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Chris and Sally's house: Adapting a home for people living with dementia (innovative practice)

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Chris and Sally's House: Adapting a Home for Living with Dementia (Innovative Practice)

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Keywords:	Built environment, independence, Human Factors, evidence-based design, personas
Abstract:	How can domestic housing be adapted to support people living with dementia staying in their own homes for as long as they choose? This paper describes the innovative practice of using evidence-based design personas in a building refurbishment project (Chris and Sally's House) with a multidisciplinary team of architects, ergonomists, psychologists and experts. A 100sqm Victorian two bedroom house was adapted to help educate house builders, carers and relatives on how to better support those living with dementia to live in their own home for longer. The design principles include clear sight lines, mobility support and provision for overnight carers.

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Chris and Sally's House: Adapting a Home for Living with Dementia (Innovative Practice)

Background

'A person's home is not just the place where they live, but also a place of work for home care workers' (Taylor & Donnelly, 2006). Home care aims to satisfy peoples' health and social needs in their homes by *'providing appropriate and high-quality home-based healthcare and social services, by formal and informal care-givers, with the use of technology when appropriate, within a balanced and affordable continuum of care'* (WHO, 2008). The home setting presents challenges for caregiver-patient interactions and will probably require adaptations for work policies, protocols and routines. As 61% of people living with dementia in the UK live in the community (Prince et al., 2014), ensuring that housing is designed to meet the needs of people living with dementia is of the utmost importance.

This innovative practice paper describes how research (Jais, Hignett, and Hogervorst, 2018) was translated into practice using evidence-based personas (archetypical descriptions of people) to refurbish a two-up/two-down Victorian terraced house in the UK. The adapted house aims to support independent living for people living with different stages of dementia.

A set of four evidence-based dementia personas (EBDPs) were developed and validated with clinicians, care providers and designers (architects): Alison, Barry, Chris(tine), and David (Jais, Hignett, and Hogervorst, 2018) represent the symptoms, care needs, and design needs of people at different stages of dementia. The EBDPs are available in 3 formats (matrix, 3-D wheel and short film; <https://www.bregroup.com/ipark/parks/england/buildings/dementia-friendly-home/>). They are used to inform the design process by bringing the 'voice' of Alison, Barry, Chris(tine) and David into both new building and refurbishment projects. A couple persona (Chris and Sally) was developed by extending the Chris(tine) persona to include the carer (Sally) perspective.

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3 The house is located at the Building Research Establishment (BRE) Innovation Park in
4 Watford, UK. It started as a two-up/two-down terraced house with a layout that presented
5 problems for both ageing and living with dementia (Figure 1). The first floor layout posed
6 challenges as the eaves in Bedroom 1 resulted in restricted headroom in some areas. Other
7 challenges included access to the first floor (stairs), with the only bathroom on the first
8 floor. Previous research has shown that mobility problems can prevent older people from
9 using rooms on the first floor (Renaut, Ogg, Petite, & Chamahian, 2014) so someone with
10 reduced mobility might be confined to either the ground or first floor of the house and have
11 to use a commode.
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21 <Figure 1. Original layout>
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25 **Design process**

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27 The design process started with discussions about building performance requirements and
28 technologies to support the EBDPs needs. The design concepts included:
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- 30 • Clear sight lines including a view to the toilet from the living room (Caspi, 2014;
31 Nordin, Elf, McKee, & Wijk, 2015).
- 32 • Supported mobility with a lift (Hadjri, Rooney, & Faith, 2015) and easily operated
33 sliding doors in the centre of the home.
- 34 • Wheelchair-accessible bathroom equipped with modified sanitary equipment
35 (Boger, Craig, & Mihailidis, 2013).
- 36 • Kitchen positioned next to the living room and designed so that the person with
37 dementia can sit and participate in food preparation as appropriate (Nordin, Elf,
38 McKee, & Wijk, 2015).
- 39 • Features, including furniture, have been designed to be familiar to persons with
40 dementia in their early adulthood (e.g. tap design and operation; Boger, Craig, &
41 Mihailidis, 2013)
- 42 • Consideration was given to contrasting colours reflections and repetitive patterns
43 (Andersson, Lindahl, & Malmqvist, 2011).
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The team needed to ensure that the final design was representative of what was possible and realistically achievable when adapting a two-bedroom house for people with dementia. Five design scenarios (Table 1) were created by the architect partners (WH) based on building regulations M4.2 standard (apart from Bed 1 and Bathrooms using M4.3 standard) to include a range of options for mobility, (lift between floors), hygiene (ground floor wet room), and overnight carer support (small kitchen/dining area on first floor). Each scenario was discussed at length to consider how it met the care needs of each EBDP.

