



Heart Attack Hope

Pilot Study May Stop Attacks in Their Tracks

By KATHLEEN SMITH
Texas Medical Center News

When you look at Carl Chargois, you're looking at progress.

"People tell me to act my age, but I don't know what they're talking about," he said.

Chargois keeps active by bowling, hunting, fishing, golfing ... and riding a motorcycle.

Not one to let retirement slow him down, the 69 year old didn't think twice when he hopped on his motorcycle the morning of Nov. 10. The road took the former Maxwell House Coffee percolator operator, who lives at the south end of Houston near Hobby Airport, to the complete opposite end of town, near Spring.

On the way home he had a craving for some pecans, so he took a detour on the 610 North Loop to Canino's produce market on Airline Drive. He never expected the life-changing event that would happen next.

"I pulled into the parking lot," Chargois said, "and I had only walked about five steps when I felt this incredible pressure on my chest and began sweating profusely."

He had to back up and take a seat on his bike.

Chargois said the staff at Canino's was extremely helpful. They offered him orange juice, bottled water and a telephone to call a friend. They even offered to do the dialing.

The friend asked Chargois if he was having a heart attack. Thinking that his friend might be on to something, Chargois hung up the phone and asked the market staff to call 9-1-1.

That's when Bonnie Richter appeared.

Richter has been a Houston Fire Department paramedic for 8.5 years. She is a graduate of the University of Houston, and before her fire department career, was a physical therapist at Ben Taub General Hospital.

"You know the trauma patients



READY TO RIDE—Paramedic Bonnie Richter responded to a medical emergency Nov. 10, when motorcycle enthusiast Carl Chargois had a heart attack. A partnership pilot study between Memorial Hermann Hospital and the Houston Fire Department is testing how clot-dissolving drugs re-open clogged arteries. The quick treatment has led to shorter hospital stays and reduced long-term problems for the patients. Chargois was back on his bike and ready to ride a month after the ordeal. Richter has trained 350 paramedics in Harris, Walker and Montgomery counties to respond to heart-attack calls with the therapy.

you hear about on the news who are taken to Ben Taub? The next day they would often become my patients," she said.

Richter said her career began to

feel stagnant, and a former boyfriend, who was a police officer, told her that he thought she would be a good paramedic.

When Richter responded to the

Canino's emergency, she soon recognized that Chargois was in trouble.

"He had pretty-much stopped sweating at that point," she said, "and when we hooked him up the electrocardiogram there were some obvious changes signaling a myocardial infarction."

Richter said she and her team talked to Chargois about what was happening.

"He was one of the best kinds of patients," she said. "He didn't get alarmed and he was responsive - easy to talk to and he had a lot of really good questions. He told me, 'This is not at all what I expected a heart attack to feel like.'"

CARDIAC TACTICS

Most heart attacks begin slowly, unlike in the movies where dramatized chest clutching leaves little doubt as to what is happening. Often, people don't understand heart-attack

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UH, Methodist Sign 30-Year Agreement

Will Collaborate to Advance Biomedical Research, Clinical Care

The Methodist Hospital and the University of Houston System have signed a 30-year agreement to jointly develop health service and education programs and to participate in research efforts and technology transfer.

"Drawing on the University of Houston's excellence in science, we can accelerate our own research and significantly improve the quality of health care for Houstonians and increase biomedical knowledge for the world," said Ron G. Giroto, president and CEO of The Methodist Hospital System.

"It's become increasingly clear that no one entity can perform the level of sophisticated biomedical research required for continued excellence; or, for that matter, provide the full range of programs needed to develop top-flight health care professionals," said Jay Gogue, UH System chancellor and UH president.

