

Touch, Smell, Hear, and See: Programming for Late-Stage Dementia

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Abstract

The growing rate of Alzheimer's (AD) is projected to affect up to 16 million individuals by 2050 (Center for Disease Control and Prevention [CDC], 2011). Currently, there is no cure for AD (CDC, 2011) and treatment often involves potentially harmful pharmaceuticals that only ameliorate symptoms (Gitlin, Kales, & Lyketsos, 2012). Approaches used in occupational therapy offer alternatives through sensory-based activities that elicit positive responses through touch, smell, sight, hearing, and proprioceptive input to decrease symptoms, increase function, and prolong health (Wood, Womack & Hooper, 2009). Cascade Park Gardens (CPG), a memory care facility in Tacoma, WA, was the setting for this project where an occupational therapy student team provided sensory-based activity kits to support residents in late-stage AD. A pilot program revealed decreased agitation and increased participation among multiple residents. In addition to the kits, a manual, an in-service training, and an exit survey were provided to educate the staff on the activities to reinforce the effectiveness of the sensory-based activity kits.

Objectives: At the end of the poster session, participants will be able to:

1. Identify 4 senses that can be used to elicit a positive response in people with late-stage AD and how.
2. Identify how and why sensory-based activities are relevant for these residents.
3. Describe 2 ways the staff at CPG will benefit from this project.

Introduction

Alzheimer's (AD) is a progressive neurological disease that affects older adults. With no cure available for AD, common treatment supports health through decreasing symptoms and preserving quality of life (Ettema, Dröes, Lange, Mellenbergh, & Ribbe, 2005). People living with AD experience cognitive losses that decrease abilities to participate in valued occupations, therefore, jeopardizing their quality of life (Chiu et al., 2013). One way to engage this population in activity is through utilizing sensory strategies, an area of relatively new research in geriatric care (Sanchez, Millan-Calenti, Lorenzo-Lopez, & Maseda, 2013). The purpose of this project was to design and implement sensory-based kits to be utilized in a memory care unit to increase life satisfaction.

A facility that specializes in memory care and supports residents with varying cognitive abilities, such as those with AD, is Cascade Park Gardens (CPG) in Tacoma, Washington. Currently, their activities program is well-suited for high functioning residents, providing opportunities to participate in daily activities, including crafts, bingo, musical shows, and outings. However, CPG lacks appropriate activities for lower functioning residents who are limited in their ability to participate. According to the CPG Activities Director, Monika Cubine and the Nursing Director, Sonia Ferrera, the first floor residents are unable to engage in traditional activities used on other floors because their attention spans and ability to follow directions are almost absent (M. Cubine and S. Ferrera, personal communication, December 20, 2013).

According to Bowlby, lower functioning residents typically do not process information in the same way as higher functioning residents (1993). This population can become easily over or under stimulated, resulting in withdrawal or agitation. Many residents may have lost the ability

to initiate an activity, even if it is something they enjoy. Others may not verbalize or even physically participate, however their brains are quite active. It is imperative that the activities that lower functioning residents are presented with are ones they can understand and participate in (Bowlby, 1993). Through sensory-based activities, residents can receive input that supports them in participation. Residents need these activities in their immediate surroundings in order to receive the intervention and to provide brain stimulation (Chiu et al., 2013). Sensory-based activities are unique as they do not rely on cognitive skills, which make them one of the most highly effective treatments for people in late-stage dementia (Bowlby, 1993).

When a person or group of people lose the right to choose meaningful activities due to external constraints, they become vulnerable to occupational deprivation. This relates to the concept of occupational justice, which states that everyone should have the right to participate in occupations that are meaningful and valuable in order to create a personalized quality of life (Wilcock & Townsend, 2009). Therapists and caregivers working with people with AD should continue to support them in participating in life as fully as they can, regardless of their level of cognition. Occupational therapists are inherently excellent resources and advocates for addressing the needs of people with AD who are typically in danger of occupational injustice (Wilcock & Townsend, 2009). The occupational therapy student team (OTS) designed a series of sensory-based activities, a manual of resources and an in-service training to provide the CPG staff with tools to engage the residents in meaningful activity to prevent occupational deprivation.

