Village Christian Parke Retirement Home
Designing Outdoor Spaces for Those Affected With Alzheimer's Disease

Comprehensive Design Project
by
Frances E. Barth
The Little Boy and the Old Man

Said the little boy, “Sometimes I drop my spoon.”
Said the little old man, “I do that too.”
The little boy whispered, “I wet my pants.”
“I do that too,” laughed the little old man.
Said the little boy, “I often cry.”
The old man nodded, “So do I.”
“But worst of all,” said the boy, “it seems
Grown-ups don’t pay attention to me.”
And he felt the warmth of a wrinkled old hand.
“I know what you mean,” said the little old man.

Shel Silverstein

from: *A Light in the Attic*
Village Christian Park Retirement Home of Zionsville, Indiana

Designing Outdoor Spaces for Those Affected With Alzheimer's Disease.

Comprehensive Design Project
LA 404

by
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College of Architecture and Planning
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Dedication

To Christopher Barth, whose advice and friendship I count on daily, and whose support, tolerance and much needed humor are tested frequently. You have given me the inspiration to be my own person and be the best that I can be.

“A faithful friend is a sure shelter. Whoever has found one has found a rare treasure.”

- Ecclesiasticus 6:14

To my mom and dad. Thank you for a lifetime of love, patience, prayers, loyal support and continuing encouragement. The sacrifices have not gone unnoticed and are forever appreciated.

To all of my fellow classmates and professors for their inspiration and friendship.

To all those individuals whose lives have been affected by Alzheimer’s disease and remind us to live each day to the fullest!

Finally, thanks to the Lord! You continue to amaze me!
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Abstract Statement

This project explores the design of outdoor spaces tailored specifically for those individuals with Alzheimer's disease and attempts to create design guidelines and design solutions for facilities that treat Alzheimer's patients. One of the key issues addressed is that of stage-specific design and how horticultural ideas and activities can be equated to a person's physical and mental ability at each of three stages of the disease.

The goal of this project was to design three outdoor gardens that represent each stage of the disease on the grounds of the Village Christian Retirement Home in Zionsville, Indiana. The site has not been developed for outdoor use.
SECTION 1.- INTRODUCTION
Introduction

Since the beginning of civilization the landscape setting has been known to have a restorative effect on people. However, research on the topic has only recently received much attention as part of the search for alternative forms of treatment. While it is known that nature plays a vital role in healing the spiritual, emotional and physical well-being of human beings, it is still being questioned as to whether the landscape has that same kind of value to those affected with Alzheimer’s disease.

It is the intent of this project to explore the effectiveness of the therapeutic environment on the individual with Alzheimer's disease and how the environment contributes to overall quality of life for the patient, visitor and staff, as well as create design guidelines and design solutions that respond to each stage of the disease.
SECTION II.- PROBLEM STATEMENT
Problem Statement

**Topic Area**
Designing outdoor spaces for those affected with Alzheimer's Disease.

**Problem Definition**
"Alzheimer's disease is a progressive, irreversible brain disease that affects approximately 5 million Americans today. Currently there is no known prevention or cure" (Beckwith 46). There are however, new methods of therapy that are being sought to bring comfort and support to the patient and the families affected by this disease. Horticultural therapy is one of the most dynamic and progressive of these methods. Horticultural therapy uses plants and plant related activities as a medium to enhance the physical, social, and emotional well-being of people. Therapeutic landscapes are meant to stimulate the senses, the body, and the mind and to encourage imagination and exploration (figure 1).
This experience can be much more significant when we understand the design issues that are critical to the Alzheimer population. Helping patients heal through contact with nature can only be effective if we as designers:

1. Understand how to emphasize elements of the landscape and nature to make it function in a therapeutic manner;
2. Understand the different needs and characteristics of the patient through each stage of the disease;
3. Understand the needs and concerns of the families, administration and staff.

The real question then becomes: Understanding the specific deterioration process of Alzheimer's disease, how can we as designers create landscapes tailored to those symptoms as well as incorporate horticultural activities as a new method of therapy?

In recent years there has been improvement in the design of nursing homes that reflect the needs of its users. Unfortunately this has rarely gone beyond the building. The landscape has received inadequate attention other than what has been done as embellishment, and serves no function other than to provide a pleasant entry to the facility. We have an opportunity to reverse this trend and provide natural areas that serve a function
for the patients and staff of the facility. To improve this situation there needs to be an ongoing dialogue between healthcare providers, horticultural therapists, and landscape architects so that a space can be designed to function at its maximum potential.

While there are universal design guidelines for all patient groups (safety and security, wayfinding, non-toxic plants, ability to carry out ADL's -activities of daily living- etc.) additional guidelines should be tailored to the particular disease at hand. By communicating with other professions, we can begin to create design principles unique to the needs of that particular patient population and thus create better garden settings.
SECTION III.- IMPORTANCE OF THE STUDY
Importance of the Study

Healthcare design is becoming increasingly important in today's society for several reasons. First, there has been a rapid increase in the elderly population. It is predicted that in the next several decades there will be an increase in the number of people who live into their eighties and nineties. With this increased life expectancy there is the frightening estimate that the number of people with dementia will reach significant proportions. As a result, we will not only need to "determine how this large number of elderly persons will be cared for, but also how they will be given the opportunity to live with dignity and grace even though they may be physically or cognitively impaired" (Coons, 114).

Second, there is the general idea "that if a person can no longer do something they must learn to do without. Old age and Alzheimer's disease becomes their prison and every year brings declining abilities and fewer joys" (Stoneham 1). Sadly, the outdoor environment for Alzheimer patients is seen as a place that has gradually become more difficult to use and enjoy. Unfortunately, society has not considered how a garden could continue to give pleasure to these individuals through modifications that respond to their needs.

