



BCIT researcher collaborates to develop ‘rowing machine’ for people with mobility impairments

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Rowing machines provide users a great way to get cardiovascular exercise and help build strength. While standard rowing machines for gym facilities or home use are widely available, they don't address the seating and positioning needs of people with spinal cord injuries (SCI) and other mobility impairments requiring use of a wheelchair.

A collaborative project with UBC and SFU

BCIT researcher Dr. Jaimie Borisoff is the Canada Research Chair in Rehabilitation Engineering Design, an ICORD Principal Investigator, and someone who lives with an SCI. Jaimie recently collaborated with SFU researcher, [ICORD](#) Principal Investigator and project lead Dr. Carolyn Sparrey and Dr. Bonita Sawatzky, UBC researcher and ICORD Principal Investigator, to develop a rowing ergometer for people with disabilities. The project aimed to develop adaptations that allow commercially available rowing machines to be used by

wheelchair users, thus making rowing an accessible, effective, and enjoyable exercise for people with spinal cord injury and other disabilities.

“We call it the AROW, which is short for Adapted Rowing Machine,” says Jaimie. “The device consists of a support arm that connects to the front end of a standard rowing machine you would find in a community gym. The arm provides adjustable chest and lap supports to stabilize use from a wheelchair.” It is important to note that the AROW isn’t a device exclusively for use by wheelchair users, it can also be used as seated exercise by seniors and those with physical limitations that prevent them from using a standard rowing machine.

Creating an affordable and accessible exercise device



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Jaimie’s [Rehabilitation Engineering Design Lab \(REDLab\)](#) at BCIT specializes in applied research that aims to find solutions and provide commercially viable products in a timely way. Creating an inexpensive and accessible device were key requirements for the AROW. “To encourage community gyms and other facilities to provide an alternative accessible exercise option, we wanted a product that could be available as soon as possible and with a limited financial commitment,” Jaimie says.

The AROW completed extensive testing with diverse users and in various settings. This allowed researchers to confirm the viability and feasibility of the device’s design and benefits. The testing included a physiology study that compared AROW with an arm-cycle exerciser. Results showed that participants really liked the AROW because it uses different muscles than wheeling. As well, for a given workload, users were able to achieve a higher heart rate and expend more energy, thus achieving a more intense workout.

Making exercise accessible across Canada



Dr Jaimie Borisoff former Canada Research Chair in Rehabilitation Engineering Design

A key part of this research is to be able to embed accessible exercise options where people are, with the goal of making exercise convenient and more feasible. REDLab has built eight units of AROW that will be installed in community gyms across Canada. Six units will be located in BC, and one will be placed in the Canadian Paralympic wheelchair basketball training centre in Ontario. To support users, an [online resource](#) is available with [design plans](#), [demonstration videos](#), [instructions](#), and [links](#) to additional resources for adapted rowing—for example, harnesses, binders, gloves, handles, and grips.

If you've read this and want to contact the researchers please contact Johanne Mattie by email (Johanne_Mattie@bcit.ca). The work was funded by the [Craig H. Neilsen Foundation](#) (based in the USA) and an [ICORD SEED grant](#).