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Dogs as an Intervention for Behavioral Symptoms of Older Adults with Dementia:

A Systematic Review

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### Abstract

The purpose of this systematic review was to determine if dogs are an effective occupational therapy intervention for reducing agitation and increasing social participation among older adults with symptoms of dementia by examining and rating the current published evidence. Studies were included if a dog was the primary intervention, and participants were at least 65 years of age with a diagnosis of dementia. Eleven studies were identified that met inclusion criteria. A majority of those studies found that the use of a dog reduced agitated behaviors and promoted social participation in older adults with dementia. While the variability in the methodology of the interventions in these studies make specific clinical recommendations difficult to determine, the current literature does suggest that animal assisted therapy would be an effective intervention strategy for occupational therapists working with clients in all stages of dementia.

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### Dogs as an Intervention for Behavioral Symptoms of Older Adults with Dementia:

#### A Systematic Review

According to the U.S. Census Bureau (1995), the population of older adults in the United States has increased at a faster rate than any other age group. In the previous decade alone, the number of persons over the age of 65 has increased exponentially from 3 million to 33 million. This rate increase is predicted to continue such that by 2030 one in five individuals in this country will be over the age of 65 (United States Census Bureau, 1995). The Aging, Demographics, and Memory Study found that age to be of the most consistent predictors of dementia (Plassman et al., 2007), making it likely that there will be a parallel increase in dementia accompanying the increase in the older adult population. The same study estimates that there are currently 3.8 million Americans with some form of dementia. As the number of individuals affected by dementia continues to rise in the absence of a cure or preventative measures, exploring treatment options for these individuals becomes crucial for promoting the best possible care.

Dementia is the term used to describe conditions, such as Alzheimer's disease, which are characterized by cognitive degeneration that interferes with a person's ability to meet life's demands. In addition to the deterioration of cognitive functioning, later stages of dementia typically include behavioral changes. Agitation and reduced social participation are two common behavioral changes seen as a result of dementia that limit an individual's ability to engage in meaningful activities. These limitations in occupation may result in a reduction in life roles, such as being a parent, spouse, or neighbor, their relationships with others, and quality of life (Doble, 2009). It is of great importance, therefore, to reduce behavioral symptoms and to

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support social participation in order to help the client maintain or restore engagement in meaningful activity.

There are many approaches to reducing behavioral symptoms, the most common being medications, such as cholinesterase inhibitors and memantine (Cranwell-Bruce, 2010). These drugs are often accompanied by adverse side effects including nausea, dizziness, and confusion. In addition to medication, there are numerous non-pharmaceutical intervention strategies for addressing the behavioral symptoms of dementia. A review of alternative approaches to the behavioral symptoms of dementia conducted by Kong, Evans, and Guevara (2009) found that sensory interventions, such as aromatherapy and calming music, showed potential for reducing the agitated behavior of individuals with Alzheimer's type dementia. One study found that the use of lavender aromatherapy significantly reduced agitated behaviors of individuals with behavioral and psychological symptoms of dementia, further supporting the potential efficacy of non-pharmacological interventions with this population (Fujii et al., 2008). Furthermore, non-pharmacological interventions, as compared to their prescription drug counterparts, have the additional advantage of being low risk and cost effective while having the potential to improve the client's quality of life.

Occupational therapists support individuals and families coping with dementia through a variety of non-pharmacological interventions including caregiver education, and environmental and task modification to enhance performance in activities of daily living (Doble, 2009). However, they may also address behavioral symptoms in order to support engagement in meaningful activities that support mental and physical wellness. As stated by the American Occupational Therapy Association (2010), "Interventions designed to enhance or restore well-being, occupational balance, and occupational engagement are critical components of the

therapeutic process.” Similarly, the Occupational Therapy Practice Framework (2008), which guides the profession, states that, “occupational therapy practitioners are concerned not only with occupations, but also the complexity of factors that empower and make possible clients’ engagement and participation in positive health-promoting occupations.” If the behavioral changes associated with dementia interfere with an individual’s ability to engage in meaningful occupations, then it is within the scope of occupational therapy to address it.

### **Background**

Occupational therapists work with clients with dementia and their caregivers in a variety of practice settings. Depending upon the stage of dementia, the severity of the symptoms, and the resources of the individual and their family, occupational therapists may provide interventions in the client’s home, the home of a family member, a skilled nursing facility, special care unit of a skilled nursing facility, or an adult day care program. Their caregivers are equally diverse in their relationship to the individual. Family members, including children and spouses, are often caregivers in this situation, but paraprofessionals and medical professionals also work with these clients. Thus, occupational therapists will assist clients, their families, and their caregivers in many settings each of which has their own set of environmental demands.

**Social participation.** Social participation is an area of occupation defined by the Occupational Therapy Practice Framework (American Occupational Therapy Association, 2010) as patterns of behavior that are expected of an individual as they engage in activities in the community, and among family members, friends, and peers. This broad definition leaves room for interpretation with regard to what qualifies as social participation. In the most obvious sense, communicating with friends, family and community members in a contextually appropriate manner is social participation. However, social participation need not be limited to verbal

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communication with other people. People frequently communicate with one another using non-verbal forms of communication, such as gestures and facial expressions. Similarly, leaning towards another person and laughter can convey enjoyment between people. In addition to communication with other people, many behaviors indicative of social participation can occur to interactions between individuals and pets. For example, typical social behaviors of people interacting with dogs include talking, non-verbal expressions, and touching that engages the dog in a social way. In this review, social participation will include interaction between adults with dementia and other adults as well as therapy dogs.