With people living longer, it is my goal to ensure that those extra years are worth living. It is the intent of this project to improve both the quality of care and the quality of life by designing outdoor environments that respond to the needs of the patients as well as the staff (figure 2).
SECTION IV.- REVIEW OF THE RELATED LITERATURE
Review of the Related Literature

What is Alzheimer’s Disease?

Alzheimer’s disease is a degenerative disorder that attacks the brain. It generally begins in the later years of life and is first recognized by forgetfulness and confusion. As the disease progresses, cognitive functions such as language, speech, memory, judgment and emotions are affected and eventually result in the complete loss of mental function. This is accompanied by a gradual loss of a person’s physical functions, such as walking, standing or sitting and ultimately leads to the inability to care for one’s self. There has been no clear cause of what triggers the onset of Alzheimer’s disease. “Genetic and environmental influences have been suggested and studied” says Carly Hellen, “but no definite conclusions have been made” (Hellen ix).

Alzheimer’s disease has become progressively more common and currently affects over 5 million Americans age 65 and older. This figure is only going to rise with the aged population in the U.S. expected to double in the next 20 to 30 years. Alzheimer’s disease is generally uncommon before the age of 65. However, studies have shown that as age increases so does the chance of getting Alzheimer’s disease (Khachaturian 54). The majority of persons with Alzheimer’s disease are women because women, on average, tend to live longer than men and the occurrence of the disease is strongly related to age.

Behavioral Regression

The progression of Alzheimer’s disease often triggers a number of bizarre changes in behavior. Many of these behaviors are seen as “negative” or “problem” behaviors. The behaviors of the patient are, however, a means of communicating feelings and needs, and not an act of aggression and anger. The continuing disintegration of the cognitive functions results in a steady decrease in the control of their behavior. “The patient reverts more and more to behavioral patterns developed earlier as a child, but which are no longer adequate for an adult” (Souren 59). Many specialists refer to it as a reverse form of child development. As memory, thought, judgment, and insight continue to gradually develop throughout child development, they are lost in the reverse order in which they were acquired during Alzheimer’s disease. “Alzheimer patients gradually
regress to the intellectual level of a young child” (Souren 59). The early stage of Alzheimer's disease corresponds to the functional level of a 14 year old. It is at this age that children are gaining their independence and autonomy, exploring their surroundings, and seeking control of their lives. This is the goal for patients in the early stage of the disease. The moderate stage of Alzheimer's disease corresponds to the functional level of an 8-13 year old child. It is at this age where children are in the transition from dependence and independence from their parents. They are finding their own identity and trying things on their own, but still rely heavily on adult supervision. This is the goal for patients in the moderate stage of the disease. Finally the late stage of Alzheimer's disease corresponds to the functional level of an infant to a 7 year old. At this point children rely on their parents for everything. Safety and security are their biggest needs, and these are the goals for patients in this stage of the disease.

*Stages of the Disease*

“Alzheimer's disease is a progressive disorder with an average duration of 9 years (range 1-16 years) from symptom onset to death” (Kovach 6). This model is a general guide for classifying behaviors and symptoms and it should be known that Alzheimer victims will vary in their symptoms and behavior. The rate of deterioration for each patient is not absolute. Patients may not deteriorate at the same rate, nor go through each stage of the disease.

Several health care professionals have classified the stages of Alzheimer's disease in a variety of ways. One of these classifications divides the disease into three stages: early, moderate and late. This is a broad description of the course of Alzheimer's disease and must be looked at as a basic guideline and not a rule. In general, stage one primarily deals with impaired memory, stage two, gross deficits with other cognitive fields, and stage three, with intellectual and physical deterioration.

The following is a summary of the three stages of the disease and their symptoms. To help organize the symptoms six major areas of deterioration throughout the course of Alzheimer's disease have been identified. A list of possible symptoms have been appropriately placed under each major area of deterioration.
Stage 1 - Early - Supervision and Stimulation

Main Symptoms: Short term memory, confusion, loss of initiative; Withdrawal, isolation, depression, anger
Main Goals: Decrease stress and loneliness; Increase self esteem; Maximize the patients remaining physical, mental, and social skills
Duration: Approximately one to three years
Intellectual and Emotional Level of fourteen year old

Memory
- Short term memory is the most impaired
- Forgets the name and use of common items
- Unable to remember how common objects fit together
- Has sketchy recall of current events
- Confuses the chronology of life history

Concentration and Attentiveness
- Attention span is about 30 minutes to one hour
- Can function independently, but needs to be reminded what to do
- Has noticeable difficulty learning new tasks
- Poor judgment- cannot manage finances; driving becomes too difficult
- Can follow 2 or 3 step processes that lead to goal completion
- Works best in small group activities

Time and Place Orientation
- Shows consistent confusion of time and place
- Often forgets the day or month
- Often gets lost or forgets where they are
Speech and Language:
- In conversation, language may appear to be normal
- Difficulty remembering words, names, and functions of objects
- Speech is slower, with frequent pauses
- Vocabulary is reduced

Motor Skills and Coordination
- Routine tasks such as walking, dressing, bathing and eating become more difficult
- Familiar hobbies become more difficult to complete, or are poorly done
- Increased possibility of falls

Mood and Personality Changes
- Fairly normal external appearance
- Avoids challenging situations
- Withdrawal or depression
- Loses interest in once loved activities
- Feels like their losing control of their life
- They still have some idea of the nature of their condition, but are not able to cope with the complexity of their situation.
- Tendency to wander off
- Does not want to be told what to do
Stage 2 - Moderate Guidance and Intervention

Main Symptoms: All cognitive abilities decrease such as memory loss, attention span, language; constant wandering

Main Goals: Give the patients a sense of freedom and autonomy, yet at the same time a sense of safety and security; Provide visual cues in the environment to help navigate and assist the patients in optimal daily functioning.