Literature Review/Background

Dementia and Alzheimer's

The word “dementia” is a comprehensive term to describe a number of neurologically progressive or static cognitive diseases (Doble & Vania, 2009). Alzheimer's is the most prevalent type of dementia in people 65 and older (Schaber, 2011). A large number of individuals born between 1946 and 1964, referred to as “Baby Boomers,” are presently aging into the highest risk categories. The Alzheimer's Association projects that this at-risk population will double every five years (Alzheimer's Association, 2014). According to statistics from the Center for Disease Control and Prevention (2011), the disease is expected to affect 11 to 16 million individuals by 2050. Treatment must continue to improve if society is to meet the growing demands of the aging population.

Alzheimer's attacks the nervous tissues of the brain resulting in a range of symptoms, including deficits in memory, thought formation, and language skills, as well as motor function. All of these negatively impact a person's ability to perform daily tasks and valued occupations (Alzheimer's Association, 2014), resulting in feelings of major disorientation and physical discomfort (Schaber, 2011). The abilities of people with AD can be described using Allen's Cognitive Levels, an ordinal scale commonly used by healthcare professionals, which rates a person's cognition from zero to six with higher numbers indicating higher function. These levels serve to describe an individual's cognitive status and help to paint a picture of his or her level of function as the disease progresses (Allen, 1982).

Understanding the Allen's Cognitive Levels helps professionals provide appropriate care and treatment (Doble & Vania, 2009). According to the scale, a person at level six is capable of problem solving, trial and error and organizing his or her behavior. At level five, function starts

to diminish as problem-solving capabilities lessen, especially regarding a person's ability to anticipate and plan for future activity demands (Allen, 1982). Individuals at level four perform familiar tasks, but are unable to master new skills. They tend to focus on immediate surroundings and are generally unaware of what is outside their personal space. A person at level three is described as only being capable of performing repetitive tasks. For these people, 24-hour caregiver assistance is recommended. Individuals at level two, who are mainly concerned with fulfilling basic needs, such as comfort, may become easily agitated and have aimless actions such as pacing or wandering. Individuals at level one have little motor control and are unaware of much outside of their immediate self. Individuals who are below level three are at risk for limited participation in activities (Allen, 1982).

Considering the progressive nature of the disease, treatment for people with AD is typically focused on their symptoms (Schaber, 2011). Common symptoms for people in the low ranges of Allen's Cognitive Levels include multi-sensory loss, personality and mood changes, and decreased ambulation (Allen, 1982). Negative behaviors include unsafe wandering, combative behavior, agitation, and loss of attentiveness (Reisberg, 1984). These symptoms tend to be exacerbated as their ability to navigate the environment decreases (Schaber, 2011). People in the late-stages of AD present further challenges when it comes to treatment, as they are generally unable to self-report on their experiences, making it difficult to pinpoint the root of their symptoms (Reimer, Slaughter, Donaldson, Currie, & Eliasziw, 2004).

The Role of Medication

In an effort to care for people with AD, healthcare facilities and insurance companies invest in pharmacological methods, spending \$234 billion in 2008 (Gu, Dillon, & Burt, 2010). People with AD may be prescribed anti-psychotics like haloperidol and thioridazine to curb

negative behaviors. These medications are used despite the fact that they can be detrimental to a person's health, causing heart arrhythmias and possible death (Nazarko, 2009). A newer generation of medications, known as atypical antipsychotics, were thought to be safer. However, they can also result in negative side effects, such as increased weight and cholesterol gain, heightening the risk of stroke (Nazarko, 2009). Currently, both classes of drugs are directly linked to increased risk of death, and despite their "black box" warnings are used in treatment for dementia-related psychosis (U.S. Food and Drug Administration, 2013). Discoveries that these medications lack effectiveness and are potentially harmful to patients have resulted in trends away from using pharmacological treatment (Gitlin et al, 2012). Until there is a cure, research is focused on how to decrease symptoms of unwanted behavior such as agitation, verbal outbursts, and lack of focus (Padilla, 2011). The goal of medication is to limit negative symptoms, yet there are less invasive ways to increase participation and address quality of life that are not readily used.

