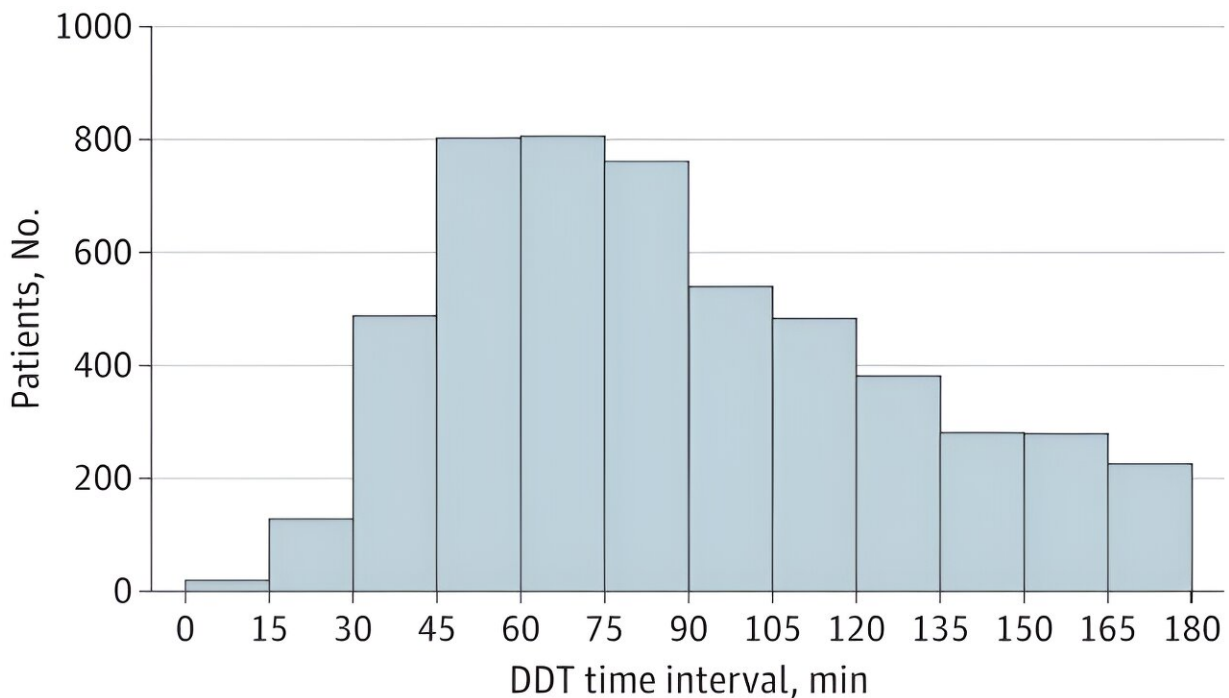


# Faster brain hemorrhage treatment increases survival odds, new study finds

February 14 2024, by Isabella Backman



Distribution of Patients by 15-Minute Increments in Door-to-Treatment (DDT) Time Windows. Credit: *JAMA Neurology* (2024). DOI: 10.1001/jamaneurol.2024.0221

Taking an anticoagulant, or blood-thinning medication, can increase one's risk of—or exacerbate—a brain bleed, also known as a brain hemorrhage, which is the deadliest type of stroke. Now, new research finds that faster treatment for these patients is associated with a greater

likelihood of survival.

A [hemorrhagic stroke](#) occurs when a weakened blood vessel ruptures and causes bleeding within the brain. Approximately 20% of patients who suffer brain hemorrhages have been found to be taking an anticoagulant, such as warfarin, rivaroxaban, dabigatran, and apixaban. These [blood thinners](#) are commonly used to treat cardiovascular conditions such as [atrial fibrillation](#) (an irregular heart rhythm) and chronic and acute blood clotting disorders.

"Oral anticoagulation agents are highly effective and important medications for the population, which individuals appropriately need. As a consequence, it's important to know the infrequent but serious individual risk," says Kevin Sheth, MD, professor of neurology and of neurosurgery at Yale School of Medicine. "Our health systems need to be prepared and ready to move fast when something does go awry."

Over the past decade, scientists have developed reversal agents for specific anticoagulants, including idarucizumab for dabigatran in 2015 and andexanet alfa for rivaroxaban and apixaban in 2018. These are typically administered in hospital emergency departments and can save the lives of those suffering brain bleeds.

Now, using a large, real-world dataset, researchers have shown that administering these treatments more quickly can increase a patient's chance of survival. The researchers published their [findings](#) in *JAMA Neurology* on February 9.

"As these reversal treatments have been coming to the fore, experts have been wondering if earlier timing was better," says Sheth, who was first author of the study. "This paper, for the first time, demonstrates that it is."

There are two main types of strokes—bleeding (brain hemorrhages) and clotting. A clotting (ischemic) stroke occurs when clots block blood flow to the brain. In 1995, the U.S. Food and Drug Administration (FDA) approved the first clot-busting agent for ischemic strokes, named tissue-type plasminogen activator (tPA).

Shortly after its approval, researchers learned that earlier tPA treatment—within four and a half hours—led to better health outcomes. "This insight changed stroke systems of care," says Sheth. "We had to identify those suffering clotting strokes and get them to the hospital quickly."

But for brain bleeds, says Sheth, "that paradigm has never been there."

## **Earlier brain hemorrhage treatment resulted in better outcomes**

Sheth's recent publication is the result of a collaboration with the American Heart Association Get With The Guidelines stroke registry, one of the largest stroke registries in the world. Within the registry, his team identified people who had suffered a [brain hemorrhage](#), who were on blood thinners at the time of their hemorrhage, and who had received anticoagulant reversal agents.

Then, for this cohort, they observed the time duration between patients' arrival to the [emergency department](#) and delivery of treatment. "There was a large distribution there," says Sheth. "Some received the reversal agent quickly, while for others it was quite slow."

Their analyses revealed that those who were treated quickly with a reversal agent showed the best outcomes. Patients who were treated within an hour of arrival to the emergency department had the greatest

likelihood of survival. "There are popular phrases we have in neurology like, 'time is brain,' and 'every minute counts,'" says Sheth. "These results are in line with these phrases, but for brain hemorrhages, they are being verified for the first time."

The team also found several factors that were significantly correlated with shorter wait times. For example, white patients faced significantly shorter wait times than Black patients. "We not only have the opportunity to improve overall survival for brain hemorrhages, but also for attenuating health disparities," says Sheth.

The study is evidence that brain hemorrhages are a time-sensitive emergency in which every minute counts. "Before, we didn't know time was important, so clinicians weren't making the same mad rush that they were for clotting strokes," says Sheth. "Now, we can begin driving quality improvement efforts for treating brain hemorrhages more quickly."

Sheth's team is continuing to work with the American Heart Association to conduct further analyses. They hope to learn more about the factors underlying why some patients wait longer for treatment, and also develop and roll out initiatives for helping patients get the care they need more rapidly.

**More information:** Kevin N. Sheth et al, Time to Anticoagulation Reversal and Outcomes After Intracerebral Hemorrhage, *JAMA Neurology* (2024). [DOI: 10.1001/jamaneurol.2024.0221](https://doi.org/10.1001/jamaneurol.2024.0221)

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