Using the Environment to Support Communication and Foster Independence in People with Dementia

A REVIEW OF CASE STUDIES IN LONG TERM CARE SETTINGS

Are there aspects of the care environment that may be distracting to those with dementia?

Would you like to know how to make lighting and contrast support independence?

Need some fresh ideas to facilitate wayfinding?

Would you like helpful hints for creating meaningful conversations with people with dementia?

Read on for help from I.D.E.A.S., Inc.

Authors Jennifer A. Brush, MA, CCC/SLP, Hannah A. Fleder, Margaret P. Calkins, PhD

Introduction

Communication deficits in people with dementia can lead to reduced participation in social activities and increased social withdrawal. Impaired communication skills can also create difficulties between elders in care communities and their caregivers, leading to dependence among elders and stress among caregivers. When caregivers take over activities of daily living for a person with dementia, excessive disability and aggressive behaviors often result.

The care community environment can acts as a barrier to expression and comprehension when it either lacks environmental supports to facilitate communication, or when it is so full of environmental stimuli such as signs, sounds, movement, and smells, that it becomes very difficult for a person with dementia to focus on one or two helpful cues. Some elements of the environment attempt to communicate helpful information, such as an activity calendar, but do it in such a way (small size, low contrast print) that the person cannot use the cue.

Caregivers should think of the environment as another tool that will help support people with dementia during communication and activities of daily living. Rather than relying only on verbal cueing, try using environmental cueing such as light, color, contrast, or signs to enhance communication and independence.

Environmental cues can support communication when they:

- help a person know what to expect
- put them in the situation that will trigger the right pattern or behaviors
- use multi-sensory strategies to provide information
- reduce distracting stimulation

Environmental strategies for people with dementia should be implemented to reduce the demands on the impaired communication functions, compensate for the impaired function by using the preserved abilities of other communication functions, or enhance the ability of a caregiver to provide assistance.

Three long term care communities identified aspects of the physical environment that they thought were negatively impacting the residents for whom they care. Given a three-six month time frame and a restrictive budget, the staff from nursing, rehabilitation, and activities worked together to make a positive change in both the environment and the residents' quality of life. This paper shares some of the goals and outcomes from a project funded by the National Institute on Deafness and Other Communication Disorders. The purpose of the project was to use the *Environment and Communication Assessment Toolkit for Dementia Care*, or ECAT™ (Brush, Calkins, Bruce, & Sanford, 2012), to demonstrate that simple environmental changes can improve functional independence and well-being for people with dementia.

The ECAT™ is an assessment protocol and resource on the long-term care environment that provides clinicians with the knowledge and skills to modify the care environment to best facilitate communication. This toolkit provides a practical means of organizing, analyzing, and translating environmental information into appropriate recommendations for interventions and treatment goals and also evaluating intervention decisions.

Environmental Strategies for Dementia

Optimize Cognitive Aspects of the Environment

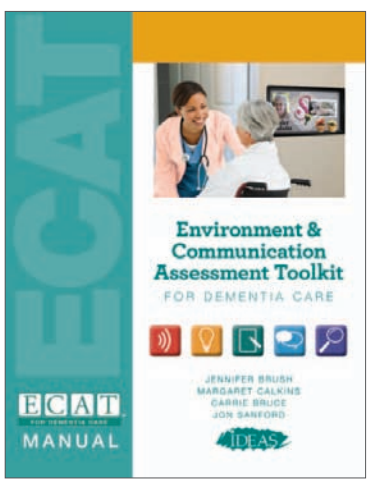
- Maximize Cues
- Personalize Spaces and Materials

Optimize Visual Aspects of the Environment

- Enhance Lighting
- Enhance Visual Organization
- Maximize Sightlines
- Maximize Contrast
- Minimize Glare

Optimize Auditory Aspects of the Environment

- Minimize Background Noise
- Minimize Reverberation



Community Descriptions

Three very different long term care communities participated in this project.

Community One is situated in a small mid-western town. The nearby college offers many cultural and educational opportunities for the community residents to enjoy. Community One offers independent living in cottages and apartments. Then, as needs may change, the Care Center provides both assisted living and skilled nursing care. The Care Center offers 42 private nursing home rooms and 24 private personal care rooms. Emphasis is placed on continuing wellness, physical fitness, and maintenance of each individual's highest level of self-care and independence. The Care Center was the first in the state to be accredited as a Person-Centered Long Term Care Community. Individual preferences are honored in dining, activities, bathing and waking times, and other activities of daily living.

Community Two is located on the outskirts of a small east coast city. The Community was established in 1967 as a for-profit proprietary nursing home. With the addition of 17 rehabilitation beds in 1974, Community Two began its evolution toward today's 355-bed skilled nursing facility. Most rooms were semi-private at the time of the study. In 1993, Community Two became a not-for-profit nursing home and affiliated with large local hospital. The affiliation with the hospital offers the highest level of clinical expertise and access to a full spectrum of health care services. They provide 24-hour skilled nursing care to those in need of rehabilitation, long-term care, transitional care, hospice care, and care for dementia. Consistent assignments mean the staff know and establish real relationships with the residents and their families.

Community Three is located in the Pacific Northwest just outside of a large city. It is an independent, non-profit Senior Living Community offering a full continuum of care from, independent living to nursing, for the past 50-years. Forty two residents who require varying levels of care reside in the Health Center, which offers both private and semi-private rooms. Positive attitude and teamwork, good communication at all levels, a consistent, dedicated group of caregivers, and support from all departments undergird the care. The flexible and dynamic environment in the Health Center provides person-centered care based on choice. Individual preferences are honored in dining, activities, bathing and waking times, and other activities of daily living.

Case Studies

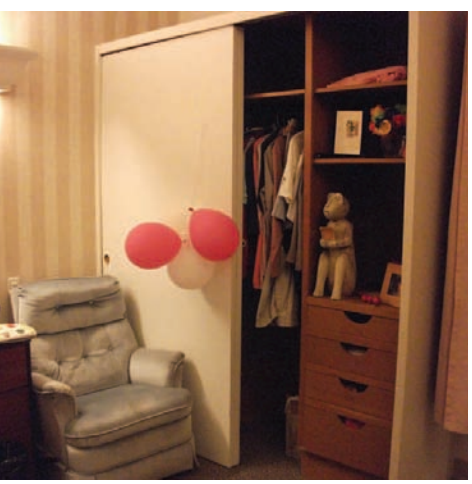
Because the ECAT™ is primarily based on an individualized assessment and treatment plan for the individual with dementia, staff selected a small number of residents in each community with whom to do targeted interventions in their bedrooms. In addition, in two communities interventions were also targeted for behaviors in shared areas of the care environment; one addressed residents trying to leave the care environment unattended and lack of personal cues to assist in wayfinding and the other community addressed modifications to the dining room. We start by providing the individualized case studies, then report on the group interventions.

Measures: The ECAT™ was administered at the beginning of the project, and then again after modifications were made. Other measures included the *Saint Louis University Mental Status* (SLUMS), the *Montreal Cognitive Assessment* (MoCA), the *Functional Assessment Staging of Alzheimer's Disease* (FAST), and the *I.D.E.A.S. Resident Related Stressors Scale* (RRSS). Descriptions of these measures are provided at the end of this report.

