## Use of rt-PA in a statewide acute stroke registry

Deng et al. found that among 2,566 acute stroke admissions to 16 statewide hospitals, 12.9% were eligible for rt-PA treatment. Of these, 13% received treatment. Treatment rate was better in men and in patients treated by emergency medical services. The primary reasons for nontreatment were delayed presentation and unknown onset time.

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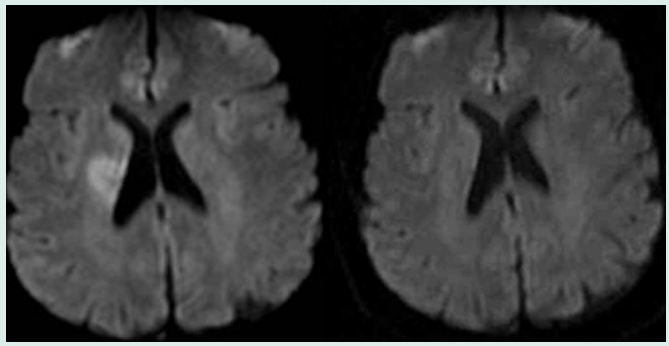
## Understanding chaos and the transformation of acute stroke care

Commentary by David S. Liebeskind, MD

During the minutes immediately following stroke onset, there may be dramatic changes in clinical symptoms ranging from rapid resolution of disabling deficits to sudden neurologic deterioration. Dynamic fluctuations in acute stroke pathophysiology may be characterized by chaos theory, where complex changes and instability may be determined by potentially predictable specific underlying factors. Initial patient encounters as early as 20 minutes after stroke onset in the FAST-MAG Phase 3 trial underscores these very early dynamic phases.[1] The mounting extent of brain injury across individuals makes it imperative to diagnose and treat as early as possible, even if such an approach results in a large percentage of emergently triaged TIA (figure) cases. Such chaos during early stages allows for dramatic reversal of a devastating disorder.



*Spontaneous clinical improvement and recanalization of transient right middle cerebral artery occlusion associated with resolution of diffusion-weighted imaging abnormality between images acquired at 1 hour (left) and 4 hours (right) after symptom onset.*

The Deng et al. study assessed the use of IV tissue plasminogen activator (tPA) in a statewide registry and identified factors associated with tPA use in eligible cases, pointing to the need for improved public education, rapid triage, and associated documentation in acute stroke. Paramedic transport, documentation of time of onset, and earlier presentation within the narrow 3-hour window were associated with increased use of tPA. Time was an essential, pervasive component in nearly all analyses. A large percentage of TIA cases was also noted in those not receiving tPA, an expected result when one targets the early dynamic phases of acute stroke. This realistic perspective on the relatively chaotic nature of acute stroke care in clinical practice reflects the Michigan experience, yet similar approaches may be used to identify important variables and patterns in other regions.

Understanding the chaos inherent in acute stroke pathophysiology and complex association with time as a pivotal variable is not limited to tPA, and is likely to affect future treatment options including strategies for intracranial hemorrhage.[2] Early and appropriate intervention will depend on adapting current models of stroke care delivery to the chaotic nature of stroke and its management in clinical practice across a diverse range of settings.

### References

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