Adaptation 1	Adaptation 2	Adaptation 3	Adaptation 4	Adaptation 5
Install lift	Install lift	Install lift	Install lift	Install w/chair lift
Living space upstairs	Retain 2 bedrooms upstairs	2 bedrooms upstairs	2 bedrooms upstairs	2 bedrooms upstairs
Move bedroom downstairs		Add bedroom downstairs	Add bedroom downstairs	Add daybed recess downstairs
Add bathroom with dementia friendly design	Add dementia friendly bathroom upstairs.	Add dementia friendly bathroom downstairs and upstairs.	Add dementia friendly bathroom upstairs.	Add dementia friendly bathroom downstairs and upstairs.
Retain upstairs bathroom			Disabled WC downstairs	
	Add kitchen/dining upstairs	Add kitchen/dining upstairs		Add kitchenette upstairs

Table 1. Proposed Adaptation Options

Adaptation option 5 was selected and a second round of discussions started to refine the layout. Further revisions included moving the first floor wet room (with washing machine space), and a smaller kitchenette on the first floor (rather than a full kitchen). A sliding door was added between the ground floor bedroom (day room) and the living room to allow flexibility so both spaces could be used as one larger living and dining area until a ground floor bedroom became necessary. Wheelchair charging points were added on both floors. These design considerations were addressed in the final design (Figures 2 and 3).

<Figure 2. Final design (first floor)>

To plan for care in all stages of dementia (including end-of-life), it was necessary to ensure that the design could both accommodate current needs and be adaptable to meet future needs when symptoms are more severe (Table 2). For example, David has severe dementia and reduced mobility so carers would benefit from the inclusion of a ceiling hoist track to assist with transfers between the bed, shower and toilet. However, the presence of hoist ceiling tracks might be distressing for Alison and Barry, who are in the earlier stages of dementia but are aware that their condition may progress. The design balanced the needs of the different EBDPs, for example by providing adequate space (and ceiling load -bearing infrastructure) so that a ceiling hoist could be installed in the future if needed.

<p>ALISON, 70 [KITCHEN] Widowed, no children Younger sister who lives in Australia, they catch up once a month via Skype Enjoys reading, dancing and going out for dinner with friends Used to work in a shop and enjoyed chatting to customers Has worn glasses since the age of 23 MMSE: 23; MoCA: 26; ACE-III: <82-88; AMT: 6</p>	<p>DESIGN RESPONSE</p> <ul style="list-style-type: none"> • Good lighting levels • Accessibility criteria • Equal light reflectance values (LRV) between flooring and at thresholds • Good contrasting LRV's between walls, floor and kitchen units, doors and furniture • Walkability – positioning of fixtures, fittings and furniture for safe negotiation and minimising risk of falls
<p>BARRY, 74 [LOUNGE] Never married, no children 2 younger siblings who work full time Retired postman and spent much of his working life outside Enjoys gardening and staying active Likes to be able to watch football on TV MMSE: 18; MoCA: 20; ACE-III: <82-88; AMT: 4</p>	<p>DESIGN RESPONSE</p> <p>As for Alison plus:</p> <ul style="list-style-type: none"> • View to green – garden • View to bathroom • View to kitchen • Open plan arrangement • Memory wall and clock and calendar.
<p>CHRISTINE, 82 [DAY ROOM] Married, has 1 daughter who lives nearby Used to work as a Psychology lecturer and is very interested in people.</p>	<p>DESIGN RESPONSE</p> <p>As for Alison and Barry plus:</p> <ul style="list-style-type: none"> • Could function as a music room • Quiet area – soothing (troubles with noise) • Averting over-stimulation

