



# operation adapting business ideas to healthcare... makeover

**W**hat if everything you needed came directly to you? At St. Clair Hospital's emergency department, that's how it works these days. Instead of waiting in the waiting room, then talking to a triage nurse, then waiting in the waiting room again, and finally going to a room and waiting for a nurse and then the doctor, in most cases patients answer a few quick questions, get an ID band and go directly into their own private treatment room. This happens within 12 minutes of a patient walking in the door. Sometimes the process is so quick that both the doctor and nurse are with the patient within minutes.

From there, virtually everything comes to patients in their treatment rooms. "I love it, and I love showing it off," says Peggy Rohland, St. Clair's director of emergency services. "We all go to the patient now."

The "go to" concept is just one change in the hospital's new emergency department, a \$13.5 million expansion that swelled it from 26 treatment rooms to 46, adding 18,000 square feet. The project started in 2007 and progressed in phases. Doctors worked out of the old wing while the new wing was built. Then in September 2008, they moved into the new wing and work began on the old

section. By the end of this month, the whole department will be fully open.

Changes in the physical plant are dramatic, but the improvements in procedure are equally important, notes Dr. Christopher DeLuca, chair of the department of emergency medicine and a Lebanon Hills Drive resident. "Building a new building isn't going to fix your problems. You can't move bad habits into a new facility."

So, operations got a total redo as part of the expansion project, with the staff borrowing procedures from legendary business models like Toyota. Technology also got an overhaul, cutting out wasted time and fostering better communication. "It's a combination of improving your systems, improving your technology and improving your facilities," DeLuca says.

## THE CIRCULATORY SYSTEM

The heart of the ED is a three-person team of Rohland, DeLuca and David Kish, the hospital's executive director of emergency services and patient logistics. The trio can barely contain their excitement over the changes. The massive system overhaul started with a "Kaizen event," or a very intense planning session like the Toyota Corporation uses. The leadership trio and seven others had several weeks of rethinking everything, starting from scratch. What did they want to do and how would they make it happen? The



The new emergency department at St. Clair Hospital includes the latest in computerized patient data, with a fully equipped doctors' work area. Dr. Christopher DeLuca, chairman of the department of emergency medicine (in the white coat), has access to the most current test results and treatments of every patient in the ED.



**Peggy Rohland, director of emergency services, and Shawn Balaschak, manager of the cardiac cath lab, stand outside the doctors' work area, answering questions about the new \$13.5 million emergency department, which will be fully operational at the end of January.**

overriding goal was to increase efficiency.

"It's like a restaurant, and you know when you're open 6 A.M. to 6 P.M., the way you maximize your profit is to turn your tables," DeLuca said. Only with hospitals, it's not profit they seek. It's getting patients back home, or admitted to the hospital if need be, freeing up an emergency bed to treat someone else.

The task force looked at hospital practices and brainstormed ways to adapt business ideas to healthcare. Once they had the measures in place and workers had been trained in their new roles, they had to ensure the system worked. That's when they began "rapid-cycle quality improvement." It's another way to say "This particular aspect isn't working. What should we do now?" instead of waiting months to figure out if there is a problem.

Key to the system was the elimination of the triage desk, which was replaced by an intake nurse. The nurse asks a few questions, puts an identification band on the patient and sends him or her to a room in as few as three minutes.

On a busy day, the department treats up to 220 patients with the peak time from 4 P.M. to midnight, when people who have been sick all day realize they just aren't getting better or when doctors do their rounds at local nursing homes and decide a patient needs more care.

The 100-person staff had some learning curves. Nurses who used to treat patients only after they arrived on the floor learned to handle intake. But once in place, the new system clearly worked even without all the new rooms open. The waiting room is virtually obsolete. In October 2007, it took patients an average of 61 minutes to get into an exam room; in October 2008, it was down to 12 minutes.

"We're never going to be happy with our times," Rohland says, explaining that if they reach a benchmark, they'll simply reach higher.

And if you think faster times are just a convenience, consider this: time is crucial when a patient is seriously ill with events such as heart attacks. The time it takes to open a clogged artery with a balloon angioplasty can mean the difference between full recovery, severe heart damage or death.

Since the emergency department's rehab, St. Clair's "door to balloon rate" is now the fastest in Allegheny County, says Shawn Balaschak, manager of the hospital's cardiac catheterization lab. Those stats are kept by the Joint Commission on Accreditation of Healthcare Organizations and the Center for Medicare Services. The speed even surpasses places like the Cleveland Clinic and Johns Hopkins, he says. The American Heart Association and the American College of Cardiology recommend that the door to balloon rate be no more than



Medics from the Medical Rescue Team South Authority (MRTSA) can get patients to the St. Clair Hospital Emergency Department in a matter of minutes. Using their 12-lead EKG machine and a cell phone, they can transmit patient data to doctors at the hospital, so the cardiac team is assembled and ready before the patient arrives.