The Role of Activity

When provided in a therapeutic way, activity can be an alternative to pharmaceutical interventions. Wood et al. (2009) found that when people with AD spend their time doing meaningful activities, there are greater displays of positive emotions rather than agitation and distress. Inadequate care or lack of environmental supports may lead them to experience further debilitating circumstances (Wood et al., 2009). For the AD population, it is necessary that they be provided with opportunities to participate in activities that maximize their engagement to prevent excess disabilities.

Participation in activities poses a challenge for people in late-stage AD, as they may be limited by negative symptoms (Kovach & Magliocco, 1998). When withdrawn or fatigued,

patients may seem to be disengaged from reality, but their inwardness may be a result of an inability to process sensory information or simply a lack of environmental and social support (Bowlby, 1993). Following an increase in environmental or social stimulation, after a period of relative deprivation, patients may experience improved social and communication skills known as “rementia” (Kitwood & Brendin, 1992). One study showed that the majority of patients were likely to participate for longer periods when engaged in spiritual and sensory-based activities when compared to other activities such as exercise and pet therapy. This study also found that the duration of participation increased when two or more senses were stimulated (Kovach & Magliocco, 1998). For people with AD, activity is principally important in that it can provide a sense of purpose and therefore, lasting roles and identity (Egan, Hobson, & Fearing, 2006).

The Role of Caregivers

People living in long-term care facilities are supported by teams of professional healthcare providers, including physicians, nurses, and nurse’s aides, among others (Alzheimer’s Association, 2014). Teams work to maintain an individual’s participation in activities of daily living such as bathing, dressing, grooming, and leisure. For people in the earlier stages of AD, caregivers can provide access to puzzles, bingo, social events, and television. However, for people in the later stages who are severely limited in function, team members are challenged to deliver more than tutelary services for a range of reasons, including lack of training or insufficient staffing (Kovach & Magliocco, 1998). Caregivers, specifically certified nursing assistants, may not have adequate training to match the high demands of specialized care units. They are also more likely to report instances of low job satisfaction and even higher instances of depression (Brenner et al., 2006). Not surprisingly, these positions are known to have high turnover rates (Coogler, Parham, & Young, 2007).

With Americans aging at a rapid rate, an additional 3.5 million healthcare workers will be needed by 2030 (Alzheimer's Association, 2014). As a result, finding new, innovative ways to alleviate the paid caregiver burden is of high importance to the healthcare industry. Multisensory approaches to treatment result in short-term reduction of AD symptoms, which decreases the amount of time caregivers spend coping with negative behavior, greatly reducing the demands of their job (Padilla, 2011). Interventions provided by occupational therapists are designed to help caregivers deal with complications related to individuals with AD in order to alleviate their overwhelming workload (Corcoran & Gitlin, 2001).

Current Healthcare Policy

After much debate over the structure of the United States' healthcare system, the government is making substantial changes to accommodate the needs of Americans. President Obama signed the Patient Protection and Affordable Care Act (PPACA) into effect in 2010 which aims to provide insurance to nearly 94% of American citizens, as well as to improve services and cut cost (Responsible Reform For The Middle Class, 2010). Many of the aspects of its implementation have already gone into effect, however the law will take years to be fully operational. Part of this law increases access to innovative medical therapies and improves the resources available to older adults living in long-term care. Special priority within the PPACA is given to improving these facilities (Responsible Reform, 2010).

Another important bill for the future of AD was enacted in 2012 by President Obama and the U.S. Department of Health and Human Services (HHS), titled the National Plan to Address Alzheimer's, which allocates \$156 million to "prevent and effectively treat" the disease by 2025. This plan outlines several goals and strategies that will help to achieve the objective, including enhanced care, support and awareness, as well as funding for research. The HHS is attempting to

develop medical and non-drug related therapies that reduce the prevalence of AD and provide treatment for its symptoms (U.S. Department of Health and Human Services, 2012).