Social participation is a meaningful occupation that contributes to an individual's well-being and quality of life in many ways. Interacting with others and the environment establishes and maintains roles and identities, which in turn provides a sense of purpose and autonomy. Social participation also promotes physical, mental and emotional health by engaging individuals in meaningful activity, strengthening coping ability during difficult life circumstances, and keeping individuals attuned to the present. The benefits of social participation become increasingly important to individuals as they age and lose some of the roles and occupations they once held. Amid the restrictions and losses imposed by age, relationships with others become crucial forms of reinforcement of identity, and interacting with the environment promotes a sense of purpose and autonomy (Doble, 2009).

For individuals experiencing the progression of dementia in addition to the aging process, social participation becomes increasingly difficult and critical. The accelerated loss of occupations due to the effects of the dementia greatly reduces an individual's sense of self and often results in the loss of relationships. The loss of verbal communication during the late stages of dementia further limits social participation for this population. Increasing social participation

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for adults with dementia is needed to reinforce their sense of personhood, support them in coping with the losses associated with dementia, and re-engage them in meaningful activities that will increase their quality of life (Schaber, 2011).

**Agitation.** The progression of dementia leads not only to reduced levels of social participation, but also to inappropriate vocal or motor activity referred to as agitation (Cohen-Mansfield & Billig, 1986). While the source of agitation is difficult to determine, limitations on one's ability to perform tasks, increasing dependence upon others, disorientation, and loss of verbal communication are all changes associated with dementia that seem likely to induce frustration and anxiety.

Agitation is one of the primary reasons that individuals with dementia move to long-term care facilities (Alzheimer's Association, 2011). For individuals who relocate to one of these facilities, the unfamiliar surroundings and new care providers may increase the level of agitation the person experiences. In these circumstances, it is common for agitated behaviors to be directed towards staff members, which interferes with the ability of the staff to assist them (Cohen-Mansfield, Werner, & Marx, 1992). This may lead to a lower quality of care and dehumanization of those with dementia as staff members limit their interactions with the individual to only what is necessary, and spend less time regarding the person as an individual.

An observational study conducted by Schreiner, Yamamoto, and Shiotani (2005) found that individuals with dementia exhibited fewer agitated behaviors during recreational activities. One of the primary differences between time spent in these recreational activities as opposed to usual activities was the social environment. When not engaged in recreational activities, the participants spent 74% of their time in solitary activity. This study draws attention to the

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interconnectivity between social participation and agitated behaviors among individuals with behavioral symptoms of dementia.

**Occupational therapy interventions.** Occupational therapy's unique perspective focuses on the interplay of client factors, environmental demands, and activity demands making it well suited to addressing the psychosocial concerns faced by individuals with dementia. Occupational therapy interventions for clients with dementia often focus on caregiver education, compensatory techniques such as adapting the home environment, creating routines to increase safety, simplifying tasks for clients and their caregivers, and supporting leisure activities and social participation (Schaber, 2011; Dooley & Hinojosa, 2004; Letts et al., 2011). Occupational therapists working with clients with dementia may opt to utilize an ecological model of practice, which examines the fit among the person, the environment, and the occupation (Strong & Rebeiro-Gruhl, 2011) and identifies opportunities to adapt these factors to promote engagement and success among their clients. As dementia progresses and personal factors such as cognitive and physiological abilities decline, environmental and activity adaptations become more appropriate for supporting occupational performance.

A recent literature review by Letts et al. (2011) in the American Journal of Occupational Therapy found that interventions aimed at improving social participation for this population included interaction with volunteers, and reminiscing groups. Reminiscing groups are a type of intervention that promotes social participation by discussing memories about a common theme in a small group setting. A study by Okumura, Tanimukai, and Asada (2008), compared the efficacy of a reminiscing group with a conversation group for clients with dementia and found that the reminiscing group participants were more engaged with other group members. Okumura et al. (2008) suggest this increased participation may be a result of a common and appropriate



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topic of conversation. In other words, by providing a focal point to the activity, the activity demand was reduced such that clients were more able to participate. In both studies, social participation interventions were directed at individuals in the early to middle stages of dementia, while verbal communication was still possible. Letts et al. (2011) highlighted the need for occupational therapists to identify methods of supporting social participation for those in the later stages of dementia after verbal communication had declined. For these reasons, an occupational therapy intervention that may create a good match among individuals at all stages of dementia, activity demands, and environmental demands is animal assisted therapy.

**Therapeutic use of animals.** Dogs have long been touted to be “man’s best friend,” with anecdotal evidence suggesting that dogs provide numerous benefits to their owners and those they encounter throughout their lives. Among the proposed benefits are reduced levels of stress, and improved physical health. Pet Partners (2012) is an organization dedicated to “improving health through therapy, service and companion animals.” The organization advocates for the therapeutic use of animals by certifying dog and handler teams, providing educational materials to the public, supporting research, and coordinating volunteers and facilities. Pet Partners defines two types of animal assisted interventions, animal assisted activity and animal assisted therapy. Animal assisted activities are less structured, are not intended to achieve specific goals, and do not require a professional to direct them. Pet therapy and families bringing pets to care facilities would fall into this category. Animal assisted therapy is the incorporation of an animal in therapy under the direction of a health or human services professional to achieve specific goals. Given the necessity of goals in occupational therapy practice, use of a therapy dog as an intervention by an occupational therapist would be considered animal assisted therapy.

