**University of Leicester**

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| **Project Reference** | BRC Studentships |

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| **Additional Supervisor** | Dr Alex Rowlands​ |

**Section 2 – *Project Information***

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| **Project Title** | ​​​Using physical activity and physical function metrics to develop a ‘movement age’ and personalized intervention in those with multiple long-term conditions (MLTCs)​​​ |
| **Project Highlights:** | 1. | Opportunity to work in a patient population recognised as a high clinical priority in the NHS. |
| 2. | Undertake cross-cutting, multidisciplinary research in an internationally-renowned academic environment. |
| 3. | Will allow the student to generate experimental, epidemiological and behavioural science evidence in an open, inclusive work environment. |
| **Project Summary**  |
| **Background**: ​​Increases in life expectancy and advances in healthcare have led to growing numbers of people living with multiple long-term health conditions (MLTCs). This has significant implications for the symptom complexes, such as frailty. The frailty phenotype is characterised by slow walking pace, low strength, low physical activity levels and general exhaustion, often compromising quality of life and increasing the risk of premature mortality. In people with MLTCs, the frailty phenotype can be an enigma, as it represents a model of **accelerated biological ageing and risk of frailty** often encompassing obesity and occurring at an earlier age. As such, there is a need to identify accessible outcome measures that are easily able to detect trajectories towards frailty before the phenotype is manifested.  **Aim**: ​To investigate whether daily 24-hour movement profiles (encompassing physical activity, sedentary behaviour and sleep, recorded using a wearable device) alongside an individual’s physical function, can be used to provide reliable estimation of biological age (conceptualised as ‘**movement age**’), and inform a personalised intervention in adults with MLTCs.​ **Research Plan**: ​The programme of work will encompass epidemiological, qualitative and experimental methodologies. These include:* ***Systematic review (year 1)****:* A review of the biological vs. chronological age literature, with a particular focus in MLTCs and movement behaviours.
* ***Epidemiological and qualitative methodologies (years 1-3):*** Develop and validate an evidence-based metric examining the most appropriate outcomes for describing ‘movement age’. Explore the acceptability of including ‘movement age’ in a series of focus groups.
* ***Experimental methodologies (Year 3):***​ A 12-week randomised controlled study will determine the efficacy of a personalised movement-based intervention to improve ‘movement age’ in those with MLTCs

**Expected outcomes and impact**: ​​This multi-disciplinary, cross-cutting application will produce and test a simple, easy to understand metric (‘movement age’) that can be embedded into existing BRC programmes. By placing movement age at the clinical interface, it will also allow the facilitation of the most effective conversations around movement behaviours.  |