Long-Term Care

According to the CDC, there were 15,700 nursing homes operating in the United States in 2012 (Harris-Kojeti, Sengupta, Park-Lee, & Valverde, 2013). People in long-term care facilities are provided for in-terms of medical treatment, yet they often lack optimal social and physical environments (Reimer et al., 2004). Since the passing of PPACA, special care units (SCU) are emerging to accommodate the growing number of people diagnosed with AD. These facilities not only focus on medical treatment, but also train staff to enhance the social and physical environments through meaningful activities and greater personal contact (Reimer et al., 2004). As stated by Reimer et al. (2004), people living in SCU's score higher on measurements of quality of life and have lower reports of anxiety and fear in comparison to traditional institutions.

Occupational Therapy Involvement in Alzheimer's

Occupational therapy (OT) practitioners are effective in achieving goals with older adults in a variety of settings, including traditional and special care units (Carlson, Fanchiang, Zemke, & Clark, 1995). The Occupational Therapy Practice Framework (2008) provides client-centered guidelines for OT practitioners to address the needs of clients, including people with AD. Some of these needs include strategies for preventing negative behaviors and sensory-based activities that will ultimately facilitate participation. Individuals in late-stage AD are often unable to participate in group activities (L. Barnett, personal communication, February 22, 2013). However, it is believed that through the engagement of senses, the mind and body can be stimulated in a similar way to group activities (Baker et al., 2003). Thus, the use of sensory-based activities as additional treatment are valuable therapeutic interventions for people in late-

stages of AD.

Sensory Activities as Treatment

Along with national legislation and strides to redefine quality care, additional treatment modalities are gradually influencing the future of AD treatment (Alzheimer's Association, 2014). Incorporating sensory input through activities is one form of such therapy. As aging adults experience a decline in sensory function, studies have shown that sensory deprivation results in poor concentration, motor coordination and increased disorientation (Bowlby, 1993). Because the AD population frequently experiences sensory deprivation, presenting meaningful and familiar smells, visual and tactile sensations and sounds in a simple format can compensate for this loss (Bowlby, 1993). Multi-sensory experiences that integrate a variety of sensory stimuli are becoming increasingly popular due to the therapeutic effects they have on individuals with AD (Klages, Zecevic, Orange, & Hobson, 2011).

Researchers have noted positive effects in people with AD, such as increased engagement, as well as decreased fear and anxiety, following a short-time spent experiencing sensory input (Hope, 1997; Hope & Waterman, 1998). Studies provide evidence that sensory-based activities can be effective in mitigating negative behaviors by reducing agitation while promoting relaxation and a calm mood (Padilla, 2011). Studies also support the positive effects sensory-based activities have on a person's ability to interpret and give meaning to the environment that previously was confusing or disorienting (Padilla, 2011). Staal, Pinkey and Roane (2003) found that patients may speak more spontaneously and relate better to others after interacting with sensory stimuli. Experts suggest that in order to be most effective, sensory-based activities should focus on repetitive and familiar tasks that involve many different senses (King, 2012).

Research shows that sensory-based activities are effective in making short-term behavior changes (Dowling, Baker, Wareing, & Assey, 1997). Sensory therapy may provide short-term change in unwanted behavior, however research shows that it does not guarantee a permanent change once the patient has left the treatment environment (Doble & Vania, 2009). Still, sensory-based activities are an appropriate treatment approach for people with AD because they do not focus on cognitive ability and can be implemented by staff without extensive training (Bowlby, 1993). Once the caregiver has helped them reach a state of calm, they can assist patients in essential self-care tasks, such as dressing, bathing, and feeding (Padilla, 2011). Specific treatments can be broken down by each sense to illustrate their calming and arousing elements. Sensory-based activities may incorporate tactile, proprioceptive, visual, olfactory, and auditory components.

