An Australian Government Initiative

The use of environmental assessment tools for the evaluation of Australian residential facilities for people with dementia



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HammondCare

8 March 2010

Translating dementia research into practice

The use of environmental assessment tools for the evaluation of Australian residential facilities for people with dementia

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Acknowledgement

This project was supported by a grant from the Primary Dementia Collaborative Research Centre, UNSW, as part of the Australian government's Dementia: A Health Priority national initiative.

The Dementia Collaborative Research Centres acknowledge the financial and other support provided to this Project by the Australian Government.

Introduction

In her influential statement on designing environments for people with dementia Professor Mary Marshall of the Dementia Services Development Centre in the University of Stirling, Scotland recommended that dementia specific residential facilities should:

- Be small in size and
- Domestic and home like;
- With scope for ordinary activities (unit kitchens, washing lines, garden sheds);
- Include unobtrusive safety features;
- Have rooms for different functions with furniture and fittings familiar to the age and generation of the residents;
- Provide a safe outside space;
- Have single rooms big enough for a reasonable amount of personal belongings;
- Provide good signage and multiple cues where possible; e.g. sight, smell, sound;
- Use objects rather than colour for orientation;
- Enhance visual access, i.e. ensure that the resident can see what they need to see from wherever they spend most of their time; and
- Control stimuli, especially noise. (Marshall 2001)

A recent review of 57 empirical studies relevant to these principles found that there is substantial support for them (Fleming, Crookes et al. 2008). In particular there is good evidence that unobtrusive safety features improve resident well being, especially by reducing depression (Wells and Jorm 1987; Zeisel, Silverstein et al. 2003) . However an over emphasis on safety may have a detrimental effect (Torrington 2006). There is also good evidence for the provision of a variety of spaces in environments for people with dementia as they assist in reducing anxiety and depression while improving social interaction and may assist the resident to find their way around (Zeisel, Silverstein et al. 2003). The availability of single rooms for people with dementia appears to be beneficial (Morgan and Stewart 1998; Zeisel, Silverstein et al. 2003).

The careful optimisation of levels of stimulation is well supported (Cleary, Clamon et al. 1988.; Cohen-Mansfield and Werner 1995; Zeisel, Silverstein et al. 2003). Methods of dealing with specific elements of the environment that cause overstimulation, e.g. hiding or disguising busy entry doors that provide a view to the outside, have been thoroughly investigated and found to be effective (Namazi, Rosner et al. 1989; Dickinson, McLain-Kark et al. 1995). While it is necessary to reduce unhelpful stimulation care must be taken to optimise helpful stimuli. There is good evidence to show that increasing levels of illumination beyond that which is usually considered to be normal can improve sleep patterns and reduce behavioural disturbance (Thorpe, Middleton et al. 2000; Ancoli-Israel, Gehrman et al. 2003; Sloane, Christianna et al. 2007).

The evidence for the incorporation of good visual access, i.e. the opportunity for the resident to see all of those things and places that she wants to access, on the unit level scale is not strong (Elmstahl,

Annerstedt et al. 1997; Passini, Pigot et al. 2000) but the dramatic effect of making an important amenity, the toilet, easily seen provides good supporting evidence for the concept (Namazi and Johnson 1991a) .

While there is evidence supporting the proposition that small size is associated with a variety of positive outcomes for people with dementia it is impossible to quantify the contribution that the size of the unit makes in comparison with the other environmental factors that are commonly associated with a purposely designed, small unit e.g. home likeness, safety and familiarity (Reimer, Slaughter et al. 2004). The same problem of an intricate relationship between the social/professional environment, i.e. philosophy of care, staff skills, good management practices, and the physical environment make it difficult to conclude that a homelike physical environment has a broad impact, especially in the case of people with advanced dementia. However there is good evidence that it reduces aggression (Zeisel, Silverstein et al. 2003).

There is moderately strong evidence for the beneficial effects of providing people with dementia with an environment that gives them an opportunity to engage in ordinary activities of daily living (Melin and Gotestam 1981.; Reimer, Slaughter et al. 2004) However it is very difficult to differentiate the contribution of the physical environment from that of the staff encouragement and support. There is little evidence for the benefits of outside spaces by themselves but good evidence of benefit when combined with staff interaction (Cox, Burns et al. 2004). The evidence for the beneficial effects of signage is not strong (Hanley 1981; Namazi and Johnson 1991b) and no empirical support was found for the use of the display of personal memorabilia as aids to orientation.

Although the evidence for the beneficial effects of environments specifically designed or modified for people with dementia is growing in strength it has been noted that “instruments for assessing physical environment remain in a relatively primitive state” (Lawton, Weisman et al. 2000). Very few of the studies described above utilise a standardised approach to measuring the overall quality of the environment. They are usually limited to the measurement of a single variable, e.g. intensity of light or the presence of signage. Our understanding of the nature of good environments and their relationship to good outcomes for people with dementia is likely to be improved by the use of measurement instruments that provide us with an indication of the quality of the environments, allow us to compare one environment with another, enable weaknesses in the environment to be identified and to describe the changes made in the environment in our attempts to make them more suitable for people with dementia.

Frequently used environment assessment scales

The systematic assessment of residential care environments for people with dementia has a 25 year history beginning in earnest with the publication of the Multiphasic Environmental Assessment Procedure (MEAP) (Moos and Lemke 1984). During these 25 years only a handful of quantative assessment tools have been published and of these only 3 have been widely used.

Amongst those that have not become standard tools are the Environment Behavior Model for special care units which assesses eight conceptually derived environment concepts (exit control, wandering paths, individual away places, common space, outdoor freedom, residential scale, autonomy support, and sensory comprehendability) (Zeisel, Hyde et al. 1994) and the Nursing Unit Rating Scale which measures separation, stimulation, stability, complexity, control, and continuity of unit environments for people with dementia (Grant 1994). The latter is based on interviews with a charge nurse and focuses on care practices and policies with environmental aspects of care an ancillary interest.

More recently a comprehensive assessment tool which provides information on environmentally relevant constructs such as function-enhancing features, life-enriching features, resident environmental controls, and personalization has become available (Cutler, Kane et al. 2006). This tool comprises separate observational checklists for the room and bath environment, unit environment, and facility environment. These checklists are extremely detailed. While the initial report indicates that this tool has good inter-rater reliability and is able to distinguish between groups of residential facilities in a manner that could stimulate further research by identifying clusters of factors related to quality of life, it has not yet been referenced in any major papers.

The assessment of environments for people with dementia has been dominated by 3 scales and their variations, the MEAP, the TESS and the PEAP.

The Multiphasic Environmental Assessment Procedure (MEAP) (Moos and Lemke 1984)has been described as ‘the most established instrument’ (Sloane, Mitchell et al. 2002). It has a number of components, only one of which, the Physical and Architectural Features Checklist, is concerned with the physical environment. The scales of this procedure were designed to assess planned residential environments for older people ranging from congregate housing to nursing homes. The physical-feature dimensions were derived from an a priori theoretical model with nine dimensions: Physical Amenities, Social-Recreational Aids, Prosthetic Aids, Orientational Aids, Safety Features, Architectural Choice, Space Availability, Staff Facilities, and Community Accessibility. It is a very detailed assessment which is not suitable for use by nonresearchers, its scoring is biased toward larger, more institutional settings; and it is compiled at the facility level rather than at the unit level (Moos and Lemke 1984)

These limitations were addressed in the development of the Therapeutic Environment Screening Survey for Nursing Homes (TESS-NH) (Sloane, Mitchell et al. 2002). The TESS_NH has undergone several stages of development. It began its life as the 12 item Therapeutic Environment Screening Scale (Sloane and Mathew 1990). This scale was used as the basis for the TESS 2+ used in the large North American National Institute of Ageing project on the evaluation of special care units for people with dementia which began in 1991. The NIA workgroup identified six consensus goals of the physical environment in long-term care that were to be evaluated: provision of safety, security, and physical health; orientation; provision of privacy, control, and autonomy; stimulation (both positive and negative); enhancement of socialization (social milieu); and personalization/familiarity. Although face-validated by numerous experts, the TESS-2+ was put into use with only modest pilot testing, without reliability studies, and without scale development.

On the basis of the distribution of responses in the data collected by the NIA SCU studies, a number of modifications were made. Categorical items for which more than 85% of responses fell into a single response option were eliminated because of the lack of variability and items with one or more options with fewer than 5% of responses were simplified. The resulting instrument was designated the TESS-NH. In contrast to the earlier instrument, the TESS-NH is a collection of descriptive items (hence the term survey rather than scale, which was used in the previous versions). Embedded within the TESS-NH is the Special Care Unit Environmental Quality Scale (SCUEQS), (Sloane, Mitchell et al. 2002)

The TESS-NH contains 84 discrete items plus 1 global item that cover 13 domains. These domains include exit control, maintenance, cleanliness, safety, orientation/cueing, privacy, unit autonomy, outdoor access, lighting, noise, visual/ tactile stimulation, space/seating, and familiarity/home likeness. It takes 30-45 minutes to complete.

All of the observational items in the TESS-NH are scored so that the higher number is hypothesized to represent a more favorable attribute of the physical environment. All items are categorical, except for the global measure of physical environment, which is in Likert format with responses ranging from 1 (low, distinctly unpleasant, negative, and nonfunctional) to 10 (high, quite pleasant, positive, and functional). The TESS-NH instrument and instructional manual are available at http://www.unc.edu/depts/tessnh/index.html

The Professional Environmental Assessment Protocol (PEAP) (Lawton, Weisman et al. 2000) was developed to supplement the TESS, which is completed by research assistant focussing on objective, observable features, by providing an assessment of a set of conceptual dimensions. It is designed to be completed by raters who possess substantial knowledge and expertise in person-environment design research.

The PEAP consists of five-point ratings of nine dimensions, each of which represents a desired outcome of “quality” environments: Maximizing Awareness and Orientation, Maximizing Safety and Security, Provision of Privacy, Stimulation and Coherence (Regulation), Stimulation and Coherence (Quality), Support of Functional Abilities, Provision of Opportunities for Personal Control, Continuity of the Self, and Facilitation of Social Contact. Each dimension is defined, with an expanded conceptual discussion of its meaning, followed by a rater's guide to what to observe and inquire about at the time of the walk-through. Each point of the scale is described in such a way as to highlight the differences among the five points. The following exemplifies the approach to definition and conceptual elaboration. It is taken from the Facilitation of Social Contact dimension:

> ***“Definition:*** *The extent to which the physical environment and rules governing its use support social contact and interaction among residents.*
> *The focus is not whether social contact and interaction are desirable, but rather the extent to which they are facilitated or discouraged by the environment. Physical proximity between people is a precondition for social interaction, with interaction also contingent on the level of acuity of residents. For more impaired individuals, contact may be all one can reasonably expect. More generally, it should be recognized that levels of contact and interaction for*

people with dementia may not be very high and that interaction does not necessarily imply verbalization.

