American Red Cross

American Red Cross
Advisory Council on
First Aid, Aquatics,
Safety and Preparedness

ACFASP Advisory
Compression Only CPR

Overall Recommendation including any Standard, Guideline or Option:

Standards: There is not sufficient evidence to support a treatment standard.

Guidelines: There is not sufficient evidence to support a treatment guideline.

Options: **There is sufficient evidence to demonstrate that compression-only CPR is an acceptable alternative treatment for a victim of primary cardiac arrest by lay responders who are unwilling, unable, untrained, or are no longer able to perform full CPR.**

Questions to be addressed:

Under what circumstances can continuous cardiac chest compressions without expired air ventilation be an effective procedure for the treatment of out of hospital cardiac arrest by lay responders?

Introduction/Overview:

Some studies have shown that chest compression- only CPR may be effective in providing life-sustaining blood flow in the first few minutes following an out of hospital cardiac arrest. Compression-only CPR may be an acceptable alternative in the treatment of a patient suffering cardiac arrest for laypersons who are unwilling unable, untrained, or no longer able to perform full CPR.

Mouth-to-mouth ventilation remains part of standard CPR for treating persons in respiratory and cardiac arrest. Compression-only CPR has been shown to be effective in improving patient outcomes when compared to no CPR.

Summary of Scientific Foundation:

Studies

Multiple swine model studies examined efficacy of ventilation during the early stages of CPR. A wide range of down times and resuscitation times were evaluated. Similar survival results with and without ventilations were obtained for Ventricular Fibrillation (VF) arrests for downtimes between 2 and 5 minutes prior to care, when BLS care was provided for 8 to 10 minutes, and for room air ventilation (when provided).

100% survival at 24 hours was demonstrated when study animals were provided 100% oxygen prior to VF arrest and then CPR begun within 30 seconds for both the Standard and Chest Compression-only CPR. These and other studies appear to demonstrate that the omission of

ventilations during bystander CPR may not change patient outcome due to cardiac etiology arrests. However, when downtimes exceed 4 minutes, or when the arrest is due to asphyxia, ventilation appears to improve victim outcome.

Three descriptive human studies have been published that appear to indicate that providing compression only CPR yields better outcomes than no CPR. These studies were performed prior to the renewed emphasis on chest compressions and minimizing time off the chest during CPR. Peter Safar also noted that the swine model is remarkable by the straightness of the pig airway compared to the human airway, thus compressions may also passively assist ventilations in that model more than it would occur in the human.

Primary Cardiac Arrests

Implemented within 6 minutes of primary cardiac arrest, compression-only CPR has been demonstrated to be as effective as full CPR in one study. During primary cardiac arrest the arterial blood is generally well saturated with oxygen. Further, the left side of the heart and the arterial system contain significant levels of oxygenated blood that can be circulated to the vital organs by continuous cardiac chest compressions. Expired air ventilations may not increase arterial blood saturation. Finally, in witnessed cardiac arrests, trained and untrained bystander initiated compression-only efforts may potentially increase the incidence of resuscitation efforts by lay responders for persons suffering primary cardiac arrest.

Primary Respiratory Arrests/Secondary Cardiac Episodes

In drowning cases or other forms of respiratory arrest, expired air ventilations and cardiac chest compressions remain the essential treatment by lay responders. In respiratory arrest, the arterial blood saturation is severely low and must be supplemented with mouth to mouth ventilations or supplemental oxygen. Cardiac chest compressions then circulate oxygenated blood to the vital organs.

Special Circumstances

The 2005 Guidelines for Emergency Care and Education currently recommends Compression-only CPR can be used in certain Circumstances.

> *"Compression-only CPR can benefit persons suffering from cardiac arrest, but standard CPR, with rescue breaths is superior to compression-only CPR. If a lay responder is unwilling, unable, or untrained in full CPR, they should be encouraged to give continuous chest compressions once someone has activated the EMS system."*

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