standard CPR	Pulseless VT/VF/PEA/Asystole	1784	Multicenter	Outside U.S.	During Cardiac Arrest
Stiell 2001[80]	*Lancet*	IHCA	40 IU IV Vasopressin versus 1mg IV epinephrine	Pulseless VT/VF/PEA/Asystole	200	Multicenter	Outside U.S.	During Cardiac Arrest
Stiell 2007[81]	*Circulation*	OHCA	Fixed lower energy (150-150-150 J) versus escalating higher energy (200-300-360 J)	Pulseless VT/VF patients with initial defibrillation by biphasic AED	221	Multicenter	Outside U.S.	During Cardiac Arrest
Stiell 2011[82]	*New England Journal of Medicine*	OHCA	Early-rhythm analysis (30 to 60 seconds CPR) versus delayed-rhythm analysis (180 seconds CPR)	Pulseless VT/VF/PEA/Asystole	9933	Multicenter	Inside/Outside U.S.	During Cardiac Arrest

Svensson 2010[83]	*New England Journal of Medicine*	OHCA	Compression-only CPR versus standard CPR	Pulseless VT/VF/PEA/Asystole	1276	Multicenter	Outside U.S.	During Cardiac Arrest
Takeda 2014[84]	*Resuscitation*	IHCA/OHCA	Pharyngeal cooling (saline 5°C into pharyngeal cuff for 120 min) versus standard of care	Pulseless VT/VF/PEA/Asystole	108	Multicenter	Outside U.S.	Post Cardiac Arrest
Thel 1997[85]	*Lancet*	IHCA	IV magnesium sulfate (2 g bolus followed by 8 g over 24 hours) versus placebo	Pulseless VT/VF/ EMD/Bradycardia/ Asystole	156	Single	U.S.	During/Post Cardiac Arrest
van Alem 2003[86]	*Resuscitation*	OHCA	Biphasic truncated exponential versus monophasic damped sine shocks	VF	120	Multicenter	Outside U.S.	During Cardiac Arrest
Vukmir 2006[87]	*American Journal of Emergency Medicine*	OHCA	1 mEq/kg IV sodium bicarbonate versus placebo	Pulseless VT/VF/PEA/Asystole	792	Multicenter	U.S.	During Cardiac Arrest
Wenzel 2004[88]	*New England Journal of Medicine*	OHCA	2 ampules of either 40 IU IV vasopressin versus 1 mg IV epinephrine	VF/PEA/Asystole	1186	Multicenter	Outside U.S.	During Cardiac Arrest
Wik 2003[89]	*Journal of the American Medical Association*	OHCA	CPR before defibrillation versus immediate defibrillation	Pulseless VT/VF	200	Single	Outside U.S.	During Cardiac Arrest
Wik 2014[90]	*Resuscitation*	OHCA	Integrated automated load-distributing band CPR versus standard CPR	Pulseless VT/VF/PEA/Asystole	4231	Multicenter	Inside/Outside U.S.	During Cardiac Arrest
Wolcke 2003[91]	*Circulation*	OHCA	ACD-CPR + ITD versus standard CPR	Pulseless VT/VF/PEA/Asystole	210	Multicenter	Outside U.S.	During Cardiac Arrest