Tactile

According to Calkins (2005), tactile input is a way to engage people with AD. In a literature review of quantitative and qualitative research about occupational therapy intervention for adults with AD and their caregivers, women with AD were found to increasingly identify with tangible objects that represented parts of their previous life and were used to maintain identity (Egan et al., 2006). Tactile senses can be stimulated by activities such as interacting with dolls, folding clothes, sorting nuts or buttons, and rolling yarn for comfort (King, 2012). It is important to create a pleasant environment by providing soft textures such as fur or velvet (Calkins, 2005). Touching objects and materials is satisfying to people with AD as they can do this independently (Bowlby, 1993). Research purports that sensory-based activities that are most effective at reducing agitation and supporting engagement include tactile tasks (King, 2012). Other examples of objects that provide tactile sensory input are familiar objects such as

telephones, pocket watches, hair brushes, horseshoes, leather ropes, cloth bound books, kitchen utensils, musical instruments, and sports equipment (Bowlby, 1993).

Proprioceptive

The sense of proprioception allows individuals to feel where their bodies are in space. According to Chen, Yang, Chi and Chen (2013), deep touch pressure can be used to regulate mood and manage anxiety. Physical touch or compensatory tools like weighted blankets decreases input to the parasympathetic nervous system, the flight or fight response, and produces feelings of calm and safety (Chen, Yang, Chi, & Chen 2013). Older studies indicate that pressure to the skin decreases respiration rate and blood pressure (Takagi & Kobayasi, as cited in Krauss, 1987). A study conducted on a convenience sample of 32 adults ranging from ages 18 to 64 with no apparent medical conditions or physical injuries found that after using a 30 lb. weighted blanket, 63% reported lower anxiety after use and 78% reported that the weighted blanket had a calming effect (Brian, Champagne, Krishnamurty, Dickson, & Gao, 2008). Research regarding the application of deep pressure reports no harmful side effects and has been noted to promote relaxation (Krauss, 1987).

Visual

A person's visual acuity and perception generally decreases with age and can be further diminished by the progression of AD. People with AD may have problems with depth perception, making it hard to distinguish the foreground from the background (Sadun, Borchert, DeVita, Hinton, & Bassi, 1987). Artwork and images in long-term care facilities should use simple, graphic imagery, so as not to cause confusion (Caspari, Eriksson, & Nåden, 2011). According to Caspari et al. (2011), sky scenery on the ceiling has been one effective environmental enhancement.

Lighting in care facilities often consists of overhead fluorescent lights. Ambient and less abrasive lighting, including cove lighting, creates a calming environment for residents.

Introducing lighting that simulates natural light is optimal in these facilities, as some rooms may not have windows (Calkins, 2005). For those who experience agitation and for whom soothing interventions are sought, research shows that using pastel shades are effective (King, 2012).

However, residents who have low vision and color blindness can benefit from deep primary colors (Calkins, 2005). Both methods show how using various colors is an option when considering visual sensory-based interventions. Additional examples of visual input are clear, uncomplicated pictures with bright colors and high contrast focused on simple subject matter such as antique cars, flowers, and mountains. Considerations for wall hangings include maps, posters or mirrors (Bowlby, 1993).

Olfactory

One method to affect the olfactory senses is through aromatherapy (Calkins, 2005; King, 2012). Aromatherapy has been found to be an effective non-pharmacological intervention method for people with AD, and may show some potential for improving cognition (Jimbo, Kimura, Taniguchi, Inoue, & Urakami, 2009). According to research, scents of lavender and lemon have positive results when gently massaged into the skin (Holmes, 2002). Additional ideas for olfactory input are peppermint and maple extract, scented candles, and flowers. Fir bark chips, sawdust, cut lemon, cinnamon sticks, herbal tea, and coffee have also shown to be effective (Bowlby, 1993).

Auditory

Long-term care facilities are rife with atmospheric noise including many bothersome sounds, such as exit alarms, elevators, and beeping medical equipment (Calkins, 2005).

According to Locke and Mudford (2010), music, an auditory stimulus, was especially effective in decreasing outbursts in people with AD. It has been shown that ubiquitously familiar sounds, such as those found in nature, are more likely to soothe the senses (King, 2012). Further examples that affect the auditory sense are musical instruments such as cowbells, triangles or meditation bowls. Atmospheric sounds such as whistles, nature sounds, party noisemakers, and bicycle horns are shown to be favorable (Bowlby, 1993).

