

POSTER PRESENTATION 1: HOUSING AND DAILY LIVING

Adapting smart supportive technology for hospital use: A case report

F. Knoefel, L. Ault, C. Wilson, C. Trudel, M. Hamza, R. Wallace, M. Jaana, R. Goubran, H. Sveistrup, P. Tan, N. Thomas

Purpose Persons living with dementia (PLWD) often have demanding needs, placing burden on healthcare systems and care partners (GBD, 2019). Smart supportive technology is emerging as a solution to improve PLWD's quality of life/wellbeing, increasing interest in ambient assisted living (Gettel, 2021). However, there is limited research surrounding the customization of systems to each user's needs, which may lead to higher rates of acceptance (Fares, 2021). This case study explores the personalization of a smart technology system adapted to a hospital setting. **Method** A male patient in his late 60s, who is ambulatory and relatively independent, residing at Greystone Village Retirement, Ottawa, Ontario, Canada, participated in this study. The patient lives with dementia and a significant psychiatric diagnosis. A bed pressure sensor and motion sensors were installed in the room. The bed pressure sensor was placed under the mattress to indicate bed occupancy. One motion sensor was placed on the bedroom wall to detect movement in the room. A contact sensor for the doorway was intended to be installed to indicate room exits. Starting at 10pm, alerts would be sent to a cellphone in the nursing station if the patient was detected to be out of bed for a defined period of time (risk of fall) or had left the room during the night (risk of wandering). Weekly meetings with facility staff assessed their satisfaction with the technology. The facility staff kept reports on each alert that was received, the action(s) taken, and noted if there were any false alerts. **Results & Discussion** Since this patient leaves his door open overnight, the door contact sensor would not indicate room exits. Instead, a second motion sensor was placed in the closet. As the patient was relatively independent, the second sensor would sense when they would attempt to access the closet to get ready for their day, presumably prior to leaving the room. The system was first set up to alert if the patient did not return to bed within 8 minutes. However, this patient would typically leave the bed to head directly to the nurses' station, taking less than 8 minutes and rendering the alert useless. Consequently, the alert was adjusted to notify immediately after a bed exit, with a maximum frequency of one every 20 minutes. After a month, the system was readjusted to alert when the patient did not return to bed after 12 minutes. Staff reported satisfaction and are integrating the technology into their workflow. For example, staff would instinctively go to the medicine room when the alert went off, as the patient typically required as-needed medication at that time. The increased success and acceptance of the system after adjusting it to the user suggests that adaptation of smart technology to a patient's unique behavioural considerations and staff care needs is important for clinical use. Future digital solutions should aim to customize their systems to the user, rather than implementing a 'one size fits all' approach.

References

- Global Burden of Disease (GBD) 2016 Dementia Collaborators. (2019). Global, regional, and national burden of Alzheimer's disease and other dementias, 1990–2016: a systematic analysis for the Global Burden of Disease Study. *The Lancet*, 18(1), 88-106. [https://doi.org/10.1016/S1474-4422\(18\)30403-4](https://doi.org/10.1016/S1474-4422(18)30403-4)
- Gettel, C. J., Chen, K., Goldberg, E. M. (2021). Dementia Care, Fall Detection, and Ambient-Assisted Living Technologies Help Older Adults Age in Place: A Scoping Review. *Journal of Applied Gerontology*, 40(12), 1893-1902. <https://doi.org/10.1177/07334648211005868>
- Fares, N., Sherratt, R. S., Elhajj, I. H., (2021). Directing and Orienting ICT Healthcare Solutions to Address the Needs of the Aging Population. *Healthcare*, 9(2), 147. <https://doi.org/10.3390/healthcare9020147>.

Keywords: smart technology, aging in place, ambient assisted technology, staff satisfaction

Address: Bruyère Research Institute, 85 Primrose Ave, Ottawa, ON K1R 6M1, Canada.

Email: fknoefel@bruyere.org

Acknowledgement The project received financial support from the Ontario Academic Health Sciences Centres Academic Funding Plan Innovation Fund and was supported by the Bruyère Academic Medical Organization. AGE-WELL NCE Inc. provided financial support to AGE-WELL NIH SAM3. Frank Knoefel acknowledges funding for the University of Ottawa Brain and Mind – Bruyère Research Institute Chair in Primary Health Care Dementia Research.