See the Difference with Mechanical CPR

What Is Mechanical CPR?

Mechanical cardiopulmonary resuscitation devices provide automated chest compressions to cardiac arrest victims. They're designed to help achieve the return of spontaneous circulation (ROSC), just like manual CPR.

It's all about perfusion:
How high-quality CPR can help

High-quality CPR is a key determinant of patient survival and can double or even triple the chance of survival. High-quality CPR typically refers to a manual method of delivering chest compressions to an unresponsive individual to provide perfusion and oxygen to the heart and the brain and eventually facilitate the return of spontaneous circulation.[1]

In their Guidelines, both the AHA (2020) and the ERC (2021) agree that to provide high-quality CPR in adults you need to perform chest compressions to a depth of at least 5 cm but not more than 6 cm at a rate of 100–120 compressions per minute, minimizing pauses in compressions.

However, in specific settings, delivering prolonged manual high-quality CPR can become physically exhausting for rescuers, and properly timing compressions can become mentally challenging.

Continuous support when it's needed most

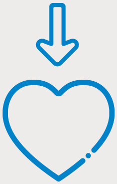
Mechanical CPR can deliver high-quality CPR on a continuous basis. Once the device is applied, it performs compressions at a consistent rate and depth, allowing rescuers and clinicians to transport the patient or perform other necessary interventions.

Used as an adjunct to manual CPR, automated high-quality chest compressions give rescuers time to assess and treat other aspects of the patient's condition. Mechanical CPR devices can be an essential tool during transport, in environments with limited space, and in other challenging situations.

Mechanical CPR devices are especially helpful in conditions inside and outside the hospital where high-quality CPR is difficult, if not impossible, to provide for an extended period. The 2021 ERC Guidelines and the 2020 AHA Guidelines both recommend use of a mechanical CPR device if patient transport (i.e., a moving ambulance or in the angiography suite) and prolonged CPR is required, or the specific setting presents challenges (e.g., in the cath lab). Both the ERC and the AHA also stress the importance of having a trained team familiar with the device present to minimise interruptions when a mechanical CPR device is used. [2,3]

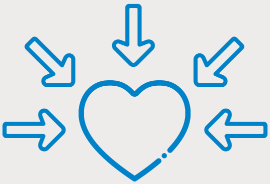
How do mechanical CPR devices work?

There are two types of modern mechanical CPR devices: piston-based and load-distributing band-based. Both perform automatic compressions, but how they do this differs:



Piston

Uses a backboard placed beneath the patient, with the device affixed to one or both sides and the piston positioned above the end of the patient's sternum.



Load-distributing band

Uses a backboard placed beneath the patient and a band that embraces the entire patient chest; an electric motor pulls the band in a rhythmic motion, compressing the entire chest and improving perfusion to the heart and brain. A study showed that load-distributing band technology improved coronary perfusion pressure by 33% compared to sternal compressions — from 15 to 20 mmHg,[4] with 15 mmHg considered the minimum threshold of likelihood to achieve ROSC.[5]

How are ZOLL mechanical CPR devices unique?

ZOLL's mechanical CPR uses load-distributing technology that squeezes the patient's entire thoracic cavity. Multiple studies have shown that circumferential compressions improve blood flow and help restore vital signs in cardiac arrest patients.[6-8]

A recent study also confirmed that among all the mechanical CPR devices involved in the study, only a load-distributing band device was able to favourably affect 30-day survival.[9]

The force required to achieve adequate compression depth varies with each patient. ZOLL mechanical CPR devices fit a wide range of patient sizes, automatically adjusting to the appropriate parameters upon startup.

Patients receive consistent high-quality compressions for as long as CPR is required, eliminating the challenges of performing manual CPR from the scene throughout transport and advanced treatment.

Because ZOLL's circumferential compressions are fundamentally different from manual compressions, the compression rate differs from what is recommended in the Guidelines. To allow for complete chest wall recoil, ZOLL's mechanical CPR solution provides 80 compressions per minute.[4,8]

EMS transport directly to the cath lab helps minimise time to lifesaving treatment for some cardiac patients. STEMI patients progressing to cardiac arrest can receive consistent compressions all the way through an intervention. In-hospital cardiac arrest patients can quickly begin receiving mechanical CPR while providers address additional medical issues or begin transport to other care units.

ZOLL mechanical CPR

Clinically proven

Proven clinical benefits for cardiac arrest patients

Consistent

Provides uninterrupted compressions throughout the continuum of care

Customised

Optimizes compressions for each patient

For more information: zoll.com/seethedifference

[1]American Heart Association. CPR Facts & Stats, cpr.heart.org website: https://cpr.heart.org/en/resources/cpr-facts-and-stats. Accessed April 16, 2024

[2]European Resuscitation Council website: https://cprguidelines.eu/assets/guidelines/European-Resuscitation-Council-Guidelines-2021-Ca.pdf. Accessed April 16, 2024

[3]AHA 2020 Guidelines. Circulation. 2020;142(suppl 2):S366-S4684 Ong ME, et al. JAMA. 2006;295:2629-2637

[4]Timerman S, et al. Resuscitation. 2004;61:3:273-280

[5]Paradis et al. JAMA 1990;263:1106-1113

[6]Westfall M, et al. Crit Care Med. 2013 Jul;41(7):1782-17892

[7]Ong ME, et al. JAMA. 2006;295:2629-2637

[8]Casner M, et al. Prehosp Emerg Care. 2005;9:61-67

[9]Primi, R. et al. J. Clin. Med. 2023;12:13:4429. https://doi.org/10.3390/jcm12134429

MCN IP 2403 0833-05

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