

Summer Bursary 2026 Report – Sam Millward

Investigating the Links between Systemic Frailty and Brain Frailty in Acute Ischaemic Stroke

The BIASP summer bursary has greatly broadened my understanding of what a stroke career can look like and reinforced the significance of a clinical practice grounded in research. My time spent with the Evans' group at the VPD Heart and Lung Research Institute, as well as with the Stroke Medicine department at Addenbrooke's Hospital was a fantastic adjunct to my core placements, allowing ample time to appreciate the varied aspects of stroke treatment, from acute to rehabilitative settings. Along with the research work undertaken, this has allowed me to situate my own career and academic goals within the complex and changing landscape of stroke research and care.

As a tertiary centre for stroke patients, spending dedicated time in Addenbrooke's showed how essential such experiences are for career planning and understanding the different paths available within one specialty. Coming to appreciate the relationship between intersecting services within a hospital, such as DME, rehabilitation medicine and stroke, significantly alters your view both of a patient's journey through care, and your own future training. I partially applied to BIASP to develop my sense of the different interventions Stroke physicians can make and their impact longitudinally, and have come away with a clearer understanding of their hyper-acute role, but also their consultative support of neurosurgical, geriatric and radiologist colleagues. Appreciating the coordinating role of the Stroke physician in these cases, marrying disparate, complex information and negotiating viewpoints, whilst advocating for often vulnerable patients, is a dimension that is easily missed in normal placements.

Beyond the clinical, I have benefited greatly from immersion in a research environment, spending time developing my own interpretation skills across multiple imaging modalities, as well as being exposed to diverse research strategies in neuroimaging. These included innovations in AI processing and industry-NHS interactions in tool development. Undertaking an imaging-based project, I processed several hundred patient MRIs, grading them for brain frailty and identifying a cohort for whom systemic and brain frailty could be compared. Applying established methods, I utilised semi-empirical scales such as Fazekas' and Global Cortical Atrophy scoring to measure age related appearances and the development of white matter hyperintensities on MRI, amongst other indicators of tissue health. Indexing patients by brain frailty served as an essential comparator for further analysis, specifically phenotypical, systemic frailty and mRS outcomes post-CVA. Working with this data emphasised the need for networked approaches which do not treat stroke as an isolated pathology but invite insight from related conditions of aging.

This was reflected in the research environment of the HLRI, where opportunities to discuss and develop complimentary ideas were easy to come by. Still ongoing, this project has guided my thinking around aging more generally; treating different syndromes of aging as interlinked and mutually affecting can inform pathology-specific investigation, whilst guiding our systematic approaches to caring for older patients.

I am grateful to all of the staff at Addenbrooke's and the HLRI for their efforts, and especially to my supervisor Dr Nicholas Evans for his continued support. I am looking forward to continuing with this research and taking these experiences forward, both into my clinical placements and my career long term.