AMBIGeM: Innovative use of technology to monitor humans and reduce risk of falls in acute care

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Aims

Despite progress towards best practice, falls rate in hospital remain high. Technology may assist clinicians prevent falls in acute care but to date there has been very little research in this area. The aims
were to: a) characterize fallers as well as evaluate the circumstances surrounding falls in hospital; and b) pilot the AMBIGeM (Ambient Intelligence Geriatric Management) system and determine its predictive ability to identify high risk movements commonly associated with falls in healthy young volunteers.

Method

An audit of 65 first fall occurrences in hospital was undertaken. 10 healthy adult volunteers (age 23-30
years) were given scripted routines of activities of daily living (ADLs) that incorporated common activities that increased risk of falls in hospital and the data gathered was analysed and the predictive ability of the AMBIGeM system determined.

Results

Falls were more common in older people (70% for >75 years) and those with cognitive impairment (50%). 71% of falls occurred between 1700 hrs. and 0700 hrs. while 69% of falls were not witnessed and 37% resulted in injuries. Almost all falls were related to transfers and toileting. Correspondingly, 80% of falls occurred in the bedroom or bathroom. The AMBIGeM system used to identify common hospital falls risk related activities in the pilot study classified sitting or standing movements with sensitivities and specificity values between 90 and 98%. The AMBIGeM system predicts with 100% accuracy the following movements: getting in and out of bed, entering and leaving the bathroom and walking without an aid.

Conclusion

Falls are common in hospital and often associated with injury. The AMBIGEM is a technological solution that may assist clinicians prevent falls in acute care and pilot results are promising. Further clinical research and technology refinement is required to progress this system. If successful, this will have national and international impact.