

New York State Department of Health Dementia Grants Program
2003-2005 Grant Funded Project

*Horticulture Therapy in Dementia Care Impact on Behavioral
Symptoms, Physical and Cognitive Activities*

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Project Title: Horticultural Therapy In Dementia Care
Impact On Behavioral Symptoms

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Names of all participating Nursing Homes: Elant At Goshen Inc.

Listing of all subcontractors: None

Section I:**Goals:**

The primary goal is to demonstrate through a replication project that horticultural therapy and related activities will achieve favorable behavioral outcomes for residents with Alzheimer's disease and other dementia related disorders. The primary question this project will address is; what is the impact of horticultural therapy on the resident's display of the progression of dementia specifically related to the symptoms of agitation?

Objectives:

Horticultural Therapy will have an impact upon the resident's by:

There will be a reduction in the frequency of the behavioral symptoms of agitation as measured by the Cohen Mansfield Agitation Inventory Instrument.

Research Hypothesis:

There will not be a reduction in the behavioral symptoms of agitation as measured by the Cohen-Mansfield Agitation Inventory Instrument.

Section II: Background and Rationale:

Elant at Goshen Inc., formerly known as The Arden Hill Life Care Center is a 120 bed skilled nursing center that is a 503 (c) not-for-profit corporation located 60 miles north of Manhattan in Goshen, New York. The mission statement is “to provide compassionate and high quality care to persons of diverse generations, cultures and needs with a special emphasis on the elderly and their lifestyles.” Our tagline is “the difference is in the lifestyle”. Elant at Goshen Inc. has been the recipient of five Best Practice awards by the New York State Department of Health and the Hunter/Mt. Sinai Geriatric Center. The awards spotlight creative and innovative approaches to resident care practice and services. The National Alzheimer’s Association has also recognized the facility, for it’s residential environment design. We are not an institution; we are a gracious and loving home.

In our continuing quest to fulfill our mission we applied for a Dementia Grant from the NYS Department of Health planning to replicate behavioral symptom projects completed in other long term care environments that will demonstrate the positive impact/outcomes of horticultural therapy on the lifestyle of residents with Alzheimer’s and other dementia related disorders. In order to achieve this goal we proposed to use grant monies to develop a horticultural therapy program for our residents led by a horticultural therapist and to construct a greenhouse that will provide healing/therapeutic year round gardening opportunities for our residents with dementia to enjoy.

At Elant at Goshen we know that a significant number of our residents and or family members identify gardening as one of favorite pastimes. Families further confirm that the residents have gardened throughout their lives, especially the women. Revisiting this activity may stimulate memories and encourage old familiar skills. Channeling energy into gardening will reduce agitation.

There is a need for replication studies in the area of horticultural therapy. A review of the literature has shown promise but because of the characteristics of this often-frail population, many do not complete the project time period. More research is needed to validate the positive impact on behavioral outcomes related to agitation behaviors of the residents who participate in this therapy.

The primary team members involved in this project included, a horticultural therapist, the R.N. Nurse manager on the unit where many of the Alzheimer’s/dementia residents are located, a Vice President for Clinical Affairs to complete documentation requirements, the Director of Nursing, and a consultant to assist with stastical design and evaluation.

Section III: Methods:

Study Design:

A sample of fifty-three residents was selected with a primary diagnosis of Alzheimer's disease and or other dementia-related disorders (see diagnosis codes) and who displayed symptoms of agitation as described in the Cohen-Mansfield Agitation Inventory (short form) tool. Baseline assessments were made beginning on March 1, 2004. Baseline assessments were completed before the initiation of horticultural therapy for a period of three months. Horticulture therapy was initiated under the direction of a newly hired Horticultural Therapist on 7/6/04. Weekly assessments were completed using the Cohen-Mansfield Agitation Inventory Instrument.

