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## **Mechanical Cardiopulmonary Resuscitation and the American Heart Association Guidelines**

The latest American Heart Association Cardiopulmonary Resuscitation (CPR) Guidelines were released in the fall of 2015. The Guidelines address all aspects of CPR and contains recommendations for the methods and techniques that should be used. Specific recommendations include:

- Rescuers should begin the CPR sequence with compressions rather than breaths.
- If rescue breaths are used, they should be performed in a ratio of 30:2 compressions to breaths.
- With an advanced airway, rescuers should deliver 1 breath every 6 seconds (10 breaths per minute).
- Chest compressions should be performed at a rate of 100 per minute to 120 per minute.
- Chest compression depth should be at least 2 inches or 5 cm for an average adult.
- Interruptions in chest compressions should be avoided.
- Full chest recoil should be allowed between compressions.

The new American Heart Association Cardiopulmonary Resuscitation Guidelines, released in the fall of 2015, address mechanical CPR devices specifically in Part 6 Alternative CPR Techniques. "Mechanical piston devices" consist of a compressed gas or electric-powered plunger positioned over the sternum, which compresses the chest at a set rate. Several studies referenced in the Guidelines demonstrate improved end-tidal CO<sup>2</sup> during adult cardiac arrest resuscitation with mechanical CPR.

The Guidelines that state mechanical piston devices can be considered for use by properly trained personnel in specific settings for treatment of adult cardiac arrest in circumstances that make manual resuscitation challenging or dangerous, including:

- Limited rescuers available
- Prolonged CPR
- During hypothermic cardiac arrest
- CPR in a moving ambulance
- CPR in the angiography suite
- During preparation for ECPR

Performing good CPR in a timely manner during a cardiac arrest situation can save lives. The new guidelines make the following statement:

Data is available showing that high-quality CPR improves survival from cardiac arrest, including:

- Ensuring chest compressions of adequate rate
- Ensuring chest compressions of adequate depth
- Allowing full chest recoil between compressions
- Minimizing interruptions in chest compressions
- Avoiding excessive ventilation

Studies show that manual CPR often has serious quality problems due to poor technique, fatigue, excessive hands-off fraction and technique drift (Wik et al., 2005; Sugerman et al., 2009). In addition, EMS staff often over-ventilate, and that can reduce survival (Aufderheide et al., 2004).

The Life-Stat" mechanical piston CPR which always performs perfect CPR according to the current AHA Guidelines. It is an electronically controlled oxygen-powered system with a built-in automated transport ventilator (ATV). The Life-Stat® can deliver compression depth of 2 inches or more (variable from 0 – 3.2 inches), always with complete recoil. Adjustable tidal volume pressure-relief oxygen ventilation is coordinated with compressions using a one-second inhalation phase in either 30:2 or continuous compression modes and will not over ventilate. Compression rates of 100 per minute or 120 per minute are available.

New rapid deployment and setup methods of the Life-Stat® at the patient site include a one-time transfer from manual to mechanical CPR in less than 5 seconds. Thereafter, Life-Stat® utilization doesn't require any interruption. **The current Life-Stat® is fully compliant with the new 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care.**