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While evidence for the physical health benefits of animal assisted activity and animal assisted therapy is scarce, there is evidence to suggest that dogs may enhance psychosocial benefits to individuals in a variety of settings. In a survey of nursing homes conducted by Darrah (1996) identified sensory stimulation, social interaction, stress reduction, and companionship as the primary reasons for the use of animal assisted activity and animal assisted therapy in that setting. In a study by Le Roux and Kemp (2009), animal assisted activity significantly reduced levels of depression in older adults living in a long-term care facility and participants who received the animal assisted therapy reported increased social participation, though it was not a measured outcome in the study. Studies by Fick (1993) and Bernstein, Malaspina, and Friedmann (2000) found that animal assisted therapy increased social behaviors, such as smiling, gesturing, and verbalizing among residents of long-term care and nursing home facilities participating in a group activity. The researchers suggested that animal assisted therapy facilitates communication by creating a comfortable environment, and providing a topic for conversation. Additionally, Bernstein et al. (2000) compared the frequency of nonverbal communication that occurred during animal assisted therapy and non-animal assisted therapy sessions and found that there was significantly more touch as a form of nonverbal interaction when a dog was present. This was an unanticipated result as the authors anticipated a similar level of touch as a means of communication and interaction between staff and participants, but found that it occurred almost exclusively when the therapy dog was present. The increased occurrence of nonverbal communication in the presence of a dog may have particular significance to occupational therapists seeking interventions for clients in late stage dementia with impaired speech capabilities.

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Overall, the positive results of these studies of nursing home and long-term care residents indicate that the potential of animal assisted therapy to provide a similar benefit for clients who are experiencing a decrease in social behavior as a result of the symptoms of dementia should be explored. Many of the qualities by which dogs may be able to impart a positive effect on social behavior may also reduce agitated behaviors. Improving engagement in meaningful activity with the assistance of a therapy dog has the potential to improve both behavioral side effects of dementia and quality of life for the individual experiencing dementia. The purpose of this systematic review was to determine if animal assisted therapy or activity with a dog is an effective intervention for reducing agitation and increasing social participation in older adults with symptoms of dementia. Examining and rating the current published evidence may help occupational therapists apply it appropriately to promote engagement in meaningful occupation.

### **Method**

A systematic review of literature on the topic of the use of dogs as an intervention for reducing agitation and increasing social participation among individuals with dementia was conducted. Evidence was sought to determine the efficacy of this type of intervention and to determine the current best practices based on the available literature.

The following databases were searched: American Journal of Occupational Therapy, PsycINFO, CINAHL, and PubMed. The following keywords were used to find articles in the databases: dementia, Alzheimer's, dog, pet, animal assisted therapy, pet therapy, agitation, and social participation. The reference lists of the selected articles were also searched for possible inclusion in the study.

Studies were included if they met the following criteria: participants had a diagnosis of dementia; outcome measures included agitation, social participation, or both; a dog was used as

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the main form of intervention; the mean age of participants was at least 65. Studies were excluded if: an animal other than a dog was used as the intervention, and criteria for diagnosis, outcome measures and age were not met.

### **Data Analysis**

The following information was recorded for articles that meet the inclusion criteria for this study: level of evidence as determined by the Research Pyramid (Tomlin & Borgetto, 2011) and traditional levels (Baker, 2006), study objectives, study design, intervention, outcome measures, and statistically or clinically significant results. These data were recorded in a table and ranked according to their level of evidence with highest-ranking studies presented first. A chart was developed to do a visual comparison of difference intervention strategies for studies that reported significant changes in agitation or social participation. In particular, the comparison focused on 1) whether dogs were used as part of an animal assisted therapy or animal assisted activity intervention, 2) the frequency and duration of therapy sessions, and 3) whether participants received the intervention on an individual basis or as part of a group. Conclusions regarding the current best practices, implications for the field of occupational therapy, and recommended avenues for future study in the area of animal assisted therapy for the purposes of reducing agitation and increasing social participation were drawn from the compiled data.

The Research Pyramid model of ranking evidence was chosen to include and give weight to studies that utilize a qualitative approach. In a clinical setting, decisions are often based on both qualitative and quantitative information and the intention of this review is to inform the clinical reasoning process of practicing therapists. In this model, studies are separated into four categories based on study design: descriptive, experimental, outcome, and qualitative. Within

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each category, studies are given a rank of 1- 4 based on the degree of rigor, with 1 being the most rigorous. The numerical ranking indicates a similar level of rigor across categories.

Additionally, studies included in this review were ranked according to the traditional Hierarchy of Levels of Evidence (Baker, 2006). This system of classification uses the following levels of evidence: Level I (systematic reviews), Level II (randomized clinical trials), Level III (quasi-experimental, pre-test/post-test, cohort, and case control studies), Level IV (correlational studies of multiple sites), Level V (correlational studies, qualitative studies, expert opinions).

### **Results**

Using the databases and search terms outlined, 12 articles that met the inclusion criteria were identified. Of those 12, 11 were selected for use in this study. One article was removed based on the lack of rigor in the study design, poorly defined outcome measures, and lack of systematic analysis of the data. The articles were then reviewed and classified by the first author. Selected articles from those 11 were then reevaluated for accuracy of classification and interpretation by the second and third authors. The results of the review are given in Table 1. A majority of the articles were from journals on the topic of aging and dementia and were not specific to a single medical discipline. One article (Zisselman, Rovner, Shmuelly & Ferrie, 1996) was from the American Journal of Occupational Therapy. Other fields represented in the selected articles were nursing and therapeutic recreation.

