Dr. Cawley

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ARDIAC ARREST

...Victims can be saved by a new first-aid technique

By Patrick Young
FROM SEATTLE

therine Brudevold's heart stop-s she shopped here in a super-t. David Evans collapsed twice, at his office and four months while seeing a friend off at a tation. Both were victims of car-

To Your Health

rrest, yet both are alive today, t because of a highly success-nd unusual emergency-medicine m.

this city of 530,000, one citizen en is trained to give cardiopul-y resuscitation, or CPR, a closed-massage that substitutes for the beat of a person in cardiac ar-

tims of such sudden heart at-almost always die where they ut in the past five years here, 's specially trained firemen and ry have performed 554 success-suscitations in which "clinically persons without pulse or respira-ere revived, hospitalized, and eventually returned home, usually to resume normal lives.

Your Consuming Interests

If you are destined to suffer cardiac arrest, then you'll be lucky if you're in Seattle when it happens.

"In Seattle, if you collapse on the street [in cardiac arrest], you essentially have a 50-50 chance of being brought back to life by our out-of-hospital first-aid system, and a one-in-four chance of going back home again," says Lt. Michael Olsen of the Seattle fire department.

Seattle's life-saving program is the brain child of Dr. Leonard A. Cobb, professor of medicine at the University of Washington School of Medicine and chief of cardiology at Harborview Medical Center here. Cobb wanted to do something to reduce the number of heart-attack victims who die before getting to the hospital—estimated at up to 450,000 annually in the United States.

Working with Gordon F. Vickery, then Seattle's fire chief, Cobb devised a program called Medic I. A group of firemen, all volunteers, was given 1,018 hours of paramedical training. Medic I began operation in March 1970, with the paramedics manning several mobile-care units. In the mid-1960s physicians in Belfast, Northern Ireland, had first shown that the use of such specially equipped units could cut heart-attack deaths.

Civilian Volunteers

Medic I succeeded so well—"we were doing better at resuscitating people than we ever thought we'd do," says one physician—that Cobb urged that every fireman be trained in CPR. He also suggested that fire engines, as well as mobile-care units and fire-department "aid cars," be used to answer medical-emergency calls. Chief Vickery asked why CPR couldn't be taught to civilian volunteers.

"We couldn't give him an excuse why it wouldn't work, and that is how Medic II was born," says Dr. Hernan Alvarez III, a University of Washington cardiologist who has worked with Medic I since its inception.

Citizens' Training Program Spreads

The success of Seattle's Medic I program has spurred similar programs in several other U.S. cities and helped generate new interest in training citizens in cardiopulmonary resuscitation (CPR).

CPR training programs are available in a number of communities, large and small. The American Heart Association says its local chapters can provide information on where CPR courses are available. And the American Red Cross is readying a vigorous effort in CPR training. "Within the next few months all Red Cross chapters will be offering this service," says a Red Cross spokesman.

Medic II is the name given the program's citizen-training portion. It is a three-hour course in CPR given free by fire-department instructors. Officials here estimate it costs $1.25 to train each CPR student. To date, 96,400 people have taken the training, 78,800 from Seattle and the rest from surrounding King County.

Worth the Risk

Medic II training began in October 1971. Red Cross officials opposed it initially; they were concerned about the risk of injury to people who received CPR. The technique involves a strong, rhythmic compression of the chest that can break bones and cause internal injury.

But Cobb and his colleagues argued that the risk was worth it. In cardiac arrest, brain damage generally occurs after five or six minutes, unless blood circulation is restored and oxygen reaches the brain. Early experience with Medic I showed that patients who were resuscitated in less than five minutes survived 2½ times more often than those resuscitated after five minutes.

"A broken rib, a damaged liver, a fractured collarbone can be handled, but a dead brain can't be," says Lieutenant Olsen, who serves as officer-in-

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'The alternative to breaking a rib is sending the person to the coroner. . . .'

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charge of the Medic I program. "The alternative to breaking a rib is sending the person to the coroner with his ribs intact."

Quick Response

Today Medic I operates four mobile coronary-care units, staffed by 48 paramedics working in two-man teams. In addition, heart-attack victims can expect help from one of the fire department's nine aid cars, whose crews are graduates of an 80-hour emergency-medicine course, or from oxygen-equipped fire trucks from 35 stations around the city, whose crews have passed advanced first-aid courses.

"The real key to our success is our quick response time," says Olsen. "From the time the fire department says 'hello' [on the telephone] to the arrival of a unit on the scene averages 3.1 minutes."

Cardiac-arrest victims can be taken to 14 hospitals throughout the city, where they are admitted directly to the coronary-care unit, rather than to the emergency room. "A substantial proportion of the in-hospital [heart] deaths occur between the emergency entrance and the front door of the coronary-care unit," says Alvarez. He and Cobb say the innovation here of direct admittance has saved additional lives.

No Complaints

Medic II has proved itself as well. Today about 20 per cent of the resuscitations in Seattle are begun by people on the scene before a fire department unit arrives.

In the first two years of Medic I, when resuscitations were almost always begun by firemen, 173 of 511 cardiac arrests, or 34 per cent, were revived, and 57 lived to leave the hospital. In the fifth year, with heavy citizen involvement, 147 of 287 resuscitation attempts, or 51 per cent, succeeded, and 76 patients lived to return home.

To date, no one has complained or filed a lawsuit after receiving CPR on the street.

Sudden-death heart attacks, in which the victim dies within minutes, have long puzzled physicians. When the Seattle program began, doctors here assumed most such attacks involved a myocardial infarction, the death of heart muscle.

But to their surprise, doctors found that fewer than half of the resuscitated cardiac-arrest patients showed any evidence of damaged heart muscle. Instead, it became clear that most of the cardiac arrests resulted from ventricular fibrillation, in which the heart's electrical system short circuits and the heart quivers rather than pumps.

This finding and later studies of cardiac-arrest patients are giving researchers here better insights into sudden-death heart attacks. "We're hoping we can come up with a profile that will predict who is at greater risk of ventricular fibrillation," says Alvarez. "But we can't do it yet."