Thus, major indicators of environmental support for contact include existence of multiple common spaces, enlargement (beyond the limits of the 8-foot corridor) of floor space around areas of high activity, spaces where walking patterns cross, and spaces where there is interesting activity to watch supported by the presence of chairs and their appropriate placement. Functional uses of space, interesting activity, and associated props often generate onlookers, and sometimes interaction will occur."(Lawton, Weisman et al. 2000)

The time taken to complete the PEAP during the validation study was 45-90 minutes. However it has also been described as requiring a 'several hour visit' for completion (Sloane, Mitchell et al. 2002).

The relationship between the PEAP and an earlier version of the TESS was shown to be moderately strong with a correlation of .55 between the PEAP total score and the SCUEQS and a multiple correlation of .89 between all TESS items and the PEAP total score. (Lawton, Weisman et al. 2000). The correlation between the TESS-NH and the PEAP was found to be similar (Norris-Baker, Weisman et al. 1999). When SCUEQS scores were compared with independently conducted expert assessments using the PEAP in 44 SCUs the correlation between the global PEAP assessment (a 5-point scale) and the SCUEQS was moderately strong ($r = .52$, $p < .01$), the correlation between the global PEAP scores and the TESS-NH global rating item was very strong ($r = .68$, $p < .01$).

The choice between these scales is reasonably clear when the environment being assessed is a residential unit for people with dementia. The MEAP does not address some of the environmental issues that are considered to be important in dementia care, its scoring is biased toward larger, more institutional settings and it appears to have fallen into disuse in research in dementia care. A Medline search for articles describing projects using MEAP identified only 1 in the last 10 years. The PEAP requires a sophisticated and experienced rater able to devote a considerable amount of time to the assessment. The TESS-NH yields results that correlate well with the PEAP, takes half the time and can be used by a research assistant after 8 hours of training (Sloane, Mitchell et al. 2002). So the TESS-NH has a practical edge over the PEAP and the MEAP has dropped out of the running.

However the TESS_NH has some severe limitations. While the 84 items cover a wide variety of relevant environmental features they do not combine to form a scale and therefore do not enable a simple summary of the quality of the environment to be obtained. This is left to the single item global rating scale and the much less than comprehensive SCUEGS.

The single item global rating scale, a 1 to 10 Likert scale, completed by the rater at the conclusion of the assessment appears to be quite robust. It correlates highly (0.71, $p>0.01$) with the PEAP total score (Lawton, Weisman et al. 2000). This leads to the somewhat surprising conclusion that a research assistant, with a modest amount of training and the help of a good survey tool, can make a global judgment about the quality of an environment for the care of people with dementia that is as

good as that of an expert in environmental design. But what does it mean if the research assistant rates the environment as a 7? The instructions given are:-

> ***Question 32****. This question addresses your opinion of the overall physical environment. In making this decision consider all factors related to the physical environment that have already been answered previously. Circle a response 1-10.*

The scale is only defined at 2 points:-

Score 1	Distinctly unpleasant, negative and nonfunctional
Score 10	Quite pleasant, positive and functional.

A score of 7 may tell us that the environment is better than another environment that scored 5 but leaves us in the dark as to how it is better or what recommendations should be made to improve it.

The SCUEGS score tells us a little more by ensuring that equal weight is given to a comprehensible number of defined items. However of the 18 SCUEGS items 4 deal with maintenance matters, 3 with cleanliness, 2 with odour from bodily excretions, i.e. 50% of the scale is of dubious relevance to the specific care of people with dementia as it is understood in the Australian context (Judd, Marshall et al. 1998) or described by the accumulating research evidence described above.

Assessing two alternative scales

The question then arises as to whether or not there are assessments that are better suited to the understanding of environments for people with dementia that is current in Australia. The following criteria will need to be met, as a minimum, for the new scale to be considered more appropriate than the TESS_NH:

1. The items of the scale must have been selected because of their relevance to the current understanding of what constitutes a good environment for people with dementia.
2. The items must have as good inter-rater reliability as the TESS-NH
3. If the items are arranged into sub-scales the sub-scales must have adequate internal reliability as calculated using Cronbach's alpha.
4. The total scales must have inter-rater reliabilities at least as high as the SCUEGS.
5. The total scale must correlate highly with the Global Judgment Scale of the TESS-NH, i.e. they must have good concurrent validity.
6. The total scale must correlate significantly with the SCUEGS but this correlation should not be as high as the correlation with the Global Judgment Scale as the new scale should be adding some information to the picture so that it provides a related but different view from the SCUEGS.
7. The scale must be as easy to use as the TESS-NH

This report provides a comparison of two assessment tools with the TESS-NH. They are the recently released Audit Tool designed to be used in conjunction with the Best Practice in Design for People with Dementia booklets published by the Dementia Services Development Centre in Stirling, Scotland (Cunningham 2008; DSDC 2008) and the most recent version of the Environmental Audit Tool developed in a NSW Department of Health project on adapting wards in small, regional hospitals for long term use by people with dementia (Fleming, Forbes et al. 2003). The Scottish tool will be referred to as the Stirling Environmental Audit Tool (SEAT) and the Australian tool as the Environmental Audit Tool (EAT).

The SEAT comprises 194 statements describing the features of the environment. The descriptions are designed to focus attention on design features that are recognised in the literature or in good practice as being significant for the well being of people with dementia (Cunningham 2009). They are divided into two categories, Essential (81 items) described as 'essential criteria, based on research and expert opinion' and Recommended (113 items) described as 'based on current evidence and international best practice'.

An example of an Essential item is 'The colour of the toilet seat contrasts with both the toilet bowl and the floor'. A related Recommended item is 'Cisterns are traditional in appearance and have lever handles or pull chains which contrast in colour to the cistern or background wall'.

The items are organised by location so that the SEAT can be completed by walking through a facility area by area. The locations covered are hall/entrance way, lounge/day room, bedrooms, toilet (ensuite), toilet (communal), bathroom (ensuite), bathroom (communal), dining room, examination/consulting room and the exterior spaces. In addition there are sections on opportunities for meaningful activity, the quality of the lighting and general principles.

Each item is scored on a 3 point scale with 0 indicating standard not met, 0.5 indicating standard partially met and 1 that the standard has been fully met. The final score is weighted according to category. The Essential percentage makes up 30% of the overall rating and the Recommended percentage makes up 70%.

The EAT comprises 72 items that have been selected to exemplify a set of design principles first used in the development of the units for the Confused and Disturbed Elderly (CADE Units) built by the NSW Department of Health in the late 1980s and early 90s (Fleming and Bowles 1987; Fleming 1989; Atkinson 1995) and extended in the publication of the adapting the ward manual (Fleming, Forbes et al. 2003). The items are grouped by the 10 principles:-

The environment should:

1. Be safe and secure
2. Be small
3. Be simple with good visual access
4. have unnecessary stimulation reduced

5. Have helpful stimuli highlighted
6. Provide for planned wandering
7. Be familiar
8. Provide opportunities for a range of social interactions from private to communal
9. Encourage links with the community
10. Be domestic in nature providing opportunities for engagement in the ordinary tasks of daily living.

The items are not uniformly spread across the groups. The principle of smallness is covered by a single question on size while the largest group of questions, 14, deals with safety and security features. The majority of questions are answered either Yes or No, some have a Not Applicable option and some provide for extra points in certain circumstances, for example, if the safety feature is unobtrusive. Each principle is considered to be a sub-scale with a score expressed as a percentage of the available score to ensure that all sub-scales have equal weight. The total score is the mean of the sub-scale scores.

The following example is drawn from the group of questions dealing with simplicity and visual access.

Can the kitchen be seen into from the dining room? If there is more than 1 dining room answer with reference to the one used by most confused residents.	N/A	NO Score 0	YES Score 1	Score entered here Vis7

While the SEAT and the EAT have developed in different countries they share a common approach to the design of environments for people with dementia. The organisations that have hosted their development, the Dementia Services Development Centre at Stirling University and the Dementia Services Development Centre in HammondCare, Sydney have collaborated on many projects and share a general philosophy of care based on the value of small, homelike facilities that provide opportunities for engagement in everyday life. A philosophy that has become a standard in Australia.

The SEAT and the EAT differ primarily in the detail of the questions and the way in which they are organised. The SEAT has more detailed questions and organises them around locations. The EAT organises observations around a set of principles.

Study Aims

The purpose of this study is to evaluate the SEAT and the EAT as alternatives to the TESS-NH in an Australian setting. If they are to be considered viable alternatives they must:-

1. Be relevant to the current understanding of what constitutes a good environment for people with dementia in Australia.
2. Have as good inter-rater reliability at the item level as the TESS-NH

3. Have adequate internal reliability as calculated using Cronbach's alpha.
4. Have inter-rater reliabilities at the total score level at least as high as the SCUEGS.
5. Have a significant and high correlation with the Global Judgment Scale of the TESS-NH
6. Have a significant and high correlationtly with the SCUEGS
7. Be as easy to use as the TESS-NH

Methodology

In order to determine the sample size necessary for the study it was assumed that the inter-rater reliability of the SEAT and the EAT would approximate that obtained with the SCUEGS, i.e. an ICC of 0.93 (Sloane, Mitchell et al. 2002). The appropriate sample size was initially determined by reference to the graph provided by Streiner and Norman (Streiner and Norman 1995)(page 125) and later checked by the application of the formula provided by Walter to optimise the number of observations required in inter-rater reliability studies (Walter, Eliasziw et al. 1998). This indicated that a sample of 18 would be sufficient at a power of 80% with an expected ICC of 0.93. It was decided to use a sample size of 30 In order to allow for the possibility that the inter-rater reliability would fall a little below that of the SCUEGS.

