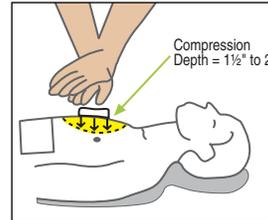


## Automated External Defibrillator with Real CPR Help *Technical Application Note*

### Measuring Chest Compression with Real CPR Help™

Failure to adequately compress a victim's chest is a common error during CPR.<sup>1,2,3</sup> The force required to properly compress a victim's chest 1½ -2 inches varies depending on the patient's build and anatomy. Until now, only force and pressure sensors have been available.

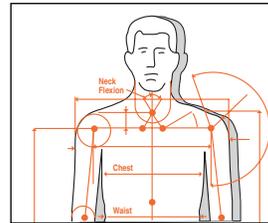
Real CPR Help technology in ZOLL's CPR-D•padz™ includes a hand-placement locator, an accelerometer, electronics, and a sophisticated processing algorithm. This technology accurately measures chest compression and converts the motion of the accelerometer over time into distance moved. Only Real CPR Help can help an infrequent rescuer correct and improve compressions in real-time as CPR is performed during the rescue.



Real CPR Help provides unique assistance to rescuers with valuable feedback on CPR compression depth and rate.

### One Electrode Size Fits All

A one-piece electrode design must account for anatomical variation in the patient population. The design of ZOLL's CPR-D•padz is based on extensive human anthropometric data and studies designed to accommodate the wide range of patient sizes and shapes and to ensure that a one-piece electrode meets the needs of emergency AED use. The design developed for the CPR-D•padz meets the anthropometric characteristics of 99% of human chest anatomy. A special feature lets the rescuer separate the apex (lower) electrode to cover the other 1% of the population whose anatomical variations require special adaptation.



ZOLL's one-piece CPR-D•padz are designed to fit 99% of the population's chest anatomy.

### Simplified Electrode Placement

Simplifying electrode placement is critical to widespread use of AEDs. Labeling helps but is often overlooked or discarded in an emergency that is sudden and unanticipated. The infrequent rescuer is easily confused when looking at a victim as to "left," "right," "up," and "down." Two separate electrodes cause concern over incorrect placement and technical complications if electrodes stick together before being placed correctly on the patient.

The unique one-piece design of ZOLL's CPR-D•padz addresses these problems by orienting the simple design to the head while using the easily remembered CPR landmark (the sternum) as the key placement cue. Packaging is then removed by a simple pull after positioning. Because this is the same placement taught for CPR hand position, AED users benefit from having to remember only one easy landmark for both interventions.



CPR-D•padz offer clear anatomical placement illustrations and a CPR hand-positioning landmark.

# ZOLL

# AED+PLUS®

## Automated External Defibrillator with Real CPR Help *Technical Application Note*

### Four-Year Shelf Life Sacrificial Element Technology

Infrequently used AEDs need electrodes that do not require frequent replacement. Most AED electrodes will expire before they are used. Corrosion of the electrode element due to long-term contact with ionic gel is the main limitation of electrode shelf life.

ZOLL's CPR-D•padz protect the electrode elements with a novel design that sacrifices a non-critical element in the electrode to control the corrosion process and allow an unmatched four-year AED electrode life. ZOLL's CPR-D•padz reduce electrode replacement costs, facilitate AED readiness and maintenance, and decrease the probability of an AED's failure due to electrode expiration.



*CPR-D•padz come complete with rescue essentials including a barrier mask, a razor, scissors, disposable gloves, and a towelette.*