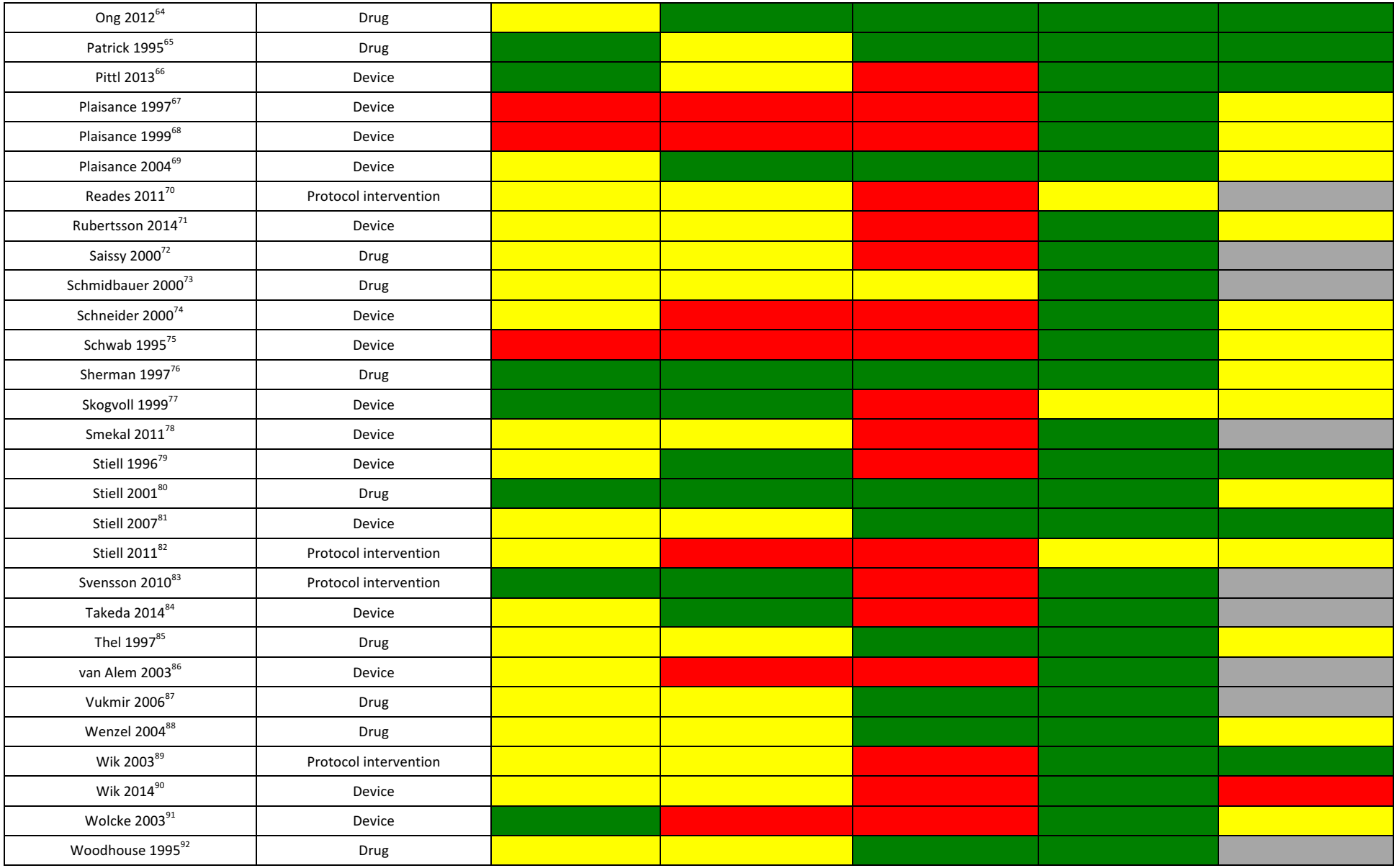
Woodhouse 1995[92]	*Resuscitation*	IHCA/OHCA	High-dose (10 mg IV) versus standard-dose (1 mg IV) adrenaline versus placebo	Pulseless VT/VF/EMD/Asystole	194	Single	Outside U.S.	During Cardiac Arrest

Supplementary Appendix Table A Abbreviations. ACD = active compression-decompression; AED = automated external defibrillator; CPR = cardiopulmonary resuscitation; EMD = electromechanical dissociation; IHCA = in-hospital cardiac arrest; Hydroxy ethyl starch; ITD = impedance threshold device; IV = intravenous; OHCA = out-of-hospital cardiac arrest; PEA = pulseless electrical activity; TH = therapeutic hypothermia; VT = ventricular tachycardia; VF = ventricular fibrillation; IPPV = intermittent positive pressure ventilation.

Supplemental Appendix B. Cochrane Collaboration Risk of Bias Assessment of Included Studies of RCTs of Adult Cardiac Arrest Treatments

Study Author/Publication Year	Trial Intervention	Sequence Generation	Allocation Concealment	Blinding of Primary Personnel	Blinding of Primary Outcome Assessors	Blinding of Global Ordinal/ Quality-of-Life Outcome Assessors
Abu-Laban 2002[1]	Drug					
Abu-Laban 2006[2]	Drug					
Allegra 2001[3]	Drug					
Arntz 2001[4]	Device					
Aufderheide 2005[5]	Device					
Aufderheide 2011[6]	Device					
Aufderheide 2011[7]	Device					
Axelsson 2006[8]	Device					
Axelsson 2009[9]	Device					
Baker 2008[10]	Protocol intervention					
Baubin 1999[11]	Device					
Bender 2007[12]	Drug					
Berdowski 2010[13]	Protocol intervention					
Bernard 2002[14]	Device					
Bernard 2010[15]	Device					
Bernard 2012[16]	Device					
Bertrand 2006[17]	Drug					
Bjelland 2012[18]	Drug					
Bohn 2011[19]	Protocol intervention					
Bottiger 2008[20]	Drug					
Breil 2012[21]	Drug					
Callaway 2006[22]	Drug					
Castren 2010[23]	Device					
Chardoli 2012[24]	Protocol intervention					
Choux 1995[25]	Drug					
Debaty 2014[26]	Device					
Dorian 2002[27]	Drug					
Dybvik 1995[28]	Drug					
Fatovich 1997[29]	Drug					

