**Exploratory study of ease of walking on low impact flooring.**

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**Preamble**

Falls in hospital are common. Between 35-42% of falls cause injuries and 1 – 3% result in a fracture. These fractures are usually hip or pelvis fractures which threaten life and/or independence. Whilst there are some effective fall prevention strategies for falls in hospitals, fall rates and fall related injuries remain high. It is generally not possible to predict which falls or patients will have injurious falls. One approach is to tackle the whole population at risk by using energy absorbing or low impact flooring (LIF) to prevent injury.

One trial to investigate the practical aspects LIF has already been completed and another is ongoing investigating falls and fall related injuries. For both, 3 different LIFs have been laid in one ward at PMH (total of 12 bed spaces) whilst 8 bed spaces have standard vinyl flooring (SF). During the trial, staff noted that 1 Parkinson’s patient appeared to have more gait initiation difficulties on the LIF. Parkinson’s patients often have gait initiation problems. Staff have commented that some other patients were thought to have “sticky feet” on LIF.

Softer surfaces (includes carpets or LIF), could potentially worsen gait in patients with existing poor balance (eg Parkinson’s and stroke patients). Thus the aim of this exploratory study is to examine gait characteristics on LIFs compared to SF in different patient diagnostic groups.

**Methods**

The LIFs are currently in situ and are being used in clinical patient areas in one ward (2B) at TPMH. There are 3 different LIFs being trialled for their practicality (durability, staff acceptability, infection control issues and cleaning issues).

**Patient sample**

Current inpatients from any of 5 PMH inpatient wards will be recruited aiming to select a convenience sample that includes:

* Parkinson’s patients (N=20)
* Stroke patients with either motor deficits such as hemiplegia with foot drop, poor foot clearance or proprioceptive loss (N= 20)
* Control group-non stroke and non-Parkinson’s (N=20)

Patients need be mobile with or without a walking aid (can be with one person assistance) to be included. Those less mobile, such as those requiring 2 people for walking or hoist transfers are excluded, but could be included later when their mobility has improved.

Baseline characteristics of this patient group will be collected routinely collected as part of normal clinical practice including age, gender, Functional Independence Measure (FIM) on admission. In addition, an assessment of their frailty will be made using Clinical Frailty Scale (no input from patient required) as well as a measure of their current balance, using the Berg Balance scale (BBS). The BBS is a standard measure routinely used in our wards and so will not require additional assessments for this study.

The **outcome measures** will be patient mobility, recorded by observation, looking at the following components of mobility:

1. gait initiation,
2. gait fluency and symmetry
3. speed of walking in straight line,
4. turning and
5. any tendency to trip

Each of these will be assessed during a standard 3 metre Timed Up and Go [TUG], with 2 tests for each patient on each of Floors B and C (the 2 most preferred LIFs) and SF (control). Each TUG test will be video-recorded (video recording will be anonymised by not including the head and neck of patient), thus allowing blinded (to floor type) outcome assessments. The order of allocation to each floor type will be randomised.

Patients will be asked to rate each of the 3 different floor surfaces in terms of

1. Comfort whilst walking
2. Perceived stability whilst walking
3. Make any additional comments on any difficulties with each surface

Comparisons will be made by patient group, adjusting for severity of disability, and by floor type.

**Potential significance**:

Staff have spontaneously commented that some floors may cause feet to “stick”. The softer surface of LIFs could potentially also alter gait pattern and thus increase (or decrease) tendency to fall. This study aims to examine whether there are any changes in gait and balance and determine whether the reported stickiness is real or not for patients.

The effect of LIFs on gait changes, and fall injury rates, are both important to guide decisions as to whether LIFs are suitable for in a hospital environment.