

SUCCESS STORY

Rapid team notification accelerates acute stroke treatment at St. John Hospital and Medical Center



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Hospital:

St. John Hospital & Medical Center

Health system:

St. John Providence Health System

Location: Detroit, MI

Beds: 772

Medical Staff: 1,300+

Stroke occurs frequently in the United States, with almost 800,000 people suffering a new or repeat stroke each year.¹ It is a common cause of death in this country and a major cause of disability.^{1,2}

Timely treatment of acute ischemic stroke has been shown to significantly reduce disability and mortality.

In-hospital mortality was significantly lower among acute stroke patients who were treated with intravenous tissue plasminogen activator (tPA) within 60 minutes of ED arrival, compared with those who were treated after more than 60 minutes.³

A recent study found no benefit to tPA when administered 4.5 hours or more after symptom onset; beyond this time point, the risks associated with the therapy may outweigh the potential benefits.⁴

Current treatment recommendations emphasize the need for rapid evaluation and treatment of patients presenting with symptoms of acute stroke.

Joint American Heart Association/American Stroke Association guidelines call for interpretation of the CT scan within 45 minutes of ED arrival and treatment initiation within 60 minutes.⁵

Few organizations are currently able to meet these challenging goals. To assist in achieving them, in 2000 the Brain Attack Coalition recommended the development of primary stroke centers to deliver standardized acute stroke care.⁶

As of January 2011, there are more than 800 certified primary stroke centers across the country.⁷ Experts have identified key elements of these focused treatment centers that are associated with improved outcomes.

These elements include certification by an independent entity and identification of an acute stroke team that can be mobilized to the bedside within 15 minutes of patient presentation.⁶

However, operationalizing a coordinated rapid team response on a 24/7/365 basis can be a daunting administrative task and a significant barrier to providing timely acute stroke treatment.

Staff at St. John Hospital & Medical Center (SJHMC) have built a reliable process for rapidly evaluating and treating patients with acute stroke—and have seen their door-to-treatment times decline steeply and the number of patients treated with tPA increase substantially. Single-call notification of the acute stroke team with PerfectServe is central to this process.

Closing the gaps in acute stroke care

A member of the St. John Providence Health System, SJHMC is a 772-bed acute care hospital located in Detroit.

Known for its centers of excellence in neurosciences, cardiology, oncology and several other clinical areas, the hospital was in the process of preparing for The Joint Commission certification as a primary stroke center in 2009.

Carrie Stover, MSN, NP-C, director of neuroscience for the St. John Providence Health System, was charged with reconfiguring the program to meet certification standards.

Along with a multidisciplinary team of physicians and other staff from neurology, the ED and neurosurgery, Stover identified single-call team notification as an important priority.

“We were looking for a mechanism to contact both the neurologist and the neuroendovascular physician at the same time. We realized that PerfectServe—which we were in the process of setting up for all providers—would let us alert more than one person at a time, provide a backup, and track calls.”

According to Stover, there were a number of shortcomings in the acute stroke treatment process prior to the overhaul.

“We had no system for escalation or back-up if the neurologist didn’t call back quickly.”

Carrie Stover, MSN, NP-C
Director of neuroscience

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Dr. Paul Cullis
Chief of neurology, Stroke program director
St. John Hospital

“We had no system for escalation or backup if the neurologist didn’t call back quickly. We had to update the on-call list in the ED continually. The neurologists couldn’t easily tell if an incoming call was routine or related to a stroke. We couldn’t track calls. And we didn’t have a mechanism for easily tracking patients who were evaluated for acute stroke but discharged with a different diagnosis.”

Paul A. Cullis, MD, chief of neurology and director of the stroke program at the hospital, recalls that identifying the correct physician to contact was a major issue.

“The ED staff never knew who was on call. The schedule wouldn’t get disseminated properly or got lost. A few times, the wrong physician was contacted because the staff was looking at the schedule for the correct month but from a previous year. Nobody knew who to contact, when, how, why and where. Sometimes a particular neurology group might be assigned to take stroke calls, but until you called their answering service, waited on hold and finally spoke with someone, you wouldn’t know who was on call that day. It was a major bottleneck.”

According to Robert B. Dunne, MD, vice chief of the emergency department, the lack of an automated escalation system for callbacks added extra work for the ED physician.

“We had written policies on escalation, but they were all driven by physicians in the ED. I might become busy, then remember that the neurologist I paged 25 minutes ago hadn’t called back. The clerk would try him again and then the next neurologist on the list. A busy ED physician shouldn’t have to remember that.”

Dunne also points to challenges with collecting and extracting data regarding calls and call times, difficulty altering the call schedule (a task requiring 5 to 10 phone calls to inform others of the change), and delays in treatment initiation due to a lack of timely communication. He also saw a great deal of variability in the timeliness of treatment.

“If the ED physician was very motivated and the ED wasn’t too busy, he or she could make the calls, set up the CT scan and speak with the radiologist. But the ED physician had to create the protocol on the fly every time. A problem in any one of those steps could cause a delay.”

