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

**Worksheet author(s)**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Date Submitted for review:</th>
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<tbody>
<tr>
<td>Anthony J Handley</td>
<td>13 September 2009</td>
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**Clinical question.**

In BLS providers (P), does video self-instruction (I) compared with traditional instructor-led courses (C) improve skill acquisition and retention (O)?

**Is this question addressing an intervention/therapy, prognosis or diagnosis?** Intervention

**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?

Co-author of one paper quoted (Jones et al 2007). Research and other studies published on subject of self-instruction.

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

**Medline (direct); Scopus:** to 2009

- Basic life support OR BLS AND skill acquisition
- Basic life support OR BLS AND video
- Basic life support OR BLS AND self-instruction
- Basic life support OR BLS AND DVD
- Basic life support OR BLS AND instruction

<table>
<thead>
<tr>
<th>Database</th>
<th>Results</th>
<th>Relevant</th>
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<tr>
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Follow-up of references including citations via Scopus

  - Search strategies as for Medline
  - None found

**Cochrane Database: To 2009**

None found

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* State inclusion and exclusion criteria
- All results to 16 August 2009
- None for initial search
- Review inclusion: Comparison of video/DVD/on-line self-instruction with instructor-led course
- Review exclusion: AED only

* Number of articles/sources meeting criteria for further review:
- 734 papers met the above initial criteria; 69 papers were reviewed; 13 papers met the review inclusion criteria; 1 paper was subsequently discarded; 12 papers relevant.

Updated search: A further 12 papers met the criteria (some overlap Medline with Embase); 3 papers reviewed – none relevant to question.
## Summary of evidence

### Evidence Supporting Clinical Question

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<thead>
<tr>
<th>Good</th>
<th>Lynch 2005 E</th>
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**Level of evidence**

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

### Evidence Neutral to Clinical question

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**Level of evidence**

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### Evidence Opposing Clinical Question

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**REVIEWER’S FINAL COMMENTS AND ASSESSMENT OF BENEFIT / RISK:**

Five studies (3 LOE 1: Lynch 2005, 31; Todd 1998, 364; Einspruch 2007, 476. 1 LOE 2: Batcheller 2000, 101. 1 level 3: Braslow 1997, 207) showed that subjects self-taught CPR by use of a video (8-34 min duration) have significantly better skills at the end of training than those attending a traditional, instructor-led course of 1-6 hours duration. The skills acquired through self-instruction deteriorate, but at about the same speed as those acquired through an instructor-led course.

A single study (LOE 2: Moule 2008, 427) showed that healthcare professionals learnt BLS/AED theory as well from an e-learning program as from an instructor.

Six studies (3 LOE 1: Todd 1999, 730; Reder 2006,443; Roppolo 2007, 276. 3 LOE 2: Liberman 2000, 249; Isbye 2006, 435; Jones 2007, 350) showed no significant difference in skill acquisition and/or retention for video (interactive computer program in one case), self-instruction or instructor-led teaching, but the tendency was for video self-instruction to give better results.

A single study (LOE 1: Dracup 1998, 170) showed better infant CPR skill acquisition after instructor-led training than video, but study protocol had deficiencies.

Although different studies identified certain skills that appeared to be better acquired by self-instruction or instructor-led training, the skills were not consistent from study to study and no conclusions can be drawn.

Most studies included manikin practice for both self- and instructor- training, but one study (Reder 2006, 443) showed better skills when the subjects had hands-on practice.

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**Citation List**

**Batcheller A M, Brennan RT, Braslow A, Urrutia A, Kaye W. Cardiopulmonary resuscitation performance of subjects over forty is better following half-hour video self-instruction compared to traditional four-hour classroom training.” Resuscitation 2000; 43: 101-110.**

Level 2; fair; supporting: 34-minute self-instruction video compared with instructor-led course (?up to 4 hours) in lay volunteers. Randomized but course cancelled and some other volunteers re-allocated; poor overall randomization. Skills tested immediately after course (acquisition, not retention). Highly significant benefit for video group for overall skills, correct compressions, and correct ventilation.