The agreement calls for Methodist and UH to share facilities at both

("Agreement" continued page 18)



HI-TECH CHECK—Morgan Dunn O'Connor, chair of the University of Houston System board of regents, gets her vital signs checked by a thermal imaging camera developed by UH's Infrared Imaging Group. The high-tech checkup took place at a Feb. 15 press conference announcing a 30-year collaboration agreement between The Methodist Hospital and the University of Houston. Onlookers include, from left, Ron G. Giroto, president and CEO of The Methodist Hospital System; Arthur C. Vallas, vice chancellor and vice president of research for the UH System and UH; Michael Lieberman, M.D., director of The Methodist Hospital's Research Institute; and Colin Puri, a UH computer science graduate student. (Photo by Jerome Crowder)

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warning signs and may wait too long before getting help. A few surefire warning signs include discomfort in the center of the chest that lasts for more than a few minutes, or comes and goes. Some compare the pressure to what it might feel like if an elephant was sitting on their chest. There may also be discomfort in one or both arms, the back, neck, jaw or stomach. Additionally, shortness of breath, profuse sweating, nausea or lightheadedness could accompany any of these symptoms.

Richard W. Smalling, M.D., Ph.D., head of The University of Texas Medical School's cardiology division and director of interventional cardiology at Memorial Hermann Hospital, and his team, have partnered with the Houston Fire Department on a study to stop heart attacks before a patient gets to the hospital. Houston is the nation's largest emergency medical service system to put a program of this type in place.

The Pre-Hospital Administration of Thrombolytic Therapy with Urgent Culpit Artery Revascularization, known as PATCAR, tests how the clot-dissolving drug Retavase reopens clogged arteries, returning oxygenated blood flow to the heart muscle and preventing further damage. The quick treatment leads to shorter hospital stays and reduced long-term problems for patients. The program celebrated its one-year anniversary last December.

Houston Emergency Medical Services' Physician Director David E. Persse, M.D., said Houston is the first major urban area in the nation to provide thrombolytic therapy to citizens with acute myocardial infarctions.

"The Houston Fire Department and The University of Texas Medical School at Houston have found ways to overcome the roadblocks to success prohibiting so many other communities from providing this level of care," he said. "The Houston success story will become the template for other communities to begin saving lives of heart-attack patients across the nation and around the world."

HEART ATTACK HISTORY

In the early 1960s, heart-attack patients were treated with an oxygen/morphine combination, and were for years. Treatment began upon arrival at the hospital. Mortality during that era was about 20 to 30 percent.

In the mid '60s, the ambulance system morphed into a more modern transportation mode, where they essentially became mobile intensive care units.

These vehicles could handle intensive coronary care, Smalling said, and patients could be continuously monitored.

"About that time, defibrillators were developed," he said. "Complica-

tions, including life-threatening irregular heart beats, could be treated and the heart could be shocked back into rhythm. Mortality dropped down to about 15 percent."

During the same period, Smalling said, different physicians tried various clot-dissolving drugs to restore heart health.

Most heart attacks are caused when a blood clot forms on an irritated area of an artery, usually over a blockage. This is called a ruptured plaque. A heart attack happens when the clot completely blocks off the flow of blood to the heart, causing that particular area of heart muscle to die.

"The heart's main function is acting as a pump. If part of that heart muscle doesn't work, then the pumping action is badly affected," Smalling said. "If enough heart muscle is affected, then the heart can't pump at all and a patient may die."

Smalling said the thought was that if a clot-dissolving drug could be given intravenously, the clot causing the heart attack would dissolve, and therefore stop the attack.

The results weren't so good - doctors waited too late to give the drug, bleeding complications were high, and heart attacks were not diagnosed quickly enough. An enzyme test was needed to confirm suspicions, but results weren't usually available until about 12 hours later. By the time patients received the intravenous therapy it was often too late.

In 1979, physicians at the University of Göttingen in Germany experimented with using catheters, similar to those used for angiograms, to infuse clot-dissolving medicine directly into the artery, rather than waiting for systemic delivery. It was given immediately upon learning of

patients' chest pains, rather than waiting for confirmed diagnoses.

SEEING IS BELIEVING

In 1979, K. Lance Gould, M.D., the UT Medical School Martin Bucksbaum Distinguished University Chair in Heart Disease, who was the school's chief of cardiology at the time, sent Larry Reduto, M.D., a former UT cardiology associate, to Germany to review the cases and determine if they were real.

