

3 Psychiatric Tools That Could Boost the Brain's Natural Healing

They work for depression and P.T.S.D. Could they also help the brain repair itself after a neurologic catastrophe?



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In the 15 years that Dr. Sean Dukelow has been treating stroke patients at Foothills Hospital in Calgary, Canada, he has had just one proven tool to offer them: neurorehabilitation. Performing the same actions over and over in speech therapy, physical therapy and occupational therapy has been shown to harness the brain's natural plasticity, leading to neuron growth and new connections. "There's going to be a lot of repetition," he warns his patients.

Beyond that, therapies to boost long-term recovery are scant and limited to invasive implants that stimulate the vagus nerve or spinal cord. Now, neurologists are racing to find the first substance or device that could grease the wheels of healing — a turbo boost for brain recovery. "That turbo boost may be the

difference between you walking again, talking again, being able to get home, versus having to go to a nursing home,” Dr. Dukelow said.

Promising contenders include transcranial magnetic stimulation, antidepressant pills and psychedelics, therapies that are better known for treating conditions like depression, post-traumatic stress disorder and obsessive-compulsive disorder. In psychiatry, these methods are thought to hack into the circuits that underlie memory and learning — the same circuits posited to animate stroke recovery.

The hope is that, in addition to changing old thought patterns, such therapies can help the brain find different ways to do the things it used to do — letting us walk, speak, remember — by forging new paths around dead and damaged neurons. But can therapies used to reset a disordered brain also help to repair a damaged one? Here’s what scientists know.

Transcranial Magnetic Stimulation

Unlike its much maligned ancestor, electroconvulsive therapy, T.M.S. is generally painless and memory-sparing; no seizure required. Coils wrap around the outside of the scalp, sending brief magnetic pulses with about the same power as an M.R.I. machine. It’s a “clever trick” to pass through the skull to stimulate brain

circuits, said Dr. Mark George, a neurologist at the Medical University of South Carolina who pioneered the use of T.M.S. for depression.

Yet while T.M.S. has been shown to work for obsessive-compulsive disorder, migraines and smoking cessation, its use for stroke recovery remains contested. In general, clinical trials have been small and have shown mixed results. In April 2025, Dr. Dukelow published the results of a small trial in which he showed that T.M.S., paired with intensive speech therapy, could help stroke survivors speak more fluently more than six months after a stroke. One participant even relearned how to speak two of the four languages she had lost.

The ability to speak and process language is associated with Broca's area, near the front of the brain's left hemisphere. When that region is damaged, language can "migrate" to the right hemisphere, which seems to be less effective at making use of it, Dr. Dukelow said. "Our hypothesis was that if we inhibited the right Broca's area, our homologue of Broca's area, then we'd push language back into the left hemisphere," he said. "It worked."

Dr. Dukelow's team acted on a hunch. Larger, more targeted trials are needed, he said.

Prozac

In 2011, it seemed to scientists that a potent neuroplasticity booster might already be in many Americans' medicine cabinets: the antidepressant Prozac. That year, a French trial found that Prozac could help stroke survivors recover motor skills months after their injuries. But when other researchers rushed to replicate the experiment, the results were underwhelming. "Many of us were disappointed," Dr. Dukelow said. "We had a lot of hope that this might actually be the drug that breaks through and helps our patients."

But those follow-up studies had major flaws, said Dr. Steven Cramer, a neurologist at the University of California, Los Angeles, who consults on stroke-recovery therapies. For one, it isn't enough to simply pour a plasticity-enhancing drug on a healing brain; that plasticity must be directed toward skills you hope to recover. "Whatever magic pixie dust you sprinkle on the injured brain, you're not going to get maximum benefit unless you pair it with some kind of training," he said.

There is a theoretical basis for using a psychological tool to treat brain damage: "It's the same organ," Dr. Cramer said. Animal studies and small clinical trials have shown that these pills can excite brain circuits, lower inflammation and increase growth factors that enhance plasticity. Studies also find that patients who

are less depressed are more motivated in rehabilitation, leading to a better recovery. “To me, that’s a pop-of-champagne moment,” Dr. Cramer said.

Several new trials are in the works, including one using Lexapro and intensive speech therapy to treat patients with severe language disorders beginning six months after a stroke.

Psychedelics

Dr. Gül Dölen, a neuroscientist at the University of California, Berkeley, might be best known for administering ecstasy to octopuses in the name of science. In 2023, she discovered that some psychedelics seemed to break down the extracellular matrix, or scaffolding, around neurons, allowing previously hardened circuits to be remodeled and reopening a critical window of social learning.

Based on this finding, she theorized that psychedelics might also open a window of enhanced motor learning after a stroke. She and Dr. Steven Zeiler, a stroke neurologist at Johns Hopkins University School of Medicine, are now testing the safety of administering psilocybin, the active ingredient in hallucinogenic mushrooms, to stroke survivors as they undergo a program of intense physical rehabilitation. (It includes a virtual-reality game in which participants interact with a dolphin named Bandit.)

The jury is still out on whether psilocybin can actually help patients recover lost skills, the researchers concede. “In humans, it’s still a hypothesis,” Dr. Zeiler said. Nevertheless, in two years, they plan to conduct an ambitious clinical trial: Rather than try to extend the critical window immediately after stroke, they want to try to reopen it months to years after the event.

“I don’t like to do easy experiments,” Dr. Dölen said. “I go for the gold.”