

Early Defibrillation in the Hospital

Is It Time for AEDs on Crash Carts?

It has become increasingly clear that even in hospitals, early defibrillation can be a challenge. Recent reports from Chan et al demonstrate that not only does time to first shock have a significant impact on in-patient survival for those who experience VF arrest, but also that the time to first shock varies considerably and does not correlate to hospital size or location. Furthermore, time to first shock is a valuable measure, but how long is it taking before a patient is actually found in arrest and the Code activated? The LifeVest® wearable defibrillator has a time to first shock of approximately 30 seconds with a 98%+ first shock success rate (Figure 1). Are we missing a window of opportunity in hospitals (Figure 2)?

As a result, hospitals continue to look for ways to improve the overall Code response time – and that usually means empowering and encouraging the first responders to act to assess the situation and deliver a shock if indicated. Unfortunately, the complexity of the crash cart defibrillator and the limited opportunity to practice resuscitation for the average floor nurse contributes to a reluctance to act in fear of doing something wrong and hurting the patient or themselves.

Some have suggested that the answer is to place AEDs on the crash carts in the lower-acuity units – using the same public access units that are found in airports and casinos. However, there are problems with this solution. Public access defibrillators are designed for infrequent use, offer minimal options, and do not have AC power. In addition, when the Code team arrives with an ACLS defibrillator, there may be a need to change out cables, electrodes, and such. In addition, the analysis time of many AEDs leaves patients without CPR support for periods that can significantly impact shock conversion success as demonstrated by Edelson et al. The trade-offs may be too great to make this a viable solution (Figure 3).

Figure 1

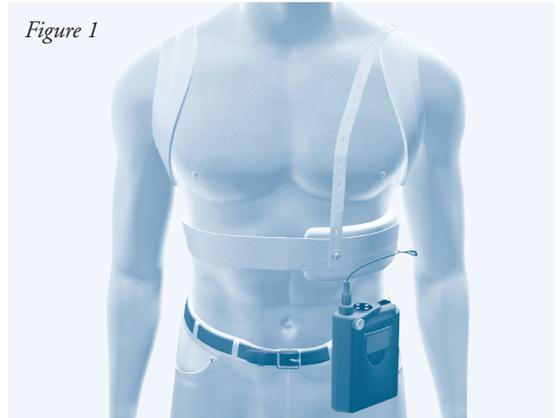
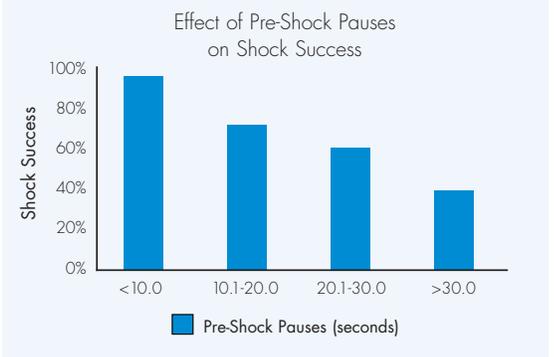


Figure 2



Chan, P.S. et al, Delayed Time to Defibrillation after In-Hospital Cardiac Arrest. *N Eng J Med* 2008;358:9-17.

Figure 3



Edelson, D.P. et al, *Resuscitation* 2006;71:37-145.

If that is the case, is there some other more viable solution that can encourage first responders to act while eliminating the drawbacks of using a layperson defibrillator?

ZOLL Medical recently introduced the R Series® Plus to the hospital environment (Figure 4). This unit has a single button AED interface, just like a public access AED. When turned on, the device prompts the first responder to place the defibrillator pads on the patient, then it either prompts him/her to stand clear during analysis or start CPR. The pads are pre-attached to the unit and are automatically tested daily along with more than 40 other aspects, such as circuitry. During CPR, the defibrillator measures both depth and rate of CPR compressions and will prompt users to press harder if the depth is insufficient, while a metronome activates if the user is not compressing at the correct rate.

Upon arrival of the Code team, one press of a soft key turns the AED into a backlit full-service ACLS defibrillator, complete with pacing and advanced monitoring parameters such as non-invasive blood pressure, SpO₂, and EtCO₂ – without interrupting resuscitation in progress and with no need to change pads, cables or add additional CPR feedback tools (Figure 5). A unit that encourages first responders to act, coaches proper CPR, tests itself daily, and turns into a full ACLS unit – that may just be the best of all worlds.

Figure 4

R Series Plus with one-button AED Interface



Figure 5

R Series Plus in full ALS mode



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