Purpose Statement

The purpose of this project was to provide staff at Cascade Park Gardens (CPG) with sensory-based kits in order to support residents with late-stage Alzheimer's to participate in activities that increase quality of life and decrease negative behaviors.

Procedure

This project began with the OTS team researching the background, trends, and current research on AD and sensory-based activities. With the support of the project chair, a partnership with CPG was developed. The mission of this facility is to provide “compassionate care” by cultivating a familiar, home-like environment. The values of CPG include compassion, innovation, fun, and providing people with the utmost quality of life and dignity, regardless of their limitations. Through therapeutic activity and prolonging participation in life, the skilled staff at CPG promote independence and safety for their residents (Cascade Park Gardens, 2014).

To perform a needs assessment and foster rapport, the OTS team spent time with the residents at CPG in order to gather information to guide client-centered sensory-based activities. After this period of observation, further research on sensory-based activities and treatment concepts was completed in order to support the facility's specific needs. Additionally, a visit to a sensory room at another memory care unit, the Orting Soldier Home in Orting, Washington, was

made to see what elements are successful at other institutions.

Once this information was compiled, the OTS team made a list of items they would hand-make and purchase to put in the kits for CPG (see Description of Final Project for the detailed list). After the activity kits were completed, the team piloted the project with the residents. The purpose of this trial was to inform the OTS team whether activity components were to be refined in terms of grading, meaningfulness, clarity of instructional material and safety. Following the pilot, an in-service training was given on the research and application of various sensory-based activities. The staff interacted with the activities and reported their reactions in a short exit survey, followed by a discussion. Photographic documentation was taken during the pilot and in-service for use during a final poster presentation.

Description of Final Product

A comprehensive kit and manual were designed to support the staff at CPG to provide appropriate sensory-based activities for the first floor residents. The sensory-based activities provided in the kit encompass the visual, auditory, tactile, olfactory, and proprioceptive sensory systems. The sensory-based activities include; four weighted blankets, two weighted sweatshirts, two hardware fidget boards, two fidget pillows, one fidget apron, one aromatherapy diffuser and five different bottles of essential oils, two multi-colored fiber optic lights, one vibrating massager, two auditory CD's, one rotating LED "Crystal Ball" light projector, one "Space Projector" light, two multicolored fiber optic light, and an assortment of palm-sized, textured balls that can be manipulated for tactile input.

The spiral bound manual contains multiple sections, such as, background information, sensory research, and specifics of sensory-based activities items. There is information on the purpose of each sensory-based activity, how and when to use it, and basic upkeep of the

materials. An appendix includes worksheets for tracking individual preferences, resources for recreating items, supply lists, purchase locations, key terms, and references. The sections are tabbed and include colored photographs. The in-service training educated CPG staff and care providers on the importance of sensory-based activities, how to appropriately choose an activity and allotted time for the staff and care providers to experience the items themselves. During the in-service, the staff filled out a brief exit survey to demonstrate their comprehension of the purpose and inform the outcomes of the project.

Outcome of Project

An exit survey was completed during the in-service. The survey addressed the three goals and seven objectives outlined under the Goals and Objectives section. In order to meet the objectives and considered the in-service successful, the participating staff at CPG should score an 80% or higher. There were two optional questions on the survey designed to provide the OTS team with subjective insight regarding the quality and usability of the sensory-based activities.

On March 29, 2014, the OTS team piloted the sensory-based activities at CPG with the residents and staff present. The weighted sweatshirt provided proprioceptive input (e.g. lifting and carrying) for one male resident who was reported to push around a wheelchair and bump into other residents. When asked what he thought about the sweatshirt he said, "I love this." One woman, while fidgeting with the apron, engaged in reciprocal communication with a member of the OTS team. The fiber optic light appeared to have an instant calming or alerting response for multiple residents; one resident who reportedly spends his time dozing in his wheelchair was actively engaging with the fiber optic lights. Another resident, who was displaying agitated behavior instantly calmed down following the introduction of the Crystal Ball light projector on the walls and ceiling.