Level 3; fair; supportive: 34-minute practice-as-you-watch video compared with 3-4 hour instructor-led course. Pilot video and revised version used – revised version more effective. No randomization. More healthcare workers and more with previous BLS training in instructor-led group. Tested immediately and 60 days after training. Skill acquisition significantly better for video group; 60-day testing showed better results for video group, but not significant.


Level 1; poor; opposing: 480 parents of at-risk infants taught CPR. Randomized to instructor-led + video, instructor-led + social discussion+ video, video alone. Significantly more successful if instructor-led. No pre-allocation comparison of groups; no details of randomization; no details of course and/or video duration; instructor-led training also received video.


Level 1; fair; supportive: Follow-up of Lynch 2005 study (see below). Volunteers re-tested 2 months after training (retention). Skill scores decayed in both groups compared with immediate testing, but remained better than original control. Self-trained (video) group still showed better overall skill level, but no statistical comparison between them is given.

Level 2; fair; neutral: 24-min DVD-based self-instruction compared with 6-hour instructor-led course. Laypersons without BLS training within 5 years randomized according to place of work. DVD group also took manikin home for further practice. Feedback device (CPR Coach) used by DVD group. Tested at 3 months. Ventilation volume and compression depth greater in DVD group, but overall no difference.


Level 2; fair; neutral: Lay volunteers who had requested CPR training. Allocated according to place of training (not true randomization). 8-minute video (up to 15-min training) compared with 1-hour instructor-led course. Tested before and immediately after training. Overall no significant difference in post-training skills, but video group displayed less deep compressions and more hands-off time.


Level 2; fair; neutral: Nursing students randomized into 4 groups: 11-minute video + unlimited time on manikin; 2 instructor-led courses (different student:manikin ratios); 2-hr practical teaching. Tested immediately after training and at 17 weeks. No overall difference in skill scores.


Level 1; good; supportive: Lay volunteers aged 40-70 – no BLS training within 5 years. Randomized. 22-minute video (plus manikin & feedback of compression depth) compared with 3-4 hour Heartsaver, instructor-led course. Control group. Tested immediately after training. Video group had better overall skills (acquisition) than instructor-led (p=0.031) but both better than control.


Level 2; poor; supportive: Healthcare professionals (mental health) allocated to 2.5h lecture or 3h e-learning programme (not specified). Both groups then received 1h instructor-led practical training. No randomization. Groups unequal numbers and professional mix. MCQ and performance tests pre- and post-training. Both groups had better theory and practical scores after training. E-learning group had tendency to better practical performance but no statistical difference between groups.


Level 1; fair; neutral: High-school children. 45-min interactive computer programme vs. 45-minute computer programme plus 45 mins of instructor training vs.45min x 2 instructor training vs. control (no teaching). Tested 2 days after training and 2 months late. Those that received hands-on training performed better than those without, but otherwise little difference in skill performance. Interactive computer programme led to better knowledge.


Level 1; poor; neutral: Laypeople without CPR training within 5 years randomized to 23-min video + demonstrations of choking management + use of feedback device and use of AED, or 3-4 Hour Heartsave AED, instructor-led course. Tested immediately after training and at 6 months. No significant difference between the skills immediately after training or 6 months later. Confused by additional skills and feedback device.

*Level 1, fair, supportive: Medical students. 34-min video + manikin compared with 4-hr Heartsaver instructor-led course. Randomized. Tested 2-6 weeks after training (average time same for each group). Overall scores for 14 skills significantly better for video group.*


*Level 1, good, neutral: Adults from a church congregation. Randomized to 34-min video self-instruction + simple manikin compared with 4-hour Heartsaver course. Tested 1+ month after training. Generally skills were poor, but no significant difference between the groups except for position on chest which was significantly better performed by video group.*