



Robotic invention used to assess stroke patients

<http://www.firstlight.cn> 2007-04-19

April 17, 2007, Researchers at Queen's and Providence Continuing Care Centre (PCCC) are testing a robotic tool – designed and invented by Anatomy and Cell Biology professor Stephen Scott – to determine if it can assess neurological and motor functioning of stroke patients more accurately than traditional methods.

Team members hope the new device will improve assessment and treatment, leading to faster and more effective rehabilitation and recovery for people who have had strokes.

Called KINARM (Kinseological Instrument for Normal and Altered Reaching Movement), it is the only device of its kind that measures multi-joint movement at the shoulder, elbow and hand, leading to new findings about how the brain coordinates limb movements.

Also on the research team are: fourth-year resident Sean Dukelow and clinical leader Stephen Bagg (both from Physical Medicine and Rehabilitation); Kathleen Norman (Rehabilitation Therapy); and Janice Glasgow (Computer Science).

“Preliminary results show that the KINARM is more sensitive in studying reaching movements than traditional clinical measures and may also be useful as a therapeutic tool,” says Dr. Dukelow. “We hope that in the future it will be used routinely to assess and treat patients after a stroke to find out if they can re-learn and optimize recovery.”

A stroke is the sudden loss of brain function caused by the interruption of blood flow to the brain or the rupture of blood vessels in the brain. The effects of stroke depend on where the brain was injured as well as how much damage has occurred. A stroke can impact the ability to move, see, speak, read, write, reason and remember.

Stroke patients undergo a detailed testing of cognitive abilities and neuromuscular function to determine the extent and exact location of damage in the brain. This allows clinicians to tailor rehabilitation and physiotherapy based on the needs of individual patients. The faster a patient can begin rehabilitation and physiotherapy, the better the chances of recovery.

Funded by the Canadian Institutes of Health Research (CIHR) and DiMedix, a medical education company, the collaborative project has assessed about 26 stroke patients over the past 18 months. St. Mary's of the Lake Hospital admits about 80 stroke patients to the stroke rehab program annually. More than 50,000 strokes occur each year in Canada, and that number is expected to rise as a result of the aging population.

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