**WORKSHEET for Evidence-Based Review of Science for Emergency Cardiac Care**

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<tr>
<th>Worksheet author(s)</th>
<th>Date Submitted for review: 12/1/09</th>
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<td>Jonathan Weinstock</td>
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**Clinical question.**  
In adult cardiac arrest during PCI (P), does use of any specific intervention (I) as opposed to standard care (acc to treatment algorithm) (C), improve outcome  

**Is this question addressing an intervention/therapy, prognosis or diagnosis?** Intervention/therapy  
**State if this is a proposed new topic or revision of existing worksheet:** New topic

**Conflict of interest specific to this question**  
Do any of the authors listed above have conflict of interest disclosures relevant to this worksheet? No

**Search strategy (including electronic databases searched).**

- **Pubmed:** "Heart Arrest"[Mesh] (24315) AND "Angioplasty, Transluminal, Percutaneous Coronary"[Mesh] (22200) (194)  
  Review of References from articles, Review of citing articles of relevant articles  
  Cochrane Database of Systematic Reviews: “Percutaneous Coronary Intervention” (17) and Cardiac Arrest (85) yielded 3 results none of which addressed the worksheet question.  

- **Embase:** 'heart arrest/exp AND 'percutaneous coronary intervention'/exp AND [humans]/lim AND Embase]/lim'treatment outcome'/exp

**State inclusion and exclusion criteria**

The following studies were excluded: Not related to cardiac arrest DURING PCI, Not related to any intervention during cardiac arrest during PCI, Intervention discussed already part of ACLS protocols. Included only articles discussing non standard interventions for cardiac arrest DURING PCI. All sources focused on continuous mechanical chest compression during PCI. All other interventions studied during PCI are part of standard care. Did not include studies of effectiveness of mechanical CPR in general, as this is the subject of another worksheet.

**Number of articles/sources meeting criteria for further review:**

5 sources meeting criteria for further review. 2 case reports, 1 of which was single patients, and one with 2 patients. One of the case reports is a research correspondence which also includes a small animal study (5 pigs). 3 Case series, one with 13 patients, one with 28 patients, and one with only a single patient that fit inclusion/exclusion criteria imbedded within a larger case series. One source is a review article.
## Summary of evidence

### Evidence Supporting Clinical Question

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**Level of evidence**

- **A** = Return of spontaneous circulation
- **B** = Survival of event
- **C** = Survival to hospital discharge
- **D** = Intact neurological survival
- **E** = Other endpoint

**Agostini P 2008 ABCD**

**Grogaard HK 2007 A**

### Evidence Neutral to Clinical question

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**Grogaard HK 2007ABC**

**Steen S 2005 ABCD**

**Larsen AJ 2007 ABCD**

**Wagner H 2009 ABCD**

### Evidence Opposing Clinical Question

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**Grogaard HK 2007 A**

**Steen S 2005 ABCD**

**Larsen AJ 2007 ABCD**

**Wagner H 2009 ABCD**
In adult cardiac arrest during PCI (P), does use of any specific intervention (I) as opposed to standard care (acc to treatment algorithm) (C), improve outcome.

In the search of the literature, automatic mechanical chest compression is the only intervention other than standard care that is being used during cardiac arrest during PCI (or coronary angiography). The device is being used in some centers due to an identified problem of performing continuous chest compressions in the middle of a coronary procedure, during which it is impossible to perform simultaneous manual chest compression and perform coronary procedures [Larsen AI, 2007, 454]. There are no randomized trials assessing this technology versus standard care. All the identified publications are either case reports, series, or animal studies. This worksheet did not address the overall effectiveness of mechanical CPR as that is the subject of a different worksheet.

There are difficulties in assessing this intervention, as one measure of success in many studies is merely the maintenance of circulation in order to perform the procedure. From that point of view, all the case reports [Agostini P, 2008, e19], [Groggard HK, 2007, 1093] [Steen S, 2005, 25], series [Larsen, Al, 454] [Wagner 2009, in press] and animal studies [Groggard HK 2007, 1093] support that outcome. On the other hand, given the fact that none of the studies were randomized trials, it is difficult to assess the effectiveness of automatic mechanical chest compression in this setting. In neither of the 2 case series were the survival outcomes very good [Larsen, Al, 454] [Wagner 2008, S12]. In one [Larsen AI, 2007, 454], none of the 13 patients survived, and in the other [Wagner H 2009, in press] 11/43 patients survived to discharge.

Acknowledgements:

Citation List


Notes: Larger case series which likely includes the already reported 28 patients in abstract below [Wagner 2008]. LOE 4 (case series), Fair Quality, Neutral (allowed for procedure to be performed but minority, 11/38 survived with good neurological function), ABCD


LOE 4 (single case report), Fair quality, Supporting, ABCD


Section of publication with animal study – LOE 5, poor quality (no control group without mechanical CPR), Supporting, A

LOE 4 (case series), Fair Quality, Neutral (allowed for procedure to be performed but none of the patients survived), ABCD


Notes- CASE REPORT. Only one of these patients had continuous mechanical CPR in the field which was continued in the cath lab. PCI of LAD was performed. The patient did not survive to discharge due to anoxic brain damage.

LOE 4 (single case report), Fair Quality, Neutral (allowed for procedure to be performed but patient did not survive), ABCD


REVIEW ARTICLE

Wagner H, Van der Pals, Olsson HR, Gotberg M, Harnek J, Olivecrona. Mechanical chest compression devices can save lives in the cath lab. Resuscitation 2008; 77: S12

Mechanical chest compression devices can save lives in the cath lab
H. Wagner, J. Van der Pals, H.R. Olsson, M. Gotberg, J. Harnek, G. Olivecrona
Department of Cardiology, Lund University Hospital, Sweden

Abstract of 28 patients between 2004-07 in single center cath lab, who at some point during the angiogram, PCI or pericardiocentesis required continuous mechanical compression. 5 patients had cardiac rupture during PCI and those 5 died. Of the remaining 23 patients 1 had successful pericardiocentesis and 7 had successful PCI during mechanical chest compressions. 7 of these patients were discharged from the hospital 6 of which had good neurological function.

LOE 4 (case series), Fair Quality (abstract only not published in full), Neutral (allowed for procedure to be performed but minority, 7/28 survived with 6/7 good neurological function), ABCD