

During CPR, more chest compressions mean more saved lives

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The chance that a person in cardiac arrest will survive increases when rescuers doing cardiopulmonary resuscitation (CPR) spend more time giving chest compressions, according to a multi-center study reported in *Circulation: Journal of the American Heart Association*.

"Chest compressions move blood with oxygen to the heart and the brain to save the brain and prepare the heart to start up its own rhythm when a shock is delivered with a [defibrillator](#)," said Jim Christenson, M.D., lead author of the study and clinical professor of emergency medicine at the University of British Columbia. "We found that even short pauses in chest compressions were quite detrimental."

The proportion of time during CPR that rescuers spend giving chest compressions during each minute of CPR, called the chest compression fraction (CCF), is extremely variable.

Prior to 2005, interruptions to chest compressions resulted in less than 50 percent of total CPR time being spent on chest compressions. However, the 2005 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care emphasized the importance of minimizing interruptions in chest compressions. This resulted in some emergency medical services (EMS) agencies achieving a CCF between 60 percent and 85 percent, Christenson said.

Researchers analyzed data from 78 EMS agencies in seven locations that

were part of the Resuscitation Outcomes Consortium (ROC), a group of 11 regional clinical centers in Canada and the United States that study promising out-of-hospital therapies for [cardiac arrest](#) and [traumatic injury](#).

The study is the first to analyze CPR tracings in a large group of patients. Automated external defibrillators measured the presence and frequency of chest compressions for each patient.

Patients were studied if they had a ventricular fibrillation or pulseless ventricular tachycardia cardiac arrest prior to EMS arrival between December 2005 and March 2007.

[Ventricular fibrillation](#) or pulseless ventricular tachycardia are abnormal heart rhythms in which the heart's lower chambers contract erratically or extremely rapidly and pump little or no blood.

In the 506 cases analyzed, researchers found that a return to spontaneous circulation was achieved 58 percent of the time when the CCF was 0 percent to 20 percent, and up to 79 percent when the CCF was 81 percent to 100 percent.

Return of spontaneous circulation means that the heart begins pumping blood effectively on its own.

Survival to hospital discharge occurred in 12 percent of patients when CCF was 0 percent to 20 percent. It increased to nearly 29 percent when CCF was 61 percent to 81 percent, but dropped slightly to 25 percent when CCF was 81 percent to 100 percent CCF.

Researchers said the slight drop in survival in the group with the highest CCF rate was likely due to the small sample size of the study and wide confidence limits, although they acknowledge the possibility of a plateau

effect when CCF is above 80 percent.

"There was roughly a 10 percent increase in the chance of survival for every 10 percent increase in the chest compression fraction," Christenson said.

More study is needed to identify the ideal CCF or to show when compressions are the most important, such as immediately before or after delivery of a shock, Christenson said.

"We should continue chest compressions as much as possible, only pausing to do things that are proven to be medically beneficial," he said.

For bystanders, the results emphasize the lifesaving potential of learning CPR and delivering chest compressions.

"The chest compressions you do on a loved one are one of the most important things that can be done," Christenson said. "If you feel rusty or are not confident giving mouth-to-mouth ventilation along with chest compressions then just do chest compressions. Even by themselves, [chest compressions](#) can make a difference."

Source: American Heart Association ([news](#) : [web](#))

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