Parkinson's Research Outreach Network at the University of Hertfordshire

Report on the 'Research in Motion: Institute of Sport research visit', University of Hertfordshire, de Havilland campus, Hatfield, 12 September 2025

PRONET

The Parkinson's Research Outreach Network at the University of Hertfordshire (PRONET at UH) was set up with the aim of bringing together people interested in research into Parkinson's, including people living with the condition, their family members and carers, professionals working with people with Parkinson's including clinicians, and researchers based at the university. Events organised by PRONET focus on different aspects of research, including in October 2024 'Meet the Researcher' at which researchers at the University of Hertfordshire talked informally about their research relevant to Parkinson's, and in March 2025 'Experiences of taking part in Parkinson's research' at which a panel of people with Parkinson's talked about what was involved and what it was like to take part in research studies.

The 'Research in Motion: Institute of Sport research visit' was inspired by discussions with people from the local Parkinson's community. Visits to research laboratories to see where and how research is undertaken was a popular suggestion at workshops planning PRONET activities. The focus of the present event was to see equipment at the Institute of Sport, University of Hertfordshire, used in research studies to measure and manipulate movement, with the potential to better understand and improve movement in Parkinson's.

The Institute of Sport at the University of Hertfordshire

The Institute of Sport is housed in recently refurbished buildings on the de Havilland campus at the University of Hertfordshire, close to the Hertfordshire Sports Village. The excellent facilities are used both for research and for teaching and learning, including for students training in sports and exercise science, sports therapy and sport sciences. The biomechanics laboratory includes one of the few Gait Real-time Analysis Interactive Laboratory (GRAIL) systems available at a university in the UK for measuring gait and balance.

Institute of Sport entrance

Welcome and introduction by Lindsay and Nada

The event opened with a welcome to the Institute of Sport from Professor Lindsay Bottoms, Head of Centre for Research in Psychology and Sports, and a brief overview of PRONET from Dr Nada Yousif, PRONET steering group member. As this event involved visiting research laboratories, spaces were limited. Attendees were organised into groups of around 6 or 7 people to visit each of the 4 demonstrations of research equipment in turn. The relatively small size of the groups enabled attendees to ask questions and get involved in conversations with the demonstrators about how the equipment can be used in research relevant to Parkinson's.

The Demonstrations

1. GRAIL Treadmill

Dr Arezoo Amirpourabasi demonstrated the safe and effective use of the GRAIL treadmill, a state-of-the-art gait and balance analysis system. The GRAIL consists of a treadmill with a screen in front showing a scene that moves as the person on the treadmill moves. Cameras track movements using motion capture technology. Arezoo's demonstration showcased how the immersive virtual environment and body-weight support system allow participants to walk and train safely while minimising fall risk. Attendees observed how motion capture and real-time feedback provide valuable data on gait patterns and movement control. Arezoo emphasised safety protocols and discussed how the GRAIL system could support rehabilitation and research aimed at improving mobility and quality of life for people with Parkinson's.

Arezoo and volunteers from the audience demonstrating the GRAIL equipment

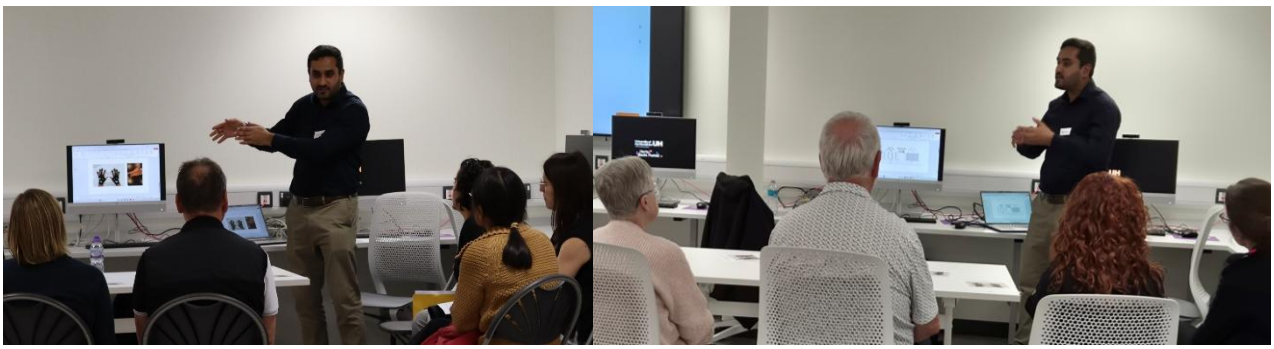
2. VALD Performance Systems Equipment

Dr Camilla Holland and Dr Joel Harris introduced attendees to VALD (Vertical Assessment of Landing Dynamics) Performance systems equipment. This included force plates, the Force Frame strength-testing system, and a handheld dynamometer. They demonstrated how these tools provide objective measures of rehabilitation variables such as balance and time to stabilise movement. After the demonstration there was an interactive question and answer session with the audience. The attendees asked several insightful questions demonstrating their grasp of the benefits both physically and psychologically of having an objective measure with which to monitor Parkinson's symptoms.

