

LIFEPAK[®] AED Response System

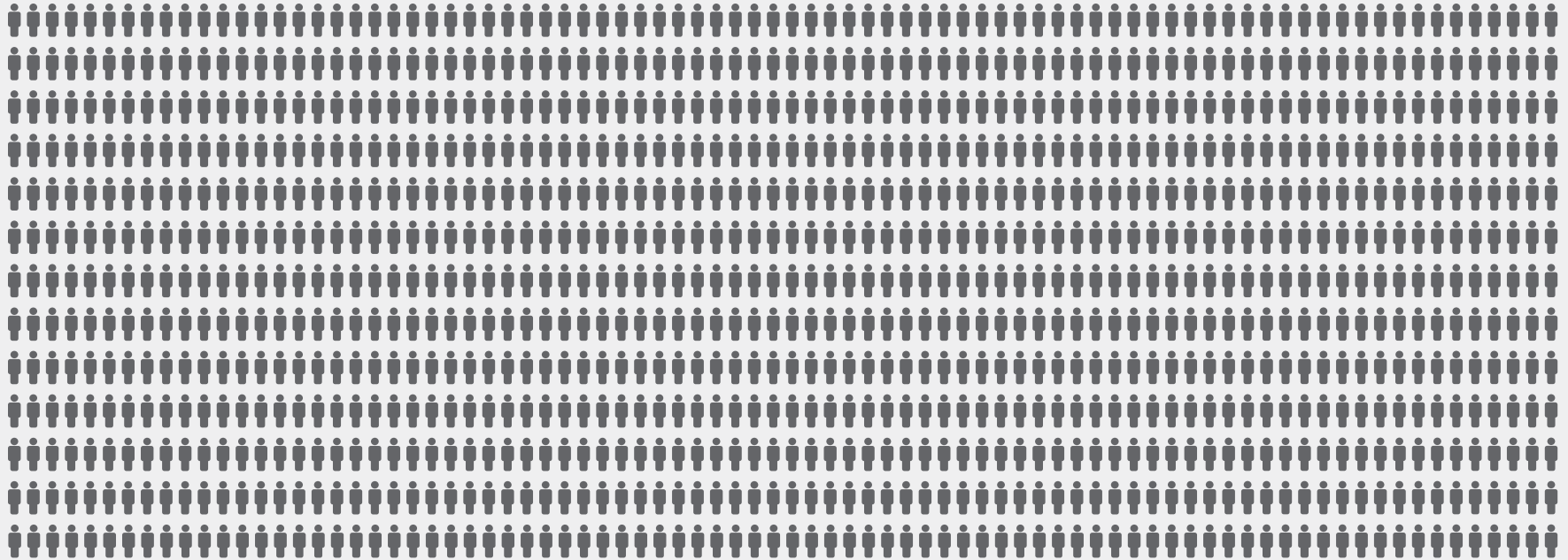


LIFEPAK[®] CR2 Defibrillator
with LIFELINKcentral[™] AED Program Manager



Cardiovascular Disease is an Epidemic

Globally ~20,000 people per day experience SCA



Change is Needed

~10% of SCA victims survive...



AED Programs are Critical

- Sudden cardiac arrest can happen to anyone, anywhere. A victim's chance of survival dramatically decreases for every minute without treatment.
- That's why public access automated external defibrillators (AEDs) are so important.
- To save lives, though, they must be easy to use, effective and always ready.

We envision a future where better technology enables better outcomes – and more lives saved.


The groundbreaking LIFEPAK CR2 Defibrillator with LIFELINKcentral AED Program Manager is at the heart of a complete AED response system.

Connected. Ready.

LIFEPAK® CR2 Defibrillator
with **LIFELINKcentral™** AED Program Manager

©2016 Physio-Control, Inc. Redmond, WA. USA

Connected. Ready.

- 
1. Self-monitors to ensure readiness
 2. Enables remote AED program management with the push of a button
 3. Sends patient data to emergency responders and hospitals

Regular Self-Tests to Monitor Readiness

Daily

- Electrode expiry
- Battery expiry
- Battery capacity

Weekly

- Daily test
- Memory

Monthly

- Daily and weekly tests
- ECG and impedance
- Charging and shock
- Speaker
- Wi-Fi®
- Cellular

Power-Up

- Self-test upon power-up

Integrated Wireless Technology



Automatic Notifications



- ✓ Supplies at or nearing expiry
- ✓ Failed self-test/device issue
- ✓ Software update available
- ✓ AED location out of range
- ✓ AED in use
- ✓ Device did not check in

Ready

The screenshot displays the LIFELINKcentral AED Program Manager interface. The top navigation bar includes the Physio-Control logo, the product name 'LIFELINKcentral™ AED PROGRAM MANAGER', the location 'London National Rail / Waterloo Station', and a user profile for 'Account, Sample'. A left sidebar contains navigation options: Alerts, My Customers (5), Account, Sites (3), Equipment (2), and Manage Equipment. A central dashboard widget shows 'AEDs Ready 2 of 2' with a green progress indicator. The main content area is titled 'Equipment' and features a search bar and a list of two AED units, both marked as 'READY'. Each unit entry includes details for the battery and electrodes.