Duration: Approximately two to five years

Intellectual and Emotional Level of an eight to thirteen year old

Memory
• Increased memory deficit
• Unable to recall own address, telephone number or names of close family members
• Major past events are not remembered

Concentration and Attentiveness
• Attention span is about 15 minutes
• Severe loss of judgment - refuses to bathe, eat or go to the bathroom saying that they have already done so
• Rational thinking is decreased

Time and Place Orientation
• Disorientation is more advanced
• Increased confusion to person, place, time, and weather
• Gets lost when going to familiar places
Speech and Language
- Ability to understand written and spoken language continues to deteriorate
- More difficulty in finding words, finishing thoughts or following directions
- Conversations are confusing and make little sense
- Difficulty getting “to the point”
- Instructions must be repeated often
- Persistence in pursuing one idea or thought...i.e. thinking that it is time to eat after they have just finished eating

Motor Skills and Coordination
- Cannot survive without assistance
- Walks slowly with small, careful steps, however, bumps into things and falls easily
- Still possesses a great deal of energy. Releases it by pacing or wandering constantly.
- Perceptual dysfunction's such as lack of depth perception
- Needs to be physically active but doesn’t know what to do
- Limited range of motion

Mood and Personality Changes
- Paces, wanders and compulsively touches things, often agitated and restless
- Frequent repetitive behaviors
- Delusions, hallucinations, paranoia (people are stealing their things)
- Apathetic personality- they have no insight into their condition and are not bothered by their relatives’ distress over it
- Sundown Syndrome (see appendix for definition)
- Lack of initiative and self neglect
- Significant impairment of other cognitive abilities
  - Anomia- difficulty if finding the correct words for objects
  - Agnosia- inability to recognize various objects
  - Apraxia- inability to carry out purposeful movements and actions
  - Aphasia- inability to comprehend what one hears
Stage 3 - Late Takeover

Main Symptoms: Physical functions decrease - walking, standing, sitting; Total shutdown of body functions that may result in complete immobility; Live in immediate present and are only aware of sensory stimuli

Main Goals: Provide patient with a feeling of dignity, peace, safety and security; Improve environmental awareness through enhanced sensory stimulation

Duration: Approximately 8 to 12 years

Intellectual and Emotional Level of a one to seven year old

Memory
• Very poor memory - unaware of all recent events, but usually retains some knowledge of his or her past
• Can often distinguish familiar and unfamiliar faces
• Can almost always recall his or her own name

Concentration and Attentiveness
• Attention span of 5 minutes - to gain attention touch is required
• Extremely poor performance on new tasks
• Forgets what they were asked to do before completing the task
• Unable to respond for safety, i.e. dresses inappropriately for the weather, wears shoes on the wrong feet; scalds skin in showers because water is too hot

Time and Place Orientation
• Unaware of surroundings, the year, the season
• Cannot distinguish night from day
• When indoors, has no concept of the outside
Speech and Language
- Ability to communicate is severely impaired
- Repeats words or phrases continuously
- Tendency to lapse into an unintelligible mumble
- Gradually the person loses the ability to speak entirely
- Severely impaired comprehension

Motor Skills and Coordination
- Needs constant supervision
- Needs help toileting, eating, getting dressed
- Spends most of the time sitting in a chair or lying in bed
- Muscle joints become rigid
- Mobility becomes unsteady, falls frequently occur; may become completely immobile
- “Although words may not be understood, they can communicate feelings through expression, touch and body language” (Hellen 143)

Mood and Personality Changes
- Lives in the immediate present and is only aware of sensory stimuli
- Obsessive symptoms continue: continually touches things; washes hands repeatedly
- Bowl and bladder continence are present
- Has a flattened affect- emotion and personality disappear
- Anxiety and agitation increase
- “Too much extreme stimuli causes catastrophic emotional reactions” (Ebel 5)
- Lapses into a coma prior to death
The Normal Aging Process

This project is dealing strictly with those individuals with Alzheimer's disease. However, in the nursing home environment the outdoor spaces may be used by others within the facility. It is important that the general conditions that elderly and frail people suffer from are reviewed and taken into consideration. Not only may a person be suffering from Alzheimer's disease, they may also be suffering from conditions associated with the normal aging process. The following is a list of common factors that may be a result of the normal aging process. This information is taken from Jane Stoneham's book, Landscape Design for Elderly and Disabled People.

