

# Initiative Boosts Cardiac Arrest Survival in Ariz.

BY DOUG BRUNK

FROM THE ANNUAL MEETING OF THE CALIFORNIA CHAPTER OF THE AMERICAN COLLEGE OF EMERGENCY PHYSICIANS

SAN DIEGO —The dismal survival rate of out-of-hospital cardiac arrest—only 5%-10%—varies from region to region, according to a database study.

"I don't think the public really thinks about or understands that you have a 500% better chance of survival if you collapse in one city than another," Dr. Ben Bobrow said at the meeting.

"I believe that making cardiac arrest a reportable illness would help improve survival rates," he noted. "Why shouldn't people in the community know what their survival rates are? [It is] similar to knowing what the crime rates are," said Dr. Bobrow, medical director of the Bureau of Emergency Medical Services and Trauma System for the Arizona Department of Health Services, Phoenix.

In 2004, Dr. Bobrow led an effort to regionalize the state's cardiac arrest care by collecting and analyzing data from first care reports of out-of-hospital cardiac arrest (OHCA) patients on whom resuscitation was attempted in the field (Prehosp. Emerg. Care 2008;12:381-7). Data

for the effort, known as the Save Hearts in Arizona Registry and Education (SHARE) program, were initially obtained voluntarily from 35 EMS agencies and are now obtained from more than 80 EMS agencies (www.azshare.gov).

Dr. Bobrow found that between Jan. 1, 2005, and April 1, 2006, 1,484 cases of OHCA were reported by the 35 departments, of which 1,104 were of presumed cardiac etiology occurring prior to arrival of EMS. Only 37 (3.4%) of 1,076 OHCA patients survived to hospital discharge. Bystander CPR had a positive effect on survival (odds ratio of 3.0), yet was provided only 25% of the time.

Because there were so few OHCA survivors, the SHARE program's directors decided to modify the state's OHCA protocol based on current evidence, and to track the results closely.

The program's directors adopted a multipronged strategy that was disseminated to the state's EMS agencies: training EMS dispatchers to provide chest compression-only instructions to 911 callers; advocating for chest compression-only CPR to increase the likelihood that bystanders will provide CPR; increasing the odds of early defibrillation by establishing a more structured public-

access defibrillation program; enabling minimally interrupted cardiac resuscitation by EMS providers; and a creating a statewide system of cardiac receiving centers where patients would get guideline-based postarrest care such as therapeutic hypothermia.

One of the main changes was the shift



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DR. BOBROW

from conventional CPR (with breaths) to chest compression-only CPR (without mouth to mouth). "There's a lot of data to show that even brief, 10-second interruptions in chest compressions are enough to decrease the chance of successful defibrillation," Dr. Bobrow said.

The program used a series of public service announcements to educate citizens in Arizona about how to perform chest compression-only CPR. The state also partnered with the American Heart

Association to launch a hands-only CPR campaign (handsonlycpr.org).

At the AHA's 2009 Resuscitation Science Symposium, the SHARE team presented data showing that the overall incidence of bystander CPR rose from 25% to 40% after the program, while the overall incidence of hands-only CPR rose from 16% to 77%.

"This really simple intervention of bystander chest compression-only CPR was incredibly powerful," Dr. Bobrow remarked. "Survival was significantly better for OHCA victims if they received chest compression-only CPR than no CPR or conventional CPR."

Evaluation of the initial 1,500 OHCA cases in the state revealed that the rate of survival to discharge for the subset of patients with a witnessed collapse and ventricular fibrillation upon EMS arrival increased significantly, from 20.3% to 39.5%, after centers earned a CRC designation. The all-rhythm survival rate to hospital discharge also rose significantly, from 10.1% to 20.1%. ■

**Disclosures:** Dr. Bobrow disclosed that he has received funding from the National Institutes of Health, the American Heart Association, and the Medtronic Foundation.