<p>Sometimes she is quite happy to sit and 'people watch'</p> <p>She is a talented musician and enjoys playing the piano and listening to music</p> <p>Has used hearing aids in both ears since the age of 70</p> <p>MMSE: 17; MoCA: 18; ACE-III: <82-88; AMT: 3</p>	
<p>CHRIS, 78 & SALLY 75 [THROUGHOUT THE HOUSE]</p> <p>Married for 50 years</p> <p>2 sons who are both married with children</p> <p>They love to spend time with their 3 grandchildren who they see most weekends</p> <p>Sally is starting to find it difficult to care for Chris now that his dementia is progressing</p> <p><i>Assessment Scores as Christine.</i></p>	<p>DESIGN RESPONSE</p> <p>As for Alison, Barry and Christine plus:</p> <ul style="list-style-type: none"> • Dementia design approach to address: <ul style="list-style-type: none"> - Wayfinding - Accessibility – all floors and bathrooms - Spatial perception through use of LRV • Black out blinds to aid sleep patterns.
<p>DAVID, 85 [MAIN BEDROOM]</p> <p>Married, has 2 sons</p> <p>Used to work as an office manager and spent much of his working day in boardroom meetings</p> <p>Has enjoyed painting since he was a child and particularly likes to paint landscapes</p> <p>Has used a walking frame for the last 5 years</p> <p>MMSE: 0; MoCA: 14; ACE-III: <82-88; AMT: 1</p>	<p>DESIGN RESPONSE</p> <p>As for Alison, Barry and Christine plus:</p> <p>Accessibility for walking frame and wheelchair including:</p> <ul style="list-style-type: none"> • Lift accessible • Bathroom fully wheelchair accessible and within view from the bed • Hoist provision • Provision for carers and medical staff including overnight accommodation • Tea point – food and drink preparation • Possible medical storage and administration.

Table 2. Design responses for each EBDP

<Figure 3. Final design (ground floor)>

Conclusion

This paper describes a design project in which a two-bedroom house was adapted as a means of supporting independent living for the increasing numbers of people living with dementia. The EBDPs were useful as a framework by creating a shared mental model across

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3 the multidisciplinary team to review each design using the symptoms, care needs, and
4 design needs of the EBDPs to assess whether or not they were likely to be suitable, and
5 whether future changes would be needed to maintain a supportive environment.
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8 The EBDPs ensured that the needs of people living with dementia were both represented
9 and prioritised during design discussions. The five personas were useful to create an
10 adaptable environment for people both at different stages of dementia and on good,
11 average, and bad days. This supports inclusive design to consider the changeable nature of
12 dementia. While there were some challenges working in a multidisciplinary team such as
13 differing/conflicting priorities there were also advantages in being able to draw on different
14 areas of expertise.
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23 References

- 24
25 Andersson, M., Lindahl, G., & Malmqvist, I. (2011). Use and Usability of Assisted Living
26 Facilities for the Elderly: An Observation Study in Gothenburg Sweden. *Journal of Housing*
27 *For the Elderly*, 25(4), 380–400.
28
29
30 Boger, J., Craig, T., & Mihailidis, A. (2013). Examining the impact of familiarity on faucet
31 usability for older adults with dementia. *BMC Geriatrics*, 13(1), 63.
32
33
34 Caspi, E. (2014). Wayfinding difficulties among elders with dementia in an assisted living
35 residence. *Dementia*, 13(4), 429–450.
36
37
38 Hadjri, K., Rooney, C., & Faith, V. (2015). Housing Choices and Care Home Design for People
39 With Dementia. *Health Environments Research & Design Journal*, 8(3), 80–95.
40
41
42 Jais, C., Hignett, S., & Hogervorst, E. (2018). Human Factors for Dementia: Evidence-Based
43 Design. In S. Bagnara, R. Tartaglia, S. Albolino, T. Alexander, & Y. Fujita (Eds.), *Proceedings*
44 *of the 20th Congress of the International Ergonomics Association (IEA 2018). Volume IX:*
45 *Aging, Gender and Work, Anthropometry, Ergonomics for Children and Educational*
46 *Environments (36–43).*
47
48
49
50
51 Nordin, S., Elf, M., McKee, K., & Wijk, H. (2015). Assessing the physical environment of older
52 people's residential care facilities: development of the Swedish version of the Sheffield
53 Care Environment Assessment Matrix (S-SCEAM). *BMC Geriatrics*, 15(1), 3.
54
55
56 Prince, M., Knapp, M., Guerchet, M., McCrone, P., Prina, M., Comas-Herrera, A., ...
57
58 Salimkumar, D. (2014). *Dementia UK: Update 2nd ed.* Retrieved from
59 https://www.alzheimers.org.uk/download/downloads/id/2323/dementia_uk_update.pdf
60

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2
3 Renault, S., Ogg, J., Petite, S., & Chamahian, A. (2014). Home environments and adaptations
4 in the context of ageing. *Ageing and Society*, 1–26.

5
6
7 Taylor, B. J. & Donnelly, M. (2006). Risks to home care workers: Professional perspectives.
8
9 *Health, Risk & Society*. 8(3), 239-256.

