

# Improving Shock Success

Each year, more than 300,000 people die from Sudden Cardiac Arrest (SCA). More people die from SCA than breast cancer, lung cancer and AIDS combined.<sup>1</sup> Unfortunately, those who experience a witnessed SCA have a very low chance of survival—the national average is about 5%. Early defibrillation can play a critical role in survival. Shock success during this stage can be influenced by a number of important factors, including improving time to first shock, reducing CPR pauses, and the availability of higher levels of energy.

## Improving Time to First Shock

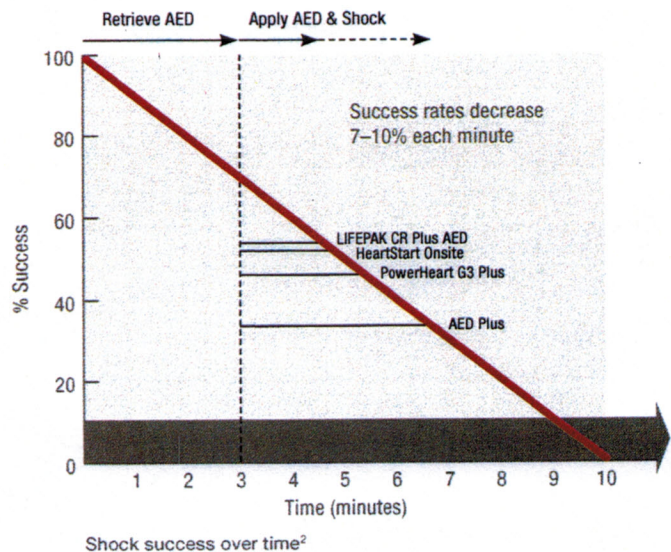
Although not everyone can be saved from sudden cardiac arrest, studies show that early defibrillation can dramatically improve survival rates. Early defibrillation combined with CPR can improve survival rates to as high as 74% when defibrillation is provided within three minutes of collapse.<sup>2</sup> For every minute that elapses between sudden cardiac arrest and defibrillation, the chance of survival decreases 7 to 10%.<sup>3</sup>

Many factors influence time to first shock, including determining an AED is needed, retrieving the AED, turning the AED on, applying the pads, and then delivering a shock. Determining an AED is needed and retrieving an AED can vary based on the event and location. However, the time between device retrieval and first shock is largely influenced by the AED used.

Usability studies have shown that AEDs differ dramatically in their ease of use and subsequent time to first shock. In a study of untrained bystanders, Dr. Andre et al. found the LIFEPAK CR® Plus AED had the shortest average time to shock of four leading AEDs studied.<sup>4</sup> Time to shock was defined as the time rescuers entered the room until the time a shock was delivered. Other AEDs had considerably longer average time to shock intervals.

	Time to Shock (sec)
<b>Physio-Control®</b> LIFEPAK CR Plus AED	93
<b>Philips®</b> Heartstart Onsite	99
<b>Cardiac Science™</b> PowerHeart G3 Plus	132
<b>ZOLL®</b> AED Plus	210

The goal of public access defibrillation (PAD) programs is to reduce time between onset of SCA and shock delivery. A general rule of thumb for PAD programs is to place AEDs within three minutes of locations where cardiac arrests are likely to occur. Assuming it takes three minutes to retrieve an AED, we can predict the following time to first shock using the data from the Andre study.



## Reducing CPR Pauses

Minimizing pre-shock pauses in CPR improves the chances of shock success and patient survival.<sup>5</sup> There are a number of AED design features that can influence pre-shock CPR pauses, including:

- Reducing the time required for analysis and charging.
- Eliminating the need to push the shock button. The LIFEPAK CR Plus AED is one of the few fully automatic AEDs available. A fully automatic AED will give a shock automatically, if needed, without the rescuer having to push a button to deliver that shock. This type of AED is designed to help responders who may hesitate in cardiac arrest emergencies.
- Enabling a pre-shock CPR interval. The LIFEPAK® 1000 Defibrillator is the only AED available that offers unique cprMAX™ technology, allowing you to provide compressions until the moment of shock.

## Availability of Higher Energy Levels

Clinical data suggests that higher energy levels are associated with higher shock success rates.<sup>6</sup> 360 joule (J) biphasic defibrillators have successfully resuscitated patients that were not resuscitated by



other defibrillators with energy limited to 200J. The FDA is investigating 14 reports of events in which a 200J biphasic defibrillator was ineffective and a subsequent shock from a different 360J biphasic defibrillator resulted in immediate defibrillation/cardioversion. All Physio-Control defibrillators deliver a full range of energy up to 360J – the most energy available in the industry today.

## The End Result

The LIFEPAK CR Plus AED compares favorably against the competition on a number of key features associated with improved shock success and higher survival, including time to first shock, reduced CPR pauses, and availability of a higher level of energy. Investing in an AED program is a commitment to protect the lives of those in your community. Why not invest in the best?

## REFERENCES

1. Sudden Cardiac Arrest Association. Sudden Cardiac Arrest Facts. May 2011. [http://associationdatabase.com/aws/SCAA/asset\\_manager/get\\_file/6068/sudden\\_cardiac\\_arrest\\_fact\\_sheet.pdf](http://associationdatabase.com/aws/SCAA/asset_manager/get_file/6068/sudden_cardiac_arrest_fact_sheet.pdf)
2. Valenzuela T.D. et al. Outcomes of rapid defibrillation by security officers after cardiac arrest in casinos. *New England Journal of Medicine* 2000; 343:1206-1209.
3. Cummins R.O. 1989. From concept to standard-of-care? Review of the clinical experience with automated external defibrillators. *Annals of Emergency Medicine*; 18:1269-75.
4. Andre, et al. "Automated External Defibrillator Use By Untrained Bystanders: Can the Public Model Work?" *Prehospital Emergency Care* 2004; 8:284-291.
5. 2010 American Heart Association Guidelines for CPR and ECC, Volume 122, Issue 18\_suppl\_3; November 2, 2010; S641.
6. Stiell IG, et al. The BIPHASIC Trial: A randomized comparison of fixed lower versus escalating higher energy levels for defibrillation in out-of-hospital cardiac arrest. *Circulation* 2007; 115:1511-1517.

**AED users should be trained in CPR and use of the AED. LIFEPAK AEDs require a prescription. Please consult your physician. All information including comparative statements are valid as of May 2011.**

**For further information, please contact Physio-Control at 800.442.1142 (U.S.), 888.879.0977 (Canada) or visit our website at [www.physio-control.com](http://www.physio-control.com).**

**PHYSIO  
CONTROL**

### Physio-Control Headquarters

11811 Willows Road NE  
Redmond, WA 98052  
[www.physio-control.com](http://www.physio-control.com)

### Customer Support

P. O. Box 97006  
Redmond, WA 98073  
Toll Free 800 442 1142  
Fax 800 426 8049

### Physio-Control Canada

Medtronic of Canada Ltd  
99 Hereford Street  
Brampton, ON  
L6Y 0R3  
Tel 888 879 0977  
Fax 866 430 6115



Physio-Control, Inc., 11811 Willows Road NE, Redmond, WA 98052 USA