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Management of Agitation in Individuals with Dementia: an Animal-assisted Therapy Approach

Karen L. Tanner
Philadelphia College of Osteopathic Medicine, karen_L_tanner@msn.com

Philadelphia College of Osteopathic Medicine

Department of Psychology

MANAGEMENT OF AGITATION IN INDIVIDUALS WITH DEMENTIA: AN ANIMAL-ASSISTED THERAPY APPROACH

By Karen L. Tanner

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Dissertation Approval

This is to certify that the thesis presented to us by Karen L. Tanner on the 18th day of March, 2003, in partial fulfillment of the requirements for the degree of Doctor of Psychology, has been examined and is acceptable in both scholarship and literary quality.

Committee Members' Signatures:

Bruce Zahn, Ed.D., ABPP, Chairperson

Robert A. DiTomasso, Ph.D., ABPP

Maureen Gibney, Psy.D.

Arthur Freeman, Ed.D., ABPP, Chair, Department of Psychology

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Abstract

Dementia is not a natural and normal part of aging, but rather a symptom of a disease process. Most individuals with dementia experience emotional distress or behavioral problems best summed up by the term agitation. Approximately 90% of individuals with dementing illnesses demonstrate problem behaviors ranging from repetitive verbalizations and wandering to verbal and physical aggression toward self or others. Each evening thousands of older adults in the community and in institutions become agitated, restless, and confused and begin to wander about or scream. This phenomenon is referred to as sundown syndrome, since it occurs in the evening hours after sunset. Sundown syndrome is not a psychiatric diagnosis, but it is a common and recognizable phenomenon for those who provide care for individuals with dementia (Burney-Puckett, 1996; Churchill, Safaoui, McCabe, & Baun, 1999).

There is an enormous amount of pressure on nursing facility staff to manage agitation in individuals with dementia without resorting to the use of chemical and physical restraints. The federal government became involved in the oversight of nursing home care with the passage of the Omnibus Budget Reconciliation Act (OBRA, 1990). One of the goals of these regulations was to improve the quality of nursing home care by reducing the use of chemical and physical restraints in the management of agitation.

The Omnibus Budget Reconciliation Act regulations recommend that an environmental and/or behavioral management strategy be the first line of treatment for agitated residents. Environmental and/or behavioral management strategies need to be devised to reduce the level of agitation in individuals with dementia, as well as provide feasibility for nursing facility staff to implement and incorporate these interventions into

individual plans of care. Animal-assisted therapy is an environmental intervention that can be implemented by nursing facility staff as a nonpharmacologic treatment approach to managing agitation in individuals with dementia. This study was designed to investigate whether or not an animal-assisted therapy approach would be effective in managing agitation associated with sundown syndrome in individuals with dementia, thereby reducing the need to use chemical and/or physical restraints.

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Statement of the Problem

Dementia presents a major health problem for the United States because of its enormous impact on individuals, families, the health care system, and society as a whole. The prevalence of dementia increases dramatically with age. Dementia affects approximately 5% to 8% of individuals older than 65, 15% to 20% of individuals older than 75, and 25% to 50% of individuals older than 85 (American Psychiatric Association, [APA], 1997). Dementia places a heavy economic burden on society. The annual national cost of caring for individuals with dementia is estimated to be slightly more than $100 billion (Kahn et al., 1998). Dementia is not a natural and normal part of aging, but rather a symptom of a disease process. Dementia is the loss of mental or cognitive abilities, and the symptoms of dementia may be caused by various diseases (Hoffman & Platt, 2000). The core feature of dementia is a decline in cognition. Individuals with dementia are slowly robbed of the ability to remember, communicate, make judgments, perform activities of daily living, tolerate stress, and interact socially. Many individuals also suffer from behavioral manifestations including depression, wandering, relentless pacing, agitation, aggression, hallucinations, paranoid ideation, and alterations in sleep patterns (Hall, Gerdner, Zwygart-Stauffacher, & Buckwalter, 1995; Kahn et al., 1998). An estimated four million individuals in the United States have dementia, of whom

approximately one million reside in nursing homes (Dyck, 1997). A high proportion of individuals with dementia eventually require placement in nursing homes or other long-term care facilities because of the progression of the illness, the emergence of behavioral problems, the development of intercurrent illness, or the loss of social support (American Psychiatric Association, 1997).

One prominent feature that causes significant problems in the care of individuals with dementia is agitation. Most individuals with dementia experience emotional distress or behavioral changes best summed up by the term agitation (Alexopoulos, Silver, Kahn, Frances, & Carpenter, 1998). Agitation has been defined as inappropriate verbal, vocal, or motor activity that is not explained by needs or confusion (Cohen-Mansfield & Billig, 1986). The management of agitation in individuals with dementia poses a difficult and challenging experience for nursing facility staff. The traditional method that staff have used to manage agitation has been to administer chemical restraints by means of tranquilizing psychotropic medications and apply physical restraints by means of lap buddies, belts, geriatric chairs, vests, or trays which keep the body immobile in a chair, as well as side rails, vests, jackets, and belts, which keep individuals confined to their beds. The use of any medication may increase the risk of confusion and impairment of cognitive functioning in individuals with dementia, and the use of psychotropic medications in the elderly has been shown to increase the risk of falls (Monane & Avorn, 1996; Ray, Griffin, Schaffner, Baugh, & Melton, 1987; Thapa, Gideon, Fought, & Ray, 1995). The elderly and individuals with dementia are more sensitive to side effects of psychotropic medications than are individuals who are younger and do not have dementia. The age-related physiological changes in absorption, distribution, metabolism,

and excretion need to be considered in the prescription of any medications to the elderly. General medical conditions and potential drug interactions can also result in serious complications in individuals with dementia (Gurvich & Cunningham, 2000).

The Omnibus Budget Reconciliation Act (OBRA) instituted regulations that specifically addressed the need for staff to use interventions other than chemical and physical restraints (OBRA, 1990). The OBRA was established in 1987 and revised its standards in 1990. The Health Care Financing Administration (HCFA) developed the initiatives to implement the OBRA regulations (Health Care Financing Administration, 1992). These regulations were devised to assist individuals with cognitive impairment to maintain their autonomy, dignity, and quality of life (HCFA, 1992; OBRA, 1990; Tabloski & Williams, 1998). Nursing homes have been moving toward the use of fewer restraints because of research that has shown that these particular interventions may create additional negative physical and psychological effects (Bradley, Siddique, & Dufton, 1995; Capezuti, Evans, Maislin & Strumpf, 1996; Evans & Strumpf, 1989, 1990; Hardin et al., 1993; Strumpf & Evans, 1988; Tinetti, Liu, & Ginter, 1992). Chemical and physical restraints raise issues of side effects, such as sedation, fall injuries, pressure ulcers, loss of function, confusion, depression, feelings of punishment, and increased agitation (Colorado Foundation for Medical Care [CFMC], 1998; Tabloski, McKinnon-Howe, & Remington, 1995). Physical restraint usage typically ran in the 40% to 50% range prior to the passage of OBRA 1987. However, national figures now vary between 5% and 30%, with the lower figure representing the goal of most national restraint reduction initiatives (CFMC, 1998; Dewey & Brill, 2000).

The implementation of the OBRA and HCFA regulations has been problematic for the staff in nursing facilities for several reasons. Nursing facility staff have experienced difficulty in providing appropriate interventions to manage agitation in individuals with dementia because of the lack of education and training in identifying the behavioral manifestations of the disease. Many nursing facility staff attempt to control an individual's behavior, rather than try to understand the source of the problem. Nursing facility staff also lack education and training in appropriate ways to manage these behavioral manifestations without resorting to the use of chemical and physical restraints. The result is that the use of chemical and physical restraints may exacerbate the behavioral manifestations which are the target of interventions and can contribute to additional difficulties for the individual with dementia (Tabloski & Williams, 1998).

The search for nonpharmacological treatment approaches to manage agitation in individuals with dementia reflects the need for alternative and less restrictive interventions, including behavioral engineering and restructuring the environment. Environmental modifications need to be devised to reduce the level of agitation in individuals with dementia, promote the maximum potential within the limits of each individual's remaining cognitive abilities, and provide feasibility for nursing facility staff to implement and incorporate these interventions into individual plans of care.

Purpose of the Study

Dementia is best defined as a clinical syndrome caused by a wide range of diseases that affect the brain. Dementia has many presentations as well as causes, and its

core feature is a decline in cognition (Rabins, Lyketsos, & Steele, 1999). The cognitive functions that can be affected in dementia include learning and memory, language, problem solving, orientation, perception, attention and concentration, judgment, social abilities, and personality (Kaplan & Sadock, 1998). Dementia develops when parts of the brain associated with the cognitive functions are affected by any of various neurological, vascular, infectious, or metabolic diseases. The most common cause of dementia is Alzheimer's disease (AD), and it is estimated that as many as 50% to 75% of individuals who suffer from dementia have AD (American Psychiatric Association, 1997). Vascular dementia has until recently been considered responsible for most remaining cases of dementia, occurring either alone or in association with AD. Lewy body disease has become much more prevalent in recent years, and researchers are still unclear if it is a distinct clinical entity or perhaps a variant of Alzheimer's or Parkinson's disease (McKeith et al., 1996). Other less common causes of dementia may include HIV disease, Parkinson's disease, Pick's disease, Huntington's disease, and Cruetzfeldt-Jakob disease (American Psychiatric Association, 1997). Dementia is considered a late-life disease because it tends to develop mostly in elderly individuals. Today, in the United States, there are approximately four million individuals with dementia, most of whom are elderly, and by 2050, that number will increase to an estimated 14 million (Alzheimer's Association, 1998). Currently, approximately 60% of all nursing facility residents have been diagnosed with some form of cognitive impairment (Dellasaga & Schellenbarger, 1992).

The effects of these cognitive impairments may alter an individual's mood and his or her ability to function independently. Agitation is an example of a behavioral

disturbance that can occur in individuals with dementia. Agitation has been identified as one of the most common reasons for placement in a nursing facility (Colerick & George, 1986). Agitation can include behaviors such as wandering, pacing, cursing, screaming, biting, and fighting which can endanger the individual, staff, and other residents (Cohen-Mansfield, 1986). Nursing facilities typically have insufficient staff-to-patient ratios and many times are unable to manage these behaviors appropriately. As a result, individuals may be chemically and/or physically restrained, or isolated in their rooms so as not to disturb others, which may ultimately lead to increased confusion, social isolation, and further agitation.

Animal-assisted therapy (AAT) is a goal-directed intervention in which an animal meeting specific training criteria is incorporated as an integral part of the treatment process (Gammonley & Yates, 1991). Boris Levinson, an American child psychologist, was one of the early pioneers of AAT. He used a dog in his sessions with severely withdrawn children and observed that the dog served as an "icebreaker" and provided a focus for communication (Levinson, 1962). Levinson was not the first scientist to study the use of animals in treating psychological disorders, but he was the first to write seriously and extensively about it. He is credited with sparking widespread research into the role of AAT. His work stressed the importance of pets to children, but he also recognized the value to adults, especially the elderly (Cusack, 1988; Levinson, 1969). During the past several decades, AAT has been used successfully with a variety of populations, including coronary patients (Friedman, Katcher, Lynch, & Thomas, 1980), hospitalized psychiatric patients (Corson, Corson, Gwynne, & Arnold, 1977),

emotionally disturbed youth (George, 1988), prison inmates (Lee, 1984), and the elderly, on an outpatient basis and in institutionalized settings.

This study investigated the effect of AAT on the management of agitation in individuals with dementia. This study also monitored the administration of psychotropic medications on an "as needed" basis and the application of physical restraints on these individuals throughout the duration of the study. AAT is an intervention that can be implemented by nursing facility staff as a nonpharmacological approach to managing agitation in individuals with dementia. This particular treatment approach was used to decrease the overall level of agitation in individuals with dementia, thereby reducing the need to use chemical and/or physical restraints.

The AAT approach that was used in this study involved the introduction of an aquarium of fish. The innovative use of aquariums has been employed recently to increase food consumption in individuals with AD and appear to promote relaxation. Edwards and Beck (2002) found that individuals with AD who were exposed to aquariums of brightly colored fish during mealtimes appeared to be more relaxed, alert, and demonstrated improvement in their eating habits. This study also showed a decrease in the number of instances of disruptive behaviors such as wandering, pacing, yelling, and physical aggression, which can interfere with eating. While the exact mechanisms are unclear at this point, the aquarium may serve as a distraction to individuals with AD, which assists in reducing stress and promoting relaxation. One potential mechanism may be that a shift in attention away from the self and toward a pleasant, absorbing stimulus reduces anxiety.

A tip-proof aquarium has been specifically designed for nursing homes and features a locked top, unbreakable glass, and a specially designed background that allows the fish to be easily seen by individuals with visual impairments. The aquarium is entirely self-contained and imposes no additional burden on nursing facility staff in terms of overall care. The aquarium is constructed on wheels which allows easy implementation and the ability to intervene on an individualized basis (Gaidos, 1999).

Rationale or Theoretical Background

Theories of agitation in individuals with dementia. Dementia is caused by a disease of the brain, and this disease process may produce neuronal loss or other structural damage to the brain (Rabins et al., 1999). Behavioral disturbances often accompany dementia and are an extremely common complication of the disease. Poorly understood behaviors often accompany the gradual loss of cognitive abilities associated with dementia. Behavioral disturbances are seen most often in mid-to-late stages of dementia and rarely remit spontaneously once they have begun. One of the most serious behavioral disturbances that occurs in dementia is agitation. Physical aggression (hitting, pinching, punching, throwing objects), wandering, and problematic vocalizations (swearing, name-calling, shouting, repetitive screaming) are behaviors that commonly occur in mid-to-late stages of dementia (Kolanowski, 1999). These behaviors are viewed as offensive and frightening by caregivers and other residents in proximity to the individual with dementia, draining and demoralizing to the individual with dementia, and

they may endanger the safety of the individual with dementia or others (Hall et al., 1995; Kahn et al., 1998; Kolanowski, 1999).

Nursing facility staff are faced with the great pressure and extreme burden of implementing strategies to control and manage these behaviors (Kolanowski, 1999). These behaviors complicate the care-planning process, as individuals with dementia typically do not respond to the traditional interventions and restorative measures used with individuals without a dementing illness. Also, some of the traditional interventions may increase fear and frustration in individuals with dementia, which may ultimately result in a worsening of the agitation (Hall, 1994). A conceptual framework for caring for individuals with dementia and managing these behavioral manifestations is needed. This conceptual framework is needed to provide the nursing facility staff with a rapid assessment of behavioral problems, a repertoire of environmental strategies designed to meet the specific need at the time of the problem, and a means of evaluating the outcome of the interventions. The Progressively Lowered Stress Threshold (PLST) model and the Need-Driven Dementia-Compromised Behavior (NDB) model are two conceptual frameworks that have been developed to understand and manage the behavioral problems manifested in individuals with dementia (Algase et al., 1996; Hall & Buckwalter, 1987).

The progressively lowered stress threshold model. The PLST model was designed to help health care providers manage behavioral problems in individuals with AD using environmental modifications. The PLST model was derived from the psychological theories of stress, adaptation, and coping along with findings from behavioral and physiological research of AD (Hall et al., 1995). The PLST model

provides a conceptual foundation for the effects of stress on individuals with AD. The progressive cerebral pathologic condition associated with cognitive decline in AD results in a progressive decline in the stress threshold and impairment in the four mechanisms hypothesized as required for coping: cerebral integration, ability to sense, ability to produce energy, and ability to move. The PLST model divides the symptoms of AD into four clusters which include cognitive or intellectual losses, affective or personality losses, conative or planning losses, and loss of stress threshold causing dysfunctional behavior such as agitation (Hall & Buckwalter, 1987). Table l provides the list of symptoms associated with each cluster.

Table 1

Symptom Clusters Associated with Progressive Dementing Illness

Cluster	Symptoms
I. Intellectual Losses	Loss of memory, initially for recent events
	Loss of sense of time
	Inability to abstract
	Inability to make choices and decisions
	Inability to reason and problem solve
	Poor judgment
	Altered perceptions and ability to identify visual and auditory stimuli
	Loss of expressive and receptive language abilities
II. Affective or Personality Losses	Loss of affect
	Diminished inhibitions, characterized by emotional lability, spontaneous conversation with loss of tact, loss of control of temper, and inability to delay gratification
	Decreased attention span
	Social withdrawal and avoidance of complex or overwhelming stimuli
	Increasing self-preoccupation

	Antisocial behavior
	Confabulation, perseveration
	Psychotic features, such as paranoia, delusions, and pseudohallucinations
III. Conative or Planning Losses	Loss of general ability to plan activities
	Inability to carry out voluntary activities or those activities requiring thought to set goals, organize, and complete task
	Functional loss, starting with high-level maintenance activities such as money and legal management, shopping, and transportation; these progress to losses in activities of daily living, generally in the following order: bathing, grooming, choosing clothing, dressing, mobility, toileting, communicating, and eating.
	Motor apraxia
	Increased fatigue with exertion or cognition, loss of energy reserve
	Frustration, refusal to participate, or expressions of helplessness when losses are challenged
	Increased thought about function tends to

	worsen performance
IV. Progressively Lowered Stress Threshold	Catastrophic behaviors
	Confused or agitated night awakening
	Purposeful wandering
	Violent, agitated, or anxious behavior
	Withdrawal or avoidance behavior, such as belligerence
	Noisy behavior
	Purposeless behavior
	Compulsive repetitive behavior
	Other cognitively and socially inaccessible behaviors

Note. From "Care of the patient with Alzheimer's disease living at home," by G. R. Hall, 1988, *Nursing Clinics of North America, 23*(1), p. 33. Copyright 1988 by Geri R. Hall. Reprinted with permission.

Individuals with AD exhibit three main types of behavior that occur throughout the course of the disease, which include baseline, anxious, and dysfunctional. The proportion of each behavior type changes as the disease progresses; however, these behavioral states are considered the foundation of the PLST model. Baseline behavior is a generally calm state, which incorporates cognitive, affective, and conative losses, and is characterized by the individual's being socially and cognitively accessible. The individual who is socially accessible is able to communicate needs and respond to communications from others. The individual who is cognitively accessible is aware of, or oriented to, the environment (Wolanin & Phillips, 1981). Individuals exhibiting baseline behavior can function within the limits of their neurologic deficits; however, these behaviors diminish with disease progression and are replaced by more anxious and dysfunctional behaviors. Anxious behavior occurs when the individual with AD feels stress. The individual loses eye contact and attempts to avoid offending stimuli. Health care providers are still able to make or maintain contact with the individual. Dysfunctional or catastrophic behavior occurs in the individual with AD if the stress level is allowed to continue or increase (Hall & Buckwalter, 1987). The individual is unable to communicate effectively with others and is not able to use the environment in a functionally appropriate manner (Wolanin & Phillips, 1981).

The PLST model hypothesizes that symptoms in the progressively lowered stress threshold cluster are related to a progressive loss of the individual's ability to cope. The individual with AD becomes increasingly anxious when excessive stress is present and exhibits increased psychomotor behavior such as restlessness. If the stress threshold is exceeded, a dysfunctional episode results, which produces one or more of the behaviors

in the progressively lowered stress threshold cluster. During this episode, the individual becomes socially and cognitively inaccessible, fearful, and temporarily decompensates, with a decreased ability to think and function. These dysfunctional episodes may occur during, immediately after, or a day or two after a particular causative event (Hall et al., 1995).

Individuals with AD typically demonstrate several symptoms from each cluster that are mild and intermittent initially, but become worse and more constant as the disease progresses. The health care provider can also evaluate the symptoms and functional abilities of individuals with AD by assigning one of four stages in the disease continuum (Hall, 1994). Table 2 lists four stages of functional loss associated with dementing illness.

Table 2

Stages of Functional Loss Associated with Dementing Illness

Stage	Description
1. Forgetfulness	The individual has begun to forget and lose things, expressing awareness of losses and compensating for them. This might be attributed to stress, illness or fatigue. Depression is not uncommon.
2. Confusion	The individual has increasing difficulty with money management, legal decisions, occupation, transportation, driving, home maintenance, housekeeping, shopping, and cooking. Overlearned skills are generally retained, such as some women retain the ability to cook long into the disease. There is withdrawal from complex social groups, such as lodges and clubs, and the individual has increasing difficulty functioning in environments other than the home. This makes travel difficult. Individuals may become profoundly depressed and/or may deny symptoms while giving clues to self-knowledge: "I think I am losing my mind," or "I can't believe this is happening to me." Individual may complain of increasing fatigue. Behaviors related to the progressively lowered stress threshold symptom cluster occur when the individual is under extreme stress, fatigue, change, or

	illness. Individuals may be placed in adult day care, or, if living alone, may move into residential-level care due to compromised safety or inability to manage maintenance tasks.
3. Ambulatory dementia	Functional losses begin to occur in the basic activities of daily living. (See Table 1, cluster III, for order of losses.) The individual begins to withdraw from family and close social groups, becoming increasingly self-absorbed. Affect remains flat. Stress threshold behaviors are increasingly common and the individual might be up at night, pacing, wandering, confused, agitated, or belligerent. These symptoms are worse late in the day. Communication becomes increasingly difficult because the individual has progressive difficulty understanding the written and spoken language. The individual may return to using a primary language, which also might be distorted. The individual's ability to reason, recognize others, and plan for safety are impaired. Frequently, the individual becomes increasingly resistant to having anyone but the primary caregiver in the home. Dependence on the caregiver increases until the individual no longer allows the caregiver out of sight. This restrictiveness and loss of

	freedom poses a major dilemma for caregivers: should they seek the respite that they need but that the individual refuses? Another common aspect of late ambulatory dementia is the development of pseudohallucinations. The individual begins to mistake common visual stimuli for other things. Common examples include thinking that the television represents people in the house, mistaking shadows, photographs, paintings, or mirror images for people.
4. End	The individual no longer ambulates and has little purposeful activity. Consistent recognition of caregiver, family members, body parts, and mirror images is generally gone. However, the individual may experience moments of lucidity. The individual may be mute or may scream spontaneously. The individual forgets how to eat, swallow, and chew, losing weight. Problems associated with immobility, such as skin breakdown, contractures, urinary tract infections, and pneumonia are common. As the individual becomes increasingly vegetative, death ensues, usually from pneumonia or another complication.