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<th>Implications For Design</th>
<th>Design Solutions</th>
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<tr>
<td>Sensory Loss</td>
<td>Reduced Sensory perception</td>
<td>Safe materials, plant selection for texture, scent, color and safety.</td>
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<td>Hearing, Sight</td>
<td></td>
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<tr>
<td>Neurological Conditions</td>
<td>Reduced mobility, loss of strength &amp; stamina, loss of balance, reduced agility.</td>
<td>Unimpeaded access, secure, non-slip surfaces, hand rails, raised beds, frequent resting points, choice of Route lengths, features of interest Near building.</td>
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<td>Stroke. Parkinson's disease.</td>
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<td>Motor neuron disease. Tremor.</td>
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<td>Reduction in intellectual, motor functions, e.g. Alzheimer’s disease &amp; other dementia’s.</td>
<td>Altered mobility, reduced sensory perception, danger of wandering.</td>
<td>Unimpeaded access, interest near building, use of courtyards, non-hazardous materials &amp; plants, no sudden changes to familiar surroundings (e.g. path layout).</td>
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<tr>
<td>Respiratory Conditions Bronchitis, emphysema &amp; asthma. Breathlessness</td>
<td>Limited mobility, tiring easily, loss of strength &amp; stamina.</td>
<td>Unimpeaded access, choice of route lengths, frequent resting points, raised beds, features of interest near building.</td>
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<tr>
<td>Condition</td>
<td>Description</td>
<td>Accommodation Features</td>
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<td>Hypertension</td>
<td>Dizziness from changes in posture.</td>
<td>Raised beds for gardening/plants.</td>
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<td><strong>Cardiovascular Conditions</strong></td>
<td><strong>Peripheral vascular disease.</strong></td>
<td><strong>Unimpeded access, raised planters,</strong></td>
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<td><strong>Angina.</strong></td>
<td><strong>Limited mobility, tiring easily, loss of strength &amp; stamina.</strong></td>
<td><strong>choice of route lengths,</strong></td>
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<td><strong>Breathlessness.</strong></td>
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<td><strong>frequent resting points,</strong></td>
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<td><strong>Falls</strong></td>
<td><strong>Reduced confidence in mobility.</strong></td>
<td><strong>features of interest near building.</strong></td>
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<td><strong>Drop Attacks.</strong></td>
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<td><strong>Postural hypertension.</strong></td>
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<td><strong>Skeletal Conditions</strong></td>
<td><strong>Limited mobility, painful movement, increased risk of bone fracture,</strong></td>
<td><strong>Unimpeded access, secure, non-slip surfaces,</strong></td>
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<tr>
<td><strong>Arthritis.</strong></td>
<td><strong>loss of strength &amp; stamina,</strong></td>
<td><strong>hand rails, raised beds,</strong></td>
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<tr>
<td><strong>Bone diseases,</strong></td>
<td><strong>reduced reach &amp; grip.</strong></td>
<td><strong>frequent resting points,</strong></td>
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<td><strong>e.g. osteoporosis.</strong></td>
<td></td>
<td><strong>choice of route lengths,</strong></td>
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<td><strong>Gout.</strong></td>
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<td><strong>features of interest near building.</strong></td>
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<td><strong>Incontinence</strong></td>
<td><strong>Travel restricted to short distance from Building.</strong></td>
<td><strong>Features of interest near building,</strong></td>
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<td><strong>Hypothermia</strong></td>
<td><strong>Vulnerability to Extremes of temperature.</strong></td>
<td><strong>choice of route lengths.</strong></td>
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Horticulture Therapy

What is it?

With the institutionalization of the elderly comes a decreased connection to the outside world. Patients that were once extremely active in gardening are now no longer able to participate in a once loved activity. However, a recent trend in nursing homes and long term care facilities is the implementation of a horticultural therapy program. "Horticultural therapy is a medical discipline that uses plants, gardening activities and the natural world as vehicles for professionally conducted programs in therapy and rehabilitation" (Svever Davis, President, American Horticultural Therapy Association). It can be practiced in most medical and social service settings such as hospitals, correction facilities, and vocational programs.

It has been documented that many patients have an interest in gardening or have some past experience with plants and would like to continue in this activity. Many have participated in garden clubs, community garden associations, plant societies, arboretum and botanical garden programs. The addition of a horticultural therapy program will allow individuals with Alzheimer's disease an opportunity to participate in horticultural activities in a therapeutic garden setting. Horticultural activities could include group sessions, nature studies, an indoor plant-table area, hands on plant propagation, flower arranging, sensory stimulation, nature crafts, corsage making, smell and tell sessions and outdoor garden planting.

Benefits of Horticultural Therapy

Historical literature and recent studies in environmental psychology and horticultural therapy illustrates that the horticultural setting improves social development, increases psychological well-being, improves physical abilities and contributes to the overall quality of life for patients, visitors and staff. The general benefits achieved with Alzheimer's patients in a horticultural therapy program are:
Social Development
1. Provides conversational and social opportunity.
2. Facilitates independence and maximizes capabilities.
3. Allows the therapist to build a rapport with the client.

Psychological
1. Helps meet nurturing needs through the caring for other living things (plants).
2. Increases self-esteem and control over personal autonomy.
3. Decreases stress, anger and aggressiveness.
4. Improves the quality of life and self-concept.
5. Provides a "meaningful activity" for patients that gives them a sense of accomplishment.
6. Receiving enjoyment from the activity is more important than completing the task.
7. Horticultural therapy can provide awareness of time and seasonal events.

Physical
1. Stimulates the senses through the use of natural materials.
2. To improve attention span.
3. To stimulate response by eye movement, touch, smiles and gestures.
4. Peace and solitude of the garden setting offsets the lack of privacy and forced interaction that occurs within the facility.
5. Can be tailored to meet a range of physical and mental abilities and interests.
6. Activities help utilize the enormous energy that individuals with Alzheimer's disease seem to need to expand.
General Guidelines for Therapeutic Activities

As individuals with Alzheimer’s disease become more impaired it is important that the activities stress their abilities and encourage participation. The following are guidelines for therapeutic activities that may help to increase the success of the project. These guidelines are taken from Dorothy Coons’ Quality of Life in Long Term Care (129).

- The activity needs to have obvious purpose and meaning for the person.
- The activity must offer a reasonable chance of success.
- The activity must confirm dignity. It must never be perceived by individuals as childish, or inappropriate to their social status.
- The activity should offer pleasure.
- The activity does not reinforce inadequacy or add to anxiety.
- The activity is individualized.
- The activity capitalizes on remaining abilities.
- The activity breaks tasks down into steps.
- The activity meets basic human needs for identity, mastery, and self-esteem.
- The activity encourages social interchange.