Alerts	Count
My Customers	5
Account	
Sites	3
Equipment	2
Manage Equipment	>

AEDs Ready
2 of 2

Equipment	Status
LIFEPAK CR2 (88800014) Food Court Battery: CR2 Lithium Battery (7/1/2020) Electrodes: CR2 QUIK-STEP Electrodes, Adult/Infant/Child (7/1/2020)	READY
LIFEPAK CR2 (88800015) Platform 8A Battery: CR2 Lithium Battery (7/1/2020) Electrodes: CR2 QUIK-STEP Electrodes, Adult/Infant/Child (7/1/2020)	READY

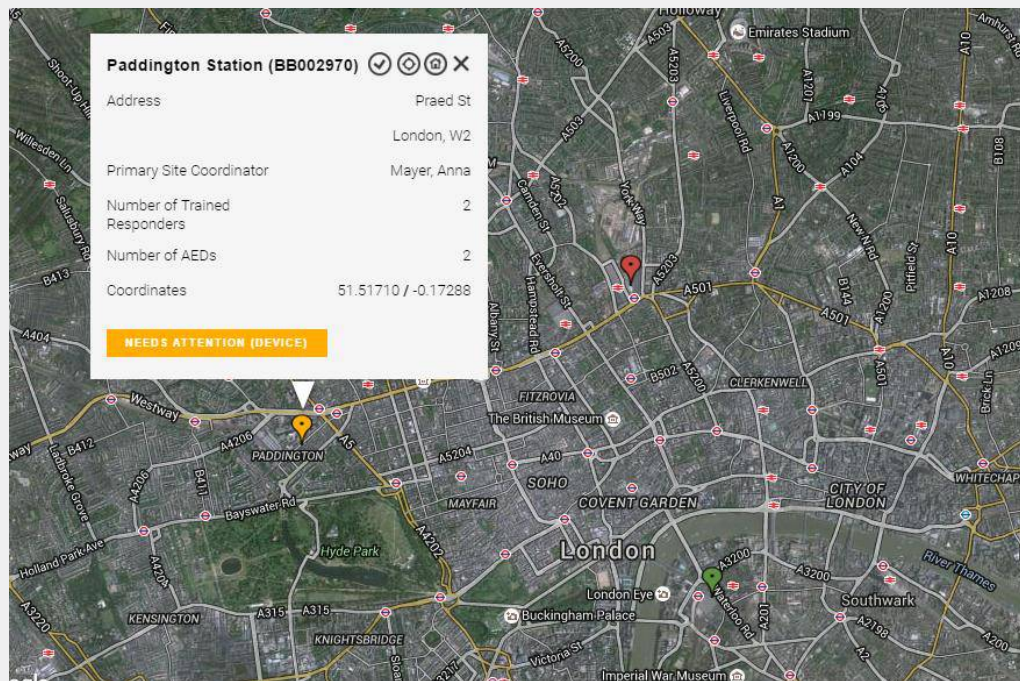
Needs Attention—Supply Expiry Dates

The screenshot displays the LIFELINKcentral AED Program Manager interface. The top navigation bar includes the Physio-Control logo, the text 'LIFELINKcentral™ AED PROGRAM MANAGER', the location 'London National Rail / Paddington Station', and a user profile 'WELCOME Account, Sample'. A left sidebar contains navigation options: Alerts, My Customers (5), Account, Sites (3), Equipment (2), and Manage Equipment (>). Below the sidebar is a donut chart showing 'AEDs Ready 1 of 2' with a legend for 'Ready' (1) and 'Needs Attention' (1). The main content area shows the 'Equipment' details for 'LIFEPAK CR2 (88800018)'. A yellow-bordered alert box states: 'NEEDS ATTENTION (BATTERY EXPIRING) This device is ready to use, however, the battery is nearing expiration. Contact [Account Support](#) to reorder a battery and replace as soon as possible. If your account has LIFELINKcentral Supply Replenishment go to Accessories to check or place an accessory order.' Below the alert is a table of device details.