Resident	SLUMS Score	MoCA Score	FAST level
Resident One	19	16	5
Resident Two	8	12	6abcd
Resident Three	17	20	6abc
Resident Four	11	13	6bc
Resident Five	10	16	4
Resident Six	0	0	6c
Resident Seven	0	0	6d

Increasing contrast and visual cues in the bathroom and closet can improve independence.

Low contrast and an absence of visual cues make this bathroom a barrier to independence.



Dark, only partially accessible closet does not support dressing. There are no labels or visual cues to compensate for impaired abilities.

Resident One

Increasing Independence in Dressing, Toileting and Hygiene Skills

Resident One is a 98 year old female who has been diagnosed with dementia. She has a high school education. Participation in community activities was minimal. When asked if she wished to participate in a given event, she denied interest and often became anxious. Although her expressive language skills were within functional limits, she rarely participated in more than two conversational turns with staff. These interactions often seemed more like interviews than conversations, due to the number of questions required to elicit responses. She had difficulty choosing and accessing her clothes from her closet and would often choose soiled clothes. Her frequent bouts of incontinence and poor hygiene practices after toileting were offensive to her roommate and others. According to the RRSS, staff reported that this resident engaged in behaviors bothersome to her roommate 2-4 times a day.

Relevant Occupational and Speech-Language Pathology Goals

- To increase participation in community activities, resident will identify day and time with environmental aids. Resident will participate in at least one community activity per day.
- Using a memory book, resident will maintain 10 conversational turns.
- Resident will improve toileting ability and hygiene tasks through use of environmental cues in the bathroom with minimal staff cueing.
- Resident will independently access and retrieve clothing from her closet to change outfits.
- Resident will accurately locate soap and wash her hands in the bathroom with visual environmental cues.

Environmental Barriers Related to Therapy Goals

- Bathroom door not easily visible or distinguished from surroundings. The door opened into the room in a way that limited line of sight into the bathroom.
- Toilet not easily distinguished from surroundings.
- Grab bars, toilet paper, and flush handle not easily distinguished from surroundings.
- No cues for task completion in bathroom.
- No signs to aid in wayfinding, orientation, or task competition.
- Sink, grooming area, and hygiene items not easily visible, organized, or distinguished from the surroundings.
- No clock or other orientation aids that were easily accessible or readable.
- One closet door was broken; closet was dark, unorganized, and partially inaccessible because of a large chair in front of the door.
- Staff described the room as noisy, cluttered, homelike, small, and dark.

Interventions

- Large monthly calendar was mounted in a central location, and the resident's room was rearranged so that her chair was in a central, well-lit location. With these simple changes, her orientation to time immediately increased. With SLP, she practiced accessing, scanning, and entering functional information into her calendar.
- The SLP reviewed the monthly events schedule with her and identified activities of interest. She identified 14 events the first month, and 12 the next. She entered these events into her calendar and checked the calendar every morning.
- With help from her son, meaningful pictures were gathered and phrases were added to create a memory book.
- A new closet was installed with large drawers and a pull out hanging bar, which increased her ease of access to the closet. Drawer labels of her choice were added in order to facilitate dressing activities.
- Contrast in the bathroom increased by painting the lower half of the wall a color that contrasts from the toilet and floor. A chair rail, a pump type soap dispenser with the label of "Soap", and a framed sign stating "Clean hands feel good" were also added.

Results

- After the environmental modifications, staff reported that this resident engaged in behaviors bothersome to her roommate only two or fewer times per week.
- Orientation to day of the week increased from 25% to 100% with occasional verbal cues. Orientation to time increased from 75% of the time with maximum cues from staff to 95% of the time independently.
- Participation in activities increased from three activities per week to one event per day on average. She attends the majority of events written on her calendar.
- Ability to maintain conversational turns has increased from 5 conversational turns with moderate verbal cues to more than 10 conversational turns with the aid of a memory book. The memory book created greater access to intact expressive abilities. This was achieved by both reducing the retrieval of names needed to discuss past events and by providing a shared and meaningful context for conversations. With the aid of the book, the conversational partner was able to identify topics of interest for the resident, and the resident was able to discuss topics that were both motivating and familiar. As a result, the resident has taken pleasure from reminiscing, and the staff have been able to maintain more meaningful and enjoyable exchanges with her.
- Resident had extremely limited access to her clothing and was unaware of soiled clothes. Now, she is able to independently access closet for clothes approximately 4 out of 7 days a week.
- Ability to complete toileting and hygiene tasks through use of environmental cues in the bathroom has increased to 80% accuracy and minimal staff cueing. Incidence of incontinence has decreased 90%.

Bathroom After Modifications (Top)
Grab bars, towels, and a toilet that contrast from the wall support independence by using color to provide information.

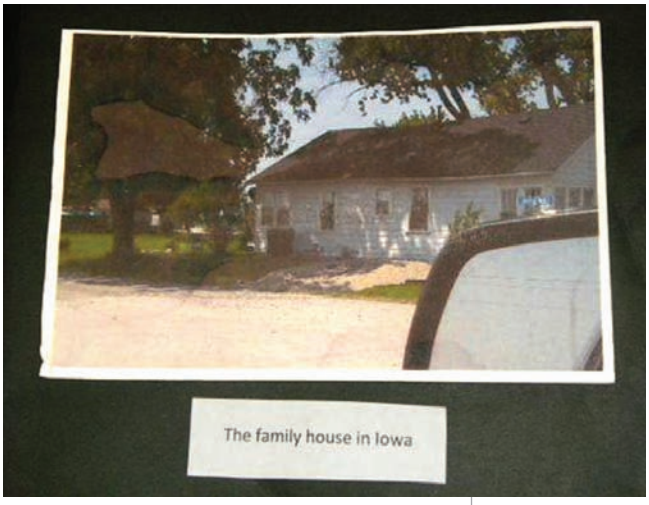
Hygiene Cueing in Bathroom (Middle)
Visual cues such as labels use preserved reading skills to compensate for deficits.

Closet After Modifications (Bottom)
Well lighted, accessible, and clearly labeled, this closet has a pull out clothing bar to support dressing skills.

Resident Two

Using a Memory Book to Expand Utterances and Increase Meaningful Communication with Others

Resident Two is a 90 year old man who has been diagnosed with Alzheimer's disease. He has a Master's level education. Although scores from language testing revealed fairly intact expressive abilities, he had difficulty maintaining conversations due to deficits in attention, processing, naming, and high levels of anxiety. He adopted a range of repetitive utterances in order to engage staff in conversation. Whenever he desired to communicate a want or need he could not readily express, or wished to expand or prolong a conversation, he would interject with a standard question. This resident was also confused by the analog clock in his room and the analog wrist watch he wore. Although he could identify meal times consistently, his inability to tell time led to anxiety and constant fidgeting with his watch.



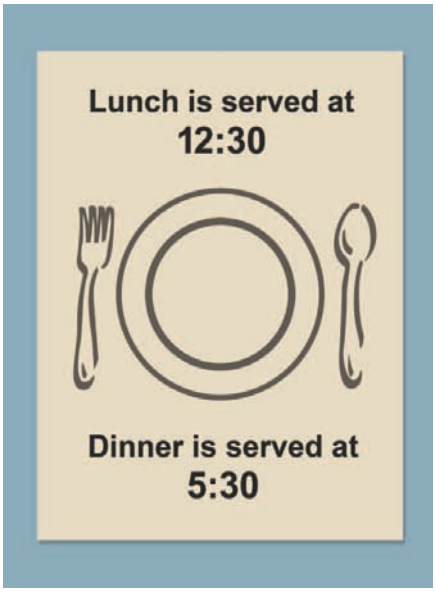
A low-cost or no-cost intervention, such as a memory book, can serve as an effective external cue that supports communication and ADLs.

