

# Brain biomarker in blood sample predicts stroke, researchers demonstrate

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Researchers at Uppsala University Hospital and Uppsala University have demonstrated that a simple blood test that reflects brain health can predict which people are most at risk of suffering a stroke. The discovery could contribute to more individualized treatment of patients with atrial fibrillation. The study has been [published](#) in the journal

## *Circulation.*

Atrial fibrillation is the most frequent [cardiac arrhythmia](#), affecting around a third of all people at some point in their life. Atrial fibrillation is a common cause of [stroke](#), since the cardiac arrhythmia increases the risk of blood clots forming in the heart's atria. Many people with [atrial fibrillation](#) therefore receive anticoagulation [treatment](#) with a view to preventing stroke.

However, since anticoagulation treatment leads to an increased risk of serious hemorrhages, only people with a moderate or high risk of experiencing a stroke receive this treatment, instead of all people with atrial fibrillation. This makes it important to be able to identify, with as high a degree of precision as possible, the individuals who will benefit from anticoagulation treatment.

The researchers have now analyzed the substance neurofilament, a protein that is released from the brain in cases of injurious strain and hypoxia, in blood samples from more than 3,000 people with atrial fibrillation. The researchers then followed these people for an average of one and a half years. The individuals with the highest neurofilament levels in their blood had the highest risk of suffering a stroke. The risk of stroke among the quarter with the highest neurofilament levels was more than three times as high as for those with the lowest levels.

"As the risk of suffering a stroke determines which type of treatment is appropriate, this can help to increase the precision in the selection of treatment," says Julia Aulin, cardiologist at Uppsala University Hospital and researcher at Uppsala University, and the lead author of the study.

When the researchers then combined neurofilament with ordinary cardiac blood samples from the same individuals, this further increased the ability to predict stroke.

"We have not been able previously to measure the effect of atrial fibrillation on the brain in this way. Since atrial fibrillation affects both the heart and the brain, it is logical that the precision improves when both are assessed," says Karl Sjölin, stroke physician at Uppsala University Hospital, co-author of the study.

Blood tests are in everyday use in health care to evaluate the functioning of our organs, such as the heart, the kidneys and the liver, but there is no established blood test to evaluate the condition of the brain in connection with cardiovascular disease.

"We have been aware of neurofilament for a long time, but it is only in recent years that we have begun to understand how to use it," Sjölin adds.

The next step is to investigate the effect of various treatments in health care on neurofilament levels and whether this in turn has any significance for the risk of suffering a stroke or death.

"We hope to be able to intervene at an earlier stage and inhibit injurious strain on the brain before it gives rise to symptoms. The findings are probably transferrable to other groups of patients with cardiovascular-related disorders, though this remains to be demonstrated. Our hope is that it will ultimately be possible to assess [brain health](#) with a [simple blood test](#) at the local health center," Aulin says.

**More information:** Julia Aulin et al, Neurofilament Light Chain and Risk of Stroke in Patients With Atrial Fibrillation, *Circulation* (2024). [DOI: 10.1161/CIRCULATIONAHA.124.069440](https://doi.org/10.1161/CIRCULATIONAHA.124.069440)

Provided by Uppsala University

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