A sub sample of 28 facilities who were taking part in a project aimed at quantifying the relative contribution of person centred care and environmental modifications to the well being of people with dementia took part in this study. This was supplemented with two dementia specific units to arrive at the sample size of 30. The sample comprised 22 dementia specific units and 8 units accommodating people with a variety of diagnoses. The dementia specific units had a minimum of 10, maximum of 61 beds (mean 23.18, S.D. 12.06) and the mixed diagnoses units had a minimum of 18 beds, maximum 47 (mean 36.13, S.D. 12.93). The mixed diagnosis units were significantly larger than the DSUs (sig = 0.02). The proportion of people with dementia occupying beds in the units was 68% in the mixed units and 90% in the DSUs. A number of vacant beds contribute to the less than 100% proportion of people with dementia in the DSUs.

The two raters who were employed for the observations each received approximately eight hours of training. One rater had many years of experience as a consultant on the care of people with dementia and had been involved in many design exercises; the other was a first year PhD candidate with a degree in psychology. They were provided with the 3 assessments and supporting manuals and spent 3 hours reading them and in discussion with the author. They then assessed two facilities (not included in the sample) in collaboration, discussing the interpretation of questions and the method of completing the tools as they went. The results of these assessments were fed back to them. There were few disagreements. Where there were disagreements these were discussed with the author and a consensus determined.

The raters then visited the sample of 30 facilities over a period of 6 weeks. The order of assessments was varied at each visit to control for the contamination of one assessment tool by the provision of

information from another tool. The raters worked independently in each facility, helped by a staff member who identified the boundaries of the unit and provided them with access to the required areas. The completion of the 3 assessments took between 1.5 and 2.5 hours.

The 6 week period included a break for Christmas. The raters refreshed their memory of the instructions for the assessments by re-reading the manuals after the break.

Data were entered into SPSS 17 for analysis. The level of inter-rater reliability was calculated using the Intraclass Correlation Coefficient for both categorical and quantitative data following the recommendations of Fleiss and Cohen (Fleiss and Cohen 1973) who found that the ICC and weighted kappa are equivalent. The ICCs reported here are therefore comparable to the weighted kappas reported in the TESS-NH validation study (Sloane, Mitchell et al. 2002).

Results

The mean percentage of absolute agreement on the item scores of the TESS- was 84.4% (range 43% to 100%). Three items (doors to rest of facility disguised, cleanliness of social spaces and visibility of signs from resident rooms) had negative correlations; however the last is a dichotomous variable. ICCs ranged from -0.07 to 1; 18.1% of items had ICCs of less than 0.4 and 39.8% of the ICCs were greater than .70. The interrater reliability of the SCUEGS was 0.84. Three of the subscales have a Cronbach's alpha below the usually acceptable level of 0.6., 3 were not calculable and 7 were above the acceptable level.

Table 1: TESS-NH: distribution of scores and Interrater Reliability (SCUEGS items highlighted)

Domain and Item number	Item Description	Scoring Range	Distribution in sample		Reliability	
			M	SD	% agreement	ICC
Unit autonomy						
1	Unit nursing station presence/type	0-2	1.87	0.51	100%	1
2a	Nursing station for paperwork	0-1	0.93	0.25	100%	1
2b	Desk for paperwork	0-1	0.23	0.43	93%	0.79
2c	Combined work area for paperwork	0-1	0.97	0.18	73%	a
2d	Enclosed workroom, not a nursing station	0-1	0.43	0.50	87%	0.77
3	Unit used as pathway between other units	0-1	0.10	0.30	90%	0.53
4a	Residents eat on/off unit	0-3	2.97	0.18	100%	1
4b	Formal activities on/off unit	0-3	2.90	0.30	100%	1
4c	Residents bathe on/off unit	0-3	3.00	0.00	100%	a
						Cronbach's alpha 0.24
Exit control						
5a	Doors to rest of facility disguised	0-2	1.50	2.64	77%	-.05
5b	Doors to outside disguised	0-2	2.03	3.23	60%	.37
6a	Number of exits off the unit	N/A	2.70	1.21	90%	.95
6b	Number of elevators off the unit	N/A	0.17	0.46	93%	.49
6c	Doors are locked	0-1	0.91	0.29	80%	1
6d	Locking device triggered by approach	0-1	0.00	0.00	100%	a
6e	Lock disengaged by keypad/switch	0-1	0.93	0.26	100%	1
6f	Locked at night or during bad weather	0-1	0.11	0.31	83%	.51
6g	Doors are alarmed	0-1	0.47	0.51	90%	.86
6h	Alarm triggered by device worn by resident	0-1	0.00	0.00	100%	a
6i	Alarm disengaged using keypad, card or switch	0-1	0.87	0.34	97%	.78
6j	Alarm sounds with all entries/exits	0-1	0.19	0.40	93%	.44
						Cronbach's alpha not calculated as some items mutually exclusive
Maintenance						
7a	Maintenance of social space	0-2	1.83	.461	87%	a
7b	Maintenance of halls	0-2	1.80	.484	90%	.36
7c	Maintenance of resident rooms	0-2	1.97	.183	97%	a
7d	Maintenance of resident bathrooms	0-2	1.87	.346	93%	.72
						Cronbach's alpha 0.68
Cleanliness						
8a	Cleanliness of social spaces	0-2	1.73	.450	70%	-.07
8b	Cleanliness of halls	0-2	1.87	.346	90%	.37
8c	Cleanliness of resident rooms	0-2	1.87	.346	87%	a
8d	Cleanliness of resident bathrooms	0-2	1.63	.490	73%	.36
9a	Bodily excretion odour in public area	0-2	1.67	.479	73%	.55
9b	Bodily excretion odour in resident rooms	0-2	1.80	.407	83%	.55
						Cronbach's alpha 0.81
Safety						
10a	Floor surface in social spaces	0-2	1.57	.679	87%	.84
10b	Floor surface in halls	0-2	1.60	.675	83%	.8
10c	Floor surface in resident rooms	0-2	1.57	.679	90%	.76
10d	Floor surface in resident bathrooms	0-2	1.53	.681	83%	.69
11a	Handrails in hallways	0-2	1.93	.365	97%	.89
11b	Handrails in bathrooms	0-2	1.97	.183	87%	.04
						Cronbach's alpha 0.73
Lighting						
12a	Light intensity in hallways	0-3	1.83	.461	73%	.15
12b	Light intensity in activity areas	0-3	1.93	.254	80%	.24
12c	Light intensity in resident rooms	0-3	1.83	.379	83%	.60
13a	Glare in hallways	0-2	1.60	.563	77%	.69
13b	Glare in activity areas	0-2	1.77	.568	87%	.73
13c	Glare in residents rooms	0-2	1.73	.583	83%	.68
14a	Lighting evenness in hallways	0-2	1.87	.346	77%	.13
14b	Lighting evenness in activity areas	0-2	1.97	.183	93%	.66
14c	Lighting evenness in resident rooms	0-2	1.87	.346	87%	.52
						Cronbach's alpha 0.76
Space, seating						
15	% of rooms with a chair per person	0-3	2.60	.968	80%	.76
16a	Public room inventory	N/A	N/A	N/A		
17a	Path leads to dead ends	0-1	.47	.507	77%	.53
17b	Path with places to sit	0-1	.87	.346	90%	.62
18	Configuration of rooms on unit	0-2	.70	.596	83%	.75

Domain and Item number	Item Description	Scoring Range	Distribution in sample		Reliability	
			M	SD	% agreement	ICC
		Cronbach's alpha not calculated, too few responses to some items				
Homelike						
19	Public areas homelike	0-3	1.47	1.306	43%	.80
20	Kitchen on the unit	0-2	.50	.777	80%	.84
21	Pictures/mementoes in resident rooms	0-3	2.90	.403	93%	.79
22	Non-institutional furniture in resident room	0-3	1.33	1.398	73%	.93
23	Resident appearance	0-2	1.90	.305	90%	a
						Cronbach's alpha 0.74
Visual/tactile stimulation						
24a	Bedroom with view of courtyard	0-3	2.33	.922	80%	.88
24b	Public areas with view of courtyard	0-3	2.40	.894	77%	.48
25a	Tactile stimulation opportunities	0-3	1.60	.724	73%	.60
25b	Visual stimulation opportunities	0-3	2.50	.731	63%	.53
						Cronbach's alpha 0.94
Outdoor access						
26	Enclosed courtyard	0-3	2.60	.675	90%	.68
27a	Attractiveness of courtyard	0-3	2.33	.711	70%	.72
27b	Courtyard is functional	0-3	2.27	.691	60%	.63
						Cronbach's alpha 0.66
Orientation						
28a1	Doors left open	0-1	.97	1.802	67%	.04
28b1	Residents name on/near door	0-1	.43	.504	87%	.79
28c1	Current picture of resident	0-1	.13	.346	97%	.84
28d1	Old picture of resident	0-1	.07	.254	97%	.66
28e1	Objects of personal significance	0-1	.10	.305	93%	.72
28f1	Room numbers	0-1	.90	.305	93%	1
28g1	Colour coding	0-1	.07	.254	97%	1
28a2	Bathroom door left open, toilet visible from bed	0-1	.33	.479	93%	.85
28b2	Bathroom door left open, toilet not visible from bed	0-1	.40	.498	80%	.59
28c2	Bathroom door closed, picture or graphic	0-1	.43	.504	77%	.62
28a3	Activity area visible from 50% of residents rooms	0-1	.57	.504	80%	.61
28b3	Visual indicator of activity area visible from 50% of residents rooms	0-1	.23	.430	83%	.39
28c3	Direction, identification sign visible from 50% of resident rooms	0-1	.10	.305	87%	0.02
						Cronbach's alpha -0.48
Privacy						
29a	Privacy curtain provides only separation between beds in semi-private rooms	0-1	3.67	3.836	87%	.76
		Cronbach's alpha not calculated as scale is a single item				
Noise						
30	Status of TV in main activity area	0-6	1.70	2.938	90%	.89
31a	Resident screaming/calling out	0-2	1.67	.606	63%	.43
31b	Staff screaming/calling out	0-2	1.90	.305	83%	.12
31c	TV/radio noise	0-2	.57	.504	67%	.26
31d	Loudspeaker/intercom noise	0-2	1.77	.430	90%	.57
31e	Alarm bell noise	0-2	1.47	.571	77%	.57
31f	Other machine noise	0-2	1.33	.479	83%	.46
						Cronbach's alpha 0.1
Global rating						
32	Subjective rating of overall involvement	1-10	6.63	2.205	50%	.93
SCUEGS score	Special Care Unit Environmental Quality Scale – a summary scale comprising items with shaded Item Numbers	0-41	31.13	5.17		.84
						Cronbach's alpha 0.84

a Not calculated as at least one rater had insufficient variance
N/A Not Applicable, descriptive

The average percentage of absolute agreement between the two raters using the EAT was 86.8% (range 46.6% to 100%). One item (artificial lighting bright enough) had a negative correlation. ICCs ranged from -0.05 to 1; 13.8% of items had ICCs of less than 0.4 and 54.2% of the ICCs were greater than .70. The interrater reliability of the total score was 0.97. Two of the sub-scales (Highlighting of helpful stimulation and Familiarity had Cronbach's alphas below the usually acceptable level of 0.6 (Bland and Altman 1997).

