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## Alberta scientists invent technology to improve the lives of people with stroke and spinal cord injury

*Web-based rehabilitation system is picked up across Australia, New Zealand, Canada, and US*

Reporters are invited to meet the team that invented a revolutionary new system that improves the quality of life for people paralysed by stroke or spinal cord injury. Led by Alberta Heritage Foundation for Medical Research Scientist Arthur Prochazka, PhD, the team will unveil its invention on Wednesday, June 17, 2009 at 10 a.m. in the Heritage Medical Research Centre Laboratory 507, University of Alberta Faculty of Medicine & Dentistry, on 87 Avenue, between 112 and 114 Street, Edmonton, Alberta.

This spring, the system was distributed for clinical trials in hospitals and clinics around the world. International partners in the world's first large-scale study of in-home, web-based rehabilitation include: University of British Columbia in Vancouver, and McGill University in Montreal, Canada; the University of Miami, and Georgia Institute of Technology – Atlanta in the United States; and the University of Melbourne in Australia. Spinal units in Melbourne, Brisbane, Sydney, Adelaide and Perth in Australia as well as Auckland in New Zealand are introducing a multi-centre trial using the Canadian rehabilitation system.

This announcement includes Ginny Bockman of Thorsby, Alberta, who volunteered for a clinical trial of this unique web-based rehabilitation system after she suffered a spinal cord injury during a car accident, leaving her in a wheelchair. The media event also includes Su Ling Chong, a U of A research physiotherapist who participated in the clinical trial, and U of A graduate student Jan Kowalczewski who designed key components of the system, including the video games. Mary Galea, PhD, professor of clinical physiotherapy, University of Melbourne, and director of the Rehabilitation Sciences Research Centre, Austin Health, Australia, is attending via video link from Melbourne, Australia.

A video news release (VNR) will be available on satellite news feed:

Wednesday, June 17, 2009 at 8 a.m. Mountain Time

Anik F2C/3B – C-Band Analog, Bandwidth: 36 Mhz, Orbital Location: 111 Degrees West, Uplink: 6045 Horizontal, Downlink 3820 Vertical, Audio's: 6.8 & 6.2

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The VNR will also be available for download at [www.ahfmr.ab.ca](http://www.ahfmr.ab.ca).

Media, please park in the Education parkade at the corner of 87 Avenue and 114 Street.

For more information please contact Karen Thomas, AHFMR Media Specialist, 1.877.423.5727 x225, 403.651.1112 (cell), [Karen.Thomas@ahfmr.ab.ca](mailto:Karen.Thomas@ahfmr.ab.ca)

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Alberta scientists have invented a revolutionary new system that improves the quality of life for people paralysed by stroke or spinal cord injury. Led by **Alberta Heritage Foundation for**

**Medical Research Scientist Arthur Prochazka, PhD**, the University of Alberta team has designed a system known as ReJoyce and completed a successful clinical trial with participants from across Western Canada.

"Many people who have suffered a stroke or spinal cord injury have weak or paralysed hands, making daily tasks such as eating or getting dressed impossible," says **Arthur Prochazka, PhD, a professor in the Centre for Neuroscience at the University of Alberta Faculty of Medicine & Dentistry**. "We have designed this web-based rehabilitation system for people to use in the comfort of their homes, supervised by a physiotherapist who can sign on from anywhere – their office, home or cabin in the Rockies."

The ReJoyce (Rehabilitation Joystick for Computerized Exercise) system is a spring-loaded arm with special handles and attachments that the user twists, squeezes, and moves around to play custom-made video games. The user wears a wristlet with small electrodes that stimulate his/her hand muscles. "The wristlet is controlled by a tiny wireless earpiece. People simply click their teeth once to open their hand, and once again to close it," says **U of A graduate student Jan Kowalczewski**, co-inventor of ReJoyce.

"This is another example of our AHFMR Endowment Fund at work to support high-caliber researchers for the benefit of Albertans," says **Doug Horner, Minister of Advanced Education and Technology**.

**Ginny Bockman, a 32 year old from Thorsby, Alberta** who rolled her work truck and suffered a spinal cord injury that left her in a wheelchair, participated in the ReJoyce clinical trial. "When I first started using the system, my hands were like little tiny fists that I couldn't use for anything," she says. "Today, I can brush my hair, lift and drink from a coffee mug, even get dressed. I have a lot more independence."

"I am tremendously hopeful about what this system can do for stroke and spinal cord injury survivors around the world," says **Mary Galea, PhD, professor of clinical physiotherapy, University of Melbourne, and director of the Rehabilitation Sciences Research Centre, Austin Health, Australia**. "On the strength of the excellent results in Canada, our team secured \$4.6 million from the Victorian Neurotrauma Initiative for a multi-centre clinical trial using ReJoyce in all of the spinal units in Australia and New Zealand," says Galea.

14 people with spinal cord injury took part in the clinical trial of ReJoyce in Western Canada, involving six weeks of daily exercise sessions supervised by physiotherapists via web camera over the Internet. "Everyone who participated in the trial had clinically significant improvements in their wrist and hand function," says Prochazka.

Funding support for this research has been provided by: the International Spinal Research Trust (ISRT) in the United Kingdom, Alberta Heritage Foundation for Medical Research, Canada Foundation for Innovation, Canadian Institutes of Health Research, Victorian Neurotrauma Initiative in Australia, and SCI Solutions Network in Vancouver.

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[Video News Release \(328MB .mpg\)](#)

Reporters please contact Karen Thomas, AHFMR Media Specialist, 1.877.423.5727 x225, 403.651.1112 (cell), [Karen.Thomas@ahfmr.ab.ca](mailto:Karen.Thomas@ahfmr.ab.ca)

For more information on ReJoyce, please contact Arthur Prochazka, PhD, at 1.780.492.3783, [arthur.prochazka@ualberta.ca](mailto:arthur.prochazka@ualberta.ca) or visit [www.hometelemed.com](http://www.hometelemed.com)

## Background

ReJoyce has sensors embedded in each moving part, feeding into a computer program that controls video games designed to improve hand dexterity and range of motion in the arms.

The program also runs a five minute automated hand-arm function test and generates a realtime report, allowing doctors, therapists and scientists around the world to instantly assess participants' progress, strengths and weaknesses based on measured performance. At present, these tests rely on human judgment, which can vary widely. The software also uses the data to adjust the difficulty of games, allowing therapists to design exercise sessions to focus on areas of weakness. "Often, people are having so much fun playing the games, they are surprised when I tell them their session is over," says **Su Ling Chong, a U of A research physiotherapist**. "Conventional therapy just doesn't get these kinds of results."

Therapists are able to supervise up to four clients at one time, and from thousands of kilometers away. "That offers significant benefits, not only in healthcare dollars saved, but also in reducing the need for stroke and spinal cord survivors to take long journeys for rehabilitation in major hospital or clinic sites," says Prochazka.

Arthur Prochazka, PhD, founded Rehabtronics Inc., a spin-off company which has licensed ReJoyce and the FES wristlet to Bioness Inc., a medical devices company in California.