Sample:

A sample of fifty-three residents (total number of residents residing in facility) who met the criteria of diagnosis and symptoms were selected for this replication study. At the conclusion of the study time period there were forty-two residents remaining from the original group. One resident moved to another state, the remaining residents expired before the end of the study time period (78 weeks). The "n" for residents who were included in the final sample weeks used for analysis that had data for both pre and post therapy was n=43.

Data Collection: (variables)

The Cohen Mansfield Agitation Inventory tool includes fourteen behaviors. Weekly assessments were completed for these behaviors for a period of 78 weeks. Included for each behavior are five frequencies. In order to accommodate the data set size limits for the Statistical Program for the Social Sciences (SPSS) software analysis program the behaviors the fourteen behaviors exhibited by the residents were condensed into three main categories in keeping with recommendations included with the Cohen-Mansfield instrument and our consultant David Rule PhD. This modification will maintain the validity and reliability of information collected for this study. The categories are as follows:

Physically Aggressive Behaviors: (PA)

Hitting, kicking, punching, biting, scratching, aggressive spitting
Grabbing onto people, throwing things or destroying property
Intentional falling, making verbal or physical sexual advances, eating/drinking/chewing inappropriate substances, hurting self or others

Physical Non-aggressive Behaviors: (NPA)

Pacing, aimless wandering, trying to get to a different place
General restlessness, performing repetitious mannerisms, tapping, strange movements
Inappropriate dress or disrobing
Handling things inappropriately
Hiding, hoarding things

Verbal Behaviors: (V)

Cursing
Constant requests for attention or help
Repetitive sentencing, calls, questions or words
Complaining, negativism, refusal to follow directions
Strange noises (weird laughter or crying)
Screaming

To address the frequency reported for each behavioral category we decided to use the guidelines established by CMS for the completion of frequency for the MDS assessment tool. The frequency assigned would be to report the highest frequency number that occurred within the category of behaviors for the time period being assessed.

The frequency categories/code numbers are as follows:

1. Never
2. < 1x/week
3. 1-2 x/week
4. 1-2 x/day
5. 1-2 x/hour or continuous

Other data points collected for each resident included:

Sex: Male (M) and Female (F)

Age as follows: (three categories)

Code # 1 = adult (50-64 years),
Code # 2 = Adult 2 (65-79 years)
Code # 3 = Geriatric (80 plus years).

Drug Class: (code & name)

1 = No Psychotropic medications
2 = Antidepressants
3 = Hypnotics
4 = Psychotropic
5 = Antidepressants + Psychotropics
6 = Hypnotics + Psychotropics
7 = Antidepressants + Hypnotics

Diagnosis: (code # & name)

- 1 = Alzheimer's,
- 2 = dementia other than Alzheimer's,
- 3 = Depression,
- 4 = Anxiety Disorder,
- 5 = Manic Depressive (Bipolar Disorder),
- 6 = Schizophrenia
- 7 = No Psychiatric Diagnosis

Absence Codes:

- Sick
- Hospital
- Leave of Absence
- Expired
- Removed from study
- Greenhouse unavailable
- Horticulture Therapist unavailable

Quantitative/Qualitative Methods:

A quantitative method was used to report resident assessments completed. The Cohen-Mansfield Agitation Tool (short form) uses a number value for each behavior (14 total) and for each of the five frequencies that the behavior is manifested.

This quantitative method (number) is then used to complete statistical analysis that is then translated into outcomes

Data Analysis:

The Stastical Package for the Social Sciences (SPSS) is the software program used for the data analysis. David Rule PhD, currently President at Muskegon Community College in Muskegon, Michigan is the individual who provided the software and consultation for results.

Conclusions:

The methods chosen to complete this study have proven to be overall successful in terms of the replication study results. We did experience a variety unanticipated computer related issues. The first challenge we faced was related to software limitations when using the SPSS program on a personal computer. We were unsuccessful in locating a large "mainframe" computer to run the program. The primary problem was that the size of the data set collected in terms of the number of columns containing the variables was

too large. This ultimately required the team to identify a method that would not impact upon the validity or reliability of the information collected and the outcome of the study. After consultation with Dr Rule, our consultant statistician and Philip McCallion from SUNY Albany, it was agreed to decrease the amount or size of the data by condensing the fourteen behaviors into three categories.

