

Clinical Summary

Effect of real-time feedback during cardiopulmonary resuscitation outside hospital: prospective, cluster randomized trial

Hostler D, Everson-Stewart S, Rea TD, et al. *BMJ* 2011;342:d512.

Purpose:

To test whether automated real time CPR feedback compared to standard CPR alone would increase return of spontaneous circulation (ROSC) during out-of-hospital cardiac arrest (OHCA).

Methods:

This was a cluster randomized trial taking place in 3 sites in the US (King County, WA and Westmoreland County, PA) and one Canadian site (Thunder Bay, Ontario) within the Resuscitation Outcomes Consortium (ROC). Philips® MRx defibrillators were used with real time audio and visual CPR feedback. Baseline data without feedback was initially collected in 229 cases, then cluster groups of various sizes were randomly assigned to feedback on or feedback off groups. Assignment of the groups to feedback on and feedback off groups changed every two to seven months depending on the expected number of cardiac arrests in each cluster. Data was collected on 1586 people experiencing OHCA in whom resuscitation was attempted by EMS (815 with feedback on and 771 with feedback off).

Results:

	Feedback ON* (N=815)	Feedback OFF (N=771)
Frequency of prehospital ROSC	44%	45%
ROSC at hospital arrival	32%	32%
Survival to hospital discharge	11%	12%
CPR fraction	66%	64%
Compression depth	40mm (1.58 inches)	38mm (1.50 inches)
Incomplete release	10%	15%

*Feedback was muted by EMS in 14% of cases during the feedback on period.

Conclusions:

Real time feedback altered CPR performance slightly so it more closely conformed to the guidelines, but it was not associated with ROSC or any other improvements in clinical outcomes.

Physio-Control Discussion Points:

This randomized, controlled study was conducted under rigorous scientific standards with a very large group of OHCA patients. Some minimal improvement in CPR occurred, but there was no significant difference in clinically meaningful outcomes, either in ROSC or survival to hospital discharge. Accelerometer-based real time feedback devices such as those used in this study are intriguing but have important limitations. These include inaccurate readings in a moving vehicle and on compliant surfaces such as mattresses and stretchers.^{1,2,3}

More significant improvement in CPR quality has been achieved by downloading and reviewing post event CPR data and giving prompt feedback to the responders, rather than from real time feedback.⁴ All currently marketed LIFEPAK® defibrillators are capable of automatically

gathering CPR data through conventional therapy electrodes. Data can then be downloaded and viewed with CODE-STAT™ software with Advanced CPR Analytics. Reports can be generated and feedback from the reports can be shared with responders. Baseline CPR statistics can be gathered in a cost-effective way using existing equipment before implementing changes in equipment, protocols or training.

Metronomes have also been shown to be highly effective in guiding rescuers to the correct compression rate.^{5,6,7} The CPR Metronome in the LIFEPAK 15 monitor/defibrillator is a proven technology⁸ that actively guides users to a consistent compression and ventilation rates without the need for external hardware.

REFERENCES

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