Relevant Speech-Language Pathology Goals

- Using environmental aids, resident will identify time of day to increase participation in activities.
- Resident will complete ten conversational turns using a memory book and decrease repetitive utterances during conversational turns.
- Resident will increase out-of-room social participation.

Environmental Barriers Related to Therapy Goals

- No time or location cues.
- No personalized items in his in room to serve as a communication support.
- No environmental cues (inside or outside of the room) in order to personally orient the resident to his room. There was also no signage to indicate the location of the room.
- No environmental cues to enhance communication with others.



Mealtime Cueing
Simple signage can help people with dementia identify mealtimes consistently.

Interventions

- Interventions began by having the resident look at a series of pictures to elicit conversation. Immediately, his ability to maintain topic, ask questions, and expand on the topic increased. Personal pictures were gathered, and a memory book was constructed with phrases that provided information about the pictures.
- A large numbered digital wall clock and a digital wrist watch were provided.

Results

- The resident's time orientation with the use of his room clock and watch increased from 10% accuracy with maximum verbal cues, to 100% independence using both the wall clock and his watch. His anxiety and fidgeting have also noticeably decreased. Another surprising result is that his frequent trips to the dining room—seeking food between meals because he read his watch wrong and thought it was time to eat—have also decreased.
- His ability to complete conversational turns has increased and now he is able to maintain several conversational turns with picture/written cues and occasional verbal cues. Staff have reported an increase in verbalizations and greater initiative from the resident in asking for assistance.
- Resident previously utilized repetitive utterances for 50% of all utterances, but after developing a memory book, he maintained an average of 12 conversational turns before stating a repetitive utterance. The aid of pictures and written cues, gave him enough scaffolding to formulate appropriate responses and keep the conversation going. Interestingly, even when the pictures were not used, he still demonstrated a decrease in repetitive utterances of one repetitive utterance per three conversational turns. This decrease in repetition, although less significant than when the memory book was utilized, may still prove beneficial when the book is not readily available.
- He is more willing to leave his room for specific activities 60% of the time.
- Personal displays now orient the resident to his room. The clock and other orientation information are clearly visible and legible. Signage overall has been improved and he is able to navigate much better.

Resident Three

Improving Safety and Independence during Activities for Daily Living

Resident Three is an 82 year old man who was diagnosed with Parkinson's disease. He has a Doctorate level education. His level of participation in community activities and activities of daily living was steadily decreasing. At the time of the evaluation, he was able to express his wants and needs to staff, express complex thoughts, and discuss current events. However, he had difficulty recognizing the safest way to perform an action and as a result experienced falls. Attempts to reason with him about safety were often met with resistance, skepticism, or frustration due to poor insight into deficits. He expressed that he wanted to know what time it is was whenever he was sitting in his recliner. Staff report that he engaged in behaviors they found stressful to manage 2-4 times a day.

Relevant Occupational Therapy and Speech-Language Pathology Goals

- Increase ability to appropriately use toilet independently.
- Resident will locate self care/grooming items with use of environmental cues.
- Resident will independently access and retrieve clothing.
- Resident will increase awareness of safe steps performance and verbalizations for getting out of his chair to reduce risk of falls.
- To increase ability to participate in activities, resident will increase identification of place and temporal concepts.
- Resident will increase his ability to choose activities for the day.
- Resident will improve sustained attention to a communication task to 30 minutes with minimal redirection.
- Resident will increase the ability to select music choice and play CDs.

Environmental Barriers Related to Therapy Goals

- No time or orientation cues were visible or easily distinguished from the surroundings.
- No signs that served as useful communication cues were present.
- Clothes storage was not visible or easily distinguished from the surroundings. The lighting at the closet was not adequate (24 fc).
- The TV, CD player, and phone were not accessible, easily visible, nor had controls that were simple to understand.
- Personal items were not visible or easily movable so that he could transfer them to seating area or bed.
- Bathroom door not visible or easily distinguished from the wall.
- Toilet not easily visible or distinguished from the surrounds. Contrast and lighting in bathroom was not adequate.

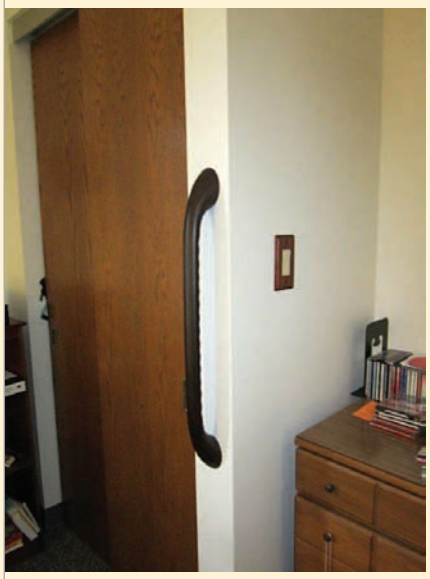
Interventions

- Simple, large print instructions for safely getting up from recliner were framed on wall and combined with spaced retrieval training.
- Whiteboard with date and activities for the day.
- Large, digital clock was mounted on wall opposite wall from recliner.
- Improved visual organization in room such as end table near recliner, organizational bins for papers, easily accessible organizer for CDs, clutter removed, magazine holder, moved books to shelves, bins/trays for mail and newspaper/recycling, etc.
- Removed bathroom door, installed curtain that contrasted with wall and could be left open when bathroom is not in use to allow for toilet to be in line of sight.
- Painted bathroom in a color which contrasted from the toilet, sink, and floor.
- Installed grab bar outside closet and bench next to closet to increase ease and safety of getting dressed and accessing clothing.
- Light installed inside closet.

Results

- Ability to toilet independently increased from 50% to 75% accuracy through the use of environmental supports.
- Ability to locate self-care items increased 55%.
- Independent access and retrieval of clothing increased from 10% to 85% accuracy.
- Awareness of safe steps for getting up from chair increased to 90% with 25% verbal cueing and visual cues in the environment.
- The simple implementation of a digital clock by the his recliner has resulted in a significant improvement to time orientation and ability to plan activities for the day. He stated, "You were responsible for getting the clock right? It has been so helpful. I really like that."
- After improving the visual organization of an extremely cluttered room, his ability to sustain attention to a functional communication task has increased from 10 minutes to 18 minutes with minimal redirection.
- He always enjoyed listening to music. Simply by organizing the music in a meaningful way for this resident, he now often independently chooses music for his enjoyment throughout the day.

"You were responsible for getting the clock right? It has been so helpful. I really like that."



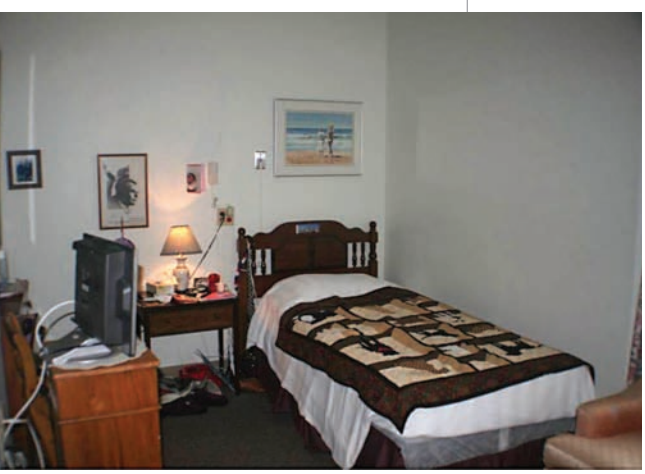
Grab Bar
A grab bar next to the closet can make getting dressed easier and safer.

