The world’s population is ageing at an unprecedented rate. According to the World Health Organization, between 2015 and 2050 the number of individuals aged 60 years and over will increase from 12% to 22%. Although an increased lifespan potentially brings new opportunities for the elderly, studies have shown that their quality of life is adversely impaired by a decline in health. The risk of developing diseases such as kidney failure, type 2 diabetes and cancer increases rapidly as ageing bodies physiologically deteriorate. This causes emotional distress for the sufferer and their family, and increases pressure on already strained health services.

Many research groups have focussed their efforts on developing novel therapies for treating these devastating diseases. However, Professor Dionne and her team at the Research Centre on Ageing explore how specific exercise programmes can reduce the risk of certain age-related disorders such as cardiovascular disease, type 2 diabetes and sarcopenia. However, these exercise regimes may be difficult to implement due to a lack of motivation and confidence in older individuals. Professor Dionne aims to address this problem by developing innovative ways to encourage the elderly to exercise.

Currently, the Canadian Society for Exercise Physiology guidelines encourage adults aged 65 and over to participate in a minimum of 150 minutes of vigorous aerobic exercise per week. The guidelines also encourage individuals to perform muscle and bone strengthening activities two days per week.

However, these recommendations are generalised and do not target specific health conditions. Different types of PA including aerobics and resistance at different modalities and intensities, can positively affect individual physiological functions. Professor Dionne therefore aims to improve the guidelines by designing different exercise plans that focus on reducing the risk of developing certain diseases in older ‘at risk’ individuals.

RESISTANCE EXERCISE AND SARCOPENIA

Sarcopenia is a muscle degenerative disorder associated with ageing. A reduction in muscle mass can result in falls, fractures and physical incapacity, greatly impairing an individual’s quality of life. Studies have shown that resistance exercise (using weights to strengthen muscles) stimulates protein synthesis, increasing muscle mass. However, only 15% of Canadian adults reach the weekly recommended minimum 150 minutes of physical activity.
In order to address these concerns, Professor Dionne focussed her efforts on developing creative and novel exercise regimes to engage the elderly with exercise. For example, during ‘green exercise’, individuals are encouraged to conduct PA outside, rather than indoors. The team conducted a study on 23 older post-menopausal women, comparing the health benefits of indoor vs outdoor exercise.

Interestingly, the results indicated that the different environments offer unique physiological benefits. Indoor training is associated with a maintenance in performance intensity and significant improvements in body composition and VO2 max. On the other hand, although training in a natural environment reduces maximum workout intensity over time, resting blood pressure and upper-body maximum strength significantly improved. Furthermore, outdoor training increases adherence in the elderly (97% vs 91% for indoor training) and even reduces depression symptoms.

These exciting findings suggest that ‘green exercise’ can be a long-term solution to the lack of PA engagement in the elderly.

FUTURE RESEARCH
Overall, the research of Professor Dionne and her team has highlighted the importance of regular PA as a preventative measure against age-related diseases. Different forms of exercise can positively impact different physiological functions which, in turn, can target specific ailments. Furthermore, the team have addressed a major obstacle – limited adherence in the elderly. Training in natural environments inspires and motivates older individuals, encouraging them to persevere with regular exercise, promoting successful ageing. The team has shown that even at the age of 75 years, the best predictor of good health is current physical activity; it is never too late to begin exercising!

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