Note. From "Care of the patient with Alzheimer's disease living at home," by G. R. Hall, 1988, *Nursing Clinics of North America, 23*(1), pp. 36-37. Copyright 1988 by Geri R. Hall. Reprinted with permission.

The PLST model also identifies six common stressors that temporarily worsen behavioral symptoms in individuals with AD and produce dysfunctional episodes. These include: (1) fatigue; (2) change of environment, routine, or caregiver; (3) misleading stimuli or inappropriate stimulus levels; (4) affective responses to perception of loss; (5) internal or external demands that exceed functional capacity; and (6) physical stressors such as pain, discomfort, infection, acute illness, and depression producing concomitant delirium (Hall, 1988; Hall et al., 1995; Hall & Laloudakis, 1999). This sudden functional decline that occurs is also known as excess disability. Excess disability occurs when an individual with AD who has experienced prolonged periods of high stress develops additional functional impairment and losses that clear once the stressors are removed. This concept is consistent with the stage of exhaustion in Selye's (1980) General Adaptation Syndrome (GAS). The stage of exhaustion refers to the point at which the body's finite ability to tolerate stressors is reached, producing disability and death if the stressor is not removed (Hall & Buckwalter, 1987). The six common stressors identified by the PLST model can assist health care providers in planning care and provide a quick assessment measure for causative factors once a dysfunctional episode has occurred (Hall et al., 1995).

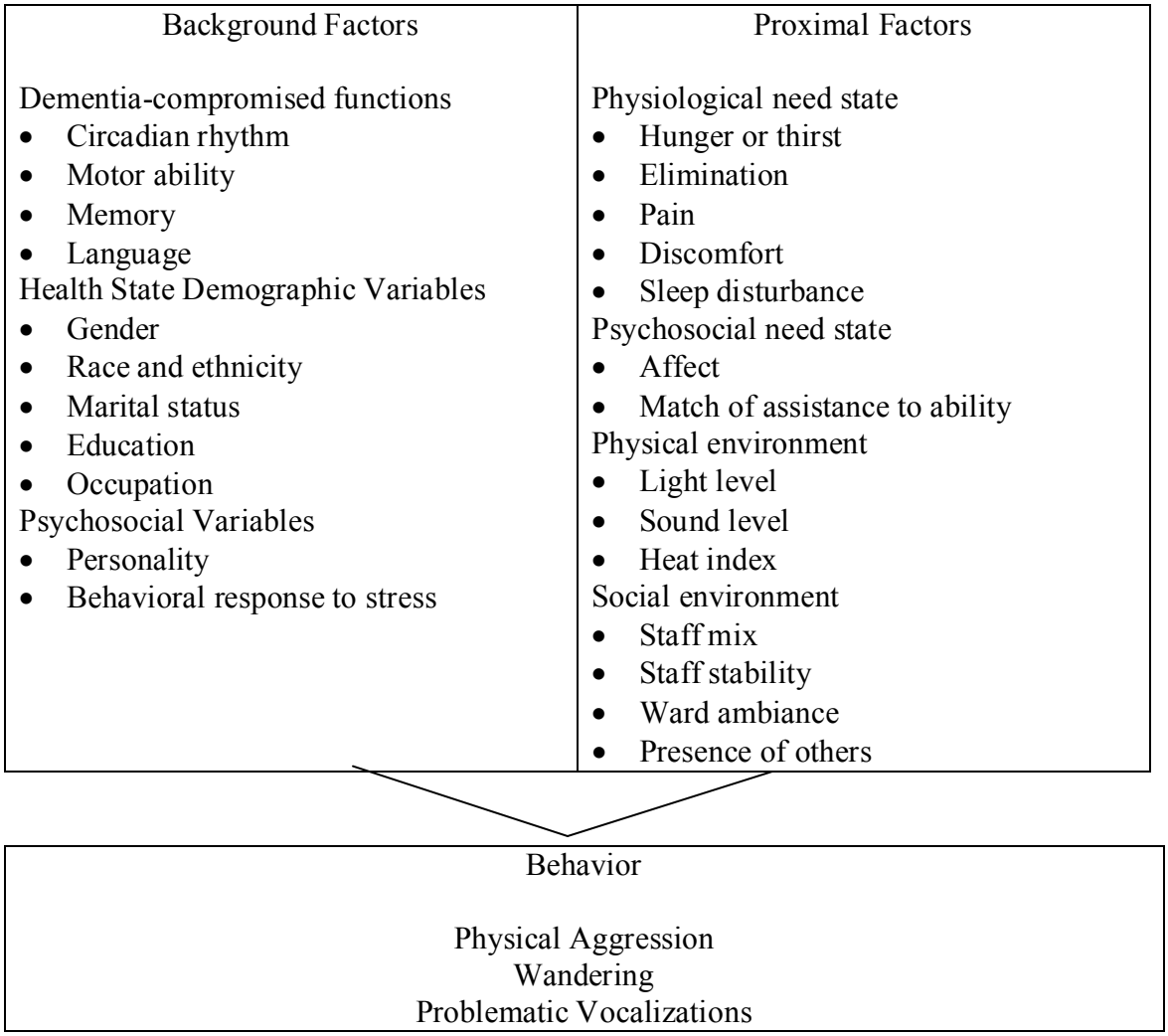
The underlying assumptions of the PLST model include the following: (1) all individuals require some control over their person and environment and need some degree of unconditional positive regard; (2) all behavior has meaning; therefore, all catastrophic and stress-related behaviors have a cause; (3) the confused or agitated individual is not comfortable and should be regarded as frightened; all individuals have the right to be comfortable; and (4) the individual exists in a 24-hour continuum;

therefore, care cannot be planned or evaluated on an 8-hour shift basis. The PLST model essentially suggests that individuals with AD need their environmental demands modified to compensate for their declining ability to adapt (Hall & Buckwalter, 1987).

The need-driven dementia-compromised behavior model. The NDB model changes the predominant view of dementia-related behaviors as "disruptive" or "disturbing" to a perspective that conceptualizes these behaviors as potentially understandable needs (Kolanowski, 1999). Disruptive behavior is a term that reflects the caregiver's view of a situation. While behaviors such as wandering or repetitive questioning may interfere with or disrupt clinical care routines, they may actually express the goal or needs of the individual with dementia. The model proposes that NDBs arise in pursuit of a goal or as expression of a need. NDBs reflect the interaction of salient background and proximal factors found within either the individual or his or her immediate environment or both. NDBs constitute the most integrated and meaningful response possible, given limitations imposed by a dementing condition, strengths preserved from the individual's basic abilities and personality, and constraints, challenges, or supports offered by the immediate environment (Algase et al., 1996). The NDB model is depicted below in Figure 1.

Figure 1

Need-Driven Dementia-Compromised Behavior model.



Note. From "An overview of the need-driven dementia-compromised behavior model," by A. M. Kolanowski, 1999*, Journal of Gerontological Nursing, 25*(9), p. 8. Copyright 1999 by SLACK Incorporated. Reprinted with permission.

The dementia-compromised behaviors reflect the interaction of background factors and proximal factors. Background factors are the relatively stable individual characteristics that shape the more enduring patterns of behavior. Proximal factors are the more changeable environmental triggers that induce a need state and precipitate dementia-related behaviors. The interplay of these factors produces NDB, which has been described as the most integrated and meaningful response individuals with dementia can make. The behaviors are perceived in this model as meaningful and useful in directing nursing care rather than disruptive or disturbing. The NDB model focuses on individual needs as the basis for interventions (Kolanowski, 1999).

Related Research

Treatment of agitation in individuals with dementia. Agitation in individuals with dementia is considered one of the foremost management problems among health care professionals (Cohen-Mansfield, 1986). Agitation can be a direct consequence of dementia or it can be caused by other identifiable problems. Some of the identifiable problems include: medical issues resulting in delirium, pain, or discomfort; drug or substance toxicity; environmental or psychosocial stress; or neuropsychiatric syndromes such as psychosis, anxiety, depression, insomnia, or sundowning. Treatment of the agitation is focused on the underlying causes and involves correcting medical problems, alleviating physical discomfort, improving the environment, and then considering medications that specifically address neuropsychiatric symptoms (Kahn et al., 1998).

Pharmacological interventions documented as effective for the treatment of agitation in individuals with dementia include specific antipsychotic agents (Coccaro et al., 1990; Gottlieb, McAllister, & Gur, 1988; Schneider, Pollock, & Lyness, 1990), anticonvulsants (Gleason & Schneider, 1990; Leibovici & Tariot, 1988b; Mellow, Solano-Lozez, & Davis, 1993), anxiolytics (Ancill, Carlyle, Liang, & Holliday, 1991; Cantillon, Brunswick, Molina, & Bahro, 1996; Hermann & Eryavec, 1993; Smeraski, 1988; Stern, Duffelmeyer, Zemishlani, & Davidson, 1991), antidepressants (Beasley, Sayler, Bosomworth, & Wernicke, 1991; Friedman, Gryfe, Tal, & Freedman, 1992; Lebert, Pasquier, & Petit, 1994; Sheehan, Dunbar, & Fuell, 1992; Sultzer, Gray, Gunay, Berisford, & Mahler, 1997), cholinergic agents (Coccaro et al., 1990; Kanfer, Cummings, & Christine, 1996), hormones (Kyomen, Nobel, & Wei, 1991), lithium carbonate (Leibovici & Tariot, 1988a), and beta blockers (Pauszek, 1991).

Antipsychotic agents appear to be the most common group of medications for the treatment of agitation in individuals with dementia. However, controversy continues regarding their use and effectiveness. Barnes, Veith, Okimoto, Raskind, and Gumbrecht (1982) reported on the effectiveness of antipsychotic medications in 60 demented patients exhibiting specific behavioral problems. In contrast, Druckenbrod, Rosen, and Cluxton (1993) reviewed the data on antipsychotic drugs between 1966 and 1992 and found no data documenting the efficacy of antipsychotics in elderly agitated patients. They cautioned that antipsychotic drug administration should be restricted to only those individuals experiencing infrequent, sustained agitation, and advise that manipulation of environmental causes for agitation should be attempted first. Taft and Barkin (1990) cautioned against the misuse of psychotropic drugs and Thomas (1988) reported that

pharmacological agents are only partially effective and place the patient at high risk for serious side effects. Thomas (1988) recommended that the pharmacological control of agitation be undertaken only for clearly defined goals and for short periods of time.

The American Psychiatric Association Practice Guidelines for the treatment of Alzheimer's Disease and other dementias of late life provides a thorough review of the published evidence regarding the diagnosis and treatment of the cognitive and behavioral symptoms of dementia (APA, 1997). Currently, there are no well-designed studies showing that different psychotropic agents target specific symptoms or subsyndromes of agitation, and no medication has been approved by the Food and Drug Administration for the specific indication of agitation in individuals with dementia (Kahn et al., 1998).

Nonpharmacological interventions have been used in the treatment of agitation in individuals with dementia (Burgio & Bourgeois, 1992). Behavioral approaches and environmental interventions have been demonstrated as effective in the treatment of agitation in individuals with dementia. Mishara and Kastenbaum (1973) documented a decrease in self-injurious behaviors with 80 patients who received social stimulation and improved environment. Rosberger and MacLean (1983) obtained a decrease in inappropriate behavior in one patient who received social reinforcement of appropriate behaviors. Vaccaro (1988, 1990) demonstrated significantly reduced aggressive behaviors in patients who received positive reinforcements. Rapp, Flint, Herrmann, and Proulx (1992) reported a decrease in agitated behaviors in two demented geriatric patients using patient-specific behavior modifications; however, no systematic measurement of agitation or dementia was used.

The environmental intervention of human touch in the treatment of agitation in individuals with dementia has been used in several studies. Marx, Werner, and Cohen-Mansfield (1989) used the Cohen-Mansfield Agitation Inventory (CMAI) and measured the impact of touch on the level of agitation in 24 nursing home residents. The results were mixed and demonstrated that touch increased aggressive behaviors and decreased physically nonaggressive behaviors. The researchers hypothesized that touch may be viewed as a violation of personal space, thereby increasing aggressive behaviors. In contrast, touch may provide a quieting and comforting form of communication, thereby decreasing physically nonaggressive behaviors. Snyder, Egan, and Burns (1995) evaluated hand massage as an intervention to decrease agitated behaviors associated with care activities for 26 Alzheimer care unit residents. The results indicated a significant decrease in the frequency and intensity of morning agitated behaviors related to care activities; however, gender differences were reported. Hand massage administered by female nurses increased the frequency and intensity of agitated behaviors in men, whereas a reverse effect occurred in women.

Sundown syndrome in individuals with dementia. Each evening thousands of older adults in the community and in institutions become agitated, restless, and confused and begin to wander about or scream. This phenomenon is referred to as sundown syndrome, since it occurs in the evening hours after sunset. Sundown syndrome has been defined as a marked increase in confusion, disorientation, and possibly agitation at sunset in individuals with dementia or in individuals with acute or chronic confusion (Evans, 1987). Sundown syndrome is not a psychiatric diagnosis, but it is a common and

recognizable phenomenon for those who provide care for individuals with dementia (Burney-Puckett, 1996; Churchill et al., 1999).

There is controversy in the literature about the causes of increased agitation that seem to be associated with late afternoon or early evening. Several behavioral studies have attempted to categorize agitation that corresponds to time frames. Cameron (1941) induced sundowning by placing a group of elderly individuals with dementia in a darkened room during the daytime. Cohen-Mansfield, Marx, Werner, and Freeman (1992) found that vocalizations, involuntary picking at bed clothes, and physically aggressive behaviors were likely to occur during the hours of 4:30 p.m. to 11 p.m., rather than during the hours of 4:30 p.m. to 7 p.m., the sunset hours. Bliwise, Bevier, and Bliwise (1990) determined that sunset may be a vulnerable period for agitation for individuals with dementia, but Bliwise, Carroll, Lee, Nekich, and Dement (1993) found that agitation was no more likely to occur during the afternoon or at night than during the day. Bliwise (1994) found that more severe agitation occurred in the winter, rather than autumn, and the time of occurrence was near sunset.

There is limited research on the cause of sundown syndrome, although its causes appear to be multifactorial. Several risk factors have been identified, which may signal the potential for sundown syndrome including advanced age, dementia, other organic brain syndromes present, poor vision, hearing deficits, dehydration with electrolyte imbalances, adverse medication reactions, and fatigue (Churchill et al., 1999). Evans (1987) reviewed medical charts of a large group of elderly institutionalized subjects who were experiencing sundown syndrome, and demonstrated a significant relationship with a number of physiological variables, including disturbed circadian rhythms. Evans (1987)

also suggested that psychological variables such as the role of stress be considered crucial in understanding the phenomenon of sundown syndrome. Wolanin and Phillips (1981) acknowledged the role of physiological variables in the etiology of sundown syndrome, but also emphasized the interaction with staff as crucial in assessing confusion in cognitively impaired individuals. Kral (1975) stressed the importance of psychosocial stressors, such as bereavement and loss of independence as precipitants to confusion in cognitively impaired individuals. In sum, most studies have tended to explain sundown syndrome according to physiological, environmental, and psychological variables.

A major concern with the use of the term sundown syndrome is the implication that the loss of sunlight is the primary cause for the increase in agitation in individuals with dementia, and interventions to manage agitation due to the loss of sunlight are not likely to be effective (Exum, Phelps, Nabers, & Osborne, 1993). The behaviors of sundown syndrome can include increased restlessness and verbal behavior, confusion, aimless wandering, paranoia, agitation, and aggressive behavior, such as hitting, kicking, and biting directed toward staff, family, or other patients (Evans, 1987). The symptoms of sundown syndrome resemble delirium in terms of disordered cognition, attention, sleep-wake pattern, and psychomotor behavior, and pose tremendous management problems for nursing facility staff (Exum et al., 1993).

There is a paucity of research on the nonpharmacological treatment of symptoms associated with sundown syndrome in individuals with dementia (Bliwise et al., 1990; Campbell, Satlin, & Volicer, 1991; Okawa, Mishima, & Hishikawa, 1991). There is only one study to date that has specifically evaluated the impact of animals on agitation associated with sundown syndrome in individuals with dementia. The development of

environmental interventions for managing agitation associated with sundown syndrome in individuals with dementia is definitely needed. Few agitation studies exist in the health care literature and much more research is needed to demonstrate the effectiveness of these types of interventions (Weinrich, Egbert, Eleazer, & Haddock, 1995). Cost-effective, easily replicated, environmental interventions need to be developed and evaluated to specifically address the treatment of agitation associated with sundown syndrome in individuals with dementia.

Animal-assisted therapy for individuals with dementia. AAT is one environmental intervention that has been used for individuals with dementia; however, there is a paucity of research to support its use. The majority of the studies on AAT have targeted the elderly population in general. Therefore, a definite need to specifically evaluate the effectiveness of AAT for individuals with dementia exists (Kongable, Buckwalter, & Stolley, 1989). A brief review of the research studies which have used AAT for individuals with dementia are presented below.

Kongable, Buckwalter, and Stolley (1989) observed the effects of a therapy dog on the social behaviors of 12 Alzheimer's patients residing on a special care unit in a large Veterans' Home. The eight categories of social behaviors included smiles, laughs, looks, leans toward stimulus, touch stimulus, verbalizations, name-calling, and other. The researchers conducted observations of the social behaviors during three separate time periods; that is, pretreatment, during weekly pet visitations, and permanent placement of the pet. A repeated measures within subject design was conducted and observation data were collected using an observational checklist developed by the first author. The results

indicate that the presence of the dog increased the number of total social behaviors of the AD patients; however, no differences were found in behaviors between the temporary and permanent placement of the dog.

Fritz, Farver, Kass, and Hart (1995) evaluated the effect regular association with a companion animal had on the progression of cognitive decline and the manifestation of concomitant noncognitive symptoms in 64 patients with a diagnosis of possible or probably AD who were still living at home. The primary caregivers of the Alzheimer's patients provided information related to contact with pets and noncognitive symptoms, and medical information was obtained from records of an AD referral center. The Fuld Adaptation of the Blessed Information/Memory/Cognition Test (BIMC), the Mini-Mental State Examination (MMSE), and the Blessed Dementia Rating Scale (BDS) were used to determine the stage of disease progression and level of cognitive impairment. The results indicated that the presence of a pet in the patients' homes appeared to temper the display of behaviors reflective of agitation and aggression. Patients who spent more time interacting with pets were observed to have fewer episodes of anxiety, verbal aggression, and hyperactivity. There was no significant difference in the rate of cognitive decline between patients with pets compared to patients without pets. These findings suggest that interaction with pets can aid in tempering the expression of agitation and aggression in individuals with AD.

Batson, McCabe, Baun, and Wilson (1998) examined the effect of the presence of a therapy dog on socialization and physiological indicators of stress in 22 individuals with probable AD (ages 62 to 96) on special care units in three long-term care facilities. A within-subject, repeated-measures experimental design was used to measure the

physiological variables, and the individual sessions were videotaped to code the social interaction variables. The social interaction variables included verbalizations, looks, smiles, leans toward stimulus, tactile contact, praise, physical warmth, and temporal response time. The physiological variables included heart rate, blood pressure, and skin temperature. Daubenmire's Data Coding Protocol (DDCP) was used to document social interaction variables, and the severity of dementia was rated by using the Burke Dementia Behavioral Rating Scale (BDBRS). The results indicated that the presence of a therapy dog increased the total number of socialization behaviors of individuals with AD during one-on-one interactions. The frequency scores for smiles, tactile contact, looks, physical warmth, and praise were significantly higher when the pet was present, and there were no significant interaction effects for heart rate, blood pressure, or skin temperature. These findings suggest that pets can serve as a useful intervention for increasing socialization for individuals with AD (Batson et al., 1998).

Churchill, Safaoui, McCabe, and Baun (1999) followed up and built on the previous study (Batson et al., 1998) and investigated the effects of the presence of a therapy dog on agitation and socialization in individuals with AD or related disorders who display behaviors consistent with sundown syndrome. The researchers also examined if changes in agitation and socialization were related to the level of dementia. An experimental within-subject repeated-measures design was used with 28 individuals on AD special care units in three extended care facilities. The level of agitation was measured using the Agitation Behavior Mapping Instrument and the severity of dementia was measured using the BDBRS. The subjects were videotaped under two random ordered conditions, both with and without the dog present, and DDCP was used to

document the frequency and duration of socialization behaviors. The results indicated that the presence of a therapy dog improved socialization and decreased agitation in individuals with AD or a related disorder during sundown hours, and these results were unrelated to the severity of dementia. These findings suggest that the use of pets may be a beneficial intervention for increasing socialization and decreasing agitation associated with sundown syndrome in affected individuals, regardless of the level of dementia (Churchill et al., 1999).