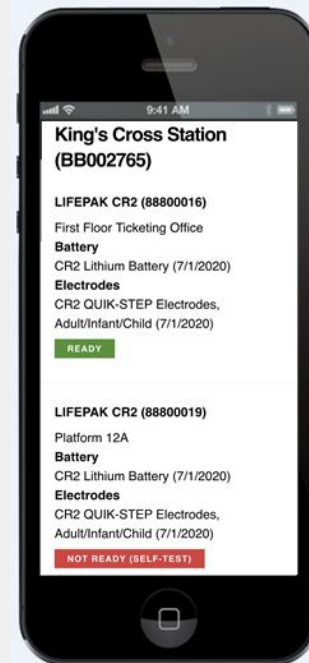
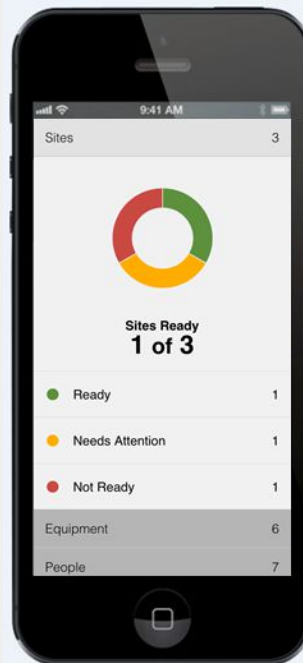
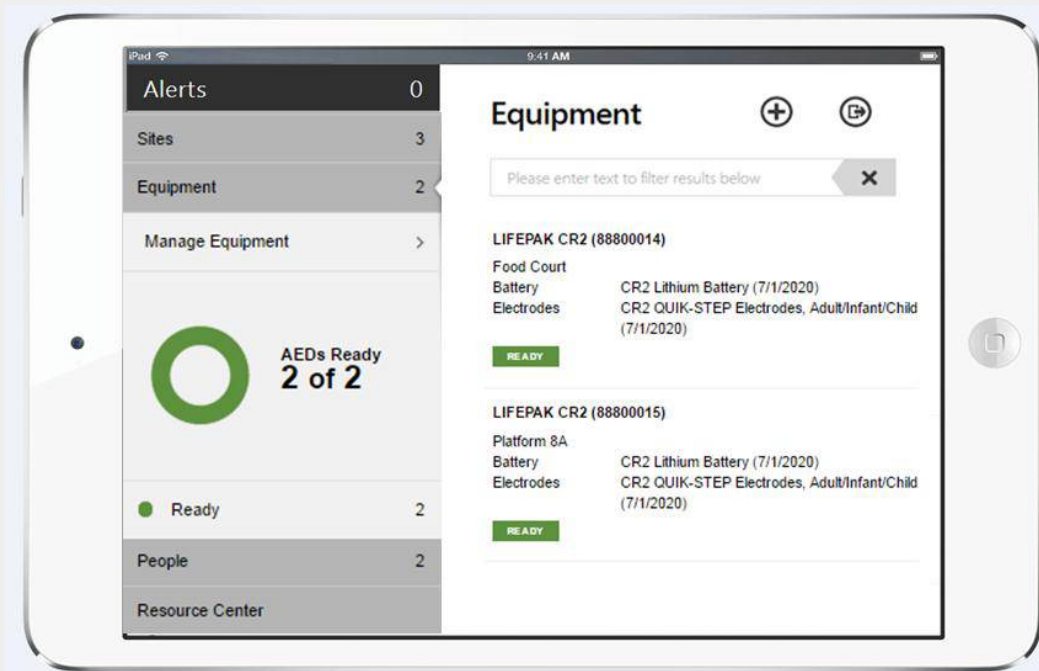
Location	Platform 4C (51.51710/-0.17288 as of 4/21/2016)
Readiness Reported Time	4/21/2016 11:28 AM via System
Battery	CR2 Lithium Battery expires on 6/21/2016
Electrodes	CR2 QUIK-STEP Electrodes, Adult/Infant/Child expires on 6/21/2016
Customer ID	Not Specified
Unique Device Identification (UDI)	UDix
Mobile Device	No
Manual Inspection Schedule	AED Inspection Schedule
Next Scheduled Inspection Date	5/1/2016
Device State	Active
Device Manufacturer	Physio-Control
Manufacture Date	4/20/2016
Date Added	4/21/2016

- 90/60/30 day supply expiry notification with reorder details
- Auto updates expiry date/status when replaced

LIFELINKcentral AED Program Manager Readiness Map



LIFELINKcentral AED Program Manager Flexibility



Connect Electrodes through Continuum of Care

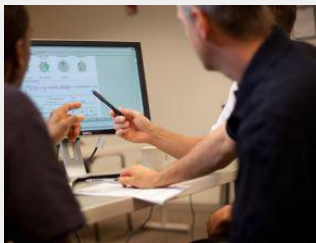


- ✓ Save time
- ✓ Easy transition to LIFEPAK 1000, LIFEPAK 12, LIFEPAK 15, and LIFEPAK 20e devices

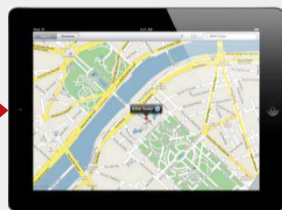
Connect Event Data through Continuum of Care



Emergent Data
Transmission via
Wi-Fi



EMS CODE-STAT™ (optional)
post-event review



LIFENET AED Event Viewer



Hospital LIFENET® Alert



Care Provider

The Benefits of a Connected AED are Clear

- 1. Better prepares you to save a life**
Daily self-tests and automatic readiness status notifications
- 2. Saves time and money**
Wireless monitoring helps your team locate and centrally track AEDs without visual checks
- 3. Introduces the link between lay responders and professional caregivers**
Professionals can capture key event data



More Continuous, High-quality CPR

More Continuous, High-quality CPR



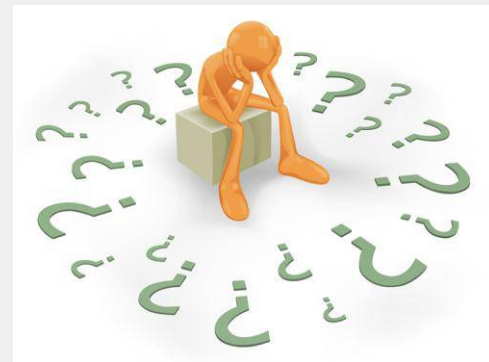
Perform High-quality CPR



Lay users often struggle with incorrect hand placement, rate and depth



Users often deliver CPR with lots of long pauses



Most solutions to support CPR are costly, confusing and can make an AED harder to use

Imagine a World in which a Simple AED

- Provides users with confidence to perform CPR correctly
- Increases hands-on time (compression fraction) which is directly tied to improved survival rates¹
- Reduces longest pauses in CPR, which have the biggest impact on outcomes¹
- Improves overall CPR performance with coaching
- Can be used on children with the push of a button

¹Christenson J, et al. Chest compression fraction determines survival in patients with out-of-hospital ventricular fibrillation. *Circulation*. 2009;120:1241-1247.