### **Participants**

All participants had a diagnosis of dementia, with the exception of those in the study by Zisselman, Rovner, Shmuelly and Ferrie (1996) in which some, but not all, participants were diagnosed with dementia. The level of dementia was not consistent across studies, but covered the spectrum from mild to severe. While age was not always provided, all articles described

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participants as elderly or geriatric, suggesting they were above 65 years of age. Among articles that listed the age of their participants, the range was between 66 and 88 years. Sample sizes varied from 4 to 58 participants. Studies took place in several settings, including: two adult day care centers, two long-term care facilities, four special care units, two nursing homes, and a geriatric psychiatry unit.

### **Study Design**

No systematic reviews or meta-analyses were found that were appropriate for inclusion in this review. The most commonly used study design was a repeated measures design in which participants served as their own control and comparisons were made between behavior with and without a dog present. One experimental design study did use a randomized controlled trial design (Zisselman, Rovner, Shmuelly & Ferrie 1996) to compare animal assisted therapy to an exercise intervention. One experimental study had separate experimental and control groups that were not randomly assigned (Kanamori et al., 2001). A summary of the study designs used by articles in this review may be found in Table 1. Further information with regard to both the Research Pyramid model and Traditional Hierarchy may be found in Appendix A.

### **Interventions**

All studies that claimed to use animal assisted therapy met the criteria set forth by Pet Partners (2012). Animal assisted activity was used to accurately describe the use of the dog in two studies. Other studies used terms such as canine companion, resident dog, and therapy dog to define the role of the dog. A summary of the terminology utilized in the studies can be found in Table 2.

Duration of animal assisted activity and animal assisted therapy interventions ranged from three minutes to the dog being a full-time resident of a facility. The frequency of sessions

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again covered a broad range with the study by Marx et al. (2010) involving a single three-minute session between an individual and a dog to two studies observing the effect of having a dog present full-time (Kongable, 1989; McCabe, 2002). Most studies took place over one to three weeks with four to ten sessions total. No schedule of session frequency and duration was the same between any two studies.

Animal assisted therapy and animal assisted activity were delivered under two conditions; individually or in a group setting. Neither condition appeared to deliver consistently better results. A summary of these results can be found in Table 3.

### **Outcome Measures**

A variety of outcome measures were employed in measuring agitation and social behaviors. Agitation was measured using the Agitation Behavior Mapping Instrument, the Cohen-Mansfield Agitation Inventory, the Nursing Home Behavior Problem, the Behave-AD and the Irritability Scale. These assessments employed either a checklist completed by an observer or an interview with the individual's caregiver to estimate the frequency and duration of agitated behaviors. Assessment tools that were used to measure social behaviors used similar methods. Social behavior was measured using the Social Behavior Observation Checklist, Daubemire's Data Coding Protocol, Observational Measurement of Engagement, Motor Behavior Observation Form, Apathy, and direct. While there was some variation in what was considered social behavior, the overlap was considerable and included smiling, laughing, leaning toward, verbalization, and tactile contact. These behaviors were considered social behavior whether they were directed at a person or the dog. Measures for each study are included in Table 1.

## **Study Results**

Five of the eight studies evaluating the effect of a dog on agitation found that it significantly reduced agitated behavior. Of those five studies, three used animal assisted therapy and two used animal assisted activity. Six of eight studies found a significant increase in social behaviors in the presence of a dog. Two of the six studies that observed a significant increase in social behavior used animal assisted therapy, and four used animal assisted activity. These results are summarized in Table 4.

## **Discussion**

### **Agitation**

A majority of studies found that the presence of a dog did significantly reduce agitation in older adults with dementia. All three studies that clearly used animal assisted therapy reported a decrease in agitated behavior. Richeson (2003), whose study included both a baseline and a follow-up phase, stated that animal assisted therapy may decrease agitated behavior by meeting the need for meaningful activity. The two studies that did not report significant differences in agitation did find that participants had lower levels of agitation, but the results did not reach the level of significance following the intervention. Zisselman et al. (1996), who looked at older adults with conditions such as depression as well as dementia, found no significant difference in the decrease in agitation of groups assigned to either an exercise group or an animal assisted activity group. However, a majority of participants did demonstrate a decrease in irritable behaviors; in particular, women with dementia seemed to receive the greatest benefit from either intervention. While women with dementia also responded well to an exercise intervention, the progressive nature of dementia means that physical exercise may not be an option for reducing



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agitation in later stages of the disease. These later stages may be the point at which animal assisted therapy can provide the most benefit to clients with symptoms of dementia.

### **Social Behavior**

A majority of studies also found that the presence of a dog significantly increased social behavior in older adults with dementia. The two studies that did not find a significant increase in social behaviors compared the effect of a live dog to variations of dog-like stimuli over a brief time period. Kramer, Friedmann and Bernstein (2009) compared the social behaviors of individuals during a three-minute visit by a person alone, a person accompanied by a dog, and a person with robotic dog. However, the brief duration of the visits in this study and the single visit under each condition may not have been long enough to make an accurate comparison of social participation behaviors. Similarly, Marx, Cohen-Mansfield, Regier, Dakheed-ali, Srihari and Thein (2010) compared a live dog to other dog-related items, such as a stuffed dog and a video of puppies in sessions lasting a maximum of 15 minutes. There was no one else present in the room with the participant and the dog, or dog-like stimulus in this study. This study does demonstrate that dogs are capable of engaging clients with dementia even in the absence of another person, but the artificial conditions under which this study took place make it difficult to generalize results to therapeutic situations. In both studies, there was an increase in social behaviors when the dog was present, but not significantly in comparison to the other conditions. The lack of clinical significance in these studies may point to the necessity of the dog being part of a structured activity that includes other people and is of a longer duration than a few minutes. Simply being in the room with a dog does not constitute therapy and, unsurprisingly, does not yield the same degree of benefit.