McCabe, Baun, Speich, and Agrawal (2002) investigated the effect of the introduction of a resident dog on problem behaviors of individuals diagnosed with AD or related disorders. This study extended the work of Batson et al. (1998) and Churchill et al. (1999), who found that the presence of a visiting therapy dog had a calming effect on residents with AD. This study also compared the variation in the use of medications to treat problem behaviors before and after the introduction of a resident to the unit. A within-participants repeated-measures design was used with 22 individuals who resided in an AD special care unit. Problem behaviors were documented using the Nursing Home Behavior Problem Scale (NHBPS) one week before and four weeks after placement of the resident dog. The results indicated that the presence of a resident dog decreased problem behaviors in individuals with AD during the daytime hours. There was no significant change in behaviors during the evening hours, and no differences were noted in the administration of medications to treat mood and behavioral problems. These findings suggest the potential value of the use of a resident dog as an adjunct to therapies designed to reduce the occurrence of problem behaviors in individuals with AD.

Edwards and Beck (2002) investigated the impact of aquariums with brightly colored fish on the eating habits and disruptive behaviors of 60 individuals who resided on specialized Alzheimer's units in three nursing homes. Baseline information on each patient's eating and behavioral patterns were collected for four weeks before placing the fish tanks in the nursing homes. Each patient's food was weighed before and after each meal, and patients were evaluated on 29 different types of social interactions and behaviors. An informal checklist of 42 behaviors associated with AD patients was used to measure frequency, intensity, and duration of the behaviors. The results of this study indicated that the individuals ate up to 21% more food than they had prior to the introduction of the fish tanks, and the average increase in food consumption was 17.2%. The results also demonstrated a decrease in the number of instances and the duration of behaviors such as wandering, pacing, yelling, and physical aggression. The tanks of colorful, gliding fish often held patients' attention for up to 30 minutes, which is a relatively long time for many Alzheimer's patients. N. Edwards is currently designing a second set of studies to replicate her findings, and to further delineate the factors such as color, motion, and sound which may stimulate patients. She is also attempting to obtain cross-cultural information by replicating her study with a researcher from the University of North Korea. These findings suggest that placing fish tanks in nursing homes may help reduce health care costs by reducing the need for nutritional supplements, as well as medications given to help calm disruptive individuals with AD (N. Edwards, personal communication, November 2, 2000).

Behavioral assessment in individuals with dementia. Dementia is a behavioral illness, and as many as 90% of individuals with dementia demonstrate problem behaviors that range from repetitive verbalizations, agitation, and wandering to verbal and physical aggression toward self and others (Burgio & Bourgeois, 1992). Reliable and accurate measurement of these problem behaviors is vital for tracking illness progression, monitoring the effects of pharmacological, behavioral, and environmental interventions, and for continued investigation into the correlates of caregiver stress, burden, and coping. Currently, there is no single, universally accepted measure or methodology for operationalizing problem behaviors in individuals with dementia. All of the measures currently used for behavioral assessment in individuals with dementia have some limitations, and none of the measures have unequivocal support from researchers in the field (Davis, Buckwalter, & Burgio, 1997).

A variety of strategies have been developed for measuring agitated behaviors in individuals with dementia and these have been grouped into three general classes of approach: the use of observational methods, mechanical devices, and informant rating methods. The observational method involves someone observing the individual with dementia and rating relevant behaviors as they occur. A researcher can monitor the behavior of an individual with dementia in his or her environment and can rate the specific agitated behavior along relevant dimensions such as duration, severity, and disruptiveness on a scale designed for that purpose. A disadvantage of the observational method for assessing agitation is that, because many types of agitation do not occur most of the time, it may be necessary to conduct extended periods of observation or many observation sessions in order to capture the behavior. The observational method also

requires the thorough training of observers in order for the ratings to be reliable. The Agitation Behavior Mapping Instrument (ABMI; Cohen-Mansfield, Werner, & Marx, 1989) was developed specifically for observing agitation and was designed to examine environmental correlates of agitation. The ABMI assesses the following aspects of agitation: the frequency of occurrence of the agitated behaviors, the social context in which the behavior took place, the type of activity engaged in when the behavior occurs, who initiated the activity, the location of the individual on the unit, environmental characteristics such as light or noise, and the individual's body position (Cohen-Mansfield & Taylor, 1998).

Mechanical devices have been used to assess wandering behaviors associated with agitation in individuals with dementia. The mechanical devices available include instruments that gauge movement and instruments that measure the number of steps taken. The advantages of using mechanical devices include less staff time requirement, less expense, and more precise measurements (Cohen-Mansfield, Culpepper, Werner, Wolfson, & Bickel, 1997). The major disadvantage of using mechanical devices is that they can be used to measure only a limited range of behavior (Cohen-Mansfield & Taylor, 1998).

Informant rating scales have been developed for measuring agitation in individuals with dementia in nursing facilities and in the community. Many of these scales include agitation or one of the subtypes of agitation as a dimension on a scale designed to measure other constructs as well. The following examples of informant rating scales have been designed to measure behavioral and psychological changes that are associated with dementia that include measures of agitation.

Nursing facilities certified to participate in the Medicare or Medicaid programs are required by Omnibus Budget Reconciliation Act (1987) to use a standardized, comprehensive functional assessment system known as the Resident Assessment Instrument (RAI). The RAI consists of the Minimum Data Set (MDS) and the Resident Assessment Protocols (RAPs). The MDS is a core set of screening and assessment elements that forms the foundation of the comprehensive assessment, which is completed by the interdisciplinary team (Won, Morris, Nonemaker, & Lipsitz, 1999). The MDS consists of more than 400 items, which are used to help identify a resident's problems, strengths, needs, and preferences so that function is maintained or enhanced (Rantz et al., 1999). There are currently 18 RAPs that are problem-oriented frameworks for organizing MDS information. They include: delirium, cognitive loss, visual function, communication, ADL function, urinary incontinence, psychosocial well-being, mood state, behavioral symptoms, activities, falls, nutritional status, feeding tubes, dehydration, dental care, pressure ulcers, psychotropic drug use, and physical restraints. The RAI is used for clinical assessment, improvement in clinical practice, and evaluation of care outcomes. The RAI provides a comprehensive and holistic approach to assessment and helps staff members have a better understanding of the underlying causes and contributing factors for specific problems (Rantz et al., 1999; Won et al., 1999).

The Behavioral Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD; Reisberg, Borenstein, Salob, Franssen, & Georgeotas, 1987) is one of the most commonly used caregiver-rated instruments, and is designed to measure behavioral problems and psychotic symptoms among dementia outpatients. The BEHAVE-AD comprises 25 items rated on a 4-point Likert-type scale of severity, and a 4-point global

assessment of the magnitude of danger/disruptiveness of the behavior for both the individual with dementia and his or her caregivers.

The Revised Memory and Behavior Problems Checklist (RMBPC; Teri et al., 1992) is a 24-item caregiver-rated inventory that assesses observable behavior problems among individuals with dementia. The RMBPC uses a 5-point Likert-type scale to measure the frequency of behaviors and a 5-point Likert-type scale to measure the degree to which the behaviors bothered or upset the caregiver. The RMBPC is also designed with three subscales that assess memory-related problems, depression problems, and disruptive problems (Cohen-Mansfield & Taylor, 1998).

The Neuropsychiatric Inventory (NPI; Cummings, Mega, Gray, Rosenberg-Thompson, & Gornbein, 1994) was designed to assess simultaneously a wide range of behaviors exhibited by individuals with dementia. It was also developed to provide a means of distinguishing between severity and frequency of the behavior changes, and to facilitate rapid assessment via the use of screening questions. Ten domains are evaluated by the NPI and separate scores for both frequency and severity of each subscale are provided (Cohen-Mansfield & Taylor, 1998).

The Behavioral Syndromes Scale for Dementia (BSSD; Devanand et al., 1992) is a scale that focuses primarily on agitation and also measures behavioral syndromes that are associated with dementia. The syndromes evaluated by the BSSD include disinhibition, apathy/indifference, sundowning, denial, catastrophic reaction, and other clinical features such as activities of daily living, emotional dependency, paranoia, and stubbornness. All of these items are rated in relation to the premorbid manifestation of these behaviors.

Aggression is the most disruptive form of agitation and can pose serious threats to the welfare of others. The following scales have been developed specifically for the measurement of aggression. The Rating Scale for Aggressive Behaviour in the Elderly (RAGE; Patel & Hope, 1992) is a 21-item checklist that measures aggressive behavior among psychogeriatric inpatients. The items assess specific types of aggressive behavior and are rated in a Likert-type format by the nursing staff. The Ryden Aggression Scale (RAS; Ryden, 1988) is a 25-item Likert-type scale, which characterizes the nature and frequency of the occurrence of aggressive behavior among older adults. This retrospective instrument can be used by family members and caregivers to assess behaviors that occur on three subscales: physically aggressive behavior, verbally aggressive behavior, and sexually aggressive behavior. The Staff Observation Aggression Scale (SOAS; Palmstierna & Wistedt, 1987) assesses the nature and frequency of aggressive behaviors among psychogeriatric inpatients. This instrument is used to evaluate the nature of the provocation, the means used by the patient, the aim of aggression, the consequences for the object of the aggression, and the means used to end the aggression.

Agitation in individuals with dementia typically involves several components and a number of scales have been designed to specifically measure these components (Cohen-Mansfield & Taylor, 1998). The Pittsburgh Agitation Scale and the Cohen-Mansfield Agitation Inventory are two examples of these types of agitation scales. The Pittsburgh Agitation Scale (PAS; Rosen et al., 1994) is a short rating scale for agitation which categorizes agitation into four items: aberrant vocalization, motor

agitation, aggressiveness, and resisting care. These behaviors are rated on a 4-point Likert-type scale of intensity. The Cohen-Mansfield Agitation Inventory (CMAI; Cohen-Mansfield, Marx, & Rosenthal, 1989) uses a Likert-type frequency scale and rates how often an older person has exhibited 29 agitated behaviors within the past two weeks. Some of the behaviors that are assessed include pacing/wandering, inappropriate robing and disrobing, complaining, cursing/verbal aggression, hurting self or others, and handling objects inappropriately. The CMAI provides four scores that correspond to the following four types of agitated behaviors: physically nonaggressive behavior, physically aggressive behavior, verbally nonaggressive behavior, and verbally aggressive behavior. An extended version of the CMAI was designed to measure both the frequency and the perceived disruptiveness of each behavior. The CMAI was originally developed for use in nursing facilities, but a separate version is also available for use with older adults living in the community.

Single-case experimental designs. The turning point in the growth of AAT as an established field occurred in the late 1970s and 1980s. The past several decades have witnessed the benefits of using animals in therapeutic settings, and both researchers and practitioners have advocated increases in the availability of AAT services. Recently, there has been a movement characterized by an increased demand for accountability and documentation of AAT programs. In the late 1980s and the 1990s, the field of AAT experienced a dramatic shift from the use of case studies, anecdotes, and heartwarming stories to systematic evaluation and research as the criteria for justifying programs and procedures (Burch, 2000).

AAT programs can be evaluated in a variety of ways, which include the overall mission statement, physical plant, clients/patients, animals, volunteers, staff, curriculum, cost-benefit analysis, results, and long-term impact. The results and long-term impact of AAT can be evaluated using traditional research methods such as statistical and single-case experimental designs. Single-case experimental designs are seen less frequently in AAT research and program evaluation than group statistical designs, which is unfortunate because single-case methodology lends itself well to providing an ongoing assessment of program progress. Single-case experimental designs also allow the practitioner or researcher to understand the behavior of the individual participants, as these individual differences are not obscured by the averaging process which is required by group statistical designs. Group statistical designs demonstrate statistical significance, whereas single-case experimental designs can be used by program evaluators to demonstrate clinical significance (Burch, 2000).

Single-case experimental designs were first developed in animal operant conditioning, and have been adapted and used to evaluate applied problems in a variety of areas and settings (Burch & Bailey, 1999). The goal of single-case experimental designs is to demonstrate the functional relationship between an event and a target behavior. Several types of single-case experimental designs can be used for research and program evaluation, the most common being AB designs and related variations. The AB design begins with some quantification of the variable that is expected to change as a result of the intervention, or the dependent variable. The "A" represents a baseline condition in which the specified variables are observed and quantified before any

treatment takes place. The "B" in the AB design represents the treatment condition and shows the data after the intervention has been implemented (Burch, 2000).

The ABAB designs are the most basic experimental designs in single-case research, and consist of a family of experimental arrangements in which observations of performance are made over time for a given individual. The ABAB design examines the effects of an intervention by alternating the baseline condition with the treatment condition, and the A and B phases are repeated to complete the four phases. The effects of the intervention are evident if performance improves during the first intervention phase, reverts to or approaches original baseline levels of performance when treatment is removed, and improves when treatment is reinstated in the second intervention phase (Kazdin, 1998).

The ABAB design begins by the observation of behavior under baseline conditions. Treatment is implemented when a stable rate of behavior is evident and is not accelerating or decelerating. Treatment may consist of a particular intervention and it is hypothesized that the intervention is associated with some change in the observed behavior. The intervention is temporarily removed when this change in observed behavior is stable, and the baseline condition is reinstated. This return-to-baseline condition has been referred to as a reversal phase because the behavior is expected to reverse or return to the level of the original baseline. The intervention is reinstated after behavior reverts to baseline levels (Kazdin, 1998). The reversal design shows that a particular intervention is responsible for the behavior change when the onset of the intervention results in the onset of the specified behavioral change. In this type of design, experimental control can be demonstrated by "turning the behavior on and off." Reversal

designs are used when the expectation is that results are reversible, that behavior will return to baseline levels when the intervention is removed. It is unethical to use a reversal design when the removal and return to baseline levels causes negative effects to the individual (Burch, 2000).

Hypotheses

1. Dementia patients exhibiting a high frequency of agitation associated with sundown syndrome as measured by the CMAI will show clinically significant reductions in agitation during the implementation of AAT during treatment phases.

2. During treatment phases, significantly fewer orders for standing "prn" (as needed) psychotropic medications for agitation will be administered to dementia patients by their health care provider.

3. During treatment phases, physical restraints to manage agitation will be ordered and applied less often to dementia patients.

Chapter 2

Method

Participants and Setting

The clinical sample for this study included three elderly individuals, 65 years or older, who resided in a long term care unit within a nursing home in a mid sized city in the northeast region of the United States. Criteria for inclusion in the study included: a primary diagnosis of dementia by a geriatric psychiatrist according to the Diagnostic and Statistical Manual of Mental Disorders - Text Revision (American Psychiatric Association, 2000); that is, Dementia of the Alzheimer's Type, Vascular Dementia, Dementia Due to HIV Disease, Dementia Due to Head Trauma, Dementia Due to Parkinson's Disease, Dementia Due to Huntington's Disease, Dementia Due to Pick's Disease, Dementia Due to Creutzfeldt-Jakob Disease, Dementia Due to Other General Medical Conditions, Substance-Induced Persisting Dementia, Dementia Due to Multiple Etiologies, and Dementia Not Otherwise Specified; reports of agitation associated with sundown syndrome from the nursing staff; documentation of episodes of agitation during the evening hours on the MDS as reported by nursing staff, incident reports, and progress notes; and consent from the legal guardian or responsible party of the participant.

Criteria for exclusion from the study included more than a moderate impairment of vision or hearing as determined by the physician, any other Axis I diagnoses along with dementia, or serious medical conditions (i.e., recent stroke, acute heart disease, acute respiratory disease). Data was collected on each participant's age, race, gender,

diagnoses, duration of the problem, and currently prescribed medications, including psychotropics.

Approval for this study was obtained from the Institutional Review Board for the Protection of Human and Animal Subjects at the Philadelphia College of Osteopathic Medicine and the nursing home facility. Three elderly individuals who demonstrated documented episodes of agitation associated with sundown syndrome were recruited for the study. Each potential participant's legal guardian or responsible party was mailed a letter describing the research project, with a request for permission to be contacted by the investigator (see Appendix A). The investigator offered the opportunity to meet with the legal guardian or responsible party. Once permission was received, the investigator contacted the legal guardian or responsible party for each potential participant by telephone or in person and described the methods and purposes of the research project. The potential benefits and risks of participation in the study were also explained to the legal guardian or responsible party of each potential participant. The potential benefits of the study included decreased level of agitation, decreased need for prn psychotropic medications, and decreased need of physical restraints. The potential risks of participating in the study included an adverse reaction to the aquarium resulting in an increased level of agitation and the need for prn psychotropic medications and/or physical restraints. It was unlikely that an increased level of agitation would occur because experiments with aquariums have revealed the same underlying mechanism: we relax whenever any neutral visual event draws our attention outward and interrupts our ongoing train of thought (Beck & Katcher, 1996; Katcher, Friedmann, Beck, & Lynch, 1983; Katcher, Segal, & Beck, 1984; Siegel, 1990). If permission to include the

participant in the study was granted, the legal guardian was mailed a consent form to sign and return to the investigator (see Appendix B). A copy of the consent form was mailed to each legal guardian and a summary of the research findings were provided upon completion of the study.

Design

A single-case experimental design was proposed with three participants in this study (Kazdin, 1998; Richards, Taylor, Ramasamy, & Richards, 1999). An ABAB design (reversal design) was planned in which an initial baseline phase (A) was followed by a treatment phase (B), a return to baseline phase (A), and then another treatment phase (B). The independent variable was the introduction of an aquarium, which participants were asked to observe. The innovative use of aquariums has been employed to increase food consumption in Alzheimers' patients and appear to promote relaxation. Alzheimers' patients who were exposed to aquariums of brightly colored fish during mealtimes appeared to be more relaxed, alert, and demonstrated improvement in their eating habits (Edwards & Beck, 2002). The results of this study also showed a decrease in the number of instances of disruptive behaviors, such as wandering, pacing, yelling, and physical aggression, which can interfere with eating. While the exact mechanisms are unclear at this point, the aquarium may serve as a distraction to individuals with dementia, which assists in reducing stress and promoting relaxation. One potential mechanism may be that a shift in attention away from the self and toward a pleasant, absorbing stimulus reduces anxiety. The dependent variable in this study was the occurrence of verbal

displays of agitation. The administration of psychotropic medications on a prn basis and the application of physical restraints were monitored using archival data.

Procedures

Three participants who met inclusionary and exclusionary criteria, and for whom informed consent and possibly assent had been obtained, were selected for inclusion in the study. The time period for which documented episodes of agitation associated with sundown syndrome seem most problematic for each participant was identified through discussions with the nursing staff. The time period identified as problematic for the participant was planned to be observed independently by two individuals trained in the data collection procedures, but the investigator served as the only observer in this study. These individuals were to receive specific training in the methods of observation to be used in the study. The investigator was to meet with these individuals, provide them with a brief observation manual, and provide training to ensure the reliability of observations. The training manual was to specify in great detail the behaviors to be observed, their operational definitions, the data recording procedures, the process of independent observation, and ethical considerations in research with human participants. The investigator planned to initially train the observers to perform the data collection procedures on a mock trial basis.

The training of the observers was to consist of three stages. In stage one, the investigator planned to educate the observers about agitation associated with sundown syndrome and behaviors subsumed under this category. The investigator also planned to

educate the observers on the process of data collection. The investigator planned to ensure that the observers understood the behaviors and were able to list examples of agitation. In stage two, the observers were to be shown videotaped vignettes displaying examples of the specified behaviors in question and examples of behaviors that do not qualify as agitation associated with sundown syndrome. The observers were to be given the opportunity to discuss the definitions with the investigator to be certain they fully understood this behavior. In stage three, the observers were to be shown one-minute videotaped segments of behavior and asked independently to demonstrate mastery of the observational system. After each one-minute segment, the investigator planned to determine whether the observers agreed or disagreed that agitation had occurred during that one-minute segment. If agreement has occurred, the investigator planned to reinforce why the behaviors in question were examples of agitation. If there was disagreement between the observers, the investigator's judgment was to be used as the gold standard and the observers would be informed of that judgment and would be asked to reread criteria and then rerate/make a judgment. Once the observers had achieved 90% agreement, then they would be tested on an independent series of videotaped segments. If they achieved 90% agreement, then formal data collection would begin.

The data collection procedures involved time sampling periods (Saudargas & Zanolli, 1990) and the use of a behavioral observation checklist. Interobserver reliability was planned to be documented throughout the data collection periods of the study. Agitation associated with sundown syndrome was operationally defined as: cursing or verbal aggression; hitting (including self), kicking, pushing, biting, scratching, aggressive spitting; grabbing onto people, throwing things, tearing things or destroying property;

general restlessness, performing repetitious mannerisms, tapping, strange movements; constant request for attention or help (Cohen-Mansfield et al., 1989). The specific behaviors associated with agitation, along with examples, were listed on a behavioral observation checklist. The observers were to place tally marks beside each behavior observed, noting the occurrence of the behavior during the specified time period.