Compressions in the 2015 Guidelines

The longest pause in CPR has a strong influence on outcomes¹

- Survival rates from out-of-hospital cardiac arrest are linked to hands-on time¹
 - Our target should be $\geq 80\%$
- Number of chest compressions per minute can provide an indication of the CPR quality²

¹Brouwer T, Walker R, Chapman F, et al. Association between chest compression interruptions and clinical outcomes of ventricular fibrillation out-of-hospital cardiac arrest. *Circulation*. 2015;132:1030-1037.

²Idris, A. et al., "Relationship Between Chest Compression Rates and Outcomes from Cardiac Arrest," *Circulation*. 2012;125; 3004-3012.



Compressions in the 2015 ERC Guidelines

- The ratio of chest compressions to ventilations remains 30:2 (ERC Guidelines 2015)¹
- Defibrillation within 3–5 min of collapse can result in survival rates as high as 50–70%; Early defibrillation can be achieved using public access and on-site AEDs¹
- Peer-reviewed studies have shown that:
 - Audible rate guidance during chest compressions improves overall CPR performance²
 - Higher chest compression rates significantly correlated with initial return of spontaneous (blood) circulation³
 - Inadequate rate, even in the presence of sufficient depth and technique, likely reduces the effectiveness of compressions³

¹Monsieurs K, et al. European resuscitation council guidelines for resuscitation. *Resuscitation*. 95 (2015) p2.

²Kern K, et al. Metronome improves compression and ventilation rates during CPR on a manikin in a randomized trial. *Resuscitation*. 2010;81:206-210.

³Abella B, et. al. Chest Compression Rates During Cardiopulmonary Resuscitation are Suboptimal. *Circulation*. 2005;111:428-434.

Steps to Continuous, High Quality CPR

1. Get On the Chest Quickly

CPR Guidance helps users get on the chest with:

- Fastest time to start CPR¹
- Short post-shock pauses
- Quick metronome start

¹Physio-Control Internal Semi-Automatic AED Comparison Usability Study, August 2016.

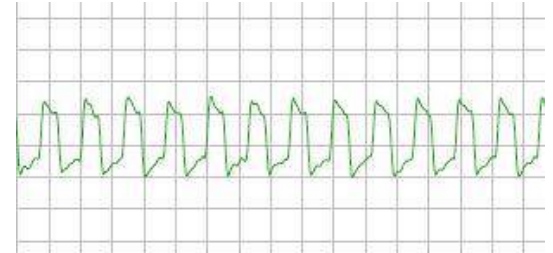


Steps to Continuous, High Quality CPR

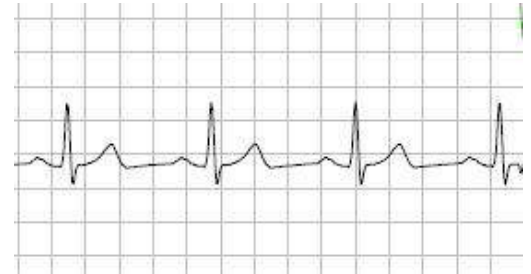
2. CPR Detection Technology

- CPR feedback: Device analyzes patient impedance, detects when CPR is not being performed and prompts the user to resume chest compressions
- Provides advanced hand placement prompts to encourage users to perform high quality CPR

Patient Impedance



Electrocardiogram



Steps to Continuous, High Quality CPR

3. cprINSIGHT™ Analysis Technology

- CR2 is the ONLY AED that can analyze the heart rhythm and make a shock/no shock decision during chest compressions
- Shock Advised: Reduces hands-off time to just during shock delivery
- No Shock Advised: Completely eliminates pause