Resident Four

Increasing lighting levels and improving visual organization can increase participation in self-initiated activities.

Increasing Participation in Leisure Activities

Resident Four is an 89 year old woman who was diagnosed with dementia and passed away before completing the study. She had a Master's level of education. She was enrolled in occupational and speech therapy because her level of participation in activities of daily living and social events in the community had decreased. At the time of the evaluation, she was able to read and participate in most self-care activities. Her episodic memory was severely impaired, which resulted in much confusion about whether she was staying at the care community, had eaten a meal, attended an activity, etc. One of the biggest obstacles to activity participation was her frequent desire to go to bed upon entering her room. After completing the ECAT™, the staff hypothesized that this behavior may in part be caused by her extremely dark room. According to the RRSS, staff described her room as dim, dreary, and cluttered.



Inadequate lighting, visual disorganization, and a lack of supportive visual cues make this bedroom a barrier to effective communication and activity participation.

Relevant Occupational Therapy and Speech-Language Pathology Goals

- Improve ability to use toilet independently.
- Resident will locate self-care/grooming items.
- Resident will retrieve books and personal items safely from shelves and drawers.
- Increase sustained attention to task to 5 minutes during meaningful communication tasks in bedroom.
- Resident will participate in individualized leisure activity in her room for 30 minutes each day.
- Using a memory book and other environmental cues, increase recall of personal and care community information.
- Resident will remain on-topic during conversational exchanges for 5 minutes facilitated by use of a memory wallet.

Environmental Barriers Related to Therapy Goals

- Inadequate, uneven lighting in the bedroom (varied from 24-45 fc)
- No visible time or orientation cues that were easily distinguished from the surroundings.
- No signs that served as useful communication cues.
- TV did not have controls that were simple to understand.
- Bathroom door not visible or easily distinguished from the wall.
- Toilet not easily visible or distinguished from the surrounds. Contrast and lighting in bathroom was not adequate (lighting varied from 12-20 fc).

Bedroom After Environmental Modifications
The addition of bright cove lighting, a designated conversation and activity area, and visual organization reduce barriers and support communication skills.

Interventions

- Removed bathroom door, installed curtain that contrasted with wall and could be left open when bathroom was not in use to allow for toilet to be in line of sight.
- Painted bathroom in a color which contrasted from the toilet, sink, and floor.
- Added a bathroom shelf in contrasting color to the wall for organizing labeled toiletries.
- Rearranged room to improve flow pattern and improve visual organization by reducing clutter, establishing orientation cues, creating a conversation area, and personalizing space.
- Added visual markers on remote control so she could watch TV independently.
- Increased lighting in bedroom by installing cove lighting.
- Created a memory book to serve as a support for meaningful communication.
- Provided materials for self-directed activities of interest to the resident for completion in room.

Results

- Staff described her room as "Awesome, she loves it."
- Lighting in bedroom increased to an average of 35.6 fc and became more consistent throughout the room. After visually organizing the room so it had distinct areas with a purpose and increasing the lighting, she was much less likely to want to go to sleep all throughout the day. Upon entering her room she was much more likely to participate in a self directed activity than get into bed.
- Ability to locate self-care/grooming items and retrieve books and personal items safely increased.
- Ability to sustain attention during meaningful communication increased from one minute to four minutes. With use of the memory wallet, her recall of personal and community information increased by 25%.

Resident Five

Journaling can be an effective way to express feelings and reduce socially inappropriate statements.

Improving Participation in Activities and Decreasing Negative Utterances

Resident Five is an 89 year old woman who has been diagnosed with dementia and depression. She has a high school education. She was identified for the study by community staff due to lack of participation in activities and the apparent gap between her functional abilities and her performance. At the time of assessment, she presented with difficulty naming objects, lack of orientation to time and place, and frequent repetitive or negative utterances which repeatedly interrupted the flow of conversation. Her confusion regarding the time of day and location often lead to anxiety. Her overall confusion and disorientation required staff to give her full assistance when trying to encourage participation in scheduled events within the community.

This resident regularly expressed negative opinions about her roommate, often with little awareness that her roommate was present in the room. According to the RRSS, staff reported that she engaged in behaviors bothersome to other residents two to five times a day or more. Staff time to manage these behaviors often took 20-30 minutes for each occurrence.

Relevant Occupational Therapy and Speech-Language Pathology Goals

- In order to choose leisure activities in which to participate, resident will utilize environmental cues to identify the day.
- Resident will decrease negative and inappropriate topics of conversation with staff and family and instead be engaged in a meaningful activity.
- Increase social participation and activity engagement to reduce anxiety behaviors in response to environmental modifications and cues with minimal staff redirection.

Environmental Barriers Related to Therapy Goals

- Staff described the resident's room as dark and crowded.
- The monthly schedule of events was not easily visible (located behind her chair), on small paper and printed in a small type size.
- No time/location signs, cues, or schedules.
- Nothing to personally orient the resident to her room.
- Visual disorganization in room.
- No environmental cues to enhance communication with others.

Interventions

- Increased the visual organization of the bedroom and increased visual cuing to support activities of daily living.
- A large monthly calendar was mounted in a central area in the resident's room and she practiced scanning and entering events. Using spaced retrieval techniques to orient to the day, she practiced crossing off the day at the end of each day.
- With the aid of a central calendar, the SLP reviewed the monthly events schedule with her and identified activities of interest. The first month, six activities in addition to an exercise class were selected by the resident. The following month, eight activities were selected.
- She was given a journal to record daily events and keep a running log of both positive and negative experiences within the environment. Due to the chronological nature of the entries, she was able to maintain conversations with fewer repetitive utterances and greater management of topic. Although many of her negative utterances were noted in the journal, when discussing the entries, the negative emotions could be expressed and then she could continue on with the next entry. The majority of the conversation was spent discussing and expanding on the more positive aspects of her experiences.

Journaling may help those with dementia improve conversation skills.

Results

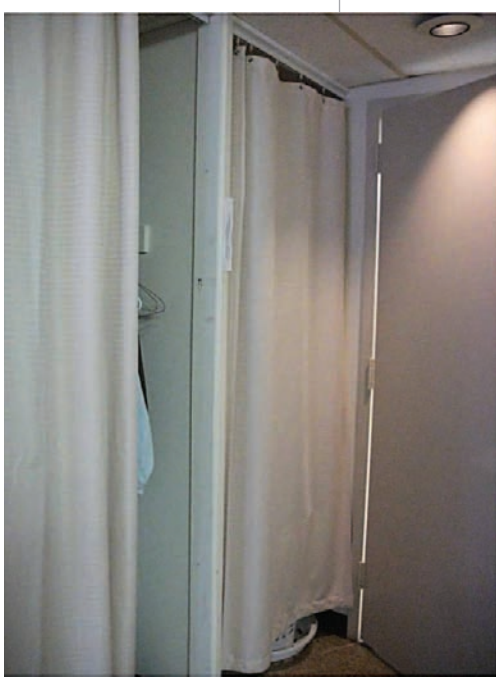
- Staff describe her room as bright, clean, cozy, and comforting.
- Reduction in behaviors that are bothersome to other residents from 2-5 times a day or more to 2 or fewer times a week. Staff time needed to manage these occurrences has decreased from 20-30 minutes to 1-5 minutes for each occurrence.
- Increase in orientation to day of the week from 50% of the time with maximum verbal and visual cues to 90% of the time independently with visual cues in the environment. She appears to feel proud of her independence and her negative perseveration on past events has decreased.
- She has shown an increase in participation in community events from less than one per day to an average of two activities per day. Overall, her mood and sense of integration increased along with her participation.
- Her habit of informing nurses, other staff, or her family regarding her roommate's actions has significantly decreased with the use of the journaling technique.
- There are personal displays to orient her to her room, and the clock and calendar are clearly visible and legible. She is now able to interact appropriately with her environment.