One of the most common measures of behavior is an estimate of the percentage of time an individual engages in a behavior, and the usual method of obtaining an estimate of this measure is to use some form of time sampling (Saudargas & Zanolli, 1990). Time sampling periods were used throughout the study to observe the individual behavior. The time sampling procedure involved dividing time into discrete units and then coding the occurrence or nonoccurrence of behaviors within the defined time units (Saudargas & Zanolli, 1990). During the baseline phase of the study, the observers were to collect data on the behavioral observation checklist every three minutes for a period of one minute during the identified time periods. Once a stable rate of behavior was evident, treatment was implemented which consisted of the introduction of the aquarium. The aquarium was to be placed in close proximity to the participant during the identified time periods and the observers were to read from a standardized instruction sheet to prompt the participant to look at the aquarium; that is, "Mr. Jones, look at the colorful fish." The observers were to collect data on the behavioral observation checklist every three minutes for a period of one minute during the identified time periods while the aquarium was present. Once a stable rate of behavior was evident during the treatment phase, the aquarium was to be temporarily withdrawn and the baseline condition reinstated. The

observers were to collect data once again during this phase until a stable rate of behavior was evident, and the aquarium was to be reinstated for another treatment phase.

Measures

Mini-mental state examination. The Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) will be administered to each participant by the investigator to determine cognitive status and corroborate the diagnosis of dementia. The MMSE is the measure most frequently used to screen for cognitive impairment and it is most suitable for detecting the cognitive deficits seen in syndromes of dementia and delirium and for measuring these changes over time (Cockrell & Folstein, 1988). The MMSE has a maximum of 30 points, and requires only 5-10 minutes to administer. It is "mini" because it concentrates only on the cognitive aspects of mental functions. It excludes questions concerning mood, abnormal psychological experiences, and the content or process of thinking (Folstein et al., 1975). The questions have been grouped into seven categories, each representing a different cognitive function: Orientation to time (5 points); Orientation to place (5 points); Registration of three words (3 points); Attention and Calculation (5 points); Recall of three words (3 points); Language (8 points); and Visual Construction (1 point) (Tombaugh & McIntyre, 1992).

The MMSE is a quantified assessment of cognitive state of demonstrable reliability and validity. The reliability of the MMSE has been demonstrated in both psychiatric and neurological populations. The examination of its psychometric properties shows moderate to high levels of reliability, with test-retest reliability higher than

measures of internal consistency (Cockrell & Folstein, 1988; Tombaugh & McIntyre, 1992). MMSE scores correlate highly with scores obtained from other types of cognitive screening tests along with psychological and neuropsychological tests measuring intelligence, memory, and activities of daily living. The validity of the MMSE has been demonstrated by a positive correlation between elderly subjects' MMSE scores and their scores on both the verbal and performance sections of the WAIS. The MMSE is portable and relatively quick to administer. The MMSE is available in several languages and has been widely used in epidemiological studies and community surveys (Tombaugh & McIntyre, 1992).

Cohen-Mansfield agitation inventory. The Cohen-Mansfield Agitation Inventory (CMAI; Cohen-Mansfield, et al., 1989) is used to assess the frequency of manifestations of agitated behaviors in older adults. The CMAI is a non-obtrusive assessment tool used for direct observation and recording of behaviors as they occur in the natural environment. The CMAI rates how often an older adult has exhibited 29 agitated behaviors within the past two weeks. The CMAI classifies agitated behaviors into four categories: physical/aggressive behaviors, physical/non-aggressive behaviors, verbal/aggressive behaviors, and verbal/non-aggressive behaviors, and produces four scores which correspond to these categories of agitated behaviors (Cohen-Mansfield et al., 1989; Cohen-Mansfield, Werner, Watson, & Pasis, 1995). The inventory uses a Likert-type frequency scale ranging from 1 = "never" to 7 = "several times an hour." An extended version of the CMAI includes measures of both frequency and perceived disruptiveness of each behavior, where disruptiveness is rated on a 5-point scale ranging

from 1 = “not at all” to 5 = “extremely.” The inter-rater reliability rates for the CMAI have been ranged between 0.88 and 0.92 (Chrisman, Tabar, Whall, & Booth, 1991; Cohen-Mansfield et al., 1989).

The short form of the CMAI was modified into a behavioral observation checklist in order to identify the occurrence of behaviors associated with sundown syndrome (see Appendix C). The categories of behaviors associated with sundown syndrome included: cursing or verbal aggression; hitting (including self), kicking, pushing, biting, scratching, aggressive spitting; grabbing onto people, throwing things, tearing things or destroying property; general restlessness, performing repetitious mannerisms, tapping, strange movements; constant request for attention or help (Cohen-Mansfield et al., 1989).

Chapter 3

Results

Plan for Statistical Analysis

The interpretive method of significant effects for this single-case experimental design was inferred through visual inspection of graphed data. Data was to be collected and plotted across two baseline and two treatment phases. A comparison of data across the baseline and treatment phases was to be performed.

Anticipated Results

The anticipated results of this study are that during treatment, there will be a clinically significant reduction in the frequency of agitation associated with sundown syndrome. It is also anticipated that during treatment, there will a reduction in the frequency of orders for administration of prn medications and the application of physical restraints.

Limitations of the Study

One of the limitations of the single-case experimental design is the lack of external validity or generalizability. Another limitation of this study is the

attention-placebo effect, in which factors other than active ingredients of the intervention may be producing change in the subjects. The single-case experimental design also has limitations with regard to revealing subject characteristics that may interact with the specific treatment, and determining which specific variables associated with the intervention may be producing the effect.

Rationale

Most individuals with dementia experience emotional distress or behavioral changes best summed up by the term agitation (Alexopoulos et al., 1998). Agitation is a major problem for the elderly, their families, and caregivers. Agitation affects the quality of life of individuals with dementia and creates a difficult and challenging experience for nursing facility staff. Nursing facility staff have traditionally used chemical and/or physical restraints to manage agitation in individuals with dementia which has resulted in numerous problems. Medications can increase the risk of confusion and impairment of cognitive functioning in individuals with dementia, and the use of psychotropic medications in the elderly has been shown to increase the risk of falls (Gurvich & Cunningham, 2000; Monane & Avorn, 1996; Ray et al., 1987; Thapa et al., 1995).

The OBRA instituted regulations that specifically addressed the need for nursing facility staff to use interventions other than chemical and physical restraints (OBRA, 1990). The HCFA developed the initiatives to implement the OBRA regulations (HCFA, 1992). These regulations were devised to assist individuals with cognitive impairment to maintain their autonomy, dignity, and quality of life (HCFA, 1992; OBRA,

1990; Tabloski & Williams, 1998). The implementation of the OBRA and HCFA regulations has been problematic for the nursing facility staff. Unfortunately, the use of chemical and physical restraints may exacerbate the behavioral manifestations that are the target of interventions and can contribute to additional difficulties for the individual with dementia (Tabloski & Williams, 1998).

There is a need for nonpharmacological treatment approaches to manage agitation in individuals with dementia. Environmental modifications are needed to reduce the level of agitation in individuals with dementia, promote the maximum potential within the limits of each individual's remaining cognitive abilities, and provide feasibility for nursing facility staff to implement and incorporate these interventions into individual plans of care. AAT is an intervention that can be implemented by nursing facility staff as a nonpharmacological treatment approach to managing agitation in individuals with dementia. The rationale for this particular study was to use an AAT approach to decrease agitation associated with sundown syndrome in individuals with dementia, thereby reducing the need to use chemical and/or physical restraints.

Review of the Literature

Agitation in individuals with dementia. Agitation in individuals with dementia is a distressing and pervasive problem (Alexopoulos et al., 1998). Approximately 90% of individuals with dementing illnesses demonstrate problem behaviors ranging from repetitive verbalizations and wandering to verbal and physical aggression toward self or others. Currently, there is no single causative agent recognized for the behavioral

manifestations associated with dementia (Davis et al., 1997). Agitation is considered to be a core behavioral feature of dementia and is probably the foremost management problem for staff in nursing facilities (Cohen-Mansfield, 1986; Rowe & Alfred, 1999). There is an enormous amount of pressure on health care professionals to control agitation in individuals with dementia without resorting to the use of chemical and physical restraints. The presence of agitation signals discomfort in individuals with dementia and impairs their quality of life. The primary focus in the development of humane and effective treatment approaches for individuals with dementia needs to be these safety and quality of life issues (Kolanowski, 1999).

Definition of agitation. Agitation has been defined in a variety of ways in the literature, which has created some problems in the field of geriatric care. The inconsistencies in the definitions of agitation have incorporated physical aggression, verbal aggression, and nonaggressive behavior, such as wandering, with psychological symptoms, such as psychosis and depression, and cognitive symptoms, such as confusion and disorientation (Kahn, et al., 1998). Agitation has generally been defined as increased, inappropriate motor or vocal behavior that observers can precisely describe (Kahn et al., 1998). Cohen-Mansfield and Billig (1986) defined agitation as "inappropriate verbal, vocal, or motor activity that is not explained by needs or confusion per se" (p. 712). Cohen-Mansfield, Marx, and Rosenthal (1989) described agitated behaviors as either abusive, aggressive, inappropriately frequent, or socially inappropriate, and established three categories of behaviors to include physically aggressive, physically nonaggressive, and verbally agitated. Agitated behaviors have

also been described in more general terms, such as verbal or physical aggression, negativism, irritability, motor restlessness, demanding behaviors, or resisting activities (Gilley, Wilson, Bennett, Bernard, & Fox, 1991; Merriam, Aronson, Gaston, Wey, & Katz, 1988; Swearer, Drachman, O'Donnell, & Mitchell, 1988; Teri, Larson, & Reifler, 1988).

Sundown syndrome. Each evening thousands of older adults in the community and in institutions become agitated, restless, and confused and begin to wander about or scream. This phenomenon is referred to as sundown syndrome, since it occurs in the evening hours after sunset. It appears that orientation becomes disrupted by the dim light and other changes that sundown brings in the sensory environment. Sundown syndrome is not a psychiatric diagnosis, but it is a common and recognizable phenomenon for those who provide care for individuals with dementia (Burney-Puckett, 1996; Churchill et al., 1999).

There is controversy in the literature about the causes of increased agitation that seem to be associated with late afternoon or early evening. Several behavioral studies have attempted to categorize agitation that corresponds to time frames. Cameron (1941) induced sundowning by placing a group of elderly individuals with dementia in a darkened room during the daytime. Cohen-Mansfield, Marx, Werner, and Freeman (1992) found that vocalizations, involuntary picking at bed clothes, and physically aggressive behaviors were likely to occur during the hours of 4:30 p.m. to 11 p.m., rather than during the hours of 4:30 p.m. to 7 p.m., the sunset hours. Bliwise, Bevier, and Bliwise (1990) determined that sunset may be a vulnerable period for agitation for

individuals with dementia, but Bliwise, Carroll, Lee, Nekich, and Devant (1993) found that agitation was no more likely to occur during the afternoon or at night than during the day. Bliwise (1994) found that more severe agitation occurred during the winter months, rather than autumn, and the time of occurrence was near sunset.

There is limited research on the cause of sundown syndrome, although its causes appear to be multifactorial. Several risk factors have been identified, which may signal the potential for sundown syndrome. These include advanced age, dementia, other organic brain syndromes present, poor vision, hearing deficits, dehydration with electrolyte imbalances, adverse medication reactions, and fatigue (Churchill et al., 1999). Evans (1987) reviewed medical charts of a large group of elderly institutionalized subjects who were experiencing sundown syndrome, and demonstrated a significant relationship with a number of physiological variables, including disturbed circadian rhythms. Evans (1987) also suggested that psychological variables, such as the role of stress, be considered crucial in understanding the phenomenon of sundown syndrome. Wolanin and Phillips (1981) acknowledged the role of physiological variables in the etiology of sundown syndrome, but also emphasized the interaction with staff as crucial in assessing confusion in cognitively impaired individuals. Kral (1975) stressed the importance of psychosocial stressors, such as bereavement and loss of independence, as precipitants to confusion in cognitively impaired individuals. In sum, most studies have tended to explain sundown syndrome according to physiological, environmental, and psychological variables.

A major concern with the use of the term sundown syndrome is the implication that the loss of sunlight is the primary cause for the increase in agitation in individuals

with dementia, and interventions to manage agitation due to the loss of sunlight are not likely to be effective (Exum et al., 1993). The behaviors of sundown syndrome can include increased restlessness and verbal behavior, confusion, aimless wandering, paranoia, agitation, and aggressive behavior such as hitting, kicking, and biting directed toward staff, family, or other patients (Evans, 1987). The symptoms of sundown syndrome resemble delirium in terms of disordered cognition, attention, sleep-wake pattern, and psychomotor behavior, and pose tremendous management problems for nursing facility staff (Exum et al., 1993).

Animal-assisted therapy. AAT is defined as the introduction of an animal into the immediate surroundings of an individual or group as a means of interaction with a therapeutic purpose (McCulloch, 1983). The first recorded use of animals in a therapeutic setting was in 1792 when William Tuke used common farm animals in his York Retreat for persons with mental disorders in England. The next recorded use of animals in a therapeutic setting was in 1867 at Bethel in Biefeld, West Germany, which was a residential treatment center for persons with epilepsy (Beck, 2000). The first recorded use of animals in a therapeutic setting in the United States was in 1944 at the Army Air Force Convalescent Center in Pawling, New York. The Center was sponsored by the American Red Cross and the airmen were encouraged to interact with dogs, horses, and farm animals to serve as a diversion from the intense therapeutic programs they were undergoing (Beck & Katcher, 1996). There were no records kept on the effects of the human-animal interactions and the program was discontinued after World War II (McCullough, 1983). The next recorded use of animals in a therapeutic setting was in the

1960s by Boris Levinson in which he described his use of animals as adjuncts to his practice of psychology (Levinson, 1962, 1969). Levinson (1969) advocated the use of animals with the elderly and recommended the introduction of pets into the nursing home setting as a method of therapy for the aged.

Theory of animal-assisted therapy. During the last 20 years, the theoretical emphasis of AAT has shifted from metaphysical ideas about animals as psychospiritual mediators, toward the more scientific explanations for the apparent therapeutic benefits of animal companionship (Serpell, 1996). This shift in emphasis has mainly been attributed to the groundbreaking study of Friedmann, Katcher, Lynch, and Thomas (1980) in which 92 cardiac care outpatients were found to live longer if they were pet owners. Numerous health-related studies have been conducted since, and there has been much discussion concerning the possible mechanism(s) responsible for these important effects associated with pet ownership. The first potential mechanism that has been suggested is that animals are able to induce an immediate, physiologically de-arousing state of relaxation simply by attracting and holding individuals' attention (Katcher et al., 1983). The second potential mechanism that has been suggested is that companion animals are capable of providing people with a form of stress-reducing or stress-buffering social support (Serpell, 1996; Siegel, 1990).

Numerous studies confirm that three categories of human-animal association provide physiological benefits to individuals. These include people explicitly observing animals or pictures of animals (Katcher et al., 1983; Lockwood, 1983), people being in the presence of animals but not interacting with them (Friedmann, Katcher, Thomas,

Lynch, & Messent, 1983; Grossberg, Alf, & Vormbrock, 1988), and people touching or interacting with animals (Wilson, 1987, 1991; Vormbrock & Grossberg, 1988).

Animal-assisted therapy with the elderly. One of the earliest and most frequently cited outpatient intervention study with the elderly was conducted by Mugford and M'Comisky (1975). They selected 30 elderly individuals (ages 75 to 81) and divided them into five groups: two groups received parakeets, two groups received begonias, and a control group received neither. A 30-item questionnaire that measured attitudes toward self and others, along with physical and psychological environment, was administered to all individuals at the start and conclusion of the five month study. The presence of a television was also factored in by the researchers based on the theory that a pet might be less important to television owners, since television provides interaction with society and could have an influence on the elderly individual's evaluation of his or her loneliness. Mugford (1975) found that pet ownership had a positive effect on the elderly individuals' lives as compared to flowers or television. The 12 elderly individuals who received the parakeets demonstrated marked improvement, especially in the areas of attitudes toward other people and their own psychological health. The birds became an important topic of the elderly individuals' conversations and enhanced their social lives with friends and neighbors. The birds appeared to serve as a "social lubricant."

Gowing (1985) assessed the impact of a minimal care pet on elderly patients from home health care agencies by assigning 20 patients to a treatment group that received goldfish and supplies, and 13 patients to a control group that received no fish. The results indicated that keeping a goldfish had no significant effect on the health and social

interaction; however, the elderly patients did develop a degree of attachment to the goldfish. The study confirmed that goldfish could serve as pets, which provided cognitive stimulation and that interest and responsibility could be sustained over time for the elderly patients.

Riddick (1985) evaluated the effects of aquarium placement in elderly persons living in a low-income housing project during a six month time period. Twenty-two elderly persons were divided into three groups in which one group received the aquarium, with maintenance provided for the first few months, one group received visitors, and a third group received neither visitors nor an aquarium. The three groups were analyzed for blood pressure, happiness, anxiety, loneliness, and leisure satisfaction. The aquarium group experienced a significant decrease in diastolic blood pressure and a significant increase in leisure satisfaction, particularly in the aspect of relaxation. The visitor group experienced a significant decrease in overall loneliness. There were no significant changes for happiness, systolic blood pressure, or anxiety for any group. The most unexpected finding was that the members of the aquarium group, who had the fish all the time and visitors through the tank maintenance service, did not experience a decrease in overall loneliness. One possible explanation for this finding is that when members of the aquarium group had visits, the visits focused on the fish, whereas the visits for the visitor group focused on the person. Another explanation may be that fish do not provide the same kind of companionship as that of a dog or cat.

Harris, Rinehart, and Gertsman (1993) followed 16 homebound elderly patients of a medical services program (ages 65 to 91) who were visited by volunteers alone or with a pet. Vital signs were taken both before and after the visits. Results indicated that there

were no significant changes when the volunteer visited alone, but both blood pressure and pulse were lower after the volunteer visited with a pet. Interviews conducted with the subjects indicated that the animals were often an important focus of attention and conversation.

Research studies with the elderly in institutional settings have involved measuring the impact of both resident and visiting animals. Brickel (1979) interviewed nursing home staff, where patients had access to two mascot cats for two years, to determine the therapeutic value of these resident animals on a hospital unit. There were 20-25 patients (ages 50 to 70) who had access to the cats. Brickel (1979) ascertained that most of the patients enjoyed the company of the cats, and that the most frequently cited benefit attributed to the presence of the cats was patient responsiveness. Other benefits included the physical pleasure of stroking the cats, the enhanced home-like atmosphere of the unit, and the incorporation of the cats into the patients' daily reality. This latter effect was demonstrated by patients' concerns and awareness of the cats' health and by the patients saving food for the cats. The staff also suggested that the most withdrawn patients appeared to have the most benefits from the cats.

The Australian Joint Advisory Committee on Pets in Society (JACOPIS) conducted a 6-month study of the interaction of nursing home residents with a dog. Salmon, Hogarth-Scott, and Lavelle (1982) introduced a dog to interact with 60 patients (average age of 80) who were frail, uncommunicative, and nonambulatory. Pre-and-post-test questionnaires were administered to measure benefits and problems anticipated. The patients were closely monitored both in responses to the dog and in general social, psychological, and physical behaviors. Results indicated that the presence

of the dog promoted a greater joy in living among the patients, increased laughter, happiness, a sense of humor, alertness, responsiveness, an easygoing attitude, and an increased incentive to live. The presence of the dog also resulted in improved relationships between patients and between patients and staff. Banzinger and Roush (1983) conducted a study with 40 nursing home residents and found that individuals who received a wild bird feeder outside their window experienced greater happiness, life satisfaction, and control, as well as higher activity levels than individuals who did not. This study and the research conducted by Gowing (1985) and Riddick (1985) suggests that the lives of elderly individuals can be considerably enriched through the use of animals that require little cost and minimal upkeep.

Numerous visiting animal programs that have been conducted with the elderly have been criticized for their lack of scientific rigor; however, there has been an immense amount of anecdotal information that supports the notion that these programs are valuable (Cusack, 1988). Robb, Boyd, and Pristash (1980) conducted a study to examine the impact of a wine bottle, a flowering plant, and a caged puppy on social behavior in a population of elderly male alcoholics institutionalized at a Veterans Administration hospital. All residents seated in the day room comprised the sample for this study, which ranged from as few as three to as many as 23 residents at any single observation time. Social behavior included five observable activities: verbalization (communication of thoughts and feelings in spoken words), smile, look, eyes open, and leans toward stimulus. The researchers found that the mean number of times per resident that each of the five social behaviors was demonstrated was highest during the time the caged puppy was present. The results indicate that the puppy induced appropriate verbalization and a

decrease in hostile behaviors. During the puppy phase, verbalization became more conversational and none of the hostile behaviors observed during other phases of the study were evident.

Hendy (1984) studied the effects of different pet presentations on the sociability and health activities of 13 nursing home residents (average age 73 years). The effects of no pets, stuffed pets, videotaped pets, and live pets were examined on factors, such as proximity to others, talking, smiling, being ambulatory, alertness to the surroundings, and eating a variety of foods offered at lunch. Hendy (1984) found that live pets were far more effective in eliciting smiles and alert behavior than other pet presentations, and that these effects lasted for a four-week period.

Jendro and Watson (1984) studied the effect of interaction with puppies on 22 unit-confined male veterans (age range 43 to 85 years) in an extended care ward of a Veterans Administration medical center. The patients selected were cognitively impaired and most were unable to participate in recreational or occupational activities because of their impairment. Socialization and communication were largely absent in these patients, and behavior most often consisted of ritualistic, nonpurposeful behaviors, such as vacant staring and rocking back and forth. The Nurses Observation Scale for Inpatient Evaluation (NOSIE-80) was used to measure social competence and interest, personal neatness, cooperation, irritability, manifest psychosis, and psychotic depression, and the Stockton Geriatric Rating Scale (SGRS) was used to measure severity of impairment. The Behavioral Characteristics Instrument was used to measure purposeful versus nonpurposeful behaviors. Each of the subjects served as his own control and the men were divided into a pet group, which had contact with three or four puppies for an hour

each week for five weeks, and a control group, which did not have access to the puppies. The groups reversed after the fifth week resulting in the control group becoming the pet group and vice versa. The researchers found that the patients showed more purposeful behavior during the puppy session than in comparison periods the day before or the day after treatments. There were no significant differences found in the NOSIE and SGRS which they attributed to the severe mental impairment of the subjects and the limited amount of time spent with the puppies.

