

The bionic arm is the future of prosthetics, and it's here today

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(PhysOrg.com) -- Alberta Health Services' Glenrose Rehabilitation Hospital is pioneering a major advancement in upper-limb amputation surgery and rehabilitation with the Canadian debut of the Targeted Muscle Reinnervation procedure, or bionic arm.

The neuro-controlled bionic arm technology, developed at the Rehabilitation Institute of Chicago, allows an amputee to move their prosthetic arm as if it were a real limb, allowing patients to use their prosthetic arm with more natural motion through thought-controlled movement. Rob Anderson, 31, from Grande Prairie and Larry Hayes-Richards, 62, from Edmonton are the first two patients in Canada to undergo this procedure.

"This world-class surgery and prosthetic technology opens a whole new world of possibilities to patients," said Jackie Hebert, clinical director of the Adult Amputee program at the Glenrose and professor in the U of A Faculty of Medicine & Dentistry. "The ultimate goal for any prosthetic is to enhance outcome from limb loss; to bridge the wide gap between the actual loss of function and prosthetic replacement. The bionic arm is the future of prosthetics, and it's here today."

To provide the thought-controlled movement, nerves located in the amputee's shoulder, once terminated in the amputated arm, are re-routed and connected to healthy muscle in the chest and surrounding muscles through a surgical process called targeted muscle reinnervation.

This procedure allows the re-routed nerves to grow into the appropriate muscle and direct the signals they once sent to the amputated arm instead to the prosthetic arm. When the patient thinks about moving his or her arm, the action is carried out as voluntarily as it would be in a healthy arm, allowing for smoother, more controlled movement of the prosthetic device.

"This is another great example of how Alberta is at the forefront of health care innovations," said Ron Liepert, minister of Health and Wellness.

The collaboration between Todd Kuiken at the RIC, Hebert and the targeted muscle reinnervation team at the GRH is a unique international partnership.

"The bionic arm is a revolution in prosthetic technology and the fact we're able to offer it in Alberta is indicative of our expertise in amputation surgery and rehabilitation," said Ken Hughes, chair of the Alberta Health Services Board. "Based on the success of the first two cases at the Glenrose, we expect to offer this procedure to at least five more patients this year."

Provided by University of Alberta

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