Philips cath lab in ED cuts door-to-reperfusion time

Customer profile Mercy Medical Center

Who/where
Emergency Chest Pain Center at Mercy Medical Center, Canton, Ohio. Part of a 50/50, non-profit corporation of the Sisters of Charity of St. Augustine Health System and University Hospitals Health System.

Challenge
Put technology and procedures in place to significantly reduce door-to-reperfusion time in cases of acute myocardial infarction

Solution
Install a state-of-the-art Philips cath lab in the emergency department, promote transmitting of key patient ECG data from ambulances en route, update hospital protocols, and educate stakeholders including physicians and the community.

Mercy Medical Center is a 476-bed community hospital located in Canton Ohio. Mercy is recognized as one of America's 100 Top Hospitals for cardiovascular service and interventional cardiology. In 2006, it handled more than 3,000 cath lab cases, including approximately 800 interventional procedures. With 550 physicians on staff, Mercy Medical Center has pioneered a number of innovative heart treatments. Mercy's Emergency Chest Pain Center is certified to perform angioplasty 24/7 and includes a fully functional Philips cath lab located in the emergency department (ED).

In 2006, the ACC and the AHA adopted new guidelines, reducing the recommended door-to-balloon time from 120 minutes to 90 minutes or less. Overwhelming evidence showed that delays in restoring coronary blood flow caused increased and permanent damage to the heart muscle, and also contributed to increased mortality and morbidity.

Dr. Ahmed Sabe, FACC, FSCAI, Executive Director, Cardiovascular Center, Director Cardiac Catheterization Laboratory, Mercy Medical Center

Using the Philips Allura Xper FD10 cath lab, Mercy Medical Center is shattering this 90-minute guideline for patients presenting with acute myocardial infarction (AMI). In fact, the cardiology team at Mercy has achieved door-to-reperfusion times, an even more impressive metric, of less than 15 minutes.

Dr. Ahmed Sabe, Executive Director, Cardiovascular Center, Director Cardiac Catheterization Laboratory, considers the hospital's short timeframes for restoring critical blood flow as nothing short of amazing. He points to Mercy Medical Center's innovative installation of a state-of-the-art Philips cath lab in the ED, precisely where it was needed, as central to the improvement. Achieving this revolution in acute heart care required the total commitment of the institution—an unprecedented level of cooperation among cardiologists, primary care physicians, paramedics, and the ED staff.

PHILIPS

"Now, we have achieved door-to-reperfusion times of 14, 15, 18, 20, and 22 minutes."

Looking for a better way

Even before these new guidelines were adopted, Dr. Sabe had been pursuing a vision to improve hospital response to AMIs. One key area he looked at was how to best handle patients when they arrive at the hospital. Traditionally these patients are admitted through the ED, where they are examined and evaluated. Once it has been determined that patients need an emergency angioplasty, they are then transferred from the ED to the cath lab, adding time to the process.

Dr. Sabe points to an opinion that he hears, "Many in the field will say, 'Just transfer the patient from the ED to a specialized area where the cath lab is located.' You have to remember, this is a critical care patient. You have a nurse and all the monitors, and perhaps oxygen or IV. We estimate that it adds about a half an hour, and that can make a big difference for these patients." So Dr. Sabe posed a question: "Can we move the specialized doctors and the cath lab resources to the ED, to cut the time spent on evaluation and transport?"

While the answer seemed obvious, Dr. Sabe admits that there were legitimate questions. "What about the room and the equipment? What about doing these types of procedures in the ED environment? What about infection?"

From there, Dr. Sabe and his team set out to demonstrate the value of bringing cath lab technology and expertise directly to the patient in the ED, instead of the other way around. The team hoped to make a significant difference in how quickly they could get relief to patients presenting with AMI by positioning equipment in the ED with appropriate staff on call for emergency angioplasty. As Dr. Sabe recounts the early

The Philips Allura Xper FD10 cath lab sits just steps away from the ambulance entrance at Mercy Medical Center's ED.

experience, "We started with a portable C-arm due to cost concerns, and while there were certainly limitations, and not all the cardiologists would use it, we still proved our point. There were no infections and we could get relief to the patient in a shorter amount of time. We could save lives."