Resident Six and Resident Seven

Social Space and Memory Books Support More Effective and Meaningful Conversation

Bedroom Before Modifications

A meaningless visual cue and a poorly lit, disorganized closet are not supportive of dressing skills.



If closet curtains do not contrast with the walls, they act as a barrier to independence by "hiding" clothes.

These two residents have very similar therapy goals and the same environmental barriers in their rooms, thus the goals, interventions and outcomes are described together.

Resident Six is a 78 year old woman who has been diagnosed with vascular dementia and bipolar disorder. She has no formal education beyond middle school. English is her second language and none of the staff speak her primary language, to which she often reverts. At the time of the evaluation, she had difficulty communicating her basic wants and needs and many times throughout the day used repetitive verbalizations that escalated in intensity and resulted in grabbing, hitting, unintelligible utterances, agitation, and decreased ability to listen to staff. She had a son who was ill and this became a constant preoccupation for her, so much that she refused social activities and the perseveration impacted her ability to function during activities of daily living. According the RRSS, staff reported that two to four times a day, she engaged in behaviors bothersome to other residents and up to five or more times a day she engaged in behaviors that were challenging or stressful for staff to manage. Staff described her room as dark, institutional, no personal items displayed, outdated, cluttered, and with filthy floors.

Resident Seven is an 86 year old woman who has been diagnosed with Alzheimer's disease. She has a high school education. She wandered throughout the care unit and repetitively sought information from staff about how to get home. Staff described her room as dark, institutional, lacking personal items, cluttered, and outdated.

Relevant Occupational and Speech-Language Pathology Goals

- Independent completion of toileting, including locating the bathroom, finding light switch, turning on light, and locating the toilet through environmental supports.
- Complete activities of daily living such as tooth brushing with greater independence.
- Residents will locate their own bed independently by identifying individualized comforter.
- Residents will initiate leisure activities of their choice in the bedroom.
- Increase ability to express basic needs using a multi-modality communication aid.
- Improve their ability to attend to a chosen activity through environmental supports
- Residents will use external communication aids to have a meaningful conversation using turn taking skills, answer questions and make statements for 5-10 minutes.
- Comprehension of yes / no questions at the sentence level when shown related picture or other environmental stimuli related to personal needs.

Environmental Barriers Related to Therapy Goals

- Absence of conversation area in residents' rooms for staff and visitors to sit with them. There were no self-directed activity materials or stimulating conversation starters in the rooms. The families reported a decrease in frequency of visits because they did not know how to have meaningful conversations or how to spend time with residents during visits.
- Bathroom doorway, toilet, toilet paper, sink, and grooming items were not visible or easily distinguished from the surroundings.
- Clothing storage was not clearly visible. Clothes were located behind curtains that did not contrast from the walls, in an area that was poorly lit behind the bedroom doors. Closets were labeled "Bed A" and "Bed B", which was meaningless to residents.
- There were no time or location cues in the rooms.
- The rooms were not personalized in a way which would help the residents to identify their room or their belongings. There were no family pictures in the rooms.

Environmental Interventions

- Created a conversation area in each room with self-directed activities of interest to the residents and memory books to support conversation during family visits.
- Painted bathrooms a contrasting color from the floor and fixtures. Organized and labeled personal care items on shelves that contrast from the wall color.
- Helped them to participate in choosing their own comforters and asked family to bring personalized items for their rooms.
- Installed free standing wardrobes and night stands that were accessible and labeled for easy identification and access to clothing.
- Increased task lighting to appropriate levels.
- Installed shadow boxes outside of rooms to serve as a wayfinding cue for room identification.

Results

- With the use of appropriate activities, a memory book, and well lit conversation area, residents are able to attend to an activity for 30-50 minutes with verbal cues. Resident six especially likes her memory book, carrying it with her at all times and slipping it under her pillow at night.
- Residents have meaningful conversations for an average of 30-50 minutes answering mostly yes / no questions. There is now more spontaneous speech heard during conversation tasks.
- There has been a significant decrease in repetitive statements about going home. Resident seven easily chooses and engages with activities instead of asking repetitive questions.
- Residents now have external communication aids in place to aid in facilitation of communication. Using books geared towards adults with clear colorful pictures, residents demonstrate appropriate turn taking, answer basic questions and make personal statements contributing to the conversation. They engage in conversation for at least 30-45 minutes.
- At the time of the initial evaluation both residents needed assistance to find bathroom and supervision to complete tasks. They now require supervision/verbal cues only, locating the bathroom independently from inside the bedroom given signage and sufficient lighting 75% of the time, turning on light in bathroom independently given illuminated light switch 100% of the time and locating the toilet independently given a contrast in wall paint color 100% of the time.
- The staff now describe the rooms as homelike, clean, bright, relaxing, and comfortable.

From Top
Bedroom After Modifications

A wardrobe that is visually organized and labeled, contrasts from the wall, and is easily accessible helps to trigger correct behaviors for dressing.

A conversation area with clearly displayed family photos facilitates reminiscing during family visits.

Interventions for Shared Social Spaces

Clearly not all challenging behaviors occur in residents' bedrooms. Two of the communities had issues within their shared social spaces that they wanted to address. The challenge here is that interventions are likely to impact all residents. Therefore, care must be taken to introduce changes that will not hinder some residents while helping others. Thus in this section, we also refer to the research literature to help identify strategies that are likely universally positive in their impact.

The doors at the end of this hallway attract attention and invite exit seeking, since there is nothing of visual interest to distract residents along the way.

A series of visually interesting and interactive quilts distract residents and help turn them in the direction of the dining room instead of the exit doors.

Project One: Reducing Exit Seeking and Facilitating Wayfinding

At Community Three, much staff time is spent redirecting residents with dementia away from the exit doors. Due to the building's design, a majority of residents walk toward the double exit doors on their way to the dining room, which is down a side hallway. At the start of the project, there were few wayfinding cues to help them identify the path to the dining room, or even their own rooms. There was also a lack of interesting items in the hallway to captivate one's attention. This type of environment often leads to boredom and exit seeking.

