To Escalate or Not To Escalate- That Is the Question

The Science: What REALLY matters in defibrillating a victim of Sudden Cardiac Arrest?

The most critical element in determining whether a defibrillation shock is effective in stopping Sudden Cardiac Arrest is the amount of current that flows through the heart. Not the total energy, not the voltage, but the number of electrons per second that pass through the heart itself.

The amount of current that is delivered to the heart by a defibrillation shock is most greatly impacted by the *impedance* of the individual victim's body at the time of the shock taking place. Factors such as the size and weight of the individual, body fat content, internal bleeding, and overall body chemistry and density can all have dramatic impacts on the amount of impedance of a particular victim.

If the impedance is very high, there is more resistance to the current being applied by the shock and, as a result, less current actually travels through the heart- reducing the odds of a successful defibrillation.

The Past: Why did they escalate energy in the first place?

Escalating energy protocols came about because older defibrillators were only capable of delivering energy in a specific waveform. In order to do the least amount of damage, responders were advised to "try out" a shock at a low energy setting and adjust the energy upward if the initial attempt was unsuccessful.

This protocol is based on the assumption that the first shock didn't deliver enough electrical current to the heart and, therefore, increased energy was required to provide adequate current.

This was necessary, because the older equipment was not capable of measuring the impedance of the victim and modifying the energy delivered to account for a given victim's higher or lower resistance to electricity.

The Present: Why don't we need to escalate energy today?

Today, we have the technology to measure the impedance of a victim of Sudden Cardiac Arrest and modify the shape and duration of the energy waveform delivered to ensure that the appropriate amount of current is applied to the heart.

In this way, the AED is capable of providing an effective amount of current without the need to apply more energy than is necessary to achieve the desired result.

The benefit of this advanced technology is that less damage is caused to the heart because less total energy is delivered to the heart muscle itself. Any amount of electrical energy applied to the heart will cause damage, but minimizing that damage is one of the key goals of the low-energy defibrillation model.

The Reality: Does it make a difference to the victim?

Both the escalating and non-escalating energy protocols have been shown to be equally effective in terminating ventricular fibrillation. Neither has been proven to increase the chances of survival for a victim of sudden cardiac arrest.

However, there is evidence to suggest that higher-energy defibrillation results in lasting damage to the heart that is less pronounced with lower energy shocks.

The Bottom Line:

The 150-Joule, truncated exponential, impedance-compensated, bi-phasic energy defibrillation waveform employed by the Lifeline AED has the greatest amount of in-field data on its use and effectiveness. It has been proven to be effective in the pre-hospital treatment of Sudden Cardiac Arrest to a much greater extent than any other energy protocol on the market.

There is no data to support any argument that escalating energy "saves more lives" but there IS data to support the fact that additional damage will be done to the heart at higher energy levels.

In short, the Lifeline waveform is, clinically, equally effective at treating Sudden Cardiac Arrest and has a greater chance of minimizing lasting damage to the heart after the save.

Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.

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