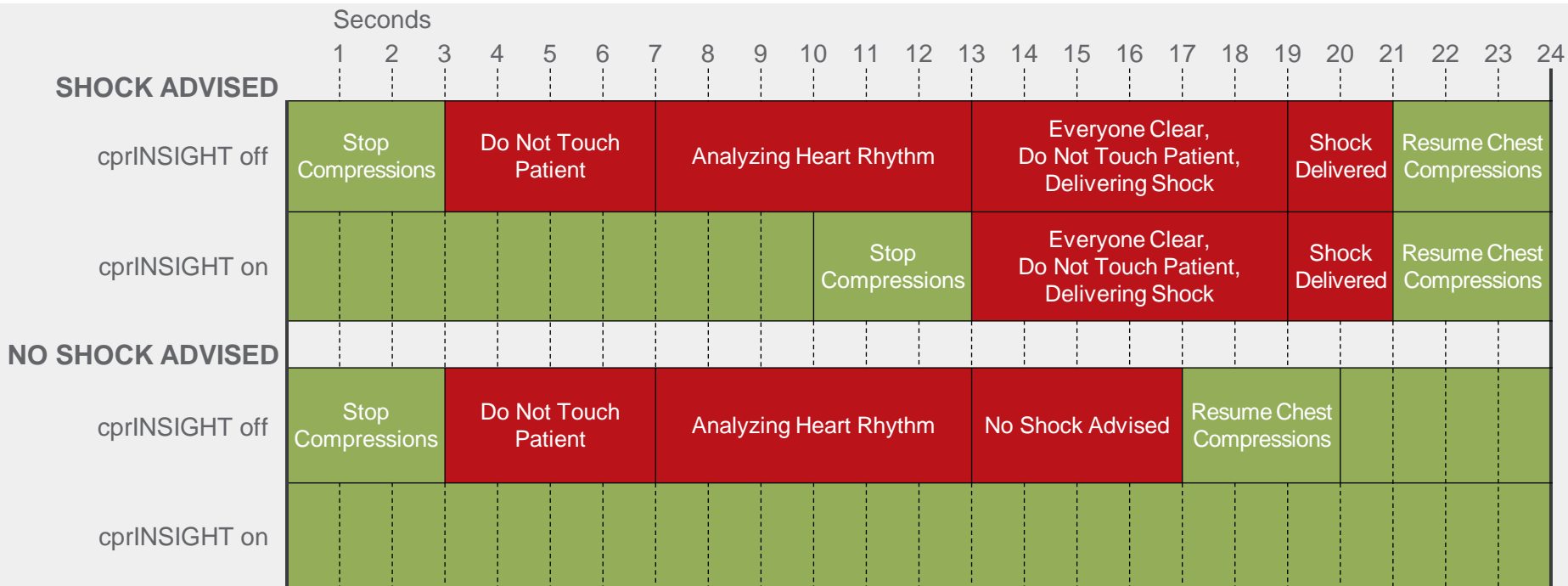
How Does cprINSIGHT Technology Work?

cprINSIGHT technology is a proprietary algorithm that allows the CR2 to make a “shock” or “no shock” decision during ongoing chest compressions

- The algorithm processes ECG and patient impedance data during compressions
- This data can then be interpreted by the AED to make a “shock” or “no shock” decision, without the need for users to press a shock button
- These decisions are extremely accurate—as has been validated by world-class physician experts



Increase Hands-on Time by at Least 10 Seconds*!



* Based on the fully automatic version

Dramatic Reduction of Pause Time

SHOCK ADVISED	PAUSE TIME
cprINSIGHT off	18 seconds
cprINSIGHT on	8 seconds

NO SHOCK ADVISED	PAUSE TIME
cprINSIGHT off	14 seconds
cprINSIGHT on	0 seconds

*Fully automatic

CR2 Provides the Most Hands-on Time

1. Fastest time to start CPR¹
2. Detection if CPR is not being performed
3. Perform CPR more continuously with fewest pauses¹

¹Physio-Control Internal Semi-Automatic AED Comparison Usability Study, August 2016.

Prompting Developed through Global Usability Testing



What is the Rate of Chest Compressions?

- Metronome set at 104 beats/minute
- Our testing shows LIFEPAK CR2 users were able to maintain a rate >100 beats/minute per AHA/ERC guidelines¹

¹Physio-Control Internal Semi-Automatic AED Comparison Usability Study, August 2016.



What is the Depth of Chest Compressions?

- Regular guidance for the users to push hard and to push at least 5cm
- Advanced CPR prompting guides users to a compression depth within the range recommended by the AHA and ERC

Hand-placement Coaching

- Prompting to tell users exactly where to place the hands on the chest
- Prompting has been shown to help users with correct hand placement and proper form during extensive usability testing¹

¹Physio-Control Internal Semi-Automatic AED Comparison Usability Study, August 2016.

CPR Feedback Does Not Need to be a Compromise Or Come with Additional Costs



Good Therapy

Ease of Use

Challenges with Accelerometers

- Complexity of placing accelerometer tool in addition to pads
 - Risk of placing accelerometer in the wrong location
 - Risk of delay in therapy
- Confusion around prompting from accelerometer
- Accelerometers overestimate depth of compression:

¹Perkins G, et al. *Resuscitation*. 2009;80:79-82.

⁷2010 ERC Guidelines *Resuscitation*. 2010;81 (p1283, p1436)

²Nishisaki A, et al. *Resuscitation*. 2009;80:540-545.

⁸Sutton R, et al. *Paediatrics*. 2009;124:494-500.

³Fischer H, et al. *Resuscitation*. 2011;82:902-7.

⁹Monsieurs K. *Resuscitation*. 2009;80:503-504.

⁴Loesert H, et al. *Arch of Int Med*. 2006;166:2375-2380.

¹⁰Nishisaki A, et al. doi:10.1016/j.resuscitation. 2012.01.016 *In Press*.

⁵Banville I, et al. *Circulation*. 2011;124 (21 Suppl) A217

¹¹Handley A, doi:10.1016/j.resuscitation.2012.03.019 *In Press*.

