

Use of emergency CPR device rising despite lack of evidence

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Despite significant cost and minimal evidence that mechanical resuscitation devices benefit patients in cardiac arrest more than resuscitation performed by people, the devices are being used more often than ever, says a new study.

The research, published this month in the *Journal of the American Medical Association (JAMA)*, found a fourfold increase of the cardiopulmonary resuscitation (CPR) devices among emergency medical technicians in the U.S. over a six-year period.

"It was particularly surprising because the mechanical CPR has not been tested for effectiveness by the FDA, even though it was approved by the FDA," says T. Greg Rhee of UConn Health, and a study author. "We don't really know if it is effective in terms of keeping people alive and whether it is cost effective."

Rhee, along with collaborators at Yale University and University of California, San Francisco, reviewed data from 2010 to 2016, for 892,022 patients nationally who were identified by emergency [medical professionals](#) as having an out-of-hospital cardiac arrest.

In settings outside of hospitals, CPR performed manually is still done much more often than by machine—about 69% of the time, the researchers found. However, the mechanical use rose steeply during that time period—from about 2% in 2010 to 8% in 2016.

Increasingly, EMTs are using the devices, even though it's not clear whether it is more effective than CPR performed by hand, says Rhee, assistant professor of public health sciences who specializes in population-based clinical outcomes research and health care policy.

Scope of the problem

According to the federal Centers for Disease Control and Prevention, every year in the United States, about 735,000 people have a heart attack.

CPR, which is to be done when the heart stops beating, can double or

triple the chances of survival after cardiac arrest, when done immediately by keeping the blood flow active, says the American Heart Association.

An increase in incidents of cardiac arrests being treated outside of hospitals along with anecdotal evidence on an uptick in the use of the mechanical intervention helped spur the decision to do the study, according to Rhee.

CPR is used on the vast majority of people who suffer cardiac [arrest](#) outside of hospital settings. Mechanical CPR devices are expensive and prior clinical trials have not provided evidence of benefit for patients when compared with manual CPR, the authors say.

The increase is particularly worrisome, not only because of the uncertainty of clinical benefit associated with device use, but also because of the devices' known significant costs; mechanical CPR devices are often priced higher than \$10,000 per unit.

"Given the high costs of mechanical CPR devices, better evidence is needed to determine whether these devices improve clinically meaningful outcomes for patients treated for out-of-hospital [cardiac arrest](#) by emergency services professionals to justify the significant increase in their use," the researchers wrote.

Rhee says one possible reason for the increased use of machine CPR is marketing done by medical [device](#) companies. But more research needs to be done on that question, he says.

More importantly, according to Rhee, more research must be done to determine the effectiveness of machine versus manual CPR, which the researchers are now planning to pursue.

"This is more like an initial step to build further research on mechanical CPR used outside of the hospital setting," says Rhee.

More information: Peter A. Kahn et al, Use of Mechanical Cardiopulmonary Resuscitation Devices for Out-of-Hospital Cardiac Arrest, 2010-2016, *JAMA Network Open* (2019). [DOI: 10.1001/jamanetworkopen.2019.13298](https://doi.org/10.1001/jamanetworkopen.2019.13298)

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