Appendix A
Education Implementation and Teams – 2026 Evidence to Decision Table

Targeted BLS training for likely rescuers of high-risk populations (EIT 6105

QUESTION

Should targeted BLS training of likely rescuers (e.g family or caregivers) vs. no such targeting be used for adults and children at risk of out-of-hospital cardiac arrest (OHCA)?	
POPULATION:	adults and children at risk of out-of-hospital cardiac arrest (OHCA)
INTERVENTION:	targeted BLS training of likely rescuers (e.g family or caregivers)
COMPARISON:	no such targeting
MAIN OUTCOMES:	Patient outcomes (Critical) • Survival with favourable neurological outcome at discharge and 30 days • Survival to hospital discharge/30 days • Return of spontaneous circulation • Bystander CPR quality during OHCA (any available CPR metrics) Process outcomes (Critical) • Rates of bystander CPR (subsequent use of skills) • Rates of AED use (subsequent utilisation of skills) • Bystander CPR quality during OHCA (any available CPR metrics) Education outcomes (Important) • CPR quality and AED competency post training completion and within 12 months of training • CPR and AED knowledge post training completion and within 12 months of training • Confidence to perform CPR post training and within 12 months of training • Willingness to perform CPR post training and within 12 months of training • Secondary training of others
SETTING:	lay person BLS training
CONFLICT OF INTERESTS:	Kevin Nation is employed by the NZ and Australian Resuscitation Councils

ASSESSMENT

Problem Is the problem a priority?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ No ○ Probably no ○ Probably yes	Out-of-hospital cardiac arrest (OHCA) is a significant cause of death and a high proportion of OHCA occur in the home. Bystander CPR rates are low.[1]	Institutions treating cardiac arrest patients have the opportunity to reach these groups and can

● Yes ○ Varies ○ Don't know	This topic was reviewed by ILCOR in 2015 and again in 2022.[2, 3] An earlier systematic review was published in 2016.[1] The 2015 ILCOR review found 32 studies relating to BLS training in likely rescuers of high-risk OHCA groups.[2] The 2021 ILCOR updated search found 12 new studies published since the 2015 review.[3] All the studies used varying methods for BLS training, control groups and assessment of outcomes and were too heterogeneous for meta-analysis for any outcome to be performed. There continues to be insufficient evidence found on trainees' use of BLS skills and OHCA patient outcomes following the training of likely rescuers of patients at high-risk of cardiac arrest.	potentially teach them CPR with low effort.

Desirable Effects

How substantial are the desirable anticipated effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Trivial ○ Small ● Moderate ○ Large ○ Varies ○ Don't know	An updated systematic review has been published in 2025.[4] A total of 48 studies (17 new non-randomised studies) were found. We conducted an updated search run on 20 November 2025 and found one additional non-randomised study, of moderate risk of bias.[5] **Subsequent use of BLS skills** For the critical patient outcomes including subsequent use of BLS skills, 17 studies (including 3 RCTs) reported at least one critical outcome, with periods of follow-up ranging from 3 months to 10 years and most studies relied on self-reported outcomes.[6-22] Both the adult (n=919) and pediatric (n=818,) studies often reported significant loss to follow-up with few subsequent OHCA events making the effect of the interventions on patient outcomes unclear. [4] Among the studies examining patient outcomes, there were two large RCTs.[6, 8] The Home Automated External Defibrillator Trial (HAT) randomized 7001 adult patients with acute myocardial infarction to have an AED with BLS training compared to CPR training alone.[8] In this study, with 100% follow-up, 160 OHCAs occurred over a median follow-up of 37 months, but only 58 (36%) arrests were witnessed by trained family members. It is unclear how many received CPR, but 29 (50%) patients had an AED applied. Notably, in this study, there were seven instances of study AEDs being used for individuals not included in the study (e.g. neighbors). There was no difference in mortality between the 2 study groups (n=228/3506 (6.5%) in the control group vs n=222/3495 (6.4%) in the AED group (hazard ratio, 0.97; 95% CI, 0.81 to 1.17; P=0.77)	These groups are likely willing to be trained and are unlikely to have any or recent BLS training. They are also unlikely to seek training on their own.