Francis, Turner, and Johnson (1985) conducted a study to determine the value of domestic animal visitation on semi-institutionalized elderly living in group homes. The researchers used two group homes and each group received a pre-and-post-test on nine variables: health self-concept, life satisfaction, psychological well-being, social competence and interest, personal neatness, psychosocial and mental function, and depression. The experimental group home residents (n = 21) were visited weekly by six puppies and their handlers for several hours for a total of eight weeks; the control group residents (n = 19) were visited only by humans. The results indicate that the residents who interacted with the animals improved in seven of the nine variables measured. The variables that were not affected were personal neatness and health self-concept. There were no changes registered in the control group. The researchers have suggested that the affected, measured variables may be indicators of quality of life, and that this study has possibly shown that a simple, inexpensive treatment modality with animals can significantly improve quality of life.

Treatment of anxiety in older adults. Anxiety is one of the more common problems experienced across the life cycle and can be extremely disabling to an otherwise healthy elderly individual (Blazer, 1994). Anxiety exists in the older adult as a symptom and as a disorder and is often unrecognized and inadequately treated. Several factors that have complicated the recognition and treatment of anxiety in older adults include concomitant medical illness, overlap with cognitive disorders, and comorbid depression (Shamoian, 1991; Small, 1997).

Anxiety is a rather complex human emotion which is experienced throughout all stages of the life cycle, including old age. Anxiety is a sense of apprehension or nervousness about some future event. Anxiety may be defined as a subjective state of internal discomfort, dread, and foreboding, accompanied by autonomic nervous system arousal, and it tends to occur without conscious or apparent stimulus. The physical symptoms include hyperventilation, palpitations, sweating, diarrhea, trembling, dizziness, headache, restlessness, and muscle aches. Certain cognitive changes are also associated with anxiety and include impaired attention, poor concentration, and memory problems (Gurian & Miner, 1991; Scogin, 1998). Anxiety has an adaptive value in that it helps an individual anticipate, prepare for, and possibly avoid undesirable events. Anxiety, however, can take on pathological features if it becomes excessive (Sheikh, 1996).

Cognitive-behavioral therapy (CBT) has become the accepted treatment for anxiety disorders in people of all ages; however, systematic studies of the effectiveness in anxious older adults are lacking. Most reports involving cognitive-behavioral therapy with anxious older adults are case studies using an individual treatment format, and controlled trials with a nonclinical population of older adults using group treatment

designs (Wisocki, 1998). A number of uncontrolled case studies have addressed the utility of cognitive-behavorial therapy for older adult patients with generalized anxiety disorder, panic disorder, specific phobia, and obsessive compulsive disorder (Calamari, Faber, Hitsman, & Poppe, 1994; Fabian & Haley, 1991; King & Barrowclough, 1991; Rowan, Holburn, Walker, & Siddiqui, 1984; Thyer, 1981). The following is a brief review of several of these case studies and their respective findings.

Thyer (1981) used graded in vivo exposure with a 70 year old woman who had a seven year dog phobia. The patient's fears were eliminated and treatment gains were maintained at six month follow-up. Hussain (1981) used relaxation, positive self-talk and imagery, and in vivo exposure in the treatment of four nursing home residents with elevator phobia. All four residents were able to ride the elevator with minimal anxiety at two month follow-up.

Rowan, Holborn, Walker, and Siddiqui (1984) used a behavioral treatment program developed for younger adults with obsessive-compulsive disorder with a 67 year old woman who had a 45 year history of obsessional checking. The interventions consisted of in vivo exposure and response prevention, and almost complete elimination of ritualistic behavior was found at the completion of an eight session treatment program. These treatment gains were maintained at 18 month follow-up.

Rathus and Sanderson (1994) used the standard, manualized protocol for the treatment of panic disorders in two elderly patients (Barlow & Cerney, 1988). The CBT interventions included psychoeducation, cognitive restructuring, breathing retraining, and systematic exposure. There were no panic attacks reported after 12 weeks of therapy, and

at an 8 month and 10 month follow-up, only one of the two patients reported experiencing a panic attack.

These studies support the use of exposure, response prevention, relaxation training, and cognitive restructuring with older adults. These studies also address the specific adaptations that facilitate the use of these interventions with older adults, such as the use of multimodal teaching tools, slow and clear presentation of information, and greater explication of treatment rationales (Beck & Stanley, 1997).

A number of controlled trials using group treatment designs of CBT with older adults have been conducted (DeBerry, 1982; DeBerry, Davis, & Reinhard, 1989; King & Barrowclough, 1991; Rickard, Scogin, & Keith, 1994; Sallis, Lichstein, Clarkson, Stalgaitis, & Campbell, 1983; Scogin, Rickard, Keith, Wilson, & McElreath, 1992; Yesavage, 1984; Yesavage & Jacob, 1984; Yesavage, Rose, & Spiegel, 1982; Yesavage, Sheikh, Tanke, & Hill, 1988). The following is a brief description of several group studies and their respective findings.

DeBerry (1982) conducted a study with a sample of 36 elderly women who reported anxiety, tension, fatigue, insomnia, sadness, and various somatic complaints. He compared relaxation-meditation, with and without an additional 10 week home practice follow-up, to a pseudorelaxation control group and found that both forms of relaxation training produced significant reductions in state and trait anxiety.

Sallis, Lichstein, Clarkson, Stalgaitis, & Campbell (1983) found that rational emotive therapy was as effective as relaxation training and pleasant events scheduling, when compared with a control condition for a sample of 24 elderly community volunteers

reporting anxiety and depression symptoms. There was significant improvement on state and trait anxiety scores and depression measures in both groups.

Scogin, Rickard, Keith, Wilson, and McElreath (1992) found that elderly adults exposed to either progressive or imaginal relaxation procedures reported significant relaxation effects. These findings are important for elderly adults who may experience physical limitations that contraindicate muscle-tension-release procedures. Rickard, Scogin, and Keith (1994) demonstrated that the results of these interventions were maintained at a 1-year follow-up. Stanley, Beck, and Glassco (1996) examined the comparative efficacy of CBT with nondirective supportive therapy in 48 older adults (ages 60 and older) with well diagnosed generalized anxiety disorder. CBT was composed of progressive muscle relaxation, cognitive therapy that focused on the control of anxiety evoking thoughts, and exposure that focused on the utilization of newly acquired coping skills through graduated practice with anxiety producing situations. The members of the supportive therapy group were encouraged to discuss their anxiety, share their anxiety, share their experiences, and provide support for each other without direction from a group leader. Treatment consisted of small groups that met for 1 ½ hour sessions over 14 weeks. The clinical features of generalized anxiety disorder in the elderly were specifically targeted, and the results indicated that both treatment conditions showed significant decreases on measures of worry, anxiety, and depression at posttreatment. Treatment gains were maintained in both CBT and supportive therapy conditions at 6-month follow-up (Stanley, Beck, & Glassco, 1996). This study is the strongest support to date for the direct application of established cognitive-behavioral therapy procedures with the elderly.

These studies demonstrate the efficacy of a variety of cognitive behavioral interventions for anxiety. The majority of these controlled studies used self-report measures of subjective anxiety in community older adult volunteers and did not use clinical samples of older adult participants who met the established diagnostic criteria for anxiety disorders (Beck & Stanley, 1997).

Anxiety in individuals with dementia. The phenomenon of anxiety in individuals with dementia has been relatively neglected and misunderstood (Cohen, 1998). Individual symptoms of anxiety such as tension, restlessness, irritability, fear of being left alone, are common, and estimated to occur in 22% to 81% of individuals with dementia (Ballard, Boyle, Bowler, & Lindesay, 1996; Jost & Grossberg, 1996; Mega, Cummings, Fiorello, & Gornbein, 1996). Several factors have contributed to the current lack of awareness and understanding of the phenomenon of anxiety in individuals with dementia.

First, many anxiety symptoms are nonspecific and tend to overlap with symptoms of other psychiatric syndromes that are common in dementia, in particular depression and agitation. Second, a number of anxiety symptoms are cognitive in nature and cannot be easily evaluated in individuals with dementia using standard self-report measures. Third, the comorbidity of anxiety and depression in nondemented older adults is highly prevalent and has been widely reported for individuals with dementia as well (Ferretti, McCurry, Logsdon, Gibbons, & Teri, 2001).

An individual with dementia can experience anxiety which may present with verbal or facial expressions of worry, nervousness, or fear and/or somatic symptoms such as palpitations, stomach problems, or feelings of tension. An individual with dementia

who experiences anxiety may also perseverate with requests for reassurance (Kahn et al., 1998). Individuals who have progressive dementia become less and less able to interpret, process, and adapt to environmental stimuli (Hall & Buckwalter, 1987). Hall and Buckwalter (1987) hypothesize through their Progressively Lowered Stress Threshold (PLST) model that once the environmental demands exceed the individual's accommodation abilities, levels of stress increase and are manifested in anxiety and finally, in agitated behaviors. It is also hypothesized through the PLST model that if environmental stimuli were manipulated by caregivers to create a less challenging environment for the individual with dementia, then quieter, more adaptive behavior would replace these catastrophic reactions born of anxiety.

Ferretti, McCurry, Logsdon, Gibbons, and Teri (2001) investigated symptoms of anxiety in two samples of clinic outpatients and found that anxiety was highly associated with depression, behavioral disturbances, and increased cognitive impairment in individuals diagnosed with AD. These findings indicate the need for effective clinical measures of anxiety to help identify and treat dementia patients with anxiety symptoms. There is a paucity of research about the development and progression of anxiety in individuals with dementia. Much more research is needed to clarify the full phenomenology of the anxiety construct and to understand the natural history of anxiety in dementia.

Psychotherapy for individuals with dementia. The use of verbal psychotherapy for individuals with dementia has been a controversial issue (Frazer, 2000). The more commonly accepted psychotherapeutic practices for individuals with dementia are

therapeutic support for family members, socialization, and adjunctive therapies such as music, art, or recreation. Questions raised regarding the appropriateness of verbal psychotherapy for individuals with dementia involve the issues of memory impairment, inability to abstract, and doubtful improvement due to a progressive decline in functioning. Despite the controversy, a few efforts have been made in the use of psychotherapy with individuals with dementia.

Teri and Gallagher-Thompson (1991) have outlined a structured cognitive and behavioral treatment program for depression in cognitively impaired individuals based upon Beck's cognitive theory of depression (Beck, Rush, Shaw, & Emery, 1979). The goal of therapy is to challenge negative cognitions, reduce cognitive distortions, and assist the individual generate more adaptive cognitions. Adaptations of standard cognitive therapy for depression have been made for the mildly cognitively impaired individual with dementia, and behavioral strategies are used with more moderately or severely impaired individuals (Teri & Gallagher-Thompson, 1991).

Jones (1995) applied the principles of interpersonal therapy for the treatment of anxiety in individuals with dementia. Jones (1995) used Sullivan's theory, which focuses on the role of the "self" in managing anxiety, and noted that in a progressive dementia, the self becomes increasingly regressed and unable to negotiate the interpersonal world successfully. The goal of therapy in the early stages of dementia, when the individual is aware of deficits, is to help him or her use premorbid coping mechanisms to manage anxiety and fear. The progressive course of a dementia creates more anxiety by increasing deficits and decreasing coping mechanisms, and this anxiety may be manifested in a variety of problematic behaviors. The goal of therapy in the late stages of

dementia is to help the individual manage the anxiety through application of greater or lesser environmental stimulation (Jones, 1995).

The purpose of psychotherapy with individuals with dementia must be clearly stated and specific therapeutic goals must be identified. It is extremely important when providing either verbal or nonverbal psychotherapy to foster a supportive, trusting relationship, to enhance a sense of control, and to alter the environment in ways to decrease problematic situations and increase pleasure for the individual with dementia (Frazer, 2000).

Relaxation training paired with animal stimuli. Interaction with animals has been shown to have an effect on the physiological responses in humans, and numerous studies supporting the health benefits of companion animals have emerged over the last decade (Akiyama, Holtzman, & Britz, 1986; Beck & Rowan, 1994; Serpell, 1996; Siegal, 1990). Cardiovascular effects have been the focus of much of the research since the often cited study by Friedmann, Katcher, Lynch, and Thomas (1980) that reported longer survival rates following myocardial infarction for pet owners compared with people with no pets. A more recent study by Anderson, Reid, and Jennings (1992) demonstrated that pet owners had significantly lower blood pressure and triglyceride levels compared with people who did not own pets, and these findings could not be explained by differences in cigarette smoking, diet, body mass index, or socioeconomic profile.

Researchers have hypothesized that companion animals may serve to lower levels of stress and anxiety, which are considered contributory factors to cardiovascular disease (Beck & Rowan, 1994; Patronek & Glickman, 1993; Siegel, 1990). Short-term

interactions with companion animals have also resulted in physiological effects indicative of relaxation including blood pressure, heart rate, and peripheral skin temperature (Baun, Bergstrom, Langston, & Thoma, 1984; Grossberg & Alf, 1985; Schuelke et al., 1992). These physiological responses on the cardiovascular and neural-endocrine systems may be mechanisms by which interaction with companion animals produces its calming effects (Batson et al., 1998).

Laboratory experiments as early as 1929 showed that canine heartbeat slowed and blood pressure lowered in response to human petting. Human contact was able to alleviate the stress factors and promote relaxation in the animal. Researchers have now confirmed that this effect is not one-way, but that there exists a "reciprocal" or "mutually sympathetic" relationship between pets and people (Cusack & Smith, 1984). A number of studies also suggest that the presence of a pet can reduce stress and promote a feeling of safety, and that the sight of an animal alone is enough to lower anxiety and tension (Beck & Katcher, 1996; Cusack, 1988; Friedmann et al., 1983; Katcher et al., 1983; Katcher et al., 1984; Lockwood, 1983; Sebkova, 1977). These findings have been cautiously interpreted as indicating that a shift in attention away from the self and toward a pleasant, absorbing stimulus reduces anxiety. Thus, animal stimuli are capable of relaxing humans (Siegel, 1990).

Lockwood (1983) examined the effect of the presence of an animal on the perception of people and social interactions by asking two groups of subjects to interpret scenes of ambiguous situations, with and without the presence of an animal. The results indicated that the presence of an animal leads to the interpretation of social scenes as less threatening. There was a general tendency to interpret people associated with pets in a

more positive light than people in scenes lacking animals. The study also indicated that people associated with the animals were perceived as less dangerous and were often judged to be friendlier, happier, bolder, and less tense. Sebkova (1977) measured the anxiety levels of 20 individuals in two environments, one with her dog and one without her dog. The results indicated that subjects had much lower anxiety scores and few anxious mannerisms when the dog was present in the psychology lab.

Friedmann, Katcher, Thomas, Lynch, and Messent (1983) measured the blood pressure and heart rate of 38 children over two, 4-minute periods during which each child was asked to rest for 2 minutes and to read aloud for 2 minutes. A dog was present during either the rest or reading period and the children did not interact with the dog at all; the dog was part of the visual environment. The findings indicated that the presence of the dog resulted in lower blood pressures during both the rest and reading period. The study also demonstrated that the children had lower blood pressures throughout the experiment if the dog was present at the beginning of the session. Other studies have demonstrated that children entering a neighbor's home for the first time experience reduced blood pressure if the neighbor's dog is present, and individuals interviewed in the waiting room of a veterinary clinic have lower blood pressure when touching or talking to their pet while questioned by the researcher than when interviewed alone. These findings reinforce the premise that companion animals can make people feel safe, especially in situations characterized by a high degree of novelty (Cusack, 1988).

Katcher, Friedmann, Beck, and Lynch (1983) investigated the influence of animals that were not touched and were not considered members of the family, but were only visual objects. The most obvious choice of animals was tropical fish and the

experiment was designed to study how contemplation of an aquarium could influence blood pressure. The researchers measured the blood pressure of two groups of subjects while they read aloud for 2 minutes, watched a blank wall for 20 minutes, and watched the fish tank for 20 minutes. The first group of subjects consisted of a group of young students and university employees who had blood pressures at the low end of the normal range, and the second group of subjects were older and had clinical hypertension. The subjects were asked to fill their minds with the sight of the fish when they watched the fish tank.

The results demonstrated that watching the tropical fish lowered blood pressure to levels below that produced by resting in a chair with no special focus of gaze and produced a state of calm relaxation. The subjects' blood pressure began to fall while they sat quietly in a chair for 20 minutes, doing nothing but watching a wall, and fell again as they watched the fish. The average blood pressure level of the hypertensive group fell to levels within the normal range while watching the tropical fish. The study also demonstrated that the calm induced by watching fish also reduced the subjects' response to stress. When subjects were asked to read aloud at the end of the study, the rise in blood pressure was less than half as large as it was at the beginning of the experiment, which suggests that being relaxed allowed them to tolerate stress better (Katcher et al., 1983).

Katcher, Segal, and Beck (1984) investigated the effect of contemplation of an aquarium on anxiety and discomfort prior to and during dental surgery. Forty-two patients scheduled for elective dental surgery were assigned to five groups: contemplation of an aquarium, contemplation of an aquarium after hypnotic induction,

contemplation of a poster of a color photograph of a mountain waterfall, contemplation of the poster after hypnotic induction, and a control condition in which a group simply rested. Blood pressure and heart rate were measured by the researchers, and the levels of anxiety and comfort were rated by the subjects, the dentist, and an observer. The subjects were told that the contemplation of the aquarium would produce relaxation, and that they could continue the relaxation during surgery by closing their eyes and visualizing the aquarium.

The results demonstrated that all the treatment groups were more comfortable and less anxious than the control group, and that the aquarium conditions produced the greatest comfort and least physiological arousal. Hypnosis was used to promote relaxation and enhance the effectiveness of the contemplation because anxious subjects have difficulty paying attention to the environment. The findings indicated that hypnosis significantly increased the effectiveness of the poster as an object of contemplation, but did not enhance the calming and stress reducing effect of contemplating an aquarium. These findings suggest that contemplation of an aquarium may have valuable clinical utility in reducing the anxiety of both dental patients and other individuals in anxiety producing circumstances (Katcher et al., 1984).

These findings suggest that the sight of animals can be an effective relaxing agent in humans. The calming influence of attention to exterior sights or sounds was demonstrated more than 40 years ago by John and Beatrice Lacey (as cited in Beck & Katcher, 1996), psychophysiologists renowned for their early experiments of blood pressure and heart rate responses to psychological stimuli. They studied the physiological responses of subjects to different kinds of laboratory tasks, and measured

heart rate, blood pressure, and the activity of the sweat glands of the palm, a good index of anxiety. They found that when subjects were required to think, to process data, or to do mental work, blood pressure and heart rate increased, the palms secreted more sweat, and the subjects became stressed and anxious. When the subjects were asked to attend to the external environment, such as waiting for a light to flash, listen to music, or listen to instructions, the heart rate and blood pressure fell and the palms became drier. The experiments with the fish tanks revealed the same underlying mechanism: we relax whenever any neutral visual event draws our attention outward and interrupts our ongoing train of thought.

Conclusions

In sum, dementia is best defined as a clinical syndrome caused by a wide range of diseases that affect the brain. Dementia has many presentations as well as causes, and its core feature is a decline in cognition (Rabins et al., 1999). There are approximately 4 million individuals with dementia, and by 2050, that number will increase to an estimated 14 million (Alzheimer's Association, 1998). One prominent feature that causes significant problems in the care of individuals with dementia is agitation. Agitation has been defined as inappropriate verbal, vocal, or motor activity. Agitation can include behaviors such as wandering, pacing, cursing, screaming, biting, and fighting, which can endanger the individual, staff, and other residents (Cohen-Mansfield, 1986). Agitation in individuals with dementia may decrease their sense of well-being, affect the quality of

their lives, and increase the likelihood that they will have to enter a long term care facility.

The management of agitation in individuals with dementia poses a difficult and challenging experience for nursing facility staff. The traditional method that staff have used to manage agitation has been to administer chemical restraints by means of tranquilizing psychotropic medications and to apply physical restraints by means of belts, geriatric chairs, vests, or trays, which keep the body immobile in a chair, and side rails, vests, jackets, and belts, which keep individuals confined to their beds. The use of any medication may increase the risk of confusion and impairment of cognitive functioning in individuals with dementia, and the use of restraints may create additional negative physical and psychological effects (Bradley et al., 1995; Capezuti, Evans, Strumpf, & Maislin, 1996; Evans & Strumpf, 1989, 1990; Hardin et al., 1993; Strumpf & Evans, 1988; Tinetti, Liu, & Ginter, 1992). Chemical and physical restraints raise the issues of side effects, such as sedation, fall injuries, pressure ulcers, loss of function, confusion, depression, feelings of punishment, and increased agitation (Colorado Foundation for Medical Care, 1998; Tabloski, McKinnon-Howe, & Remington, 1995).

