

Resident Dog in the Alzheimer's Special Care Unit

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Behavioral disturbances are a common feature of Alzheimer's disease (AD). Prior studies have demonstrated a significant reduction in agitation behaviors during short-term exposure to a dog on an Alzheimer's special care unit (SCU) for persons with AD. The purpose of this study was to determine the effect over time of a resident dog on problem behaviors of persons with AD in an SCU. A within-participants repeated-measures design was used for this study. The Nursing Home Behavior Problem Scale was used to document behaviors (on days and evenings) 1 week before and 4 weeks after placement of the dog. Participants on the day shift exhibited significantly fewer problem behaviors across the 4 weeks of the study ($F[1, 80] = 7.69, p < .05$). No significant change in behaviors occurred on the evening shift. The findings support the long-term therapeutic effects of dogs for persons residing in Alzheimer's SCUs.

The purpose of this study was to determine the effect of the introduction of a resident dog on problem behaviors of persons diagnosed with Alzheimer's (AD) or related disorders who reside in an AD special care unit (SCU). A secondary purpose was to compare the variation in use of pharmacological agents to treat problem behaviors before the introduction of the resident dog to the unit and for the first 4 weeks after the introduction of the resident dog.

Issues and Interventions for Persons With AD

AD is a progressive neurodegenerative disorder characterized by impairment in a wide spectrum of cognitive abilities including memory, language,

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mood, judgment, and social behaviors. The Alzheimer's Association (1998) estimates that there are 4 million persons with AD, and by 2050 there will be 14 million persons with this disorder (Alzheimer's Association, 1998). A definitive diagnosis of AD can only be made through brain autopsy at this time. Although the causes of AD are unknown, pathophysiologic changes that occur in the brain result in a progressive decline in cognitive functioning. Although there is no established treatment to permanently reverse or stop the changes associated with AD, the use of cholinesterase inhibitors such as Aricept (donepezil), Exelon (rivastigmine), and Reminyl (galantamine) have been demonstrated to slow down and, in some cases, temporarily reverse cognitive decline. Successful pharmacological management of cognitive decline and function in persons with AD is currently limited (Keltner & Folkes, 1997). Until researchers definitively establish the underlying pathophysiology of this disease, the goal remains that of effectively managing the associated symptomatic behaviors.

Behavior disorders are a common feature in dementia and become more problematic as the disease progresses. Symptoms include agitation, aggression, delusions, hallucinations, sleep problems, wandering, incontinence, and vocalizations (Stoppe, Brandt, & Staedt, 1999). Behavioral disturbances are usually more problematic than cognitive difficulties for caregivers and are often the reasons for institutionalization. Behavioral problems can be managed with environmental modification, alterations in caregiving, and pharmacotherapy (Sloane, 1998). Certain behavioral disturbances, such as hallucinations, anxiety, and depression can be treated effectively with antipsychotic, mood-stabilizing, and antidepressant medications (Kumar, Durai, & Jobe, 1998), but given the risk-benefit of most psychotropic drugs used in older persons with dementia, the effectiveness of nonpharmacological strategies is deserving of systematic study (Keltner & Folkes, 1997). One approach that is designed to be responsive to the specific needs of persons with AD are SCUs (Sand, Yeaworth, & McCabe, 1992). SCUs provide activity-based interventions and behavioral management for AD residents who may be difficult to manage in a nonspecialized facility. Therapeutic environments are created that use a variety of techniques to promote independence, decrease the use of chemical agents and physical restraints, and improve the quality of life for these residents (Alzheimer's Disease and Related Disorders Association of Eastern Massachusetts, 1999). The design of SCUs stresses the role of environmental factors on the behavior of persons with AD. Attention is directed to lighting, colors, and noise that can influence the behavior of SCU residents. SCUs provide settings that are secure, comforting, and nonthreatening. They offer a familiar frame of

reference, lessen confusion, and offer freedom of movement within an unrestricted space (Teresi, 2000).

