



LUCAS[®] CHEST COMPRESSION SYSTEM



Your Partner in Life Support

Effective Compressions, Good Blood Flow Lead to Lifesaving CPR

Effective chest compressions deliver vital oxygen to the brain and can prime the heart for a successful shock. Maintaining sufficient coronary perfusion pressure during cardiac arrest improves the likelihood of return of spontaneous circulation (ROSC).¹

However, as any rescuer or caregiver knows, performing manual CPR according to current AHA and ERC Guidelines is difficult and tiring. In fact, many organizations have added extra staff to cardiac arrest calls to switch out rescuers performing compressions.



The LUCAS Chest Compression System is designed to deliver uninterrupted compressions at a consistent rate and depth to facilitate ROSC. It delivers automated compressions from first response in the field to ambulance transport and throughout the hospital. LUCAS facilitates consistent blood flow from the moment it is turned on, helping to improve a patient's chance for a successful outcome.

“It’s simple and easy to use, and it’s small and compact.”

— Dr. Charles Lick, Medical Director, Allina Medical Transportation



Increasing opportunities for improved outcomes

Effective, consistent and uninterrupted compressions according to current AHA and ERC Guidelines

LUCAS is a portable, easy-to-use device that delivers automated, guidelines-consistent chest compressions to improve blood flow in victims of cardiac arrest. LUCAS performs chest compressions at a rate and depth according to 2010 AHA and ERC Guidelines. It also allows for complete chest wall recoil after each compression and provides a 50% duty cycle—equal compression and relaxation time for the chest wall.

Maintain good blood flow

Several studies show the effectiveness of manual chest compressions can drop rapidly—often after only one minute—due to rescuer fatigue.^{2,3} With LUCAS, automated compressions are delivered consistently and continuously, helping to maintain good circulation to the patient during transport and throughout the hospital.

Increasing operational effectiveness

Easy to use and efficient to own

LUCAS is lightweight, comes in a backpack and can be applied quickly to a patient, interrupting manual compressions for less than 20 seconds. It’s simple to apply whether the patient is on the ground, on a bed or on a stretcher in the ambulance.

Keep personnel safe during CPR

Whether you are delivering chest compressions in the back of an ambulance or in an emergency department, LUCAS can help keep responders safe. In a mobile environment, rescuers can be safely seat-belted in the back of an ambulance while LUCAS delivers compressions. In a hospital environment, LUCAS may help decrease occurrences of back injuries sustained while delivering CPR, as rescuers will no longer have to deliver prolonged CPR on a bed.

In a study found in *Resuscitation*, of 205 respondents, over 80% experienced back discomfort; 56% felt the discomfort was related to the duration of CPR. 20% suffered back injury or prolapsed disc; 40% considered their back injury related to/aggravated by CPR.

Jones A. Can cardiopulmonary resuscitation injure the back? *Resuscitation*. 2004;61(1):63-67.





A tireless lifesaver

When Leon Schmidt, 68, suffered a massive cardiac arrest, it was LUCAS that kept him alive. “As soon as the paramedics arrived, they had Leon on the LUCAS,” recalls Gayle Schmidt, Leon’s wife. Later, Gayle was told that patients who experience the same type of cardiac arrest as her husband have only a three percent survival rate.

“If it wasn’t for the LUCAS,” she insists, “Leon wouldn’t be with us today.”

Results like this are encouraging to Charles Lick, MD, medical director for Allina Medical Transportation and Emergency Department director for Buffalo Hospital.

“In 2005, the AHA determined that we need to focus on performing better chest compressions to move the blood around and keep the organs working. We know that CPR is difficult to do well. People slow down. They don’t always do it appropriately—even professional rescuers. A machine doesn’t get tired; it is consistent, and consistency is key,” he explained.

All Allina Medical Transportation ambulances are equipped with the lifesaving devices. And now Buffalo Hospital has added a LUCAS device to its Emergency Department.

“Someone who has suffered a sudden cardiac arrest in the field has a good chance of suffering another one as we work on them in the Emergency Department,” Lick said.

“The LUCAS is as valuable here as it is in the field.” Lick predicts that in the coming months, LUCAS will help more patients like Schmidt get on with their lives. “I’m convinced we can do much better CPR with LUCAS than we can with human intervention.”