The OBRA instituted regulations that mandate health care workers to explore alternatives to chemical and physical restraints for the management of agitation in individuals with dementia (OBRA, 1990). The search for alternative treatment approaches to manage agitation in individuals with dementia has resulted in the need to use less restrictive interventions, including behavioral engineering and restructuring the environment. Environmental modifications are needed to reduce the level of agitation in individuals with dementia and promote the maximum potential functioning within the

limits of each individual's remaining cognitive abilities. In order to be effective, these modifications must be feasible for nursing facility staff to implement and incorporate into individual plans of care.

Implications

The development of cost-effective, easily replicated, environmental interventions to specifically address agitation associated with sundown syndrome in individuals with dementia is needed. AAT is an environmental intervention which has been used for individuals with dementia; however, there is a paucity of research to support its use. The few studies that have been performed have evaluated the impact of animals on social behaviors, progression of cognitive decline, physiological indicators of stress, and eating habits and disruptive behaviors in individuals with dementia. There is no study to date that has specifically evaluated the impact of an aquarium on agitation associated with sundown syndrome in individuals with dementia. Therefore, this clinical case study is specifically designed to use an aquarium to specifically address agitation associated with sundown syndrome in individuals with dementia.

Clinical Case Summary

The individual who was used for this case study was an older adult with dementia who exhibited agitation associated with sundown syndrome, and received psychotropic medications to manage these behaviors. The *DSM-IV*-TR (2000) identifies the essential

feature of a dementia as the development of multiple cognitive deficits that include memory impairment and at least one of the following cognitive disturbances: aphasia, apraxia, agnosia, and a disturbance of executive functioning. The cognitive deficits must be sufficiently severe enough to cause impairment in occupational or social functioning and must represent a decline from a previously higher level of functioning in the individual (American Psychiatric Association, 2000).

Dementia presents a major health problem for the United States because of its enormous impact on individuals, families and the health care system, and it places a heavy economic burden on society (American Psychiatric Association, 1997). The annual national cost of caring for individuals with dementia is estimated to be slightly over $100 billion (Kahn et al., 1998). Individuals with dementia are deprived of the most basic pleasures that give life meaning, such as active involvement in purposeful activity, shared experiences, and memories. Individuals with dementia are slowly robbed of the ability to remember, communicate, make judgments, perform activities of daily living, tolerate stress, and interact socially.

Most individuals with dementia experience emotional distress or behavioral changes best summed up by the term agitation (Alexopoulos et al., 1998). Sundown syndrome is common in individuals with dementia and is generally manifested by agitated behaviors occurring primarily during the evening hours. Some of the behavioral changes of sundown syndrome include increased restlessness and verbal behavior (Evans, 1987), confusion, aimless wandering, paranoia, and aggressive behavior, such as hitting, kicking, and biting directed toward staff, family, or other residents (Churchill et al., 1999).

The management of agitation in individuals with dementia poses a difficult and challenging experience for nursing facility staff. The traditional method that staff have used to manage agitation has been to administer chemical restraints and apply physical restraints. The OBRA instituted regulations that specifically addressed the need for staff to use interventions other than chemical and physical restraints (OBRA, 1990).

The search for nonpharmacological treatment approaches to manage agitation in individuals with dementia reflects the need for alternative and less restrictive interventions, including behavioral engineering and restructuring the environment. Behavioral engineering generally refers to interventions that modify an individual's behavior or an individual's environment, but also includes staff approaches to care. Environmental modifications need to be devised to reduce the level of agitation in individuals with dementia, promote the maximum potential within the limits of each individual's remaining cognitive abilities, and provide feasibility for nursing facility staff to implement and incorporate these interventions into individual plans of care.

Animal assisted therapy is an example of a nonpharmacological environmental intervention that can be used to reduce the level of agitation in individuals with dementia. A specially designed aquarium of fish was used in this case study to manage agitation in an individual with dementia. The individual who was used for this case study was Mrs. B., a 97 year old Caucasian female, who resided in a long term care unit within a retirement community in a mid sized city in the northeast region of the United States. Mrs. B. had a primary diagnosis of Dementia of the Alzheimer's Type, demonstrated agitated behaviors associated with sundown syndrome, and received psychotropic medication on a routine and prn basis to manage this agitation.

Reason for Referral and Presenting Problem

Agitation is a major problem for elderly individuals, their families and care providers, and is common in individuals with dementia. Agitation can include behaviors such as wandering, pacing, cursing, screaming, biting, and fighting, which can endanger the individual, staff, and other residents (Cohen-Mansfield, 1986). Nursing facilities typically have insufficient staff to patient ratios and many times are unable to manage these behaviors appropriately. As a result, individuals may be chemically and/or physically restrained or isolated in their room so as not to disturb others, which may ultimately lead to increased confusion, social isolation, and further agitation. It is vital to find alternative ways to decrease agitation and associated responses that others have toward the individual who displays agitated behavior (Kongable, Buckwalter, & Stolley, 1989).

Sundown syndrome, which is common in individuals with dementia, causes restlessness, confusion, aimless wandering, agitation, and aggressive behavior. It typically arises in the evening as individuals with dementia become uncooperative, making management of their care difficult for those who provide it. Sundown syndrome has been defined as a marked increase in confusion, disorientation, and possibly agitation in an elderly or severely cognitively impaired individual at sunset or when daylight is reduced (Duckett, 1993). The agitated behaviors of the individual with sundown syndrome may be in the form of acts of violence toward self or others, wandering, verbal outbursts, and resistance or refusal of care (Wallace, 1994). These agitated behaviors

may lead to alienation, loneliness and fear, and ultimately may result in increased aggressiveness (Churchill et al., 1999).

Mrs. B. was identified by the nursing facility staff as a potential subject for the study. The nursing facility staff reported that Mrs. B. demonstrated various mood and behavior patterns consistent with agitation, which were clearly documented on her chart. These behaviors included the following: repetitive verbalizations (i.e., calling out for help up to five days a week); expressions of what appeared to be unrealistic fears (i.e., fear of being abandoned or left alone up to five days a week); insomnia/change in sleep pattern daily or almost daily; sad, pained, worried facial expressions (i.e., furrowed brows daily or almost daily); crying and tearfulness up to five days a week; repetitive physical movements (i.e., pacing, hand wringing, restlessness, fidgeting, or picking up to five days a week); and reduced social stimulation up to five days a week. The nursing facility staff indicated that Mrs. B. demonstrated an increase in these behaviors during the late afternoon and early evening hours, and received "prn" antianxiety medications on a relatively frequent basis to manage these symptoms.

DSM-IV Diagnosis

One of the criteria for inclusion in the study was a primary diagnosis of dementia according to the *DSM-IV-TR* (2000), that is, Dementia of the Alzheimer's Type, Vascular Dementia, Dementia Due to HIV Disease, Dementia Due to Head Trauma, Dementia Due to Parkinson's Disease, Dementia Due to Huntington's Disease, Dementia Due to Pick's Disease, Dementia Due to Creutzfeldt-Jakob Disease, Dementia Due to Other General

Medical Conditions, Substance-Induced Persisting Dementia, Dementia Due to Multiple Etiologies, or Dementia Not Otherwise Specified. Mrs. B. carried the following diagnoses:

Axis I: 294.11 Dementia of the Alzheimer's Type With Behavioral Disturbance
293.83 Mood Disorder Due to Alzheimer's Disease, with Depressive Features

Axis II: V71.09 No Diagnosis

Axis III: Hypothyroidism, History of Fracture Left Femur, Osteoporosis

Axis IV: Social Isolation

Axis V: GAF (current) = 20

Background/Relevant History

Mrs. B. was a 97 year old widowed Caucasian female who was born in the Midwest but grew up in a mid sized city in the northeast region of the United States. Her parents were of Norwegian descent, and she was the middle of three siblings, all sisters. There was a 5-year age difference between Mrs. B. and both of her siblings. Mrs. B. was raised on a farm and spent most of her time outdoors. She enjoyed camping, swimming, horseback riding, and walking through the woods. Mrs. B. was the valedictorian of her high school and college. She played basketball while in college, and graduated with a degree in biology. She met and married her husband in college, and they had one daughter. Mrs. B. and her husband were both school teachers. Her husband was a

college physics professor, but he suffered a stroke in his late 40s and was physically disabled. Mrs. B. cared for him at home for approximately 15 years, prior to placing him in a nursing home. She has been widowed for 32 years.

Mrs. B. was a high school business teacher for more than 30 years. She taught classes in typing and shorthand, and won numerous contests for her excellent skills as a typist and stenographer. She developed numerous acquaintances among her coworkers, and was well liked and respected by her colleagues. Mrs. B. retired from teaching more than 30 years ago, but remained active with a variety of hobbies. She enjoyed traveling, journaling, gardening, walking, cooking, and playing bridge. Mrs. B. spent time organizing her favorite memoirs and had begun to write her autobiography. She particularly enjoyed traveling, and was very frugal with her money so that she could take a special trip each year. She traveled through every state in the union and many of the countries in Europe.

Mrs. B. did not develop any close friendships, but she had a very close relationship with her younger sister. She lived with her sister for a brief period after her husband died, but then moved into an apartment on her own. Mrs. B. and her sister always lived near each other and spent the majority of their time together. They traveled and vacationed together, went shopping together, and attended church every Sunday together. They both enjoyed keeping physically fit, and walked five miles a day for many years. Mrs. B. and her sister actively participated in all the church events, and they both volunteered at a Co-op program in the neighborhood. Mrs. B.'s sister currently resides in the independent living section of the retirement community and visits with her sister frequently. Mrs. B.'s oldest sister lived in the Midwest and is deceased.

Mrs. B.'s daughter lives in the area and has been actively involved in her care and treatment since her mother entered the retirement community. She has been named her Power of Attorney for health care. She described her mother as a rather shy, sensitive, but extremely intelligent woman, who was a perfectionist and set very high standards for others. Mrs. B.'s daughter stated that her mother was a strict parent who had difficulty showing affection. She noted that they did not have a close relationship at all, and she rebelled by getting married at a young age so that she could move out of the house. Mrs. B.'s daughter said she deeply regrets being estranged from her mother until recently.

Mrs. B. had remarkably good health throughout her life. She never smoked and there was no history of any drug or alcohol use. Her medical problems included hypothyroidism and history of a fracture of her left femur secondary to osteoporosis. She also exhibited signs of a depressed mood and was being treated with an antidepressant medication. Her medications included: Paxil, Zyprexa, Synthroid, Stress Formula with Zinc, Promod Powder (protein supplement), Puralube tear drops, Ativan prn for agitation, and Tylenol prn for pain/fever. It is important to note that the most common psychological symptom associated with hypothyroidism is depression. Some of the symptoms may include a loss of interest and initiative, slowing of mental processes, poor short term memory, general intellectual deterioration, and depression with a paranoid flavor. The records indicated that Mrs. B. was diagnosed with hypothyroidism many years ago, and has been maintained on a synthetic thyroid hormone (Synthroid). She was being closely monitored by her family physician, and her laboratory reports indicated that her thyroid serum levels were within normal limits.

Mrs. B.'s medical records also indicated that she had a history of chronic urinary tract infections and fluctuating delirium. Delirium is characterized by an acute change in mental status, which fluctuates throughout the day. The hallmark feature of delirium is reduced alertness, manifested by difficulty maintaining attention and focusing concentration. The altered level of consciousness may range from lethargy to a hypervigilant state characterized by agitation and hyperactivity. Disorientation is common in delirium and perception is also affected, which may result in auditory, visual, and tactile hallucinations or illusions. Although the onset of delirium is acute and the duration may be brief, the course tends to fluctuate and symptoms may persist for days to weeks. When delirium is superimposed on an existing dementia, the clinical picture is even more complex. There is increasing evidence when individuals have a pre-existing cognitive impairment, that the symptoms of delirium are not transient, but often persist, even with appropriate treatment.

There are several risk factors that may increase an individual's chance of developing delirium. These include advanced age and pre-existing cognitive impairment, such as Alzheimer's Disease. In the elderly, medications are the most frequently cited cause of delirium, and some of the high risk medications include cardiovascular drugs, barbiturates, sedatives, tranquilizers, analgesics, and antiparksonian medications. Medical conditions may also increase an individual's risk of developing a delirium, and some of these conditions include myocardial infarction, stroke, hypothyroidism, electrolyte imbalances, as well as acute infections such as urinary tract or respiratory infections. Mrs. B.'s age, medical conditions, diagnoses, and medications may have placed her at risk for developing delirium.

Recent History

Mrs. B. entered the independent living section of the long term care retirement community 12 years ago. Approximately 5 years ago, she began showing signs of increased confusion and increased gait instability, and she sustained four falls within a two-month period. She suffered broken bones on six different occasions as a result of these falls. The nursing facility staff and Mrs. B.'s daughter decided that Mrs. B. would benefit from a more structured environment, so she was transferred to the Health Care Center section of the long term care community. She has remained in the Health Care Center section since that time. The nursing facility staff reported that Mrs. B.'s physical and cognitive health has declined during the past 5 years. She was no longer ambulatory and required total assistance with her activities of daily living. The staff also reported that Mrs. B. had become much more confused and agitated the past year. The staff indicated that she spent most of her time in her room in a gerichair, with a self-releasing seat belt around her waist to prevent her from falling. Mrs. B.'s daughter expressed some concerns regarding her mother's episodes of agitation, and provided informed consent for her to participate in the study.

Assessment

The MMSE is the measure most frequently used to screen for cognitive impairment, and it is suitable for detecting cognitive deficits seen in syndromes of dementia and delirium and for measuring these changes over time (Cockrell & Folstein,

1988). The MMSE has a maximum of 30 points and requires only 5 to 10 minutes to administer. It is "mini" because it concentrates only on the cognitive aspects of mental functions. It excludes questions concerning mood, abnormal psychological experiences, and the content or process of thinking (Folstein et al., 1975). The MMSE was administered to Mrs. B. to determine cognitive status and to corroborate the diagnosis of dementia.

The CMAI is used to assess the frequency of manifestations of agitated behaviors in older adults. The CMAI is a non-obtrusive assessment tool used for direct observation and recording of behaviors as they occur in the natural environment. The CMAI rates how often an older adult has exhibited 29 agitated behaviors within the past two weeks. The CMAI classifies agitated behaviors into four categories: physical/aggressive behaviors, physical/non-aggressive behaviors, verbal/aggressive behaviors, and verbal/non-aggressive behaviors, and produces four scores corresponding to these categories of agitated behaviors (Cohen-Mansfield et al., 1989, 1995).

The short form of the CMAI was modified into a behavioral observation checklist by the investigator in order to identify the occurrence of behaviors associated with sundown syndrome. The categories of agitated behaviors identified on the CMAI include: cursing or verbal aggression; hitting (including self), kicking, pushing, biting, scratching, aggressive spitting; grabbing onto people, throwing things, tearing things or destroying property; other aggressive behaviors or self abuse including intentional falling, making verbal or physical sexual advances, eating/drinking/chewing inappropriate substances, hurting self or others; pace, aimless wandering, trying to get to a different place (i.e., out of the room, building); general restlessness, performing

repetitious mannerisms, tapping, strange movements; inappropriate dress or disrobing; handling things inappropriately; constant requests for attention or help; repetitive sentences, calls, questions, or words; complaining, negativism, refusal to follow directions; strange noises (weird laughter or crying); hiding things, hoarding things; and screaming (Cohen-Mansfield et al., 1989). The CMAI was used by the investigator on a daily basis to monitor the occurrence of Mrs. B.'s agitated behaviors.

Case Formulation and Clinical Impressions

Mrs. B. had been a resident of a long term care retirement community for the past 12 years. She lived alone in the independent living section of this retirement community until approximately 7 years ago. At that time, Mrs. B. fell in her apartment and suffered a fractured left hip and was transferred to the community's Health Care Center. She spent several months in rehabilitation at the Health Care Center, and then returned to her apartment. She was able to live independently in her apartment for the next 2 years.

Mrs. B. fell in her apartment again in January of 1997 and suffered a fractured right humerus. She was transferred to the Health Care Center for rehabilitation, but her course of rehabilitation was complicated by increased episodes of confusion and short term memory loss. She experienced a decline in both her cognitive and physical capabilities compared to her treatment at the Health Care Center in 1995. In February of 1997, Mrs. B.'s daughter authorized her mother's permanent residency at the Health Care Center due to severe cognitive impairment and inability to manage her activities of daily

living. Mrs. B. has remained in this section of the retirement community since that time, and has been under the care of a family physician and consultant psychiatrist.

Mrs. B. began to exhibit some signs of agitation, that is, restlessness, inability to sit still, demanding verbalizations, screaming out, in March of 1997, and was started on an antianxiety medication (Xanax) on a prn basis to manage these behaviors. She was using a wheelchair and walker, but refused to request assistance from staff to transfer in and out of her chair or bed. As a result, she fell in her room in November of 1997 and suffered a fractured right hip. Mrs. B.'s episodes of agitation increased over the next several months, and her antianxiety medication (Xanax) was increased to both a routine and "prn" dosage.

Mrs. B. fell again in her room in July of 1998 and fractured her left hip, which required surgery. She experienced a decline in her cognitive status upon her return from the hospital, and her episodes of agitation continued to increase. She exhibited more frequent episodes of confusion and disorientation, and she developed paranoid ideations toward the staff. She continued to scream loudly and cry out for help (i.e., "Get me out of here!" "God help me!") and was very resistive to any care provided by the staff. In November of 1998, Mrs. B. was prescribed an antipsychotic medication (Mellaril) to assist in the management of her agitation and psychotic symptoms. Mrs. B.'s antianxiety medication (Xanax) was discontinued in December of 1998, and she was prescribed another antianxiety medication (Ativan) on a prn basis. She was maintained on these medications (Mellaril and Ativan) for the next year. She was no longer able to ambulate via a wheelchair or walker, and she was placed in a gerichair with a self-releasing seat belt due to her impulsive unsafe behaviors.

Mrs. B.'s episodes of agitation (i.e., restlessness and crying out) continued and she began to exhibit signs of depression (i.e., tearfulness and sleep problems). In March of 2000, she was prescribed an antidepressant medication (Paxil) to assist in the management of her depressive symptoms. During the next several months, her episodes of agitation increased and she became combative toward staff. At this time, Mrs. B.'s antipsychotic medication (Mellaril) was tapered and discontinued, and in September of 2000, she was prescribed an atypical antipsychotic medication (Risperdal). Mrs. B. developed some adverse side effects from this medication (i.e., stiffness and leaning to one side) so it was discontinued. In November of 2000, she was prescribed another antipsychotic medication (Moban) and an antiparkinsonian medication (Cogentin). She continued to receive an antianxiety medication (Ativan) on a prn basis for her episodes of agitation.

Mrs. B. continued to engage in physically assaultive behaviors toward the staff (i.e., hitting and kicking) and she continued to exhibit episodes of tearfulness. In February of 2001, she was prescribed another antidepressant medication (Trazadone) to assist in the management of her agitation, and her antidepressant medication (Paxil) was increased to assist with the management of her depressive symptoms. Mrs. B.'s speech became more and more incomprehensible, and she continued to exhibit episodes of agitation (i.e., screaming and crying out for help). She continued on this medication regimen for the next year. In November of 2001, her antipsychotic medication (Moban) and antidepressant medication (Trazadone) were discontinued, and she was prescribed another atypical antipsychotic medication (Zyprexa). Mrs. B. has continued to exhibit episodes of agitation (i.e., repetitively crying out), but the nursing facility staff indicated

that these episodes have been much less frequent, and have been interspersed with episodes of fatigue and lethargy.

Mrs. B. carried the diagnosis of Dementia of the Alzheimer's Type and exhibited agitated behaviors associated with sundown syndrome. She continued to receive an atypical antipsychotic medication (Zyprexa) and an antidepressant medication (Paxil) on a routine basis to manage the symptoms associated with her illness, along with the antianxiety medication (Ativan) on a prn basis to manage her episodes of agitation. The nursing facility staff reported that they attempted to engage her in numerous activities to help reduce her episodes of agitation, without success. The nursing facility staff also reported that Mrs. B. preferred to remain in her room, except for occasional periods in the hallway outside her room and during meals.

Mrs. B. was approached by the investigator on three separate occasions prior to the start of the study to administer the MMSE, but due to the advanced stage of her dementia, she was unable to participate in the interview. She responded to her name upon approach, but her speech was incoherent and irrelevant. Upon further questioning, she became easily agitated and was unable to respond appropriately to any of the subsequent tasks of the assessment. Mrs. B. obtained a score of 0 on the MMSE, which suggests a severe impairment in cognitive functioning.

Therapy Goals

This case study was designed to investigate whether or not an AAT approach would be effective in managing agitation associated with sundown syndrome in an

individual with dementia. AAT is an intervention that can be implemented by nursing facility staff as a nonpharmacological approach to managing agitation in individuals with dementia. This particular treatment approach was used to decrease the overall level of agitation associated with sundown syndrome in Mrs. B., who carried the diagnosis of Dementia of the Alzheimer's type, thereby reducing the need to use chemical and/or physical restraints. The administration of psychotropic medications on a prn basis and the application of physical restraints on Mrs. B. were monitored throughout the duration of the study.

Rationale for Interventions Used

AAT is defined as the introduction of an animal into the immediate surroundings of an individual or group as a means of interaction with a therapeutic purpose (Gammonley & Yates, 1991). During the last 20 years, the theoretical emphasis of AAT has shifted from metaphysical ideas about animals as psychospiritual mediators, toward the more scientific explanations for the apparent therapeutic benefits of animal companionship (Serpell, 1996). Several mechanisms associated with the therapeutic benefits of AAT have been identified. The first potential mechanism that has been suggested is that animals are able to induce an immediate, physiologically de-arousing state of relaxation simply by attracting and holding individuals' attention (Katcher et al., 1983). The second potential mechanism that has been suggested is that companion animals are capable of providing people with a form of stress-reducing or stress-buffering social support (Serpell, 1996; Siegel, 1990).