Another aspect of the environment receiving increased attention is the use of companion animals in the clinical setting. Animals have long been a part of programs to help people. As early as the 17th century, the health benefits of animals were recognized. The idea that human interaction with companion animals can result in psychological and physiological benefits is receiving increased attention by health professionals (Willis, 1997). Pets provide affection and companionship regardless of one's cognitive or physical abilities (Kongable, Buckwalter, & Stolley, 1989).

Several studies have demonstrated that interactions with animals have positively influenced people in a variety of settings, such as home (Fritz, Farver, Kass, & Hart, 1995), psychiatric (Walsh, Merten, Verlander, & Pollard, 1995; Zisselman, Rovner, Schmuely, & Ferrie, 1996), and nursing facilities (Darrah, 1996; Fick, 1993). Physical benefits of association with animals include decreased blood pressure and heart rate and increased peripheral skin temperature (Baun, Bergstrom, Langston, & Thoma, 1984; Oetting, Baun, Bergstrom, & Langston, 1985). Psychological benefits include relaxation, reality orientation, self-worth and companionship (Fine, 2000). Long-term associations of companion animals with community-residing persons with AD have been linked with fewer episodes of verbal aggression and anxiety compared with those not having a companion animal (Fritz et al., 1995). Persons with AD who were attached to their pets had fewer reported mood disorders (Fritz, Farver, Hart, & Kass, 1996). In a study conducted on an AD SCU, the presence of a therapy dog increased the total number of socialization behaviors of persons with AD during one-on-one interactions (Batson, McCabe, Baun, & Wilson, 1998). The presence of a visiting dog showed increased social behaviors in persons with AD residing on an SCU (Kongable et al., 1989; Kongable, Stolley, & Buckwalter, 1990).

Although pet therapy is becoming increasingly popular in a variety of settings, most research has addressed only the short-term effects of pet therapy using a visiting pet, usually a dog. One of the few studies that addressed the long-term effects of pet therapy was conducted in prisons where small farm animals were used. Data demonstrated that inmates became less violent, had fewer conflicts, required fewer medications, and showed more acceptable behaviors (Greenberg, 1996). A recent study by Churchill, Safaoui, McCabe, and Baun (1999) on an AD SCU reported a decrease in agitation and improved socialization in AD residents during sundown hours when a dog visited. The study reported here builds on the study by Churchill et al.

(1999) by focusing on the extent to which changes in problem behaviors are sustained for 1 month after the introduction of a resident dog to an AD SCU. This study examined the effect of the introduction of a resident dog on problem behaviors of persons with AD who reside in an SCU and compared the use of pharmacological agents to treat behavioral problems before and 1 month after the introduction of the resident dog on the SCU.

METHOD

Design

A within-participants repeated-measures design was used in this study. Facility staff members used the Nursing Home Behavior Problem Scale (NHBPS) (Ray, Taylor, Lichenstein, & Meador, 1992) to document problem behaviors before the introduction of the dog and weekly for 4 weeks following placement of the dog on the unit. Medications used for problem behaviors were also recorded during the same time frame. The data analyzed were part of a clinical improvement project designed by the staff on the unit where this project was conducted. One of the investigators had a faculty practice appointment at this facility thus making it possible to access recorded data. The Institutional Review Boards of both the medical center where the investigators were employed and the institution where this study was conducted approved the study. It was not necessary to get approval from the Institutional Animal Care and Use Committee of the investigators' employment institution because the decision to place a resident dog on the SCU was an independent decision made by the facility staff prior to the implementation of this study.

Eligibility criteria included a probable diagnosis of AD or a related disease and residence on an AD SCU. Records of both men and women were reviewed for reports of agitation or aggression behaviors recorded on the NHBPS by the primary caregivers of the SCU residents as well as the administration of pharmacological agents to treat mood and behavioral problems.