Activities to Avoid in Alzheimer’s Disease Units

The following activities should be avoided whenever possible. If the activities are too difficult to understand or interpret catastrophic reactions may occur such as a sudden change in mood, crying, pacing, or restlessness. These guidelines are also taken from Dorothy Coons’ Quality of Life in Long Term Care (130).

- Tasks that require several steps.
- Crafts or tasks that require decisions about which item to select or what step is next.
- Tasks or activities that are new to the person.
- Tasks that convey a childish message such as games or puzzles that use children’s supplies (crayons, plastic blocks, etc.).
• Tasks that depend on lost skills such as language (discussion groups), fine motor skills, or judgment.
• Tasks with unpredictable elements.
• Tasks that require abstract thought, mathematics, or visualization.

Staff and Visitor Requirements

While the main users of the outdoor courtyards will be the Alzheimer's patients, the concerns of the staff and visitors must be taken into consideration. This is difficult because the staff's needs and considerations are generally opposite to those of the residents (figure 5).

Staff Concerns:
• Concerned with the convenience and safety of the gardens. The more trouble it is for them to unlock the doors, or watch the patients, the less likely that the space is going to be used.
• Concerned that the grounds are easy and economic to run.
• Staff may need outdoor space for storage facilities that are convenient but discrete.
• Peaceful and attractive rest areas for the staff to take a break from the demanding and hectic work schedule.
• Nursing stations should be accessible and able to accommodate a high staff-to-resident ratio.

Visitor Concerns:
• Visitors need a positive first impression of the home.
• The home should feel warm and inviting rather than leave the impression of a stereotypical institution.
• Visitors want a place to take their family member outside for lunch or to talk.
The Current Use of Outdoor Spaces

Elderly people in long term health care facilities have as much need and desire to be outdoors as anyone else, but little effort has been given to designing spaces that address their concerns. While outdoor spaces have been provided in many facilities, they are rarely used by the patients. Why is this? A study in Ontario, Canada sampled random nursing homes that had outdoor spaces to determine why they were not used and what motivations would encourage its use. Their study suggested that the use of outdoor spaces is directly related to motivation. “If motivation is not present the residents do not go outside” (Lovering 80). Many areas were not used because there is nothing interesting occurring. They did find that the main motives for going outside involve watching people, observing environmental changes or using outdoor spaces as an activity site. A study in Australia took on the same type of project and identified 22 motives for why patients and the health care staff accessed the therapeutic gardens at the Peter MacCallum Cancer Institute (figure 6). While the patients preferred the peace and tranquility of the outdoor environment, the staff accessed the site for socialization and observation of activities.

<table>
<thead>
<tr>
<th>Responses</th>
<th>Patient</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peace, quiet tranquility</td>
<td>60</td>
<td>28.6</td>
</tr>
<tr>
<td>View colorful flowers</td>
<td>60</td>
<td>-</td>
</tr>
<tr>
<td>Exit hospital environment</td>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td>Pleasant surrounds/scenery</td>
<td>40</td>
<td>-</td>
</tr>
<tr>
<td>Fresh air</td>
<td>35</td>
<td>-</td>
</tr>
<tr>
<td>Sit under trees</td>
<td>35</td>
<td>14.3</td>
</tr>
<tr>
<td>Relaxation</td>
<td>35</td>
<td>7.1</td>
</tr>
<tr>
<td>Observe wildlife</td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td>Area of lawn</td>
<td>25</td>
<td>21.4</td>
</tr>
<tr>
<td>Exercise</td>
<td>15</td>
<td>14.3</td>
</tr>
<tr>
<td>Commune with nature</td>
<td>15</td>
<td>7.1</td>
</tr>
<tr>
<td>Pick flowers</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Socialize with family/friends</td>
<td>5</td>
<td>42.9</td>
</tr>
<tr>
<td>Observe activities within area</td>
<td>5</td>
<td>35.7</td>
</tr>
<tr>
<td>Private seating to reflect</td>
<td>-</td>
<td>35.7</td>
</tr>
<tr>
<td>Feeling of normality/home envir.</td>
<td>-</td>
<td>21.4</td>
</tr>
<tr>
<td>Meditation</td>
<td>-</td>
<td>14.3</td>
</tr>
<tr>
<td>Enjoy sunshine</td>
<td>-</td>
<td>7.1</td>
</tr>
<tr>
<td>Access</td>
<td>-</td>
<td>7.1</td>
</tr>
<tr>
<td>Protected seating from weather</td>
<td>-</td>
<td>7.1</td>
</tr>
<tr>
<td>Non smoking area</td>
<td>-</td>
<td>7.1</td>
</tr>
</tbody>
</table>

*figure 6: “reasons for accessing and remaining in the therapeutic garden (%)*
SECTION V.- PROGRAM
Program

A. Project Goals and Objectives

Several goals were established to define the general parameters of the comprehensive design project:

1. Create a safe and comfortable environment.
   A. Research the best methods of elderly and handicapped design.
   B. Provide a controlled environment with a simple garden layout, full time visual supervision, and controlled access.

2. Understand the specific symptoms of Alzheimer’s disease and create design guidelines tailored to those symptoms.
   A. Create stage-specific garden designs that address the functional ability level of the patients associated with each stage of the disease.

3. Address the needs of the administration and staff.
   A. Keep an ongoing dialogue between the staff and the designer to achieve the best design solution possible
   B. Develop a program that obtains enough staff support to encourage its use.

4. Include horticulture therapy as a critical program element for this project.
   A. Determine the most appropriate horticulture therapy activities that will best suite Alzheimer’s patients.
   B. Maintain the idea that horticulture therapy is an important tool that improve the quality of life of some patients.
B. Client/Users

The primary clients identified for the comprehensive design project consist of the individuals with Alzheimer's disease and other residents of the facility. The secondary clients for the comprehensive project are the administration and staff of Village Christian Parke Retirement Home as well as caregivers of other Alzheimer's facilities, and the families of the patients.

