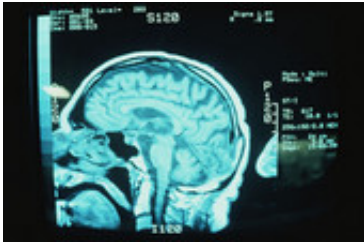


# Stem cells show promise for stroke recovery

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Early study found they can be safely transplanted into the brain; 2 patients showed significant improvement.

(HealthDay)—In an early test, researchers report they've safely injected stem cells into the brains of 18 patients who had suffered strokes. And two of the patients showed significant improvement.

All the patients saw some improvement in weakness or paralysis within six months of their procedures. Although three people developed complications related to the surgery, they all recovered. There were no adverse reactions to the transplanted [stem cells](#) themselves, the study authors said.

What's more, the researchers said, two patients experienced dramatic recoveries almost immediately after the treatments.

Those patients, who were both women, started to regain the ability to talk and walk the morning after their operations. In both cases, they were more than two years past their strokes, a point where doctors wouldn't

have expected further recovery.

The results have encouraged researchers to plan larger and longer tests of the procedure, which uses stem cells cultured from donated bone marrow.

An expert who was not involved in the research called it a promising first step.

"It's a small, early human study. It takes multiple steps to get to something clinically useful, and this is a nice, early step," said Dr. Steven Cramer, clinical director of the Stem Cell Research Center at the University of California, Irvine.

The findings were to be presented Monday at the American Association of Neurological Surgeons annual meeting, in San Francisco. The results of studies presented at meetings are considered preliminary until they've been published in peer-reviewed medical journals.

Strokes occur when a blood clot or bleeding disrupts blood flow to the brain. Brain cells deprived of oxygen and nutrients quickly die. Strokes kill about 137,000 Americans each year, according to the American Stroke Association, making them a leading cause of death in the United States, but they disable many more.

Some 7 million American adults are estimated to be living with the aftereffects of stroke, which can include difficulty speaking, weakness, paralysis, and trouble with thinking and memory. Intensive physical therapy can help people regain abilities they've lost after a stroke, but there's currently no way to repair damaged brain tissue, experts say.

In animal studies, stem cells have shown great potential to help heal the brain damage caused by strokes.

The new research is one of the first tests of the treatment in humans, the researchers said.

Participants in the new study ranged in age from 33 to 75. Each had experienced a stroke caused by a blood clot at least six months before their procedures. And each had been left with some weakness or paralysis in a limb.

The stem cells used in the study came from [bone marrow](#) donated by two people who were unrelated to the study participants. Special cells called [mesenchymal stem cells](#) were isolated from the marrow and grown in a lab, where they were treated with a gene that's thought to enhance their healing abilities.

Study participants were tested to make sure their bodies wouldn't reject the stem cells, but they weren't given any immune-suppressing medications.

Surgeons used a computer to sync images from MRI and CT scans, to form a three-dimensional picture of the stroke-damaged areas within the brain.

Patients were awake, but sedated, when surgeons drilled a nickel-sized hole in their skulls. Doctors used three passes with long needles to place 15 deposits of stem cells around the border of the damaged tissue. Six patients got a dose of 2 million cells, another six got 5 million, and the last six got 10 million cells, according to the report.

In animal studies, research has suggested that stem cells injected into the brain don't regrow damaged tissue.

"What these cells seem to do instead is to modulate repair processes. They don't replace the damaged brain so much as massaging the bits that

are left, to get maximum function out of them," Cramer explained.

The study was primarily designed to evaluate the safety of this kind of [stem cell transplant](#). Researchers said they were pleased with the results on that score.

Three patients suffered adverse events that were related to the brain surgery. One developed bleeding between the brain and skull. Another patient suffered a seizure, while a third developed pneumonia. All recovered after treatment.

None of the patients showed any signs that their bodies were rejecting the foreign cells.

In addition to safety, researchers looked for signs that the cells had improved stroke symptoms. Most patients made gradual progress. By six months, all the patients demonstrated improvement in their weakness or paralysis on three different tests of post-stroke function, the researchers said.

But two patients in particular piqued researchers' interest.

"We had two patients who had remarkable recoveries," said study author Dr. Gary Steinberg, chairman of neurosurgery at Stanford University.

Both were women. One was 71, while the other was 33.

"They were very disabled. The 71-year-old could only move her left thumb. She couldn't move the arm or hand and could barely get her leg off the bed," he said.

"The day after surgery, she was lifting her arm over her head, and lifting her leg off the bed. She's walking now. She was wheelchair-bound

before," Steinberg added.

Similarly, the 33-year-old had a severe speech deficit and had trouble holding her arm up. Steinberg said the day after surgery she was lifting her arm over her head. A year later, her gait and speech have improved.

Steinberg cautioned that these "miracle-type" recoveries are not typical. And because there was no control group in the study, it's impossible to say whether it was the stem cells or something else about the procedure that helped the women.

"We never would have expected two years or more out that [patients](#) could recover from a stroke," said Steinberg. "We thought the circuits were dead. Now we know they're still viable. We just have to know how to activate them."

**More information:** Visit the [U.S. National Institute of Neurologic Disorders and Stroke](#) for more on stem cell research.

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