	The largest pediatric RCT, which trained parents of 462 infants discharged from a neonatal intensive care unit, compared three methods of CPR training in addition to a control group with no training.[6] At one year, only 58% were followed up, with parents of these infants reporting 13 OHCA events in the home. All these children were successfully resuscitated (not defined), and all had received CPR training, with no events reported in the control group. We found moderate certainty evidence (downgraded for risk of bias) from one additional non-RCT that surveyed family members of patients with chronic diseases six months after training, 10 individuals (7.1%) had performed CPR.[5] Two cases of CPR were successful (not defined). **CPR Quality and AED competency** For the important educational outcome of CPR Quality and AED competency 19 studies (1 RCT, 18 non-RCTs) were found.[15, 23-39] For non-RCTs the certainty of evidence was upgraded from very low to low for consistency in findings and RCT certainty of evidence remained as moderate, downgraded for risk of bias. Studies that reported an overall quality or competency metric (and not specific measures) generally found improvements post-training. Beyond training completion, 7 non-RCTs reported on CPR quality and AED competency.[10, 23, 31, 35, 40-42] The time points of follow-up varied from 2 months to 1-year after the initial training. Recent studies (2012 – 2020) were able to measure and report on each aspect of CPR skills.[23, 33, 35, 36, 38, 40, 41, 43] Most studies reported an improvement in compression rate/depth or rates being at guidelines standard from baseline skills or immediately post-training. Correct use of an AED was assessed in one study and showed an improvement from baseline immediately after training.[23] One study reported retention over time by comparing skills at different time points, they identified that refresher training resulted in less decay of skills (rate, depth, hand position and recoil) over time compared to once-off training.[35] **CPR and AED knowledge** For the important educational outcomes of CPR and AED knowledge, 13 studies (1 RCT, 12 non-RCTs) were found.[8, 22, 28, 30, 31, 34, 37, 39, 44-48] Knowledge was often reported using a test created by the study authors. Most studies found an increase in knowledge immediately post-training. Only two non-RCTs examined knowledge beyond training completion, one at two months and one at 12 months.[31, 42] The 12-month study examined the impact of reminders to refresh training, and showed CPR knowledge at 12-	

	months was significantly higher in the two intervention groups (audio-visual and audio-visual-practice training with reminders) compared to control (booklet and DVD with no reminders). No initial post-training assessment was done to assess retention over time.[42] **Confidence to perform CPR** For the important outcome of confidence to perform CPR, five non-RCTs with a low certainty of evidence (downgraded for risk of bias, upgraded for consistency) were found.[23, 33, 35-37] All five studies identified increased confidence following any type of CPR training. However, for studies with ongoing follow-up, a decay in confidence over time was identified.[23, 37] We found moderate certainty evidence (downgraded for risk of bias) from one additional non-RCT that surveyed family members of patients with chronic diseases, six months after training, to evaluate their confidence to perform CPR. 43.6% expressed confidence in their ability to perform CPR, 45.7% had moderate confidence, 10.7% lacked confidence.[5] **Willingness to provide CPR** For the important outcome of willingness to provide CPR, moderate certainty of evidence from one RCT and a low certainty of evidence from nine non-RCTs was found.[10, 12, 15, 32, 33, 43, 45, 46, 49, 50] Evidence from the RCT was downgraded to moderate for risk of bias and evidence from non-RCTs was rated as low after being downgraded for risk of bias but upgraded for consistency. Three studies reported a significant increase in willingness to provide CPR after training compared to before training.[12, 33, 49] Willingness based on the relationship to the patient was described in two studies, with lower rates as the example theoretical patient (i.e. imagine the patient was your father) became less “known” to the participant.[10, 49] The method of CPR training was examined in two studies, with one finding slight increases in willingness to perform continuous compression CPR compared to standard CPR, and the other identified traditional “didactic” training to be superior to other forms such as video training.[50] **Secondary training** For the important outcome of secondary training, we found a low certainty of evidence from one RCT (downgraded for risk of bias) and eight non-RCTs (downgraded for risk of bias but upgraded for consistency).[14, 17, 23, 33, 36, 41, 43, 51, 52] These studies describe participants sharing of CPR training and/or teaching materials with others. Of these studies, five reported the proportion of participants providing secondary training with rates varying between 22% to 72%.[23, 33, 36, 41,	

