

In first real-world example, study shows mechanical and manual CPR produce equivalent survival

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Mechanical CPR, in which a device is used by Emergency Medical Service (EMS) providers to deliver automated chest compressions during cardiac arrest resuscitation care, is associated with an equivalent survival rate for patients experiencing cardiac arrest outside of the hospital as manual CPR, according to new findings from a team of researchers at the Perelman School of Medicine at the University of Pennsylvania. The study is the first large scale, real-world proof that mechanical CPR may be an equivalent alternative to manual CPR for treating patients experiencing extensive cardiac arrest episodes and requiring advanced life support services. The results are being presented during the American Heart Association Scientific Sessions.

Previous research has questioned the effectiveness of mechanical CPR, citing concerns about costs, and the time it takes to apply the device. Other studies have suggested that while there is some low-quality evidence showing that mechanical CPR can improve consistency of [chest compressions](#), evidence showing the effect on survival rates and neurological outcomes is lacking.

"The takeaway here is that these devices may very well be a useful alternative to manual CPR for patients who may be in need of advanced [life support](#)," said the study's corresponding author Benjamin S. Abella, MD, MPhil, an associate professor of Emergency Medicine and clinical research director of the Center for Resuscitation Science at Penn

Medicine. "This information holds important possibilities for EMS providers who may be located in a rural area, or whose patients may be in transit to a hospital for an extended period of time due to traffic or other conditions. Patients who have extended cardiac arrest duration likely need proper administration of CPR for a longer time, which is where the mechanical devices may play a role, as they remove the element of human error and fatigue.

In the study, researchers analyzed more than 10,000 cardiac arrest cases outside of a hospital, of which 18 percent received mechanical CPR from an EMS provider, and 81 percent received manual CPR. Overall, manual CPR was associated with better outcomes overall. However, the researchers suspected the information was skewed based on the fact that good outcomes are more likely in cases where a pulse is regained quickly. In most of these cases, mechanical CPR would not be available or necessary. After accounting for the amount of time the patient experienced the cardiac episode and removed incidents where the patient regained a pulse quickly, the results showed that patients who received mechanical CPR were eight percent more likely to regain a pulse than those who received manual CPR.

"In recent years, proper administration of CPR has become an important focus of successful resuscitation, leading many EMS agencies to adopt mechanical CPR devices in an effort to provide consistent compressions while transporting cardiac arrest patients to hospitals," Abella said. "Now that we know the survival rates are equivalent for mechanical CPR and that the EMS providers aren't causing harm to these [patients](#), we can start designing more advanced studies that take other characteristics of [cardiac arrest](#) into account."

Study authors suggest further research is necessary to fully realize the effectiveness of mechanical CPR and factors associated with its survival rate.

Provided by University of Pennsylvania School of Medicine

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