Setting

The study site was a 22-bed SCU of an urban extended health care facility in a midwestern state. The philosophy of the unit was consistent with criteria developed by the Alzheimer's Association (1992) and published in *Guidelines for Dignity*. All aspects of care provided on this unit were designed to

promote functional capacity and dignity of the residents. Residents on the unit were free to move about the unit at will. The unit included both private and semiprivate rooms. A common area on the unit was used as the dining room as well as the area for planned unit activities. In the common area, there was an aquarium with tropical fish, a pair of caged budgies, and a variety of nontoxic houseplants. Incorporating plants and animal life in a long-term care setting is consistent with the Eden Alternative model of care designed to “deinstitutionalize” the nursing home environment (Thomas, 1994, 1996). A social model of care was emphasized in daily interactions between staff members and residents. Staff education and research utilization relevant to the care of persons with AD was emphasized. In addition, the staff had prior experience with research studies designed to measure responses of the residents to visitor dogs on the unit. Visiting animals, most of which were dogs, were frequently present on the unit.

Measurement Tools

The measurement tools used in the study included a demographic profile, a medication review form, and the NHBPS. The demographic profile collected information about participant age, gender, medications, and length of stay on the SCU. The medication review form was used to examine the medical record for information about the total number of mood- and behavior-altering medications, category of medication, dose, frequency, and whether the medication was prescribed as routine or as needed (PRN).

The NHBPS

The NHBPS was used to measure the level of problem behaviors. The NHBPS was developed to measure the specific disruptive behavior problems that occur in a nursing home setting and may result in use of antipsychotic drugs or physical restraints. The scale consists of 29 items. There are 6 subscales: uncooperative or aggressive behaviors, irrational or restless behaviors, sleep problems, annoying behaviors, inappropriate behaviors, and dangerous behaviors. The scale was designed to be completed by nurses and nursing assistants who are familiar with the resident. The rater is asked to report the frequency of each behavior in the past 3 days, using a 5-point frequency of occurrence scale (0 = *never* to 4 = *always*). The overall score is calculated as the sum of the individual items; larger scores indicate a greater level of behavioral problems. A 3- to 5-minute time frame per resident is needed to complete the scale. The scale interrater reliability was measured by the Pearson correlation coefficient, with interrater

correlations of approximately .8 (Ray et al., 1992). The instrument has high convergent validity; the correlation with the widely used Nurse Oriented Scale for Inpatient Evaluation (NOSIE) was $-.747$ and that with the Cohen Mansfield Agitation Inventory (CMAI) was $.911$ (Ray et al., 1992).

Therapy Dog

The therapy dog used for this study was a neutered male blue heeler. This adult dog was adopted by the participating facility from a local county humane society. The estimated age of the dog was 4 years. The dog was evaluated and professionally trained for a period of 3 weeks in basic obedience by a well-respected local trainer in the community where the facility was located. The dog was judged to have a docile personality and to be well mannered. The dog was currently immunized and verified to be in good health by a local veterinarian. Arrangements for the dog to live on the unit included identifying a staff member as well as a designated alternate who would assume primary responsibility for the dog, developing criteria to assure proper health maintenance activities for the dog, developing criteria as to when and where the dog could roam on the unit, and creating a living space for the dog adjacent to the unit. The dog had independent access to the enclosed outdoor courtyard from his living space. The dog was present on the unit from morning to evening with the exception of mealtimes, when he was confined to his living space adjacent to the unit. While on the SCU, the dog freely interacted with the residents in common areas of the SCU and spent time in individual resident rooms. It was not uncommon for the dog to accompany staff members as they assisted residents with activities of daily living.

Data Collection Procedure

One investigator reviewed and transcribed entries from resident records pertaining to the NHBPS, administration of mood-altering drugs, and selected demographic information onto a data collection sheet. The primary care staff nurse completed the NHBPS for each resident on the day (7 a.m. to 3 p.m.) and evening (3 p.m. to 11 p.m.) shifts 1 week prior to the introduction of the resident dog and weekly for 4 weeks following the placement of the dog on the unit. The recorded data represented frequency of occurrence of each behavior within the past 3 days. Data were recorded on Tuesday thus representing both weekend and weekday behavior patterns.

