

# Hospital uses 'lean' manufacturing techniques to speed stroke care

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A hospital stroke team used auto industry "lean" manufacturing principles to accelerate treatment times, according to new research in the American Heart Association's journal *Stroke*.

In a prospective observational study, the average time between patients arriving at Barnes-Jewish Hospital in St. Louis, Mo., and receiving the clot-busting agent [tissue plasminogen activator](#) (tPA), decreased 21 minutes using process improvement techniques adapted from auto manufacturing. Data from more than 200 patients was included in the study analysis, ranging over 3 years.

The shorter the time between patients arriving at the hospital and receiving tPA, the greater the chance to reduce [brain injury](#) after stroke, researchers said. Using lean techniques, the hospital's stroke team identified unnecessary or inefficient steps such as inefficient patient transportation, tasks performed one at a time rather than simultaneously, and time-consuming traditional lab-based tests. Protocols were formulated to eliminate wasteful steps, keeping only crucial steps that added "value" to patient care, in keeping with auto-manufacturers' lean methods which eliminates inefficiencies in [automobile production](#).

The team streamlined the process by having EMS route patients directly to the [CT scanner](#) for immediate brain imaging, enlisted the help of more team members each with fewer tasks to complete, and instituted bedside tests which provide laboratory results within minutes. These modifications ensured that rapid diagnosis and treatment would be

available for patients as soon as they arrived at the Emergency Department.

As a result, 78 percent of [stroke patients](#) received tPA within one hour of arrival. The "Get with the Guidelines" national database indicates that currently only about 30 percent of patients in the United States are treated within one hour. The overall treatment time was reduced from 60 minutes to 39 minutes—sustained for a year after implementation.

The protocol changes didn't alter patient safety or clinical outcomes, researchers said.

"There is growing awareness that fast and efficient treatment is important for improving the effectiveness of tPA. National guidelines suggest that door-to-needles times should be under 60 minutes, yet these guidelines do not state how this can be achieved. Lean process improvements methodology can be effectively applied towards achieving this and other process improvement goals," said Jin-Moo Lee, M.D., Ph.D., lead author of the study and Director of the Cerebrovascular Disease Section in the

Department of Neurology at Washington University School of Medicine in St. Louis.

A larger study is needed to validate results, researchers said.

Provided by American Heart Association

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