

# Potential for stroke victims to dramatically regain mobility

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(PhysOrg.com) -- In a discovery with the potential to drastically improve the lives of stroke and head injury victims, University of Otago and UCLA researchers have come up with a drug therapy which could unlock paralysed arms and legs, restoring mobility by up to half.

The results of the two and a half year study have been published in *Nature* on-line today.

Study co-author, University of Otago research fellow from the Department of Psychology, Anatomy and Structural Biology, Dr. Andrew Clarkson, says human trials using drug compounds, known to enhance cognition that are currently being trialled in people with learning difficulties, could potentially begin within two years.

In the first study of its kind, Dr. Clarkson and his colleagues found that the compound, when administered to mice via a slow-release pump implanted under the skin over a six week period, would re-activate neurons in the brain responsible for limb function. The neurons initially appeared to be dead or dormant after a stroke.

Treatment of the mice was begun three days after the stroke event, which in human terms equates to about three weeks.

The researchers needed to wait until the initial stroke event was over and the damaged areas surrounding the stroke site had settled into a state of dormancy before administering the compound.

After six weeks of treatment with the drug compound a “dramatic” restoration of mobility of the limbs was then observed. Mice which received the compound consistently regained an extra 50 per cent of gross motor limb mobility.

This was in addition to the 10 to 15 per cent gain in motor function shown normally to occur in mice which are not treated with the drug compound.

“When the compound is given, the dormant neurons fire up again and that leads to telling your limbs to work. At the moment we know this works on gross motor skills, and whether the compound would also lead to greater use of fine motor skills associated with speech, for example, we will hopefully know within the next two years after further research,” Dr. Clarkson says.

“This also provides hope for those with traumatic head injuries – the brain mechanisms of repair are similar so there is potential for this to work for them too.”

If successfully tested on humans, the therapy will provide new hope for people who suffer ischemic [stroke](#), which accounts for about 80% of all strokes.

At present, the class of compounds, known as an “extrasynaptic GABA inverse agonists”, are not advanced enough to be used on a prolonged basis in humans as they are known to affect the kidneys. But once this problem has been ironed out, it should be possible for [stroke victims](#) to use the drug as part of a trial.

At present, a therapy called transcranial magnetic stimulation and/or remedial therapies are the most frequently used means to aid [stroke victims](#) to recover function. However, this therapy only manages to

restore some ten to 15 per cent of mobility in humans, compared to the potential gains which could be made using the compound.

Dr. Clarkson says that when he set out to begin this study, he had wanted to test his hypothesis that the drug could work for [stroke](#) victims based on studies indicating that the brain can compensate for the loss of function through relearning. The study's co-author is Dr. S. Thomas Carmichael from the Department of Neurology, UCLA, California.

Provided by University of Otago

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