NEWS RELEASE

Wilfrid Laurier University

Professor awarded grant to study how footwear affects balance

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WATERLOO – Laurier kinesiology professor Stephen Perry has been awarded a three-year grant worth $164,655 from the Canadian Institutes of Health Research (CIHR) to study the effects of footwear on the balance of older adults.

Perry's research will lead to practical applications, such as improved footwear design and guidelines for footwear intervention strategies, to increase balance control. These applications could reduce the risk of falling and the occurrence of foot disorders that result from improper footwear.

"This research will identify very specific footwear design characteristics and their influence on balance control," says Perry. "This approach will provide a valuable understanding of the role footwear and sensory information play during balance control and will provide guidelines and educational resources for clinicians in the field."

Reducing falls could pay huge dividends in reducing health-care costs. Health Canada estimates that falls cost the Canadian health-care system $2.4 billion every year. Very little research, however, has been done on the influence of footwear on balance control.

Falling can have deteriorative results in the long term, especially for seniors who rarely make a full recovery from a fall. Forty percent of those who suffer a fall and fracture a hip will die due to complications. As well, those who experience a fall often live in fear of falling again and become less active and more reclusive, which results in an overall deterioration in their quality of life.

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Common footwear choices can affect how people sense and react to potential balance disturbances. The foot acts as a mechanical structure for creating movements to maintain balance and as a transmitter of sensory information for triggering these reactions.

High heels are a dramatic example of footwear that not only affects balance but can possibly create physiological problems later in life. A lifetime of wearing high-heeled shoes can lead lower-leg muscles to readjust to a certain kind of balance. If a doctor tells a patient to wear flats for health reasons, the shift of the body is dramatic and can cause an imbalance in how the patient reacts to a missed step or bump in a crowd.

Shoes with small toe boxes can also create problems by restricting the toes and extremely thick-soled running shoes can affect the foot's ability to feel differences in terrain.

"My research will hopefully lead to footwear designs that allow the foot to function normally," says Perry. "Our shoes are currently restructuring the actual, natural function of the foot. Footwear can have a substantial effect on control of balance and subsequent risk of falling."

His research project will include international collaboration with leading footwear experts Stephen Lord and Hylton Menz of Australia, Mark Redfern of the University of Pittsburgh, along with local clinicians Kim Rau from Pedorthic Services and Dan Blocka from George Brown College.

Perry is also involved in two other large-grant projects. He is a co-investigator on a New Emerging Team Program grant from CIHR. Collectively valued at $616,679, the grant will fund innovative approaches to optimizing balance and mobility in older adults.

As well, Perry is one of the main designers and future users of the Challenging Environment Assessment Laboratory (CEAL). The laboratory will feature a circular platform which can be rotated in any direction in order to facilitate studies on the traction and stability of wheelchairs and walking when climbing and descending slopes.

CEAL is part of the larger Intelligent Design for Adaption, Participation and Technology (iDAPT), a new $18.4-million facility for the Toronto Rehab Institute funded by the Canada Foundation for Innovation and Ontario Innovation Trust.

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