

Timely treatment after stroke is crucial, researchers report

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For years, the mantra of neurologists treating stroke victims has been "time equals brain." That's because getting a patient to the emergency room quickly to receive a drug that dissolves the stroke-causing blood clot can make a significant difference in how much brain tissue is saved or lost.

But specific information has been limited on just how the timing of giving the [intravenous drug](#)—known as a [tissue plasminogen activator](#), or tPA—influences outcomes for victims of ischemic (clot-caused), stroke, the most common type of stroke.

Now, a team led by UCLA researchers has conducted a major study on the importance of the speed of treatment when using tPA, analyzing outcomes for more than 50,000 [stroke patients](#) and determining just how critical the time between the onset of stroke and the administering of treatment is.

"We found that treatment time has a profound influence on outcome," said the study's first author, Dr. Jeffrey Saver, a professor of neurology and director of the UCLA Stroke Center. "The sooner treatment is started, the better. Beginning treatment earlier resulted in an improved ability to walk, the ability to remain living independently, less bleeding in the brain and reduced mortality."

The team's findings are reported in the June 19 issue of the *JAMA, The Journal of the American Medical Association*.

Previous research had demonstrated that administering tPA intravenously up to 4.5 hours after a stroke occurs benefits patients with moderate to severe [acute ischemic stroke](#). Data pooled from a number of small, [randomized clinical trials](#) showed that the benefit of tPA was greatest when given very early after stroke, and that the benefit declined throughout the first 4.5 hours.

But the available data from these clinical trials was small—just 1,850 tPA-treated patients from eight trials—limiting precision in delineating the influence of time-to-treatment, as well as researchers' ability to determine whether the benefits could be generalized to a wider population. To address this need, the current study used a large national registry to determine more precisely the association of time-to-treatment and the resulting outcomes.

The team, which included UCLA's Dr. Gregg C. Fonarow, a professor of cardiovascular medicine and the director of the Ahmanson–UCLA Cardiomyopathy Center, analyzed data from the national stroke care quality-improvement database maintained by the American Heart Association/American Stroke Association's Get With the Guidelines–Stroke program (GWTG–Stroke). They looked at the relationship between the time of treatment and in-hospital outcomes for 58,353 acute [ischemic stroke](#) patients treated with tPA within 4.5 hours of stroke onset.

The data was obtained from 1,395 hospitals between April 2003 and March 2012. The median age of patients, who were evenly divided between males and females, was 72. The average time from stroke onset to the beginning of treatment was 144 minutes, or roughly 2.5 hours. The extensive GWTG–Stroke database included information on each patient's medical history, stroke onset time, arrival time at a hospital, the time [tPA](#) treatment began, and other treatments and procedures.

Distilling this information, the researchers were able to confirm precisely how critical the time gap is between when a stroke occurs and when treatment begins.

"We know from brain-imaging studies that in humans, the volume of irreversibly injured tissue in the brain from an ischemic stroke expands rapidly over time, consuming 2 million additional neurons every minute until blood flow to the brain is restored," Saver said.

In examining the data from the GWTG–Stroke database, the researchers found that for every 15-minute faster interval of treatment, going home was 3 percent more likely, walking at the time of discharge was 4 percent more likely, having symptoms of hemorrhaging in the brain was 4 percent less likely to occur, and death was 4 percent less likely.

The findings underscore the important public health message that "time lost is brain lost in acute stroke," Saver said. "These results support the importance of the American Heart Association's "Target: Stroke" campaign, and the ongoing worldwide efforts to get stroke patients to a hospital and begin clot-busting treatment as soon as possible."

Please see the full *JAMA* paper for other authors and institutions that participated in the study, as well as for all author disclosures.

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