Numerous studies confirm that three categories of human-animal association provide physiological benefits to individuals. These include people explicitly observing animals or pictures of animals (Katcher et al., 1983; Lockwood, 1983), people being in the presence of animals but not interacting with them (Friedmann et al., 1983; Grossberg et al., 1988), and people touching or interacting with animals (Wilson, 1987, 1991; Vormbrock & Grossberg, 1988). The findings from these studies suggest that interacting with animals can be an effective relaxing agent in humans. The research studies with aquariums of fish have revealed a similar underlying mechanism: we relax whenever any neutral visual event draws our attention outward and interrupts our ongoing train of thought (Beck & Katcher, 1996).

Annotated Session Material

This case study was designed as a single case experimental study using an ABAB design. The ABAB design (reversal design) involves an initial baseline phase (A) followed by a treatment phase (B), a return to baseline phase (A), and then another treatment phase (B). The independent variable was the introduction of an aquarium, which Mrs. B. was asked to observe. This case study on the management of agitation associated with sundown syndrome in an individual with dementia of the Alzheimer's Type was conducted according to the following procedures.

The time period for which documented episodes of agitation associated with sundown syndrome was the most problematic for Mrs. B., and was identified through discussions with the nursing facility staff. The nursing facility staff reported that she

experienced episodes of agitation at various times throughout the day, but it seemed to increase during the late afternoon or early evening hours. The observational time period for Mrs. B. was determined to be 4 p.m. She was observed for approximately 30 minutes every day during this time frame. The 30-minute observational period was derived from a previous research study, which used this aquarium with Alzheimer's patients (Edwards & Beck, 2002).

The data collection procedures consisted of time sampling periods and the use of the behavioral observation checklist. The time sampling procedures involved collecting data on the behavioral observation checklist every 3 minutes for a period of one minute from 4 p.m. to 4:30 p.m. A tally mark was placed beside each behavior observed, noting the occurrence of the behavior during the specified time period. The total number of occurrences of agitated behaviors for that day was graphically recorded. Mrs. B. was observed on a daily basis using these procedures until a stable rate of behavior was evident.

Mrs. B. was in her gerichair outside her room in the hallway on the first and second days of observation. She was relatively quiet and was observed to be performing some repetitive mannerisms (i.e., picking at her clothes). On the third day of observation, she was in her room, rocking back and forth in her gerichair, and was verbalizing some repetitive words (i.e., "Oh God," "Oh God."). Mrs. B. was in the hallway outside her room on the fourth day of observation, and was relatively quiet. She was initially observed verbalizing some repetitive words again but then fell asleep. On the fifth and sixth days, Mrs. B. was observed to be quite agitated. She was in her gerichair in her room, rocking back and forth, crying and screaming out loud (i.e., "Oh God!" "Oh

God!"). Mrs. B. was in the hallway by the nursing station on the seventh day of observation, sitting quietly in her gerichair.

Mrs. B. was in her gerichair in the hallway outside her room on the eighth day of observation and was sound asleep. On the ninth day, she was in the hallway in front of the nursing station, then she was moved into the dining room by staff. She was relatively quiet and only a few episodes of restlessness were observed. Mrs. B. was in her room in her gerichair on the 10th day of observation, repetitively saying "Oh God," "Oh God." One of the certified nursing assistants came into her room approximately 20 minutes into the observation, and took her to the tub room for a shower. On the 11th day, Mrs. B. was observed to be quite agitated. She was in the hallway outside her room, rocking back and forth in her gerichair, and repetitively yelling "Oh God!" "Oh God!" She received a "prn" of Ativan at 8 a.m. on this day. Mrs. B. was in her room on the 12th and 13th days of observation, sitting quietly in her gerichair with her eyes closed. She received a "prn" of Ativan at 9 a.m. on the 12th day. On the 14th day of observation, Mrs. B. was in her room in her gerichair, repetitively saying "Oh God," "Oh God," in a low tone of voice.

Mrs. B. was in her room in her gerichair on the 15th day of observation, repetitively saying "Oh God," "Oh God." She received a "prn" of Ativan at 9 a.m. on this day. On the 16th day, Mrs. B. was observed to be quite agitated and was yelling "Oh God!" "Oh God!" She had pulled her gerichair over to the dresser, and was rummaging through one of the drawers. She received a "prn" of Ativan at 10 a.m. on this day. Mrs. B. was in front of the nursing station on the 17th day of observation, picking at her clothes and occasionally rocking back and forth in her gerichair. She received a "prn" of Ativan at 10 a.m. on this day. On the 18th day, Mrs. B. was observed in her room in her gerichair

repetitively saying, “Oh God,” “Oh God,” in a low tone of voice. Mrs. B. was in her room in her gerichair on the 19th and 20th days of observation, repetitively saying “Oh God,” “Oh God,” in a low tone of voice, and then she fell asleep. Mrs. B. was in her gerichair in her room on the 22nd day of observation, repetitively saying “Oh God,” “Oh God,” and “Please God,” “Please God.” On the 23rd day, she was in the hallway outside her room and was observed to be quite agitated, repetitively crying out very loudly “Oh God!” “Oh God!” “Oh God!”

The data collected during the baseline phase suggested that Mrs. B. demonstrated a reasonably consistent pattern of agitated behaviors, so the intervention was applied which involved the introduction of the aquarium. During this treatment phase, the aquarium was placed in close proximity to Mrs. B. in her room each afternoon. She was prompted with the phrase “look at the colorful fish” at 10-minute intervals during the 30-minute time frame. The first prompt occurred when the aquarium was initially placed in her room, and the subsequent prompts occurred at 10-minute intervals thereafter, for a total of three times during the 30-minute observation period. The behavioral observation checklist was used to collect data every three minutes for a period of one minute during the time from 4 p.m. to 4:30 p.m. A tally mark was placed beside each behavior observed, noting the occurrence of the behavior during the specified time period. The total number of occurrences of agitated behaviors for that day was then graphically recorded.

The aquarium was wheeled into Mrs. B.’s room on the 24th day of observation and placed in front of her while she was sitting in her gerichair. She was observed to be talking to herself while intermittently watching the fish, and repetitively saying “Oh

God," "Oh God," in a low tone of voice. She received a "prn" of Ativan at 9 a.m. on this day. On the 25th day, Mrs. B. was again observed talking to herself and repetitively saying "Oh God," "Oh God," in a low tone of voice. She intermittently watched the fish and was observed reaching out toward the aquarium. Mrs. B. was in the activity room by herself on the 26th day of observation, so the aquarium was wheeled in and placed in front of her while she was sitting in her gerichair. She was relatively quiet throughout the time period, but was observed repetitively saying "Oh God," "Oh God," in a low tone of voice. She was observed once again reaching out toward the aquarium. On the 27th and 28th days of observation, Mrs. B. was in her room and was quite agitated. She was crying out loudly and repetitively saying "Oh God!" "Oh God!" She attempted again to reach out toward the aquarium, and was observed to intermittently watch the fish. She received a "prn" of Ativan at 5 p.m. on the 27th day of observation.

Mrs. B. was in her room rocking back and forth in her gerichair on the 29th and 30th days of observation, and was repetitively saying "Oh God," "Oh God," and "Please God," "Please God." At the end of the observation period on the 30th day, she was reaching out toward the aquarium, so the aquarium was moved within her reach. She grabbed onto the bottom of the aquarium and began shaking it and screaming quite loudly and repetitively, "Oh God!" "Oh God!" "Oh God!" "Oh God!" so the aquarium was removed from her room. On the 31st day, Mrs. B. was in her room and was relatively quiet. She was in her gerichair with her eyes closed, and was observed to perform only a few repetitive mannerisms (i.e., rubbing her chair). Mrs. B. was in her room in her gerichair on the 32nd day, and was observed quietly mumbling to herself. She sat with her eyes closed and did not respond to the prompts to look at the fish. On the 33rd day,

Mrs. B. was in her room in the gerichair with her eyes closed. She responded to the first prompt to look at the fish, but then closed her eyes and fell asleep. Mrs. B. was extremely agitated on the 34th and 35th days of observation. She was in her room in her gerichair, rocking back and forth and repetitively yelling out, "Oh God!" "Oh God!" She appeared confused and disoriented and cried out, "I can't do it!" "We have to go now." "Please God!" "Please God!" She focused on the aquarium for the entire observation period, despite her increased level of agitation.

Mrs. B. was in her room in her gerichair on the 36th day, and was observed to be agitated. She continued to appear confused and disoriented and stated "Oh God," "Oh God," "God Please God." "I can't stand it." "Get mother." She was also observed rocking back and forth in her chair and reached out again toward the aquarium. On the 37th day of observation, Mrs. B. was in her room crying out very loudly, "Oh God!" "Oh God!" and reached out and grabbed the investigator as the aquarium was being brought into her room. She was observed rocking back and forth in her chair while watching the fish, and stated "They're dead." Mrs. B. was in her room in her gerichair on the 38th day, repetitively saying "Oh God," "Oh God," in a low tone of voice while focusing on the aquarium. On the 39th day, Mrs. B. was in her room and was observed to be much calmer. She sat with her eyes closed initially, and then watched the fish intermittently while repetitively saying "Oh God," "Oh God," in a low tone of voice. Mrs. B. was in her room on the 40th day, and was observed to be rather calm and quiet. She watched the fish intermittently at first, but then was observed to be focused on her clothes and fingers (i.e., pulling at her pants and picking at her fingers). She received a "prn" of Ativan at 11 a.m. on this day. On the 41st day, Mrs. B. was observed to be extremely calm and quiet.

She focused on the fish for the entire time period, and exhibited no episodes of agitated behaviors. Mrs. B. was observed to be relatively calm again on the 42nd day, with only a few repetitive words in a low tone of voice.

Mrs. B. was in her gerichair in her room on the 43rd day of observation with her eyes closed. She opened her eyes after the initial prompt to watch the fish, and was observed to be relatively calm. She verbalized a few episodes of repetitive words, i.e., "Oh God," "Oh God," and then fell asleep. On the 44th day, Mrs. B. was in her gerichair in the activity room after attending a church service. She was taken back to her room to observe the fish, and became quite agitated once she was in her room. She began rocking back and forth, calling out loudly "Oh God!" "Oh God!" "Gladys!" "I can't!" and was unable to focus on the aquarium. Mrs. B. was in her gerichair in front of the nursing station on the 45th day of observation, and was taken to her room to observe the fish. She became agitated once she was in her room, rocking back and forth and calling out repetitively, "I can't do it!" "Oh God!" "I can't do it!" She was unable to focus on the aquarium. On the 46th day, Mrs. B. was in her room and was observed to be relatively quiet. She was repetitively saying "Oh God" and "Gladys" in a low tone of voice, but then began to fidget with her hands while watching the fish intermittently. She verbalized that she was tired. Mrs. B. was in her room on the 47th day of observation and was quiet. She stated again that she was tired and sat in her gerichair with her eyes closed. There were no episodes of agitation observed on this day. On the 48th and 49th days, Mrs. B. was observed to be agitated and was rummaging through her one of her dresser drawers, repetitively saying "Oh God," "Oh God." She was unable to focus on the fish, but made several attempts to grab onto the bottom of the aquarium. She cried

out loudly and was observed rocking back and forth in her chair. She received a "prn" of Ativan at 12 p.m. on this day.

Mrs. B. was in her gerichair in her room on the 50th day, and was observed to be relatively quiet. She was repetitively saying "Oh God," "Oh God," in a low tone of voice, and focused on the aquarium intermittently. On the 51st day of observation, Mrs. B. was in her room and was much more agitated. She appeared confused and disoriented and was shouting "Oh God!" "Oh God!" and "Mama!" She was unable to focus on the fish. Mrs. B. was in her room on the 52nd day of observation and was agitated. She was observed rocking back and forth in her chair, repetitively saying "Oh God," "Oh God," while intermittently focusing on the tank. She received a "prn" of Ativan at 11:30 a.m. On the 53rd day of observation, Mrs. B. was in her room and was quite agitated. She was repetitively calling out "Oh God," "Oh God," "Please God," "Please God," as she intermittently watched the fish. She received a "prn" of Ativan at 5 p.m.. Mrs. B. was in her room on the 54th day and was relatively quiet. She verbalized some repetitive words in a low tone of voice and was observed reaching out toward the aquarium. She was also observed with her eyes closed intermittently throughout the time period. She received a "prn" of Ativan at 2 p.m.. On the 55th day of observation, Mrs. B. was in her room and was calm and quiet. She stated that she was tired, but was observed to watch the fish throughout the time period. Mrs. B. was in her room on the 56th day and was quite agitated. She was shouting "Oh God!" "Oh God!" "Please God!" "Please God!" "Gladys" "I can't!" while watching the fish. She received a "prn" of Ativan at 5 p.m. On the 57th day of observation, Mrs. B. was in her room and was quite agitated. She was shouting "Oh God!" "Oh God!" "I can't!" while rocking back and forth in her chair. The

self-releasing seat belt was used as a physical restraint while Mrs. B. was in her gerichair due to her impulsive unsafe behaviors, throughout the entire data collection period.

Homework Samples

Homework samples were not used in this study due to the cognitive deficits associated with the diagnosis of dementia of the Alzheimer's Type.

Treatment Outcome

The expected outcome of this study was that the observation of the aquarium would be effective in managing agitation associated with sundown syndrome in Mrs. B. One of the expectations was that since Mrs. B. exhibited a high frequency of agitation associated with sundown syndrome, she would demonstrate a decrease in the episodes of agitation during the implementation of the AAT intervention in the treatment phase. It was also expected that during the treatment phase, fewer orders for prn psychotropic medications for agitation would be administered to her, and physical restraints to manage her agitation would be ordered and applied less often. Unfortunately, this nonpharmacological intervention of AAT, which involved the observation of an aquarium was not effective in managing Mrs. B.'s episodes of agitation.

The daily observations that were conducted throughout the baseline phase of the study provided information on the extent of the occurrence of Mrs. B.'s agitated behaviors. Mrs. B. exhibited episodes of confusion and disorientation quite often, which

appeared to contribute to the fluctuation in her episodes of agitation, as well as the intervals of high frequency of agitation. The baseline data indicated a reasonably consistent pattern to her episodes of agitation after approximately three weeks of observation, so the treatment phase was implemented.

The daily observations that were conducted throughout the treatment phase of the study provided information on the effectiveness of the AAT intervention, the observation of the aquarium. The expectation of the treatment phase was that the observation of the aquarium would reduce the occurrence of Mrs. B.'s agitated behaviors. The data indicated that Mrs. B.'s episodes of agitation did not change during this phase, but continued in a very similar pattern to the graphically recorded data of the baseline phase. She continued to demonstrate episodes of agitation throughout the first three weeks of observation, and she continued to experience fluctuating episodes of confusion and disorientation. She appeared to have great deal of difficulty focusing on the aquarium for any length of time, despite the intermittent prompts to do so.

The daily observations of the treatment phase were continued for another two weeks, to determine if additional time observing the aquarium would ultimately reduce the occurrence of Mrs. B.'s agitated behaviors. The graphically recorded data indicated that the comparison of the baseline and treatment phase resulted in two overlapping distributions. It appeared that Mrs. B.'s fluctuating episodes of confusion and disorientation interfered with her ability to focus on the aquarium, and resulted in the lack of any significant change in her behavior between the two phases. The behavioral observations were discontinued at this point in the treatment phase due to Mrs. B.'s

fluctuating delirium and her inability to benefit from the AAT intervention. The graphically recorded data is presented below.