Freese 2013[30]	Protocol intervention					
Gueugniaud 1998[31]	Drug					
Gueugniaud 2008[32]	Drug					
Hallstrom 2000[33]	Protocol intervention					
Hallstrom 2006[34]	Device					
Hassan 2002[35]	Drug					
Heard 2010[36]	Device					
Holzer 2002 (HACA)[37]	Device					
Hostler 2011[38]	Protocol intervention					
Jacobs 2005[39]	Protocol intervention					
Jacobs 2011[40]	Drug					
Jaffe 2004[41]	Drug					
Jost 2010[42]	Protocol intervention					
Kim 2007[43]	Device					
Kim 2014[44]	Device					
Knor 2011[45]	Drug					
Kovoor 2005[46]	Drug					
Kudenchuk 1999[47]	Device					
Kudenchuk 2006[48]	Drug					
Laurent 2005[49]	Device					
Longstreth 2002[50]	Drug					
Luiz 1996[51]	Device					
Ma 2012[52]	Protocol intervention					
Mader 1999[53]	Drug					
Mader 2003[54]	Drug					
Mauer 1996[55]	Device					
Mauer 1998[56]	Device					
Mentzelopoulos 2009[57]	Drug					
Mentzelopoulos 2013[58]	Drug					
Morrison 2005[59]	Device					
Mukoyama 2009[60]	Drug					
Nielsen 2013[61]	Device					
Oksanen 2007[62]	Drug					
Olasveengen 2009[63]	Protocol intervention					



Ong 2012[64]	Drug					
Patrick 1995[65]	Drug					
Pittl 2013[66]	Device					
Plaisance 1997[67]	Device					
Plaisance 1999[68]	Device					
Plaisance 2004[69]	Device					
Reades 2011[70]	Protocol intervention					
Rubertsson 2014[71]	Device					
Saissy 2000[72]	Drug					
Schmidbauer 2000[73]	Drug					
Schneider 2000[74]	Device					
Schwab 1995[75]	Device					
Sherman 1997[76]	Drug					
Skogvoll 1999[77]	Device					
Smekal 2011[78]	Device					
Stiell 1996[79]	Device					
Stiell 2001[80]	Drug					
Stiell 2007[81]	Device					
Stiell 2011[82]	Protocol intervention					
Svensson 2010[83]	Protocol intervention					
Takeda 2014[84]	Device					
Thel 1997[85]	Drug					
van Alem 2003[86]	Device					
Vukmir 2006[87]	Drug					
Wenzel 2004[88]	Drug					
Wik 2003[89]	Protocol intervention					
Wik 2014[90]	Device					
Wolcke 2003[91]	Device					
Woodhouse 1995[92]	Drug					

Risk of bias is denoted as low risk of bias (green box), high risk of bias (red box), and unclear risk of bias (yellow box).
For the "blinding of global ordinal/quality-of-life outcome assessors" domain, a gray box was used to indicate studies that did not report the aforementioned outcomes.

Supplemental References. Bibliography of Included Studies of RCTs of Adult Cardiac Arrest Treatments

