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New CPR technique for out-of-hospital cardiac arrest increases survival by 53 percent

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A study led by Dr. Tom P. Aufderheide, professor of emergency medicine at The Medical College of Wisconsin, shows an alternative method of cardio-pulmonary resuscitation increases long-term survival of patients.

The study, which is published in the January 19th, 2011 online version of *Lancet*, and will be in an upcoming publication of *Lancet*, determined that active compression-decompression cardio-pulmonary resuscitation (CPR) with augmentation of negative intrathoracic pressure gave patients a better chance of survival. When the pressure inside the thorax decreases, blood flow to the heart and brain increases.

About 800,000 people in the U.S., Canada and Europe have an out-of-hospital cardiac arrest every year. The survival rate averages just 5%, in part because standard CPR is inefficient, providing just 25% of healthy blood flow to the heart and brain.

In the randomized study, 46 emergency medical service (EMS) agencies in urban, suburban and rural areas of the USA, including EMS in Oshkosh, provided either standard CPR or the new technique to adults who had a non-traumatic arrest presumed cardiac in nature.

The new technique uses two devices simultaneously to increase circulation. One is a handheld device that attaches with a small suction

cup to the patient's chest. After each compression, the suction cup allows the chest to be lifted up, stimulating blood flow. The second device, called an impedance threshold device, attaches to the patient's airway using a facial mask or breathing tube. When the chest lifts upward, the impedance threshold device prevents air from rushing into the lungs. That creates a vacuum inside the chest and helps refill the heart after each compression. Researchers found in each compression-decompression cycle, the heart and brain receive nearly three times more blood flow when compared with standard CPR.

A total of 813 standard CPR patients and 840 intervention patients were analyzed in the study. Researchers found 6% of the standards CPR patients survived to hospital discharge with favorable neurologic function. That compares with 9% in the intervention group (improvement of survival chance 53% in intervention group). The same proportions of patients in each group survived to one year.

"Based on our findings, active compression-decompression CPR with augmentation of negative intrathoracic pressure should be considered as an alternative to standard CPR to increase long-term survival after cardiac arrest," said Dr. Aufderheide.

Provided by Medical College of Wisconsin