

Quietly, doctors lift odds of surviving a heart attack

CAMDEN, N.J.

Death rates fall sharply as hospitals rich and poor streamline treatment

BY GINA KOLATA

Yvette Samuels was listening to jazz late one night when she felt a stabbing pain down her left shoulder. She suspected a heart attack — she had heard about the symptoms from watching a Rosie O'Donnell standup routine on television — and managed to scratch on the door that connected her single room to her neighbor's. He found her collapsed on the floor.

Paramedics arrived minutes later and slapped electrocardiogram leads on her chest, transmitting the telltale pattern of a heart attack to Our Lady of Lourdes Medical Center here.

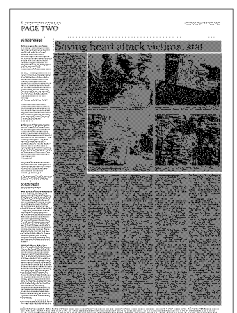
As the ambulance raced through the streets, lights swirling, sirens scream-

ing, Ms. Samuels, who took phone orders for a company that delivers milk, asked the paramedic, "Can this kill me?" He murmured yes, then told the driver, "Step on it!" She thought to herself, "This will be my last view of the world, the last time I will see the night sky."

Instead, she survived, her heart undamaged, the beneficiary of a revolutionary change in heart attack care. With no new medical discoveries, no new technologies, no payment incentives — and little public notice — hospitals in recent years have slashed the time it takes to clear a blockage in a patient's arteries and get blood flowing again to the heart.

The changes have been driven by a detailed analysis of the holdups in treating patients and a nationwide campaign led by the American College of Cardiology, a professional society for specialists in heart disease, and the American Heart Association. Hospitals across the country have adopted common-sense steps that include ambulance drivers' transmitting electrocardiogram readings di-

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Saving heart attack victims, stat

HEART, FROM PAGE 1

rectly to emergency rooms and the summoning of medical teams with a single call that sets off all beepers at once.

From 2003 to 2013, the death rate from coronary heart disease has fallen about 38 percent, according to the American Heart Association citing data from the Centers for Disease Control and Prevention. The National Heart, Lung and Blood Institute, the primary federal agency that funds heart research, says this decline has been spurred by better control of cholesterol and blood pressure, reduced smoking rates, improved medical treatments — and faster care of people in the throes of a heart attack.

“It may not be long before cardiovascular disease is no longer the leading cause of death” in the United States, said Dr. Michael Lauer, the director of the Division of Cardiovascular Sciences at the National Heart, Lung and Blood Institute.

And care has improved not just in elite medical centers, but in local hospitals like Our Lady of Lourdes, here in a city that is tied for the title of the poorest in America. Disparities that used to exist, with African-Americans, Hispanics and older people facing the slowest treatment times, have disappeared, Dr. Harlan Krumholz, a cardiologist at Yale, and his colleagues said in a paper in *Archives of Internal Medicine*.

The reinvention of protocols to hasten treatment is part of a broad rethinking of how to tackle heart disease, which accounts for one out of every seven deaths in the United States or 375,000 a year. Just this month, powerful drugs from the first new class of medicines to lower bad cholesterol levels in a generation neared approval by the Food and Drug Administration. At the same time, new, less invasive methods for replacing aged heart valves are raising hopes that ailing patients will be able to live longer.

LACK OF SPEED KILLS

In a heart attack, a blocked artery prevents blood from reaching an area of heart muscle. At first, cells are merely stunned, but as minutes tick by, they start to die. The way to save the heart is to open the blocked artery by pushing in a catheter, inflating a tiny balloon that shoves the blockage aside, and holding the artery open by inserting a stent, a tiny wire cage.

But leading cardiologists had despaired of reaching a national goal set by the American College of Cardiology and the American Heart Association of getting this done for at least half of heart attack patients within 90 minutes of arrival at a hospital. Often it took more than two hours for blood to flow to a patient's heart again.

Now, nearly all hospitals treat at least half their patients in 61 minutes or less, according to the most recent data from the American College of Cardiology. At Yale-New Haven Hospital, where half the patients used to have to wait at least 150 minutes before their arteries were opened, the median time is now 57 minutes; at the Mayo Clinic and at major academic centers like New York-Presbyterian Hospital, it is 50 minutes — a statistic that, amazingly, Lourdes matches.