After validating the German study, on Aug. 8, 1980, the first Texas heart attack patient - and one of the first in the United States - was treated with the catheterized clot-dissolving drug intercoronary streptokinase. Within about 30 minutes, the artery, which was completely blocked, opened up and the heart attack ceased.

"We want to prove that the time of onset pain to treatment can be shifted from three to four hours, down to one to two; this should shift the mortality rate to 2 percent or less." - Richard Smalling, M.D., Ph.D.

"Everybody cheered," Smalling said. "It was amazing."

Smalling said the success kicked off a U.S.-based study aiming to duplicate the German investigation.

"I was a youngster at the time," he said. "I began working with the team and when Dr. Reduto left, Dr. Francisco Fuentes, director of cardiac rehabilitation at UT Medical School and Memorial Hermann, and I took over the project."

The study demonstrated that by stopping a heart attack, blood flow to the heart muscle would improve, as well as heart muscle function. It set the stage across the country for development of other intravenous clot-dissolving therapies, such as tPA, which is now commonly used to treat strokes, and comparing them to intercoronary streptokinase.

Other Texas Medical Center institutions questioned the ethics of Smalling's team.

He said a study at one claimed that heart-attack patients did worse when they were catheterized and taken to surgery right away. It maintained that mortality was too high, and a six-week waiting period was required to see benefits of catheterization. However, Smalling said these patients were treated more than three or four hours after the beginning of the heart attack. By then, heart muscle that could have been saved was already dead. Interventional procedures wouldn't help, and only a bypass could possibly save the patient.

"It turns out, we were eventually proven right," Smalling said.

The key, he said, is to ideally open an artery with a clot dissolver within an hour of a heart attack's onset.

"Almost nobody dies," he said.

In the 1990s, there were a series of newer clot-dissolving drugs, and large-scale trials evaluating them against each other to determine which was the best. Additionally, coronary angioplasties came along to increase arterial blood flow.

"There's been a big debate over whether it's better to give clot-dissolving drugs early, and then if that doesn't work, do the angioplasty," Smalling said. "Others say to do angioplasties on everyone, because bleeding risks are too high. These arguments have continued until now."

THE FUTURE OF INFARCTION TREATMENTS

The heart-attack mortality rate in the United States is now at about 10 percent, but has plateaued for about 10 years.

"Only about one-third of heart-attack patients currently get either clot-dissolving drugs or angio-

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plasties," Smalling said, "because most end up in places that don't see large volumes of heart attacks. Once a patient arrives, the staff spends a few hours trying to figure out what to do—but by then, it's too late."

"Furthermore, it's been demonstrated that there isn't a big difference whether you get a clot-dissolving drug early, or do an angioplasty," Smalling continued. "The mortality rate is about the same."

There have been other trials where patients receive a clot-dissolving drug in the ambulance before arriving at the hospital versus just transporting the patient for an angioplasty, Smalling said. However, the patients who receive the clot dissolvers on the road end up being less sick than those who wait. They don't go into shock, often because their arteries open en-route to the hospital, he said.

"We see this as a one-two punch," Smalling said. "Right now, it normally takes one to two hours for a patient to call an ambulance once they have chest pains; it typically takes another

hour or two to get to the hospital and notify the necessary team members needed to take care of the patient. We're looking at three to four hours before most patients in the United States are treated for heart attacks."

Smalling and his team devised a plan for ambulances to carry the clot-dissolving drug Retavase, and for paramedics to administer it to patients. Most ambulances carry briefcase-sized electrocardiogram machines that have computers and defibrillators built into them. The computers can analyze the ECGs automatically and alert the paramedics if a heart attack is in progress.

It doesn't take much training, just 30 or 40 minutes, for a paramedic to learn to reliably interpret an ECG, Smalling said.

Smalling said by initiating treatment in the field, patients can then be transported to hospitals with catheterization laboratories, where they are taken right away to check if an artery is open, and if not, open it immediately.

The idea is to begin treating heart-attack patients like trauma patients. Just as not every hospital has a trauma center, not every hospital has a cath lab.

"Like trauma, this is a coordinated system of care," Smalling said. "We would like to see Memorial Hermann Hospital become a Level I cardiovascular center—just as we have a Level I trauma center—where we can do anything it takes to fix a patient and stop their heart attack."