Putting a cath lab in the ED

Encouraged with this initial progress, Dr. Sabe and his team felt that they could achieve even shorter door-to-reperfusion times. "I saw my major task as putting a full cath lab right in the ED at the door," Dr. Sabe recalls.

Mercy received a government grant to help with the purchase of the cath lab. However, finding the *right* lab was another story.

Dr. Sabe comments on the process of comparing different cath labs, "It turned out that our physicians liked Philips and felt it was the most appropriate lab. We viewed Philips as being genuinely interested in working with us. In fact, I think they were as excited about the project as we were."

In July 2006, Mercy Medical Center installed a Philips Allura Xper FD10 cath lab directly into their ED. It is believed to be the first ED cath lab installation in the country.

Referring to the flat panel detector on the Philips FD10 system, Dr. Sabe says, "This is the newest generation, state-of-the-art technology. It is currently the best quality lab in the institution. We looked at the image quality. When you can visualize the arteries better you can make a more accurate and faster decision, especially in the case of a patient who may be overweight."

"Our physicians liked Philips… We looked at the image quality. When you can visualize the arteries better you can make a more accurate and faster decision."

Allyson Kelly, RN, BSN, Administrative Director, Cardiovascular Services, Mercy Medical Center

Reducing door-to-reperfusion time

One of the most important considerations for Dr. Sabe was the Philips system's speed, and how that could contribute to his overall goal. He explains, "You know minutes count here. And the fact that the machine moves back and forth so fast is an advantage. We are truly racing against time."

Obviously pleased with the significant reduction in the time it takes to get the blood flowing back to a patient's heart, Dr. Sabe lists some impressive numbers. "Now we have achieved door-to-reperfusion times of 14, 15, 18, 20, and 22 minutes."

Dr. Sabe also emphasizes that Philips understood the importance that Mercy placed on consistent system performance. He acknowledges that the outstanding reliability of the Philips FD10 cath lab made it ideal for placement in the ED. "You have to remember," he explains, "that this is an emergency situation, and you really have to be certain that this lab is going to be dependable, because down here this will be the only choice. Upstairs, if something goes wrong, I can move the patient to another lab, but downstairs if I have to move him it is going to be a huge issue. So the dependability of the lab is very critical."

Dr. Sabe also mentions the importance of ease-of-use for the cath lab in the ED. "It's helpful that our hospital also has Philips PACS and Philips echo. The integration makes things easier. There is a comfort level in knowing it is the same user interface on the equipment."

A key role for 12-lead ECG

In addition to having a cath lab physically located within the ED, Mercy's drive to reduce door-to-reperfusion time involves rethinking the protocols for handling emergency patients, along with patient data, throughout the entire cycle of care. For example, providing many of the ambulances in the community with ECG upgrades allows paramedics to transfer the 12-lead ECG information directly to Mercy's ED.

Allyson Kelly, Administrative Director, Cardiovascular Services, explains the hospital's proactive approach. "We've done a lot of outreach and education with the paramedics. And, with this additional piece that we purchased for them, they can run the 12-lead ECG data and hand it to us when they arrive, or call us and say 'I've a got a 12-lead that says this.' Or even transmit it directly. We are just trying to get the patient here faster and the team here faster, and get the artery open faster."

Dr. Sabe opening an occluded artery on an emergency AMI, just minutes after the patient arrives in the ED.

Michele Nelson, the cath lab manager at Mercy, agrees on the importance of the ECG information. "If they can do the ECG in the field and transmit it while they're still en route, it gets the ball rolling that much sooner. If they don't have that capability, or choose not to use that function, then the patient has to get here, get checked in, and then they do the ECG. It's that much more of a delay."