In a recent survey, nearly 25% of ambulance officers suffered back injury, and as many as 62% of these reported that the cause of the injury was related to CPR delivery.

— Jones A, Lee R. Cardiopulmonary resuscitation and back injury in ambulance officers. *International Archives of Occupational and Environmental Health*. 2005;78(4):332-336.



Improving operations in the field

Chiefs, training officers and medics are always looking for ways to maximize their resources while improving response in the field. Having LUCAS at your side during a cardiac emergency allows you to reduce the number of EMTs or firefighters to assist with CPR. This lessens chaos on the scene and frees up equipment and staff to go on to other emergencies.

When the cardiac arrest victim is ready for transport, LUCAS moves with the patient from the emergency scene to the ambulance. LUCAS provides continuous, effective compressions, helping to maintain good circulation in the patient while medics remain seat-belted for better safety in a mobile environment.

CPR is difficult to do well. Manual CPR training can help and it's expensive and cumbersome to schedule and track. LUCAS is simple and easy to use with minimal training, keeping the cost of ownership low.

A vital tool for the clinically progressive agency

Medical directors know the value of quality CPR in achieving optimal clinical outcomes. With LUCAS, you can be confident that chest compressions are delivered according to the guidelines. By ensuring compressions continue uninterrupted at a consistent depth to facilitate ROSC, your teams are able to help patients to be more viable candidates for recovery.

LUCAS can be part of a clinically progressive resuscitation program. It works in tandem with cooling therapies or impedance threshold devices for a comprehensive approach to patient resuscitation.

“The mood in the cath lab was calm at all times despite the ongoing VF. This is quite contrary to what usually happens in such situations when manual compressions are used.”

— Olivecrona, Lund, Sweden, (tctmd.com 24 Oct 2006)



Provide continuous care in the emergency department

For an emergency department or nurse manager, LUCAS is a vital tool in the treatment of cardiac arrest patients. LUCAS delivers effective, consistent, uninterrupted chest compressions and can help effectively manage the code scene while helping the patient to maintain good circulation. Emergency department staff, relieved of the need to perform manual compressions, can more efficiently assess the patient's condition and determine the best treatment plan. This can reduce crowding and chaos in the emergency department, which can help to maintain calm and focus amongst the staff, and potentially free up resources for use in other emergencies.

Using LUCAS in the emergency department can help maintain circulation without interruption which is crucial to improving patient outcomes.

Keep up the pressure in the cath lab

In the event of cardiac arrest due to refractory ventricular fibrillation or a nonshockable rhythm, LUCAS enables the intervention to continue by providing consistent, guidelines-quality chest compressions, which facilitates blood circulation to supply oxygen to vital organs. In addition, LUCAS creates a less stressful environment that enables quality decision making and keeps staff safely out of the x-ray field.

LUCAS is mainly radio translucent, except for the hood and piston, enabling you to capture most fluoroscopy projections without removing LUCAS. The following fluoroscopy projections can be captured in monoplane while LUCAS is attached to the patient: LAO Cranial/Caudal Oblique; RAO Cranial/Caudal Oblique; Straight Caudal; Straight Lateral; and Straight Cranial. The 2010 AHA Guidelines have given a Class IIa, LOE C recommendation to LUCAS use during PCI.

LUCAS™ 2



LUCAS™



LUCAS CHEST COMPRESSION SYSTEM



The LUCAS 2 Chest Compression System is shipped with one battery, patient straps, three suction cups, a carrying bag and the instructions for use. Also available are additional accessories and power options designed to meet your needs including a radiotranslucent, carbon fiber back plate for PCI use.





Battery

Operation Panel

Patient Strap

LUCAS 2

Release Ring

Suction Cup with Pressure Pad

Backboard

Stabilization Strap

LUCAS



“If I had one arm,
and could only grab
one thing to take into
the house, it would
be LUCAS.”

- Paramedic and Field Supervisor
Cypress Creek



LUCAS 2

CHEST COMPRESSION SYSTEM

COMPRESSIONS

Compression Frequency: 102 ± 2 compressions per minute

Compression Depth: 2.1 inches ± 0.1 inches for nominal patient*

Compression/Decompression Duty Cycle: 50 ± 5%

Patients Eligible for Treatment:

- Sternum height of 6.7–11.9 inches (17 – 30.3 cm)
- Maximum chest width: 17.7 inches (45 cm)

The use of LUCAS is not restricted by patient weight.

