

The Hospital-to-Home (H2H) Study: using smartwatch technology to support older people following a hip fracture

Luke Hodgson is an Intensive Care and Respiratory Consultant working at Worthing Hospital, University Hospitals Sussex NHS Foundation Trust, with an interest in applied technology in acute care settings.

Below, he outlines the research he has been undertaking, with an Applied Research Collaboration Kent Surrey and Sussex (ARC KSS) Individual Development Award (IDA), to look at how using smartwatch technology could support people following a hip fracture.

During the COVID-19 pandemic, exercise and socialising in the hospital and home have been reduced, particularly affecting our older population. Though technology may offer solutions to support older people, we do not know whether the use of 'smartwatches' and online platforms or Apps are acceptable for use in acute hospital settings.

The NHS annually manages over 66,000 people who have suffered a hip fracture, with a significant number unable to return home or continue to experience ongoing problems. At two hospital sites (Worthing and St Richard's, Chichester), the H2H study is exploring whether a group of hip fracture patients at one site would be happy to use smartwatch technology connected to an 'App' and if this helps their recovery at home, with remote coaching. The App developed by CUSH Health allows patients and their clinical team to track activity such as step counts and has personalised videos including exercises, pilates and yoga to help recovery. While in hospital, we are exploring different ways to encourage activity on the wards within COVID related restrictions such as group music sessions. Progress is being compared with a control group at the second hospital. At both sites, baseline demographics, activity levels and quality of life data are being collected and then will be repeated up to one-year.

The study was planned in consult with our Trust's research champions who include patients and the public, providing valuable insights into what participants would likely be able to cope with, during an obviously stressful time. The study has been adopted on the NIHR portfolio and won an award from Innovate UK's Sustainable Innovation Fund in Collaboration with CUSH Health. H2H is providing research experience to a number of early career researchers including Adele Hill a Physiotherapist who has now successfully applied to commence a PhD through the NIHR and Rob Wagner, also a Physiotherapist and a research scholar at the Trust.

Two of the main study outcomes will be to establish acceptability and feasibility. Although these are commonly used terms, they may not be obvious to everyone. Acceptability is the degree to which a participant deems in this case, a wearable device, to be appropriate in relation to needs and preferences. This may be ascertained through user satisfaction, actual use, effective use or intention to use the technology. Participant satisfaction and experience determine acceptability. Importantly, acceptance is not inferior to physiological accuracy, as acceptance is central to a patient-centred care approach. Low acceptance is a barrier to the success of technology including devices: if patients find them uncomfortable and obtrusive, they will be less likely to wear them and this may impact negatively on their experience.

Adherence is measured through duration of smartwatch use and drop-out rates. In the intervention group, patient reported experience measures (PREMs) will be gathered using Davis' technology acceptance model, using a questionnaire covering technology anxiety, resistance to change, perceived usefulness, ease of use, attitudes and behavioural intention. These measures will provide a valuable insight into several behavioural factors that could act as inhibitors or facilitators for adoption and use of the technology. Interviews with patients from both groups and healthcare professionals will be undertaken to understand barriers and facilitators to both models of rehabilitation (technology supported versus usual care).

Feasibility measures in addition to acceptability will also aim to:

1. Establish the number of patients that can be included and complete the intervention.
2. Explore opportunities of patient and public involvement, to progress from consultation to co-production, in a future trial.
3. Describe and adapt delivery of the study to NHS acute hospital settings and the community, considering challenges such as staffing availability.
4. Identify primary outcome measures and aid power calculations for a future randomized controlled trial.

The study will be providing preliminary findings before the end of 2021 and one-year outcomes in the summer of 2022.

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More information about Cush Health: <https://cushhealth.com/>