SWAT 244: Feasibility of collecting longitudinal accelerometry data in a randomized trial of mobility after hip fracture

Objective of this SWAT
To determine the feasibility of collecting longitudinal accelerometry data among older adults enrolled in a feasibility randomised trial testing an intervention to promote recovery of outdoor mobility after hip fracture.

Additional SWAT Details
Primary Study Area: Data Collection/Quality
Secondary Study Area: Barriers and facilitators; Document design and delivery
Who does the SWAT intervention target: Participants
Estimated resources needed to conduct the SWAT: Medium
Estimated cost of the SWAT (£): £14,597

Findings from Implementation of this SWAT
Reference(s) to publications of these findings:
Primary Outcome Findings:
Cost:

Background
UK hospitals admit 70,000 adults with hip fracture annually.[1] Patients consider recovery as community reintegration, which often requires outdoor mobility.[2] However, despite patient reported goals of outdoor mobility, there are low rates of recovery of outdoor mobility among patients after hip fracture. For example, among 24,492 patients with outdoor mobility before their fracture, only 2275 (9%) recovered their pre-fracture abilities by 30-days post-admission,[3] increasing to 26% by 120-days.[4]

A systematic review of community-based physical activity levels among older adults after hip fracture reported average daily step counts from 612 to 4279 steps per day across studies, classifying all participants as sedentary.[5] While daily step count increased with time since fracture, these remained below age-matched values and the threshold for ‘low active’ (≥5000 steps) in most cases.[5] These findings were supported by another systematic review which indicated that patients with serious orthopaedic injury (>50% studies on hip fracture) achieved only 1% of recommended physical activity levels 7 months post-injury, spending 76-99% of waking time sitting.[6]

Despite these data, guidelines for community rehabilitation following hip fracture are limited to in-home self-care and mobility, which present less opportunity for both physical activity and community integration. This gap is important because outdoor mobility is more physically, psychologically and cognitively challenging than indoor mobility.[7]

This Study Within a Trial will be embedded in a feasibility randomised trial which will help fill this gap by testing an intervention to promote recovery of outdoor mobility after hip fracture (ISRCTN16147125).[8] This SWAT will assess the inclusion of device-based measures of physical activity (inclusive of outdoor activity) which, if shown to be feasible to use and acceptable to participants, will be more sensitive to any changes in level and pattern of physical activity than self-reported questionnaire measures in a future definitive trial.

Host Trial Population: Adults
Host Trial Condition Area: Rehabilitation

Interventions and Comparators
Intervention 1: Twenty adults (aged ≥60 years) discharged home after hip fracture surgery who are randomised to an outdoor mobility intervention or comparator group in the host trial will receive research grade wrist-worn triaxial accelerometers (GENEActiv www.activinsights.com) by post for 10 days of wear at baseline (on return home), and at 6 weeks, 12 weeks, and 6 months post-randomisation. A wrist worn device was selected due to the higher reported wear time

adherence compared to devices on other body locations[9] and our requirement for light measurement. Ten days wear is recommended to enable reliable estimation of both habitual and moderate-to-vigorous physical activity (accounting for the day-to-day variability).[10] After receipt, participants will wear the accelerometer continuously for 10 days before returning it to the research team by courier (pre-paid). Previous studies of older adults with a similar data collection protocol reported adherence to physical activity monitoring using the GENEActiv accelerometer of >90% at baseline,[11] and 80% at 6-months follow-up.[12]

Method for Allocating to Intervention or Comparator: Randomisation

Outcome Measures
Primary Outcomes: Feasibility of longitudinal accelerometry data collection among older adults enrolled in the host trial (measured by the proportion of accelerometers returned with 5 or more days of data at the 12 weeks and 6 months follow-up time points).
Secondary Outcomes: 1) Acceptability of accelerometry data collection (measured using participant semi-structured telephone interviews at the end of the host trial, using updated topic guides informed by the Theoretical Domains Framework to structure discussion of barriers and facilitators and including questions about accelerometry data collection to enable a theory driven assessment to better understand uncertainties.[13])

2) Barriers/enablers to accelerometry data collection (measured using participant semi-structured telephone interviews at the end of the host trial, using the methods described above).

3) Feasibility of identifying ‘outdoor time’ from accelerometer light sensors and acceleration data (measured using the accelerometers which have an ambient light and temperature sensor which will be used as a proxy to estimate the frequency of active outdoor events. Events will be classified as outdoor if the mean lux value for the event is >1000 lux. This is a well-established upper limit for indoor exposure and lower limit for outdoor exposure.[14])

4) Completeness of accelerometry data and descriptive, between-groups comparison of accelerometery derived variables (days of valid wear, frequency and volume of activity, temporal distribution of activity and estimate of frequency of active outdoor events).

Analysis Plans
Accelerometry data will be analysed descriptively with measures of central tendencies and dispersion for each time point, overall and by group allocation in the host trial. Between-group differences, including in changes from baseline, will be reported with corresponding confidence intervals. Qualitative data transcribed verbatim from the interviews will be analysed using a thematic analysis approach.[15]

Possible Problems in Implementing This SWAT
Potential burden to participants.

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References to This SWAT

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Source of This SWAT

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