

Basic Life Support

AS013

The FirstAED global positioning system organizes a first responder team with distinct roles and ensures the possibility for early cardiopulmonary resuscitation and defibrillation



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Purpose: FirstAED is an auxiliary to the public emergency services and enables the dispatcher to send an organized team of first responders to the scene. FirstAED organizes three first responders in a team: no. 1 reaches the patient to give cardiopulmonary resuscitation (CPR); no. 2 brings the Automated External Defibrillator (AED); and no. 3 is the on-site coordinator. The aim is to shorten the first responder response time at emergency calls and the time to the AED on-site to below 5–6 min.

Methods: CPR and first aid is provided by 175 trained lay first responders who use their smartphones. The population purchased 95 AEDs which are available around the clock and placed less than two kilometres apart. FirstAED global positioning system (GPS)-track the nearby first responders who can accept or reject the alarm. FirstAED chooses the three most optimally placed first responders who accepted the alarm.

Results: During the first 24 months the FirstAED GPS system was used 718 times. FirstAED entailed a guarantee for first responder CPR and a significant reduction in median response time to 4 min 9 s. The comparable median ambulance response time was 13 min and 20 s. The AED was on-site in more than 99% of the cases and with a median on-site time of 5 min and 47 s. Three first responders arrived in 89.1%, two first responders in 7.1%, one first responder in 3.0% of the cases. The first responders arrived before the ambulance in 94.3% and at the same time in 2.4% of the cases. The first responders were involved in cardiac arrests, serious respiratory arrests, and a patient with subarachnoid hemorrhage.

Conclusions: GPS-tracking and a team structure with distinct roles reduces the response times and ensures the possibility for early CPR and defibrillation.

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AS014

Self-adhesive electrodes do not cause burning, arcing or reduced shock efficacy when placed on metal items



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Objective: The 2010 AHA guidelines have noted that sparking from poorly applied defibrillator paddles can cause fire. The purpose of this study was to evaluate the impact on defibrillation safety and effectiveness of placing disposable adhesive pads over an underwired bra. The potential for arcing, burning or conduction by an applied shock was assessed in an attempt to establish if injury

could be caused to the patient or if first shock defibrillation efficacy is reduced.

Methods: A porcine model was fitted with a suitably sized underwired bra, with a section of the underwire intentionally exposed. The adhesive AED pad was placed in direct contact with the bra's metal wire, to maximize the potential of arcing or other adverse events. VF was induced and defibrillation was administered using an AED, 15 s after induction of VF. Pre and post resuscitation recordings of arterial blood pressure and pulse duration were noted. The animal and bra were both assessed for evidence of arcing, burning or other skin damage.

Findings: A total of 126 shocks were administered using 4 pigs, at an energy of 200 J with a recovery period of 3 min between shocks. No arcing was observed and with no redirection of current from the patient for any of the shocks. In addition, there was 100% 1st shock success with no instances of refrillation. Furthermore, no incidences of scorching or burning of the bra or animal or other skin damage to the animal was observed.

Conclusions: This study demonstrates that poor placement of adhesive pads does not pose a risk to either operators or patients of arcing, burning or decreasing shock efficacy when applied suboptimally. In the rare case where burning may occur the risk-benefit ratio strongly favors the delivery of timely therapy over significantly delayed or potentially no therapy.

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AS015

Locations of sudden cardiac arrest over a 3 year period and associated outcomes



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Objective: The purpose of implantable defibrillation is to ensure high risk patients are given the greatest chance of successful resuscitation. The earlier the onset of sudden cardiac arrest, the greater the chance of a patient presenting with a shockable rhythm. Applying this theory to public access defibrillation, reminds us of the importance of the "early access" link in the "chain of survival". Therefore if public access defibrillation times can be reduced to minutes, chances of successful resuscitation are significantly improved. The objective of this sub-analysis of 791 patients was to assess the impact of response time on presenting rhythm and outcome, and to determine if response time is location dependent.

Methods: Worldwide patient data collection was initiated in October 2012 in accordance with the Declaration of Helsinki. Patient records were anonymised prior to data entry and analysis and were subject to audit. Age, gender, location of arrest, 1st shock success and patient outcome were collected. Response time, pre-shock CPR duration, and each patient's medical history was captured if available.

Findings: A sub-analysis was performed on 124 patients who suffered sudden cardiac arrests in public locations worldwide, including the US, UK, Amsterdam, Singapore, and Australia. Patient ages ranged from 10 to 91 years with 84.3% male and 15.7% female. A total of 69 (57.0%) patients were in a shockable rhythm. Of these, 53 patients achieved a first shock success (80.3%). The median