Exit seeking behaviors can usually be curbed once staff understands why a specific person is exit seeking, and then engages them in meaningful activities during the times when exit seeking behaviors are most frequent. In a summary of current research literature, Day and Calkins (2002) discuss strategies that have been found to successfully discourage residents' exit attempts, such as a full length mirror placed in front of the exit door (Mayer & Darby, 1991); two-dimensional grids on the floor in front of doors (possibly interpreted by residents as three-dimensional barriers) (Hussian & Brown, 1987); cloth panels to camouflage door knobs or panic bars (Namazi, Rosner, & Calkins, 1989); and closed, matching mini-blinds installed to restrict light and views through exit door windows (Dickinson, McLain-Kark, & Marshall-Baker, 1995). Disguised doors may be most effective in limiting exit attempts when disguises (blinds, etc.) also limit views to attractive nearby locations (Chafetz, 1990; Morgan & Stewart, 1999; Namazi, Rosner, & Calkins, 1989). Kincaid and Peacock (2003) found that a wall mural over the exit door significantly reduced overall door testing behavior. However, a mural that disguises the door is not allowed by current fire regulations in many states.

The staff tried several different environmental interventions to curb exit seeking while creating effective wayfinding cues. The first modification was painting the exit vestibule a significantly darker color than the surrounding corridor walls. Prior to painting the exit vestibule, there were 18 occurrences of exiting seeking over a seven day period. After painting, there were again 18 occurrences of exiting seeking over the next seven day period. Though the vestibule remained a dark color for several months, this intervention never proved to be successful.

Clockwise from Left

A hat with a center pocket holds flowers that can be buttoned and unbuttoned. The hat's ribbon can be tied and untied.

A beach scene with real shells, sea glass, drift wood, fluffy clouds, and textured fabric for sand provide a varied tactile and visual experience.

A fishing boat with a netting pocket, fishing rods, and fish that fit within the waves has movement colors, textures, and items to manipulate.

Passersby are invited to make veggie soup by flipping through a brightly colored book and picking out vegetables to stick in the pot. The garden above it offers items for reminiscence such as shovels, seeds, and even a frog hiding under a watering can!

These interactive quilts hung throughout the hallway make the exit less interesting.

Success with Quilts

Other modifications addressed wayfinding and the lack of interesting, homelike items in the environment. First, the community changed the bland cream colored walls and painted the hallways a cheerful blue. Next, interactive wall quilts were placed at the corner of the hallways before the exit doors. The researchers commissioned a fiber artist to create these works of multisensory art for display. By using fabrics of varied colors and textures, the artist created three separate interactive pieces that invite passersby to touch, tie, button, move, admire, and reminisce as they walk through the community. Each piece was created to withstand manipulation and sized so that all parts of the wall hanging can be easily reached by the residents. The quilts were strategically placed to serve as landmarks for wayfinding and distract residents from the exit doors.

"Each of the three quilts created for the community has a unique theme. The first quilt has a beach theme with soft 'sand' to touch, rocks lining the beach, and a fishing boat with wooden rods and fish on lines that can be placed in a variety of pockets to move them through the sea. This quilt was placed near the existing aquarium, and staff have observed residents looking from the quilt to the aquarium and back again seemingly making the connection with the two features.

This hallway lacks both wayfinding cues and interesting, homelike décor.

Resident created shadow boxes serve as personal landmarks and opportunities for reminiscence.

"The second quilt is a Spring theme with a bonnet with button-on flowers and a ribbon to tie and a tree of life with Velcro birds and leaves to move to various places. This quilt is strategically placed just before the exit doors and serves as a great conversation starter between residents and staff as they near the corner where they must choose to either turn down a hallway toward the dining room or continue straight to the exit doors. As residents and staff stop and turn to look at and interact with the quilt, their bodies are positioned to head down the hallway, setting them up for a successful turn down the hall rather than out the doors. With this quilt, residents self-initiate most frequently with the Velcro leaves and manipulate these often without staff direction.

"The third quilt has a gardening and cooking theme with brightly colored vegetables, a recipe book with pages that turn, and Velcro vegetables that can be removed from the recipe book and placed into a pot of stew. The community is very outdoor oriented with a beautiful courtyard and its own farmer's market during the summer. Perhaps due to this predisposition or because of the bright colors, this quilt is a resident and staff favorite. As one resident passed the reception desk, which is at the opposite end of the hall from the quilt, he proclaimed with a big smile on his face, 'I moved all the vegetables around!'

"The quilts create endless opportunities for play and conversation. Many of the residents were quilters or fondly remember their mother or other family member piecing quilts. Each quilt has two squares that are traditional quilt patterns, and residents take the time to explain to staff the significance of each or to tell stories about quilts they have created. The subject matter of each quilt also starts conversations, such as reminiscing about trips to the beach."

Success with Shadow Boxes

Lastly, residents created shadow boxes to provide room identification cues, allow them to express themselves, and help staff learn about important milestones in the their lives.

"When staff was initially introduced to the I.D.E.A.S., Inc. study and the shadow boxes, we were absolutely thrilled. Shadow boxes are something that we have been wanting for the outside of residents' rooms for quite some time to not only help them way find but also to have a representation of themselves.

"We held an initial meeting to decide on a process to create the shadow box for each resident. It was important to us to create shadow boxes that had real meaning for each resident rather than seeing this project as a series of tasks to be completed. It was decided at the meeting that the Activities Director would take the lead on the project and that two certified nursing assistants, the social worker, social work interns, and volunteers would support the project by talking to family members and supporting the residents by talking with them about the project and reminiscing about their lives to generate ideas for what to include in the shadow box.

"At the outset of the project, we sent a letter to all families asking for their involvement. We followed up by discussing the project at each quarterly care conference, complete with a sample shadow box that our Activities Director made for herself! We also included an article about the shadow boxes in our monthly newsletter that goes out to family and friends of Health Center residents and stayed in touch with families regarding this project via email. Family members were encouraged to bring in items in addition to those the resident had in their living space such as old photos and treasured items.

"Once all objects for a particular box were acquired, the Activities Director, social work intern, or volunteer initiated the creation of the shadow box. Residents who were interested in being a part of the crafting process were encouraged while others preferred to watch and tell stories about the items. Backgrounds, photographs, and personal belongings were discussed and placed in each box with care and consideration. Family was also encouraged to participate in the making of the shadow box with their loved one. Each resident also selected whether they wanted their box to be horizontal or vertical. When their box was finished, each resident selected the height at which they wanted their box to be hung, usually based on where they could most easily view it.

"The making of the shadow boxes was extremely rewarding for both the residents and the staff involved. It was an absolute pleasure to have the opportunity to create works of art representing each and every person that lives in the Health Center. We have found that the shadow boxes are sources of pride for their owners. They are conversation starters between residents, allowing people a medium through which to share their stories and to get to know one another. Family members walk through the halls with their loved ones looking at each box and talking about the people who live there. Staff have learned more about the people for whom they care. The shadow box project has been successful from start to finish. We expect that each person's shadow box will evolve over time as each person identifies new objects they wish to include or grow tired of other items currently in the boxes. The shadow boxes are easily renewed and will remain a dynamic piece of art here."

By implementing multiple interventions and involving staff, residents and family, this community has created a more homelike setting that provides meaningful cues and stimulation for community members as they move from place to place throughout the building.

Even light levels and glare reduction can help residents better see their food and thus eat more.

This dining room has dark areas and glare from light fixtures.

New ceiling fixtures create more even light levels and reduce glare.

From Left
Small menus holders and entrance signage are barely noticeable and difficult to read.

Oversized signs display the menu in large print.

Large sign above entrance identifies the dining room.

