

Chip inserted under the skin may better identify patients at risk of recurrent stroke

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A blood clot forming in the carotid artery. Credit: American Heart Association

For patients who have experienced certain common types of stroke, a small chip inserted under the skin may help physicians predict their likelihood of experiencing a second stroke, and therefore their likelihood

of benefiting from preventive therapy. The findings come from a recent clinical trial published in the *Journal of the American Medical Association* and led by investigators at Massachusetts General Hospital (MGH) and Northwestern University Feinberg School of Medicine.

Each year, approximately 800,000 strokes occur in the United States, and as many as one-fourth occur in people who experienced a previous [stroke](#). Investigators have been searching for ways to identify patients who are likely to experience a recurrent stroke, as these individuals could be candidates for taking certain medications such as blood thinners. One group of patients who face an elevated risk of recurrent strokes are those with [atrial fibrillation](#)—an irregular and often rapid heart rate—that often goes undetected and untreated. (Irregular heartbeats can allow blood to pool in the heart, which can cause clots to form and travel to the brain.)

Recent research has shown that a small chip inserted under the skin can monitor the heart rate and rhythm, and help physicians detect atrial fibrillation in patients who previously experienced what's called a cryptogenic stroke, one with no identified cause despite thorough patient testing. Now investigators have tested the chip—less than 1¾" long and 1/6" thick and called an insertable cardiac monitor—in patients who experienced a stroke caused by narrowing of a large artery like the carotid artery, or blockage of a small artery deep in the brain where atrial fibrillation would be unexpected.

In the Stroke of Known Cause and Underlying Atrial Fibrillation (STROKE AF) trial, 492 patients were randomized and completed 12 months of follow-up after receiving either an insertable cardiac monitor within 10 days of an initial stroke or usual care consisting of external cardiac monitoring through electrocardiograms or other tracking methods.

The chip detected atrial fibrillation in 12.1% of patients, compared with 1.8% detected through usual care. The team noted that the episodes of atrial fibrillation were not brief, with most lasting at least one hour. Most stroke experts would recommend that patients with this degree of atrial fibrillation start taking blood thinners to prevent a future stroke.

"We found that a significant minority of patients with stroke not thought to be related to atrial fibrillation actually have atrial fibrillation, but we can only find it with an implantable monitor," says lead author Richard A. Bernstein, MD, Ph.D., a professor of Neurology at Northwestern University Feinberg School of Medicine.

Adds senior author Lee H. Schwamm, MD, C. Miller Fisher Chair of Vascular Neurology at MGH: "Based on the study findings, we believe that patients with stroke who are similar to those in the STROKE AF Trial should now undergo long-term cardiac monitoring with an insertable cardiac monitor to identify unsuspected atrial fibrillation."

Schwamm notes that for every eight [patients](#) monitored, clinicians could expect to find atrial fibrillation in one of them in the first year. "This could dramatically change the treatment recommendations by their doctor," he says.

Next steps in this research include identifying patient factors that predict the development of atrial fibrillation and the duration and extent of the arrhythmia. Additional studies are being explored to further understand the association of silent atrial [fibrillation](#) and recurrent stroke of all types.

More information: Bernstein RA et al. Effect of Long-term Continuous Cardiac Monitoring vs Usual Care on Detection of Atrial Fibrillation in Patients With Stroke Attributed to Large- or Small-Vessel Disease: The STROKE-AF Randomized Clinical Trial. *JAMA*, (2021).

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