

## REFERENCE

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Kam W, Holmes DN, Hernandez AF, et al. Association of Recent Use of Non–Vitamin K Antagonist Oral Anticoagulants With Intracranial Hemorrhage Among Patients With Acute Ischemic Stroke Treated With Alteplase. *JAMA*. Published online February 10, 2022.

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## SUMMARY

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This study provides the largest data to date supporting the safety of alteplase for acute ischemic stroke in patients taking NOACs. A large gap still exists as only 25 patients had a documented last NOAC dose <48 hrs prior to hospital arrival of which 8% developed symptomatic ICH.

## BACKGROUND

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○ Despite their efficacy in preventing thromboembolic events, approximately 1% to 2% of patients taking NOACs are anticipated to experience an ischemic stroke each year.

Currently due to limited robust clinical data assessing the safety of alteplase use in patients taking non–vitamin K antagonist oral anticoagulants (NOACs) prior to their stroke, thrombolytic therapy is recommended to be withheld due a perceived increase risk of symptomatic intracranial hemorrhage or other serious bleeding complications.

## STUDY OBJECTIVE

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○ To evaluate the safety and functional outcomes of intravenous alteplase among patients who were taking NOACs prior to stroke and compare outcomes with patients who were not taking long-term anticoagulants.

## STUDY DESIGN

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○ A prespecified retrospective analysis of data from 2 interrelated registries (GWTG-Stroke registry and The ARAMIS registry) of patients who had an acute ischemic stroke in the US.

## STUDY INTERVENTION & COMPARISON

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○ The study population included 163,038 patients with acute ischemic stroke who were treated with intravenous alteplase within 4.5 hours of

symptom onset. Patients were either taking NOAC medications (2,207) or not taking any anticoagulant medications prior to their admission (160,831).

## RESULTS

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### ○ Primary Outcome

The unadjusted rate of symptomatic intracranial hemorrhage

- **NOACs - 3.7%** (95% CI, 2.9% to 4.5%)
- **Not taking anticoagulants - 3.2%** (95% CI, 3.1% to 3.3%)

Secondary Safety

Unadjusted: Inpatient mortality

- NOACs - 6.3%
- Not taking anticoagulants - 4.9%

Unadjusted: Life-threatening or serious systemic hemorrhage within 36 hours

- NOACs - 0.7%
- Not taking anticoagulants - 0.6%

Unadjusted: Any alteplase-related complication

- NOACs - 6.9%
- Not taking anticoagulants - 6.0%

Unadjusted: Combined in-hospital mortality or discharged to hospice

- NOACs - 12.4%
- Not taking anticoagulants - 9.4%

### ○ Secondary Outcomes

○ After risk adjustment, patients taking NOACs were significantly more likely to ambulate independently at hospital discharge (51.7% vs 57.9%), be discharged home (45.9% vs 53.6%), be free of disabilities at hospital discharge (26.9% vs 34.0%), and be functionally independent at hospital discharge (37.1% vs 44.5%)

○ There were no significant differences in the proportion of patients who were discharged to hospice, an inpatient rehabilitation facility, or a skilled nursing facility between the 2 groups

## EXPLORATORY ANALYSIS

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Of the 25 patients who took their last NOAC dose between 0 and 48 hours ago, 2 (**8.0%**) developed symptomatic intracranial hemorrhage after receiving thrombolytic therapy

## AUTHOR CONCLUSION

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\*\*“Among patients with acute ischemic stroke treated with intravenous alteplase, use of NOACs within the preceding 7 days, compared with no use of anticoagulants, was not associated with a significantly increased risk of intracranial hemorrhage.”\*\*

## ADDITIONAL READINGS

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1. Powers WJ, Rabinstein AA, Ackerson T, et al. Guidelines for the early management of patients with acute ischemic stroke: 2019 update to the 2018 guidelines for the early management of acute ischemic stroke. Published correction appears in *Stroke*. 2019;50(12):e440-e441. *Stroke*. 2019;50(12):e344-e418.
2. Jin C, Huang RJ, Peterson ED, et al. Intravenous tPA (tissue-type plasminogen activator) in patients with acute ischemic stroke taking non-vitamin K antagonist oral anticoagulants preceding stroke. *Stroke*. 2018;49(9):2237-2240.
3. Xian Y, Federspiel JJ, Hernandez AF, et al. Use of intravenous recombinant tissue plasminogen activator in patients with acute ischemic stroke who take non-vitamin K antagonist oral anticoagulants before stroke. *Circulation*. 2017;135(11):1024-1035.
4. Fonarow GC, Reeves MJ, Smith EE, et al. Characteristics, performance measures, and in-hospital outcomes of the first one million stroke and transient ischemic attack admissions in Get With The Guidelines–Stroke. *Circ Cardiovasc Qual Outcomes*. 2010;3(3):291-302.
5. Xian Y, Hernandez AF, Harding T, Fonarow GC, Bhatt DL, Suter RE, Khan Y, Schwamm LH, Peterson ED. Acute management of stroke patients taking non-vitamin K antagonist oral anticoagulants Addressing Real-world Anticoagulant Management Issues in Stroke (ARAMIS) Registry: Design and rationale. *Am Heart J*. 2016 Dec;182:28-35. doi: 10.1016/j.ahj.2016.07.023.

