In hospital and out hospital studies* have shown that performing ACD CPR:

- Increases arterial blood pressure
- Increases coronary perfusion pressure
- Lowers intrathoracic pressure during the decompression phase of CPR
- Increases short-term and long-term survival rates

The CardioPump permits the rescuer to actively re-expand the chest during the decompression phase of cardiopulmonary resuscitation (CPR). Active compression decompression CPR (ACD CPR) enhances the intrathoracic vacuum (negative pressure) during chest wall recoil, resulting in more blood being returned to the heart (preload). Enhanced preload leads to increased cardiac output on the subsequent chest compression.

The design of the device allows the rescuer to use the same position and compression technique as for standard CPR. The suction cup sticks to the chest and transfers a lifting force to the thorax. Active chest decompression is obtained simply when the operator swings their body weight upwards after each compression while holding on to the CardioPump’s handle. Chest compression is accomplished in the same manner as for standard manual CPR by pushing down on the CardioPump.

When ACD CPR is performed in conjunction with the ResQPOD Impedance Threshold Device (ITD), hemodynamics are further improved.

In hospital and out-of-hospital studies* have shown that performing ACD CPR:

- Increases arterial blood pressure
- Increases coronary perfusion pressure
- Lowers intrathoracic pressure during the decompression phase of CPR
- Increases short-term and long-term survival rates

The CardioPump is indicated for use in the treatment of adult patients with out-of-hospital cardiac arrest (absence of effective pulse and respiration) to improve the overall efficiency of cardiopulmonary resuscitation (CPR) and the chances for short and long-term survival. It is intended to be used as an adjunct to locally recommended protocols for basic cardiac life support.
**Technical Specifications**

**Dimensions**
- Suction cup: 135 mm OD
- Handle: 143 x 108 mm
- Weight: 0.58 kg (1.24 lbs)

**Gauge range**:
- Compression: 0-50 kg (0-110 lbs)
- Decompression: 0-15 kg (0-33 lbs)
- Accuracy: ± 10% of reading

**Operating temperature range**: -20°C to 50°C
**Storage temperature range**: -40°C to 70°C

**Metronome Function**
- Signal pitches: 768 and 3070 Hz
- Sound level: 65 dB at 0.5 m from the sound source
- Signal rate: 80 signals per minute
- Battery life: Approx. 250 service hours
- Battery shelf life: Approx. 10 years

**Materials**
- Suction cup: Silicone rubber
- Handle: Polyamide (nylon), glass fiber reinforced
- Metal parts: Stainless steel, brass

The CardioPump does not contain latex.

---

**CardioPump Components:**

- **Suction Cup** – provides the suction necessary to actively lift the chest during decompression. A compression pad located inside helps cushion the surface between the chest and the device.
- **Handle** – transfers force from the rescuer to the victim through the piston
- **Force Gauge** – guides both compression and decompression forces
- **Metronome** – guides proper compression/decompression rate and duty cycle

---

**Survival to 24 Hours**

Wolcke et al. Circulation 2003

<table>
<thead>
<tr>
<th>%</th>
<th>All Patients</th>
<th>Witnessed Vfib</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>30</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>58</td>
<td></td>
</tr>
</tbody>
</table>

For both $P<0.05$

**References for ACD CPR:**

**ACD CPR with an impedance threshold device (ITD) (e.g. ResQPOD®):**