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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 based upon medical preference.

The 2010 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 energy levels, should be at least equivalent and higher energy levels may be considered.”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 a large body of published, peer-reviewed clinical evidence. We believe this energy protocol can help minimize the delay in shockable rhythm termination and unnecessary CPR interruptions that result from ineffective defibrillation shocks. Additionally, the evidence reviewed and published in the 2010 Guidelines state “human studies have not demonstrated evidence of harm from any biphasic waveform defibrillation energy up to 360J, with harm defined as elevated biomarker levels, ECG findings, and reduced ejection fraction.”¹

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 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 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 the most current body of clinical evidence, and in keeping with the AHA Guidelines 2010 recommendations, Physio-Control defibrillators will continue to provide a default biphasic energy protocol of 200J–300J–360J for treatment of adult VF. We believe, 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,

PHYSIO-CONTROL, INC.

Paula Lank
Vice President, Regulatory and Clinical Affairs

References

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⁴Kramer-Johansen, et al. Pauses in chest compression and inappropriate shocks: A comparison of manual and semi-automatic defibrillation attempts. *Resuscitation*. 2007;73:212-220.

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;115:1511-1517.