

# ACADEMIC INTERNATIONAL EXCHANGE IN PHYSICAL ACTIVITY FOR PEOPLE WITH SPINAL CORD INJURY: EXPERIENCE REPORT FROM MCMASTER UNIVERSITY

Elaine Cappellazzo Souto

*Professora de Educação Física Adaptada da Universidade Federal da Paraíba*

Jennifer Crozier

Kathleen Martin Ginis

*Departamento de Cinesiologia - Universidade McMaster*

The goal of this report is to describe the international academic experience at McMaster University, Department of Kinesiology, in June, 2016, during the PhD. in Associate Graduate Program in Physical Education UEL / UEM. McMaster University is home to two important activities in physical activity and spinal cord injury: SCIAction Canada and MacWheelers exercise program.

SCIAction Canada, has the mission to develop and mobilize evidence-based strategies that inform, teach and enable people living with spinal cord injury (SCI) to initiate and maintain a physically active lifestyle. One unique aspect of SCIAction Canada is the joint participation of university researchers and community organizations.

SCI Action Canada has taken the lead in disseminating the evidence-informed physical activity guidelines to improve physical fitness in people with SCI. This guidelines encourages adults with SCI to participate in at least 20 minutes of moderate to vigorous intensity aerobic activity twice a week and perform strength training exercises twice a week, which consists of 3 sets of 8-10 repetitions of each exercise for each major muscle group.

In order to help adults with SCI meet physical activity guidelines, SCIAction Canada has created some intervention materials. The **SCI GET FIT Toolkit**, consists, in one panel with physical activity examples for adults with tetraplegia and paraplegia, with information about benefits of physical activity, strategies to overcome common physical activity barriers for adults with SCI and tips for beginning your own physical activity plan action. Furthermore, other strategies of SCIAction Canada include **Get in Motion**, a FREE Physical

Activity Counselling Service, done over the telephone and **Active Homes**, done with a home visit, by fitness trainer and peer with paraplegia. Both strategies have shown good results in increasing intentions, actions plans, and for doing exercises among adults with paraplegia or tetraplegia.

The other activities just as important as the SCIActionCanada is to people with SCI is the **MacWheelers Exercise Program**. The MacWheelers is part of McMaster Physical Activity Centre of Excellence (PACE), exercise research and training centre, that attends to older adults and people with chronic diseases and and or disabilities. In MacWheelers, individuals with SCI have an adapted exercise program, with one-on-one assistance from student volunteers and with staff. The most are student volunteers. These students receive orientations from the programs' staff consisting of Registered Kinesiologists and Physiotherapists.

The days of operation are Monday to Thursday and the sessions have a duration of about 2.5 hours. Within each session around 15 clients attend regularly, twice a week. To begin in the program, it is necessary for people with SCI to have a physician referral completed where all declared information about diagnosis, and related details about recommended level of physical activity are included. With this authorization the program starts with a talk with the MacWheelers coordinator and Registered Kinesiologist that designs the clients exercise program based on recommendations from the Physiotherapy assessment. Each training session starts with at least 10-20 min of aerobic exercises. The customer can choose different equipment, such as the Monark Rehab Trainer 881E, stationary handbike, the vitaglide wheelchair fitness machine, or using legs

and arms simultaneously with NUSTEP exercise equipment. Normally, the tetraplegics have their hands tied with bands or using special gloves that fix their hands to the equipment.



Figure 1. Monark Rehab Trainer 881E

Source: personal archive



Figure 2. Stationary handbike

Source: personal archive



Figure 3. Vitaglide fitness machine

Source: personal archive



Figura 4. NUSTEP exercise equipment

Source: personal archive

The strength exercises are performed in multi-station wheelchair accessible weight training machines, wall pulleys, free weights, and elastic bands. A wide variety of exercises are available for each of the following muscle groups: forearm/wrist, biceps, back, chest, abdominals, shoulder, triceps, and legs (appropriate subjects only). Two exercises from each of the muscle groups on a given training day. Throughout the training, after each exercise the Borg ratings of perceived exertion (RPE) (1-pt scale 10) are recorded to ensure appropriate exercise intensity. The clients are encouraged to provide their sense of effort and maintain training intensity between 4 - 5 points on the scale. There is a strap to hold the wrist to the pulleys with hooks and special gloves assist in safe execution of exercises. At the end of the workout stretching is done.



Figure 5. Special gloves for tetraplegics

Source: personal archive

The training is individualized and training intensities are changed daily to customer self-declaration about their sense of effort for each exercise. Every day, staff and volunteers have individualized exercise programs to follow with each client, with photos and description of the exercises, previously organized by the coordinator and Registered Kinesiologist. This form of organization contributes to the program being conducted in a safe and easy manner. If the volunteers have doubts, the staff and coordinator are available to help them.



Figure 6. Equalizer multi-station wheelchair accessible weight training

Source: personal archive



Figure 7. Equalizer Rickshaw and wall pulley

Source: personal archive

The clients have opportunity to use innovative adaptive machines, such as Body-Weight Supported Treadmill Training (BWSTT). The person is partially suspended in a harness either from the ceiling or from an apparatus frame, in order to reduce weight bearing and provide postural support for treadmill walking. The amount of support can be gradually decreased as postural control, balance, and coordination begin to improve. Volunteers help move the clients' legs, if they are unable, through a normal gait pattern. These sessions are about an hour in length or however long the client can tolerate.



Figure 8. Body Weight Supported Treadmill Training (BWSTT).

Source: personal archive

For a month I observed the MacWheelers program. In this period, about 30 people with SCI had the opportunity to participate in the fitness program regularly. In addition, undergraduate students of Kinesiology, in the form of staff and volunteers, had an learning environment to apply their theoretical knowledge into practice to people with physical disability and the help of experts. For these reasons, this program is awesome for their contribution to the community and academic education. Moreover, MacMaster University has one reference gym, with accessible and innovative exercise equipment, serving as a model for others gyms. This situation proves that the University is ahead with respect to the options that people with physical disabilities have to engage in an active lifestyle. With the great contribution of the community, most of the equipment arises from donations and research grants. Furthermore, dialogue with the researchers in SCI Action Canada show the motto "Nothing about us without us" which was announced at the United Nations 2004 International Day of Disabled Persons and it would be beneficial to include this theory in research about exercise and lifestyle with SCI.

This period of international academic experience at McMaster University overcame my expectations. I had the opportunity to dialogue about exercise with people with SCI, about preferences of fitness equipment with researchers, staff, and also with people with SCI. These moments will certainly be important in the development of my doctorate and actions that develop in Federal University of Paraiba. Thank you professor Kathleen A. Martin Ginis, Director of SCI Action Canada to accept me and Jennifer Crozier, coordinator MacWheelers. For more information: <http://sciactioncanada.ca/> and <https://pace.mcmaster.ca/programs/mac-wheelers>