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All other studies measuring social participation found a significant increase in social participation behaviors during animal assisted therapy or animal assisted activity activities. A majority of these sessions were conducted in groups, indicating that the group format may further support social participation. Having a dog present during group activities may provide a common topic of conversation that a majority of participants can relate to. The dog's ability to engage clients with dementia, as identified by Kramer et al. (2009) and Marx et al. (2010), may prevent participants from withdrawing or losing interest. By keeping participants engaged and attuned to the present place and activity, dogs may be able to facilitate therapeutic goals beyond social participation. For example, Kongable, Buckwalter and Stolley (1989) compared the social behaviors of residents of a special care unit prior to animal assisted activity, during three-hour animal assisted activity sessions once a week, and after the dog became a permanent resident at the facility. Their study found that social behaviors increased both during the weekly visits and after the dog became a permanent resident indicating that the increase in social behavior was due to the presence of the dog as opposed to a response to the novelty of receiving animal assisted activity on a weekly basis.

### **Animal Assisted Therapy vs. Animal Assisted Activity**

The interventions utilized in the studies were varied in their structure level of description. In the studies that claimed to be using animal assisted therapy, the guidelines set by Pet Partners were met. Each of these studies had goals and interventions were provided by healthcare professionals. In most studies, however, the dog was used as part of less formal animal assisted activity, or there was not enough information provided to determine the structure of the intervention. Insufficient information may be an indication of ambiguity about the use of terminology. It may also indicate that the limited details provided in current research on the

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topic lead to hesitation to create a structured intervention utilizing dogs. Without a description of the key elements of an animal assisted therapy program, health professionals may feel they do not have enough information to create an effective animal assisted therapy session for their clients.

The variation in terminology is suggestive of a larger issue, which is the lack of information about how dogs are used in therapy. Most of the studies provided minimal information with regard to if and how sessions were structured, the qualifications of the handler or person directing the therapy, and information about the dog, such as size. All of these pieces of information are needed for the sake of replication in research or practice, and for comparison when determining the most effective use of animal assisted therapy or animal assisted activity. The most complete description of the animal assisted therapy intervention was found in Richeson's pilot study (2003). Richeson documented the qualifications of the individual leading the session, detailed information on who attended the sessions, the goal of the sessions, and how sessions were structured. This type of information provided the best opportunity for other professionals to consider the variables and evaluate results.

### **Implications for Occupational Therapy**

Animal assisted therapy is a low risk, low activity demand option for occupational therapists to consider for their clients with dementia. The majority of studies evaluated in this review reported a positive change in the behavioral symptoms of dementia as a result of an animal assisted activity or animal assisted therapy intervention, and no adverse reactions were observed. Animal assisted therapy has the potential to increase client engagement in treatment, reduce agitation, and promote social behavior for clients at all stages of dementia, but it may have particular appropriateness during the later stages when verbal communication is difficult or

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impossible. At these stages, interaction with dogs may allow clients to participate in a social activity without the activity or environmental demand of verbal communication. Petting a dog during animal assisted therapy or activity may also provide an opportunity for receiving sensory information that clients may find calming.

Occupational therapists working with clients who are facing progressively increasing challenges due to the symptoms of dementia may find that the use of animal assisted therapy reduces the environmental and activity demands for social participation. Dogs are capable of responding to non-verbal communication in kind and do not present expectations to clients, thereby reducing the environmental demand that can accompany social participation. Additionally, interacting with a dog through touch may provide sensory stimulation that is soothing and keeps individuals more attuned to the present. Dogs may also provide a ready topic of conversation and prompt memories of interactions with animals in the past, which further reduces the activity demand of social situations.

If the presence of a dog is able to support social participation in clients with dementia by reducing levels of agitation and reducing environmental demands, it may have a similar effect during occupational therapy interventions aimed at self-care. Keene et al. (1999) reported that the highest level of agitation among clients with dementia was observed during personal care activities. If this is the case, an intervention that is able to reduce levels of agitation would be beneficial to clients, and their caregivers at during these times. While the mechanism by which dogs are able to reduce agitation is not known, they may be adapting the environment in such a way as to have a calming effect that may be beneficial during many types of occupational therapy activities, including self-care. Additionally, for occupational therapists working in home care, the presence of a dog may have a positive impact on the caregiver.

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While specific recommendations on the structure of animal assisted therapy for use with occupational therapy are difficult to provide based on the current literature, there are general recommendations to consider. The first is to gather information from an organization such as Pet Partners about certification requirements and how to set up an animal assisted therapy program at a facility. Second, it is recommended that a certified dog be used. Certification programs, such as the one used by Pet Partners, ensure that therapy animals meet obedience training standards, possess a temperament suitable to working with various populations, and meet health and hygiene criteria. An occupational therapist may choose to certify their own dog, or work with a certified dog and handler team to ensure the greatest degree of safety for clients. An exception to this may be home care for a client that already owns a dog. Finally, the session will need to be structured to best fit the needs of the clients. Depending upon the stage of dementia, occupational therapist may wish to provide more or fewer directions to clients. As an example, they might allow the client to determine how to interact with the dog, or provide suggestions such as petting or grooming. In a group setting, the therapist may initiate a conversation about dogs.

