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

Worksheet author(s)

Anthony J Handley MD

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Clinical question.

In adult and pediatric patients in cardiac arrest (prehospital [OHCA], in-hospital [IHCA]) (P), does the use of compressions first (30:2) (I) compared with standard care (2:30) (C), improve outcome (eg. ROSC, survival) (O).

Is this question addressing an intervention/therapy, prognosis or diagnosis? 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? No

Search strategy (including electronic databases searched).

Medline - various platforms including Scopus
Embase
EndNote ILCOR database

1. Heart arrest OR cardiac arrest -718 results
2. 30:2 - 1180 results
3. 2:30 - 2035 results
4. Compression ventilation ratio – 1120 results
5. 5 initial breaths – 555 results
6. Initial rescue breaths – 179 results

1 AND 2 AND 3 - no results
1 AND 2 - 3 results – none relevant
1 AND 3 - 1 result – not relevant
1 AND 4 - 27 results – none relevant
1 AND 5 - 5 results – none relevant
1 AND 6 - 4 results – none relevant

References from journals not identified by database search – 3 relevant

Search strategy repeated on 10 September 2009, with follow-up of previous references: No additional relevant studies found

• State inclusion and exclusion criteria

Inclusion: Studies comparing initial compression with initial ventilation after cardiac arrest

No exclusions

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

2 papers reviewed – 1 paper met the criteria. 3 further papers are included which explain the rationale behind 30:2 rather than 2:30.

Summary of evidence

Evidence Supporting Clinical Question

Good					
Fair					
Poor					**Kobayashi, 2008, 333 E**
	1	**2**	**3**	**4**	**5**
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

Good					
Fair					
Poor					
	1	**2**	**3**	**4**	**5**
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 Opposing Clinical Question

Good					
Fair					
Poor					
	1	**2**	**3**	**4**	**5**
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

REVIEWER'S FINAL COMMENTS AND ASSESSMENT OF BENEFIT / RISK:

No studies were found that addressed the question of outcome from cardiac arrest related to use of 2:30 or 30:2 ratios, nor any that addressed paediatric resuscitation.

A single, observational, adult simulation study (LOE 5: Kobayshi, 2008, 333) showed that starting CPR with chest compressions (30:2) rather than ventilations (2:30) reduced the time to first compression.

The Dutch Resuscitation Council taught CPR with initial chest compressions until the 2000 guidelines were published, then changed to initial ventilations. This prompted publication of the arguments for a return to compression first CPR – essentially 30: rather than 2:30 (Meursing, 2005, 279).

The decision by the European Resuscitation Council to recommend starting CPR with 30 compressions rather than 2 ventilations was taken on indirect evidence only: the need for early chest compression; the relative lack of need for ventilation; rescuers' distaste for mouth-to-mouth contact; the need to avoid any delay or hesitation by rescuers before starting CPR; the hope that, having once started, rescuers will continue CPR even if they do not add ventilation (Handley, 2005,S7; Nolan 2008,194).

Acknowledgements:

Citation List

Handley AJ, Koster R. Monsieurs K, Perkins GD, Davies S, Bossaert L. European Resuscitation Council Guidelines for Resuscitation 2005. Section 2. Adult basic life support and use of automated external defibrillators. Resuscitation 2005;67S1: S7-S23.

European basic life support guidelines.

Kobayashi[a] M, Fujiwara[a] A, Morita[a] H, Nishimoto[a] Y, Mishima[a] T, Nitta M, Hayashi[a] T, Hotta[a] T, Hayashi[b] Y, Hachisuka[c] E, Sato[d] K. A manikin-based observational study on cardiopulmonary resuscitation skills at the Osaka Senri medical rally. Resuscitation 2008; 78: 333-339.

Level 5; poor (in relation to clinical question); supporting: Simulated adult CPR as part of a competition between teams of 6 healthcare professionals. Non-randomized – teams followed either AHA (2:30) or ERC (30:2) protocols. Mean time from contact with manikin to first chest compression: AHA=42s; ERC=16s but AHA sequence included separate pulse check of up to 10s.

Meursing BTJ, Wulterkens DW, van Kesteren RG. The ABC of resuscitation and the Dutch (re)treat. Resuscitation 2005; 64: 279-286.

A well-argued case for initiating CPR with chest compressions rather than ventilations.

Nolan J. Basic life support. Current opinion in anaesthesiology 2008; 21: 194-199.

Review of changes in BLS guidelines for 2005 including discussion of rationale of 30:2 versus 2:30.