90 minutes. All of St. Clair's patients meet that time, but the average time actually is much less—only 63 minutes, Balaschak says. (For details on how the cardiac cath lab works, see *Anatomy of a Heart Attack*, page 42.)

The time outpatients spend in the emergency department also is decreasing. In October 2007, patients spent an average of 186 minutes from “door to discharge.” In October 2008, that dropped to 160. That number is expected to decrease even more, once the full ED is open with the new staff in place.

## THE SKELETAL SYSTEM

The emergency department has no central nursing desk. It's split up into five zones, one of which is largely for acute care of the most seriously ill patients. Each nursing desk has a flat-screen monitor that lists vital information, including EKGs, of the patients on the floor.

Rooms are universally designed. Every room's supplies are the same, even though some are meant to be used for separate purposes. There are 31 acute adult treatment rooms, six pediatrics-equipped treatment rooms, three behavioral and mental health treatment rooms and six fast-track rooms for treating minor issues. But if the department is busy enough, any room can be used for anything. Crash carts stand ready in

the hallways, and mobile carts with specific purposes are available for any room.

Rohland says the layout means the area is quieter and more relaxing for patients. Natural light floods the area, and each zone has its own colors, ranging from tropical turquoise to bright red. Patient rooms have flat-screen TVs for comfort and distraction.

The individual rooms are not just about comfort and aesthetics. Individual treatment rooms are safer, DeLuca says. Patients won't spread sickness across a crowded waiting room, and they are closer to the medical professionals, if they become worse. “The most dangerous place to be is the waiting room,” Rohland says.

## THE NEUROLOGICAL SYSTEM

Ever been in a store where the sales associates wear headsets to talk to each other? They can find out if something is in the stockroom or find another cashier to ring a sale, so you get out of there quickly. At St. Clair, they have a similar system called Vocera, a sort of advanced walkie-talkie where doctors and nurses communicate. They know when an ambulance is arriving and what sort of patient is on it.

That's just one of the technological upgrades. Doctors now can input all of their orders for tests directly into the

computer. This eliminates the previous step of having a secretary decode their writing and input it to the computer, reducing the chance for error. Blood gets to the lab via pneumatic tubes like a bank drive-through. When the lab has finished the tests, the results immediately are available on the computer. The quicker the results are known, the faster the treatment will be.

Computer terminals centrally located in the physicians' station keep track of all patients and test results, including what treatments are in progress. A high-resolution screen allows doctors to view X-rays or any other digital image and see the same results a radiologist would see on specialized equipment.

St. Clair executive vice president Tom Ague takes pride




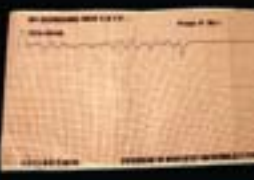
in the hospital's high technology, pointing out that having everything computerized is not common in emergency departments yet. "It is the most advanced way to treat patients," he says, adding the doctors are thrilled: "They can't live without it."

The last step will be to add staff. An extra physician and two extra nurses will be hired to work during that busy 4 p.m. to midnight shift because, DeLuca says, there's a point where extra rooms don't help if there's not enough staff available.

And the number of patients keeps growing. Last year, the hospital treated 52,000 patients in an emergency department designed to handle 38,000. Now the ED can treat 80,000 patients a year. It has been quite a journey since the hospital opened in 1954 with 100 beds. 📷