Once a paramedic has diagnosed a heart attack in the field, an ECG is faxed to the Memorial Hermann emergency room where the ER doctor can confirm the paramedic's impression. Once the paramedic receives the OK, they administer a half of a dose of Retavase, plus a blood thinner and an aspirin on the spot. The whole process takes less than five minutes.

Smalling's team is then notified by a special text paging system called the "Heart BEEP."

He recounted a recent page that notified him when a 41-year-old Huntsville man had a heart attack. The patient walked into the city's hospital emergency room and had a cardiac arrest in their triage center. He actually died, they shocked him back, gave him the Retavase, and, because there is no cath lab at the Huntsville hospital, he was soon on his way to Memorial Hermann via LifeFlight.

"The LifeFlight crew brought the patient directly down the elevator and into the cath lab where we were already waiting," Smalling said. "He was still having discomfort, so we did an angiogram. The artery was still blocked, so we did an angioplasty. Within about 10 minutes of his arrival at the hospital, that patient's artery was reopened. The Retavase failed—as it does about half the time. If he had remained in Huntsville, he wouldn't be alive today, yet his artery was still opened faster than if he had just walked into any ER in Houston," Smalling continued. "His heart function is now almost normal, and he had hardly any damage."

Smalling said there are three ways for a heart-attack patient to become part of the PATCAR trial: if the Houston Fire Department responds to a call; a hospital, such as the case in Huntsville, has been certified to administer the therapy, does so, and calls for a patient transport; or an untrained paramedic team who is familiar with the trial calls LifeFlight directly, and since the air ambulance service carries the drugs, they can act as a peripheral hospital.

Paramedic Richter has trained 350 other paramedics in Harris, Walker and Montgomery counties on how to respond to heart attacks using PATCAR therapy.

Smalling has a target of 1,000 patients to complete the trial. To date, more than 80 patients have been treated. He has started a center in Lubbock and will shortly be starting them in Minneapolis and at Florida's Cleveland Clinic. If his grant is approved by the National Institutes of Health, he would like to see at least 20 centers across the United States, including several others in Houston. Smalling should know the outcome this summer. Then, he expects it will take three to four years to hit his target.

"We want to prove that the time of onset pain to treatment can be shifted from three to four hours, down to one to two; this should shift the mortality rate to 2 percent or less," Smalling said. "It could save 300 to 500 lives each day in the United States."

BACK ON THE BIKE

Although Chargois takes medicine for high cholesterol, this was his first heart-related problem. He was proactive about his health, getting regular physicals, and even went through a stress test—with normal results—two months prior to his heart attack.

Upon discharge from his eight-day hospital stay, Chargois checked in to the Memorial Hermann Outpatient Wellness Center. There he learned about the importance of an exercise regimen and spoke to a dietitian, who just happened to know Chargois' cardiologist rather well. She was registered and licensed dietitian Sharon Smalling, the wife of Richard Smalling.

One month after his heart attack, Chargois was back on his bike and ready to ride.

"I am more conscious of what I eat and what activities I involve myself in," he said. "I am a little more concerned about my overall well-being. I am fully aware that a lifetime of bad habits could cause me a problem."

Chargois, now 70, said he is adamant about sticking to his new, healthy program for the rest of his life—whatever length of time it may be.

"It is really up to me," he said. "They've given me all the tools, I've just got to use them." ■

BCM

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Clinical Research

Baylor College of Medicine is currently seeking volunteers for the following study.

Soy For High Blood Pressure

Baylor College of Medicine is doing a new study to determine if a daily dose of soy, a simple and natural food additive, can be used in place of standard high blood pressure medication. This study will be done on healthy postmenopausal women age 40 and over who are not taking hormone replacement therapy, are not taking high blood pressure medication, and are not vegetarians. Blood pressure levels must be moderately elevated (130/80 to 160/100). There are no costs to participate in this 6-week study, and each participant will receive compensation upon completion. Interested women should contact the Soy Study Coordinator at 713-798-6783.

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