Launching a team-based approach

The planning group at St. John Hospital listed several priorities for the future treatment program: a dedicated neurologist on call for acute stroke, integration with the interventional group and the radiology department and a simple team communication system that would be consistent 24/7, yet easily updated by users.

The group chose PerfectServe because of its successful use in other clinical areas within the medical center.

After getting commitment from the neurology groups regarding a call system for acute stroke and achieving buy-in from primary care physicians that the designated on-call neurologist would be contacted for acute stroke patients, the group launched the treatment program, which was dubbed “Code Stroke.”

The group initiated a weekly meeting to review data and identify bottlenecks in the system. Over time, they honed the process into a highly efficient system.

Implementing a standardized process

Acute stroke treatment is now a standardized process, based on reliable, rapid team notification.

The ED staff makes a single call to PerfectServe; the on-call schedules are automatically analyzed and the appropriate team members are identified.

The entire acute stroke care team is contacted simultaneously based on the individual preferences of team members and the specific rules established for the team.

Because team members are immediately aware of the reason for the call, they respond quickly. If needed, repeat call backs and escalation occur automatically.

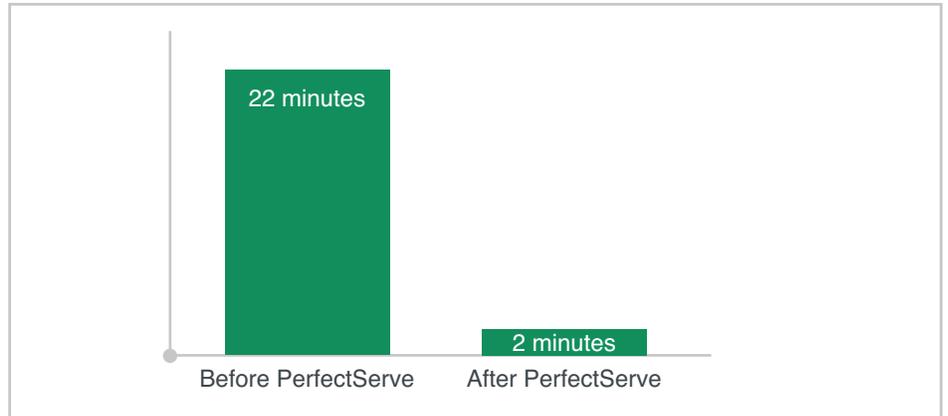
Users can easily change the call schedule via phone, Web and mobile apps. Changes are reflected in real time.

Moreover, the new process eliminated the need for ED staff to refer to printed schedules because the schedules are built into the PerfectServe platform, and messages route automatically to the appropriate clinician.

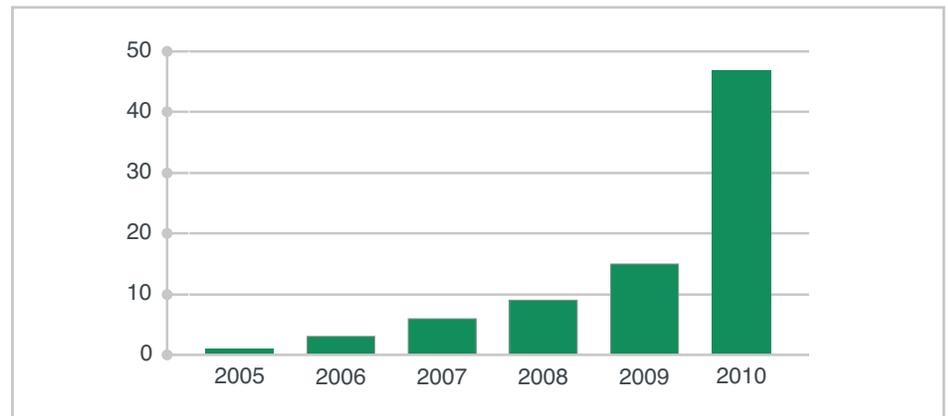
Finally, team members can easily track and analyze call times and patient data. Using these data, the team can identify and address areas of concern to drive continuous process improvement.

Results

By deploying the new process, the team was able to reduce on-call neurologist response time by 90 percent, from 22 to 2 minutes.



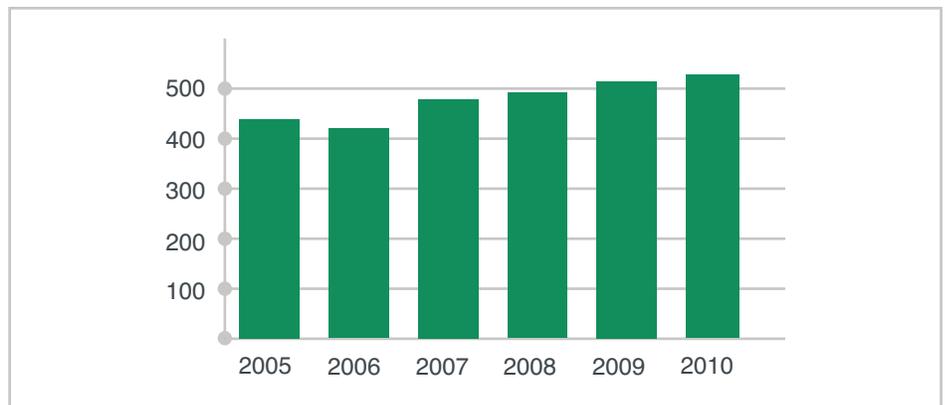
Using the revised process, SJHMC staff administered tPA to three times more patients with acute ischemic stroke in 2010 compared to 2009.



