

# Researchers find new CPR method increases survival rate by 50 percent

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A five-year clinical trial led by University of Minnesota Medical School researchers has led to a new method of cardiopulmonary resuscitation (CPR) that improves long-term survival rates with good brain function by 50 percent.

The new technique goes beyond the standard hands-only compression-decompression method to include two devices that increase blood circulation. Researchers found that the new device combination caused the heart and brain to receive nearly three times more [blood flow](#) during each compression-decompression cycle when compared to standard CPR.

Currently, nearly 300,000 Americans suffer out-of-hospital cardiac arrest every year, and overall [survival rates](#) average only 5 percent. Poor survival rates persist in part because manual [chest compressions](#) and ventilation, termed standard CPR, is inherently inefficient, providing less than 25 percent of normal blood flow to the heart and brain.

"The current method of CPR has saved countless lives and is an indispensable tool in emergency medicine, but we want to bring to light the potential of using this new dual device system in combination with compression-decompression," said Demetris Yannopoulos, M.D., Assistant Professor of Medicine and Research Director of Interventional Cardiology at the University. "This dual device system can not only increase survival rates, but can improve [brain function](#) after cardiac arrest."

According to Yannopoulos, the study's authors will recommend the method as the new standard for the American Heart Association. The device combination method is also a prospective treatment for shock and head injury, as it augments blood flow to the brain and other tissues.

In the new method, one device (ResQPump) consists of a suction cup that attaches to the patient's chest. It includes a handle to manually lift the chest after each compression, stimulating blood flow. A second device (ResQPOD) connects to the patient's airway with a facemask or breathing tube and prevents air from rushing into the lungs while the first device raises the chest. Combined, the two create a greater vacuum in the chest, pumping blood to the heart and brain more effectively.

The advance comes 50 years after the now-standard method of CPR was initially developed.

"We are moving from prehistoric times – relying only on our hands – to modern times, implementing tools to treat victims," said Keith Lurie, M.D., Professor of Medicine and Emergency Medicine at the University. "This advance is a product of collaboration between emergency medicine specialists, cardiologists, anesthesiologists, neurologists, and countless other professions. A multidisciplinary environment was absolutely necessary for our success."

CPR is an important rescue skill used to treat cardiac arrest, a condition characterized by sudden, abrupt loss of heart function. CPR can stimulate a small amount of blood flow to the heart and brain to "buy time" until a normal heart beat is restored by defibrillation or with the aid of drugs.

The CPR device (ResQPump, also called CardioPump) and the impedance threshold device (ResQPOD) are manufactured by Advanced Circulatory Systems in Roseville, Minn.

"By partnering with Advanced Circulatory Systems on their mission to restore life and improve quality of living for patients suffering cardiac arrest, we were able to develop devices that can advance a new model of collaborative patient care forward," said Yannopoulos.

Provided by University of Minnesota

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