Table 2: EAT, distribution of scores and Interrater Reliability

Domain and Item number	Item Description	Scoring Range	Distribution in sample		Reliability	
			M	SD	% agreement	ICC
Saf1	Secure garden	0-2	1.34	0.94	73.3%	.68
Saf2	Secure front door	0-2	1.83	0.53	46.7%	.42
Saf3	Secure side doors	0-2	1.79	0.63	50.0%	.5
Saf4	Restricted bed room windows	0-2	1.07	1.01	93.3%	.97
Saf5	Garden easily supervised	0-2	1.24	0.99	90.0%	.84
Saf6	Kitchen entry control	0-2	1.33	0.98	80.0%	.65
Saf7	Lockable knife draw	0-2	0.67	0.98	100.0%	1
Saf8	Gas cooker	0-1	0.09	0.30	100.0%	1
Saf9	Master switch	0-1	0.45	0.52	100.0%	1
Saf10	Water temperature limited	0-1	0.97	0.18	96.7%	[a]
Saf11	Pots small enough	0-1	0.40	0.52	90.0%	.64
Saf12	Non slippery floor areas	0-1	0.60	0.50	86.7%	.72
Saf13	Easily supervised lounge room	0-2	1.60	0.77	80.0%	.55
Saf14	Well lit	0-1	0.90	0.31	90.0%	[a]
	Safety Total	0-22	12.40	4.53		.89
						Cronbach's alpha 0.8
Size	How many people	0-3	0.97	0.89	96.7%	.98
					Cronbach's alpha not calculated as scale is single item	
Vis1	See bedroom door	0-4	1.77	1.30	86.7%	.93
Vis2	See lounge room	0-4	1.77	1.30	93.3%	.98
Vis3	See dining room	0-4	1.63	1.25	83.3%	.8
Vis4	See exit to garden	0-4	0.71	0.46	93.3%	.82
Vis5	See dining room	0-1	0.77	0.43	96.7%	.91
Vis6	See kitchen	0-1	0.72	0.46	76.7%	.49
Vis7	See into kitchen from dining room?	0-1	0.78	0.43	83.3%	.65
Vis8	See toilet from dining room?	0-1	0.43	0.50	90.0%	.8
Vis9	See toilet from lounge room?	0-1	0.40	0.50	90.0%	.79
Vis10	See lounge room from most points	0-1	0.83	0.38	93.3%	.77
	Visual Access Total	0-19	9.17	4.33		.95
						Cronbach's alpha 0.7
Stim1	Doorbell noisy	0-1	0.93	0.25	93.3%	[a]
Stim2	Kitchen noisy	0-1	0.87	0.35	90.0%	.37
Stim3	Cleaner's cupboards obvious	0-1	0.47	0.51	63.3%	.3
Stim4	Wardrobe confusing	0-1	0.23	0.43	96.7%	.91
Stim5	Food, linen etc. delivered across public areas	0-1	0.50	0.51	73.3%	.48
Stim6	Public address, staff paging.	0-1	0.23	0.43	86.7%	.74
Stim7	Front entry easily visible	0-1	0.30	0.47	76.7%	.5
Stim8	Service entryeasily visible	0-1	0.57	0.50	83.3%	.66
	Reduced stimulation	0-8	4.10	1.86		.58
						Cronbach's alpha 0.64
High1	Dining room identifiable	0-1	0.77	0.43	90.0%	.71
High2	Lounge room identifiable	0-1	0.77	0.43	90.0%	.71
High3	Bedrooms identifiable	0-1	0.93	0.25	66.7%	.2
High4	Shared bathrooms identifiable	0-1	0.59	0.50	90.0%	.8
High5	Kitchen identifiable	0-1	0.50	0.51	90.0%	.8
High6	Toilets identifiable	0-1	1.00	0.00	96.7%	[a]
High7	Natural lighting	0-1	0.97	0.18	100.0%	1
High8	Artificial lighting bright enough	0-1	0.93	0.25	90.0%	-.05
High9	Lighting free of glare	0-1	0.53	0.51	70.0%	.16
	Highlighting	0-9	6.97	1.45		.83
						Cronbach's alpha 0.44
					If scale reduced to highlighted Items Cronbach's alpha 0.62	

Domain and Item number	Item Description	Scoring Range	Distribution in sample		Reliability	
			M	SD	% agreement	ICC
Wand1a	Clearly defined path	0-1	0.47	0.51	86.7%	.74
Wand1b	Does path invite participation	0-1	0.70	0.47	83.3%	.62
Wand1c	Is the path within a secure perimeter	0-1	0.67	0.48	93.3%	.85
Wand1d	Path easily supervised	0-1	0.50	0.51	90.0%	.8
Wand1e	Chairs or benches along path	0-1	0.87	0.35	96.7%	.87
Wand1f	Sunny and shady areas along path	0-1	0.87	0.35	100.0%	1
Wand1g	Path take residents past a toilet	0-1	0.00	0.00	100.0%	[a]
Wand2a	Clearly defined internal path	0-1	0.63	0.49	83.3%	.63
Wand2b	Does internal path invite	0-1	0.87	0.35	90.0%	.37
	Wandering total	0-9	5.57	2.18		.93
						Cronbach's alpha 0.77
Fam1	Colours	0-2	1.93	0.25	100.0%	1
Fam2	Taps, light switches, door	0-2	1.17	0.46	70.0%	.41
Fam3	Furniture in public rooms	0-2	1.23	0.43	53.3%	.26
Fam4	Furniture in bedrooms	0-2	1.07	0.45	93.3%	.8
Fam5	Own ornaments, photos	0-2	1.97	0.18	96.7%	[a]
Fam6	Own furniture in bedroom	0-2	1.17	0.83	93.3%	.95
	Familiarity Total	0-12	8.57	1.36		.76
						Cronbach's alpha 0.36
						If scale reduced to highlighted Items Cronbach's alpha 0.62
Priv1	Small areas	0-3	1.40	0.97	80.0%	.89
Priv2	Pleasant or interesting views	0-3	1.17	0.99	73.3%	.85
Priv3	Space for small group activities	0-2	1.90	0.31	83.3%	.48
Priv4	Eat in small groups	0-2	1.90	0.31	93.3%	.48
Priv5	Eat alone	0-2	1.90	0.31	93.3%	.72
	Privacy	0-12	8.27	2.13		.9
						Cronbach's alpha 0.65
Com1	Area for families to share meals	0-1	0.70	0.47	90.0%	.77
Com1b	Is this area attractive	0-1	0.57	0.50	93.3%	.7
	Community	0-2	1.27	0.91		.55
						Cronbach's alpha not calculated as scale is based on single question
Dom1	Access to a kitchen	0-2	0.50	0.86	100.0%	1
Dom2	Involvement in meal preparation	0-2	0.10	0.40	96.7%	.32
Dom3	Involvement in making snacks	0-2	0.23	0.43	83.3%	.39
Dom4	Involvement in keeping bedroom clean and tidy	0-2	0.47	0.51	83.3%	.71
Dom5	Involvement in personal laundry	0-2	0.13	0.35	86.7%	.54
Dom6	Involved in gardening	0-2	0.57	0.57	90.0%	.85
Dom7	Easy access to a lounge?	0-2	1.90	0.40	96.7%	.89
Dom8	Easy access to a dining room?	0-2	1.90	0.40	96.7%	.89
	Domestic Total	0-16	5.87	2.26		.9
						Cronbach's alpha 0.69
Final Score	The Final Score is the total of the subscale scores (when they are expressed as percentages) divided by 10. (The mean of the subscale scores when they are expressed as a percentage)		63.13	16.07		.97

a Not calculated as at least one rater had insufficient variance

The average percentage of absolute agreement between the two raters using the SEAT was 79.4% (range 43% to 100%). Nine items (structural provision for wall fixing of support rails in toilet and in bathroom, toilet area walls are light and reflective, cisterns are traditional in appearance, availability of privacy screen in bathroom, adequacy of space for wheelchair in bathroom, kitchen large and separate from dining room, condition of activities equipment for visitors, adequacy of window controls to reduce glare) had a negative correlation. ICCs ranged from -0.12 to 1; 20.1% items had ICCs of

less than 0.4 and 28.8% of the ICCs were greater than .70. The interrater reliability of the total score was 0.95. Cronbach's alpha was not calculable for 1 of the sub-scales, 4 Cronbach's alphas were below the usually accepted level of 0.6 and 8 were above

