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Dear Customer,

Thank you for your question about our recommended external defibrillation energy protocol. Physio-Control believes defibrillation energy dosage is ultimately a medical decision. Biphasic LIFEPAK defibrillator/ monitors are configured to a factory default energy protocol of 200J - 300J - 360J for treatment of ventricular fibrillation (VF) in adult patients. This default protocol can be reconfigured by the user based upon medical preference.

The 2005 American Heart Association (AHA) Guidelines for CPR and Emergency Cardiovascular Care recommend a biphasic first shock dosage of 150J to 200J, and also recommend "for second and subsequent shocks, use the same or higher energy (Class IIa)."¹ The default 200J - 300J - 360J energy protocol employed by Physio-Control biphasic defibrillators is consistent with this recommendation. This energy protocol has been widely and effectively used, and is well supported by clinical evidence. Physio-Control believes this energy protocol can help minimize unnecessary CPR interruptions that result from ineffective defibrillation shocks, and this protocol thus remains appropriate in light of the CPR-optimizing resuscitation protocol changes in the 2005 AHA Guidelines.

Biphasic shocks are widely perceived to provide consistently high VF termination rates, even when lower energies are employed. While some studies have published defibrillation rates above 90%, several recent clinical manuscripts, reflecting experience with hundreds of cardiac arrest patients, report much lower (<70%) VF termination rates when lower biphasic energies are used for first (100J - 150J) and subsequent (150J - 200J) shocks^{2,3,4}. These reports indicate that use of lower energy biphasic shock regimens can leave significant room for improvement in defibrillation performance. A new randomized controlled trial in out-of-hospital cardiac arrest patients treated with biphasic shocks found that, in patients requiring more than one AED shock, a 200J - 300J - 360J energy regimen provided significantly higher rates of VF termination and conversion to an organized rhythm than an energy regimen fixed at 150J for all shocks⁵.

Based on this current body of clinical evidence, and in keeping with the AHA Guidelines 2005 recommendations, Physio-Control defibrillators will continue to provide a default biphasic energy protocol of 200J - 300J - 360J for treatment of adult VF. Physio-Control believes, while energy dosage is ultimately a medical decision, this default energy protocol is well supported by clinical science and constitutes an appropriate, effective strategy for the treatment of VF cardiac arrest.

Sincerely,

Paula Lank

Vice President, Clinical Research and Clinical Affairs

References

¹Guidelines 2005 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation* 2005; 112(24): IV-37.

²Stohtert JC, et al. Rectilinear biphasic waveform defibrillation of out-of-hospital cardiac arrest. *Prehospital Emergency Care* 2004;8(4): 388-92.

³Walsh S, et al. Efficacy of distinct energy delivery protocols comparing two biphasic defibrillators for cardiac arrest. *American Journal of Cardiology* 2004; 94: 378-380.

⁴Kramer-Johansen, et al. Pauses in chest compression and inappropriate shocks: A comparison of manual and semi-automatic defibrillation attempts. *Resuscitation*. 2007 Jan 20.

⁵Stiell 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 (12):1511-1517.