C. Client Goals

- Enhance self esteem and sense of self worth
- Decrease stress and depression
- Maximize the patients remaining physical, mental, and social skills
- Create opportunities that optimize memory
- Improve orientation
- Provide sensory stimulation
- Increase interaction and relationships with peers and staff.
- Provide purposeful activities that allow the patients to feel a sense of control and fulfillment
- Reinforce the concept of time
- Provide a calming environment to reduce fears and unwanted negative behavior
- Promote healthy fatigue and normal sleep patterns
- Lesson the confusion with a simple garden layout
D. Assumptions

The following assumptions were made to act as a guide throughout the duration of the comprehensive design project.

1. There is a need for outdoor spaces for Alzheimer's patients.
2. There is sufficient support from the faculty that the outdoor space would be a positive amenity to the facility.
3. There would be a horticultural therapist on staff to help run such a project.
4. There would be adequate funding for such a project.
5. There would be adequate use and maintenance of the garden.
6. The success of the final design relied on the acceptance of the proposal by the client and proposed users.
E. Proposed Features for Each Courtyard Garden

For the rest of this paper "Stage One" of Alzheimer's disease will correspond with "Courtyard One", or the courtyard that is currently home to the individuals in the "Good Shepherd Unit"; "Stage Two" of Alzheimer's disease will correspond with "Courtyard Two", or the courtyard that is currently home to those who want assisted living; and "Stage Three" of Alzheimer's disease will correspond with "Courtyard Three", or the courtyard that is currently home to the individuals in the "Genesis Unit".

Stage 1 - The Therapeutic Courtyard

This courtyard will be a more active or participatory garden. The patients at this stage of the disease are struggling with the loss of their short term memory and have become frustrated and depressed at their lack of control in the situation. This leads to withdrawal and isolation from their family and friends. The goals of this garden are to provide the patients with a sense of self worth and self esteem by creating opportunities for them to have some control of their lives through horticultural activities, and maximize the patients remaining physical, mental and social skills. This courtyard will include:

- A Working Greenhouse
  - Will be close to the electric and water supplies
  - Will be made of rigid, clear plastic or safety glass
  - Will face the south or west for best plant growth
  - Will not have a threshold
  - Will have lightweight sliding doors that are minimum 4' wide
  - Will have paths that are at least 3' wide
  - Will have adequate maneuvering space for wheelchair users
  - Automatic irrigation will be installed to make sure all plants get watered

- A Water Feature (figure 7)

- Raised Planters- Will provide easy access and comfortable areas to work at

- A Vegetable Garden

- Green Space- Will allow for physical activity

- A Pet Cat (if possible)- Will stimulate resident responsiveness and promote pet therapy

- A Remodeled Nurses Station
Stage 2 - The Reminiscence Courtyard

This courtyard will be a more passive garden setting. The patients in this stage of the disease have lost much of their cognitive skills, but continue to remain quite active, sometimes more vigorously than in the first stage. The courtyard will be a simple garden layout with a controlled path system that will help keep wanderers from getting lost. A focal point will serve as a place of reference for the wanderers as well as give them a sense of their orientation. The goal of this garden is to give the patients a sense of freedom and autonomy, yet at the same time a sense of safety and security in knowing that they can move throughout the garden without getting lost. In addition, there will be many visual cues in the environment to help navigate and assist the patients in optimal functioning. This courtyard will include:

- A Conservatory- Will provide a pleasant semi-outdoor area that can be used year round and that will serve as the transition between the indoors and the outdoors
- A Water Feature
- A Trellis
- Raised Planters- not as many planters are needed in this garden because of the extremely low level of functioning of the majority of patients at this stage (figure 8)
- Artifacts- sundials, an American flag, weather vanes, a windmill, old fashioned pump, wood pile, compost heap, white picket fence, clothesline, screened in porch, basketball net, putting green, a winding brook
- A Remodeled Nurses Station

figure 8- “a variety of raised beds will be provided to accommodate different users”
Stage 3: The Contemplative Courtyard

This courtyard is also a passive garden. The patients in this stage of the disease need constant supervision as they begin to lose control of all their bodily functions. The goal of this garden is to provide the patient with a feeling of dignity, peace, safety, security and intimacy. It will appeal to the patients’ visual sense by providing a picturesque setting for those that may only be able to experience the garden from their bedroom window (figure 9). This courtyard will include:

- A Terrace- Will allow beds to be rolled out into the garden
- Bird Feeders- at the patients window for visual stimulus
- A Remodeled Nurses Station

figure 9: “the importance of attractive views cannot be overemphasized. People use the landscape even when they sit and look from indoors”
F. General Design Principles

The design principles are recommendations for the design of outdoor spaces that respond to the needs of the patients with Alzheimer’s disease. There are six major issues affecting the use of the site. They are: safety and security, comfort, orientation and wayfinding, accessibility, diversity of plant material and sensory stimulation. These design principles address various forms of accommodations for the individuals with Alzheimer’s disease and thoroughly describe the site details and amenity specifications.