Goals & Objectives

Goal 1. Following an in-service and instruction on how-to use the kits, staff at CPG will have the knowledge to engage residents in sensory-based activities appropriately tailored to late-stage AD. This will be measured per participants report via an exit survey. This goal will be considered met if participants score 80% or greater on the survey. *This goal has been met.*

Objective 1. By the end of the in-service, participants will correctly identify three negative behaviors expected to decrease through the use of sensory-based activities.

Objective 2. By the end of the in-service, participants will be able to independently identify one or more reasons why participation in sensory-based activities increases the quality of life for residents.

Objective 3. Following the completion of the in-service, participants will identify one sensory-based activity and what sense it works on.

Goal 2. Through an in-service training session, the participating staff at CPG will increase their knowledge regarding sensory deprivation and how it affects the AD population. This will be measured per participants report via an exit survey. This goal will be considered met if participants score 80% or greater on the survey. *This goal has been met.*

Objective 1: By the end of the in-service training session, participants will independently state five senses that are affected due to aging.

Objective 2. By the end of the in-service, participants will correctly identify one reason why sensory deprivation interferes with a resident's participation with daily activities.

Goal 3. Through an in-service training session, staff at CPG will better understand how sensory-based activities can help to reduce caregiver burden. This will be measured per participants report via an exit survey. This goal will be considered met if participants score 80%

or greater on the survey. ***This goal was partially met*** (see *Limitations of the Project for details*).

Objective 1. Upon completion of the in-service session, participants will identify two or more reasons why engaging residents in sensory-based activities will decrease caregiver burden.

Objective 2. During the final portion of the in-service session, each participant will experiment with a sensory-based activity himself/herself. Following this experience, participants will state two ways they foresee themselves using the activities with the residents at CPG.

Implications for Occupational Therapy

Occupational therapists work to maintain, restore, and adapt people and their environments in order to optimize functional performance (American Occupational Therapy Association [AOTA], 2008). When working with aging populations who have cognitive deficits such as AD, occupational therapists consider appropriate activities, as well as the surrounding physical and systemic supports and barriers. By enhancing all areas that support individuals' participation in purposeful activities, what follows are increasing opportunities to improve client function, occupational performance, and ultimately, their quality of life (AOTA, 2008).

People with Late-Stage AD and Activity

People with cognitive disabilities, such as AD, are defined by the occupational therapist Claudia Allen (1982) as having a "restriction in voluntary motor action originating in the physical or chemical structures of the brain and producing observable limitations in routine task behavior" (Bruce & Borg, 2002 p. 245). Losses in body functions such as memory and cognitive deficits lead to detriments in most areas of occupation, including activities of daily living (ADLs), instrumental activities of daily living (IADLs), work, leisure, education, and social participation (AOTA, 2008). This concept led Allen to develop the Cognitive Disability frame of reference that guides treatment towards activities that utilize a person's remaining cognitive

ability, rather than aiming to develop it (Bruce & Borg, 2002). Typical activities are difficult for those with late-stage AD to understand and sequence, leading them to rely more on their senses in order to engage with their environment (Baker et al., 2003). Since these individuals are unable to engage in traditional activities performed by higher functioning groups, their participation in activities requires a unique approach. Thus, the focus of this project was to alter the elements that make up the environment at CPG in order to improve the performance and participation of its residents with late-stage AD, in order to enhance their overall quality of life.

Person, Environment, & Occupation

The Person Environment Occupation model (PEO) is an ecological model that was born out of the disability movement. It claims that a disability is merely the product of a mismatch between the demands of the environment, activities, and the person's abilities. The PEO model defines activity as "recognizable and observable behavior" and occupation as any "self-directed tasks" that an individual may engage in throughout life (Brown, 2009). In this model, the area in which the person, environment, and occupation intersect is referred to as a "goodness of fit" (Brown, 2009). When a person finds a synergy between herself or himself, the press of the environment and a meaningful occupation, the outcome is known as "occupational performance." Success in a person's occupational performance leads to improved function, engagement in meaningful activities, and an increased quality of life (AOTA, 2008).

