

Life After Stroke

Enhancing recovery from stroke is an active area of neurology research.

F irst, the good news: according to the American Stroke Association, stroke has decreased from the third to the fourth leading cause of death in the United States. Now, the bad news: stroke remains the most common cause of long-term disability in the United States. Approximately two-thirds of the 500,000 U.S. citizens who suffer a stroke each year have persistent stroke symptoms requiring some type of rehabilitation services.

More good news: enhancing recovery after a stroke is a very active area of research. We used to believe that damage to the brain in adults was irreparable. We now know this isn't true. The damaged brain can recover function in many ways; all involve a process called neuroplasticity. New connections can form, allowing healthy parts of the brain to "take over" for parts that are damaged. It is even possible for new brain cells to form from stem cells in the brain. Neuroplasticity also occurs in healthy brains-for example, when a baby learns to talk or a person learns to play a musical instrument.

We have discovered much about how the brain changes as people learn new things. That knowledge is now being applied to helping stroke patients recover neurologic function.

Some people who suffer a stroke can eventually recover fully, but not everyone. The amount of recovery depends on many factors, including the part of the brain that is damaged, the size of the damaged area, and how well the brain's neuroplasticity processes work. A patient should start rehabilitation as early as possible after a stroke. High-intensity rehabilitation treatments aimed specifically at the individual patient's deficits can improve neuroplasticity and aid recovery. Neurorehabilitation involves coordinated work done by a team of neurologists, physical therapists, occupational therapists, speech pathologists, and physical medicine and rehabilitation physicians in a dedicated neurorehabilitation unit.

In addition, many experimental approaches are being studied in human stroke patients and in animal models of stroke to enhance neuroplasticity beyond what is possible by neurorehabilitation alone. These are not yet ready for routine use, but they hold great promise.

For example, medications are being evaluated for their ability to promote neuroplasticity. One, the serotonin reuptake inhibitor antidepressant fluoxetine (Paxil), was studied in 118 patients with severe muscle weakness due to stroke. Half the patients were given fluoxetine and half received a placebo (pill with no active ingredients) daily beginning about 1 week after the stroke onset. All the pa-

> tients underwent the same post-stroke neurorehabilitation program. The group receiving fluoxetine had significantly greater improvement in muscle strength 3 months later than the placebo group.

Some other experimental approaches include medications to stimulate stem cells in the stroke patient's brain to become active, methods of delivering external stem cells to the injured brain by injecting them into the patient's blood vessels, and a technique called transcranial magnetic stimulation, which has the capability to turn off unwanted brain activity that hinders recovery and turn on helpful brain activity.

These treatments need more research before they can be used routinely. Not enough research has been done on how they work, how long any benefit lasts, or how safe they

might be in the long run. But all have the potential to augment neuroplasticity, and some may be used in the future to enhance stroke recovery.

For now, neurorehabilitation after stroke at a center with expertise in helping stroke patients recover is the mainstay—and it needs to begin early for the best results!

Have you or a family member gone through the recovery process after a stroke? Please share you experience by emailing us at **neurologynow@lwwny.com**.

Take good care,

Robin L. Brey, M.D. Editor-in-Chief



The damaged brain can **recover function** in many ways.