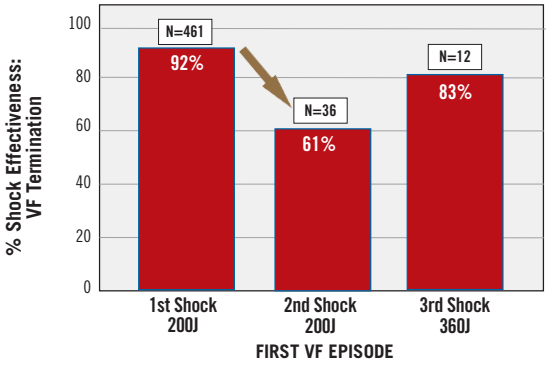
When One Defibrillating Shock Isn't Enough: New Clinical Evidence for Increasing the Dosage

PHYSIO CONTROL

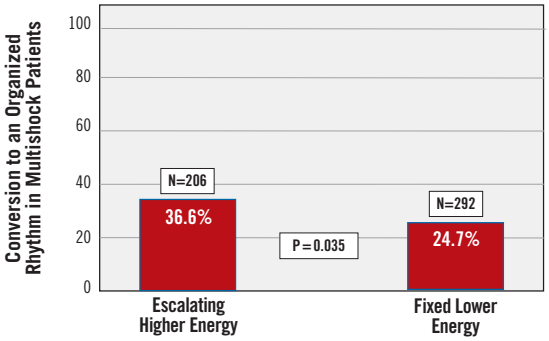
ESCALATING DOSAGE: A STRATEGY TO MAXIMIZE DEFIBRILLATION EFFECTIVENESS

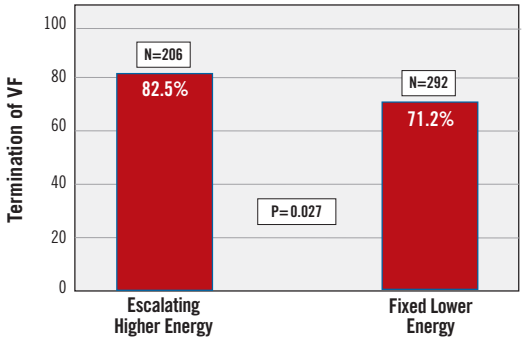
New clinical evidence from two out-of-hospital ventricular fibrillation (VF) studies[1,2] confirms the effectiveness of current AHA recommendations for first shock dosage (200J manual; 150-200J AED). But for patients who need additional shocks, these studies show that repeating the same first shock dosage is inferior to a strategy of increasing to a higher dosage.



- **High rate of 1st shock success with LIFEPAK® Defibrillator/Monitor at AHA-recommended initial manual dosage (200J; 92%)[1]**
- **Diminishing return from repeating the dosage after a first shock failed (92% first shock vs. 61% second shock success, P=0.001)**
- **121/467 (27%) known survivors at 30 days: 51% of them received 360J**

- **Triple blinded, randomized controlled clinical trial in 221 patients comparing two biphasic dosage protocols: fixed 150J vs. escalating 200J-300J-360J.[2]**
- **Among patients requiring more than one shock, the escalating higher energy regimen provided a significantly higher rate of conversion to an organized rhythm (36.6% vs. 24.7%, P=0.035) and VF termination (82.5% vs. 71.2%, P=0.027) compared to a fixed low energy regimen.**





The new clinical evidence from these two studies shows a benefit from escalating dosage. Escalating protocol is consistent with the AHA Guidelines 2005 recommendation for subsequent dosage:

> "…the rescuer may use a selected [biphasic] dose of 200J for the first shock and an equal *or higher dose* for the second and subsequent shocks." *AHA Guidelines 2005: IV-40; emphasis added.*

BROAD DOSAGE CAPABILITY: AN IMPORTANT CONSIDERATION FOR PATIENT CARE

Clinical studies have shown a majority of cardiac arrest victims with an initial rhythm of VF will experience repeated episodes of VF over the course of a resuscitation attempt.[3-7] For any given VF episode the initial shock may fail; in fact defibrillation becomes more difficult with each recurrent episode.[1] For these patients in both hospital and out-of-hospital settings, increasing the dosage of subsequent shocks above the dose used for the first shock has proven to be a better strategy for terminating VF than simply repeating a failed dosage.[1,2,8] LIFEPAK defibrillator/monitors provide broad dosage capability, up to 360J. For more information, please contact your Physio-Control representative at 800.442.1142 or visit www.physio-control.com.

1 Chapman FW, Walker RG, Koster RW. Use of 360 Joule Biphasic Shocks for Initial and Recurrent Ventricular Fibrillation in Prehospital Cardiac Arrest. *Resuscitation* 2006;69(1):49-50.

2 Stiell IG, et al. The BIPHASIC Trial: A randomized comparison of fixed lower vuersus escalating higher energy levels for defibrillation in out-of-hospital cardiac arrest. *Circulation* 2007 115: 1511-1517, Vol. 115, Issue 12: March 27, 2007.

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

4 Gliner BE, et al. Treatment of out-of-hospital cardiac arrest with a low-energy impedance-compensating biphasic waveform automatic external defibrillator. *Biomedical Instrumentation and Technology* 1998;32:631-44.

5 van Alem AP, Post J, Koster RW. VF recurrence: characteristics and patient outcome in out-of-hospital cardiac arrest. *Resuscitation* 2003;59:181-88.

6 White RD, Russell JK. Refibrillation, resuscitation and survival in out-of-hospital sudden cardiac arrest victims treated with biphasic automated external defibrillators. *Resuscitation* 2002;55:17-23.

7 Weaver WD, et al. Ventricular defibrillation -- a comparative trial using 175-J and 320-J shocks. *N Engl J Med* 1982;307:1101-6.

8 Walsh SJ, et al. Efficacy of distinct energy delivery protocols comparing two biphasic defibrillators for cardiac arrest. *Am J Cardiol* 2004;94:378-80.