Occupational therapists use their skills in activity analysis to assess the supports and barriers within contexts and environments that impact outcomes. These supports and barriers may be in the localized physical environment or in the broader structure of society. Analyzing the confluence of these along with areas of occupation, client factors, performance patterns, performance skills, and activity demands helps to find optimal activities that suit the individual

(AOTA, 2008).

At CPG there is a lack of “goodness of fit” between the residents with late-stage AD, the environment in which they reside, and their daily occupations. The dining room where the residents spend much of their day is depleted of appropriate environmental elements and activities. The sensory-based activities will help bridge the gap between resident, occupation, and environment. Adding sensory-based activities to the environment influences the person and his or her ability to participate in occupations as stated by the PEO model, resulting in improved occupational performance (Brown, 2009).

Limitations of the Project

Results of the exit survey were lower than 80% for goal three, indicating that participants had some difficulty in this area. The questions related to this goal asked them to state how they would use the sensory-based activities in the future. The OTS team hypothesized that this was difficult for participants to answer since they had not yet used the equipment. For instance, when asked to give two examples, some participants were only able to provide one. Ultimately, this goal is ongoing.

Due to the unique and individual sensory processes of each resident, reactions and behaviors may vary. Thus, there is an unpredictable element to this project. While one sensory-based activity may be effective with one person, it may have the adverse effect on another. Sensory needs and preferences may also vary from day to day, resulting in inconsistent responses from residents. It will take keen awareness on the part of the staff providing the activities to determine whether certain activities are bringing about the responses desired. The number of popular items will be limited, so sharing among residents will be necessary in some cases. Some items require supervision, which will rely on the support of staff to facilitate the activity. There

are safety concerns with some items, such as, placement of electrical equipment, choking hazards, and weighted or wood materials that could potentially cause injury. Replacement batteries are required for the fiber optics and multi-color string lights. Additionally, cleaning is a consideration due to incontinence or residents putting items into their mouths.

Recommendations for the Future and Sustainability

Recommendations of sensory-based activities to be added to the provided kits include: additional fiber optic lights of different sizes, shapes, and colors. An additional projector may be used in a smaller community room and can be purchased from Amazon.com. Lamps in the dining room can add softer ambient lighting for an overall calming and familiar effect. A waterfall machine may be purchased at a local garden store or online to provide prolonged calming auditory input. Plexi-glass can be purchased and cut to be mounted on a table with themed images underneath to provide visual input. An additional large hardware board can be handmade and mounted to the vertical surface of wall at eye-level to provide residents passing by with tactile input. The manual should be used as it provides recommendations related to general upkeep and damage prevention.

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Resources

Agrishop, Amazon, ARTCO Crafts, Goodwill, Harbor Freight Tools, Jo-Ann Fabrics, Lights.com, Marlene's Market, McLendon's Hardware, Trains Fabrics Etc., and WinCo

Key Players

Monika Cubine, Activities Coordinator, Cascade Park Gardens

Sonia Ferrera, Nursing Director, Cascade Park Gardens

Kristina Singh, Administrator, Cascade Park Gardens

Kirsten Wilbur, MS, OTR/L, University of Puget Sound

Tatiana Kaminsky, PhD, OTR/L, University of Puget Sound

Appendix
Cascade Park Gardens
Sensory Activity Program In-Service
Exit Survey
4/18/14

1. List 5 senses that are affected by aging.
2. Name 3 problem behaviors expected to decrease through the use of sensory-based activities.
3. Choose one sensory-based activity and list at least one sense that it works on.
4. State one reason why sensory-based activities could support a resident's participation in daily activities.
5. State one reason why participation in sensory-based activities could increase the quality of life for the first floor residents.
6. List 2 reasons why engaging residents in sensory-based activities could decrease caregiver burden.
7. Name 2 ways you see yourself using the sensory-based activities with the first-floor residents.
8. What sensory equipment did you enjoy the most? Why?
9. What are 2 things you learned today?

