

Lean Thinking for Healthcare  
Healthcare Delivery in the Information Age 2014, pp 143-167

# Lean Thinking in Dementia Care Through Smart Assistive Technology: An Evaluation

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## Abstract

This chapter provides an analysis and evaluation of a community-based project trialling the use of smart assistive technologies (ATs) for people with dementia and their families. The 12-month project was funded by Home and Community Care (HACC) Queensland and conducted by Alzheimer's Queensland and the University of Southern Queensland in the North Brisbane and Toowoomba areas.

Participants in the project were selected on the basis of having a diagnosis or suspected diagnosis of dementia; live at home and be HACC eligible. In most cases they were service users of Alzheimer's Queensland respite centres, but some were referred from other services; all participants had expressed an interest in trialling AT. All participants were assessed by an Occupational Therapist, and then based on this assessment of individual need and functional capacity were prescribed individual items of AT.

AT prescribed included sensor mats, emergency call systems, robot vacuum cleaners, calendar clocks, bed occupancy and exit sensors, and personal amplifying devices. Depending on when the clients entered the study, the period of trial of equipment varied from 11 months to less than 1 month. Carers were required to complete a survey before and after a trial of the AT, as well as the option to participate in an interview and or focus group after the trial. Data was also collected via interviews with the project Occupational Therapists to gain their feedback on the strengths, weaknesses and general applicability of the AT for this group. Data was analysed using both qualitative and quantitative methods.

The challenges of caring for a person with Alzheimer's disease or other forms of dementia were identified by participants in this study as being the inability to stop worrying, feeling afraid all the time, feeling isolated and feeling vulnerable. The main carer concerns were perceived as being the client falling, risk of fire and inability for the client to be left alone. Lack of sleep and inability to relax were identified as major issues for carers.

The most useful and successful types of AT were identified by respondents as being sensor mat with remote pager, bed exit sensor with interval timer and pager, the robotic vacuum cleaner and the hearing devices. Vacuum cleaners were seen as increasing independence and hearing devices improved communication.

Quantitative survey results found a significant reduction in the extent to which carers were worried about the client getting out of bed at night and falling following the implementation of AT. Qualitative results obtained in the focus groups and in-depth interviews then linked this decreased worried to improved carer sleep patterns. No difference was found in the ability of carers to leave the client alone at home as a result of the AT, nor any indication that AT made the clients feel safer. AT did not reduce their need for external support services (respite) and in-home care (housework and/or meals). Contrary to expectations, results also found that neither the levels of stress nor the frequency of stress chaptered by carers decreased significantly secondary to the introduction of AT. Finally, carers had perceived that using the AT would enable the client to remain home longer; however, this was not supported by the post-AT survey.

Carers noted that it did not take long for them to feel comfortable with the technology in the home.

All carers indicated both in surveys and interview that they felt comfortable to contact AQ at any time, but despite this training and support, when problems arose (such as persistent beeping by sensor mats or flat batteries), the carers indicated that they simply unplugged the AT and stopped using it.

Involvement in the selection of the type of AT to be used was important for carers who stated that they appreciated being able to identify their particular needs, to be listened to and to be provided with adequate and appropriate education upon receipt of the AT.

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**Title**

Lean Thinking in Dementia Care Through Smart Assistive Technology: An Evaluation

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**Book Title**

[Lean Thinking for Healthcare](#)

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**Book Part**

Part II

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**Pages**

pp 143-167

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2014

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**DOI**

10.1007/978-1-4614-8036-5\_9

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**Print ISBN**

978-1-4614-8035-8

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**Online ISBN**

978-1-4614-8036-5

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**Series Title**

[Healthcare Delivery in the Information Age](#)

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**Publisher**

Springer New York

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Springer Science+Business Media New York