	[42] One study reported 96% of participants had an intention to teach others, but ultimately only 42% of participants did with one patient-spouse pair training multiple peers.[33]	

Undesirable Effects

How substantial are the undesirable anticipated effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Large ○ Moderate ○ Small ○ Trivial ● Varies ○ Don't know	The systematic review conducted this year identified only one study demonstrating retention over time, it identified the need for refresher training. [4]	Previous CoSTRs and systematic review suggested no increase in anxiety after training.[2, 3] Degradation in BLS skills and knowledge is seen in all trained groups without further training.

Certainty of evidence

What is the overall certainty of the evidence of effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Very low ○ Low ● Moderate ○ High ○ No included studies	Two of the RCTs were deemed to have a low risk of bias overall, with the remaining two RCTs assessed as critical due to randomisation, missing data and outcome measurement. Most non-RCTs (n = 10) were at serious or critical risk of bias for patient outcomes. For educational outcomes, nine non-RCTs were assessed as having low risk of bias. The remainder (n = 27) ranged from moderate to critical risk of bias, most (n = 19) frequently due to high rates of missing data.[4] The additional study found was assessed as moderate risk of bias downgraded for moderate confounding, selection of participants and outcome measurement.[5]	The variation between studies for methods of training and outcome measurement precluded any meta-analysis.

Values

Is there important uncertainty about or variability in how much people value the main outcomes?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Important uncertainty or variability ○ Possibly important uncertainty or variability ● Probably no important uncertainty or	Initial outcomes were decided and prioritised by the EIT Task Force. Outcomes were applied as determined by the 2025 systematic review.[4]	Critical patient outcomes are survival with favourable neurological outcome. COSCA has confirmed the importance of these outcomes.(53)

variability ○ No important uncertainty or variability		

Balance of effects

Does the balance between desirable and undesirable effects favor the intervention or the comparison?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Favors the comparison ○ Probably favors the comparison ○ Does not favor either the intervention or the comparison ● Probably favors the intervention ○ Favors the intervention ○ Varies ○ Don't know	Balance of effect favours BLS training in these groups. Higher value is placed on: • the improvements in BLS skills when compared to baseline data or no training groups • the potential benefits of patients receiving early CPR by a family-member or caregiver in the case of OHCA • the willingness of this group to be trained and to use skills if required. • the potential multiplier effect of trainees training others.	BLS training in high-risk groups is already adopted.

Resources required

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ● Varies ○ Don't know	Varies. There are a number of resources required to set-up CPR training and refresh BLS skills (e.g. personnel, equipment). These costs are potentially reduced with self-instruction (e.g. CPR-kits self-training).	In one study recommendation by a healthcare professional to attend CPR training was an important contributing factor in prompting persons to participate. Encouragement, rational and providing direction or resources to refresh skills during initial training may support BLS skill and knowledge refreshment.

Certainty of evidence of required resources

What is the certainty of the evidence of resource requirements (costs)?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS

○ Very low ● Low ○ Moderate ○ High ○ No included studies	No evidence identified.	Self-training kits are now reasonably priced.

Cost effectiveness

Does the cost-effectiveness of the intervention favor the intervention or the comparison?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Favors the comparison ○ Probably favors the comparison ○ Does not favor either the intervention or the comparison ● Probably favors the intervention ○ Favors the intervention ○ Varies ○ No included studies	No evidence was found that examined the cost-effectiveness of this intervention in this group.	

Equity

What would be the impact on health equity?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Reduced ○ Probably reduced ○ Probably no impact ○ Probably increased ○ Increased ● Varies ○ Don't know	Varies. Could be incorporated into existing programs and sites (e.g. cardiac rehabilitation, hospital discharge education, hospital out-patients) to reduce inequality. There are known BLS training inequities –training high-risk groups may help to reduce these inequities.	