⁶2010 AHA Guidelines for CPR and ECC Science
Circulation. 2010; 122[suppl 3] (S697)

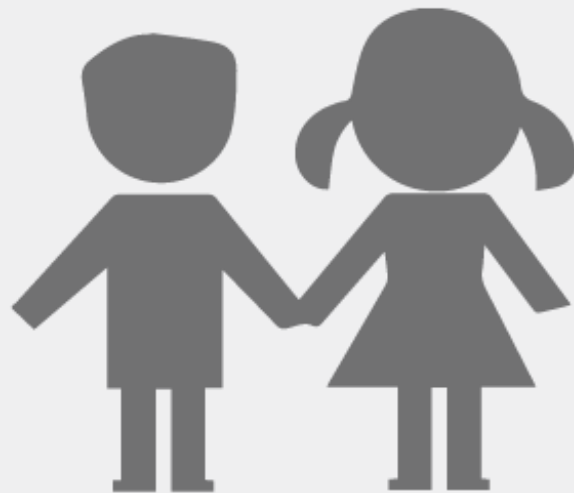
¹²Philips MRx IFU, Edition 1, April 2009:158.

Challenges with CPR Pad Placement



No Easy Paediatric CPR Option with Accelerometers

- ZOLL AED Plus and Cardiac Science G5 do not have CPR solutions for child patients—the most rare and stressful of all events
- With LIFEPAK CR2, change to Child Mode with the push of a button
 - No child key needed
 - Child Mode automatically adjusts energy and CPR prompts



CR2 Integrated CPR

- ✓ Integrated technology for complete CPR solution without additional accessories
 - ✓ Eliminates unnecessary confusion
 - ✓ Eliminates delay in therapy
 - ✓ No added costs
- ✓ Compression depth and rate within range recommended by AHA/ERC
- ✓ Significantly more hands-on time (fewer pauses) than competitive devices¹
- ✓ Fastest time to start CPR¹
- ✓ More consistent compression rate¹
- ✓ Fewest pauses during CPR¹
- ✓ Consistent with standard CPR/AED training

¹Physio-Control Internal Semi-Automatic AED Comparison Usability Study, August 2016. Reported results are median data unless otherwise noted.

Designed for User Confidence

The Problem Statement

- Cardiac arrests are very stressful situations
- Using an AED may be intimidating and users are often untrained
- Users make frequent errors such as forgetting to bare the patient's chest or confusion with the electrode liner
- Such errors can seriously impact time to shock or even ability to successfully deliver a shock



1000

LIFEPAK CR2 Defibrillator

Intuitive Design Provides Fastest Time to Use¹



¹Physio-Control Internal Semi-Automatic AED Comparison Usability Study, August 2016.

LIFEPAK® CR2 Defibrillator
with **LIFELINKcentral™** AED Program Manager

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Revolutionary QUIK-STEP™ Electrode Design



Open lid and bare
patient's chest



Pull red handle and
apply electrodes

Between
24 & 35

seconds faster
to deliver first shock
than leading
competitive AEDs¹

*Physio-Control Internal Semi-Automatic AED
Comparison Usability Study, August 2016.

Rated Easiest to Use¹

- QUIK-STEP™ electrodes are designed with human factors engineering principles to reduce application time
- No additional steps, confusion, time delay, etc.
- Fastest time to place pads¹
- Fastest time to deliver a shock¹
- Rated easiest to hear and use¹

¹Physio-Control Internal Semi-Automatic AED Comparison Usability Study, August 2016.



Fully Automatic

No hesitation as no need to push the shock button



Dual Language Option

- Increasing market need for multiple languages in lifesaving devices
- Device prompts user in second language for ease of use
- Optional configuration at order
- Second language can be customized by user
- 15 languages available



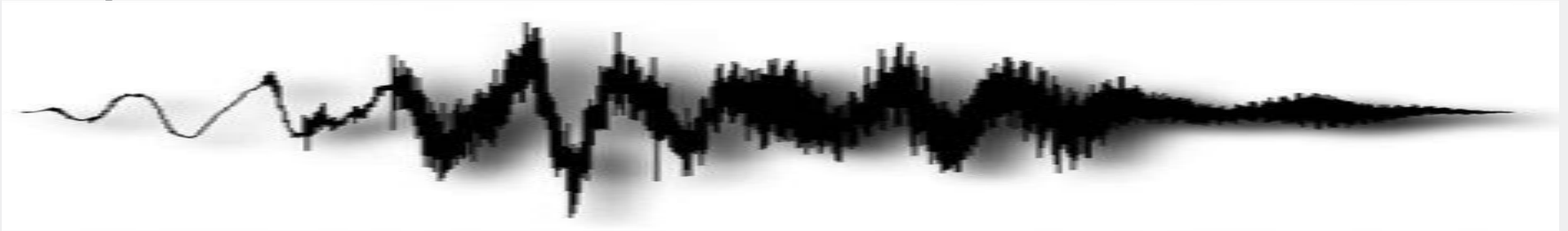
Integrated Child Mode

- Adult and Child modes
- Child Mode changes CPR prompts and reduces energy output
- Device prompts “Adult Mode” to encourage switching to Child Mode if necessary
- Uses same pads as adult
- Pad placement shown on electrodes