## Rescue Breathing Adds No Benefit to Chest Compressions

VITALS

**Major Finding:** Survival rate after cardiac arrest was 12.5% with chest compression alone and 11.0% with chest compression plus rescue breathing in a U.S./British study; corresponding survival rates were 8.7% and 7.0% in a Swedish study.

**Data Source:** Two randomized, controlled trials with a total of 3,217 patients.

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BY ROBERT FINN

FROM THE NEW ENGLAND JOURNAL OF MEDICINE

Two independent, randomized, controlled trials found no statistically significant differences in survival between patients in cardiac arrest who are given standard cardiopulmonary resuscitation with chest compression and rescue breathing, compared with those given chest compression alone.

Both studies showed that, when performed by laypeople, CPR with compression alone was at least as effective as compressions plus rescue breathing, while being simpler to teach and perform.

In 2008, modifying previous CPR recommendations that had stood for decades, the American Heart Association introduced the concept of "hands-only CPR." Citing numerous animal and human studies, the AHA announced that chest compressions alone were acceptable and potentially lifesaving when performed by people not

trained in conventional CPR or those who are unable or unwilling to perform rescue breathing in addition to chest compressions.

The newly published randomized, controlled trials confirm and extend the conclusions of the earlier studies. In one of the new studies, dispatchers in London and in two counties in the state of Washington randomly delivered compression-only or standard CPR instructions to 911 callers (999 in London).

That study, led by Dr. Thomas D. Rea of the University of Washington, Seattle, eventually enrolled 1,941 patients, of whom 981 received chest compression alone and 960 received chest compression plus rescue breathing. Among those patients, 12.5% who received chest compression alone and 11.0% who received compression plus rescue breathing survived to hospital discharge. The difference was not statistically significant (N. Engl. J. Med. 2010;363:423-33).

The investigators, reasoning that the two techniques might have different neurologic consequences, also investigated the proportion of patients who survived with favorable neurologic status. No significant difference was seen on that measure either.

One difference between the two

groups approached—but did not reach—statistical significance. Patients who had a cardiac cause of arrest were somewhat more likely to survive to discharge if they received compressions alone (15.5% vs. 12.3%,  $P = .09$ ).

In the other new study, investigators randomized 1,276 patients who were the subjects of emergency calls to the 18 emergency medical dispatch centers in Sweden. At the direction of dispatchers, 620 received compression-only CPR and 656 received standard CPR. Dr. Leif Svensson of the Karolinska Institute, Stockholm, and his colleagues found that the rate of 30-day survival was 8.7% in the compression-

only group and 7.0% in the group receiving standard CPR (N. Engl. J. Med. 2010;363:434-42).

Several planned subgroup analyses in that study also failed to reveal significant group differences. In particular, the survival rates did not differ significantly with age, with the interval between the call and the first emergency medical services response, or with the interval between the call and the first cardiac rhythm.

Citing earlier studies, the investigators wrote, "Complete occlusion of the airways does not reduce the chances of survival if reasonable circulation is provided by chest compression." ■

MY TAKE

### With CPR, Less May Be Better

The straightforward conclusion from the primary analyses of these studies is that continuous chest compression without active ventilation, which is simpler to teach and perform, results in a survival rate similar to that with chest compression with rescue breathing. Equally straightforward is the message that advocating continuous chest compression without ventilation should increase the frequency of bystanders effectively performing CPR and therefore increase the chances of survival after cardiac arrest. One suggestion made by [the U.S./British researchers] deserves some attention:

that mouth-to-mouth ventilation is performed so poorly by bystanders that this periodic interruption for "ventilation" succeeds solely in diminishing coronary flow. Nonetheless, CPR courses should teach rescue breathing, since it is important in cases of cardiac arrest from obvious respiratory failure, which include most cardiac arrests in children and some in adults.

*Excerpted from an editorial by MYRON L. WEISFELDT, M.D., of Johns Hopkins Medicine, Baltimore (N. Engl. J. Med. 2010;363:481-3). He had no relevant conflicts of interest.*