Data Analysis

To determine the effect of the introduction of a resident dog on problem behaviors of persons with AD who reside in an SCU AD unit, total scores on the NHBPS were analyzed using within-patients repeated-measures ANOVA. Descriptive statistics were used to identify changes in the frequency of use of mood-altering medications while the resident dog was present. A significance level of $p < .05$ was used for this study. Because of the small sample size, additional analyses by gender, age, and length of stay on the unit were not done.

RESULTS

Sample

The records of 22 residents (15 females and 7 males) were reviewed. Twenty residents were Caucasian, 1 was Hispanic and 1 was African American. Mean age was 83.7 years (range 68-96 years). Mean length of stay on the SCU was 2.9 years (range 0.6-8 years). All participants had a diagnosis of AD or a related disorder.

A two-way within-participants repeated-measures ANOVA was conducted to evaluate whether there was a change in behavior problem scores on the day and evening shifts over the 4-week period following the introduction of a resident dog. The dependent variable was the NHBPS total score, a measure of behavior problems. The two within-patients factors were the shift (time of day) with two levels (day and evening) and weeks with five levels (Week 1 through Week 5). Mauchly's Test of Sphericity for the interaction effect was found to be nonsignificant, $\chi^2(9) = 14.99, p > .05$, thus supporting the assumption of sphericity. The univariate tests of within-participants revealed a significant interaction between shift (time of day) and week, $F(4, 80) = 2.88, p < .05$. The univariate tests for the overall main effect of week were found to be nonsignificant, $F(4, 80) = 2.39, p > .05$. Post hoc tests were conducted and indicated a statistically significant effect, $F(1, 80) = 9.24, p < .01$, for shift (time of day). The results indicate that there was a sustained decrease over 4 weeks in behavioral problems during the day shift as compared to the evening shift. The results also indicate that overall the behavior problems were significantly less in the evening shift as compared to the day shift.

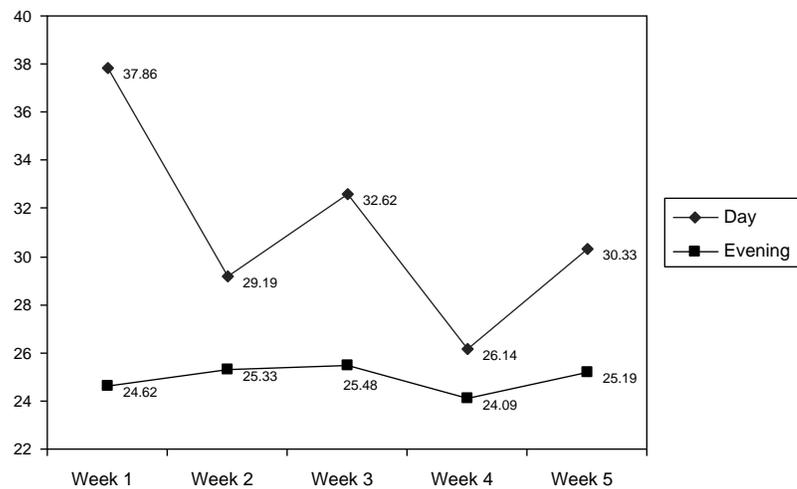


Figure 1: Mean behavior problem scales over time.

Subscales of the NHBPS

The data were also analyzed according to the 6 subscales of the NHBPS. The most frequent types of behavior problems exhibited by the participants were aggressive or uncooperative behaviors and irrational or restless behaviors. The least frequently identified behaviors were dangerous behaviors. Analysis of the subscale scores demonstrated a decrease in the mean score for each subscale of the NHBPS for the day shift. No substantial decrease in mean NHBPS subscale scores for the evening shift occurred.

