

## Local Researcher Dr. Ian Rice Discusses Current Project on Biomechanics and Novel Exercise Techniques for those who use Wheelchairs



Dr. Ian Rice

Last October, funds from the Illinois State Lottery helped launch eight innovative local MS research projects which range from investigating the reduction of disease development and stimulation of myelin repair to original rehabilitation and physical exercise techniques. To get a better understanding of the research happening statewide, Greater Illinois Chapter marketing staff interviewed the lead researcher overseeing each pilot project.

**Dr. Ian Rice** is one of the National MS Society's grant recipients for 2013. Dr. Rice completed his undergraduate degree in psychology at University of Illinois at Urbana-Champaign and holds a Master of Science degree in occupational therapy from Washington University in St. Louis. Interested in rehabilitation and helping people enhance their functional abilities, Dr. Rice practiced occupational therapy before returning to graduate school at the University of Pittsburgh to get his Ph.D. in rehabilitation science. In 2012, Dr. Rice returned to his alma mater, the University of Illinois at Urbana-Champaign, as an assistant professor of Kinesiology and Community Health and is

currently researching biomechanics, motor variability and physical activity in persons with disabilities who use assistive mobility devices.

**Q: You were recently awarded funding from the Illinois State Lottery to pursue a new research project. Can you describe what you and your research team are investigating?**

**A:** The purpose of this study is to look at people with MS who are now wheelchair users, whether it is power, scooter, or manual, and address the occurrence of physical inactivity. Once someone with MS reaches the stage in which they are reliant on a wheelchair device, many healthcare professionals are typically hesitant or cautious to prescribe exercise and physical activity in fear of exacerbating many of the symptoms commonly associated with MS. In addition many persons who use mobility devices that want to exercise are often confronted with numerous barriers such as inaccessible environments, stigma, and lack of information regarding suitable fitness regimes. We [my research team and I] want to address physical activity in this population through an intervention that incorporates manual wheelchair propulsion as a method to supplement or enhance physical activity. We do not want to replace the type of wheelchair mobility these individuals are currently using, but want them [people with MS] to consider the possibility that manual wheelchair propulsion can be used intermittently to enhance physical activity and socialization on a daily basis.

**Q: What methods are you using to conduct this study?**

**A:** In our study we use a unique type of manual wheelchair that typically people with MS would normally have difficulty accessing because of the nature of our healthcare system. The wheelchair is ultra-light, adjustable, and movable. It is something that wheelchair athletes

would gravitate towards. Additionally our team are experts in wheelchair seating and will work to expertly configure each chair to meet the unique needs of each individual. I have worked extensively in motor learning biofeedback to train biomechanically correct propulsion technique as well. Each participant will therefore receive propulsion and safety training above and beyond what is currently available in the healthcare today. This type of chair addresses many needs and many issues of those with MS and really anyone who uses a wheelchair. If we can show that people with this stage of MS can benefit from this type of wheelchair and training it may help to provide scientific evidence that could facilitate medical coverage of these kinds of durable medical equipment and services. In essence we want to show that it's worth focusing time and resources into this form of mobility and training because it keeps people healthy, happy and may serve as a viable means of mobility. When done right, which is no easy task, a properly fit ultra-light wheelchair can kill so many birds with one stone. We have seen this with other populations of individuals with disabilities so why not explore this possibility with persons living with MS.

**Q: *What is your connection to MS?***

**A:** Throughout my life and career I, have worked with a huge age range and variety of persons with disabilities. This opportunity was a really good match. I wanted to take my expertise in wheelchair propulsion training and biomechanics and apply it to people living with MS.

**Q: *Why is it important to promote physical activity in people who use wheelchairs?***

**A:** Commonly people who use wheelchairs have trouble finding opportunities to exercise and the literature shows overwhelmingly that they are less active and more sedentary than able bodied peers. These people frequently develop secondary complications from inactivity like coronary heart disease, obesity, and cardiovascular disease. The secondary complications are often as bad as or worse than those associated the primary disability itself. The goal of study is to use manual wheelchair propulsion as a supplement or form of physical activity to help combat these secondary complications and to increase socialization and improve quality of life.

**Q: *Some people have expressed reservations on how exactly this research can help someone with progressive MS. What differences can your research make to someone with progressive MS?***

**A:** The wheelchair has historically been frowned upon and been this symbol of isolation and disability. We want to depict the wheelchair as something more liberating. The bottom line is an expertly configured chair in combination with scientifically proven training methods has enormous potential to enhance a person's mobility. We are hoping to encourage people to incorporate the wheelchair into their lifestyle so they can use it to go out, to engage, and get physical activity without feeling like they're engaged in some form of mundane exercise. The goal of this study is to figure out how to use wheelchairs to increase activity while minimizing excessive energy expenditure. It's really about helping people to utilize the abilities they have, as efficiently as possible while receiving on going guidance and support from experts.

**Q: *One of the most common symptoms of MS is fatigue. Motorized wheelchairs help reduce exertion and prolong wakefulness in those with MS. How would you compare the importance of combating fatigue by using motorized wheelchairs with the benefits of exercise by use of manual wheelchairs?***

**A:** We are definitely not asking someone to replace the wheelchair they use; we want them to continue to use whatever they use, but to consider adding periods of activity with a manual chair. Our chairs are implemented with activity monitors to measure speed and other metrics. We will work with our clients to develop goals to maintain and increase activity very gradually and safely. We want to increase the time they are active and determine the extent to which this is possible and take a conservative approach without exacerbating fatigue. However, we do want to challenge people where they may not have been challenged before.

**Q: *So would you say the study is tailored to match the abilities of each individual?***

**A:** Yes. The study really has two phases. First we interview the people with MS who are using wheel mobility in order to find out everything we can about their symptoms, about the activity they already do, and where they feel their limitations are. What are the facilitators and barriers to physical activity in their lives? We want to learn as much as we can before developing a program for each individual. After these interviews we create the exercise program. In a way, each exercise program will be customized to meet the needs of the individual. The study isn't entirely about comparing individual to individual, but comparing each individual against him or herself.

**Q: *Many people with MS are hoping for a cure. As a researcher who is looking to improve quality of life of those who use wheelchairs rather than looking for a cure, what would your response to these people be?***

**A:** There are two arms of research, care vs. cure. This project aims to improve quality of life right now and to make people as healthy and active as possible right now. If and when a curative answer comes along, that's great, but this is the type of "now" quality of life research.