***Ageing and long-term conditions research programme:***

**Project 1: Creating enjoyable virtual experiences during exercise for paediatric oncology patients**

**About the PhD**

Physical inactivity has been shown to worsen negative side effects experienced by young patients undergoing cancer treatment. Less than 50% of young people with cancer achieve the recommendations for physical activity and evidence indicates that exercise during treatment leads to positive physical and psychological outcomes.

We propose an alternative approach to promoting exercise as part of cancer treatment. The traditional approach to promoting exercise has relied on providing information about the benefits of exercise (e.g., “exercise will make you healthier”). Although this approach has achieved some successes, there remains many people who are physically inactive. An alternative approach is a greater focus on how people “feel” as opposed to how people “think” about exercise. There is evidence to suggest that pleasure and enjoyment during exercise play an important role in shaping future exercise behaviour. Specifically, a person is more likely to continue with exercise if the exercise experience is pleasant.

The first aim of the project is to review current understanding of exercise promotion strategies for young people undergoing treatment for cancer. Using this understanding as a basis for developments, the second aim is to co-design enjoyable digital exercise strategies (principally virtual reality) with adolescents under the care of an oncology unit. The third aim is to test the clinical feasibility of the co-designed digital strategy in terms of promoting a pleasant and enjoyable exercise experience for the clinical population.

For further information and to discuss your ideas, contact Prof Heidi Probst, Professor of Radiotherapy and Oncology, on H.Probst@shu.ac.uk

**Project 2: Developing strategies for maintaining physical activity adherence in people with metabolic syndrome**

**About the PhD**

Aim: To develop a theoretically coherent intervention to optimise adherence to physical activity for people with Metabolic Syndrome (pwMetS)

Nearly a quarter of adults in the world have metabolic syndrome (MetS) (AKA pre-diabetes), which makes them twice as likely to develop heart and lung disease and five times more likely to develop diabetes. They also have double the health care costs of people who do not have MetS. Lifestyle treatment programs that include exercise and physical activity improve patient health, reduce prevalence of MetS and may also reduce healthcare costs. However, patients only improve their health if they adhere to the recommended exercise and physical activity programme. Despite the known benefits of exercise and physical activity for people with metabolic syndrome (pwMetS), 75% do not meet recommended levels of exercise and 90% of people with risk factors for MetS do not stick to lifestyle recommendations. There is little research into strategies that effectively increase adherence to exercise and physical activity in pwMetS. We have recently completed two systematic reviews investigating 1) determinants of adherence to exercise or physical activity in pwMetS and 2) interventions to enhance adherence to exercise recommendations in pwMetS, which will act as a platform for this proposed doctoral programme of study

In our proposed study we will:

1. further identify barriers and facilitators of physical activity for pwMetS.

2. use the identified factors to develop a list of evidence-based behaviour change techniques that could be used to increase adherence to exercise and physical activity for pwMetS.

3. Work with relevant stakeholders to develop and undertake preliminary testing of a behaviour change intervention to increase adherence with exercise and physical activity for pwMetS

This project would suit someone from a health professions, psychology or physical activity background

For further information and to discuss your ideas, please contact Dr Sionnadh McLean at s.mclean@shu.ac.uk

**Project 3: Exploring the use of technology to monitor disease progression and predict clinical outcomes in people with Peripheral Arterial Disease (PAD)**

**About the PhD**

Peripheral Arterial Disease affects 30% of people over the age of 50 and is 5 times more common in patients with diabetes. Being affected by both, increases the risk of complications such as foot ulceration and amputation, significantly affecting the quality of life of those affected. Despite this, Peripheral Arterial Disease frequently goes undiagnosed because of a lack of simple non-invasive tests, while disease progression assessment remains difficult due to NHS budget constraints and monitoring difficulties imposed by the pandemic.

Currently, there are two major knowledge gaps in regard to disease management and monitoring:

a) there is no accurate way to determine, which patients are at higher risk of developing complications such as amputation, and

b) although real time monitoring technologies, such as GPS, are readily-available, disease progression monitoring remains confined in laboratory (treadmill) assessments of maximum walking distance, which may be inappropriate for some people (due to frailty or fear) and which are difficult to perform under pandemic conditions.

For the first issue, and by using a simple, non-invasive test that measures abnormalities in the superficial small vessels in the leg, our research group demonstrated that these seem to be closely related to PAD severity. However, the importance of this finding in determining which patients at higher risk of developing complications remains unknown.

For the second issue, in a recent publication our group showed that GPS can effectively assess a reduction in maximum walking distance over time, in the general PAD population. However, it remains unknown whether such methods are feasible to implement within an NHS setting.

It is envisaged that the successful candidate will progress our work and base their PhD studies in tackling these two important research questions.

For further information and to discuss your ideas, contact Dr Markos Klonizakis, Reader in Clinical Physiology, on [m.klonizakis@shu.ac.uk](https://exchange.shu.ac.uk/owa/redir.aspx?C=1GCYwVcZVkKdDX8jw6RIv-NOhi351dEIs54OwxSznni5k1CeRhMrvbEjdKpzlPecwccKmfJojmk.&URL=mailto%3at.vernon%40shu.ac.uk)