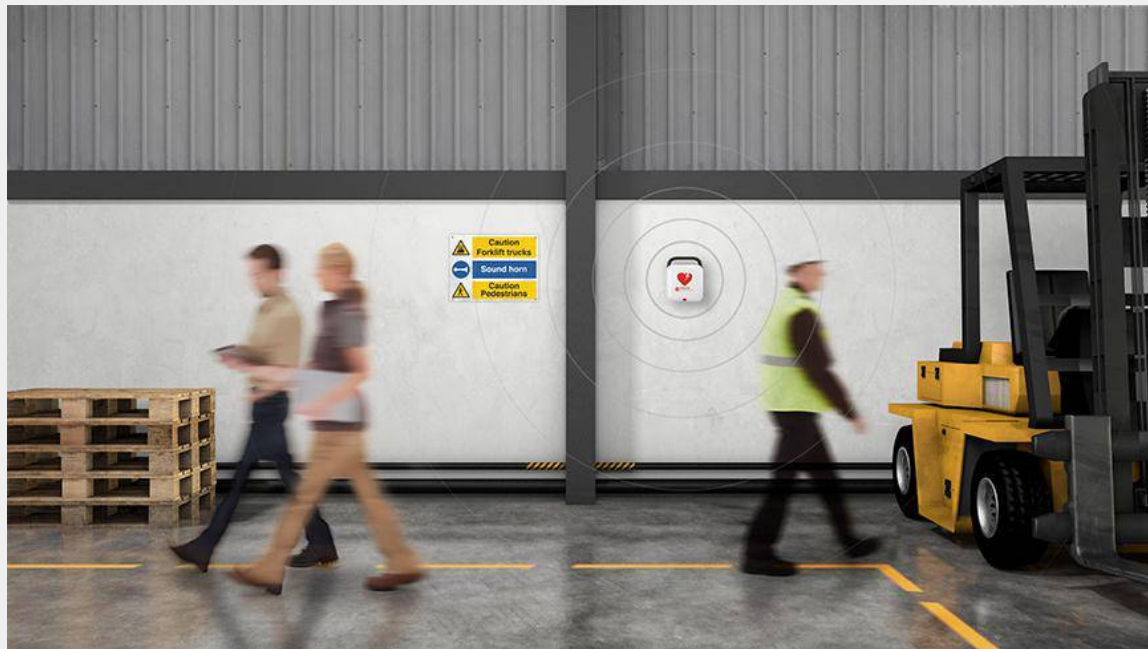
ClearVoice™ Technology

- Processing technology that allows voice prompts to be heard clearly even in noisy environments
- Adaptive prompts use a microphone to detect the ambient environment and adjust prompt volume accordingly
- All research performed by our expert Acoustic Scientist in the Physio-Control Sound Lab



Designed for Your Environment

- IP55 with electrodes connected and battery installed
- 1 metre drop test in the carry case
- 0-50°C operating temperature
- Heated cabinet available for use outdoors



Key Message: Powerful Escalating Energy

1. Physio-Control products are based on science

- Physio-Control has more biphasic shock patient data studied than all other manufacturers combined (Physio-Control published literature as of December 2015)

2. With 360J you are always ready for whatever type of patient you encounter

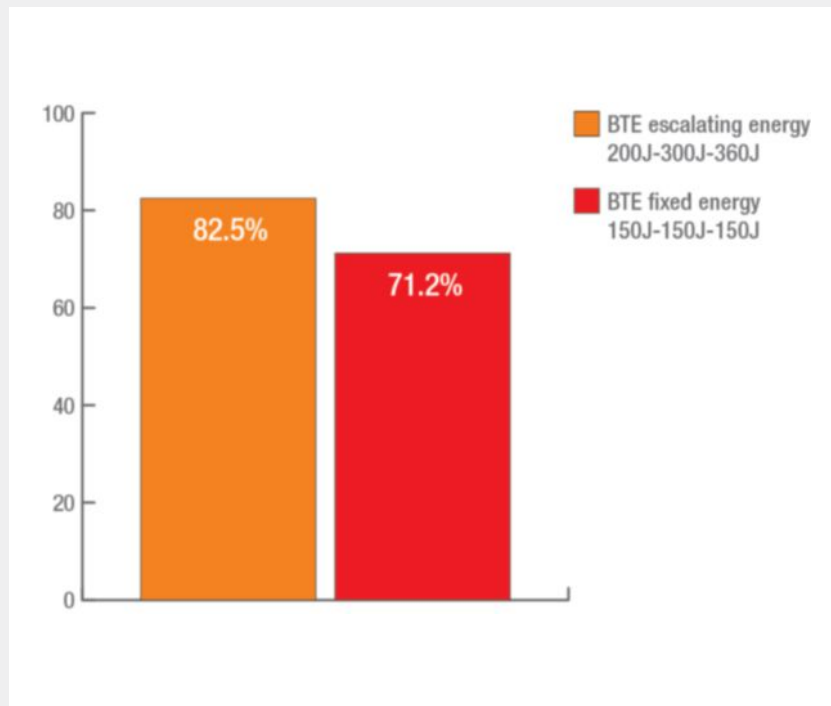
- Not all patients convert at 200J. Some patients are difficult-to-defibrillate and you can't spot them ahead of time

3. Clear clinical upside to using 360J but no downside

- Escalating biphasic shocks have been shown to improve defibrillation success in patients who require more than one shock with no myocardial damage (Stiell 2007, Koster 2008, Walsh 2004)
- Escalating energy may improve shock efficacy when pad placement is sub-optimal (Esibov 2015)

Improved Shock Success/No Myocardial Damage

- Escalating biphasic shocks up to 360J have been shown to improve defibrillation success in patients who require more than one shock
- No myocardial damage as measured by ECG changes, ejection fraction and cardiac enzymes



Stiell I, Walker R, Nesbit L, 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.

