LUCAS® Chest Compression System

Safe and effective chest compressions during helicopter transport

Definitive treatment of sudden cardiac arrest patients is not always possible on-scene. During transport in a helicopter, loading and unloading the patient, aircraft movement and limited space can make it nearly impossible to perform effective manual chest compressions, which are vital for cardiac arrest patient outcomes. In addition to being ineffective, performing manual chest compressions may put the rescuers’ own safety at risk.

“Carrying out manual chest compressions during rescue-helicopter transport is barely possible and often of poor quality.”


The LUCAS chest compression system makes it possible to provide consistent, high-quality chest compressions with minimal interruptions during all phases of helicopter transport without compromising crew safety. The LUCAS device takes care of the compressions while rescuers stay safely harnessed during the critical phases of a flight: take-off, in-flight and landing.

Equipment weight, portability and operating time are important considerations for air transport. The LUCAS device is compact and lightweight, and the typical runtime for a fully charged LUCAS battery is 45 minutes. With a fully charged spare, runtime can be extended to 90 minutes, or the LUCAS device can operate continuously on an external power supply for as long as needed.

The LUCAS device has been tested according to section 21 in the RTCA/DO-160F, Environmental Conditions and Test Procedures for Airborne Equipment, which is a standard for environmental testing of avionics hardware. The LUCAS 2 chest compression system complies with the radiated emission (category L) and with the conducted emission (category L, M and H).

The LUCAS device has been shown to improve CPR quality in simulated helicopter studies.

Guidelines for CPR5 recognize that mechanical CPR may be beneficial in situations where manual CPR is difficult to perform effectively or safely, such as during transportation, in confined spaces and during prolonged resuscitations.

During a simulated flight scenario, the LUCAS device increased CPR quality significantly over manual CPR. The percentage of correct compressions was higher in all phases of the scenario (before, during and after flight).3

“While LUCAS delivered uninterrupted high-quality chest compressions, the quality of manual chest compressions was consistently inferior throughout the scenario. This was most pronounced during the helicopter flight with only 41% of correct manual chest compressions, most likely because of the confined space and the unfavorable position of the candidates in the helicopter.”

Based on reports from our customers, helicopter rescue services around the world use the LUCAS device in a wide variety of helicopter models, including:

- AgustaWestland AW 139
- AS 332 L1 Super Puma
- Bell 407, 429 & 430
- Eurocopter EC 135, 145, & 225 LP
- Sea King MK43B

“Mechanical chest compression devices could be of significant help to avoid longer hands-off time during complex mountain and flight rescue maneuvers, which is usually not possible if the compressions are performed manually.”


Hands-on ratio in a 14 minute long resuscitation simulation in an EC 135 helicopter.4
REFERENCES