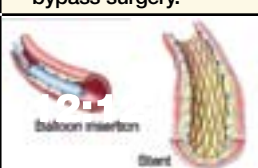
# Emergency

## anatomy of a heart attack

<p><b>11:00</b></p>	 <p>Heart Attack</p>	<p>You're getting ready to turn in for the night. Right after you pull on your flannel pajamas, you feel a twinge in your chest. Not really a pain. More like a squeeze. But it definitely wasn't there a minute ago. Is it just the burrito and cola you had for dinner making a re-appearance? You jab your wife. "Honey, you ever have a really bizarre squeezing right here?" Her eyes widen. "Uh. No." You start to sweat, a little bit at first, and then you really get the sense that this is more than a burrito. But you really aren't sure. Breathing is a little tough, but are you just hyperventilating? Panicking for no reason? Your wife does what you should have done two minutes ago. She calls 911. You are having a heart attack and this is what happens to you:</p>
<p><b>11:04</b></p>	<p><b>9-1-1</b></p>	<p>Your wife helps you downstairs to the living room and you sit on the couch. She turns on the outside lights so responders can see. Moments later, there's a knock at the door. The Mt. Lebanon Police are first on the scene just two minutes after the 911 call. While they have an automated external defibrillator in their car, you are awake and alert, so you don't need it.</p>
<p><b>11:06</b></p>		<p>An ambulance from Medical Rescue Team South Authority (MRTSA) arrives, carrying an emergency medical technician and a paramedic. One of them begins to administer oxygen to you while the other starts an assessment. What's the nature of your pain? When did it start? What's your medical history?</p>
<p><b>11:10</b></p>		<p>You have been given a spray of nitroglycerin under your tongue to help with the chest pain and you are chewing on three baby aspirin as the medic begins what is called a 12-lead EKG. It is an electrical test of the heart, where 12 sticky pads are applied to your body, attached to wires that lead back to a monitor. MRTSA was one of the first ambulance services to have such a machine on their ambulances; now it is common.</p>
<p><b>11:12</b></p>		<p>The medical providers are looking for what is called a STEMI—an ST segment elevation myocardial infarction—or, a disruption in a portion of the normal electrical wave, caused by a heart attack. In your case, they see it, so they transmit your EKG directly to the emergency department at St. Clair Hospital via Bluetooth technology over the cell phone.</p>
<p><b>11:15</b></p>		<p>The paramedic starts an intravenous line so you can receive medications quickly. They are monitoring your blood pressure and your heart rhythm to make sure there are no irregularities. In your case, your blood pressure is a little high so they give you some meds.</p>
<p><b>11:18</b></p>		<p>The doctor on duty at St. Clair reads your EKG and concurs with the ambulance crew. It looks like a heart attack. Time to get to the emergency department quickly. The heart catheterization lab, which operates 24 hours a day, is notified to be ready for you. A team of medical professionals, including a cardiologist, are called. As the folks at MRTSA say, "Time is muscle." The quicker you get treated, the less damage to your heart muscle.</p>



Balaschak shows video of a patient's cardiac catheterization, during which a balloon angioplasty procedure opens the artery, restores blood flow to the heart and saves a life. St. Clair's "door to balloon" rate averages 63 minutes, making it the best in Allegheny County.

<b>11:25</b>	Since you are on the first floor of your home, the team can load you right onto the stretcher. It is important that you not exert yourself and cause more damage to the heart muscle. Once you are properly secured, you are taken to the waiting ambulance.
<b>11:35</b>	 You arrive at St. Clair, in the emergency department. You receive a quick 10-minute assessment, where you get an identification wristband. You have a blood test to look for chemical evidence that you are having a heart attack, including elevation in certain enzymes. But since the physicians already suspect a heart attack, you pretty much breeze right through to the cath lab, just steps away from the emergency department, where everyone is already waiting for you. Called the "door to balloon team," the crew processes you quickly.
<b>11:50</b>	Once in the cath lab, you are loaded onto a white table in large white room. Your groin area is scrubbed and that area is draped. Sedation is run through your IV. Depending on your cardiologist's preference, you may be somewhat awake or completely asleep.
<b>11:56</b>	A puncture is made in your femoral artery in your groin and a catheter is inserted all the way up to your heart area. Dye is injected so the doctor can view the heart pumping and see any blockages. In your case, they see a blockage.
<b>12:06</b>	The cardiologist determines your blockage can be fixed in the cath lab, like 90 percent of patients. If the blockage had been too large or in a risky area, the cardiac surgeon would have been called and you would have been scheduled for a bypass surgery.
<b>12:12</b>	 The cardiologist sends a balloon through the catheter all the way up to the blockage. It is slowly inflated and the artery that appeared narrow now looks normal. The doctor watches on the video screen as blood flow is restored. The procedure has an overall complication rate of 1 percent. Yours goes flawlessly, as most do.
<b>12:17</b>	The doctor puts a stent—or a small brace—in the artery to keep it open. About 95 percent of patients receive one. The goal is to open that artery no more than 90 minutes after you get to the hospital to preserve the most heart muscle. But look at your time. Because MRTSA sent the results ahead and because St. Clair's cath lab is open 24 hours a day with a team always on call, you are lucky.

You spend the next 24 to 48 hours in the hospital for observation. Most people have little to no pain following the cath. You are sent home with a prescription for Plavix to prevent blood clots, some blood pressure medication and an aspirin a day. You also have a prescription for the cardiac rehabilitation center at St. Clair so you can start an exercise program under a doctor's supervision. You are educated about the importance of a good diet and you are told under no circumstances are you to smoke.

It's possible that you could have died from what just happened. If your wife hadn't called 911 and you instead went to bed, you could have had severe heart damage. Or worse—if you'd have driven yourself to the hospital, you could have gone into cardiac arrest in the car. But next month, when your grandson turns one, you will be there.

Sources: Todd Pritchard, operations director of Medical Rescue Team South; Shawn Balaschak, manager of St. Clair's cardiac cath lab.