In addition to a structured animal assisted therapy program, occupational therapists are qualified to provide guidance to animal assisted activities that may be carried out by paraprofessionals, volunteers, and family members. In these situations, the therapist may provide suggestions for grading interactions between clients and dogs to promote social behaviors similar to those used in an animal assisted therapy program. There are many possibilities for structuring animal assisted therapy and animal assisted activity programs in the field of occupational therapy and as many opportunities for improving the quality of life of clients with dementia.

**Limitations**

Sparse descriptions made it difficult to determine how dogs were being used as an intervention. This lack of information on the structure of the intervention made it impossible to determine which variables were most important in maximizing the effectiveness of animal assisted therapy and animal assisted activity. It cannot be said whether sessions need to be led by a health professional and be goal-oriented to have a positive effect on behaviors symptoms, or if a greater effect can be achieved under those conditions. The variety of frequency and duration of the interventions also made it difficult to identify optimal scheduling of animal assisted therapy and animal assisted activity sessions. In general, sample sizes were small and the intervention phases were short, limiting the ability of the results to be confidently generalized.

**Future Research**

More rigorous study designs that include a control group and a thorough description of the structure of the intervention would provide increased confidence and applicability of the results. Studies that compare frequency and duration of animal assisted therapy with this population would provide more solid information upon which to develop an animal assisted therapy program. It seems likely that animal assisted therapy may contribute to occupational therapy with many populations and therapeutic goals. If the presence of a dog is able to facilitate communication and reduce agitation, animal assisted therapy may have potential for reducing agitation during self-care therapeutic activities among clients with dementia, which are associated with increased incidence of agitated behaviors (Keene, et al., 1999).

**Conclusion**

Animal assisted therapy shows potential for decreasing agitation and increasing social participation among individuals with dementia. However, lack of details on the structure of the intervention and the small number of studies with control groups make it difficult to describe the best practices for including animal assisted therapy in occupational therapy settings.

Occupational therapists seeking an alternative option for engaging clients with behavioral symptoms of dementia, particularly in the later stages, are encouraged to incorporate animal assisted therapy based upon the results of this study. In lieu of animal assisted therapy, an occupational therapist may provide guidance for animal assisted activities to be carried out by paraprofessionals, volunteers, and family members. The incorporation of a dog into an occupational therapy intervention may reduce the environmental and activity demands of social situations for persons with dementia enabling them to participate with greater ease and reducing frustration that may lead to agitated behavioral symptoms.

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*Appendix*

## Research Pyramid

## Descriptive Research

1. Systematic reviews of descriptive studies
2. Association, correlational studies
3. Multiple-case studies, normative studies, descriptive surveys
4. Individual case studies

## Experimental Research

1. Meta-analyses of related experimental studies
2. Individual (blinded) randomized controlled trials
3. Controlled clinical trials
4. One-group pre-post studies

## Outcome Research

1. Meta-analyses of related outcome studies
2. Preexisting groups comparisons with covariate analysis
3. Case-control studies; preexisting groups comparisons
4. One-group pre-post studies

## Qualitative Research

1. Meta-synthesis of related qualitative studies
2. Group qualitative studies with more rigor
3. Group qualitative studies with less rigor
4. Qualitative studies with a single informant

## Traditional Hierarchy of Levels of Evidence

- I. Systematic review of research studies
- II. Randomized clinical trial
- III. Quasi-experimental, pre-post cohort, and case control studies
- IV. Correlational studies of multiple sites
- V. Correlational studies, qualitative studies; expert opinion

## EFFECT OF DOGS ON BEHAVIORAL SYMPTOMS OF DEMENTIA

Table 1

*Summary of Evidence*

Author/Year	Study Objectives	Pyramid/Design/Participants	Traditional Hierarchy	Intervention and Outcome Measures	Results
Zisselman, Rovner, Shmuel, & Ferrie (1996)	To evaluate the effects of AAA on geriatric psychiatry inpatients.	Level E2: Randomized controlled trial  <i>Participants</i> N = 58 Pet Therapy Group n = 33 Exercise Group n = 25 Age = elderly (not defined) Dx = chronic age-related psychiatric, medical, or neurological condition including dementia	II	<i>Intervention</i> Participants were randomly assigned to a group receiving either 1 hour AAA, or 1 hour of exercise for 5 days.  <i>Outcome Measures</i> Multidimensional Observation Scale for Elderly Subjects (agitation)	No significant differences were found between groups. Participants who received AAA showed less irritable behavior following the intervention ( $p < .07$ ).
Kanamori, et al. (2001)	To investigate the usefulness of AAT for individuals with senile dementia.	Level O3: Pre-test/post-test with control group comparison  <i>Participants</i> N = 27 Experimental Group n = 7 (5 female, 2 male) Mean Age = 79.4 Dx = AD, or other dementia Control group n = 20 (16 female, 4 male) Mean Age = 83.4	III	<i>Intervention</i> Participants received 6 individual, biweekly AAT sessions.  <i>Outcome Measures</i> Behave-AD (agitation)	The group that received the AAT intervention demonstrated a significant decrease in aggressiveness ( $p = .045$ ) and anxiety and phobias ( $p = .004$ ). The control group did not have a significant decrease in agitated behaviors.