Table 3: SEAT, distribution of scores and Interrater Reliability

Domain and Item number	Domain Description	Scoring Range	Distribution in sample		Reliability	
			M	SD	% agreement	ICC
1.1	Hall/entrance/way finding	0, 0.5 or 1	0.60	0.38	73.3%	.75
1.2		0, 0.5 or 1	0.75	0.31	86.7%	.83
1.3		0, 0.5 or 1	0.95	0.15	100.0%	1
1.4		0, 0.5 or 1	1.00	0.00	93.3%	0
1.5		0, 0.5 or 1	0.50	0.37	63.3%	.63
1.6		0, 0.5 or 1	0.78	0.25	76.7%	.67
1.7		0, 0.5 or 1	0.48	0.36	60.0%	.60
1.8		0, 0.5 or 1	0.75	0.31	46.7%	.40
1.9		0, 0.5 or 1	0.98	0.09	56.7%	.08
1.10		0, 0.5 or 1	0.68	0.31	73.3%	.72
1.11		0, 0.5 or 1	0.80	0.36	56.7%	.41
1.12		0, 0.5 or 1	0.98	0.09	93.3%	.48
1.13		0, 0.5 or 1	0.90	0.20	76.7%	.23
1.14		0, 0.5 or 1	0.75	0.31	70.0%	.53
1.15		0, 0.5 or 1	0.58	0.40	53.3%	.39
unit1E		0-4	3.05	0.62	40.0%	.68
unit1R		0-11	8.43	1.78	13.3%	.73
						Cronbach's alpha 0.76
2.1	Lounge/day room	0, 0.5 or 1	0.92	0.19	83.3%	.36
2.2		0, 0.5 or 1	0.83	0.30	80.0%	.62
2.3		0, 0.5 or 1	0.42	0.37	60.0%	.56
2.4		0, 0.5 or 1	0.97	0.13	80.0%	.24
2.5		0, 0.5 or 1	0.90	0.24	86.7%	.71
2.6		0, 0.5 or 1	0.55	0.40	73.3%	.78
2.7		0, 0.5 or 1	0.83	0.27	60.0%	.23
2.8		0, 0.5 or 1	0.50	0.39	60.0%	.67
2.9		0, 0.5 or 1	0.87	0.22	73.3%	.38
2.10		0, 0.5 or 1	0.47	0.37	66.7%	.67
unit2E		0-2	1.33	0.48	46.7%	.54
unit2R		0-8	5.92	1.27	30.0%	.85
						Cronbach's alpha 0.67
3.1	Meaningful occupation and activity	0, 0.5 or 1	0.53	0.35	80.0%	.79
3.2		0, 0.5 or 1	0.40	0.42	76.7%	.76
3.3		0, 0.5 or 1	0.37	0.37	76.7%	.82
3.4		0, 0.5 or 1	0.22	0.39	86.7%	.77
3.5		0, 0.5 or 1	0.98	0.09	76.7%	.18
3.6		0, 0.5 or 1	0.92	0.19	60.0%	.16
3.7		0, 0.5 or 1	0.67	0.38	76.7%	.77
3.8		0, 0.5 or 1	0.75	0.31	73.3%	.43
unit3E		0-1	0.67	0.38	76.7%	.77
unit3R		0-7	4.12	1.17	30.0%	.67
						Cronbach's alpha 0.69
4.1	Bedrooms	0, 0.5 or 1	0.98	0.09	96.7%	0.0
4.2		0, 0.5 or 1	0.60	0.38	73.3%	.79
4.3		0, 0.5 or 1	0.72	0.36	66.7%	.46
4.4		0, 0.5 or 1	0.48	0.46	76.7%	.86
4.5		0, 0.5 or 1	0.52	0.48	80.0%	.92
4.6		0, 0.5 or 1	0.77	0.31	53.3%	.60
4.7		0, 0.5 or 1	0.35	0.40	76.7%	.84
4.8		0, 0.5 or 1	0.70	0.31	90.0%	.87
unit4E		0-2	1.37	0.57	46.7%	.55
unit4R		0-6	3.75	1.69	40.0%	.89
						Cronbach's alpha 0.87

Domain and Item number	Domain Description	Scoring Range	Distribution in sample		Reliability	
			M	SD	% agreement	ICC
5a1	Toilet area (en-suite)	0, 0.5 or 1	0.56	0.45	100.0%	1
5a2		0, 0.5 or 1	0.86	0.23	86.7%	.28
5a3		0, 0.5 or 1	0.92	0.19	93.3%	.78
5a4		0, 0.5 or 1	0.61	0.27	86.7%	.62
5a5		0, 0.5 or 1	0.50	0.42	76.7%	.51
5a6		0, 0.5 or 1	1.00	0.00	93.3%	0
5a7		0, 0.5 or 1	0.61	0.50	96.7%	.97
5a8		0, 0.5 or 1	0.61	0.47	96.7%	.87
5a9		0, 0.5 or 1	0.22	0.43	96.7%	.96
5a10		0, 0.5 or 1	0.50	0.00	100.0%	a
5a11		0, 0.5 or 1	0.61	0.40	83.3%	.77
5a12		0, 0.5 or 1	1.00	0.00	100.0%	a
5a13		0, 0.5 or 1	0.72	0.31	96.7%	.94
5a14		0, 0.5 or 1	0.56	0.16	90.0%	.39
5a15		0, 0.5 or 1	0.86	0.23	83.3%	.27
5a16		0, 0.5 or 1	0.72	0.26	83.3%	.46
5a17		0, 0.5 or 1	0.97	0.12	66.7%	-0.12
5a18		0, 0.5 or 1	0.81	0.30	93.3%	.85
5a19		0, 0.5 or 1	0.28	0.39	86.7%	.73
unit5aE		0-9	5.97	0.87	66.7%	.86
unit5aR		0-10	6.75	1.53	50.0%	.76
					Cronbach's alpha 0.42	
5b1	Toilet area (communal/wheelchair accessible)	0, 0.5 or 1	0.56	0.45	90.0%	.98
5b2		0, 0.5 or 1	0.56	0.34	73.3%	.70
5b3		0, 0.5 or 1	0.77	0.33	70.0%	.25
5b4		0, 0.5 or 1	0.58	0.32	73.3%	.45
5b5		0, 0.5 or 1	0.52	0.43	66.7%	.67
5b6		0, 0.5 or 1	0.96	0.14	86.7%	-0.05
5b7		0, 0.5 or 1	0.19	0.36	80.0%	.57
5b8		0, 0.5 or 1	0.48	0.10	86.7%	-0.05
5b9		0, 0.5 or 1	0.71	0.36	80.0%	.81
5b10		0, 0.5 or 1	0.96	0.14	86.7%	.46
5b11		0, 0.5 or 1	0.60	0.33	83.3%	.86
5b12		0, 0.5 or 1	0.44	0.27	76.7%	.56
5b13		0, 0.5 or 1	0.92	0.19	80.0%	.41
5b14		0, 0.5 or 1	0.60	0.25	73.3%	.56
5b15		0, 0.5 or 1	0.98	0.10	90.0%	0
5b16		0, 0.5 or 1	0.96	0.14	73.3%	.31
5b17		0, 0.5 or 1	0.25	0.36	70.0%	.61
5b18		0, 0.5 or 1	0.04	0.20	96.7%	.89
5b19		0, 0.5 or 1	0.42	0.38	70.0%	.54
5b20		0, 0.5 or 1	0.46	0.41	53.3%	.23
5b21		0, 0.5 or 1	0.60	0.25	70.0%	.45
unit5bE		0-12	7.04	1.43	30.0%	.67
unit5bR		0-9	5.50	0.83	30.0%	.31
					Cronbach's alpha 0.48	
6a1	Bathroom/shower room (en-suite)	0, 0.5 or 1	0.44	0.38	80.0%	.52
6a2		0, 0.5 or 1	1.00	0.00	100.0%	a
6a3		0, 0.5 or 1	0.92	0.19	86.7%	.38
6a4		0, 0.5 or 1	0.89	0.21	86.7%	.23
6a5		0, 0.5 or 1	0.86	0.23	90.0%	.51
6a6		0, 0.5 or 1	0.92	0.19	90.0%	.49
6a7		0, 0.5 or 1	0.64	0.29	83.3%	.44
6a8		0, 0.5 or 1	1.00	0.00	96.7%	a
6a9		0, 0.5 or 1	0.53	0.44	76.7%	.51
6a10		0, 0.5 or 1	0.58	0.19	93.3%	.66
6a11		0, 0.5 or 1	0.97	0.12	66.7%	-0.12
6a12		0, 0.5 or 1	0.75	0.31	100.0%	1.00
6a13		0, 0.5 or 1	0.72	0.35	90.0%	.78
6a14		0, 0.5 or 1	0.25	0.39	86.7%	.73
unit6aE		0-10	7.50	0.95	66.7%	.82
unit6aR		0-4	2.97	0.61	50.0%	.43
					Cronbach's alpha 0.43	

Domain and Item number	Domain Description	Scoring Range	Distribution in sample		Reliability	
			M	SD	% agreement	ICC
6b1	Bathroom/shower room (communal/wheelchair accessible)	0, 0.5 or 1	0.38	0.32	76.7%	.54
6b2		0, 0.5 or 1	0.93	0.24	90.0%	.85
6b3		0, 0.5 or 1	0.43	0.29	73.3%	.48
6b4		0, 0.5 or 1	0.40	0.31	86.7%	.77
6b5		0, 0.5 or 1	0.70	0.34	70.0%	.56
6b6		0, 0.5 or 1	0.63	0.28	76.7%	.24
6b7		0, 0.5 or 1	0.93	0.18	83.3%	.33
6b8		0, 0.5 or 1	0.40	0.42	70.0%	.71
6b9		0, 0.5 or 1	0.40	0.21	93.3%	.47
6b10		0, 0.5 or 1	0.23	0.34	70.0%	.43
6b11		0, 0.5 or 1	0.80	0.25	73.3%	.39
6b12		0, 0.5 or 1	0.98	0.11	86.7%	-.06
6b13		0, 0.5 or 1	0.95	0.15	80.0%	.42
6b14		0, 0.5 or 1	0.90	0.21	70.0%	-.02
6b15		0, 0.5 or 1	0.18	0.29	76.7%	.38
6b16		0, 0.5 or 1	0.00	0.00	93.3%	a
unit6bE		0-13	7.68	1.24	36.7%	-0.02
unit6bR		0-3	1.53	0.47	63.3%	.19
						Cronbach's alpha 0.56
7.1	Dining room	0, 0.5 or 1	0.85	0.23	83.3%	.64
7.2		0, 0.5 or 1	0.50	0.39	73.3%	.67
7.3		0, 0.5 or 1	0.33	0.33	80.0%	.68
7.4		0, 0.5 or 1	0.97	0.13	73.3%	.19
7.5		0, 0.5 or 1	0.87	0.26	86.7%	.79
7.6		0, 0.5 or 1	0.17	0.30	70.0%	.55
7.7		0, 0.5 or 1	0.86	0.23	90.0%	.83
7.8		0, 0.5 or 1	0.42	0.35	43.3%	.57
7.9		0, 0.5 or 1	0.88	0.25	63.3%	-0.02
7.10		0, 0.5 or 1	0.97	0.13	93.3%	.64
unit7E		0-1	0.33	0.33	80.0%	.68
unit7R		0-9	6.50	1.07	16.7%	.71
						Cronbach's alpha 0.62
8.1	Examination/consulting/ treatment areas	0, 0.5 or 1	0.86	0.38	96.7%	.88
8.2		0, 0.5 or 1	0.50	0.29	100.0%	1.00
8.3		0, 0.5 or 1	0.29	0.27	90.0%	.5
8.4		0, 0.5 or 1	0.67	0.26	86.7%	.21
8.5		0, 0.5 or 1	0.71	0.49	86.7%	.6
8.6		0, 0.5 or 1	0.29	0.49	96.7%	1.00
8.7		0, 0.5 or 1	0.79	0.39	96.7%	.88
8.8		0, 0.5 or 1	0.21	0.39	86.7%	.52
8.9		0, 0.5 or 1	0.71	0.39	93.3%	.77
8.10		0, 0.5 or 1	0.86	0.24	96.7%	.83
8.11		0, 0.5 or 1	0.43	0.53	93.3%	1.00
8.12		0, 0.5 or 1	0.00	0.00	76.7%	a
unit8E		0-2	0.93	0.53	83.3%	.61
unit8R		0-10	5.36	1.91	83.3%	.88
						Cronbach's alpha 0.69
9.1	Lighting	0, 0.5 or 1	0.88	0.22	80.0%	.39
9.2		0, 0.5 or 1	0.80	0.25	76.7%	.49
9.3		0, 0.5 or 1	0.95	0.15	93.3%	.64
9.4		0, 0.5 or 1	0.87	0.22	86.7%	.60
9.5		0, 0.5 or 1	0.37	0.35	60.0%	.68
9.6		0, 0.5 or 1	0.75	0.29	86.7%	.82
9.7		0, 0.5 or 1	0.90	0.20	83.3%	.45
9.8		0, 0.5 or 1	0.98	0.09	96.7%	0
9.9		0, 0.5 or 1	0.92	0.19	90.0%	.72
unit9R		0-9	7.42	1.18	33.3%	.87
						Cronbach's alpha 0.75