Safety and Security:

The design of outdoor spaces should promote security and safety and accommodate the physical disabilities that are associated with Alzheimer’s disease as well as the normal aging process. Many of these symptoms can be addressed with simple design adaptations in the environment. They include:

Paths
- Will allow people to move about safely and independently throughout the outdoor environment. Attention will be paid to the features adjoining the paths in order to preserve good access
- Dimensions of paths:
  - Main routes: 6’ min. Will accommodate two wheelchairs side by side
  - Secondary routes: 4’ min. Will accommodate a single wheelchair and a pedestrian
  - Minor routes: 3’ min. Will accommodate a single wheelchair
- Materials- All surfaces will be nonslip, nonglare stained broom finished concrete
- Color contrasts will not be used on the ground itself. Individuals may perceive this as a change in grade thus resulting in a loss of balance or a fall
- Low branching trees, plants that drop fruit, have thorns or are poisonous will be avoided

Openings:
- A great barrier to going outdoors for many elderly persons is the process of going through the door. All doors will try to reduce the psychological barrier and sense of transition.
- Doors - Power-assisted doors will be used whenever possible. Push doors will have lever type handles for easier grip.
- Unnecessary gates and locks will be removed to reduce the feeling of confinement.

Handrails
- "Fear of falling was rated by staff and residents as the greatest deterrent to the residents use of outdoor spaces", according to Mary Jane Lovering, a landscape architect in Ontario Canada. As a result the installation of handrails, where possible, along the path system will assist those who walk with some difficulty as well as those who use wheelchairs.
- Height - 26-35"
- Diameter - 2 ¼" for easiest grip
- Material - Will be coated with vinyl or plastic for easy grip and have a coding system of textural markings that will help those with visual impairments identify their location within the courtyard.

Lighting
- Higher levels of lighting are needed to compensate for those with poor vision and perception difficulties. Lighting will be placed to provide an overlap that will reduce glare and shadows. Lighting will also be used at lower levels to assist those in wheelchairs or walkers (figure 10).
- Lighting can illuminate plantings for evening interest, provide safe use of pathways and give a greater feeling of security.

Miscellaneous
- All areas of the courtyard will allow for visual surveillance of the patients from the nurses station.
- All trees and garden structures will be located far enough away to discourage their use as climbing aids.
Comfort:

Many institutions have gardens or courtyards within their facility. Yet one of the main reasons as to their lack of use is that the garden is not comfortable. Comfort in the three courtyards can be increased by improving the following site amenities:

Seating
- Placement-
  - Will be in a variety of arrangements that will allow for privacy, small intimate groups and large gatherings. However, social spaces that seat four to six individuals encourage more interaction than seating that serves eight to fifteen.
  - Angled seating will provide an opportunity for eye contact and improved hearing. (figure 11)
  - Will provide seating in both sun and shade
  - Will be both fixed and movable. Moveable seating enables the individual to chose where they want to sit. This helps to compensate for poor vision or hearing.
  - Seating will be accommodated by widened paths and room will be allowed for wheelchair users to rest next to the seat and participate in the conversation (figure 12).

- Height- Ninety percent of today’s population from 74 to 91 years of age is between 4 feet 7 inches and 5 feet 4 ½ inches in height. For these individuals (mostly women), the leading edge of the seat should be no more than 17 inches above the ground plane” (Carstens 125)

- Depth- 17 inches maximum
- Armrests and Backrests- provides continuous back support
- Materials- Use of soft materials or wood prevents the conduction of heat or cold

Shade
- Protection from the sun, cold, and wind with site amenities such as overhangs, porches, or trellises
- Glare will be reduced by providing shady areas through the use of shade trees, awnings, pergolas and trellises
Miscellaneous

- Seating, work spaces, tools, and furniture will all be adapted to meet the users needs, and thus encourage more use out of the space.
- Design spaces that reinforce a sense of autonomy and independence in patients by responding to a variety of ability levels.

Orientation and Wayfinding:

"The arrangement and design of outdoor spaces should facilitate orientation and wayfinding" (Carstens 19). The Alzheimer's disease patient finds it increasingly difficult to orientate themselves in an unfamiliar environment due to poor memory. Therefore, the design of the courtyards need to be easy to maneuver in and have a basic spatial organization pattern. In addition the gardens will have:

Layout

- A simple site layout that is functional, but also enjoyable
- Spaces will be arranged in hierarchies with one space being dominant over the rest.
- Walkways will be a looping, continuous route that will begin and end in the same place to minimize the fear of getting lost.
- Low plantings will ensure visibility
- Indoor viewing area will provide a direct access to and from major outdoor areas.

Orientation

- Color contrast and illumination between doorways and walls will help orientate individual to entrances.
- Walkways will serve as orientation aids that link interesting destination points.
- Pitograms or other easily recognizable symbols will be used as eye level for orientation clues.
- Use of distinctive landmarks- trees, sculptures, gazebos, arbors, fragrant gardens.
**Accessibility:**

The design of the courtyards must provide easy and safe visual and physical access for its users. The garden should be easy to enter, move through and exit. Surfaces should allow for safe and easy movement. The gardens will accommodate a range of changing needs and abilities as well as provide convenience and flexibility for the patients. This will include:

**Raised Beds**

- Positives:
  - A lot of tasks are difficult to perform at ground level. Raising the beds up to a more comfortable level allows individuals to continue gardening.
  - They have good drainage and warm up earlier in the spring.
  - Difficult soils can be replaced by more workable ones or ones that suit a particular group of plants.

- Size: A variety of planter sizes and heights will accommodate people working from a sitting or standing position and of different stature.

- Height: Minimum of 30" or will be at grade to reduce the possibility of tripping. A maximum of 40" to limit the obstruction of view for wheelchair bound patients. Plant material height of approximately 25-35" enables those in wheelchairs to touch and smell the plant material. (figure 13)

- Two types of planters:
  - Alcove-type: provide greater working area and keeps wheelchairs out of the flow of traffic (figure 14)
  - Parallel type: allow for easy movement and increased conversation opportunities, however adequate clearance must be available for those passing by (figure 15)

**Clearances and Working Surfaces**

- Knee clearance underneath a planter increases the range of working surface reach and enables a frontal working position. (figure 16)
  - Minimum height: 27 inches
  - Maximum depth under planter: 19 inches

- Overhangs will be provided to enable wheelchair users to garden face on
Two critical dimensions are reach and elbow height. Reach determines the width of the raised area that can be gardened. Ideal reach depends on if it has one or two sided access.