It was also necessary to identify a method to decrease the amount of frequency data collected each week for each participant. We had to determine how to select one frequency for each week that would best represent the resident status. We were able to use the instructions given by CMS for recording the MDS resident assessment frequency as our reference for this task. The MDS instrument instructs the assessor to use the data frequency that was the most frequent as the one final data for the instrument. This was adopted for use when assessing the frequency code for the behaviors observed.

We also had difficulty with reference to the transfer of information from the data base program used to hold assessment data collected and the transfer to the Statistical Package for the Social Sciences (SPSS). A variety of problems occurred including difficulty of “columns shifting” when data was transferred from the database to SPSS. This presented a challenge to the technician who had developed the database to make the necessary revisions. This also caused a delay for running the program to obtain results.

The data was ultimately able to be run through the SPSS software and Dr Rule was able to provide us with tables to use to determine if the positive behavior changes we had anecdotally observed would ultimately be reflected in behavior outcomes to replicate the positive impact of horticultural therapy on residents agitated behaviors.

Section IV: Results including description of analyses and reporting of relevant statistics (see tables attached)

1. Demographic Information for participants included in study: (see Tables “Demographics”)

Age: The age breakdown for participants is as follows:

Age 50-64years. - four participants totaling 8%
Age 65-79 years - eight participants totaling 16%
Age 80 years plus – thirty-eight participants 76%
Mean = 87.4 years (see table “Ageval”)
Median = 87.0
Mode = 85.0
Standard Deviation = 7.8

Gender:

Female – forty-two persons 84%
Male – eight persons 16%

Diagnosis: (Dementia)

Alzheimer’s Disease: three persons representing 6%
Dementia Other than Alzheimer’s: forty persons representing 80%
Depression: two persons representing 2%
No Psychiatric Diagnosis: five persons representing 10%

Drug Class:

No psychotropic medications (code 1)– twenty-three persons
Antidepressants (code 2) – five persons
Psychotropics (code 4) – thirteen persons
Anti-depressants and Psychotropics (code 5) – eight persons
Hypnotics and Psychotropics (code6) – one person

2. Analysis for Impact of Horticultural Therapy upon Behaviors:

The completed replication study was able to successfully demonstrate through the use of a “1-tailed test” the statistical significance for the reduction of agitation behaviors for residents with dementia whose behavior type and frequency were assessed both pre and post the initiation horticultural therapy. This data supported the direction of our hypothesis, specifically, that we had predicted the behavior outcome that treatment would

reduce the levels of agitation. In other words the post-treatment behaviors would be lower than the pre-treatment.

The specific behaviors that were classified as non-physical agitation (NPA) and physical agitation (PA) were those that decreased over the time period studied. The results were statistically significant for both of these behaviors. For NPA, the “t” value was 2.55 and for PA behaviors the “t” value was 2.7. For NPA, the difference between the pre-treatment (weeks 10 through weeks 22 combined) mean is 26.46 and post treatment (weeks 23 through 35 combined) mean is 19.2 with a “t” statistic = 2.56, with 40 degrees of freedom probability = .014. That represents a less than 14 in 1000 probability of this behavior change occurring due to chance. This is highly statistically significant demonstrating the large impact of treatment on this type of behavior. The results were similar for the Physically Aggressive behaviors (PA). The PA behavior pre-treatment mean is 16.8 and the post-treatment mean is 14.5 with a standard deviation of 9 and 5.6 respectfully. See tables for NPA and PA.