1. Abu-Laban RB, Christenson JM, Innes GD, et al. Tissue plasminogen activator in cardiac arrest with pulseless electrical activity. *N Engl J Med.* 2002;346(20):1522-1528.
2. Abu-Laban RB, McIntyre CM, Christenson JM, et al. Aminophylline in bradyasystolic cardiac arrest: a randomised placebo-controlled trial. *Lancet.* 2006;367(9522):1577-1584.
3. Allegra J, Lavery R, Cody R, et al. Magnesium sulfate in the treatment of refractory ventricular fibrillation in the prehospital setting. *Resuscitation.* 2001;49(3):245-249.
4. Arntz HR, Agrawal R, Richter H, et al. Phased chest and abdominal compression-decompression versus conventional cardiopulmonary resuscitation in out-of-hospital cardiac arrest. *Circulation.* 2001;104(7):768-772.
5. Aufderheide TP, Pirrallo RG, Provo TA, Lurie KG. Clinical evaluation of an inspiratory impedance threshold device during standard cardiopulmonary resuscitation in patients with out-of-hospital cardiac arrest. *Crit Care Med.* 2005;33(4):734-740.
6. Aufderheide TP, Frascone RJ, Wayne MA, et al. Standard cardiopulmonary resuscitation versus active compression-decompression cardiopulmonary resuscitation with augmentation of negative intrathoracic pressure for out-of-hospital cardiac arrest: a randomised trial. *Lancet.* 2011;377(9762):301-311.
7. Aufderheide TP, Nichol G, Rea TD, et al. A trial of an impedance threshold device in out-of-hospital cardiac arrest. *N Engl J Med.* 2011;365(9):798-806.
8. Axelsson C, Nestin J, Svensson L, Axelsson AB, Herlitz J. 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(1):47-55.
9. Axelsson C, Karlsson T, Axelsson AB, Herlitz J. Mechanical active compression-decompression cardiopulmonary resuscitation (ACD-CPR) versus manual CPR according to pressure of end tidal carbon dioxide (P(ET)CO2) during CPR in out-of-hospital cardiac arrest (OHCA). *Resuscitation.* 2009;80(10):1099-1103.
10. Baker PW, Conway J, Cotton C, et al. Defibrillation or cardiopulmonary resuscitation first for patients with out-of-hospital cardiac arrests found by paramedics to be in ventricular fibrillation? A randomised control trial. *Resuscitation.* 2008;79(3):424-431.
11. Baubin M, Sumann G, Rabl W, Eibl G, Wenzel V, Mair P. Increased frequency of thorax injuries with ACD-CPR. *Resuscitation.* 1999;41(1):33-38.
12. Bender R, Breil M, Heister U, et al. Hypertonic saline during CPR: Feasibility and safety of a new protocol of fluid management during resuscitation. *Resuscitation.* 2007;72(1):74-81.
13. Berdowski J, Tijssen JG, Koster RW. Chest compressions cause recurrence of ventricular fibrillation after the first successful conversion by defibrillation in out-of-hospital cardiac arrest. *Circ Arrhythm Electrophysiol.* 2010;3(1):72-78.
14. Bernard SA, Gray TW, Buist MD, et al. Treatment of comatose survivors of out-of-hospital cardiac arrest with induced hypothermia. *N Engl J Med.* 2002;346(8):557-563.
15. Bernard SA, Smith K, Cameron P, et al. Induction of therapeutic hypothermia by paramedics after resuscitation from out-of-hospital ventricular fibrillation cardiac arrest: a randomized controlled trial. *Circulation.* 2010;122(7):737-742.
16. Bernard SA, Smith K, Cameron P, et al. Induction of prehospital therapeutic hypothermia after resuscitation from nonventricular fibrillation cardiac arrest*. *Crit Care Med.* 2012;40(3):747-753.
17. Bertrand C, Hemery F, Carli P, et al. Constant flow insufflation of oxygen as the sole mode of ventilation during out-of-hospital cardiac arrest. *Intensive Care Med.* 2006;32(6):843-851.

