

Better stroke care, everywhere: Study boosts local hospitals' clotbuster use

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These 24 community hospitals across the lower peninsula of Michigan participated in the INSTINCT stroke trial. The 12 shown as gray dots were randomly assigned to receive education and 24/7 phone support from University of Michigan stroke experts; the 12 in white were not. Use of tPA clotbuster rose more at the 12 intervention hospitals. Credit: University of Michigan Health System

From the moment a stroke occurs, patients must race against the clock to get treatment that can prevent lasting damage. Now, a new study shows the promise – and the challenges – of getting them state-of-the-art treatment safely at their local hospital, saving precious minutes.

The results come from an effort that tested methods to improve delivery of a time-sensitive, clot-busting drug in [stroke](#) patients at 24 community hospitals across Michigan. To date, clot-busting [treatment](#) has been mostly used at larger hospitals.

The research effort was coordinated by members of the University of Michigan Health System's Department of Emergency Medicine, Department of Neurology and Stroke Program, which offered half the hospitals education and round-the-clock treatment assistance by phone. The study was funded by the National Institute of Neurological Disorders and Stroke at the National Institutes of Health.

By the end of the study, the community hospitals across Michigan that had the U-M experts as the "sixth man" on their teams did better at delivering the drug called tPA to eligible patients than those that didn't.

The findings of the [randomized controlled trial](#) are published in *Lancet-Neurology*. They show that community hospitals can indeed improve patients' chances of getting tPA in the first few hours of a stroke, without increased risk of dangerous bleeding.

Data from 22 of the hospitals show that tPA use more than doubled in the 11 hospitals that were randomly chosen to get the extra help, versus a smaller increase in the 11 that didn't. Some hospitals even surpassed national targets for tPA use that large stroke centers don't always reach – a true game-changing performance.

Across the U.S., less than 2 percent of stroke patients receive tPA – when more than 11 percent could – largely because of the time limits on its use and delays in getting patients to a hospital. That's why it's important for community hospitals to offer it.

The investigation, called INSTINCT for INcreasing Stroke Treatment

through INterventional Change Tactics, demonstrates that tPA can be used safely and appropriately in the community hospital setting – and that more work needs to be done to expand public access to the only treatment approved by the U.S. Food and Drug Administration to reverse the effects of stroke. While improvement at the target community hospitals that got the education was statistically significant, it was not as large as hoped for. But the findings suggest that relatively low-cost and low-tech interventions can improve local stroke care.

Lead author Phillip Scott, M.D., a U-M emergency physician and principal investigator of the trial, likens the results to the performance of teams from smaller athletic conferences that beat larger, more celebrated teams, to reach the final stages of the annual NCAA college basketball tournament.

"This study suggests that community hospitals can evaluate and treat enough emergency stroke patients to keep their teams' treatment skills sharp, but are of a size that creates rapid lines of communication and stable physician and nurse teams. This may facilitate rapid, safe stroke diagnosis and care," says Scott, an associate professor of emergency medicine at the U-M Medical School. "Four of the hospitals that received the educational intervention achieved tPA use rates of 5 to 8 percent of all stroke patients, compared to only one of the control hospitals. That's a rate many large medical centers strive to reach."

"This study, while finding only modest improvements, provides encouraging evidence that intensive professional education at [community hospitals](#) has the potential to improve the use of tPA in acute stroke care," said Scott Janis, Ph.D., program director at the NINDS. "Importantly, it also lays the groundwork for future strategies that should be explored to develop evidence-based interventions that would improve patient access to this proven therapy following stroke."

How it was done, and more about the results:

The study started by collecting baseline data on stroke treatment from 2005 and 2006 at all the hospitals. After the sites were randomized, the U-M team offered continuing medical education classes at the hospitals, workshops at U-M, and other support, including 24-hour phone consultation availability, to the hospitals chosen to receive the intervention.

All the hospitals were in the lower peninsula of Michigan, and were chosen at random from among hospitals with at least 100 stroke discharges per year. All hospitals that participated stayed in the trial until data collection ended in 2010. Hospitals could hold primary stroke center designation, as granted by the Joint Commission, but could not be tertiary academic comprehensive [stroke centers](#).

In all, 188 tPA treatments occurred among 15,065 stroke patients during the baseline period, and 557 treatments occurred among 25,758 stroke patients from 2007 to 2010. The authors note that tPA use at hospitals nationwide rose somewhat during the study period, due to factors such as insurance reimbursement and new data on tPA's effectiveness at preventing disability.

The INSTINCT study findings were complicated by the fact that one of the hospitals enrolled in the trial became an academic stroke center after starting the study. When it and its matched hospital are excluded from the analysis, the remaining hospitals showed enough of an impact from the educational effort to be statistically significant – a 105 percent increased use of tPA over baseline.

"We essentially saw a doubling of tPA usage, using standard technologies for education and support. Importantly, the increase was achieved safely," Scott says. "This shows we can translate the knowledge

of effective stroke treatment into a community setting." The size of the study, with 557 stroke patients treated after intervention began, makes it one of the largest tPA studies in the world.

More about stroke treatment:

The use of tPA in ischemic stroke has grown around the world in the last decade, but many patients who could get the drug still do not. The "treatment window" for tPA has been seen as three hours from the onset of stroke symptoms, though recent studies suggest patients can see benefit even four and a half hours out. The importance of early treatment, however, cannot be overstated, as patients treated earlier have greater benefits and the drug is not currently FDA-approved for use beyond three hours.

Considering that most stroke sufferers wait more than an hour after symptoms start before they seek help, and that travel time to a tPA-providing hospital is around 30 minutes, that leaves hospitals about an hour to do medical imaging, make a firm diagnosis and initiate tPA treatment.

Patients must then be monitored to check for brain bleeding, and to assess the impact of their stroke. To reliably accomplish this, a system for the care of acute [stroke patients](#) must already be in place when a patient arrives at the emergency department.

Patients who don't reach a location where they can received standard [tPA](#) treatment in time can still potentially be treated with advanced catheter-based clot removal treatment at a major referral [hospital](#) such as U-M. These advanced therapies have a longer time window for treatment, but have not been proven more effective than early standard treatment. The Stroke Program at U-M is participating in multiple trials to improve advanced stroke treatment.

More information: *Lancet Neurology*:
[dx.doi.org/10.1016/S1474-4422\(12\)70311-3](https://doi.org/10.1016/S1474-4422(12)70311-3)

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