Some cardiologists still express sadness at the price many patients paid when care was much slower. Dr. Mahesh Bikkina, the director of the cardiac catheterization laboratory at St. Joseph Regional Medical Center in Paterson, N.J., tells his trainees about the old days: heart muscles that literally tore, with blood leaking out of holes, and valves that ruptured, leading to sudden death if not repaired immediately with open-heart surgery.

“I tell them you will read about these things in textbooks,” Dr. Bikkina said. “You will almost never see them.”

Neurologists watched with envy as cardiologists sharply reduced their times. For strokes, too, the time it takes to be treated with the clot-dissolving drug tPA is of the essence. “Time is brain,” neurologists say. They began to copy the cardiologists.

“Seeing that someone else could do it was remarkably motivating and a little bit competitive,” said Dr. Lee H. Schwamm, the chief of stroke services at Massachusetts General Hospital.

The payoff from the changes has been breathtaking, experts say.

“Heart disease mortality is dropping like a stone. This is a reason why,” said Dr. Eric Peterson, a cardiology researcher at Duke. “And stroke has fallen to fifth as a major killer. This is a reason why.”

A CITY AT RISK

No city seemed more in need of improved heart care than Camden, where 42 percent of the population lives in poverty and heart disease risk factors abound, according to various studies. Obesity is rampant, as are high cholesterol levels, high blood pressure and smoking. A quarter of the population ages 50 to 59 who were hospitalized for any reason had diabetes. Most residents are Hispanic or African-American, groups with a relatively high prevalence of heart disease.

Most Camden residents having a heart attack are rushed to Lourdes, a midsize Roman Catholic hospital founded in 1950 by Franciscan Sisters of Allegany to serve the poor.

Heart care is the hospital's specialty, and without its revenue, said Dr. Reginald Blaber, who runs the medical cen-

ter's cardiovascular disease program, Lourdes would have to close.

In 2007, the first year of a national campaign to speed treatment, half the patients at Lourdes waited at least 93 minutes before their arteries were opened. By 2011, Lourdes had a median treatment time of 71 minutes.

But at a staff meeting that year, Dr. Blaber challenged his team to do better. He pointed out that 16 percent of patients had to wait more than 90 minutes. “What if that one time when it took more than 90 minutes it was your mom?” he asked them.

Staff members set up what they called the D2B task force, standing for door to balloon time — the crucial period from when the patient enters the hospital until the cardiologist can thread a balloon into the blocked artery, inflate it, push the blockage aside and let blood flow again. They broke down the process, looking for opportunities to shave off a minute or two.

They decided to have paramedics do an electrocardiogram, which can show the characteristic electrical pattern of the heart that signals a heart attack, as soon as they reached the patient and transmit it directly to the emergency room. That meant the staff could spring into action the moment the ambulance pulled in. The hospital designated a beige phone on a counter in the E.R. for calls from paramedics.

They eliminated a big time sink — the requirement that a cardiologist look at the electrocardiogram and decide whether an interventional cardiologist, who would open the blocked artery, should see it, too.

In another change, the hospital operator began summoning the heart attack team with a single phone call that sounded their beepers simultaneously. And each staff member on call was required to be within 30 minutes of the hospital.

Now when a patient arrives, staff members swarm the stretcher and within five minutes undress the patient, place defibrillator pads on the chest, insert two intravenous lines, shave the patient's groin where the catheter will be inserted and snaked up to the heart, supply oxygen through a cannula in the nose, and provide medications like morphine, a blood thinner and a drug to control heart rhythms.

One room has been designated for heart attack patients and is kept stocked with the necessary supplies.

And a requirement that long consent forms be filled out before the team could get to work was jettisoned.

Treatment times plunged.

LEARNING FROM THE SWIFT

The heart story began nearly a decade ago when Dr. Krumholz, the Yale cardiologist, had an idea.

Medicare had created a national database showing how long it took hospitals across the country to get heart patients' arteries opened. It was a bell curve year after year, and the times were not getting any better. But there were a few hospitals at the tail end of the curve that year after year were treating people in an hour or so.

Dr. Krumholz and his colleagues visited the 11 best-performing hospitals. The investigators recorded every detail of how the hospitals got things done.

