

Electronic supplement

Table S1: Descriptions of study intervention- standard training intervention- page 2

Table S2: Descriptions of study intervention- pit-crew training intervention- page 3

Table S3: Average differences between video reviewers- page 4

Figure S1: Bland-Altman plots- page 5

Table S1: Descriptions of study intervention- standard training intervention

Item	Description
BRIEF NAME	Standard training for the deployment of a mechanical chest compression device
WHY	<p>Current evidence shows that deployment of mechanical chest compression devices in clinical practice may be associated with prolonged pauses in chest compressions. Such pauses can be harmful and reduce the likelihood of a successful outcome.</p> <p>In this training package, we will train clinicians to effectively deploy a mechanical chest compression device, using the training approach that is commonly used in NHS practice.</p>
WHAT	<p>Materials: Materials required include a mechanical chest compression device (LUCAS-2), powerpoint presentation, presentation projection facilities, manikin, hospital bed, defibrillator, ECG simulation pad, and airway equipment.</p> <p>Procedures:</p> <ol style="list-style-type: none"> 1) Delivery of powerpoint presentation, which includes overview of how to deploy device (duration ~15-minutes) 2) Practical demonstration of process of deploying device (including which buttons should be pressed at relevant points) (duration ~5-minutes) 3) Opportunity for participants to practice deployment using simulation with feedback/ debriefing after each simulation (duration ~30-minutes) 4) Provide opportunity to ask questions and summarise key learning points (duration ~5-minutes)
WHO PROVIDED	The lead session instructor will be a Resuscitation Council (UK) Advanced Life Support with additional training in deployment of the LUCAS-2 mechanical chest compression device.
HOW	Training will be delivered face-to-face to three clinicians in each session.
WHERE	The training intervention will be delivered at a local hospital in a suitable training room (uninterrupted, adequate space) where required equipment is available.
WHEN and HOW MUCH	The training session will be delivered on one occasion. The duration is expected to be less than one hour.
TAILORING	<p>This description of the intervention was developed following an initial run-through- no significant changes were required.</p> <p>The amount of practice required by each group will be determined on a group-by-group basis. This will be decided through discussion between the instructor and participants.</p>
MODIFICATIONS	We do not anticipate making further modifications to the training package. If changes are deemed necessary, these will be recorded in any research output.
HOW WELL	The instructor at each session will record the duration of the session and any deviations from the training plan.

Table S2: Descriptions of study intervention- pit-crew training intervention

Item	Description
BRIEF NAME	Pit-crew training for the deployment of a mechanical chest compression device
WHY	Current evidence shows that deployment of mechanical chest compression devices in clinical practice may be associated with prolonged pauses in chest compressions. Such pauses can be harmful and reduce the likelihood of a successful outcome. In this training package, we will train clinicians using pit-crew principles to effectively deploy a mechanical chest compression device.
WHAT	Materials: Materials required include a mechanical chest compression device (LUCAS-2), powerpoint presentation, presentation projection facilities, manikin, hospital bed, defibrillator, ECG simulation pad, airway equipment, and pit-crew handout. The pit-crew handout will detail the process for pit-crew deployment of the device and the group will be encouraged to use it throughout the training session. Procedures: 1) Delivery of powerpoint presentation, which includes overview of how to deploy device and pit-crew concepts (duration ~15-minutes) 2) Practical demonstration of process of deploying device (including which buttons should be pressed at relevant points) (duration ~5-minutes) 3) Opportunity for participants to practice deployment using pit-crew principles in a simulation setting with feedback/ debriefing after each simulation (duration ~30-minutes) 4) Provide opportunity to ask questions and summarise key learning points (duration ~5-minutes) A key focus of the training is the requirement for team members to adopt a nominated role that is associated with specific tasks, with team members trained to perform tasks in a co-ordinated manner. These concepts are highlighted in feedback during practice scenarios.
WHO PROVIDED	The lead session instructor will be a Resuscitation Council (UK) Advanced Life Support with additional training in deployment of the LUCAS-2 mechanical chest compression device.
HOW	Training will be delivered face-to-face to three clinicians in each session.
WHERE	The training intervention will be delivered at a local hospital in a suitable training room (uninterrupted, adequate space) where required equipment is available.
WHEN and HOW MUCH	The training session will be delivered on one occasion. The duration is expected to be less than one hour.
TAILORING	This description of the intervention was developed following an initial run-through- no significant changes were required. The amount of practice required by each group will be determined on a group-by-group basis. This will be decided through discussion between the instructor and participants.
MODIFICATIONS	We do not anticipate making further modifications to the training package. If changes are deemed necessary, these will be recorded in any research output.
HOW WELL	The instructor at each session will record the duration of the session and any deviations from the training plan.

Table S3: Average differences between video reviewers

	Average difference (95% CI) between reviewers (unless stated)
Device deployment	
Flow-fraction in minute preceding first mechanical CC	0.008 (-0.008 to 0.024)
Time to deploy back-plate (secs)	0.050 (-0.175 to 0.400)†
Time to deploy upper part of device (secs)	0.000 (-0.100 to 0.300)†
Total pause for mech device deployment (secs)	-0.050 (-0.675 to 0.250)†
Time from device arrival to first mechanical CC (secs)	0.020 (-0.309 to 0.349)
Compliance with manufacturer's guidelines (out of eight)	0 (0 to 0)†
CPR quality	
Flow-fraction	
Whole episode	0.001 (-0.002 to 0.004)
Pre-device deployment	-0.000 (-0.010 to 0.009)
Post-device deployment	-0.000 (-0.002 to 0.001)
Number of pauses > 5 seconds	0 (0 to 0)†
Number of shocks delivered	0 (0 to 0)†
Shocks delivered appropriately	0 (0 to 0)†
Peri-shock pause (seconds)	
Pre-shock pause	0 (0 to 0)†
Post-shock pause	0 (0 to 0)†
Non-technical skills- TEAM tool	
TEAM tool- component score (out of 44)	-2.200 (-6.478 to 2.078)
TEAM tool- global (overall) score (out of ten)	-0.055 (-1.528 to 0.428)
†- Reported as median difference (IQR)	

Figure S1: Bland-Altman plots

In each plot, the full line represents the mean difference between the two video reviewers and the dotted lines represent the upper and lower 95% confidence interval. Bland-Altman plots are not shown for number of shocks delivered, number of appropriate shocks delivered, pre-shock pause, and post-shock pause as there was perfect agreement for these outcomes. A plot is also not shown for manufacturer compliance, where there was perfect agreement for 19 groups and a difference of one in the other group.