*Patients with sternum height between 6.7 inches-7.3 inches will receive linearly increasing depth from 1.5 inches to 2.1 inches.

OPERATION

Operation: Electrical

Power Source: Battery – Rechargeable Lithium-ion Polymer (LiPo)

- Size: 5.1 x 3.5 x 2.2 inches (13.0 x 8.8 x 5.7 cm)
- Weight: 1.3 lbs (0.6 kg)
- Capacity: 3300 mAh (typical), 86 Wh
- Battery voltage: 25.9 V
- Run time: 45 minutes (typical)
- Maximum battery charge time: Less than 4 hours at room temperature (72°F/ 22°C)
- Required interval for replacement of battery: Recommendation to replace battery every 3 years or after 200 uses

Battery Environmental Specifications

- Operating temperature: 32°F to 104°F / 0°C to +40°C
- Charge temperature: 41°F to 95°F / 5°C to +35°C
- Storage temperature: 32°F to 104°F/ 0°C to 40°C for <6 months
- IP Classification: IP44

PHYSICAL CHARACTERISTICS

Height (stowed in backpack): 25.6 inches (65 cm)

Width (stowed in backpack): 13 inches (33 cm)

Depth (stowed in backpack): 9.8 inches (25 cm)

Weight (including battery): 17.2 lbs (7.8 kg)

All specifications are at 20-25°C unless otherwise stated. Technical data are subject to change without prior notice.

Physio-Control Family of Products

Defibrillators/Monitors



LIFEPAK CR® Plus Automated External Defibrillator

Featuring the same advanced technology trusted by emergency medical professionals—yet simple to use—the fully-automatic LIFEPAK CR Plus AED is designed specifically for the first person to respond to a victim of sudden cardiac arrest.



LIFEPAK® 1000 Defibrillator

The LIFEPAK 1000 Defibrillator is a powerful and compact device designed to treat cardiac arrest patients and provide continuous cardiac monitoring capabilities. Built-in flexibility allows the 1000 to be programmed for use by first responders or professionals and enables care providers to change protocols as standards of care evolve.



LIFEPAK® 15 Monitor/Defibrillator

The LIFEPAK 15 monitor/defibrillator is the new standard in emergency care for ALS teams who want the most clinically innovative, operationally effective, and LIFEPAK TOUGH device available today.



LIFEPAK® 20e Defibrillator/Monitor

Clinically advanced and packed with power, the LIFEPAK 20e defibrillator/monitor is highly intuitive for first responders, and also skillfully combines AED function with manual capability so that ACLS-trained clinicians can quickly and easily deliver advanced therapeutic care.

CPR Assistance



LUCAS® Chest Compression System

Designed to provide effective, consistent, and uninterrupted compressions according to AHA and ERC Guidelines, LUCAS can be used on adult patients in out-of-hospital and hospital settings.

Information Management



LIFENET® System

The LIFENET System provides EMS and hospital care teams with reliable, quick access to clinical information through a secure, web-based platform, helping to improve patient care flow and operational efficiency.

CODE-STAT™ 9.0 Data Review Software

CODE-STAT 9.0 data review software is a retrospective analysis tool that provides easy access to data, reports, and post-event review.

For more than 55 years, Physio-Control, maker of the renowned LIFEPAK defibrillators, has been developing technologies and designing devices that are legendary among first response professionals, clinical care providers and the community.

REFERENCES

- 1 Paradis N, Martin G, Rivers E, et al. Coronary perfusion pressure and the return of spontaneous circulation in human cardiopulmonary resuscitation. *JAMA* 1990;263(8):1106-1112.
- 2 Ochoa FJ, Ramalle-Gómara E, Lisa V, Saralegui I. The effect of rescuer fatigue on the quality of chest compressions. *Resuscitation*. 1998;37:149-52.
- 3 Hightower D, Thomas S, Stone C, Dunn K, March J. Decay in quality of closed-chest compressions over time. *Annals of Emergency Medicine*. 1995;26:300-303.

All information including comparative statements is valid as of January 2013.

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