Domain and Item number	Domain Description	Scoring Range	Distribution in sample		Reliability	
			M	SD	% agreement	ICC
10.1	Exterior	0, 0.5 or 1	0.70	0.36	73.3%	.61
10.2		0, 0.5 or 1	0.52	0.36	73.3%	.72
10.3		0, 0.5 or 1	0.68	0.38	76.7%	.77
10.4		0, 0.5 or 1	0.80	0.34	63.3%	.31
10.5		0, 0.5 or 1	0.90	0.20	93.3%	.77
10.6		0, 0.5 or 1	0.78	0.28	73.3%	.5
10.7		0, 0.5 or 1	0.88	0.22	86.7%	.64
10.8		0, 0.5 or 1	0.72	0.36	66.7%	.73
10.9		0, 0.5 or 1	0.90	0.24	80.0%	.49
10.10		0, 0.5 or 1	1.00	0.00	93.3%	0
10.11		0, 0.5 or 1	0.88	0.28	86.7%	.64
10.12		0, 0.5 or 1	0.83	0.33	70.0%	.67
10.13		0, 0.5 or 1	0.53	0.39	63.3%	.69
10.14		0, 0.5 or 1	0.87	0.29	63.3%	.21
10.15		0, 0.5 or 1	0.72	0.28	70.0%	.50
10.16		0, 0.5 or 1	0.95	0.20	96.7%	.89
10.17		0, 0.5 or 1	0.72	0.28	56.7%	.49
10.18		0, 0.5 or 1	0.57	0.39	46.7%	.56
10.19		0, 0.5 or 1	0.03	0.13	86.7%	-0.07
10.20		0, 0.5 or 1	0.53	0.35	63.3%	.58
unit10E		0-10	7.88	1.61	40.0%	.80
unit10R		0-10	6.65	1.86	6.7%	.82
						Cronbach's alpha 0.89
11.1	General principles	0, 0.5 or 1	0.55	0.42	60.0%	.68
11.2		0, 0.5 or 1	0.73	0.29	70.0%	.49
11.3		0, 0.5 or 1	0.77	0.29	50.0%	.23
11.4		0, 0.5 or 1	0.82	0.28	66.7%	.49
11.5		0, 0.5 or 1	0.97	0.18	93.3%	.66
11.6		0, 0.5 or 1	0.53	0.32	53.3%	.57
11.7		0, 0.5 or 1	0.98	0.09	100.0%	1
11.8		0, 0.5 or 1	0.36	0.32	73.3%	.8
11.9		0, 0.5 or 1	0.88	0.22	73.3%	.43
11.10		0, 0.5 or 1	0.48	0.43	76.7%	.82
11.11		0, 0.5 or 1	1.00	0.00	50.0%	Too few cases
11.12		0, 0.5 or 1	0.43	0.29	80.0%	.68
11.13		0, 0.5 or 1	0.77	0.31	70.0%	.53
11.14		0, 0.5 or 1	0.68	0.31	86.7%	.79
11.15		0, 0.5 or 1	0.92	0.23	90.0%	.63
11.16		0, 0.5 or 1	0.97	0.18	93.3%	.89
11.17		0, 0.5 or 1	0.98	0.09	93.3%	-0.04
11.18		0, 0.5 or 1	0.87	0.26	86.7%	.67
11.19		0, 0.5 or 1	0.50		73.3%	Too few cases
11.20		0, 0.5 or 1	1.00	0.00	80.0%	0
11.21		0, 0.5 or 1	0.70	0.31	70.0%	.46
11.22		0, 0.5 or 1	0.73	0.37	70.0%	.45
unit11E		0-5	3.78	0.76	33.3%	.57
unit11R		0-17	11.80	2.36	16.7%	.85
		Cronbach's alpha not calculated, too few cases in some cells				
Final Score	The final score is weighted with the 'essential' (E scores) percentage making up 30% and the 'recommended' (R scores) making up 70% of the overall rating	0 – 100%	68.6%	11.3%	N/A	.95

a Not calculated as at least one rater had insufficient variance

Table 4: Pearson's correlations between TESS-NH Global Score, SCUEGS, EAT Final Score and Seat Final Score

	TESS-NH Global Score	SCUEGS	EAT Final Score	SEAT Final Score
TESS-NH Global Score	1	0.92*	0.82*	0.89*
SCUEGS		1	0.85*	0.87*
EAT Final Score			1	0.85*
SEAT Final Score				1

Sig. (2 tailed) 0.000

The ability of the assessments to discriminate between the Dementia Specific Units, which are likely to have some environmental features that are helpful to people with dementia, and mixed diagnosis units was assessed using the t-test for equality of means. As the sample sizes are small, especially that of the mixed diagnosis units, Levene's test for the equality of variance was carried out. It indicated that there was no significant difference in the variance of the assessment scores between the two types of unit. All of the assessments discriminated between the units. The significance of the difference between the means was 0.03 for the SCUEG total, 0.02 for the TESS-NH Global Rating, 0.05 for the SEAT and 0.01 for the EAT.

Qualitative data were collected from the raters after they had completed all of the site visits. They were simply asked to briefly record their views of the tools they had used. The following passages capture their main points:

TESS-NH

This tool took about 15-20 minutes to complete, which was a suitable length of time.

It does not simply ask whether the environment satisfies a certain question, but allows the user to rate the satisfaction using a Likert scale (usually 2, 1, or 0). Sometimes this made it more difficult to answer the question, as the satisfaction was in between two ratings. It was good, however, to be able to give a rating instead of jut answering yes or no.

The tool asks many questions regarding seating, nursing stations, number of rooms, number of exits, how exits are locked. These sections took the longest time to answer. I feel instead that a simple question could be asked, such as "Are all exits secure?," "Is there a nursing station?",

… came with very good and thorough instructions on how to complete it, yet I still felt confused about some questions. The tool gives a point to a unit if it serves as a pathway from one part of the facility to another, which makes no sense to me.

This tool also allows the user to give an overall rating of the physical environment from 1 to 10 and was the only tool to have such a rating.

SEAT

This tool took between 45 minutes and 1 hour to complete, which in my opinion was too long. I began to dread using the tool just because of its length and felt as if I'd run a marathon once it was completed. Most of the questions are easy to understand, albeit repetitive. For example, there are many questions about colours of walls, tiles, fittings, railings, flooring, etc in the toilets. It seems unnecessary to ask so many redundant questions about a place where residents do not spend a majority of their time. Some of the terminology and references are not suitable for international use i.e. Burns Suppers and the disability act.

There is no "not applicable" in this tool, so the user is left wondering how to answer such questions when the "if" is not met. Unclear questions lead to uncertain answers on the part of the user.

Finally, the tool is organised into 11 sections, some with subsections. Most of them are rooms/areas of the facility (dining room, treatment room, exterior, bedrooms, toilet), which was maybe done to help the user rate the environment more efficiently as he/she walks through the facility. This was not the case, however, due to the aforementioned flaw of the tool being too meticulous, as each section has from 8 to 21 questions.

EAT

This tool took around 15 minutes to complete. It is very well organised based on 10 principles of design for people with dementia. Each section has no more than 14 questions. The questions are very simplified making the tool easy to understand and the questions easier to answer.

There are plenty of "not applicable" situations when using these tools, and the EAT provides this as an answer in most of them. I feel that "not applicable" should always be an option …

This tool was the easiest to complete, easiest to understand …

The tool has some Likert scale style questions like the TESS, but they are easier to answer because the scales are labelled as "many, few, or none" for example with how many residents have their own furniture.

The tool is set up so that feedback can easily be given to a facility should they ask for it. The user can go through each of the sections and immediately know which principles the unit needs to improve on.

General

… the scoring is easiest to add up for the EAT, second easiest with the TESS, and quite difficult with the STIRLING. The EAT and TESS are scored by simply adding the numbers. The STIRLING requires 2 scores for each section: E's and R's. This, combined with the "met" and "part met" scores being different values made it a very time-consuming task to figure the score.

Discussion

The TESS-NH was developed in the USA in the early 1990s before much of the useful literature on environmental design was published. It reflects a rather institutional approach to the residential care of people with dementia and does not capture the person centred, small scale, domestic philosophy of care that has informed developments in Australia and the UK (Fleming, Crookes et al. 2008). The SEAT and the EAT have been developed within that philosophy and informed by the recent literature. However their currency and relevance does not guarantee their psychometric qualities.

The item by item inter-rater reliabilities of the three scales are very similar. The average level of absolute agreement between raters across all items is 84.4% (TESS-NH), 79.4% (SEAT) and 87.1% (EAT).

The intra class correlation coefficient (ICC) of the items has a greater spread with 39.8% of TESS-NH items having an ICC in excess of 0.7, 28.8% of SEAT items and 54.2% of EAT items.

