

Statewide initiative associated with improved cardiac arrest outcomes

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Statewide efforts to equip family members and the general public with the know-how and skills to use cardiopulmonary resuscitation (CPR) and automated external defibrillators (AEDs) in the home or in public coincide with improved survival and reduced brain injury in people with sudden cardiac arrest. The data, collected over a five-year period, is scheduled for presentation at the American College of Cardiology's 65th Annual Scientific Session.

The statewide program, part of the HeartRescue Project, trained family members and bystanders to recognize the signs of [sudden cardiac arrest](#), quickly call emergency responders, and use CPR or AEDs. The study is the first to separately track the effects of such interventions on cardiac arrests in public places and private homes.

"Survival is notoriously worse in private homes, where the majority of cardiac arrests occur. Little is known about whether broader efforts to teach people to recognize cardiac arrest and act quickly also impact home cardiac arrests, where the bystander is typically a family member," said Christopher B. Fordyce, M.D., co-chief fellow at the Duke Clinical Research Institute and lead author of the study. "What's interesting about this study is it's the first time a statewide intervention has improved both public and residential cardiac arrest outcomes."

The researchers analyzed 8,269 cases of cardiac arrest between 2010 and 2014 collected from the North Carolina Cardiac Arrest Registry to Enhance Survival. In 2010, bystanders administered CPR in 61 percent

of public cases and 28.3 percent of in-home cases. In 2014, the rate of bystander CPR rose to 70.6 percent of public cases and 41.3 percent of in-home cases. The rate of AED use in private homes by non-EMS first responders (police, firefighters, etc.) also rose from 42.2 to 50.8 percent over the same period. There was not a statistically significant increase in non-EMS first responder AED use in public places, which Fordyce attributes to timely defibrillation by EMS.

While the researchers did not directly compare survival rates and neurological outcomes with whether individual patients received bystander CPR or defibrillation, they did find increases in both over the duration of the study. The rate at which cardiac arrest patients survived until their discharge from the hospital rose from 10.8 to 16.8 percent for public cardiac arrests and from 5.7 to 8.1 percent for cardiac arrests in the home. The rate at which patients only suffered minor losses in brain function or regained it fully increased from 4.9 to 6.1 percent at home and from 9.5 to 14.7 percent in public.

"The absolute rates are small, but the relative changes were pretty large," Fordyce said. "That's only over five years, so if we continue to educate the [public](#), we can continue to improve outcomes."

Prior studies have shown a correlation between bystander-initiated CPR and survival rates for cardiac arrests that occur outside a hospital. A 2015 study of the same HeartRescue Project initiatives in North Carolina, published in the *Journal of the American Medical Association*, showed that survival rates for out-of-hospital cardiac arrests more than doubled when bystanders used both CPR and an AED before emergency medical services arrived.

The area from which the cases of cardiac arrests were drawn is a collection of urban, suburban and rural counties that account for approximately a quarter of North Carolina's population but included all

EMS agencies. Thus, the researchers were able to analyze every [cardiac arrest](#) in the sample area from 2010 to 2014.

There are more than 420,000 out-of-hospital cardiac arrests in the United States each year, according to the American Heart Association. Fordyce said the results of this study were encouraging, but considering how low the absolute [survival rates](#) are, there is still room for improvement. Future research in this area could include interventions such as deploying AEDs into more private homes when cardiac arrests occur and using mobile technology to notify nearby citizens trained in CPR who can initiate this care quickly.

There are several resources related to CPR and AED training available from the American College of Cardiology at CardioSmart and from the HeartRescue Project.

"You can do something," Fordyce said. "You don't have to just call 911 and stand while your loved one is on the floor. Start chest compressions immediately. Your actions actually make a difference."

More information: The study, "Statewide Initiatives Improve the Care and Outcomes of Patients with Out-of-Hospital Cardiac Arrest at Home and in Public Locations: Results from the HeartRescue Project," will be presented on April 3, 2016, at 9:45 a.m. CT/10:45 a.m. ET/3:45 p.m. UTC at the American College of Cardiology's 65th Annual Scientific Session in Chicago. The meeting runs April 2-4.

Provided by American College of Cardiology

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