Camilla and Joel demonstrating the performance equipment

3. Glove to deliver vibrations to the fingertips

Khurram Mushtaq demonstrated a non-invasive, hand-worn glove that provides precise fingertip vibrations for neuromodulation in people with Parkinson's. The glove delivers gentle, precisely timed fingertip vibrations set to specific patterns, frequencies, and intensities to help "reset" overly synchronized brain rhythms linked with Parkinson's symptoms. Attendees viewed short before-and-after videos from trials of a similar device to illustrate potential functional changes. The session explained how the glove can be worn safely at home for short multi-day periods. Initial clinical evaluations are planned to begin shortly at the University of Hertfordshire, with formal trials to follow pending approvals.



Khurram explains plans for research with the glove that delivers vibrations to the fingertips

4. Transcranial Magnetic Stimulation

Dr Fabio Castro demonstrated the use of transcranial magnetic stimulation (TMS) to study motor control and brain function. His interactive presentation explained how TMS delivers brief magnetic pulses to specific brain areas, allowing researchers to modulate brain activity involved in movement. Fabio highlighted safety procedures, participant preparation, and the interpretation of muscle responses recorded during stimulation. Attendees learned how this non-invasive technique helps uncover how the brain's motor pathways can be explored and discussed the possibility of using TMS to improve understanding and potentially improving motor function in Parkinson's.

Fabio demonstrating the Transcranial Magnetic Stimulation equipment

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Feedback

After the demonstrations, attendees gathered in the Institute of Sport seminar room for a sandwich lunch and further conversations with the demonstrators and other attendees. Attendees were asked to rate the event from 1 (poor) to 5 (excellent) and write any comments and suggestions for future events. The average rating was 4.83 (from 12 responses), with the majority rating the event as excellent.

Comments included:

- It is the first PRONET I have attended and am impressed and delighted to see the research in action which was exciting and promising. The lecturers and all involved were all so enthusiastic and welcoming.
- Once again a very interesting day. The presentations were very apposite.
- Liked hands on to go on the GRAIL. Brilliant. All good. Physical demonstrations good, would like to have had a go. Good that small groups very close up so never switched off and got more involved.
- An excellent overview of the research that is going on in Hatfield, ably presented by the researchers in a friendly and easily understandable manner. Very interesting to see all the high-tech and glad to see that it's all going on in Hertfordshire. Will be fascinated to see how the different research avenues progress and I am sure the practical nature of the research will lead to an improvement in the lives of people with Parkinson's.

- Very interesting and well organised day. Thank you.

Thank yous

Thank you to all who attended and contributed to the 'Research in Motion: Institute of Sport research visit'!

We would like to thank Dr Arezoo Amirpourabsai, Dr Fabio Castro, Dr Joel Harris, Dr Camilla Holland, and Khurram Mushtaq for their demonstrations of the equipment, Jenny Jones for use of the Institute of Sport, and Eleonora Bernasconi, Christine Caine, Christy Goodro and Eva Lesovskaya for helping at the event.

We gratefully acknowledge funding from Julie Wilson and Claire Shearer at Parkinson's UK to support this event, and from the Economic and Social Research Council (ESRC), part of UK Research and Innovation, through an award from the University of Hertfordshire's ESRC Impact Acceleration Account that supports PRONET.

Future events

The PRONET team is currently planning future events in November 2025, February and April 2026. Details of these events will be circulated to everyone on the PRONET mailing list. If you are not already on the PRONET mailing list and would like to receive information about future events, please contact pronet@herts.ac.uk to ask to join the mailing list.

If you are interested in a particular research topic relevant to Parkinson's and would like PRONET to focus on that topic at a future event, please contact the PRONET team by email at pronet@herts.ac.uk. We look forward to hearing from you.

This report was written by Nada Yousif, Khurram Mushtaq and Lucy Annett, on behalf of the PRONET steering group: Lucy Annett, Rosie Brewis, Becki Hadley, Ruth Herman, Mahmoud Iravani, Vivienne Levy, Khurram Mushtaq and Nada Yousif.

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