*Note.* E2 = level 2 experimental study; E3 = level 3 experimental study; E4 = level 4 experimental study; O4 = level 4 outcomes study; Dx = diagnosis; AD = Alzheimer's disease

## EFFECT OF DOGS ON BEHAVIORAL SYMPTOMS OF DEMENTIA

Sellers (2005)	To examine the effects of AAT on the social and agitated behaviors of elders with dementia residing in long-term care.	Level E4: Single-subject, A-B-A-B  <i>Participants</i> N = 4 (3 female, 1 male) Mean age = 87 Dx = AD, or other dementia	III	<i>Intervention</i> Two 5-day baseline periods of normal routine activities were alternated with two 5-day intervention phases consisting of 15-minute individual sessions of AAT.  <i>Outcome Measures</i> a. Agitation Behavior Mapping Instrument (agitation) b. Social Behavior Observation Checklist (social behavior)	a. Mean number of agitated behaviors decreased during the intervention phase ( $p < .0001$ ). 3 of 4 participants had statistically significant fewer agitated behaviors during both intervention phases, 1 participant had fewer agitated behaviors in only one intervention phase. b. Mean scores increased during the intervention phases ( $p < .0001$ ). All participants had individually increased social participation.
Richeson (2003)	To examine the effect of AAT on agitated and social behaviors.	Level O4: Pretest/posttest/follow-up, A-B-C  <i>Participants</i> N = 15 (14 female, 1 male) Mean age = 86.8 Dx = dementia	III	<i>Intervention</i> Five days per week for 9 weeks of group sessions consisting of 3 weeks without a dog, 3 weeks with 1 hour of AAT, and 3 weeks without dog  <i>Outcome Measures</i> a. CMAI (agitation) b. AAT Flow Sheet (social behavior)	a. Decrease in agitation between the baseline and intervention phase ( $p = .001$ ). Increase in agitation between intervention phase and follow-up ( $p = .000$ ) b. Increase in social behavior between first and last week of intervention phase ( $p = .009$ ).

*Note.* E2 = level 2 experimental study; E3 = level 3 experimental study; E4 = level 4 experimental study; O4 = level 4 outcomes study; Dx = diagnosis; AD = Alzheimer's disease

## EFFECT OF DOGS ON BEHAVIORAL SYMPTOMS OF DEMENTIA

Kongable, Buckwalter & Stolley (1989)	To evaluate the use of a pet dog as a therapeutic agent for persons with dementia living in a special care unit.	Level O4: one group, pretest/posttest  <i>Participants</i> N = 12 (2 female, 10 male) Aged = 66-88 Dx = AD	III	<i>Intervention</i> Three phases: no dog, dog visiting 3 hours once a week, dog as resident. Sessions were in both individual and group formats.  <i>Outcome Measures</i> Observational checklist (social behavior)	Significant increase in total social behaviors between the no dog phase and the dog visitation and dog as a resident phases ( $p < .001$ ). The following behaviors increased over time: smiles ( $p = .001$ ), laughs ( $p = .011$ ), leans ( $p = .020$ ), touches ( $p = .000$ ), verbalizations ( $p = .024$ ), and total social behavior ( $p = .000$ )
Mossello, Ridolfi, Mello, Lorenzini, Mugnai, Piccini, Barone, Peruzzi, Masotti & Marchionni (2011)	To assess the effects of AAA.	Level O4: one group, pretest/posttest  <i>Participants</i> N = 56 (44 female, 12 male) Mean age = 87 Dx = dementia	III	<i>Intervention</i> Two weeks of usual group activities, followed by 3 weeks with the addition of a plush dog, and 3 weeks with the addition of a live dog. Each session lasted approximately 100 minutes.  <i>Outcome Measures</i> a. Cohen-Mansfield Agitation Inventory (agitation) b. Agitated Behavior Mapping Instrument (agitation) c. Motor Behavior Observation Form (social behavior)	a. No significant difference. Lowest levels of agitation occurred during AAA phase. b. significant difference. Lowest levels of agitation occurred during AAA phase. c. No significant difference. The most vocalizations were documented during AAA phase. Significant increase in attraction to the environment during AAA ( $p = .0006$ )

*Note.* E2 = level 2 experimental study; E3 = level 3 experimental study; E4 = level 4 experimental study; O4 = level 4 outcomes study; Dx = diagnosis; AD = Alzheimer's disease



