



The SmartSocks DISCOVERY research socks (credit UKRI)

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International prize for pioneering Down syndrome dementia research

A Northumbria University researcher has won a prestigious international competition to develop innovative wearable technology for monitoring early signs of Alzheimer's disease in people with Down syndrome.

[Dr Tamlyn Watermeyer](#), an NIHR-Alzheimer's Society Dementia Fellow at Northumbria University, was named winner of the Dementia and other Neurological Disorders category in the SmartSocks DISCOVERY Pioneers Competition, beating entries from across the world.



Her winning project, SmartSleep&Steps-DS Pilot, will use pioneering [SmartSocks](#) wearable technology to monitor sleep patterns and walking in adults with Down syndrome.

This group are at exceptionally high risk of developing Alzheimer's disease, yet access to specialist dementia, sleep and movement assessment is often limited and difficult to access.

Traditional monitoring methods – such as overnight sleep studies in hospital, smartwatches and specialist walking assessment centres – are often uncomfortable, difficult to use or simply impractical for people with Down syndrome.

The SmartSocks technology offers an unobtrusive way to capture physiological data through an everyday item of clothing but has never been tested in adults with Down syndrome.

[SmartSocks DISCOVERY](#) are specialist AI-enabled research socks that monitor pulse rate, skin response, temperature and movement patterns.



The SmartSocks DISCOVERY research socks (credit UKRI)

The technology was developed with support from [Alzheimer's Society](#) to help researchers study people with dementia, autism, learning disabilities and brain injuries who often find wrist-worn devices like smartwatches uncomfortable, fiddly or stigmatising.

The socks are machine washable and collect data continuously whilst people go about their normal daily activities.

This pilot study will establish whether the technology is acceptable, practical and can generate high-quality data in real-world settings.

Dr Watermyer said: “I’m incredibly excited to work alongside adults with Down syndrome and the learning disability community to test this technology.

“SmartSocks offers a genuinely inclusive way to study early changes in sleep and movement, using something familiar and comfortable rather than invasive assessments.

“This project is an important step towards more accessible, person-centred

dementia research.”

The research forms part of Dr Watermeyer's wider work on the Revolutionising Alzheimer's Disease Assessment in Down Syndrome (RAD) programme, which is co-designing digital, home-based assessments with people with Down syndrome and their supporters to address longstanding inequalities in dementia research and care.

Dr Watermeyer leads the Neurosciences Research Venture (NeRVe) lab at Northumbria University and studies how degenerative brain diseases affect people's memory, thinking and mental wellbeing.

Her particular passion is working with under-served populations, including people with learning disabilities and global majority communities, in the dementia prevention movement.

To date, she has secured approximately £3 million as Principal Investigator and Co-investigator from funders including the NIHR, Medical Research Council, Alzheimer's Society and Alzheimer's Research UK.

As competition winner, Dr Watermeyer will receive a SmartSocks DISCOVERY Kit, allowing her to monitor participants' sleep, movement and body responses around the clock.

This research could help spot sleep and movement problems earlier – potential early signs of changes in the brain – meaning people with Down syndrome could get help and support sooner.

The pilot study will run over 9-12 months and recruit 10-15 adults with Down syndrome aged 30 and over.

The SmartSocks technology was designed by Dr Zeke Steer, Founder and CEO of Milbotix, the company which produces Smartsocks. He was inspired to create the product following his experience of watching his great grandmother develop dementia and the challenges she faced.

Dr Steer said: “We were encouraged by the quality, creativity, and ambition of the proposals we received. The winning projects demonstrate exactly the kind of visionary and impactful research SmartSocks DISCOVERY was

developed for."

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