18. Bjelland TW, Dale O, Kaisen K, et al. Propofol and remifentanil versus midazolam and fentanyl for sedation during therapeutic hypothermia after cardiac arrest: a randomised trial. *Intensive Care Med.* 2012;38(6):959-967.
19. Bohn A, Weber TP, Wecker S, et al. The addition of voice prompts to audiovisual feedback and debriefing does not modify CPR quality or outcomes in out of hospital cardiac arrest--a prospective, randomized trial. *Resuscitation.* 2011;82(3):257-262.
20. Bottiger BW, Arntz HR, Chamberlain DA, et al. Thrombolysis during resuscitation for out-of-hospital cardiac arrest. *N Engl J Med.* 2008;359(25):2651-2662.
21. Breil M, Krep H, Heister U, et al. Randomised study of hypertonic saline infusion during resuscitation from out-of-hospital cardiac arrest. *Resuscitation.* 2012;83(3):347-352.
22. Callaway CW, Hostler D, Doshi AA, et al. Usefulness of vasopressin administered with epinephrine during out-of-hospital cardiac arrest. *Am J Cardiol.* 2006;98(10):1316-1321.
23. Castren M, Nordberg P, Svensson L, et al. Intra-arrest transnasal evaporative cooling: a randomized, prehospital, multicenter study (PRINCE: Pre-ROSC IntraNasal Cooling Effectiveness). *Circulation.* 2010;122(7):729-736.
24. Chardoli M, Heidari F, Rabiee H, Sharif-Alhoseini M, Shokoohi H, Rahimi-Movaghar V. Echocardiography integrated ACLS protocol versus conventional cardiopulmonary resuscitation in patients with pulseless electrical activity cardiac arrest. *Chin J Traumatol.* 2012;15(5):284-287.
25. Choux C, Gueugniaud PY, Barbieux A, et al. Standard doses versus repeated high doses of epinephrine in cardiac arrest outside the hospital. *Resuscitation.* 1995;29(1):3-9.
26. Debaty G, Maignan M, Savary D, et al. Impact of intra-arrest therapeutic hypothermia in outcomes of prehospital cardiac arrest: a randomized controlled trial. *Intensive Care Med.* 2014;40(12):1832-1842.
27. Dorian P, Cass D, Schwartz B, Cooper R, Gelaznikas R, Barr A. Amiodarone as compared with lidocaine for shock-resistant ventricular fibrillation. *N Engl J Med.* 2002;346(12):884-890.
28. Dybvik T, Strand T, Steen PA. Buffer therapy during out-of-hospital cardiopulmonary resuscitation. *Resuscitation.* 1995;29(2):89-95.
29. Fatovich DM, Prentice DA, Dobb GJ. Magnesium in cardiac arrest (the magic trial). *Resuscitation.* 1997;35(3):237-241.
30. Freese JP, Jorgenson DB, Liu PY, et al. Waveform analysis-guided treatment versus a standard shock-first protocol for the treatment of out-of-hospital cardiac arrest presenting in ventricular fibrillation: results of an international randomized, controlled trial. *Circulation.* 2013;128(9):995-1002.
31. Gueugniaud PY, Mols P, Goldstein P, et al. A comparison of repeated high doses and repeated standard doses of epinephrine for cardiac arrest outside the hospital. European Epinephrine Study Group. *N Engl J Med.* 1998;339(22):1595-1601.
32. Gueugniaud PY, David JS, Chanzy E, et al. Vasopressin and epinephrine vs. epinephrine alone in cardiopulmonary resuscitation. *N Engl J Med.* 2008;359(1):21-30.
33. Hallstrom A, Cobb L, Johnson E, Copass M. Cardiopulmonary resuscitation by chest compression alone or with mouth-to-mouth ventilation. *N Engl J Med.* 2000;342(21):1546-1553.
34. Hallstrom A, Rea TD, Sayre MR, et al. Manual chest compression vs use of an automated chest compression device during resuscitation following out-of-hospital cardiac arrest: a randomized trial. *JAMA.* 2006;295(22):2620-2628.
35. Hassan TB, Jagger C, Barnett DB. A randomised trial to investigate the efficacy of magnesium sulphate for refractory ventricular fibrillation. *Emerg Med J.* 2002;19(1):57-62.
36. Heard KJ, Peberdy MA, Sayre MR, et al. A randomized controlled trial comparing the Arctic Sun to standard cooling for induction of hypothermia after cardiac arrest. *Resuscitation.* 2010;81(1):9-14.

37. Hypothermia after Cardiac Arrest Study G. Mild therapeutic hypothermia to improve the neurologic outcome after cardiac arrest. *N Engl J Med.* 2002;346(8):549-556.
38. Hostler D, Everson-Stewart S, Rea TD, et al. Effect of real-time feedback during cardiopulmonary resuscitation outside hospital: prospective, cluster-randomised trial. *BMJ.* 2011;342:d512.
39. Jacobs IG, Finn JC, Oxer HF, Jelinek GA. CPR before defibrillation in out-of-hospital cardiac arrest: a randomized trial. *Emerg Med Australas.* 2005;17(1):39-45.
40. Jacobs IG, Finn JC, Jelinek GA, Oxer HF, Thompson PL. Effect of adrenaline on survival in out-of-hospital cardiac arrest: A randomised double-blind placebo-controlled trial. *Resuscitation.* 2011;82(9):1138-1143.
41. Jaffe R, Rubinshtein R, Feigenberg Z, et al. Evaluation of isoproterenol in patients undergoing resuscitation for out-of-hospital asystolic cardiac arrest (the Israel Resuscitation with Isoproterenol Study Prospective Randomized Clinical Trial). *Am J Cardiol.* 2004;93(11):1407-1409, A1409.
42. Jost D, Degrange H, Verret C, et al. DEFI 2005: a randomized controlled trial of the effect of automated external defibrillator cardiopulmonary resuscitation protocol on outcome from out-of-hospital cardiac arrest. *Circulation.* 2010;121(14):1614-1622.
43. Kim F, Olsufka M, Longstreth WT, Jr., et al. Pilot randomized clinical trial of prehospital induction of mild hypothermia in out-of-hospital cardiac arrest patients with a rapid infusion of 4 degrees C normal saline. *Circulation.* 2007;115(24):3064-3070.
44. Kim F, Nichol G, Maynard C, et al. Effect of prehospital induction of mild hypothermia on survival and neurological status among adults with cardiac arrest: a randomized clinical trial. *JAMA.* 2014;311(1):45-52.
45. Knor J, Pokorna M, Skulec R, et al. Targeting out-of-hospital cardiac arrest: the effect of heparin administered during cardiopulmonary resuscitation (T-ARREST). *Signa Vitae.* 2011;6(1):24-30.
46. Kovoor P, Love A, Hall J, et al. Randomized double-blind trial of sotalol versus lignocaine in out-of-hospital refractory cardiac arrest due to ventricular tachyarrhythmia. *Intern Med J.* 2005;35(9):518-525.
47. Kudenchuk PJ, Cobb LA, Copass MK, et al. Amiodarone for resuscitation after out-of-hospital cardiac arrest due to ventricular fibrillation. *N Engl J Med.* 1999;341(12):871-878.
48. Kudenchuk PJ, Cobb LA, Copass MK, Olsufka M, Maynard C, Nichol G. Transthoracic incremental monophasic versus biphasic defibrillation by emergency responders (TIMBER): a randomized comparison of monophasic with biphasic waveform ascending energy defibrillation for the resuscitation of out-of-hospital cardiac arrest due to ventricular fibrillation. *Circulation.* 2006;114(19):2010-2018.
49. Laurent I, Adrie C, Vinsonneau C, et al. High-volume hemofiltration after out-of-hospital cardiac arrest: a randomized study. *J Am Coll Cardiol.* 2005;46(3):432-437.
50. Longstreth WT, Jr., Fahrenbruch CE, Olsufka M, Walsh TR, Copass MK, Cobb LA. Randomized clinical trial of magnesium, diazepam, or both after out-of-hospital cardiac arrest. *Neurology.* 2002;59(4):506-514.
51. Luiz T, Ellinger K, Denz C. Active compression-decompression cardiopulmonary resuscitation does not improve survival in patients with prehospital cardiac arrest in a physician-manned emergency medical system. *J Cardiothorac Vasc Anesth.* 1996;10(2):178-186.
52. Ma MH, Chiang WC, Ko PC, et al. A randomized trial of compression first or analyze first strategies in patients with out-of-hospital cardiac arrest: results from an Asian community. *Resuscitation.* 2012;83(7):806-812.
53. Mader TJ, Smithline HA, Gibson P. Aminophylline in undifferentiated out-of-hospital asystolic cardiac arrest. *Resuscitation.* 1999;41(1):39-45.

