

Does Real-Time Audiovisual Feedback for Public Access Defibrillation Enhance Device Usability and Outcomes? A Simulated Pilot Study on a Disposable Home-Use Defibrillator

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Introduction: A public access defibrillator (PAD) must be simple to operate, because in many cases the operator is a first-time user with minimal or no training. Effective treatment should be delivered to the patient in a manner which emphasises safe use of the device and minimises the risk of injury to patient and rescuer. We assessed the hypothesis that the addition of audio-visual feedback delivered to PAD users ensures they correctly place the electrodes, quickly and safely deliver a defibrillation shock, and effectively administer CPR.

Methods: Informed consent was received from 24 participants (58% male) who took part in this prospective randomised study. The participants were split into two groups – BLS trained and untrained, and randomly assigned a training defibrillator (HeartSine PDU 400 or Philips FRx). The participants were videoed so that CPR and resuscitation quality parameters could be retrospectively analysed. Between the trained and untrained group we measured differences in time to first shock, adequacy of pad placement and time to place pads as main outcome parameters, and, compression depth and rate, correct hand positions and adherence to hands-off prompts as secondary outcome parameters.

Results: All 24 participants delivered a rescue shock. The minimally trained group had the fastest time to first shock (94 ± 23 sec versus 139 ± 53 sec, $p=0.017$) and the fastest time to place pads (69 ± 19 sec versus 115 ± 52 sec, $p=0.012$). There was no statistical difference between the two groups in terms of electrode placement, CPR quality, and adherence to hands-off prompts or the device used.

Conclusions: It can be concluded that audio-visual feedback systems in PADs allow minimally trained and untrained users administer effective defibrillation therapy and CPR to SCA victims. The main difference seen between the two groups is the time to first shock, which may represent the untrained users' hesitancy to initiate the resuscitation by turning on the PAD.

Author Disclosures: **R. Di Maio:** Employment; Significant; HeartSine Technologies Ltd. **D.**

Brody: Employment; Significant; HeartSine Technologies Ltd. **J. McAnlis:** Employment;

Significant; HeartSine Technologies Ltd. **L. Crawford:** Employment; Significant; HeartSine

Technologies Ltd. **P. McCanny:** Employment; Significant; HeartSine Technologies Ltd. **A.**

McIntyre: Employment; Significant; HeartSine Technologies Ltd. **A.**

Howe: Consultant/Advisory Board; Modest; HeartSine Technologies Ltd..

Key Words: Cardiopulmonary resuscitation • Emergency care • Arrhythmias, treatment of • Cardiac arrest • Resuscitation