Project Two: Increasing Oral Intake

Maintaining or increasing oral intake in people with dementia is regularly a concern for long term care staff members. Researchers are looking for ways that the environment can encourage those with dementia to spend more time eating and enjoying the food offered. One study examined the effect of improved lighting and enhanced table setting contrast on oral intake and behaviors during meals for individuals with dementia (Brush, Meehan, & Calkins, 2002). A 3-day calorie count, foot-candle measures (light intensity), and measure of functional abilities were administered at baseline and post-intervention four weeks later. After enhancing the lighting and table setting contrast, there were significant improvements in both oral intake and functional abilities during meals.

To test their hypothesis that agitation in people with dementia may be triggered by a decrease in the amount of ambient light, Koss and Gilmore (1998) evaluated 13 residents' oral intake during the evening meal before and after improving the table setting lighting and visual contrast. The researchers found that by enhancing light at the dining tables and providing table settings with maximum visual contrast during dinner, residents with dementia ate more and displayed negative behaviors less frequently than before the change in lighting. A third study examined how contrast manipulations affected intake levels of nine men with advanced Alzheimer's disease (Dunne et al., 2004). White tableware was used for the baseline and post-intervention conditions, and high-contrast red tableware for the intervention condition. Mean percent increase was 25% for food for the high-contrast intervention (red) versus baseline (white) condition, with 8 of 9 participants exhibiting increased intake. All three studies concluded that simple environmental manipulations, such as increased lighting and contrast enhancement, can significantly increase food and liquid intake in people with dementia.

In Community One, approximately 75-80% of the residents who attend meals have dementia. The Community offers a large choice of menu items that are plated individually for each person in the adjacent large pantry. Residents choose when they would like to attend meals and may come to the dining room within flexible meal times. Staff noted that some residents fell asleep during meals, were easily distracted and found it hard to focus, and would sit for long periods of time without eating even though they were capable of feeding themselves.

The ECAT™ was completed for the dining room space and the following environmental barriers were identified.

Lighting

- Light levels were low and uneven with measurements ranging from 9-45 fc
- Residents had difficulty reading the menus
- Very little natural light was available
- Glare came from the windows during certain times of the day
- Light bulbs in ceiling fixtures had varying color renditions
- Ceiling had incandescent recessed lights in some areas causing significant glare on the tables and art work on walls

Walls

- No identifiable entry or exit
- Swinging doors into pantry were not clearly marked and were distracting to residents

Windows

- Window coverings were not adjustable
- Windows were difficult to open
- Tissue boxes were placed in window sills

Acoustics

- No barrier from pantry noise. Heard music playing and staff talking in pantry each time doors opened.
- Radio was playing in the dining room (station was chosen by residents)

Signs

- No sign outside dining room to indicate which meal is being served
- No large sign outside of entrance to identify it as the dining room
- No identifiable objects indicating entrance to a dining room
- No large print menus available

There were 45 people who regularly ate in the dining room for the entire six month period of the study (new residents or individuals who passed away or left the community were not included in this analysis). Six of these individuals were identified by staff as having behaviors that significantly impacted their ability to complete the meal, such as refusing to feed one's self despite having the skills, unable to focus on the meal or falling asleep. These individuals were closely monitored for the level of cueing they required from staff during the meal. Intake at meals was recorded for each of the 45 people for an entire month at baseline and after each of the three interventions. For the baseline condition, no changes were made in the dining room. Individuals' food was served on the community's white plates on top of paper placemats at lunch and tablecloths at dinner. The first intervention changed the plates from white to a bright gold-yellow on top of a high-contrasting, solid maroon placemat (chosen by the residents). The second intervention included renovations to the dining room. New lighting fixtures were installed to increase and even out light levels, ceiling tiles were replaced with tiles that have a higher noise reduction coefficient, a partition was constructed in front of the pantry doors to reduce reverberation, old wall paper was removed, walls were painted, the entrance to the dining room was painted a distinguishing color to contrast from the hallway, new large print menu displays were added and adjustable window treatments were installed to reduce glare and increase natural light levels. The third intervention changed the plate color to red (placed on a light colored placemat) after the dining room renovations were complete.

Results

The first test analyzed the difference in intake using the yellow plate and maroon placemat. Mean consumption for one month at baseline for the 45 individuals was 74% of the meal. Mean consumption for the month after changing to yellow plates was 70% of the meal, a reduction in consumption. While the changes were intended to increase consumption, it is possible that, while the yellow plates contrasted with the maroon placemat, there was not enough contrast between the food and the plate.

The second test evaluated the impact of the environmental modifications. At the beginning of the study, the lighting levels, assessed at 15 different tables, ranged from 9 to 45 footcandles (fc), with a mean of 31fc. It was the community's goal to have even light levels throughout the room with light levels of at least 50fc at each table. Following the installation of new lighting, measurements were made at the same tables, and light levels ranged from 35fc to 102fc, with a mean of 61fc ($p \leq 0.000$), a significant change, although light levels were not even throughout the room. As one would expect, tables next to windows had much higher light levels. The data was re-run without the data from the single table that was 102fc (an outlier), and the increase in lighting remained statistically significant ($p \leq 0.000$). After the dining room renovation and improvements in light levels, intake was recorded for an additional month. Mean consumption was 77% which is a statistically significant increase from baseline ($p \leq 0.000$) and from the time using yellow plates ($p \leq 0.000$).

Changing plate and placemat color can reduce or increase contrast at the table setting.

After the dining room renovation and improvements in light levels, intake was recorded for an additional month. Mean consumption with yellow plates post renovation was 77% which is a statistically significant increase from baseline ($p \leq 0.000$) and from the time using yellow plates before renovation ($p \leq 0.000$). Lastly, the plate color was changed to red with a white placemat and intake was measured for one more month. A matched sample t-test was conducted comparing consumption on yellow plates, post renovation with consumption on red plates, post renovation. Mean consumption on yellow plates was 75.303, and mean consumption on red plates was 76.464 (not significant). Interestingly, 26 individuals increased in consumption, 23 maintained steady consumption, while only 14 residents experienced decreased consumption with the red plates. Change in consumption ranged from -31.5% (reduction in consumption) to 24.22% (increase in consumption). A post-hoc analysis was conducted by removing 3 outliers who had much greater change in consumption (two decreased and one increased). The remainder of the residents' change in consumption ranged from -12% to 16% with a mean change of 5.5% (increase). With the 3 outliers removed, the means were 74.62 (yellow plates) and 76.77 (red plates ($p \leq 0.04$).

Results for the six individuals whose functional abilities were recorded during meals is as follows. After the lighting changes, COMFI scores improved significantly ($p \leq 0.04$) from a mean score of 73.67/100 to a mean score of 82.67/100. Specifically, the Psychosocial Interaction and Cognition portions of the COMFI improved ($p \leq 0.03$ and $p \leq 0.04$ respectively). Staff also tracked the amount of cueing residents needed in each condition. Yellow plates only made positive impact on one resident; yellow plates and increased lighting combined had statistically significant positive impact on three residents; and the red plates and increased lighting made statistically significant positive impact on three residents.

Over a six month period during which one would expect a decline in functional abilities in people with dementia, the individuals in this study actually increased the amount consumed during meals after updates lighting and dining room décor. There was a trend toward greater consumption with the red plates, but the difference was only marginal and may not be clinically significant.