54. Mader TJ, Smithline HA, Durkin L, Scriver G. A randomized controlled trial of intravenous aminophylline for atropine-resistant out-of-hospital asystolic cardiac arrest. *Acad Emerg Med.* 2003;10(3):192-197.
55. Mauer D, Schneider T, Dick W, Withelm A, Elich D, Mauer M. Active compression-decompression resuscitation: a prospective, randomized study in a two-tiered EMS system with physicians in the field. *Resuscitation.* 1996;33(2):125-134.
56. Mauer D, Schneider T, Elich D, Dick W. Carbon dioxide levels during pre-hospital active compression--decompression versus standard cardiopulmonary resuscitation. *Resuscitation.* 1998;39(1-2):67-74.
57. Mentzelopoulos SD, Zakynthinos SG, Tzoufi M, et al. Vasopressin, epinephrine, and corticosteroids for in-hospital cardiac arrest. *Arch Intern Med.* 2009;169(1):15-24.
58. Mentzelopoulos SD, Malachias S, Chamos C, et al. Vasopressin, steroids, and epinephrine and neurologically favorable survival after in-hospital cardiac arrest: a randomized clinical trial. *JAMA.* 2013;310(3):270-279.
59. Morrison LJ, Dorian P, Long J, et al. Out-of-hospital cardiac arrest rectilinear biphasic to monophasic damped sine defibrillation waveforms with advanced life support intervention trial (ORBIT). *Resuscitation.* 2005;66(2):149-157.
60. Mukoyama T, Kinoshita K, Nagao K, Tanjoh K. Reduced effectiveness of vasopressin in repeated doses for patients undergoing prolonged cardiopulmonary resuscitation. *Resuscitation.* 2009;80(7):755-761.
61. Nielsen N, Wetterslev J, Cronberg T, et al. Targeted temperature management at 33 degrees C versus 36 degrees C after cardiac arrest. *N Engl J Med.* 2013;369(23):2197-2206.
62. Oksanen T, Skrifvars MB, Varpula T, et al. Strict versus moderate glucose control after resuscitation from ventricular fibrillation. *Intensive Care Med.* 2007;33(12):2093-2100.
63. Olasveengen TM, Sunde K, Brunborg C, Thowsen J, Steen PA, Wik L. Intravenous drug administration during out-of-hospital cardiac arrest: a randomized trial. *JAMA.* 2009;302(20):2222-2229.
64. Ong ME, Tiah L, Leong BS, et al. A randomised, double-blind, multi-centre trial comparing vasopressin and adrenaline in patients with cardiac arrest presenting to or in the Emergency Department. *Resuscitation.* 2012;83(8):953-960.
65. Patrick WD, Freedman J, McEwen T, Light RB, Ludwig L, Roberts D. A randomized, double-blind comparison of methoxamine and epinephrine in human cardiopulmonary arrest. *Am J Respir Crit Care Med.* 1995;152(2):519-523.
66. Pittl U, Schratter A, Desch S, et al. Invasive versus non-invasive cooling after in- and out-of-hospital cardiac arrest: a randomized trial. *Clin Res Cardiol.* 2013;102(8):607-614.
67. Plaisance P, Adnet F, Vicaut E, et al. Benefit of active compression-decompression cardiopulmonary resuscitation as a prehospital advanced cardiac life support. A randomized multicenter study. *Circulation.* 1997;95(4):955-961.
68. Plaisance P, Lurie KG, Vicaut E, et al. A comparison of standard cardiopulmonary resuscitation and active compression-decompression resuscitation for out-of-hospital cardiac arrest. French Active Compression-Decompression Cardiopulmonary Resuscitation Study Group. *N Engl J Med.* 1999;341(8):569-575.
69. Plaisance P, Lurie KG, Vicaut E, et al. Evaluation of an impedance threshold device in patients receiving active compression-decompression cardiopulmonary resuscitation for out of hospital cardiac arrest. *Resuscitation.* 2004;61(3):265-271.
70. Reades R, Studnek JR, Vandeventer S, Garrett J. Intraosseous versus intravenous vascular access during out-of-hospital cardiac arrest: a randomized controlled trial. *Ann Emerg Med.* 2011;58(6):509-516.
71. 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.* 2014;311(1):53-61.