The results were not statistically significant for the agitation behaviors classified as verbal agitation (V) $t = .270$. The pre-treatment mean of 27 is very similar to the post treatment mean of 26.6, with standard deviation for pre-treatment at 17.8 and post treatment at 18.5. The difference between the pre and post treatment standard deviation and mean values are very small. The data for the verbal behaviors demonstrates a higher probability that change may account for the change. For this reason, we are not able to demonstrate with these results that the verbal agitation behavior is decreased directly related to the intervention of therapy. See tables for V.

In order for Dr Rule our statistical consultant to have a sufficient number of individuals to make the analysis meaningful he used data for weeks ten through twenty-two for the pre-treatment data (13 weeks) and weeks twenty-three through thirty-five for the post-treatment data (13 weeks). This had to be done because when using the software the “Statistical Package for the Social Sciences” (SPSS) there cannot be any missing data points for each individual person for the time period.

This concludes a summary of the relevant statistics to support this replication study. The team is pleased to have obtained valid data to support the success we have observed and anecdotally experienced at Elant at Goshen. (refer to Section V).

Section V: Strengths and Limitations including barriers encountered and how they were overcome

The Horticultural Therapy Program under the primary direction of the Horticultural Therapist has truly been a positive experience for the residents, their family and for the staff at the Elant at Goshen facility. The program has added “new life” to the environment. The horticultural therapy program has had so many positive outcomes that we have already successfully replicated the program at another one of our Elant skilled nursing facilities where the program has also been well received by all.

The team was initially challenged by the time delay in building the greenhouse (the foundation for the greenhouse was not able to be poured until 7/21/04) however, this barrier was turned into strength when we decided to initiate the program and study using mobile garden carts that were purchased. The Therapist we had hired was able to use the carts to go to the unit where the dementia residents lived and begin group and 1:1 programs as appropriate. Programs were also held throughout the facility leading increased interest for all. The progress in the plants growing became a topic of conversation for all, especially providing a new focus for conversation and stimulation of the senses of our residents with dementia.

Horticultural therapy was held daily with residents enjoying therapy several times each week. The residents, their families and employees all enjoyed monitoring the progress of the greenhouse construction. The resident began with planting herbs, flowers and vegetable using the carts and soon the facility both inside and out was decorated with many more green and flowering plants. Sensory and tactile stimulation was an important part of the planned therapy. Sample activities included making Halloween dish gardens, pressing fresh flowers that they had grown, using flowers to make bookmarks that were then given out at the ribbon cutting ceremony for the greenhouse, making bird baths out of clay pots, making greeting cards using pressed and dried flowers, enjoying peaches and making jam as well as many apple products with the onset of fall. On weather appropriate days the residents were taken to the courtyard to enjoy the sound of the water fountain and the many other sights and sounds of nature. The anecdotal reports for the resident response during therapy have been impressive for many individuals from the beginning.

The greenhouse construction was completed and the official ribbon cutting ceremony was held on October 20, 2004. One of the residents included in the dementia study assisted with cutting the ribbon to officially open the greenhouse. Local village officials who assisted with achieving site approval, residents, family members, employees and other guests, participated in the event. This event brought many community members to our facility. It was beneficial for the community to see our new therapy program as a positive aspect of the long-term care environment.

Invited to the official opening of the greenhouse were members of Administration from the local Orange-Ulster BOCES. This BOCES program has a horticultural program however; it did not have a clinical component. The Elant at Goshen team held a meeting

with the appropriate BOCES representatives to discuss including a clinical component in the curriculum using our site. The BOCES officials were pleased and now had added this component to their program. Initially it began with student observations in the spring semester 2005. A clinical rotation for the horticulture students was added as a rotation in the fall 2005 semester. The Elant organization is very involved with providing training for local students both at the high schools and college level. This addition was truly an example of a “win-win” experience for both Elant at Goshen and Orange-Ulster BOCES. We are pleased to be able to add this new clinical dimension to the horticulture student’s experience.