Figure 2. Total Number of Agitated Behaviors during Week One

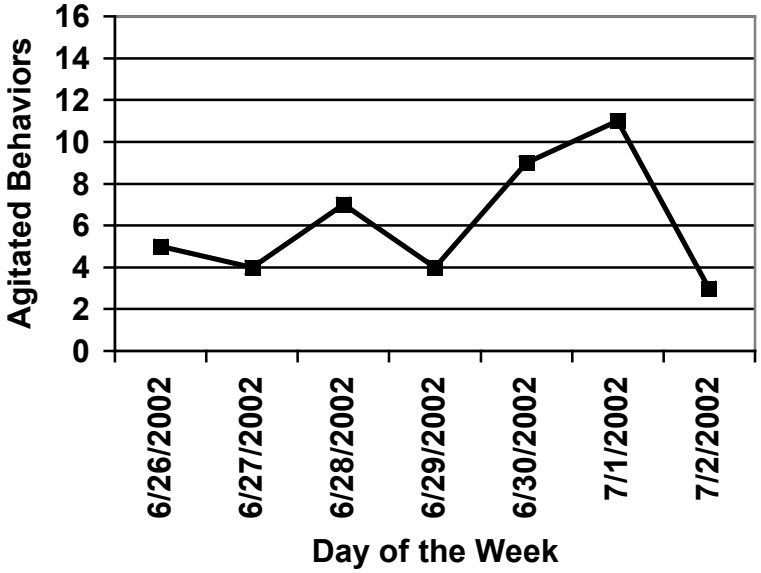


Figure 3. Total Number of Agitated Behaviors during Week Two

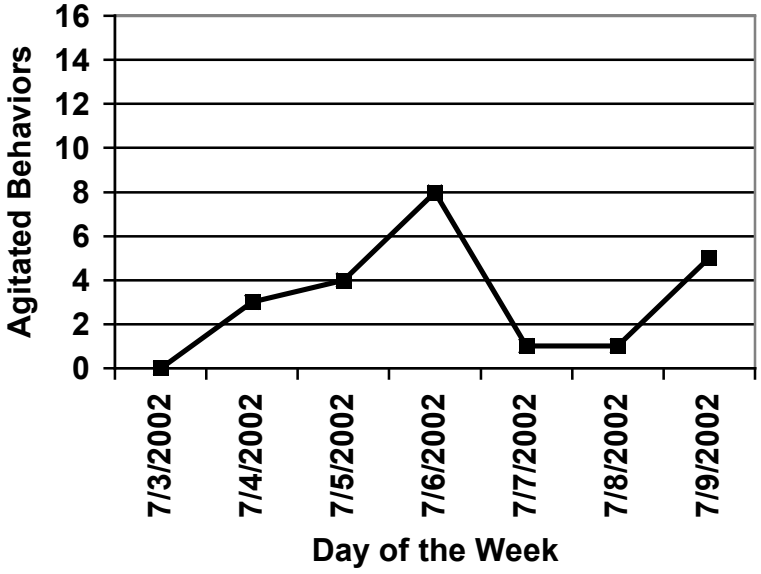


Figure 4. Total Number of Agitated Behaviors during Week Three

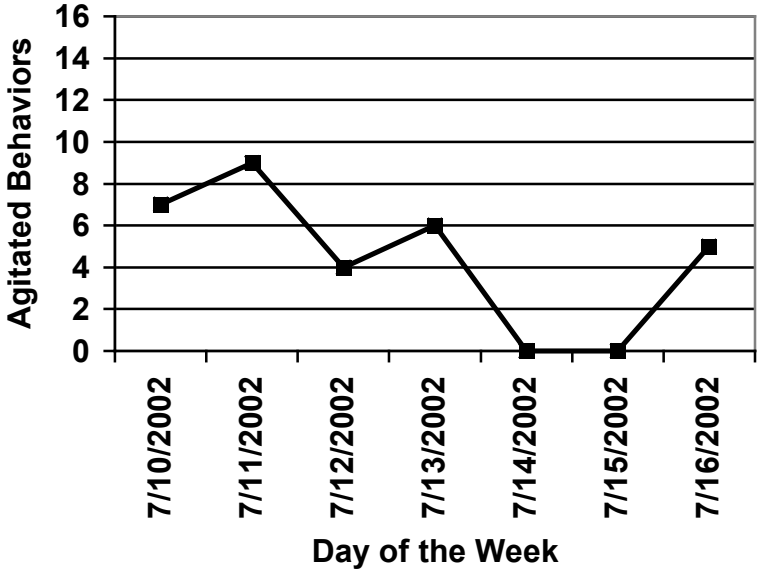


Figure 5. Total Number of Agitated Behaviors during Week Four

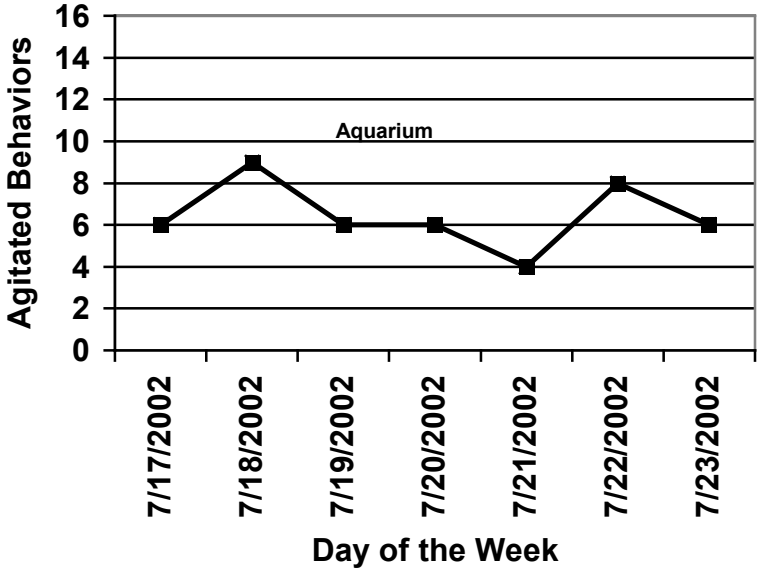


Figure 6. Total Number of Agitated Behaviors during Week Five

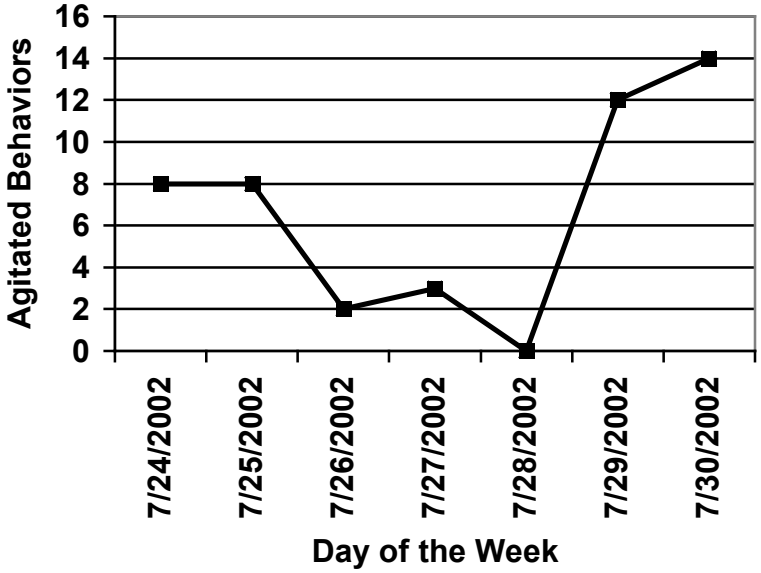


Figure 7. Total Number of Agitated Behaviors during Week Six

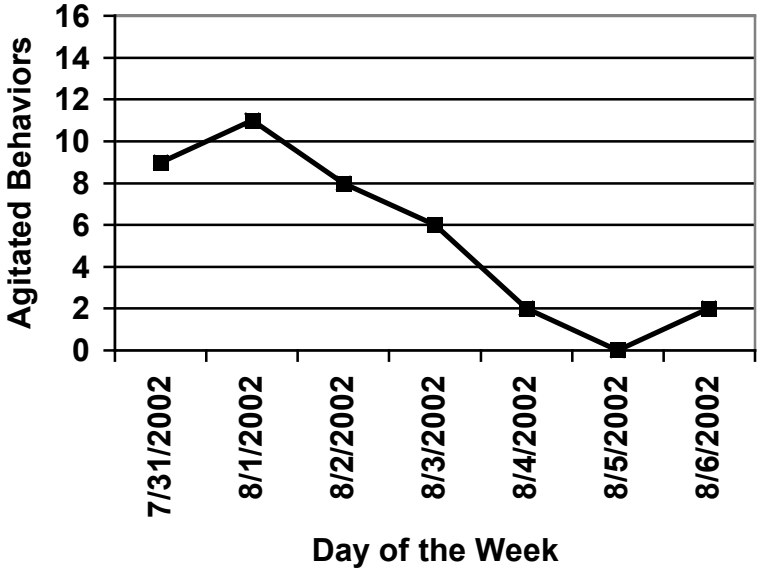


Figure 8. Total Number of Agitated Behaviors during Week Seven

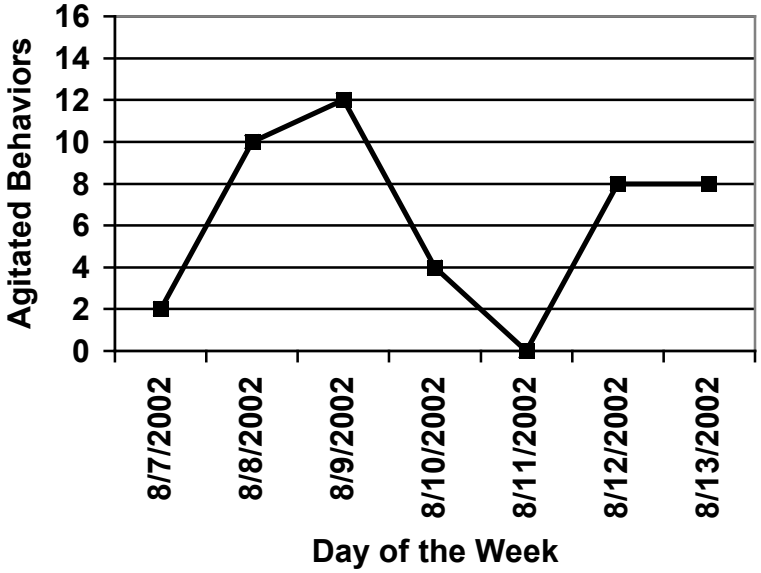
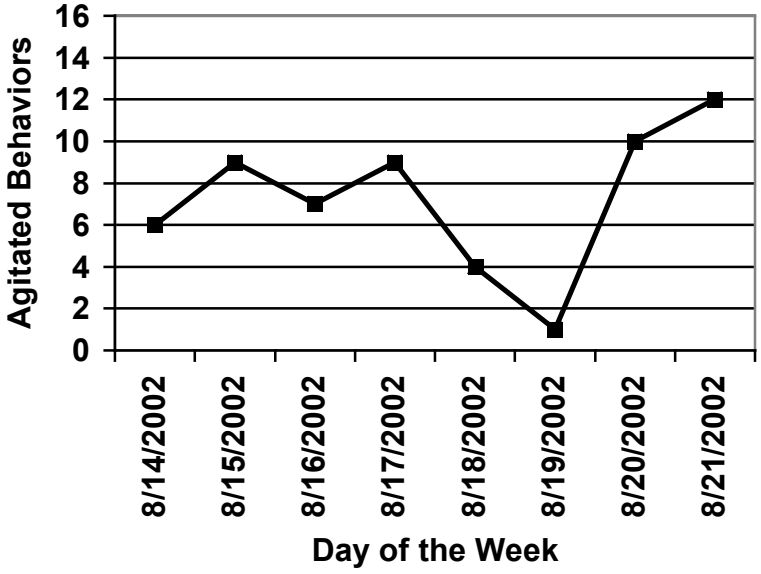


Figure 9. Total Number of Agitated Behaviors during Week Eight



Chapter 4

Discussion

This single-case experimental study was designed to investigate whether or not an animal-assisted therapy approach would be effective in managing agitation associated with sundown syndrome in an individual with Dementia of the Alzheimer's Type. It was hypothesized that the use of this environmental treatment approach would result in a clinically significant reduction in the frequency of agitation associated with sundown syndrome as measured by the CMAI, and a decreased need for the use of prn psychotropic medications and/or physical restraints to manage agitation in Mrs. B. Agitation in individuals with dementia signals discomfort and impairs their quality of life (Kolanowski, 1999); therefore, the goal of reducing the frequency of agitation was one of the potential benefits of this study. Chemical and physical restraints have raised issues of side effects such as sedation, fall injuries, pressure ulcers, loss of function, confusion, and increased agitation (Colorado Foundation for Medical Care, 1998; Tabloski, McKinnon-Howe, & Remington, 1995); therefore, the reduction in the use of these interventions was another potential benefit of this study. This study was also designed in accordance with the OBRA regulations that specifically address the need for nursing facility staff to use interventions other than chemical and physical restraints. These regulations were devised to assist individuals with cognitive impairment to maintain their autonomy, dignity, and quality of life (HCFA, 1992; OBRA, 1990; Tabloski & Williams, 1998).

Several difficulties were encountered during the implementation phase of this study, which resulted in the inability to complete it as originally proposed. The original proposal was to recruit three elderly individuals who demonstrated episodes of agitation associated with sundown syndrome in dementia. One of the problems encountered with the study was the inability to recruit appropriate participants, due to a variety of circumstances. Initially, it was difficult to locate participants who met all of the inclusion criteria of the study, as many of the nursing home facilities that were contacted were no longer using prn medications to manage agitation. Several of the nursing home administrators of these facilities indicated that they had implemented alternative methods to manage agitation in individuals with dementia, which included the provision of more specific staff training and the development of structured activity programs. It was also discovered that many nursing home facilities had discontinued their prn medication orders to comply with the specific guidelines that address the appropriate use of prn psychotropic medications. Several of the nursing home administrators indicated that according to these guidelines, if a prn medication for agitation is administered for three consecutive days, this medication is to be discontinued and ordered on a routine basis.

The inability to locate participants with a level of agitation to warrant the frequent use of prn medications was another difficulty to the implementation of this study. Although potential participants who exhibited agitation associated with sundown syndrome were primarily identified by nursing facility staff, very few agitated behaviors were observed. The level of agitation that was observed in these potential participants did not warrant the frequent use of prn medications. One reason for this low level of agitation may have been related to the prescription of atypical antipsychotic medications

on a routine basis to manage these behaviors. All of the potential participants identified for the study were maintained on routine dosages of one of these atypical antipsychotic medications. Another reason for the low levels of agitation in individuals with dementia may have been related to the environment. Several of the nursing home facilities had established special care units, often referred to as dementia units or Alzheimer's disease units. These units were physically distinct parts of the nursing facility, and were specially designed to meet the needs of individuals with Alzheimer's disease. These highly structured environments may have contributed to the low levels of agitation in individuals with dementia.

The results of this study demonstrated that the use of a specially designed aquarium was not effective with an individual who experienced fluctuating delirium superimposed on dementia. It was unfortunate that this AAT intervention was not able to be implemented with appropriate individuals, so that its effectiveness in reducing agitation could be evaluated. This study was also designed to assist nursing facility staff on the evening shift, who typically have limited access to resources to help with the management of agitation in individuals with dementia. This specially designed aquarium requires minimal maintenance and staff attention, which are very important features in terms of feasibility of use.

One of the limitations of the single-case experimental design is the lack of generalizability. It is difficult to provide generalizable findings based on an individual case such as this one. Another factor that may contribute to the inability to generalize the findings is that individuals with dementia of the Alzheimer's Type may exhibit completely different symptomatology and patterns of agitated behaviors. Another

limitation of the case study is that many alternative explanations may be available as to why the intervention was or was not effective. The interpretations of the objective data collected were based on the clinical judgment of the investigator, which may result in experimenter bias. Mrs. B. presented with a rather complicated clinical picture involving the diagnoses of dementia, delirium, and depression. It was difficult to ascertain exactly what features of which diagnoses and/or disease process may have contributed to her inability to actively participate in the study and benefit from the intervention. The management of agitation in individuals with dementia can be a complex process, but the search for nonpharmacological treatment approaches must continue despite the difficulties encountered in this particular case study.

Recommendations for Future Research

Agitation has been recognized as a common manifestation of dementia for many years. Agitation signals distress and discomfort in individuals with dementia, and can have a profound impact on the quality of care, staff morale, and the day-to-day operation of the long term care facility. There have been important advances made over the years in the definition of agitation, its epidemiology, etiology, associated risk factors, objective measurements, and pharmacologic treatment, but more research is needed to continue to determine factors predisposing individuals with dementia to agitation. Research on agitation associated with sundown syndrome is extremely limited. Studies have strongly suggested that the causes of sundown syndrome appear to be multifactorial. However,

much more information is needed to explain the etiology according to physiological, environmental, and psychological variables.

The management of agitation in individuals with dementia has posed a difficult and challenging experience for nursing facility staff. The traditional method that staff have used to manage agitation has been the administration of chemical restraints and the application of physical restraints. The federal government became involved in the oversight of nursing home care with the passage of the OBRA regulations, which were developed to assist facilities and health care professionals assure the quality of care provided to residents in long term care facilities. One of the goals of these regulations was to improve the quality of nursing home care by reducing the use of chemical and physical restraints. These regulations have caused major changes in the way individuals with dementia are cared for in nursing homes, with the ultimate goal of enabling the resident to function and participate at their highest level.

The OBRA regulations recommend that an environmental and/or behavioral management strategy be the first line of treatment for agitated residents, but research on the nonpharmacological treatment of agitation in the long term care setting has been scarce. Nonpharmacological interventions may prevent the need for medication, and there has been a growing amount of evidence that nonpharmacological interventions can be used successfully in the treatment of agitation in individuals with dementia with little or no adverse effects. Much more research is needed in these areas in order to determine the best therapeutic strategies. There is a paucity of research on the use of AAT, especially the use of aquariums, in the management of agitation in individuals with dementia. The literature has indicated that response to some of these

nonpharmacological interventions varies with the type of agitated behaviors. Therefore, research needs to continue to determine the interventions that work best with different types of agitation.

The OBRA regulations also indicate that behavioral interventions generally refer to the modification of the resident's behavior or the resident's environment, but also include staff approaches to care. Behavioral problems have been shown to be effectively reduced by active staff-resident interactions that build trust, and by interactions from staff who have been appropriately prepared to deal with residents with dementia. Training staff to effectively deal with demented individuals is critical, and strategies to conduct this training must be developed. One of the most significant factors in optimizing the care of residents with dementia, with or without agitated behaviors, is education of caregivers in providing the right environment for such residents.

Pharmacologic treatment may be indicated when nonpharmacological management strategies are insufficient to alleviate behavioral symptoms such as agitation in individuals with dementia. Pharmacologic agents should be used as a last resort or in acute situations and for the shortest period possible. All classes of psychotropic medications have been used to treat agitation in dementia, but the mainstay of therapy historically has been the traditional antipsychotic agents. The traditional antipsychotics have long been a target of concern, not only for their past history of widespread misuse as chemical restraints, but also because of questionable efficacy and side effects that can be particularly problematic in the elderly resident. Other agents may be more appropriate to treat agitation in dementia, since traditional antipsychotics tend to diminish quality of life in many elderly residents. Though there are few studies evaluating the efficacy of the

atypical antipsychotic agents in elderly demented residents, the evidence appears to suggest that a number of these agents can be more effective than the typical agents and with significantly fewer side effects. Research needs to continue to investigate the potential adverse effects of the long term use of these agents in the elderly.

Research needs to continue on the manifestations of agitation in individuals with dementia, environmental and behavioral management approaches, pharmacologic treatment, and education in caregiver approaches in order to continue to improve the care of nursing home residents. The use of alternatives to restraints in nursing homes should continue to be investigated. Research must be conducted that can provide answers to questions concerning the factors that trigger particular behaviors like agitation, the interventions that are most effective in influencing residents' behaviors, and aspects of the environment that can be modified to decrease problems for behaviorally disturbed residents. The OBRA regulations have had a positive impact on the overall care provided to nursing home residents across the county, but steps must continue to ensure that appropriate treatments are provided that will enhance the quality of life of these residents.

Legal, Ethical, and Professional Issues

The Institutional Review Board for the Protection of Human and Animal Subjects at the Philadelphia College of Osteopathic Medicine and the Executive Board of Directors of the long term care retirement community approved the study. Assent was obtained from the participant, and informed consent was obtained from the participant's

legal guardian or responsible party. All information and medical records regarding the participant were kept in a locked file for confidentiality purposes.

Cultural Diversity Issues

There may be cultural diversity issues that might impact a subject's participation in a study, but none were encountered here.

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Appendix A

Letter to Legal Guardian

Dear (Legal Guardian)

I am conducting a research project at the (Name of Facility) which will look at the effect of a fish tank on reducing upset and restless behaviors in individuals with dementia. I am writing to ask permission to contact you to explain the project in greater detail, and to discuss whether or not the individual that you stand for as Legal Guardian may be able to be a part of this project. I would appreciate it if you would check the box below to indicate whether or not I may contact you, and return this letter to me in the enclosed self-addressed envelope. I look forward to hearing from you. Thank you for your consideration in this matter.

☐ Yes, you may contact me about your research project.

☐ No, please do not contact me about your research project.

Sincerely,

Karen Tanner, MSN, RN, CS

Appendix B

Informed Consent Form

Title of Study

Management of Agitation in Individuals with Dementia: An Animal-Assisted Therapy Approach

Purpose

The purpose of this research is to examine the effect of a fish tank on reducing upset and restless behaviors in individuals with dementia.

Investigator(s)

Name: Bruce S. Zahn, Ed.D., ABPP - Principal Investigator
Karen L. Tanner, MSN, RN, CS - Responsible Investigator
Department: Psychology
Address: 4190 City Avenue, Philadelphia, PA 19131
Phone: (215) 871-6498

The study that you are being asked to give permission for as legal guardian is part of a research project. The individual that you stand for as legal guardian is unable to give legally binding/valid permission to participate in this study.

If you have any questions or problems *during* the study, you can ask Dr. Bruce S. Zahn, who will be available during the entire study. If you want to know more about Karen Tanner's background, or the rights of research subjects, you can call Dr. Bruce S.

Zahn, Dissertation Advisor at (215) 871-6498 or Dr. John Simelaro, Chairperson, PCOM Institutional Review Board at (215) 871-6337.

Description of the Procedures

You will be asked to give permission for an eleven item questionnaire to be given to the individual who you stand for as legal guardian. This questionnaire will be used to make sure that this individual has the diagnosis of dementia. You will then be asked to give permission for this individual to be observed during the remainder of the study. The individual who you stand for as legal guardian will be observed for signs of upset and restless behaviors during a certain time period in the evening hours. A fish tank filled with brightly colored fish will also be placed near this individual at times and he/she will be asked to look at the fish. The investigator will be watching and marking down any signs of upset or restless behaviors during all the time periods throughout the entire study. The investigator will be checking to see whether any medications are being used to reduce these behaviors throughout the entire study. The total amount of time that this individual will be in the study will be approximately 1 month.

Potential Benefits

The potential benefits of the study include a reduced amount of upset and restless behaviors, less need for medications to reduce these behaviors, and/or less need for the use of any kind of physical restraints.

Risks and Discomforts

A potential risk may be that a negative reaction to the fish tank may occur resulting in more upset and restless behaviors and the need for medications and/or physical restraints.

Alternatives

The other choice is not to give permission for this individual to be in this study and to have the usual treatment for upset and restless behaviors according to the nursing home.

Payment

The individual that you stand for as legal guardian will not receive any payment for being in this study.

Confidentiality

All information and medical records relating to the individual you stand for as legal guardian will be kept in a locked file. Only Karen Tanner, Dr. Bruce S. Zahn, Dr. Robert DiTomasso, Dr. Maureen Gibney, and the members of the PCOM Institutional Review Board, will be able to look at these records. If the results of this study are published, no names or other identifying information will be used.

Reasons You May Be Taken Out of the Study Without Your Consent

If health problems occur that would make staying in the study possibly dangerous to the individual you stand for as legal guardian, Karen Tanner or her associates may take this individual out of the study.

New Findings

If any new information becomes available that may affect your willingness to have the individual you stand for as legal guardian to stay in this study, you will be told about it.

Injury

If the individual you stand for as legal guardian is injured as a result of this research study, he/she will be provided with immediate necessary medical care.

If you believe that the individual you stand for as legal guardian has suffered injury or illness in the course of this research, you should notify John Simelaro, D.O., Chairperson, PCOM Institutional Review Board at (215) 871-6337. A review by a committee will be arranged to determine if this individual's injury or illness is a result of being in this research. You should also contact Dr. Simelaro if you think that you have not been told enough about the risks, benefits, or other options, or that you are being pressured to have the individual you stand for as legal guardian stay in this study against your wishes.

Voluntary Participation

You may refuse to have the individual you stand for as legal guardian to be in this study. You voluntarily give permission for this individual to be in this study with the understanding of the known possible effects or hazards that might occur while he/she is in this study. Not all the possible effects of the study are known.

You may remove the individual you stand for as legal guardian from this study *at any time*.

You also understand that if you remove this individual from this study, there will be no penalty or loss of benefits to which he/she is entitled.

I have had plenty of time to read this form and I understand all of the statements it contains. I have been given a copy for my personal records.

Signature of Participant:_____

Date: _____/_____/_____ Time:_____AM/PM

Signature of Witness:_____

Date: _____/_____/_____ Time:_____AM/PM

Signature of Investigator:_____

Date: _____/_____/_____ Time:_____AM/PM

****

I give permission for the individual who I stand for as legal guardian to be in this research study. I will provide a copy of the guardianship papers to the investigator of this study.

Name of Participant:_____

Name of Legal Guardian:_____

Signature of Legal Guardian:_____

Date: _____/_____/_____ Time:_____AM/PM

Signature of Witness:_____

Date: ____/_____/_____ Time:_____AM/PM

Signature of Investigator:_____

Date: ____/____/_____ Time:_____AM/PM

Appendix C

Behavioral Observation Checklist

Agitated Behaviors	Occurrence									
Time:										
1. Cursing or verbal aggression										
2. Hitting (including self), kicking, pushing, biting, scratching, aggressive spitting (include at meals)										
3. Grabbing onto people, throwing things, tearing things, or destroying property										
4. Other aggressive behaviors or self abuse including: intentional falling, making verbal or physical sexual advances; eating, drinking, or chewing inappropriate substances; hurt self or others										
5. Pace, aimless wandering, trying to get to a different place, e.g., out of the room, building										
6. General restlessness, performing repetitious mannerisms, tapping, strange movements										
7. Inappropriate dress or disrobing										
8. Handling things inappropriately										
9. Constant request for attention or help										
10. Repetitive sentences, calls, questions, or words										
11. Complaining, negativism, refusal to follow directions										
12. Strange noises (weird laughter or crying)										
13. Hiding things, hoarding things										
14. Screaming										
TOTAL NUMBER OF OCCURRENCES										