72. Saissy JM, Boussignac G, Cheptel E, et al. Efficacy of continuous insufflation of oxygen combined with active cardiac compression-decompression during out-of-hospital cardiorespiratory arrest. *Anesthesiology.* 2000;92(6):1523-1530.
73. Schmidbauer S, Kneifel HA, Hallfeldt KK. Endobronchial application of high dose epinephrine in out of hospital cardiopulmonary resuscitation. *Resuscitation.* 2000;47(1):89.
74. Schneider T, Martens PR, Paschen H, et al. Multicenter, randomized, controlled trial of 150-J biphasic shocks compared with 200- to 360-J monophasic shocks in the resuscitation of out-of-hospital cardiac arrest victims. Optimized Response to Cardiac Arrest (ORCA) Investigators. *Circulation.* 2000;102(15):1780-1787.
75. Schwab TM, Callaham ML, Madsen CD, Utecht TA. A randomized clinical trial of active compression-decompression CPR vs standard CPR in out-of-hospital cardiac arrest in two cities. *JAMA.* 1995;273(16):1261-1268.
76. Sherman BW, Munger MA, Foulke GE, Rutherford WF, Panacek EA. High-dose versus standard-dose epinephrine treatment of cardiac arrest after failure of standard therapy. *Pharmacotherapy.* 1997;17(2):242-247.
77. Skogvoll E, Wik L. Active compression-decompression cardiopulmonary resuscitation: a population-based, prospective randomised clinical trial in out-of-hospital cardiac arrest. *Resuscitation.* 1999;42(3):163-172.
78. Smekal D, Johansson J, Huzevka T, Rubertsson S. A pilot study of mechanical chest compressions with the LUCAS device in cardiopulmonary resuscitation. *Resuscitation.* 2011;82(6):702-706.
79. Stiell IG, Hebert PC, Wells GA, et al. The Ontario trial of active compression-decompression cardiopulmonary resuscitation for in-hospital and prehospital cardiac arrest. *JAMA.* 1996;275(18):1417-1423.
80. Stiell IG, Hebert PC, Wells GA, et al. Vasopressin versus epinephrine for inhospital cardiac arrest: a randomised controlled trial. *Lancet.* 2001;358(9276):105-109.
81. Stiell IG, Walker RG, Nesbitt LP, et al. BIPHASIC Trial: a randomized comparison of fixed lower versus escalating higher energy levels for defibrillation in out-of-hospital cardiac arrest. *Circulation.* 2007;115(12):1511-1517.
82. Stiell IG, Nichol G, Leroux BG, et al. Early versus later rhythm analysis in patients with out-of-hospital cardiac arrest. *N Engl J Med.* 2011;365(9):787-797.
83. Svensson L, Bohm K, Castren M, et al. Compression-only CPR or standard CPR in out-of-hospital cardiac arrest. *N Engl J Med.* 2010;363(5):434-442.
84. Takeda Y, Kawashima T, Kiyota K, et al. Feasibility study of immediate pharyngeal cooling initiation in cardiac arrest patients after arrival at the emergency room. *Resuscitation.* 2014;85(12):1647-1653.
85. Thel MC, Armstrong AL, McNulty SE, Califf RM, O'Connor CM. Randomised trial of magnesium in in-hospital cardiac arrest. Duke Internal Medicine Housestaff. *Lancet.* 1997;350(9087):1272-1276.
86. van Alem AP, Chapman FW, Lank P, Hart AA, Koster RW. A prospective, randomised and blinded comparison of first shock success of monophasic and biphasic waveforms in out-of-hospital cardiac arrest. *Resuscitation.* 2003;58(1):17-24.
87. Vukmir RB, Katz L, Sodium Bicarbonate Study G. Sodium bicarbonate improves outcome in prolonged prehospital cardiac arrest. *Am J Emerg Med.* 2006;24(2):156-161.
88. Wenzel V, Krismer AC, Arntz HR, et al. A comparison of vasopressin and epinephrine for out-of-hospital cardiopulmonary resuscitation. *N Engl J Med.* 2004;350(2):105-113.
89. Wik L, Hansen TB, Fylling F, et al. Delaying defibrillation to give basic cardiopulmonary resuscitation to patients with out-of-hospital ventricular fibrillation: a randomized trial. *JAMA.* 2003;289(11):1389-1395.