About the Assessment Tools Used

The *Environment and Communication Assessment Toolkit for Dementia Care*™ (ECAT™) is an assessment protocol designed to be used by clinicians who work with people with dementia in long-term care settings (Brush, Calkins, Bruce, & Sanford, 2012). Speech-language pathologists, occupational therapists, physical therapists, nurses, and other direct care staff will find the ECAT™ useful for identifying environmental barriers and facilitators to communication and developing appropriate interventions to support communication. The ECAT™ is the first resource of its kind to guide clinicians through learning about the impact of the environment on communication and to provide practical tools for identifying interventions to improve communication. The components of the ECAT™ include a Manual, Assessment Instruments (including light and sound level meters), and Intervention Procedures.

The *I.D.E.A.S. Resident Related Stressors Scale* (Calkins, 2011) is a tool that records how often residents engage in behaviors that are bothersome to others and/or stressful for staff to manage. Staff report in what spaces or during which activities these behaviors occur as well as the staff perceptions of these spaces/rooms.

The *Montreal Cognitive Assessment* (MoCA) was designed as a rapid screening instrument for mild cognitive dysfunction (Nasreddine et. al., 2005). It assesses different cognitive domains: attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation. The total possible score is 30 points; a score of 26 or above is considered normal. All residents in the study were given the MoCA to screen for dementia. Available at **www.mocatest.org**.

The *Saint Louis University Mental Status* (SLUMS) examination is a 30-point screening questionnaire that tests for orientation, memory, attention, and executive functions (Tariq et. al., 2006). The total possible score is 30 points; a score of 27 or above is considered normal, 21-26 is considered mild neurocognitive disorder, and a score of 1-20 is considered dementia. All residents in the study were given the SLUMS to screen for dementia. Available at **http://medschool.slu.edu/agingsuccessfully/pdfsurveys/slumsexam_05.pdf**.

The *Functional Assessment Staging of Alzheimer's Disease* (FAST) is a functional scale designed to evaluate people at the more moderate-severe stages of dementia when the MMSE no longer can reflect changes in a meaningful clinical way (Reisberg, 1984). In the early stages the person may be able to participate in the FAST administration but usually the information should be collected from a caregiver or care community staff. The FAST scale has seven stages: 1 which is normal adult; 2 which is normal older adult; 3 which is early dementia; 4 which is mild dementia; 5 which is moderate dementia; 6 which is moderately severe dementia; and 7 which is severe dementia. A copy can be found online at **http://geriatrics.uthscsa.edu/tools/FAST.pdf**.

Communication Outcome Measures of Functional Independence: The COMFI Scale (Santo Pietro & Boczko, 1997) measures everyday function and communication. It can be administered by anyone familiar with the person with dementia through observation of the person's performance. The COMFI Scale examines psychosocial interaction, communication and conversation, meal-time independence, and cognition. The highest possible score one can achieve is a 100, meaning that the person is independent in all areas 76-100% of the time. The COMFI was used to examine changes in functioning as a result of the dining room renovation in Community 1.

Acknowledgments

The authors would like to extend enormous thanks to many the staff, residents, and families who volunteered for this project. They spent numerous hours completing assessments, collecting data and implementing modifications. This project would not have been possible without them. All persons who participated in this study and/or their guardians provided written consent prior to their participation. All photos were taken and published with consent of the individuals and/or their guardians involved. We thank everyone for their willingness to help us to improve the quality of care for people with dementia. This project was funded by the National Institute on Deafness and Other Communication Disorders.

References and Resources

Bourgeois, M. (2007). *Memory Books and Other Graphic Cuing Systems.* Baltimore, MD. Health Professions Press.

Brush, J., Calkins, M., Bruce, C., & Sanford, J. (2012). *Environment and Communication Assessment Toolkit for Dementia Care.* Health Professions Press, **www.healthpropress.com**

Brush, J.A., & Camp, C.J. (1998). *A Therapy Technique for Improving Memory: Spaced Retrieval.* Beachwood, OH: Menorah Park Center for the Aging.

Brush, J. A., Meehan, R. A., & Calkins, M. P. (2002). Using the environment to improve intake in people with dementia. *Alzheimer's Care Quarterly,* 3 (4), 330-338.

Calkins, M. (2011) *I.D.E.A.S. Resident Related Stressors Scale.* Unpublished, available from I.D.E.A.S., Inc. **www.ideasconsultinginc.com**

Chafetz, P. K. (1990). Two-dimensional grid is effective against demented patients exiting through glass doors. *Psychology and Aging,* 5(1): 146-147.

Day K., & Calkins, M.P. (2002). Design and Dementia. In R. Bechtel & A. Churchman (Eds.) *Handbook of Environmental Psychology.* John Wiley & Sons. 2-53.

Dickinson, J., J. McLain-Kark, et al. (1995). The effects of visual barriers on exiting behavior in a dementia unit. *The Gerontologist,* 35(1): 127-130.

Dunne, T. E., Neargarder, S. A., Cipolloni, P. B., & Cronin-Golomb, A. (2004). Visual contrast enhances food and liquid intake in advanced Alzheimer's disease. *Clinical Nutrition,* 23(4), 533-538.

Hussian, R. A., & Brown, D. C. (1987). Use of two-dimensional grid to limit hazardous ambulation in demented patients. *Journal of Gerontology,* 42(5), 558–560.

Kincaid, C., & Peacock, J. (2003). The effect of a wall mural on decreasing four types of door-testing behaviors. *Journal of Applied Gerontology,* 22, 76-88.

Koss E, Gilmore GC. Environmental interventions and functional ability of AD patients. In: Vellas B, Filten J, Frisoni G, eds. *Research and Practice in Alzheimer's Disease.* New York: Serdi/Springer; 1998.

Mayer, R., & Darby, S. J. (1991). Does a mirror deter wandering in demented older people? *International Journal of Geriatric Psychiatry,* 6, 607–609.

Morgan, D. G., & Stewart, N. J. (1999). The physical environment of special care units: Needs of residents with dementia from the perspective of staff and caregivers. *Qualitative Health Research,* 9(1), 105–118.

Namazi, K. H., Rosner, T. T., & Calkins, M. P. (1989). Visual barriers to prevent ambulatory Alzheimer's patients from exiting through an emergency door. *The Gerontologist,* 29, 699–702.

Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, & Cummings JL, Chertkow H. (2005). The Montreal Cognitive Assessment (MoCA©): A Brief Screening Tool For Mild Cognitive Impairment. *J Am Geriatr Soc* 53:695–699.

Reisberg, B. (1988). Functional Assessment Staging (FAST). *Psychopharmacology Bulletin,* 24: 653-659.

Santo Pietro, M. & Boczko, F. (1997). *Communication Outcome Measures of Functional Independence: The COMFI Scale.* The Speech Bin.

Tariq S., Tumosa N, Chibnall J., Perry, M., 3rd, & Morley J. (2006). Comparison of the Saint Louis University mental status examination and the mini-mental state examination for detecting dementia and mild neurocognitive disorder – a pilot study. *Am J Geriatr Psychiatry,* 14(11):900-10.

Interactive Quilts by fiber artist Anne Marsh Stottler, tinyflowers@windstream.net

I.D.E.A.S., Inc.
8055 Chardon Road, Kirtland, Ohio 44094
440.256.1880 | www.IDEASConsultingInc.com

Brush, J., Fleder, H., & Calkins, M. (2012). *Using the Environment to Support Communication and Foster Independence in People with Dementia: A review of case studies in long term care settings.* Kirtland, Ohio: I.D.E.A.S., Inc.