Elbow Height determines at what height is comfortable to work at. A low planter reduces the effectiveness of reach and a high planter may be inaccessible.

Diversity of Plant Material:

*Purpose:* Plant material will complement and accentuate the garden's shape and structure and define spaces within the courtyards.

*Seasonal Interest:* Plant material will have value in every season and provide interest year round.

*Safety:* Hazardous plant material will not be used in the courtyards, such as plants that are poisonous, thorny, or produces messy or slippery droppings of pods, fruits, or leaves.

*Materials for Activities:* Plant material in the courtyards will not only have aesthetic value but also functional value. Plants will be chosen that have interesting features such as flowers, leaves, fruits, vegetables, and herbs that can be used in different horticultural therapy activities.

*Wildlife:* Plant material will be chosen that will encourage wildlife to feed and live within the garden setting.

Sensory Stimulation:

The environment should provide appropriate levels of sensory stimulation for each stage of the disease. Too much stimulation could result in catastrophic results. Each sense is individually addressed and will be incorporated into the gardens. Sight, sound, texture, smell and taste are discussed in terms of how each sense can be enhanced in courtyards designed specifically for Alzheimer's patients.
Sight

One of the most important senses that we possess is sight. Warm colors such as reds and oranges promote active behavior, while cool colors such as blues and greens induce inward more passive behavior. Individuals find it easier to distinguish brighter, more intense colors at the warm end of the spectrum. They may find it more difficult to differentiate between colors that are white, beige, grey, light blue, and light green.

- Seasonal blooming plants with a variety of colors and textures will be used.
- Views from various perspectives, such as wheelchairs, bedroom windows, and benches, will be taken into consideration.
- Proper lighting will be used to help compensate for poor vision.
- A variety of landscape experiences from different views.

Sound

Sound has tremendous healing qualities. The sounds of birds, falling leaves, and trickling water comfort patients and help to reduce stress. A variety of sounds will be incorporated into the courtyards:

- Water features will be present. The sounds will be varied from a more delicate, serene sound to bubbling, active water.
- Vegetation will encourage wildlife and their pleasant sounds.
- Bird feeders, birdbaths and wind chimes or sculptures will also provide soothing low-pitched sounds, better heard by Alzheimer's patients.

Texture

Tactile experiences are important in a healthcare setting. It has been thought that texture stimulates thinking and responsiveness as well as reinforces memory. Plants and garden elements need to be soft and interesting to the touch. Variety is important for different types of experiences.

- A variety of textures (dull, shiny, rough, smooth, stone, natural, hot, cool) and materials (stone, wood, water, leaf textures) will be throughout the garden.
- Fountains will be designed to allow individuals to feel the moving or still water.
Smell

The fragrance of the garden is another means of sensory stimulation. Fragrances help to evoke a variety of intense and powerful memories and emotions. Fragrance should be present in the overall design, but should not overwhelm the patients. The effectiveness of the fragrance of a plant is determined by its placement. Raised planters and hanging plants can increase the chance of smelling the plant by placing them at nose height. In addition, fragrant plants will be used near benches or entrances. It is imperative that the plants are used in moderation. Too many conflicting smells will result in sensory overload.

Taste

Edible plants such as herbs, vegetables, fruits, and edible flowers will be present in some of the gardens. However, it won't be a feature that will be highlighted due to the fact that dementia patients may get confused between edible and non-edible plant material.
SECTION VI.-  DESIGN PROCEDURE
VI. Design Procedure

A. Site Location, Setting and Context

The Village Christian Parke Retirement Home is located in the state of Indiana within the town of Zionsville. Zionsville is located just 30 miles north of downtown Indianapolis (Figure 18 and 19). Village Christian Parke is located in the southern region of Zionsville on Ford Road (Figure 20). A good number of the residents are either from Zionsville or have family living in Zionsville. The Village Christian Parke was established in 1976 to serve the elderly in the Indianapolis area. It offers a full range of services, from independent, maintenance-free cottage apartments to total nursing care. In addition, Village Christian Parke offers two different Alzheimer's units. The "Genesis Unit" provides comfortable living for 25 residents in the early stages of dementia. The "Good Shepherd Unit" provides a safe and secure environment for 26 residents in the later stages of dementia. Within the facility are three courtyard gardens, two of which are provided specifically for Alzheimer's patients. In addition, the site is surrounded by lush, open green space. The site was chosen for its uniqueness and natural beauty, and its residential location.

B. Site Selection

Village Christian Parke Retirement Home was chosen for this project for several reasons.

- The site has three existing courtyards which currently serve the Alzheimer's patients in the facility.
- The courtyards are enclosed providing protection from the wind thus making a more pleasant microclimate for the users.
- The courtyards have level topography, making it easier for the individuals to maneuver within the site.
- There are plenty of doors and access points into the site to encourage its use.
- There are no unwanted permanent features within the site that can't be removed or modified.
figure 18: "map of Indiana"

figure 19: "map of Zionsville, Indiana"
Figure 20: "Village Christian Parke Retirement Home - site plan delineates the three existing courtyards"
C. Site Inventory

Inventory- Courtyard One

This courtyard is surrounded by the wing that contains the ‘Good Shepherd Unit’. The courtyard measures 74’ x 76’ and is surrounded by 16 residential apartments. Access into the courtyard is difficult; the doors are generally locked.