### Specifications

#### DEFIBRILLATOR

Waveform: Rectilinear Biphasic • Defibrillator Charge Hold Time: 30 seconds • Energy Selection: Automatic pre-programmed selection (120J, 150J, 200J) • Patient Safety: All patient connections are electrically isolated. • Charge Time: Less than 10 seconds with new batteries. • Electrodes: ZOLL CPR-D padz or stat padz® II. • Built-in Defibrillator Self Test: Included • CPR: Metronome Rate: Variable 60 to 100 CPM • Depth: 1/2" to 3"; 1.3 to 7.8 cm. • Defibrillation Advisory: Evaluates electrode connection and patient ECG to determine if defibrillation is required. Shockable Rhythms: Ventricular fibrillation with average amplitude >100 microvolts and wide complex ventricular tachycardia with rates greater than 150 BPM for adults, 200 BPM for pediatrics. For ECG Analysis Algorithm sensitivity and specificity, refer to AED Plus Administrator's Guide. • Patient Impedance Measurement Range: 0 to 300 ohms • Defibrillator: Protected ECG Circuitry • Display Format: Optional LCD with Moving Bar • Size: 2.6" x 1.3"; 6.6 cm x 3.3 cm • Viewing Time: 2.6 seconds • Display Sweep Speed: 25 mm/sec; 1"/sec • Battery Capacity: Typical new (20°C) = 5 years (300 shocks) or 13 hours continuous monitoring. End of life designated by Red X (typical remaining shocks = 100, 5 hours continuous monitoring). • PC Minimum Requirements for configuration and patient data recovery: Windows® 98, Windows® 2000, Windows® NT, Windows® XP, IBM-compatible PII with 16550 UART (or higher) computer. 64MB RAM. VGA monitor or better. CD-ROM drive. IrDA port. 2MB disk space.

#### DEVICE

Size: (H x W x D) 5.25"x 9.50" x 11.50"; 13.3 cm x 24.1 cm x 29.2 cm • Weight: 6.7 lbs.; 3.1 kg • Power: User Replaceable Batteries. 10 -Type 123A Photo Flash lithium manganese dioxide batteries. • Device Classification: Class II and internally powered per EN60601-1 • Design Standards: Meets applicable requirements of UL 2601, AAMI DF-39, IEC 601-2-4, EN60601-1, IEC60601-1-2.

#### ENVIRONMENT

Operating Temperature: 32° to 122°F; 0° to 50°C • Storage Temperature: -22° to 140°F; -30° to 60°C • Humidity: 10 to 95% relative humidity, non-condensing • Vibration: MIL Std. 810F, Min. Helicopter Test • Shock: IEC 68-2-27; 100G • Altitude: 300 to 15,000 ft.; -91m to 4573m • Particle and Water Ingress: IP-55.

#### CPR-D•padz

Shelf Life: 4 years • Conductive Gel: Polymer Hydrogel • Conductive Element: Tin • Packaging: Multilayer foil laminate pouch • Impedance Class: Low • Cable Length: 36 in (91 cm) • Sternum: Length: 6.1 in (15.5 cm); Width: 5.0 in (12.7 cm); Length, conductive gel: 3.5 in (8.9 cm); Width, conductive gel: 3.5 in (8.9 cm); Area, conductive gel: 12.3 sq in (79.0 sq cm) • Apex: Length: 6.1 in (15.5 cm); Width: 5.6 in (14.1 cm); Length, conductive gel: 3.5 in (8.9 cm); Width, conductive gel: 3.5 in (8.9 cm); Area, conductive gel: 12.3 sq in (79.0 sq cm) • Complete assembly: Folded Length: 7.6 in (19.4 cm); Folded width: 7.0 in (17.8 cm); Folded height: 1.5 in (3.8 cm) • Design standards: Meets applicable requirements of ANSI/AAMI/ISO DF-39-1993.

<sup>1</sup>Moser DK, Dracup K, Guzy PM, Taylor SE, Breu C. Cardiopulmonary resuscitation skills retention in family members of cardiac patients. *American Journal of Emergency Medicine*. 1990;4:98-503.

<sup>2</sup>Kern KB, Hilwig RW, Berg RA, Ewy GA. Efficacy of chest compression-only BLS CPR in the presence of an occluded airway. *Resuscitation*. 1998;39:179-188.

<sup>3</sup>Handley AJ, Handley JA. The relationship between rate of chest compression and compression:relaxation ratio. *Resuscitation*. 1995;30:237-241.

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