The process also reduced the door-to-CT completion time by 41 percent, from 78 to 46 minutes.



During this study period, the number of patients with acute stroke remained relatively flat.



Reaping the rewards of rapid team notification

With the new process in place, the St. John Hospital team has achieved a significant reduction in the time to treatment for acute stroke patients.

Neurologists on call for acute stroke respond to the ED call in an average of two minutes, down from an average of 22 minutes.

“Because the notification is immediate and because the neurologist knows

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Dr. Robert B. Dunne
Vice chief
Emergency Department

the call is coming from the ED, they respond quickly. I rarely get backup calls anymore because the notification system works so well,” says Cullis.

The door-to-CT completion time averaged 78 minutes before the notification system was implemented. That number is now 46 minutes.

Although the number of patients diagnosed with acute ischemic stroke has remained stable, the number who receive tPA has increased substantially, according to Dunne.

“We were below the national average before, and now we’re way above average—and getting better all the time.”

Using call tracking to improve data collection

The team’s ability to collect data regarding patients evaluated for acute stroke also improved.

According to Stover, the process increased by 25 percent the number of patients with stroke-like symptoms who are tracked in the system.

“We can now easily identify patients who presented with symptoms of stroke but were discharged with a different diagnosis. Before, we could only easily track patients with a discharge diagnosis of stroke. It gives us a much bigger pool from which to identify trends, barriers and opportunities to improve.”

According to Dunne, the ability to capture data is important to The Joint Commission stroke certification process.

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The findings of the St. John Hospital team were presented at the Society of Academic Emergency Medicine’s national meeting in Boston in June 2011 and at the Michigan State Medical Society Quality Symposium in Novi, Michigan in October 2011.

The team plans to continue identifying and improving delays in tPA administration time, develop a database for objective outcomes analysis of National Institutes of Health stroke scores at admission and discharge and improve outreach to community hospitals for patients needing interventional treatment via telemedicine.

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Carrie Stover, MSN, NP-C
Director of neuroscience

Dunne sees the benefits of the new program for both patients and physicians. “The notification system has made the management of stroke easier for the ED doctor, which is great for patients. It reduces the frustrations of the ED physician and frees him or her up to care for patients. We have a really busy and fast-growing emergency department, so it’s important that we have a system that works well for us.”

Stover agrees. “PerfectServe really helped us to affect a practice change, making treatment better and safer for patients and easier for ED staff.”

Cullis recalls the importance of rapid treatment for a particular patient. “We had a patient who came in recently with a lack of blood supply to his brain stem—a very important part of the brain. He was treated quickly and effectively and is going to walk out of the hospital almost completely normal because of the speed of the treatment.”

He credits the PerfectServe notification system as being an essential factor in the team’s ability to treat patients quickly.

“The slogan we like to use in treating stroke is ‘time is brain.’ Cells are dying at a prodigious rate for every minute that you don’t do something, and it’s important to intervene quickly. PerfectServe helps us do that and has become an important part of our acute stroke treatment program.”

References

1. Lloyd-Jones D, Adams RJ, Brown TM, Carnethon M, Dai S, De Simone G, et al. Executive summary: heart disease and stroke statistics—2010 update: a report from the American Heart Association. *Circulation*. 2010;121:948–954.
2. Kochanek K, Xu J, Murphy SL, Minino AM, Kung H-C. Deaths: Preliminary data for 2009. *National Vital Statistics Report*. 2011;59:1–51.
3. Fonarow GC, Smith EE, Saver JL, Reeves MJ, Bhatt DL, Grau-Sepulveda MV, et al. Timeliness of tissue-type plasminogen activator therapy in acute ischemic stroke: patient characteristics, hospital factors, and outcomes associated with door-to-needle times within 60 minutes. *Circulation*. 2011;123(7):750-8.

4. Lees KR, Bluhmki E, von Kummer R, Brott TG, Toni D, Grotta JC, et al. Time to treatment with intravenous alteplase and outcome in stroke: an updated pooled analysis of ECASS, ATLANTIS, NINDS, and EPITHET trials. *Lancet*. 2010;375(9727):1695-703.
5. Adams HP Jr, del Zoppo G, Alberts MJ, Bhatt DL, Brass L, Furlan A, et al. Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups: The American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists. *Circulation*. 2007;115(20):e478-534.
6. Alberts MJ, Latchaw RE, Jagoda A, Wechsler LR, Crocco T, George MG, et al. Revised and updated recommendations for the establishment of primary stroke centers: a summary statement from the Brain Attack Coalition. *Stroke*. 2011;42:2651-2665.
7. Joint Commission. Facts about primary stroke center certification. Available at: http://www.jointcommission.org/facts_about_primary_stroke_center_certification. Accessed October 5, 2011.