In all scales there were instances of negative correlations (3 in TESS-NH, 1 in EAT and 9 in SEAT). Whether this was due to a disagreement about the meaning of the questions or differences in conclusions based on observation is not known. It should be noted that the TESS-NH ratings reported in the original paper (Sloane, Mitchell et al. 2002) included one with a zero correlation.

None of the scales achieve the desired standard of having all of the sub-scales reach the benchmark of internal consistency, i.e. a Cronbach's alpha of 0.6. Seven of the 13 TESS-NH scales achieved this, 6 of the 10 EAT scales and 8 of 13 SEAT scales.

The interrater reliability of the SCUEGS was 0.84, the TESS-NH Global Score .93, the EAT final score .97 and SEAT final score .95 indicating that all of the scales have high inter-rater reliability with the EAT and the SEAT having a slight advantage.

The correlation between the EAT and SEAT final scores and the TESS-NH Global Rating was .82 and .89 respectively. If the correlation had been low, below 0.7 for example, there would be concern that the scales had little relationship to each other and, as the TESS-NH Global Rating has been established a Gold Standard, being used as the criterion for checking the validity of the PEAP and the

SCUEGS for example (Lawton, Weisman et al. 2000; Sloane, Mitchell et al. 2002), doubt would be thrown on the validity of the scales. If on the other hand the correlation was exceptionally high there would be doubt about the new scales being sufficiently different from the TESS-NH to warrant a change to using them. The same argument applies to the correlations of 0.85 (EAT) and 0.87(SEAT) with the SCUEGS. They are high but there is room for the new scales to add value.

The ability of all of the scales to discriminate between units established for the specific purpose of accommodating people with dementia and those for a general population of elderly residents is a strong indication of their validity. The EAT provided the sharpest distinction between the two groups.

In summary the EAT item by item inter-rater reliability compares favourably with the TESS-NH and the SEAT, the EAT and the SEAT have better levels of internal consistency in their subscales than the TESS-NH, the EAT and SEAT have very high inter-rater reliability at the final score level and their validity is established by the strong correlation with the TESS-NH Global Score and the SCUEGS and by their ability to discriminate between DSUs and mixed diagnosis units.

The low Cronbach's alphas in the Highlighting of helpful stimulation and the Familiarity sub-scales of the EAT can be improved by eliminating items that have zero variance or low correlations (0.2 or below) with the sub-scale totals. This would reduce the Highlighting scale to 5 items with a Cronbach's alpha of 0.6 and the Familiarity Scale to 3 items with an alpha of 0.62. All subscales in the EAT would then have acceptable internal consistency. There would be a little loss of detail that could be useful when the scale is being used in the context of a consultation. The remaining items are identified by the highlighting of the Item numbers in Table 2

The raters were in no doubt that the EAT provides a quicker and easier way to assess the physical environment than the other two tools. However their comments were based solely on the experience of assessment. Both the EAT and the SEAT have been designed to be the first part of a consultative process which continues beyond the global assessment of the environment to the identification of specific problems and a discussion of what might be done about them. While the raters may be uncomfortable with the level of detail contained in the SEAT they looked at it from the point of view of carrying out an assessment. The origins of the SEAT are in the area of consultancy and quality control rather than research. The level of detail it provides is intended to provide a rich source of ideas for improvement where improvement is necessary (Cunningham 2009). While this requires a significant investment of time the information is likely to be of great value in the context of a consultation on environmental design or modification.

Conclusion

In general the results of this study indicate that there are two alternatives to the use of the TESS-NH in Australian aged care settings. The SEAT, which is valid and reliable and provides a great deal of information for guiding discussions on environmental modifications, and the EAT, which is quick and

easy to use, valid and reliable and arguably a better measuring instrument than the SEAT, especially if the Highlighting and Familiarity scales are shortened.

Recommendations

While progress has been made in identifying the principles that inform good design for people with dementia (Fleming, Crookes et al. 2008) there is a growing unease in the Australian aged care industry about the implementation of these principles in practice (Burton 2008; Giles 2008). The availability of environmental audit tools that are able to measure the quality of an environment against established and relevant principles provides an opportunity to assess facilities to determine if they are in fact being built with good design in mind. If a mechanism could be found to encourage the systematic use of environmental audit tools then the following benefits could be reasonably expected:

1. Those managers and architects who applied the tools would understand more about the strengths and weaknesses of their buildings
2. The knowledge gained through the process of assessment and review would naturally result in an assessment of the reasons for the gap between desirable and actual practice, i.e. in the identification of the obstacles that impede the application of good design. These might include the perceived cost; ignorance of the design principles; a decision to please the economic buyer, the relatives, rather than the person with dementia; the perceived restrictions caused by some building regulations, etc.
3. In understanding more about the obstacles to the implementation of good design the strategies required for overcoming these obstacles would become more evident. They might include carrying out a cost benefit analysis of good versus poor design; incorporating a course on design for dementia into undergraduate architecture courses; providing information to the economic buyer on the nature and benefits of good design and the commissioning of articles from organisations who have been able to interpret the regulations in a way that does not compromise the well being of the residents with dementia.

In an ideal world this knowledge translation process would result in the next generation of buildings being able to reduce confusion and agitation, increase social interaction and provide more opportunities for engagement in meaningful activities for people with dementia. However, in reality, this is unlikely to happen on a large scale without some form of incentive being provided.

In Scotland this incentive is taking the form of an accreditation system, backed by the Scottish Government, which ensures that facilities that wish to be described as dementia specific reach a specified standard. The Stirling University DSDC provided the advice on which the standards were based and is providing an auditing service using the SEAT.

It is recommended that a similar approach be taken in Australia. The development of the environmental design standards could be undertaken in collaboration with Standards Australia and the provision of auditing and consultancy services be carried out by recognised expert organisations.

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Appendix: The Environmental Audit Tool

The Environmental Audit Tool

Richard Fleming

Ian Forbes

The Environmental Audit Tool was first published in *Adapting the Ward for people with dementia,* a manual written in 2003 for the NSW Department of Health to assist staff in regional and rural hospitals who were caring for large numbers of elderly people with dementia awaiting placement in residential care. The availability of a thorough and extensive review of the environmental design literature undertaken for the Primary Dementia Collaborative Research Centre (Fleming, Crookes et al. 2008) has prompted some small revisions to the original tool while providing considerable support for the utility of the principles and examples contained in it.

The Environmental Audit Tool

> "Design of the physical environment is increasingly recognised as an important aid in the care of people with Alzheimer's disease and other dementias. …..Design is regarded as therapeutic resource to promote well being and functionality among people with dementia."
> Day, Carreon and Stump, 2000, *The Therapeutic Design of Environments for People with dementia: A Review of the Empirical Research*, The Gerontologist, Vol 40, No.4.

Until the final stages of dementia rob them of all of their abilities to engage with their surroundings, people with dementia will either be helped or harmed by the environment in which they live. This observation is now backed by more than 25 years of research into the design of prosthetic environments for people with dementia. While the research is wide ranging it can be simplified into the application of 10 principles without artificially constraining the findings.

The principles can be summarised :-

An environment that is to be used to provide care aimed at maintaining the abilities of people with dementia should

1. Be safe and secure	The confusion which accompanies dementia determines the need for a variety of safety features to be built into the environment. They include a secure perimeter, hot water control and safety switches in the kitchen .
2. Be small	The larger a facility is the more confusing it is likely to be for residents. High quality care is easier to provide in small groups.
3. Be simple and have good 'visual access'.	Confusion may be reduced by caring for the confused person in a simple environment. The simplest environment is one in which the resident can see everywhere that she wants to go to from wherever she is. This principle limits the inclusion of corridors in the design and results in the staff being able to see the residents almost all of the time. This reduces anxiety in both staff and residents.
4. Reduced unwanted stimulation	The dementing person experiences difficulties in coping with a large amount of stimulation. The unit must be designed to reduce the impact of stimulation that is unnecessary for the well being of the resident, eg. entry and exit doors used for deliveries, staff movements etc. should not be visible to the residents. Noise must also be mimimised.
5. Highlight important stimuli	Stimuli that are important to the residents should be highlighted. These include toilet doors, exit to safe outside area, aids to recognition on bedroom doors.
6. Provide for planned wandering.	Wandering is sometimes a feature of the behaviour of the person with dementia. The design should allow it to take place safely but not encourage it. The wandering path should provide an opportunity for the person to go outside and take them past areas of interest in the expectation that they will provide the person with an alternative to repetitive wandering.

7. Be familiar.	It is well known that the dementing person recalls the distant past more easily than the recent past. It follows then that their experience of recent furniture designs and decors must be less congruent with their present mental state than their experience of decors that they enjoyed in their younger days. To ensure that their experience of their surroundings is in keeping with their mental state the decor should be such that it would have been familiar to the residents in their early adulthood.
8. Provide opportunities for privacy and community	People with dementia require a range of opportunities for social interaction. Spaces are needed for sitting quietly alone, with one or two intimate friends and in larger groups.
9. Provide links to the community	The chances that the residents will continue to be part of their social network after admission should be maximised by providing for their care in small units in their community. These units should provide amenities that encourage visitors so that links with families and friends are not broken.
10. Be domestic	The environment should be as homelike as possible, recognising that the primary problem is often dementia, not an acute illness. In the absence of a treatment for dementia the goal of care is to maintain the persons abilities for as long as possible. This requires that they have opportunities, facilities and encouragement to use their abilities. So, all of the facilities found in an ordinary house need to be provided, these include a kitchen, laundry, bathroom etc. .

The following set of questions has been designed to guide the attention of management and staff to the critical areas of the environment so that they can ask, and answer, the question 'What can we do to improve the environment for people with dementia?'

Instructions

Stage 1

Answer the questions in order. They can be completed by a person working by themselves in about 10 minutes.

The questions can be used in a group setting to stimulate staff to discuss the strengths and weaknesses of the environment. This will take longer but will lead on to a greater variety of suggestions in the next stage.

Stage 2

Review the answers to the questions and make suggestions for applying each principle. The suggestions should cover short term, inexpensive measures and longer term changes that might require significant capital works.

