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Study: Chest compressions without mouth-to-mouth better for out-of-hospital cardiac arrest

A study published March 17, 2007 in *The Lancet*, one of the world's foremost medical journals, finds that the chances of surviving a cardiac arrest outside a hospital setting are almost twice as high if bystanders perform chest-compression-only resuscitation instead of traditional cardiopulmonary resuscitation (CPR) with mouth-to-mouth breathing.

The study analyzed the outcomes of resuscitation attempts performed by laypeople at the scene after they witnessed a person collapse due to cardiac arrest.

"The report confirms that what we have learned in animal experiments applies to humans as well," says Gordon A.

Ewy, MD, director of the Sarver Heart Center at The University of Arizona in Tucson where chest-compression-only resuscitation was developed.

"Bystander-initiated continuous chest compressions without mouth-to-mouth breathing are the preferable approach for witnessed unexpected collapse, which is usually due to cardiac arrest."

In an invited editorial titled "Cardiac Arrest · Guideline

Changes Urgently Needed," published in the same issue of the journal, Ewy notes that eliminating the need for mouth-to-mouth ventilation not only is more effective, but also should dramatically increase the incidence of bystander-initiated resuscitation efforts.



Gordon A. Ewy, M.D., director of The University of Arizona Sarver Heart Center, Tucson, Ariz., pioneer of the chest-compression-only resuscitation approach for out-of-hospital cardiac arrest.

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Ewy and the Resuscitation Research Group at the UA Sarver Heart Center have advocated continuous chest compressions without assisted breathing as the appropriate method for cardiac arrest for years.

The study reported in *The Lancet* analyzed the outcomes of 4,068 cases of witnessed collapse of adults in the Kanto area in Japan. The prospective, multi-center observational study, named SOS-KANTO, is the first large-scale account comparing the survival rates of out-of-hospital cardiac arrest patients who were treated either with or without mouth-to-mouth ventilations by bystanders at the scene.

"For cardiac arrest, the term rescue breathing is actually a paradox," says Ewy. "We now know that not only is it not helpful, but it's often harmful."

Studies showed that because current CPR guidelines call for mouth-to-mouth ventilations, the majority of people would not perform CPR on a stranger, partly out of fear of contracting diseases. Research by UA Sarver Heart Center member Karl B. Kern, MD, and others found that even if bystanders are willing to perform mouth-to-mouth ventilation, it takes too much time away from chest compressions, which have to be continuous to improve the chance of survival.

"We have found that the survival rate is higher even when the blood has less oxygen content, but is moved through the body by continuous chest compressions, than when the blood contains a lot of oxygen but is not circulated well because chest compressions are interrupted for mouth-to-mouth ventilations," Ewy says.

All studies on out-of-hospital cardiac arrest have shown that the chance of survival is greatest in patients whose heart is in a condition that allows paramedics to shock it back into a normal rhythm with a defibrillator. Among these patients, the SOS-KANTO researchers found the percentage surviving with a favorable neurological outcome to be 19.4 percent if bystanders administered chest compressions without mouth-to-mouth ventilations. In contrast, the favorable neurological survival rate in those who received chest compressions and mouth-to-mouth breathing was only 11.2 percent.

While the study provides unequivocal evidence that chest-compression-only resuscitation boosts survival rates for out-of-hospital cardiac arrest, Ewy points out that, for respiratory arrest such as near-drowning, drug overdose or choking, guideline CPR consisting of 2 breaths after every 30 chest compressions is still the appropriate method.

"This study confirms how critically dependent the outcome of out-of-hospital cardiac arrest is on the willingness of bystanders to activate emergency medical services and promptly initiate continuous chest compressions in a case of witnessed unexpected collapse in an adult," Ewy says.

"It is also very interesting to find how a sizeable group of laypeople, by spontaneously performing a technique that has neither been taught nor formally endorsed, achieved better outcomes than with a technique that has been advocated and taught at a cost of millions of dollars and millions of man-hours."

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To obtain a copy of the study, contact the Lancet press office at pressoffice@lancet.com or +44 (0)20 7424 4949/4249

Web links:

Bystander CCR ·three easy steps: Download pdf flyer at

<http://www.heart.arizona.edu/publiced/documents/ccr-card-english-april06.pdf>

Podcast interview with Dr. Gordon Ewy: www.thelancet.com/audio

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