A proposed system for the home-based ambient monitoring and enablement of older adults with dementia.

Joanna E. McHugh¹, Eamonn Newman², Alan Smeaton² and Kate Irving¹
¹School of Nursing & Human Sciences, and ²Clarity Centre and School of Computing, Dublin City University
Email: joanna.mchugh@dcu.ie

Background

• With the worldwide increase in dementia prevalence, more than ever we need to focus on developing an acceptable, cost-effective home-based solution to support individuals living in the community with dementia, and to delay institutionalisation.
• Ambient assistive technologies can support independent living and prolong community-based living¹.

3 Themes of Dem@Care

Lab: Diagnostics

Home: Enablement and support

Nursing home: Safety

2 Loops of Care

Home-based loop
Between person with dementia and their family caregivers
Sensor-based
Context-sensitive, evolving, personalised

Clinicin loop
Creates a faithful log of health related information
Warms clinician about deteriorations & trends
Supports care decisions

Principles of Dementia Design²,³

• Keep user interaction to a minimum²,³,⁴
• Appear familiar to the person with dementia²,³,⁴
• Be empowering and encourage the person with dementia to solve problems²,³,⁴
• Be reassuring²,³,⁴
• Algorithmic applications should be based on a large dataset, because human performance is highly variable⁵
• Be fiddle-proof, and robust³,⁶
• Have an aesthetic⁵
• Be person-centred and not carer-centred⁶,⁷
• Provide the person with dementia with a feeling of independence⁴
• Acknowledge the person with dementia as a person with abilities⁴
• Engage carers with the first stage of development, before the prototype is debuted with persons with dementia¹
• Be evultive of carer behaviour, i.e. provide reminders, support, reassurance²,³

Structure of Support

Assessment interview:
- Sleep
- Exercise
- Diet/ADL
- Socialising
- Mood

Functional decline detected in 1 or more areas

Relevant components chosen from “toolbox” of technologies and deployed to home for monitoring and support

What next?

• Technology-led design of the “toolbox” approach, creating personalised systems of home-based sensors.
• Recruitment of individuals with early to moderate stage dementia and their families
• Home-based deployment, system adapts over time.

References


Acknowledgements

This research has received funding from the European Community’s Seventh Framework Programme (FP7/2007-2013) under grant agreement 288199 – Dem@Care