Medication Use

The use of mood- and behavior-altering medications by the participating residents was reviewed. Five participants took no mood- or behavior-altering medications. Ten participants took at least one medication for mood- and behavior-altering indications, 5 participants took two medications, and 1 participant took three medications. One resident's record was not available for review of the medication history. The categories and the percentage of prescribed medications relevant to the study are as follows: antidepressants

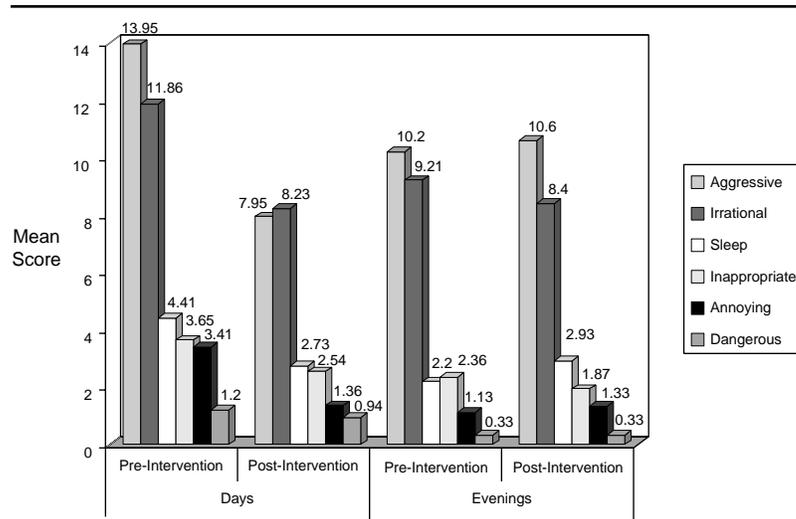


Figure 2: Mean behavior problem subscores.

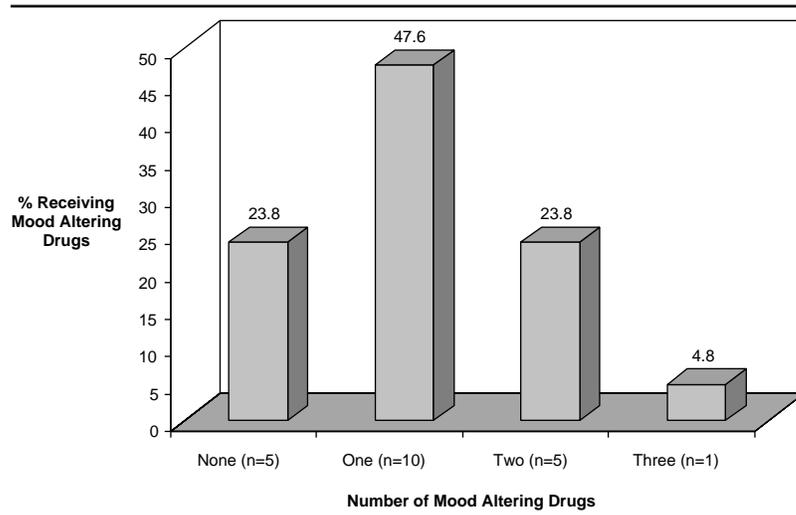


Figure 3: Total mood altering drugs prescribed

22.7%, antipsychotics 50%, benzodiazapines 9.1%, and anxiolytics 18.2%. These medications were prescribed for routine daily use; none was administered on a PRN basis. The dose and frequency of the scheduled medications remained constant throughout the study.

DISCUSSION

The presence of the resident dog decreased the occurrence of behavioral disturbances during daytime hours for the 1-month study period. There was a statistically significant decrease in the mean score of behavioral problems from Week 1 (pretest) to Week 2 (the 1st week after the introduction of the resident dog). There was a slight increase in behavior problem scores on the day shift the 3rd week of the study. Halloween festivities took place during this week and may account for the rise in behavioral problems. On Week 4 of the study, the behavioral problem scores fell again to a score even lower than the Week 2 mean score. Problem behaviors in Week 5 did, however, increase slightly but still remained less than the mean score of Week 2.