Acceptability

Is the intervention acceptable to key interest-holders?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ No ○ Probably no ● Probably yes ○ Yes ○ Varies	High proportions of eligible participants took up training. Patients, family members and staff generally have positive feedback about the training.	

○ Don't know		

Feasibility

Is the intervention feasible to implement?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ No ○ Probably no ○ Probably yes ○ Yes ● Varies ○ Don't know	Varies. Likely to require a local champion until integrated into practice.	Referral to BLS training alone is unlikely to increase training in these groups. One study has demonstrated that cardiac rehabilitation is an effective and feasible environment to provide CPR training. Using video self-instruction CPR training kits enabled further training reach to the target population.[33]

SUMMARY OF JUDGEMENTS

	JUDGEMENT						
PROBLEM	No	Probably no	Probably yes	**Yes**		Varies	Don't know
DESIRABLE EFFECTS	Trivial	Small	**Moderate**	Large		Varies	Don't know
UNDESIRABLE EFFECTS	Large	Moderate	Small	Trivial		**Varies**	Don't know
CERTAINTY OF EVIDENCE	Very low	Low	**Moderate**	High			No included studies
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	**Probably no important uncertainty or variability**	No important uncertainty or variability			
BALANCE OF EFFECTS	Favors the comparison	Probably favors the comparison	Does not favor either the intervention or the comparison	**Probably favors the intervention**	Favors the intervention	Varies	Don't know
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	**Varies**	Don't know
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	Very low	**Low**	Moderate	High			No included studies
COST EFFECTIVENESS	Favors the comparison	Probably favors the comparison	Does not favor	**Probably favors the intervention**	Favors the intervention	Varies	No included studies

			either the intervention or the comparison				
EQUITY	Reduced	Probably reduced	Probably no impact	Probably increased	Increased	**Varies**	Don't know
ACCEPTABILITY	No	Probably no	**Probably yes**	Yes		Varies	Don't know
FEASIBILITY	No	Probably no	Probably yes	Yes		**Varies**	Don't know

TYPE OF RECOMMENDATION

Strong recommendation against the intervention	Conditional recommendation against the intervention	Conditional recommendation for either the intervention or the comparison	Conditional recommendation for the intervention	**Strong recommendation for the intervention**
○	○	○	○	●

CONCLUSIONS

Recommendation

- We recommend BLS training for likely rescuers of adults and children at high-risk of out-of-hospital cardiac arrest (strong recommendation, low-to-moderate certainty of evidence).
- We recommend health care professionals encourage and direct likely rescuers of adults and children at high-risk of cardiac arrest to attend BLS training (ungraded, good practice statement).

Justification

In making this recommendation, the EIT Task Force placed higher value on:
• the improvements or competency in BLS skills and confidence when compared to baseline data or guideline standards;
• the improvements in confidence to perform BLS;
• the multiplier effect of trained individuals training others.
• the high proportion of OHCA that occur in the home and the potential benefits of patients receiving BLS by a family-member or caregiver in the case of OHCA;
• the willingness of this group to be trained and to use skills if required;
• BLS training doesn't increase anxiety in trainees; and
• that these groups are unlikely to undertake training on their own.
Given these facts we considered it important to recommend that health care professionals encourage and direct these groups to attend BLS training even though they may not take up training.

Subgroup considerations

The majority of the research is in cardiac patients or high-risk infants.

Implementation considerations

It is important that opportunity to practice BLS skills is provided with training.

Monitoring and evaluation

Research priorities

Research should focus on reporting objective measurements when reporting skill performance and standardised assessment tools when reporting knowledge to allow inter-study comparisons.
Gaps include:

- New methods, such as cardiac arrest registries, are needed to study the long-term impact of on patient outcomes.
- Best methods for training and retraining to achieve high attendance and long term skill retention.
- Whether health care providers suggesting the need for BLS training influences likely rescuers to seek training.
- Strategies to enhance secondary training where those trained educate others.

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