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

Worksheet author(s)

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Clinical question.

For lay and HCP (P) does the use of assessment (I) as opposed to no such assessment (C) improve knowledge, skills and learning/retention (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).

BHANJI SEARCH STRATEGY

Databases searched (updated Oct 16 2009)

Pubmed, EMBASE, AHA endnote library and cochrane library.

Pubmed (up to Oct 16th 2009)

("Cardiopulmonary Resuscitation"[Mesh]
OR
Pediatric Life Support OR Paediatric Life Support OR pediatric resuscitation OR paediatric resuscitation OR Neonatal Resuscitation OR Advanced Trauma Life Support OR basic life support Field: Text Word)
AND
"Educational Measurement"[Mesh]

n.b. since educational measurement is a Mesh subheading of "education", limiting the first part of the search to "education" did not result in a narrowing of the results
n.b. a 'text word' search was completed for terms that did not have readily identifiable Mesh terms.

Embase Classic and EMBASE (1947 to Oct 16th 2009)

("Resuscitation" [Subject heading]
OR
(pediatric life support OR paediatric life support OR pediatric resuscitation OR paediatric resuscitation OR neonatal resuscitation OR advanced trauma life support OR basic life support) [Keywords])
AND
"Education" [Subject heading]

AHA endnote library (2009 library)

Searched for keyword 'education'

PERKINS SEARCH STRATEGY

Strategy 1: (testing OR assessment OR examination) AND (cardiopulmonary resuscitation [Mesh] AND training). Databases searched: Cochrane library; Medline; OVID; EMBase; AHA endnote

Strategy 2: "cardiopulmonary resuscitation"[MeSH] AND ("Educational Measurement"[Mesh] OR "Feedback"[Mesh] OR "Retention (Psychology)"[Mesh]) Databases searched: Medline via pubmed

Strategy 3: Resuscitation/education[Mesh] AND Educational Measurement/*methods Databases searched: Medline via pubmed

- State inclusion and exclusion criteria

Inclusion criteria: studies evaluating impact of assessment on learning outcomes during advanced or basic life support training.

Training could involve face to face instructor led, self instruction, electronic learning, skills training, simulation or other form of resuscitation training

Included basic life support and advanced life support type courses addressing cardiac resuscitation (including neonatal and pediatric resuscitation). Also included other courses addressing principles of resuscitation training (e.g. advanced trauma life support).

Exclusion criteria: studies not examining assessment in the context of 'resuscitation training'

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

BHANJI :
1098 hits from Pubmed and Endnote searches (740 from Pubmed and 377 from Embase)
1059 hits from AHA endnote library
No hits from Cochrane library

PERKINS: The search strategies identified (1) 187 unique articles (2) 467 unique articles (some overlap with search strategy 1) (3) 29 (some overlap with previous searches). Review of titles and abstracts identified 6 articles.

There was one LOE 1 supportive (quality fair) and one LOE 1 (quality good) neutral manikin studies.

Summary of evidence

Evidence Supporting Clinical Question

Good					
Fair	**Kromann 2009 E**				
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 Neutral to Clinical question

Good	**Kromann 2009B E**				
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:

One LOE 1 (quality fair) prospective, randomized, single blind controlled manikin-based trial (Kromann, 2009, 21) favoured the use of testing during a resuscitation course. The study was conducted using seventh semester medical students undertaking a standardized resuscitation course in groups of 6 subjects. The intervention group received 3.5 hours of instruction followed by 30 minutes of skills testing, where each learner was individually tested for 5 minutes, allowing the other members of group to observe the scenarios. The control group received an identical 3.5 hours of instruction followed by a 30 minute time period used to run through 3 or 4 scenarios (identical to those used for testing in the intervention group). The learning outcome was assessed 2 weeks after the course by a single assessor, blinded to the training and 'testing' status of the subject, using a 25-item checklist with each item scored on a scale on of 0-5. Learning outcomes were significantly higher in the intervention group (n = 41; mean score 82.8%, 95% confidence interval [CI] 79.4–86.2) compared with the control group (n = 40; mean score 73.3%, 95% CI 70.5–76.1) ($P < 0.001$). These results support the notion that assessment at the conclusion of a standardized resuscitation course can improve learning outcomes compared to increased practice time without testing. Limitations of the study include the relatively short time interval between the course and the assessment of learning outcomes (i.e. demonstrates testing improved short-term retention but no comment can be made on longer term retention) and the significant loss to follow-up of enrolled participants.

KNOWLEDGE GAPS:

- Further studies evaluating the effect of testing on lay and HCP learning, retention and application of resuscitation skills would add to the literature.

Acknowledgements:

Citation List

Kromann, C. B., Jensen, M. L.Ringsted, C. (2009). "The effect of testing on skills learning." Med Educ **43**(1): 21.

- Only 96 out of 140 eligible subjects agreed to participate in the study
- 15 of the 96 enrolled subjects were 'lost to follow up'
- Intervention group went through 6 scenarios within the 30 minute 'extra' period while the control group only proceeded through 3-4 scenarios in the same time period.
- Learning outcomes assessed at 2 weeks following the course (a relatively short time interval)
- LOE 1. Graded as fair. Favours question

Kromann CB, Bohnstedt C, Jensen ML, Ringsted C (2009). The testing effect on skills learning might last 6 months. Adv Health Sci Educ Theory Pract. [Epub ahead of print]

- LOE 1 (quality good). Neutral to question.