Dr. Krumholz said he was particularly struck by the role of emergency room doctors. Interventional cardiologists were giving up the power to decide if they and the entire staff required to open an artery needed to dash in, often in the middle of the night.

"It is very rare for a group to give up power and get nothing in return," he said. "You are saying, 'You can call me at 3 in the morning and I am not going to question you.'"

At Yale, and most other places, Dr. Krumholz said, the procedures had been very different.

"A patient would come in, and the emergency room doctor would see him," Dr. Krumholz recalled. "He would say, 'O.K. I think we should call the primary care doctor.' The primary care doctor would say: 'I think we should call a cardiologist. I wonder which cardiologist to call.' Sometimes, the first cardiologist was not available, so another had to be called. The cardiologist would call an interventional cardiologist, the specialist who could open the artery. The hospital page operator would try to find phone numbers for nurses and technicians and start calling each one in turn. Finally, when the staff had arrived, the patient would be wheeled into the cardiac catheterization lab to have his artery opened."

Dr. Krumholz and his colleagues persuaded *The New England Journal of Medicine* to publish their already accepted paper in the same week in November 2006 that the American College of Cardiology announced a national campaign to get hospitals to change their ways. Twelve hundred committed to doing so.

Doctors and hospitals began competing to see who could have the best times. The initiative tapped into professional pride and a thirst to be the best. And, of course, hospitals wanted patients.

Within a few years, times were dropping all over the nation.

But then a debate arose.

A paper by Dr. Peterson, the Duke cardiologist, and his colleagues, published in *The New England Journal of Medicine* in 2013, said that even though times had plummeted, the death rates for heart attack patients whose arteries were opened with balloons and stents had not budged. Could it be that faster just seemed better but that it actually made

no difference to patient outcomes?

"That was demoralizing," Dr. Krumholz said. But he did an analysis that found that the universe of heart attack patients being treated with stents and balloons had changed markedly. It used to be just the younger and healthier people who were more likely to have their arteries opened. Now, as the procedure became popular and many more people were treated this way, the group included older and sicker people.

A NEVER-ENDING MISSION

The weekend that Ms. Samuels was rushed to Lourdes, two other heart attack patients were brought in. Kevin Whisler, 43, a postal worker by day and forklift operator by night, had been having what he thought was heartburn for two days, gulping Tums, Roloids and Pepcid. Finally, on Saturday night, March 28, he went to an urgent care center, where a practitioner did an electrocardiogram and called an ambulance.

"You've got to be kidding me," Mr. Whisler said. "I go in for heartburn and now you tell me I'm having a heart attack?"

Mr. Whisler's doctor had prescribed a statin for his high cholesterol level and a medication for his diabetes. But Mr. Whisler said he thought he was too young to be taking pills every day.

Lying in his hospital bed the next day, he said he felt great and was going home in another day, inspired now to take his medications.

But at a staff meeting the next Monday morning, no one was happy with Mr. Whisler's time — 72 minutes. The reason though, had nothing to do with the hospital; it was an issue with the urgent care center. The peeved cardiologist who treated him, Dr. Thierry Momplaisir, complained that the urgent care center did not notify the hospital that it had a heart attack patient and was not equipped to transmit his electrocardiogram. The emergency department was not prepared for his arrival, and it took 12 minutes before he had an electrocardiogram.

It took a speedy 55 minutes from the time Ms. Samuels arrived at the hospital until her artery was opened, but the time could have been even better, Dr. Momplaisir said. She had her heart attack around 1:30 a.m. on Sunday, March 29. The paramedics transmitted her electrocardiogram to the emergency room. The beige phone in the E.R. dedicated to heart attacks rang, and a doctor picked it up. "We have a STEMI, female, age 49, 10 minutes out," a paramedic said.

The only doctor in the E.R. that night was dealing with three life-threatening emergencies: a stroke patient and two people in respiratory distress who needed breathing tubes. The doctor, who declined to be identified for this ar-

ticle, knew what to do when that phone rang — decide if she agreed the patient was having a heart attack. But a colleague, Dr. Alfred Sacchetti, said the decision this time was not so clear cut. It was, he said, a judgment call.

Ms. Samuels was only 49 and her symptoms, as described, seemed ambiguous. So the doctor decided to get the emergency room ready so that as soon as Ms. Samuels arrived, she could be evaluated and have another electrocardiogram.

