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. 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. For every minute that elapses between sudden cardiac arrest and defibrillation, the chance of survival decreases 7 to 10%.

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. 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.

<table>
<thead>
<tr>
<th>AED Model</th>
<th>Time to Shock (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physio-Control® LIFEPAK CR Plus AED</td>
<td>93</td>
</tr>
<tr>
<td>Philips® Heartstart Onsite</td>
<td>99</td>
</tr>
<tr>
<td>Cardiac Science™ PowerHeart G3 Plus</td>
<td>132</td>
</tr>
<tr>
<td>ZOLL® AED Plus</td>
<td>210</td>
</tr>
</tbody>
</table>

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. 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. 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

5. 2010 American Heart Association Guidelines for CPR and ECC, Volume 122, Issue 18_suppl_3; November 2, 2010; S641.