**University of Leicester**

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| **Project Reference** | BRC Studentships |

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| **First Supervisor** | Dr Enya Daynes |
| **School/Department** | Respiratory Sciences​ |
| **Email**  | ​enya.daynes@uhl-tr.nhs.uk   |

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| **Second Supervisor** | Prof Sally Singh​  |
| **School/Department** | Respiratory Sciences​ |
| **Email**  | ​Sally.singh@uhl-tr.nhs.uk ​  |

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| **Additional Supervisor** | Dr Sam Winter (external) |

**Section 2 – *Project Information***

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| **Project Title** | Exploring breathlessness perceptions and breathlessness response to exercise among different cultures and ethnic minority groups, and the impact on treatment access and uptake.​ |
| **Project Highlights:** | 1. | Using novel techniques to understand breathlessness and provide mechanistic explanations to its presentation |
| 2. | Understand the cultural and social significance and contributions to the presentations of breathlessness |
| 3. | Work collaboratively with the NIHR Leicester BRC and the National Centre of Sports and Exercise Medicine who are world leading in respiratory and exercise research |
| **Project Summary**  |
| **Background**: ​Breathlessness is a debilitating symptom that results in poorer quality of life, increased hospitalisations, and increased mortality. Breathlessness is a complex multi-dimensional sensation with established bio-psycho-social influences that can result in disordered breathing (Hayen et al 2013).Disordered breathing patterns measured objectively via 3-dimensional motion capture (optoelectronic plethysmography – OEP) are associated with disordered breathing and breathlessness symptoms (Smyth et al., 2021). Disordered breathing may well be a confounding factor in understanding differences in response to and experience of breathlessness. **Aims** (1) To understand the differences in breathing patterns, physiological and sociological contributors to breathlessness, across different populations; (2) To understand the impact of social and cultural expectations and how they influence breathlessness perception and access and take-up of healthcare. **Research Plan:** This project will measure breathlessness perception and breathing pattern in different populations, alongside objective cardiorespiratory measures, background health and wellbeing data, and OEP-assessed breathing pattern (such as compartment contribution and inter-compartment asynchrony).  ​ ​The project will be formed by 2 phases as outlined below:* Phase 1: An experimental cohort design study to explore the multidimensional aspects of breathlessness, including breathing pattern at rest and during exercise, breathlessness sensations and health related quality of life. The experimental design study will include optoelectronic plethysmography (OEP), cardiopulmonary exercise testing, wearables for 24hour profiling of respiratory rate and physical activity, and measures of interoceptive breathlessness (i.e. filter-detection task).
* Phase 2: A qualitative exploration of breathlessness, its description, and its impact on social and cultural expectations in different populations, as well as access to valuable healthcare interventions. It will involve interviews or focus groups to explore the bidirectional relationship of social and cultural expectations to breathlessness and the experience on accessing healthcare treatments.

  ​ **Expected outcomes and impact**: Collectively, these projects will provide an in-depth understanding of physiological and societal factors contributing to breathlessness.​  |
| **References**Hayen A, Herigstad M, Pattinson KT. (2013) Understanding dyspnea as a complex individual experience. Maturitas, 76(1):45-50. doi: 10.1016/j.maturitas.2013.06.005.  Oxley R, Macnaughton J. (2016) Inspiring change: humanities and social science insights into the experience and management of breathlessness. Curr Opin Support Palliat Care, 10(3):256-61. doi: 10.1097/SPC.0000000000000221.   Smyth, C.M.E.; Winter, S.L.; Dickinson, J.W. (2021) Novel Real-Time OEP Phase Angle Feedback System for Dysfunctional Breathing Pattern Training—An Acute Intervention Study. Sensors, 21, 3714. doi: 10.3390/s21113714 ​ |