**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

**Conflict of interest specific to this question**

Do any of the authors listed above have conflict of interest disclosures relevant to this worksheet? None

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

Search strategy as on 22 November 2009

**PUBMED**

#2 Search "Heart Arrest"[Mesh] 25767

#22 Search "Cardiopulmonary Resuscitation"[Mesh] 7796

#20 Search (#13 or #15) and #18 1679

#19 Search (#2 or #4) and #18 383

#18 Search "Heart Catheterization"[Mesh] 48229

#16 Search (#13 or #15) and #10 111

#15 Search "Tachycardia, Ventricular"[Mesh] 9441

#13 Search "Ventricular Fibrillation"[Mesh] 13074

#11 Search (#2 or #4) and #10 220

#10 Search "Angioplasty, Transluminal, Percutaneous Coronary"[Mesh] 24522

#4 Search "Death, Sudden, Cardiac"[Mesh] 7788

**Cochrane**

#1 MeSH descriptor Heart Arrest explode all trees 848

#2 MeSH descriptor Death, Sudden, Cardiac explode all trees 397

#3 MeSH descriptor Angioplasty, Transluminal, Percutaneous Coronary explode all trees 2841

#4(( #1 OR #2 ) AND #3) 25

#5 MeSH descriptor Ventricular Fibrillation explode all trees 412

#6 MeSH descriptor Tachycardia, Ventricular explode all trees 451

#7(( #5 OR #6 ) AND #3) 9

#8 MeSH descriptor Heart Catheterization explode all trees 1575

#9(( #1 OR #2 ) AND #8) 5

#10(( #5 OR #6 ) AND #8) 24

#11 MeSH descriptor Cardiopulmonary Resuscitation explode all trees 369

#12(( #3 OR #8 ) AND #11) 0

**State inclusion and exclusion criteria**

• AHA Endnote Master Library, Central Register of Controlled Trials, Review of references from the related articles.
Excluded:
Articles which did not mention the treatment of cardiac arrest during percutaneous intervention,
All studies involving percutaneous intervention after cardiac arrest.
Prevention of tachyarrhythmia during percutaneous intervention was discussed rather than management.

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

18 studies met the criteria
2 studies (Linder 2006, 2390 and Criley 1976) could not find the paper.
### Summary of evidence

#### Evidence Supporting Clinical Question

<table>
<thead>
<tr>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
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<tbody>
<tr>
<td></td>
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<td>Mooney MR et al 1991 ABCD</td>
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<td>Shawl FA et al, 1990 ABCD</td>
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<td></td>
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<td>Ricciardi MJ et al, 1999 A</td>
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<td>Miller B et al, 1989 E</td>
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<td></td>
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<td>Criley JM et al, 1976 B</td>
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<td>Raithel SC et al, 1989 B</td>
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</tbody>
</table>

#### Level of evidence

- **A** = Return of spontaneous circulation
- **B** = Survival of event
- **C** = Survival to hospital discharge
- **D** = Intact neurological survival
- **E** = Other endpoint
- **Italics** = Animal studies
**Evidence Neutral to Clinical question**

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| Fair          |       |       |       |       | Sprung, 2006 E
|               |       |       |       | Addala, Khan et  |
|               |       |       |       | al, 2005 D   |
|               |       |       |       | Larsen AI et al  |
|               |       |       |       | 2007 AB     |  
| Poor          |       |       |       |       |       |
| 1             | 2     | 3     | 4     |       | 5     |

**Level of evidence**

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**Evidence Opposing Clinical Question**

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<tr>
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<td>Poor</td>
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<td>Cayla G, 2007</td>
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<td>5</td>
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*Italics = Animal studies*
REVIEWER'S FINAL COMMENTS AND ASSESSMENT OF BENEFIT / RISK:

Peri-procedural cardiac arrest during percutaneous intervention has been declining since the advent of coronary interventions. One of the major factors to have contributed to this is the immediate treatment by specialists experienced at performing successful resuscitation with all necessary equipment and medications available to them.

After an extensive search of available literature, the following five different interventions (Precordial thump, Percutaneous cardiopulmonary bypass, Cough-CPR, Intracoronary verapamil, and Mechanical chest compression devices) have been used alone or along with standard care for the management of tachyarrhythmia/cardiac arrest during percutaneous intervention.

(Mooney, 1991, 450) in their study compared 5 patients who had cardiac arrest as a result of complication of cardiac catheterization (Group I) with 6 other patients with cardiac arrest (Group II) reported the survival of all 5 patients in group I after emergency CPB in both groups. In (Grambow, 1994, 872) study PCB was instituted in 7 patients with cardiac arrest refractory to resuscitation reported increase in MAP from 0 to 56 but none of the patients survived after subsequent cardiac surgery, PTCA or medical therapy. In a study by (Rathel, 1989, 475) ECMO support was instituted for patients who underwent cardiac arrest during catheterization (n=10) and elective PTCA (n=4) 3 survived in each group. (Ricciardi, 1999, 402) reported 2 successful cases of restoration of sinus rhythm after institution of ECMO who developed VF following interventional procedures. In (Shawl, 1990, 8) study PCB was instituted in 7 patients who had cardiac arrest in catheterization laboratory followed by CABG (n=3) or angioplasty (n=2) and 4 patients survived. (Nichol, 2006, 281) in their systematic review on CPB concluded PCB as an efficacious intervention and recommended for adequately powered experimental studies to demonstrate effectiveness, safety and cost-effectiveness.

(Criley, 1976, 1246) successfully resuscitated 8 patients with VF during coronary angiography with cough CPR. With cough CPR (Miller, 1989, 168) demonstrated MAP 47 - 66% of non arrhythmic baseline, systolic pressure 40 mm of Hg higher than basic CPR and maintenance of consciousness. (Keeble 2008, E239) and (Saba 1996 47) reported maintenance of consciousness and hemodynamic stability with cough CPR in their case reports.

In a case series (Kato 2004, 702) intracoronary verapamil was used for termination of reperfusion induced ventricular fibrillation following mechanical revascularization therapy.

(Grogaard, 2007, 1093) (Larsen 2004, 754) in their studies used automated mechanical chest compression devices rather than manual chest compression in order to maintain circulation during percutaneous intervention and (Larsen 2004, 754) reported study no of the patients were discharged home alive.

Acknowledgements:

Dr Jerry Nolan, Consultant Anaesthetist, Royal United Hospital who helped me to prepare this transcript.

Citation List


LOE 4, Fair (not randomised), Neutral


LOE 5, Poor (single case report), Against


LOE 4, Fair (not randomised), supporting

LOE 4, Fair (not randomised), supporting

LOE 4, Fair (not randomised), Supporting

LOE 5, poor (case report), supporting

LOE 4, Fair, Supporting

LOE 5, Fair, supporting

LOE 4, fair, neutral


LOE 4, fair, supporting

LOE 3, fair, supporting

LOE 5, fair, supporting

LOE 4, fair, supporting

LOE 4, fair, supporting

LOE 5, fair, supporting

*LOE 4, fair, supporting*


*LOE 4, fair, neutral*