

Research Talk

TUESDAY, MARCH 24, 5 TO 6:30 P.M.

UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY
2000 SIMCOE STREET NORTH, OSHAWA, ONTARIO
SCIENCE BUILDING, ROOM 1240

Dr. Bernadette Murphy, Professor, Faculty of Health Sciences, UOIT



[Understanding How to Shape Technology so it Doesn't Shape Us](#)

We now know that abnormal postures and muscle fatigue can lead to changes in the way that the brain processes incoming sensory information and formulates outgoing commands to muscles, a process called neural plasticity. When plasticity is beneficial or adaptive, it leads to increased movement efficiency and better movement, whether in top athletes or office workers. When neural plasticity becomes maladaptive or harmful, it contributes to the development of chronic neck and back pain and a myriad of upper limb overuse injuries. If we are going to harness the power of technology to improve society and increase our efficiency, we need to better understand the human brain and how it responds so that we can ensure that technology use does not lead to maladaptive plasticity. This presentation will provide an overview of current research at UOIT including how we study neural plasticity in humans, the importance of the neck in controlling arm movement, and how we are now starting to use technology to help prevent musculoskeletal injuries, rather than being the cause of injuries.

Dr. Bernadette Murphy

Bernadette Murphy is a professor in the Faculty of Health Sciences, founding head of the Kinesiology program, and director of UOIT's Human Neurophysiology and Rehabilitation Lab. Her world-class research program contributes to our understanding of how the brain and body are connected in preventing and rehabilitating chronic neck and back pain, resulting in healthier and more productive workers, and her steadfast commitment to teaching has advanced the national reputation of UOIT's Kinesiology program and supplied highly trained professionals to chiropractic care and study, both at home and abroad.

Bernadette's internationally recognized research agenda examines how the brain and body interact. Her work aims to explain how altering sensory input from the spine and limbs affects sensorimotor integration and motor control. Chiropractic clinical practice informs her work, so her research readily translates to how we prevent, treat and manage the physiological mechanisms that underlie chronic neck, back and shoulder pain. Most recently she has begun to incorporate motor learning principles into technology using serious games as a tool to decrease injury risk in firefighters. By pointing out new ways to prevent injuries and new strategies to improve workplace design, Bernadette's research is helping to improve the health, well-being and productivity of Canadian workers, while substantially reducing costs and alleviating strains on the Canadian health-care system.

Her formidable research output speaks to Bernadette's immense research productivity. Her work is published in 51 peer-reviewed articles, she has presented at over 70 conferences, and she has jointly filed for a patent to commercialize the results of her research. She is also extraordinarily proficient at securing funding to support and advance her leading-edge work. Since joining UOIT in 2008, Bernadette has brought in over \$650,000 in funding. She currently holds research grants from the Natural Sciences and Engineering Research Council of Canada, the Canada Foundation for Innovation, the Ontario Ministry of Research and Innovation, the Manitoba Worker's Compensation Board and the Australian Spinal Research Foundation.

Her pioneering research has been instrumental in attracting award-winning graduate students whom she expertly supervises, training the next generation of kinesiology academics and professionals. Bernadette has supervised (or co-supervised) 39 undergraduate research projects, 19 master's theses, and three doctoral dissertations at UOIT. She is currently supervising five more master's and four more doctoral students. The success of her former students, many of whom are now productive and prestigious scholars in their own right, is testament to the quality of her mentorship.

Bernadette has received numerous prestigious awards for her research including the Earl Homewood Canadian Memorial Chiropractic College Professorship and the Ontario Chiropractic Association Research Award. She is a Chiropractor and Adjunct Professor at the Canadian Memorial Chiropractic College and she is a member of the editorial board of the Journal of the Canadian Chiropractic Association. Bernadette has an extensive and impactful research record, prominent international standing, and resolute commitment to the success of UOIT's research students.