No significant differences in problem behavior scores were observed throughout the study on the evening shift. The lack of significant changes on the evening shift warrants further study. Staffing patterns, unit characteristics, or unit routines during the evening hours may have influenced how the residents responded to the dog in the evening.

Throughout the study, the mean behavioral scores for the evening shift were lower than the day shift scores. These findings are similar to the low level of behavior problems during the sundown period noted by Churchill et al. (1999). Churchill et al. suggested that soothing background music as well as use of mood- and behavior-altering drugs might have accounted for the low level of behavior problems observed in study participants. Another possible explanation of the low level of observed problem behaviors is the presence of additional visitors and less staff on the evening shift. Behavior problems may have been less evident to the staff. The presence of more visitors and fewer staff members may have modified the milieu of the SCU in a way that decreased behavior problems. On the evening shift, the actual time for observation of behavior problems is shortened because some residents retire to bed in the early evening hours. Early evening is typically when residents interact with family and friends. In addition, there are fewer transient people (lab, laundry, nutrition) on the unit during the evening shift. Although literature indicates that behavior problems increase during the sundown period, the low level of the problems observed in this study may

reflect the fact that staff members may already have interventions and strategies in place to help decrease the severity of the sundown syndrome.

This study extended the work of Batson et al. (1998) and Churchill et al. (1999). They examined the effects of the presence of a companion animal and found that the presence of the visiting companion dog had a calming effect on institutionalized residents with AD. Whereas those studies used a companion animal in planned brief interactions with residents, this study showed the effectiveness of the use of a dog that resided in the SCU. The behavioral disturbances associated with AD residents were decreased in number, and the changes were sustained for 1 month. No differences were noted in the administration of pharmacological agents to treat mood and behavioral problems. One of the characteristics of an SCU is the use of nonmedication intervention. It is not unusual to see less medication usage. Further studies are needed to explore the role of nonpharmacological interventions that may effect the use of pharmacological agents.

Limitations

The study was limited to one setting with a small sample size. Results of this study are limited to generalizability to persons with AD or related dementias that reside in the SCU who were a part of the study.

Implications

The main implication for practice is the potential value of the use of a resident dog as an adjunct to therapies designed to decrease the occurrence of problem behaviors displayed by persons with AD. Further research is needed to examine other contributions of companion animals to the health of persons with AD. Additional studies should focus on the optimal use of companion animals, such as how frequently the dog should “work” on the unit and what interactions with residents are more effective in decreasing behavior problems. Reducing the occurrence of behavioral problems will improve the quality of life of persons with AD or related dementia.

Findings indicate that a resident dog was effective in reducing the number of problem behaviors by AD residents for the daytime hours but not during the evening hours. No significant changes were noted in the usage of pharmacological agents to treat problem behaviors after the resident dog was introduced.