Getting the protocol right

Mercy has also made some modifications in how the ED staff handles the AMI patient upon arrival. With the cath lab just steps away from the ambulance, they want to get the patient on the table without wasting any time. As Allyson Kelly explains, "We've cross-trained the ED nurses. As soon as they know an AMI is coming in, they have been trained to turn on our equipment in the cath lab, get the patient on the table, get the electrodes on, prep them; all before our call team people get there."

At Mercy, when patients come in with a 911 call, even though it is clear they are having a heart attack and they are going directly to the cath lab table, it is still important to

"Dealing with someone who is suffering… We can quickly take care of him, fix the problem and get him out of danger. It is an amazing feeling."

have the ED staff evaluate them. Dr. Sabe is very clear on this point, "The key element is that the patient still comes to the ED for their evaluation. It is the ED's patient initially because we need to know what else is going on, but the cardiologist and his team are preparing simultaneously."

Mercy's approach to AMI patients also includes a fairly radical change involving physician notification. In contrast to traditional approaches, once the ED physician determines the patient has an AMI, he notifies the on-call cardiologist, mobilizing the cardiac care team. While it sounds obvious in the pursuit of saving time, Dr. Sabe says this was one of the most difficult aspects of the entire process.

To help build that trust, Dr. Sabe explains that they put high standards in place for participating cardiologists. "We required a lot of experience before we started this program at Mercy. We wanted our cardiologists to have between 500 and 1,000 interventions before they could be certified for 24/7 angioplasty. We told the community that as a hospital, as a department, we will guarantee the best of care for your patient. But let's get the artery of your patient open as soon as possible." And Dr. Sabe makes the point that once the artery is open and once the emergency procedure is completed, the primary care physician is notified and he can choose which physician he wants involved in the care going forward. "The on-call cardiologist just stops the damage and then backs off."

Dr. Sabe is very excited about the cooperation among the various stakeholders and how it is contributing to dramatic reductions in door-to-reperfusion times at Mercy. He credits the commitment of the institution and the Sisters of Charity involvement, without which he feels the project couldn't have proceeded. He also feels there is no justification for not being able to work out the protocol issues once a program like this is put in place. "In my opinion, the institution put the commitment up front. We spent the time and the money. So let's work out the smaller details among us doctors. Let's get it done."

Seeing the benefits

Indeed, Mercy Medical Center is getting it done. Highlighting their reduced door-to-reperfusion times, Dr. Sabe is understandably proud. "Anything less than 15 minutes is really unbelievable. And we have done 14 minutes door-to-reperfusion. I don't think in the future we can get much shorter than this." Allyson Kelly agrees, saying, "From the time the patient hits the emergency department to when we open the artery is very fast. We've pretty much mastered everything we're going to in the cath lab."

Dr. Sabe and Allyson Kelly say the volume of cases is steadily increasing. They attribute that increase to getting the word out about just how effective Mercy's approach is for treating AMI. "Since we started to market this, we absolutely feel the Emergency Chest Pain Center and the cath lab in the ED are a competitive advantage for us, and they certainly enhance the reputation of Mercy," states Kelly. "In the year we've had the Center open, we've increased the number of cases we get per month by 60%. When people ask me about it, the bottom line benefit is that we are saving lives. We're doing everything we possibly can to make the end result positive for the patients that come in, and their families."

Dr. Sabe is very convincing when he says there is enough evidence to persuade him they are really saving time, and as a result enhancing patient care. He cautions that you can't evaluate putting a cath lab in the ED purely from a business perspective. "This is not just about business. There may be some non-productive hours with the cath lab, but we are going to save lives." In fact Dr. Sabe describes the emergency cases he does as the most rewarding interventional work in his practice. Referring to an emergency case earlier in the day, Dr. Sabe recounts, "The patient was having trouble breathing; he was in pain. And then we were able to quickly give him relief. And he starts feeling better and pretty soon he's making jokes and wants to shake my hand. It is really a luxury for us to be able to work with this system in the ED. We are dealing with someone who is suffering and may be dying. We can quickly take care of him, fix the problem and get him out of danger. It is an amazing feeling."

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www.medical.philips.com

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