90. Wik L, Olsen JA, Persse D, et al. Manual vs. integrated automatic load-distributing band CPR with equal survival after out of hospital cardiac arrest. The randomized CIRC trial. *Resuscitation.* 2014;85(6):741-748.
91. Wolcke BB, Mauer DK, Schoefmann MF, et al. Comparison of standard cardiopulmonary resuscitation versus the combination of active compression-decompression cardiopulmonary resuscitation and an inspiratory impedance threshold device for out-of-hospital cardiac arrest. *Circulation.* 2003;108(18):2201-2205.
92. Woodhouse SP, Cox S, Boyd P, Case C, Weber M. High dose and standard dose adrenaline do not alter survival, compared with placebo, in cardiac arrest. *Resuscitation.* 1995;30(3):243-249.

Supplemental Appendix C. Electronic Search Terms within the PubMed/EMBASE/Scopus Databases

PubMed

Therapy/Narrow[filter] AND (("heart arrest"[All Fields] OR "cardiac arrest"[All Fields]) OR ("Cardiopulmonary Resuscitation"[Mesh] OR "Heart Arrest"[Mesh])) AND ("1995/01/01"[PDAT] : "3000/12/31"[PDAT])

EMBASE *Note: eliminated keyword searches due to high search retrieval; all articles indexed so only EMTREE terms utilized*

'heart arrest'/exp AND 'resuscitation'/exp AND ([cochrane review]/lim OR [systematic review]/lim OR [controlled clinical trial]/lim OR [randomized controlled trial]/lim OR [meta analysis]/lim) AND (1995:py OR 1996:py OR 1997:py OR 1998:py OR 1999:py OR 2000:py OR 2001:py OR 2002:py OR 2003:py OR 2004:py OR 2005:py OR 2006:py OR 2007:py OR 2008:py OR 2009:py OR 2010:py OR 2011:py OR 2012:py OR 2013:py OR 2014:py)

Scopus *Note: filtered using adapted RCT strategy due to high search retrieval*

(TITLE-ABS-KEY ("cardiac arrest" OR "heart arrest" OR "cardiopulmonary resuscitation")) AND (TITLE-ABS-KEY ((clinical AND trial) OR “clinical trial*” OR random* OR “random allocation” OR “therapeutic use” OR “randomized controlled trial” OR (randomized AND controlled AND trial))) AND (LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2009) OR LIMIT-TO (PUBYEAR , 2008) OR LIMIT-TO (PUBYEAR , 2007) OR LIMIT-TO (PUBYEAR , 2006) OR LIMIT-TO (PUBYEAR , 2005) OR LIMIT-TO (PUBYEAR , 2004) OR LIMIT-TO (PUBYEAR , 2003) OR LIMIT-TO (PUBYEAR , 2002) OR LIMIT-TO (PUBYEAR , 2001) OR LIMIT-TO (PUBYEAR , 2000) OR LIMIT-TO (PUBYEAR , 1999) OR LIMIT-TO (PUBYEAR , 1998) OR LIMIT-TO (PUBYEAR , 1997) OR LIMIT-TO (PUBYEAR , 1996) OR LIMIT-TO (PUBYEAR , 1995))

Supplemental Appendix D. PRISMA Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	N/A
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	4
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	S.A. D
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4,5
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5,6
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	6
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	5,6
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	N/A

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	N/A
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	7
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	7-9,19, 21-23, S.A. A
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	8, 20, S.A. B
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	N/A
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	N/A
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	9-12
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	12
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	13
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	14

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097