360J: Be Ready, Be Confident

- Physio-Control products are based on science
- With 360J you are always ready for whatever type of patient you encounter
- Clear clinical upside to using 360J but no downside, even in cases of sub-optimal pad placement

Trusted Technology

- More emergency medical professionals use LIFEPAK defibrillators than any other brand
- Serving 2/3 of leading EMS agencies around the world
- Large installed base enables continuity in patient care
 - Compatibility between LIFEPAK CR2 and LIFEPAK EMS devices



AED Comparison Study



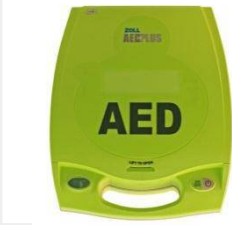

Physio-Control Internal Semi-Automatic AED Comparison Usability
Study, August 2016.

AED Comparison Usability Study

- Physio-Control has invested in an AED usability study:
 - ZOLL® AED Plus
 - Philips® Onsite
 - LIFEPAK CR® Plus AED
 - LIFEPAK CR2 AED
- Users trained in CPR
- Responder arrives at scene, treats with the AED and provides 5 minutes of CPR



Ease of Use

					
Time to Place Both Pads (minutes)	0:55	1:08	3:44* (5/15)	1:24 (7/15)	1:19
Time to Deliver Shock (minutes)	1:18	1:33	4:32*	1:53	1:42
% Able to Successfully Deliver Shock	100%	100%	80%		100%

0

1:00

2:00



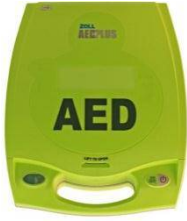



*Users were not able to place pads within the initial 2 minutes and were prompted to start 2 minutes of CPR; after performing CPR, they applied pads.

LIFEPAK® CR2 Defibrillator
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Overall CPR Quality

					
Time to Start CPR (minutes)	1:27	1:43	4:37*	1:58	2:12
Compression Fraction %	89%	52%	74%	82%	
Average Compression Depth (cm)	5.1	4.6	5.9	4.3	
Average Compression Rate (bpm)	103	112	101	99	

0

1:00

2:00

* Users were not able to place pads within the initial 2 minutes and were prompted to start 2 minutes of CPR; after performing CPR, they applied pads.



Designed for User Confidence

				
I felt confident using this AED.	5.5	4.8	4.0	5.2
This AED was easy to use.	6.7	6.1	3.5	5.9
The prompts are easy to hear.	6.7	6.6	6.2	6.5

Scored 1-7: 1=Not at all/Very difficult; 7=Very Confident/Very Easy
Average data used for comparison.

LIFEPAK® CR2 Defibrillator
with **LIFELINKcentral™** AED Program Manager

Let's help save more lives.

- ✓ Fastest time to first shock
- ✓ Fastest time to start CPR
- ✓ Most hands-on time, fewest and shortest pauses
- ✓ Highest overall CPR quality
- ✓ Consistent with 2015 CPR Guidelines
- ✓ Highest energy available
- ✓ Rated easiest to use, easiest to hear, and highest in overall user confidence



Summary

Connected. Ready.



1. Self-monitors to ensure readiness
2. Enables remote AED program management with the push of a button
3. Sends patient data to emergency responders and hospitals

More Continuous, High-quality CPR

1. Introduces new technology to maximise compression fraction which increases survival rates¹
2. Provides advanced coaching to achieve correct CPR rate, depth and hand placement
3. Leverages integrated technology to provide the best balanced CPR solution



¹Christenson J, et al. Chest compression fraction determines survival in patients with out-of-hospital ventricular fibrillation. *Circulation*. 2009;120:1241-1247.

Designed for User Confidence

1. Guides responders through the entire resuscitation, enabling the fastest time to first shock¹
2. Adapts to your situation, providing the best tool to effectively respond
3. Delivers the most powerful escalating energy available for hard-to-defibrillate patients
4. Uses the same technology trusted by more emergency medical professionals globally

¹Physio-Control Internal Semi-Automatic AED Comparison Usability Study, August 2016.



If you purchased your LIFEPAK CR2 Defibrillator from an authorized Physio-Control distributor or reseller, this distributor or reseller will have access to your LIFELINKcentral AED Program Manager account and may receive notifications prompted by the LIFEPAK CR2 Defibrillator. Please note that this setting can be disabled at ANY time; if you wish to disable this setting, please send a request to Physio-Control Customer Support to change the Distributor value to “Customer Managed”.

All claims valid as of August 2016.

For further information please contact your local Physio-Control representative or visit our website at www.physio-control.com



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