## EFFECT OF DOGS ON BEHAVIORAL SYMPTOMS OF DEMENTIA

Kramer, Friedmann & Bernstein (2009)	To evaluate the social behaviors of long-term care residents during a one-to-one visitation by a person, a person accompanied by a dog, and a person accompanied by an AIBO.	Level O4: one group, pretest/posttest  <i>Participants</i> N = 18 (all female) Mean age = not provided Dx = AD, or other dementia	III	<i>Intervention</i> Participants had a 3 minute, one-on-one visit once a week for three weeks. One visit was with a person alone, another with a person and a live dog, and another with a person and a robotic dog. Order was varied.  <i>Outcome Measures</i> Observations (social behavior)	No observed difference in the number of conversations initiated by participants in any of the conditions. The number of touches and looks increased when either the dog, or the AIBO was present. More gestures were observed when the participant was visited by a person alone.
Churchill, Safaoui, McCabe & Baun (1999)	To examine the effects of a therapy dog on agitation and socialization in persons with AD, or related disorders.	Level E4: experimental, within-subjects, repeated measure  <i>Participants</i> N = 28 (21 female, 7 male) Mean age = 83.8 Dx = AD, or other dementia	III	<i>Intervention</i> Two 30 minute group sessions, 1 with dog present.  <i>Outcome Measures</i> a. Agitation Behavior Mapping Instrument (agitation) b. Daubenmire's Data Coding Protocol (social behavior)	a. Decrease in agitated behaviors ( $p < .05$ ) b. Increases in leans, smiles, looks toward, tactile contact, and verbalization ( $p < .05$ )
McCabe, Baun, Speich & Agrawal (2002)	To determine the effect over time of a resident dog on problem behaviors of persons with AD in a skilled nursing facility.	Level O4: within-participants, repeated measures, pretest/posttest design  <i>Participants</i> N = 22 (15 female, 7 male) Mean age = 83.7 Dx = AD, or other dementia	III	<i>Intervention</i> Four weeks of resident dog present to interact with residents in both individual and group situations.  <i>Outcome Measures</i> Nursing Home Behavior Problem Scale (agitation)	Decrease in agitated behaviors during the day. ( $p < .05$ )

*Note.* E2 = level 2 experimental study; E3 = level 3 experimental study; E4 = level 4 experimental study; O4 = level 4 outcomes study; Dx = diagnosis; AD = Alzheimer's disease

## EFFECT OF DOGS ON BEHAVIORAL SYMPTOMS OF DEMENTIA

Motomura, Yagi & Ohyama (2004)	To investigate the effects of AAT.	Level O4: Pretest/posttest  <i>Participants</i> N = 8 (8 female, 0 male) Mean age = 84.8 Dx = AD or other dementia	III	<i>Intervention</i> 1 hour of structured AAA in a group for 4 consecutive days.  <i>Outcome Measures</i> a. Irritability Scale (agitation) b. Apathy Scale (social behavior)	a. No difference. b. Significant decrease in apathy after AAT ( $p \leq .05$ )
Marx, Cohen-Mansfield, Regier, Dakheed-ali, Srihari & Thein (2010)	To evaluate the level of engagement of AAT with nursing home residents.	Level O4: one group, pretest/posttest  <i>Participants</i> N = 58 Mean age = not given Dx = dementia	IV	<i>Intervention</i> Participants were given the option of individually interacting with a dog and handler, or dog related stimulus for up to 15 minutes.  <i>Outcome Measures</i> a. Observational Measurement of Engagement (social behavior) b. Observation (social behavior)	a. No difference. b. More verbal responses were made to the live dog than other types of stimuli.

*Note.* E2 = level 2 experimental study; E3 = level 3 experimental study; E4 = level 4 experimental study; O4 = level 4 outcomes study; Dx = diagnosis; AD = Alzheimer's disease

## EFFECT OF DOGS ON BEHAVIORAL SYMPTOMS OF DEMENTIA

Table 2

*Summary of Terminology Usage*

Author/Year	AAT	AAA	Other	Term
Sellers (2005)	X			AAT
McCabe et al. (2002)		X		Resident dog
Churchill et al. (1999)		X		Therapy dog
Richeson (2003)	X			AAT
Kramer et al. (2009)		X		Not defined
Motomura et al. (2004)		X		AAT
Marx et al. (2008)			X	Not defined
Mossello et al. (2011)		X		AAA
Kongable et al. (1989)		X		Not defined
Kanamori, et al. (2001)	X			AAT
Zisselman et al. (1996)		X		AAA

## EFFECT OF DOGS ON BEHAVIORAL SYMPTOMS OF DEMENTIA

Table 3

*Summary of Interventions*

Authors	Location	Structure		Duration	Frequency
		Individual	Group		
Kanamori et al. (2001)	Day care	X		Not stated	2 days/week for 3 weeks
Sellers (2005)	LTC	X		15 minutes	5 days/week for 2 weeks
Marx et al. (2004)	Nursing home	X		Maximum of 15 minutes	1 visit
Kramer et al. (2009)	LTC	X		3 minutes	1 visit
McCabe et al. (2002)	SCU	X	X	24 hours a day	4 weeks
Kongable et al. (1989)	SCU	X	X	3 hours - 24 hours a day	1 day/week - every day
Richeson (2003)	Nursing home		X	1 hour	5 days/week for 3 weeks
Zisselman et al. (1996)	Geriatric psychiatry		X	1 hour	5 days
Motomura	Nursing home		X	1 hour	4 days
Mossello et al. (2011)	Day care		X	100 minutes	3 days/week for 3 weeks
Churchill et al. (1999)	SCU		X	30 minutes	1 visit

*Note:* LTC = Long-term care; SCU = Special care unit

## EFFECT OF DOGS ON BEHAVIORAL SYMPTOMS OF DEMENTIA

Table 4

*Summary of Results*

Author	Agitation	Social Participation
Sellers (2005)	-	+
McCabe et al. (2002)	-	NT
Churchill et al. (1999)	-	+
Richeson, (2003)	-	+
Kramer et al. (2009)	NT	0
Motomura et al. (2004)	0	+
Marx et al. (2008)	NT	+
Mossello et al., (2011)	-	+
Kongable et al. (1989)	NT	+
Zisselman et al. (1996)	0	NT
Kanamori, et al., (2001)	-	NT

*Note.* + = increase in social participation behavior; - = decrease in agitated behaviors; 0 = no significant results; and NT indicates that this variable was not measured.