

Top Ten Things You Should Know About Implementing An Early Defibrillation Program

1 Time to first shock really matters

A recent study by Chan, published in 2008 in NEJM, showed that delayed defibrillation reduced survival to discharge by nearly 50% (22% vs. 39% when defibrillation was not delayed).¹ Another study by Valenzuela shows that for every minute that therapy is delayed, the chance of survival decreases by 10% to 15%.² It's clear—the faster you can defibrillate a shockable rhythm, the better the odds are for the patient.

2 You have two minutes—not three

Chan also showed that the critical juncture was two minutes to first shock, not three as originally believed. Therefore in order to meet this standard, there should be AEDs and manual defibrillators placed within a 1 minute rapid walk from one another in the hospital.

3 It's not just about the shock

Peberdy, reporting on data from the NRCPR, showed that 75% of the time, no shock was indicated.³ Whether this is due to delays in defibrillation, the shortening of the period of VF/VT or the etiology of the arrest really doesn't matter. When no shock is indicated, perfusion becomes the number one factor influencing a good outcome and that means good CPR. Defibrillators that can provide feedback about the rate and depth of CPR can help caregivers deliver the best quality CPR and increase the potential for a good outcome.

4 BLS responders that infrequently attend a code can be intimidated by manual defibrillators

Even when there is a clearly labeled AED button on a manual defibrillator, studies show that BLS trained staff are reluctant to deliver a shock and often wait for the code team to arrive. One way around this issue is to set up a two-tiered defibrillation program, distribute and have simple AEDs around the hospital for first responders and have the code team bring the manual defibrillator for ALS intervention.

5 Pre-shock pauses reduce the likelihood of successful cardioversion

Edelson showed that when the time between the cessation of CPR compressions and the delivery of a shock exceeded 10 seconds, the likelihood of the successful conversion declined—at 30 seconds, the likelihood of successful conversion declined from 90% to 30%.⁴ Look for defibrillators with rapid charge and analysis times.

6 Pre-connected electrodes and cables speed time to therapy

A code is no time to try to figure out how to connect cables and defibrillation pads to the defibrillator. Use pre-connected electrodes and cables and time to first shock will improve considerably.

7 Make sure your defibrillators are Code-Ready®

Defibrillators that perform a regular code-readiness test ensure that you won't get to a code and discover that the batteries aren't charged, the electrodes are expired or cables are missing—resulting in delays. Your defibrillator should provide visual indication that it is ready, including that electrodes are attached and not expired.

8 A uniform operating system prevents user errors

Too often there are multiple models and manufacturers of defibrillators in a hospital and this leads to problems. Users can't figure out how to use the device because it's different from the one on which they trained. The cables and electrodes are not compatible from one unit to the next—sometimes from the same manufacturer. The solution is to make sure your defibrillators have a uniform operating system and universal electrodes so a user trained on one model can step up to the next one with confidence.

9 You can't improve what you can't measure

Let's face it, if you don't have accurate time to first shock or some measure of CPR quality, you won't know how far you have to go or can go to improve. Typically hand-written code records reflect time stamps from various timepieces—the wall clock, a watch, the defibrillator clock. Look for the ability to document codes electronically and synchronize the records with the defibrillator clock. When you have this data, you can easily see where to put your efforts to improve staff response and patient outcomes.

10 Practice makes perfect

Practicing mock codes on a monthly basis, including performing CPR on a manikin with the assistance of CPR feedback, can dramatically improve response time as well as CPR proficiency. It also allows BLS responders to become more comfortable with the defibrillator before the ALS responders arrive.

According to the NRCPR, the rate of the first defibrillation shock being delivered to adults by an AED has increased in their database from 1% in 2000 to 12.6% in 2006.

Extending training with AEDs to all appropriate non-physician staff will allow lay responders to become comfortable not only with CPR but also with using the AEDs located throughout the hospital. The more staff that is comfortable with the AEDs, the faster the response rate.

1. Chan, P.S. et al. 2008. Delayed Time to Defibrillation after In-Hospital Cardiac Arrest. *NEJM*. 358(1): 9-17.
2. Valenzuela TD, Roe DJ, Cretin S, et al. Estimating effectiveness of cardiac arrest interventions: a logistic regression survival model. *Circulation*. Nov 18 1997;96(10):3308-13.
3. Peberdy, M.A. et al. 2003. Cardiopulmonary resuscitation of adults in the hospital: A report of 14,720 cardiac arrests from the National Registry of Cardiopulmonary Resuscitation. *Resuscitation* 58: 297-308.
4. Edelson, D.P. et al. 2006. Effects of compression depth and pre-shock pauses predict defibrillation failure during cardiac arrest. *Resuscitation*. 71: 137—145.