

Biphasic versus Monophasic Defibrillators

Implications of American Heart Association Guidelines 2005¹

BIPHASIC IS SUPERIOR TO MONOPHASIC

The 2005 American Heart Association (AHA) Guidelines state that lower energy biphasic shock "...has equivalent or higher efficacy for termination of VF than monophasic waveform shocks..."¹ Because of discrepancies in efficacy between biphasic and monophasic defibrillation waveforms, the AHA also now recommends starting with a first shock energy of 360 joules (J) with monophasic defibrillation.

These determinations on the part of AHA, as well as the growing weight of clinical evidence on which they are based, provide substantial reason to convert to biphasic defibrillator/monitors throughout the hospital.

NEW IMPETUS FOR CONVERTING TO BIPHASIC

Because the AHA now recommends a 360J first shock with monophasic defibrillators, monophasic dosing protocols are now inconsistent with biphasic therapy dosing protocols. Furthermore, biphasic external defibrillation is associated with a superior rate of return of an organized cardiac rhythm following shock administration.² For reasons of Guidelines compliance and patient care, it is therefore now more advisable than ever to convert to all-biphasic technology.

Exclusive use of biphasic defibrillator/monitors throughout the hospital is the best way to maintain a single, standardized defibrillation protocol that also complies with AHA Guidelines. This strategy provides continuity of care across all hospital settings, using the technology recognized in the Guidelines as most effective (biphasic shock). An added consideration in favor of standardization with Medtronic ADAPTIV™ biphasic energy is: at equally high energy doses our biphasic shock provides demonstrably greater efficacy than monophasic, while exposing the heart to about 40% less peak current.³

CONSIDERATIONS IN SELECTING A MANUFACTURER



BLS Mode, Door Closed



ALS Mode, Door Open

A leading nonprofit health services research agency recommends that hospitals standardize on a single manufacturer's biphasic product line.⁴ It recommends choosing a manufacturer based on ease of use, and on whether there is a consistent user interface between different devices in the product line. Medtronic LIFEPAK® defibrillator/monitors offer several distinct advantages.

- The LIFEPAK 20 crash-cart defibrillator is uniquely versatile and easy to use for both ALS and BLS responders. Standardizing crash-carts with the 20 enables:
 - Availability of early, effective defibrillation to all areas of the hospital;
 - Easy redeployment elsewhere as needs change, for efficient use of capital.
- Like your monophasic devices, all LIFEPAK defibrillators with ADAPTIV biphasic technology deliver energies up to 360J, so your staff can use dosing protocols consistent with the pre-Guidelines monophasic protocols they are familiar with.
- Because operator keypads are identical in all major respects, ALS responders can comfortably use either the LIFEPAK 12 or LIFEPAK 20 defibrillators.
- Clinical specialists are available for onsite, classroom style training—so standardized training is implemented quickly throughout the entire facility.

Ask your Medtronic representative for independently published evidence that full energy LIFEPAK defibrillators with ADAPTIV biphasic technology can succeed where low energy biphasic fails.^{5,6,7}

Medtronic Emergency Response Systems
Redmond WA 98052 USA

For more information, please call 1.800.442.1142
or visit www.medtronic-ers.com

LIFEPAK is a registered trademark and ADAPTIV is a trademark of Medtronic Emergency Response Systems, Inc. Medtronic is a registered trademark of Medtronic, Inc. ©2006 Medtronic Emergency Response Systems, Inc. MIN 3206581-000 / CAT. 26500-002234

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

2 van Alem AP, et al. 2003. A prospective, randomized and blinded comparison of first shock success of monophasic and biphasic waveforms in out-of-hospital cardiac arrest. *Resuscitation* 2003; 58: 17-24.

3 Niemann JT, et al. 2005. Intracardiac Voltage Gradients during Transthoracic Defibrillation: Implications for Postshock Myocardial Injury. *Academy Emergency Medicine*. February 2005, Vol 12, No. 2 HEALTH DEVICES, ECRI. May 2005; 34 (5): 161-67.

4 Kim ML, et al. 2004. Comparison of rectilinear biphasic waveform energy versus truncated exponential biphasic waveform energy for transthoracic cardioversion of atrial fibrillation. *American Journal of Cardiology* 2004; 94: 1438-1440

5 Al Atawi F, et al. 2003. Comparison of Biphasic Waveforms for the Transthoracic Conversion of Atrial Defibrillation: The Mayo Clinic Cardioversion Experience. *Circulation* 2003; 108 IV-647.

7 Neal et al. 2003. Comparison of the efficacy and safety of two biphasic defibrillator waveforms for the conversion of atrial fibrillation to sinus rhythm. *American Journal of Cardiology* 92: 810-14