Cardiac arrest

Hachimi-Idrissi and colleagues 1999[187] (conference abstract, Belgian study, language English) Prehospital cardiac arrest, total *n*=21, the first 11 were cooled, the subsequent 10 were control patients *Interventions*: Head cooling with a helmet device (?passive) during resuscitation for up to 4 hour (11) vs no cooling (*n*=10) *Outcomes*: Speed and effectiveness of helmet device to cool to target temperature of 34 °C 'No complication' from the cooling helmet	Non-randomised precursor to Hachimi-Idrissi and colleagues 2001, little information on cooling device ('new helmet device'), probably Frigicap Insufficient information on temperature to assess temperature reduction Site of temperature measurement: tympanic and bladder
Hachimi-Idrissi and colleagues 2001[69]; **Hachimi-Idrissi and colleagues 2005**[188] (study of S100β with cooling which includes the patients in Hachimi-Idrissi and colleagues 2001); additional information in Holzer and colleagues 2005[189] (Belgian study, language English) Cardiac arrest – asystole or pulseless electrical activity, total *n*=30 (plus three reported in Hachimi-Idrissi and colleagues 2005 and Holzer and colleagues 2005) *Interventions*: Passive head cooling after ROSC and stabilisation in emergency room with an aqueous glycerol helmet (Frigicap) –4ºC, applied over paper cap and changed every hour, duration of cooling 4 hours or until bladder temperature 34 °C (*n*=16) vs no cooling – passive rewarming to 37 °C if hypothermic, paracetamol if temperature >38 °C (*n*=14) *Outcomes*: Feasibility and speed of helmet device to cool to target temperature of 34 °C. CPC at hospital discharge 'No complication' from the cooling helmet	RCT. Hachimi-Idriss and colleagues 2001 has inadequate information on randomisation method ('prospectively blindly randomised') or blinding but Holzer and colleagues 2005 reports the method (random number tables, opaque envelopes) and that outcome assessors were blinded and includes data on an additional three patients Insufficient information on temperature to assess temperature reduction. Hachimi-Idrissi and colleagues 2001 reports baseline tympanic temperature but not baseline bladder, and time to target but not actual end temperatures Hachimi-Idrissi and colleagues 2005 (reports target was 33 °C) and Holzer and colleagues 2005 include no temperature data Site of temperature measurement: tympanic (infrared thermometer) and bladder
Ikeda and colleagues 2007[190] (conference abstract, Japanese study, language English) Cardiac arrest, total *n*=12 *Interventions*: Selective head cooling (*n*=7) vs whole body cooling (*n*=5), duration not reported, target temperature 34±1°C *Outcomes*: Urinary 8-hydroxy-2-deoxyguanosine, outcome at 28 days after admission	Not a RCT No information on cooling methods except 'selective head' and 'whole body' Insufficient information on temperature to assess temperature reduction. No information on temperature measurement sites No response from authors to request for further information
Busch and colleagues 2008[191] (conference abstract, German study, language English) Cardiac arrest after ROSC, total *n*=70 *Interventions*: transnasal head-cooling cooling (Rhinochill) followed by intravascular cooling (*n*=19) vs intravenous 4 °C saline followed by intravascular cooling (*n*=41) vs intravascular cooling alone (*n*=10) *Outcomes*: Time from hospital admission to target temperature; CPC and mortality at 7 days and hospital discharge	Non-randomised feasibility study of induction of hypothermia by transnasal cooling with historic control patients who had had standard care Insufficient information on temperature to assess body temperature reduction with head cooling. Temperature measurement sites: tympanic and bladder or rectal These patients may also have been included in the paper by Busch and colleagues 2010 (under included studies above)
Storm and colleagues 2008[70] (German study, language English) Cardiac arrest, total *n*=49 *Interventions*: Pre-hospital passive head cooling with gel cap after return of ROSC (*n*=24) vs standard care control patients (*n*=25) *Outcomes*: Change in tympanic temperature from pre-cooling to hospital admission, adverse events until hospital admission (none related to the device, e.g. freezing, tissue necrosis), outcome at hospital discharge	Non-randomised feasibility study: prehospital cooling with hypothermia caps (PreCoCa) Temperature measurement site (tympanic) did not meet inclusion criteria for this review

Nordberg and colleagues 2009[192] (conference abstract, Swedish study, language English) Cardiac arrest, total planned $n=100$, at time of report $n=15$ *Interventions*: Prehospital, intra-arrest transnasal cooling with Rhinochill device ($n=7$) vs standard care ($n=8$), cooling duration not reported *Outcomes*: Outcome at hospital discharge, adverse effects	RCT – early report of Pre-ROSC Intra-Nasal Cooling Effectiveness II (PRINCE II) No details on methods No temperature data reported
Takeda and colleagues 2009[193] (preliminary data); www.controlled-trials.com/ISRCTN98089900 (Japanese study, conference abstract in English) Cardiac arrest, $n=300$, $n=3$, reported in abstract *Interventions*: Active pharyngeal cooling during or immediately after resuscitation *Outcomes*: Tympanic temperature, neurological recovery, mortality	RCT. This trial has completed, report is in preparation, and a follow-on trial is planned to look at outcome (with Dr Yoshimasa Takeda, 18 April 2011, personal communication) Temperature measurement site (tympanic) did not meet inclusion criteria for this review
Wandaller and colleagues 2009[194] (Austrian study, language English) Cardiac arrest, total $n=11$: $n=5$ series 1, $n=6$ series 2 *Interventions*: Series 1 active head cooling for 1 hour after ROSC with MedCool Rapid Cooling System ($n=5$); series 2, active head cooling + neck cooling ($n=6$). Rescue therapy: endovascular cooling if temperature not reduced by 1 °C after 1 hour, required by 4/5 in series 1 and 2/6 in series 2, total cooling time 12 hours *Outcome*: Difference between jugular bulb temperature and oesophageal temperature *Device-related adverse events*: None	Non-randomised feasibility study of head cooling and head and neck cooling Data not available for temperature change with head/head and neck cooling alone: 'We regret that we were not able to distinguish between the effects of head or head and neck cooling vs endovascular cooling on the different temperature sites' (p. 464) Site of temperature measurement: tympanic, jugular bulb, oesophageal