The cardiologist on call, Dr. Momplaisir, rushed in from home, as he had for Mr. Whisler a few hours earlier, but 10 minutes had been wasted waiting for the ambulance to arrive at the emergency room before he was paged.

The outcome was excellent, though — Ms. Samuels's artery was opened fast enough to save her heart muscle. There was no permanent damage, Dr. Momplaisir said.

She is overwhelmingly grateful that she got to the hospital in time.

"I am the face of life," she said.

That same night, the beige phone rang again. Another heart attack. This time it was a 63-year-old woman, Carmen Pierce, who lives with her daughter in a trailer nearby. "I was sweating from my head on down," she said. "And I felt a pinching, in my shoulder, in my back."

She has diabetes and thought the problem must be low blood sugar. Her daughter gave her orange juice, but Ms. Pierce passed out holding the glass. Her daughter called 911.

This time, the emergency room doctor immediately told the hospital operator to page the staff and the backup cardiologist on call; Dr. Momplaisir was busy with Ms. Samuels. The cardiologist, Dr. Ibrahim Moussa, was sound asleep in his scrubs in his eighth-floor room at the Crowne Plaza, where he stays when he's on call. He arrived at the hospital just as Ms. Pierce was being wheeled in on a gurney. She and her daughter were crying in fear as staff members converged on her.

"Listen, we will get you through this," Dr. Moussa said.

Ms. Pierce started to crash by the time they got her to the operating room. Three of her arteries were obstructed and one was totally blocked, causing her heart attack. That one was calcified, making it difficult to push the artery open.

It took 52 minutes to stabilize her and open her calcified artery.

"I don't know what they did, but the pain was gone," Ms. Pierce said afterward from her hospital bed.

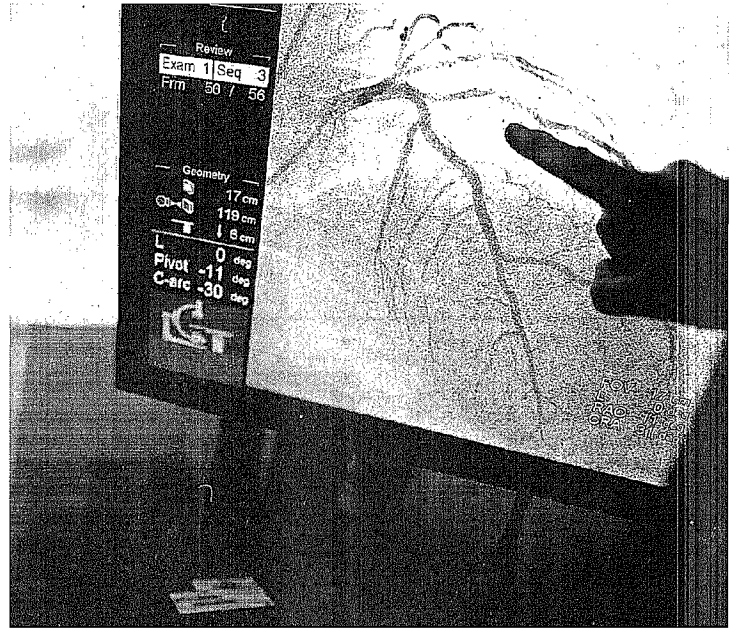
She was lucky, Dr. Moussa said. "If she had stayed home, her heart would have stopped."

Nights like that, he added, "are what we live for."



MARK MAKELA FOR THE NEW YORK TIMES

Dr. Thierry Momplaisir and emergency room staff members treating a 46-year-old man having a heart attack at Our Lady of Lourdes Medical Center, in Camden, N.J.



MARK MAKELA FOR THE NEW YORK TIMES

Dr. Hans Bauer showing the blocked arteries of a patient having a catheterization procedure at Lourdes, where the median treatment time for heart attack victims is 50 minutes.



MARK MAKELA FOR THE NEW YORK TIMES

This phone in the Lourdes emergency room is used only to alert the staff that a heart attack patient is on the way, so that the necessary team can be summoned immediately.



JESSICA KOURKOUNIS FOR THE NEW YORK TIMES

A physical therapist, Laura Funk, assisting Yvette Samuels, who was preparing for a short walk in the hallway at Lourdes as she recovered from a heart attack.