REFERENCES

- Alzheimer's Association. (1992). *Guidelines for dignity: Goals of specialized Alzheimer/dementia care in residential settings*. Chicago: Alzheimer's Disease and Related Disorders Association.
- Alzheimer's Association. (1998). *Alzheimer's disease statistics: Fact sheet*. Chicago: Author.
- Alzheimer's Disease and Related Disorders Association of Eastern Massachusetts. (1999). *How to evaluate an Alzheimer Special Care Unit*. Retrieved April 22, 1999, from <http://www.intergens.com/evalalz.html>
- Batson, K., McCabe, B. W., Baun, M. M., & Wilson, C. (1998). The effect of a therapy dog on socialization and physiological indicators of stress in persons diagnosed with Alzheimer's Disease. In C. C. Wilson & D. C. Turner (Eds.), *Companion animals in human health* (pp. 203-215). Thousand Oaks, CA: Sage.
- Baun, M. M., Bergstrom, N., Langston, N. F., & Thoma, L. (1984). Physiological effects of human/companion animal bonding. *Nursing Research*, 33, 126-129.
- Churchill, M., Safaoui, J., McCabe, B. W., & Baun, M. M. (1999). Using a therapy dog to alleviate the agitation and desocialization of people with Alzheimer's Disease. *Journal of Psychosocial Nursing and Mental Health Services*, 37, 16-22.
- Darrah, J. P. (1996). A pilot survey of animal-facilitated therapy in Southern California and South Dakota nursing homes. *Occupational Therapy International*, 3, 105-121.
- Fick, K. M. (1993). The influence of an animal on social interactions of nursing home residents in a group setting. *American Journal of Occupational Therapy*, 47, 529-534.
- Fine, A. (2000). *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. San Diego, CA: Academic Press.
- Fritz, C. L., Farver, T. B., Hart, L. A., & Kass, P. H. (1996). Companion animals and the psychological health of Alzheimer's patients' caregiver. *Psychological Reports*, 78, 467-481.
- Fritz, C. L., Farver, T. B., Kass, P. H., & Hart, L. A. (1995). Association with companion animals and the expression on noncognitive symptoms in Alzheimer's patients. *Journal of Nervous and Mental Disease*, 183, 459-463.
- Greenberg, M. (1996). Wide interest. The use of companion animals in human therapy. *Nursing News*, 20, 12-15.
- Keltner, N. L., & Folks, D. G. (1997). *Psychotropic drugs* (2nd ed.). St. Louis, MO: Mosby.
- Kongable, L. G., Buckwalter, K. C., & Stolley, J. M. (1989). The effects of pet therapy on the social behavior of institutionalized Alzheimer's clients. *Archives of Psychiatric Nursing*, 3, 191-198.
- Kongable, L. G., Stolley, J. M., & Buckwalter, K. C. (1990). Pet therapy for Alzheimer's patients: A survey. *Journal of Long Term Care Administration*, 17, 17-21.
- Kumar, V., Durai, N. B., & Jobe, T. (1998). Pharmacologic management of Alzheimer's Disease. *Clinical Geriatric Medicine*, 14, 129-146.
- Oetting, K., Baun, M., Bergstrom, N., & Langston, N. (1985). Petting a companion dog and autogenic relaxation effects on systolic and diastolic blood pressure, heart rate, and peripheral skin temperature. *Journal of the Delta Society*, 2, 72.
- Ray, W. A., Taylor, J. A., Lichenstein, M. J., & Meador, K. G. (1992). The Nursing Home Behavior Problem Scale. *Journal of Gerontology: Medical Sciences*, 47, M9-16.
- Sand, B. J., Yeaworth, R. C., & McCabe, B. W. (1992). Alzheimer's disease: Special care units in long-term care facilities. *Journal of Gerontological Nursing*, 18, 28-34.
- Sloane, P. D. (1998). Advances in the treatment of Alzheimer's disease. *American Family Physician*, 58, 1577-1589.

- Stoppe, G., Brandt, C. A., & Staedt, J. H. (1999). Behavioral problems associated with dementia: The role of newer antipsychotics. *Drugs and Aging, 14*, 41-54.
- Teresi, J. A. (2000). The therapeutic design of environments for people with dementia: Further reflections and recent findings from the National Institute on Aging Collaboration Studies of Dementia Special Care Units. *Gerontologist, 40*, 417-421.
- Thomas, W. H. (1994). *The Eden Alternative: Nature, hope, and nursing homes*. Sherburne, NY: Eden Alternative Foundation.
- Thomas, W. H. (1996). Life worth living—How someone you love can still enjoy life in a nursing home—The Eden Alternative. Acton, MA: VanderWyk & Burnham.
- Walsh, P. G., Mertin, P. G., Verlander, D. F., & Pollard, C. F. (1995). The effects of a "pet as therapy" dog on persons with dementia in a psychiatric ward. *Australian Occupational Therapy Journal, 42*, 161-166.
- Willis, D. (1997). Animal therapy. *Rehabilitation Nursing, 22*, 78-81.
- Zisselman, M., Rovner, B., Schmuely, Y., & Ferrie, P. (1996). A pet therapy intervention with geriatric psychiatry inpatients. *American Journal of Occupational Therapy, 50*, 47.