

# SCAI highlights study using wireless technology to speed care of heart attack patients

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Imagine paramedics mobilizing a team of cardiologists and nurses within minutes of arriving at the home of a person who is having a heart attack, simply by pressing a button that sends an electrocardiogram (ECG) over a wireless network. That's exactly what's being done at a Newark, NJ, medical center, and it's dramatically improving the quality of care, according to a study honored as the best abstract presented at the 30th Annual Scientific Sessions of the Society for Cardiovascular Angiography and Interventions (SCAI), May 9–12, 2007.

The wireless system, which enables on-call cardiologists to view full ECGs on "smart" phones, has cut in half the time it takes to begin the treatment of heart attack with catheter-based techniques such as angioplasty and stenting.

"We have found a way to receive electrocardiograms from home, from another hospital, from our cars—anywhere we are," said Vivek N. Dhruva, D.O., academic chief fellow in the Division of Cardiology at the University of Medicine and Dentistry of New Jersey (UMDNJ)-New Jersey Medical School, who presented the paper. "In only 4 months, we went from being in the bottom 10 percent of hospitals in the time to treatment of heart attack to being in the top 10 percent of hospitals."

The so-called door-to-balloon time—the time between arrival at the hospital and initial inflation of an angioplasty balloon to open a blocked

coronary artery—has become a recognized marker of the quality of care delivered to heart attack patients. Current guidelines have set a goal of no more than 90 minutes, a deadline that many hospitals struggle to meet.

At UMDNJ, for example, it took an average of 61 minutes in 2005 just to notify a cardiologist that a patient with a heart attack had arrived at the emergency room. Coupled with the assignment of on-call cardiologists to more than one hospital and the catheterization laboratory's 5 PM closing time, it was virtually impossible to begin catheter-based treatment within 90 minutes. In fact, the average door-to-intervention time—an alternative term used in this study to reflect the full range of catheter techniques available to interventional cardiologists—was nearly 146 minutes in 2005.

Under the guidance of Marc Klapholz, M.D., director of the Division of Cardiology at UMDNJ, the wireless system went live in June 2006. It enables paramedics to use Bluetooth technology to send an ECG not just to the emergency room but also to a receiving station in the cath lab. From there the electrocardiogram is automatically converted to a PDF file and forwarded via the hospital intranet to several e-mail addresses set up just for that purpose. The on-call cardiologist receives a text message with instructions to download the electrocardiogram for viewing on a smart phone. The file also includes the phone number of the paramedic who initiated transmission of the electrocardiogram, so the cardiologist can immediately be in contact with the ambulance crew. Patients who are clearly having a heart attack are whisked directly to the cath lab.

Using the wireless system, cardiologists are now notified an average of 15 minutes before the patient even arrives at the hospital. From June to December 2006, the average door-to-intervention time fell to 80 minutes. Today, it is lower still, averaging just 73 minutes.

Establishing the wireless system took 6–8 months of planning and involved staff from cardiology, the emergency department, and emergency medical services. Representatives from administration, admitting, information technology, and telecommunications played a key role as well, Dr. Klapholz said.

"We had a commitment from multiple stakeholders within the institution to make this a priority," he said. "Everyone was on-board and that's why we were successful."

Source: Society for Cardiovascular Angiography and Interventions

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