

CRC FOR REHABILITATION ENGINEERING

Stroke is the third leading cause of death in Australia, affecting approximately 50,000 people. About 1500 Australians suffer a new stroke every year, with a lifetime cost of \$1.3 billion. The risk and prevalence of stroke is expected to increase significantly as the population ages: one-third of Australia's population will be over 65 years of age by 2030. Although the prevalence of spinal cord injury (SCI) is much lower than that of stroke, it is a significant health concern because of the immediate and devastating loss of motor function. Roughly 10,000 Australian's suffer from SCI and most are under 25 years of age. SCI patients often sustain back and neck injuries resulting in paralysis of the arms, trunk and lower limbs. The lifetime cost of a person with quadriplegia is presently \$1.2 million. Stroke and SCI victims require extended periods of hospitalization and are often reliant on others for long-term care.

Our vision for the CRC for Rehabilitation Engineering is to enhance the quality of life for all patients suffering from movement disabilities resulting from stroke and SCI. The mission of the Centre is: to establish Australia as a world leader in research, education and delivery of rehabilitation technology; to apply advanced biomedical engineering, clinical medicine, and psychological and social knowledge to restore functional movement to patients affected by disabilities resulting from stroke and SCI; and to maximize commercial opportunities for the Centre, Australia and the global rehabilitation industry.

The Centre will support teams of engineers, clinicians, and life scientists working together in an interdisciplinary setting on basic and applied rehabilitation research. Research activities will include the development of new surgical and cell-based therapies for preventing muscle denervation; the use of patient-specific computer models of the neuromusculoskeletal system to better understand how the nervous system normally controls movement, and to quantify precisely how paralysis and other disabilities affect the biomechanics and control of limb movement; and the design, development and construction of novel devices such as neural-powered prostheses, implantable functional electrical stimulation systems, and computer-controlled robots to restore sensory and motor function to people with movement disorders. The Centre will train a new generation of biomedical scientists and engineers interested in a research career focused on human rehabilitation as well as support professional education aimed at improving the skills of rehabilitation practitioners, educators and industry staff in Australia and worldwide, in order to enhance the transfer of rehabilitation research into the marketplace.

The purpose of this one-day workshop is to refine the scope of the Centre and to plan an application for funding to the Commonwealth Government in mid 2010.