

**Title:** Can smart bed sensors differentiate between healthy adults and older adults with mobility impairment?

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**Background:** Falls are common and potentially hazardous events for older adults. The ability to detect signs of an impending fall could allow a care provider to intervene and prevent it. In previous work we have shown that bed sensor technology can classify transfers off of a bed using timing characteristics.

**Objective:** The objective of this work is to determine whether a smart bed sensor can differentiate between healthy (H) and older mobility-impaired (MI) adults using a pressure-based parameter.

**Participants:** The H group consisted of hospital employees and volunteers (18 to 75 years old). The MI group contained post-stroke and post-hip-fracture patients (60 to 86 years old), recruited from rehabilitation in- and out-patient programs.

**Data Collection:** Tactex bed sensor mats were placed under the mattress of a hospital bed and connected to a Dell laptop. Video recordings were made during sit-to-stand transfers off of the bed and algorithms were applied to extract the centre of pressure (CP) from the mats.

**Methods:** For each transfer, the path of the CP was observed over time and its deviation was measured. The measure was then compared between the two participant groups using a Kruskal-Wallis analysis of variance (ANOVA) test.

**Results/Conclusions:** The mean deviation was significantly different between the two groups (H:0.48cm, MI:1.56cm,  $p < 0.001$ ). The system was able to correctly identify 92% of the transfers as being healthy or mobility-impaired.

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