It became clear that horticultural therapy had become the highlight for many residents each day. Activities held in the last quarter of 2004 included sensory stimulation for the fall including apple cider candles, making and eating apple pies, drying apples and enjoying apple spice potpourri, caring for thanksgiving cactus and enjoying the blossoms, enjoying fall foliage projects and making birdfeeders out of bagels, peanut butter and birdseed that were hung in the courtyard where residents could later enjoy watching the birds feeding. Taking cuttings from summer plants and repotting for the spring to be cared for in the greenhouse during the winter months. Residents also enjoyed decorating pumpkins that were displayed in the facility, making homemade Christmas cards using stamps, enjoying the scent and touch of Christmas evergreens and trees. One of the highlights of the last quarter of 2004 was the bazaar held when residents were able to sell the plants and dish garden they had grown and cared for. They also sold gift cards they had made by pasting dried flowers they had grown. A calendar was made for 2005 using a picture each month of something the residents had done in their horticulture program. The money obtained from the bazaar and calendar sales were used to purchase plants and other supplies used in the program.

In the first quarter of 2005 several members of the Elant at Goshen team participated in the Dementia Grant Roundtable program and presented a summary of our progress to date. The team had made a scrapbook to illustrate the progress of the horticultural therapy initiative and enjoyed sharing this along with examples of items created by the residents. This scrapbook will also be used as evidence to support the facilities activities as part of our Edenizing process. In March 2005 the grant funding for the position of the full time Horticulture Therapist had ended. The Elant at Goshen facility has hired this person as a permanent full time employee.

There was some lessons learned from this program that we were able to include when we replicated the program at the Elant at Newburgh nursing home. An initial limitation was that we had originally envisioned the program as a group activity. We quickly learned that because of the behaviors of this resident population we needed to be very flexible adding 1:1 therapy and modifying the mix of residents in groups. We also learned that we truly needed to “expect the unexpected” with the residents in the program. There was an opportunity for some of these residents to act as a “buddy” with other residents or demonstrate new behaviors when engaging in therapy activities. It is exciting for all involved to see the changes in their behavior, demonstrating new or perhaps old patterns of behavior and interest re-emerge.

Section VI: Conclusions:

What is the answer to the result question? Does the data support the hypothesis? What should happen next (including specific plans for dissemination)

The positive results have been anecdotally demonstrated throughout this grant time period to the Elant at Goshen “family” that includes residents, employees and resident family members and friends. It is especially exciting to see the statistical results demonstrating a positive impact on the agitation behaviors of those residents suffering from dementia. Section IV of this report describes the data analysis that supports our hypothesis. The computer issues we faced have also been challenging. There is now the opportunity to expand the review of the data further now that we have resolved the major issues. It is unclear to the team without further examination why there was “missing data” in the SPSS program that restricted the number of weeks we were able to use in our analysis. The team plans to re-examine the assessment data paperwork and if there is not “missing elements” we plan to go back to the database technician to identify if there is a correction that can be made.

This replication study has been an important part of our practice for many years. We are interested in sharing our results, the lessons learned and the many positive anecdotal benefits of horticultural therapy. The Elant at Goshen facility is one of four skilled nursing facilities in our not-for-profit corporation. At Elant we are convinced that this program is an integral part of the quality care we provide. The impact has been too promising to not include this in all of our facilities.

The team plans to participate in the education programs sponsored by the Dementia Grants Program throughout the state to disseminate the success of our program and share with our colleagues in long term care how to successfully replicate this program. Our experience replicating the program already makes this important to share. We also plan to submit for publication our projects success in one of the magazines and/or journals read by our colleagues. Dr. David Rule our consultant has also agreed to assist us with this endeavor.

This experience has also taught the team the challenges in participating in a study with a frail population of residents. Our residents surprised us with their response to this therapy demonstrating involvement beyond our dreams. The many mysteries of dementia may become known through this type of therapy. Horticultural therapy has for some, permitted some behaviors to re-emerge if only for brief periods of time. The value of this is immeasurable to all whose lives are touched by these residents.