Date: Time: Facility

Unit: Number of residents when full:

Observer:

	Safety	N/A	NO	YES	Add 1 if Unobtrusive	Score
1.	Is the garden secure, i.e. are residents prevented from getting over/under fence or out of the gate without the assistance of a staff member?	0	0	1	1	Saf1
2.	If the front door leads out of the unit is it secure?	0	0	1	1	Saf2
3.	Are all side doors leading out of the unit secure?	0	0	1	1	Saf3
4.	Are bedroom windows restricted in the extent to which they open so that residents cannot climb out?	0	0	1	1	Saf4
5.	Is the garden easily supervised from the point(s) where staff spend most of their time?	0	0	1	1	Saf5
6.	Is there a way to keep residents who are not safe with knives and/or appliances out of the kitchen?	0	0	1	1	Saf6
7.	If the kitchen is used by residents is there a lockable knife draw in the kitchen?	0	0	1	1	Saf7
8.	If the kitchen is used by residents is the cooker a gas cooker?	0	0	1		Saf7
9.	If the kitchen is used by residents is there a master switch that can be turned off quickly?	0	0	1		Saf9
10.	Is the temperature of the water from all taps accessible to residents limited so that it cannot scald?	0	0	1		Saf10
11.	If residents are involved in meal preparation are the pots and pans used small enough for them to lift easily?	0	0	1		Saf11
12.	Are all floor areas safe from being slippery when wet (water or urine)?	0	0	1		Saf12
13.	Is the lounge room easily supervised from the point(s) where the staff spend most of their time?	0	0	1	1	Saf13
14.	Are all areas used by residents well lit?	0	0	1		Saf14
					Total	**Saftot**

	Size	10 or less	11-16	16-30	30+	Score
1.	How many people live in the unit?	Score 3	Score 2	Score 1	Score 0	Size

	Visual Access Features							Score
1.	What proportion of confused residents can see their bedroom door from the lounge room?	N/A	**0** Score 0	**25%** Score 1	**50%** Score 2	**75%** Score 3	**100%** Score 4	Vis1
2.	What proportion of confused residents can see the lounge room as soon as they leave their bedroom?	N/A	**0** Score 0	**25%** Score 1	**50%** Score 2	**75%** Score 3	**100%** Score 4	Vis2
3.	What proportion of confused residents can see the dining room as soon as they leave their bedroom?	N/A	**0** Score 0	**25%** Score 1	**50%** Score 2	**75%** Score 3	**100%** Score 4	Vis3
4.	Can the exit to the garden be seen from the lounge room? If there is more than 1 lounge room answer with reference to the one most used by most confused residents.	N/A		NO Score 0		YES Score 1		Vis4
5.	Can the dining room be seen into from the lounge room? If there is more than 1 dining room or lounge room answer with reference to those used by most confused residents.	N/A		NO Score 0		YES Score 1		Vis5
6.	Can the kitchen be seen into from the lounge room? If there is more than 1 lounge room answer with reference to the one used by most confused residents.	N/A		NO Score 0		YES Score 1		Vis6
7.	Can the kitchen be seen into from the dining room? If there is more than 1 dining room answer with reference to the one used by most confused residents.	N/A		NO Score 0		YES Score 1		Vis7
8.	Can a toilet be seen from the dining room? If there is more than 1 dinging room answer with reference to the one used by most confused residents.	N/A		NO Score 0		YES Score 1		Vis8
9.	Can a toilet be seen from the lounge room? If there is more than 1 lounge room answer with reference to the one used by most confused residents.	N/A		NO Score 0		YES Score 1		Vis9
10.	Can the lounge room be seen into from the point(s) where staff spend most of their time?	N/A		NO Score 0		YES Score 1		Vis10
							Total Score	vistot

Stimulus reduction features		Yes	No	Score
1.	Does the doorbell attract the attention of the residents?	0	1	Stim1
2.	Is the noise from the kitchen distracting for the residents?	0	1	Stim2
3.	Are doors to cleaner's cupboards, storerooms and other areas where residents may find danger easily seen (i.e. not hidden or painted to merge with the walls?)	0	1	Stim3
4.	Is the wardrobe that the resident uses full of a confusing number of clothes?	0	1	Stim4
5.	Are deliveries of food, linen etc. taken across public areas such as the lounge or dining room?	0	1	Stim5
6.	Is there a public address, staff paging or call system in use that involves the use of loud speakers, flashing lights, bells etc?	0	1	Stim6
7.	Is the front entry to the unit easily visible to the residents?	0	1	Stim7
8.	Is the service entry (where food, linen etc is delivered to) easily visible to the residents?	0	1	Stim8
	Score is number of NO responses			stimtot

Highlighting useful stimuli		NO	YES	Score
1.	Is the dining room looked into from the lounge room or clearly marked with a sign or symbol?	0	1	High1
2.	Is the lounge room either looked into from the dining room or clearly marked with a sign or symbol?	0	1	High2
3.	Do bedrooms have a sign, symbol or display that identifies them as belonging to a particular individual?	0	1	High3
4.	Are the shared bathrooms and/or toilets clearly marked with a sign, symbol or colour coded door?	0	1	High4
5.	Is the kitchen either looked into from the lounge or dining room or clearly marked with a sign or symbol?	0	1	High5
6.	Are toilets visible as soon as the toilet/bathroom door is opened?	0	1	High6
7.	Is there a lot of natural lighting in the lounge room?	0	1	High7
8.	Is the artificial lighting bright enough in all areas?	0	1	High8
9.	Is the lighting free of glare, eg from bare bulbs, off shiny surfaces?	0	1	High9
	Score is number of YES responses			hightot

Provision for wandering and access to outside area		NO	YES	Score
1a	Is there a clearly defined and easily accessible (i.e. no locked exit) path in the garden that guides the resident back to their starting point without taking them into a blind alley?	0	1	Wand1a
1b	Does the external path allow the resident to see into areas that might invite participation in an appropriate activity other than wandering?	0	1	Wand1b
1c	Is the path within a secure perimeter	0	1	Wand1c
1d	Can this path be easily and unobtrusively surveyed by staff members?	0	1	Wand1d
1e	Are there chairs or benches along the path where people can sit and enjoy the fresh air?	0	1	Wand1e
1f	Are there both sunny and shady areas along the path?	0	1	Wand1f
1g	Does the path take residents past a toilet?	0	1	Wand1g
2a	Is there a clearly defined path inside that takes the resident around furniture and back to their starting point without taking them into a blind alley?	0	1	Wand2a
2b	Does the internal path allow the resident to see into areas that might invite participation in an appropriate activity other wandering?	0	1	Wand2b
	Score is number of YES responses			Wandtot

Familiarity		Many	A few	None	Score
1.	Are there any colours in the furnishings or the decoration that would not have been familiar to the majority of residents when they were 30 years old?	0	1	2	Fam1
2.	Are there any taps, light switches, door knobs that are to be used by residents that are of a design that would not have been familiar to the majority of residents when they were 30 years old?	0	1	2	Fam2
3.	Are there any pieces of furniture in the lounge room or the dining room that are of a design that would not have been familiar to the majority of residents when they were 30 years old?	0	1	2	Fam3
4.	Are there any pieces of furniture in the bedrooms that are of a design that would not have been familiar to the majority of residents when they were 30 years old?	0	1	2	Fam4
5.	How many residents have their own ornaments, photos in their bedroom	2	1	0	Fam5
6.	How many residents have their own furniture in their bedroom	2	1	0	Fam6
	Total Score				**Famtot**

	PRIVACY AND COMMUNITY					Score
1	Are there small areas (nooks) that provide opportunities for casual interaction and quiet chats?	None Score 0	1 Score 1	2 Score 2	3 or more Score 3	Priv1
2	How many of these areas or nooks have views of pleasant or interesting scenes (outside, the living room, the nursing station)?	None Score 0	1 Score 1	2 Score 2	3 or more Score 3	Priv2
3	Do the shared living areas support small group activities (4-6 people) without re-arranging the furniture?	N/A	NO Score 1	YES Score 2		Priv3
4	Does the dining room provide opportunities for residents to eat in small groups (2-4)?	N/A	NO Score 1	YES Score 2		Priv4
5	Does the dining area provide opportunities for people to eat alone?	N/A	NO Score 1	YES Score 2		Priv5
	Total Score					Privtot

	Community links	NO	YES	Score
1.	Is there an area or room somewhat removed from the main dining room where families can share meals with their relatives?	0	1	Com1
1a	Is this room/area domestic and familiar in nature, to reassure family members and friends and encourage them to visit and to participate in the care of the resident?	0	1	Com1b
	Score is number of YES responses			Comtot

DOMESTIC ACTIVITY Record the percentage of residents who:-		None	Up to 50%	More Than 50%	Score
1.	Have access to a kitchen	0	1	2	Dom1
2.	Have a significant involvement in main meal preparation	0	1	2	Dom2
3.	Have a significant involvement in making snacks or drinks	0	1	2	Dom3
4.	Have a significant involvement in keeping bedroom clean and tidy	0	1	2	Dom4
5.	Have a significant involvement in personal laundry	0	1	2	Dom5
6.	Are involved in gardening	0	1	2	Dom6
7.	Have constant and easy access to a lounge?	0	1	2	Dom7
8.	Have constant and easy access to a dining room?	0	1	2	Dom8
				Total Score	Domtot

Summary of Scores			
	Possible Score	**Actual Score**	**Percentage**
Safety	14		
Size	3		
Visual Access	10		
Stimulus Reduction	8		
Stimulus Enhancement	9		
Wandering and access outside	9		
Familiarity	12		
Privacy and community	12		
Community access	2		
Domestic activities	16		
Total	95		

DEMENTIA FACILITY ENVIRONMENTAL CHECKLIST

Stage 2

List the short term goals you could set to improve the quality of your environment for people with dementia and then briefly describe how you will achieve it (strategy).

	Goal	Strategy
1. Be safe and secure		
2. Small		
3. Simple and have good 'visual access'.		
4. Reduced unwanted stimulation		
5. Highlight important stimuli		
6. Provide for planned wandering.		
7. Familiar decor.		
8. Provide opportunities for privacy and community		
9. Links to the community		
10. Domestic		

List the long term goals you could set to improve the quality of your environment for people with dementia and then briefly describe how you will achieve them (strategy).

	Goal	Strategy
1. Be safe and secure		
2. Small		
3. Simple and have good 'visual access'.		
4. Reduced unwanted stimulation		
5. Highlight important stimuli		
6. Provide for planned wandering.		
7. Familiar decor.		
8. Provide opportunities for privacy and community		
9. Links to the community		
10. Domestic		