10 WHO (2008). *The Solid Facts: Homecare in Europe*. Retrieved from

11 http://www.euro.who.int/_data/assets/pdf_file/0005/96467/E91884.pdf
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Figure 1. Original layout
196x252mm (96 x 96 DPI)

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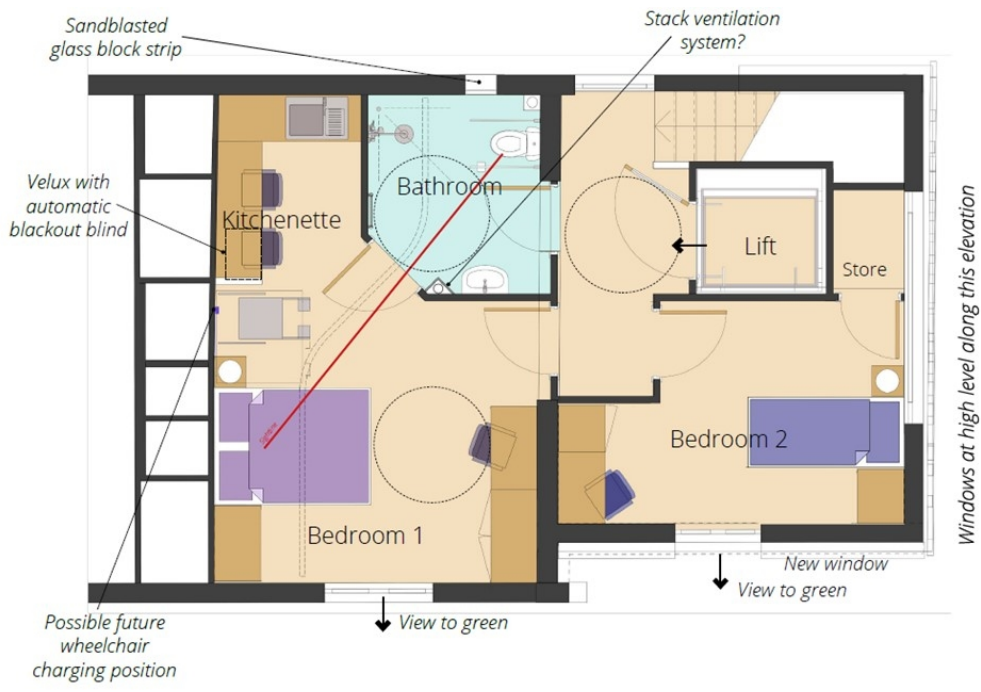


Figure 2. Final design (first floor)

248x169mm (96 x 96 DPI)

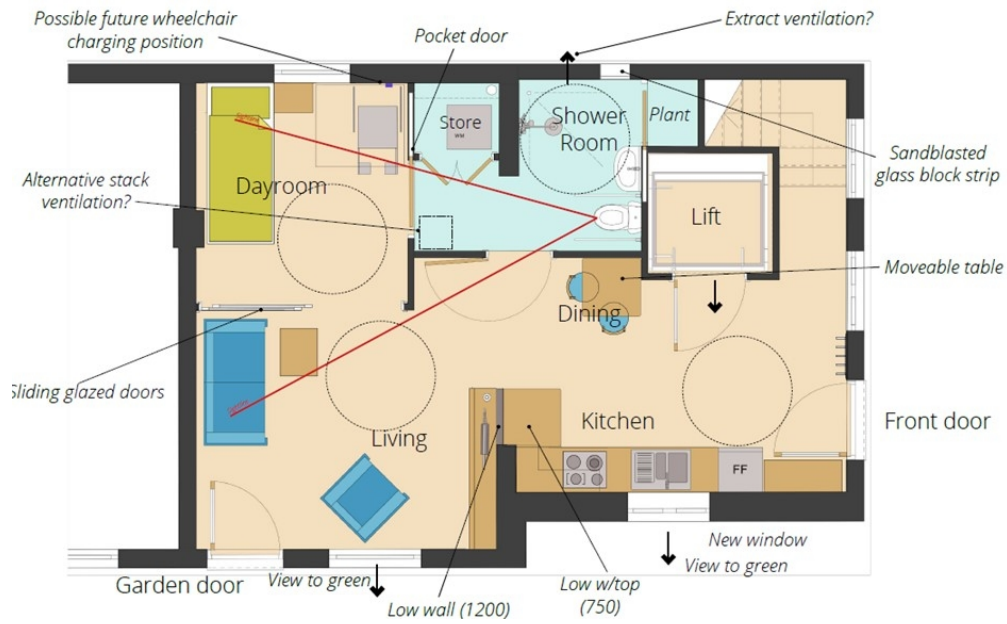


Figure 3. Final design (ground floor)

248x154mm (96 x 96 DPI)