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## Healing the Whole Person: A Post Occupancy Evaluation of the Rooftop Therapy Park at Fort Sanders Regional Medical Center, Knoxville, Tennessee

Brad Edward Davis

*Louisiana State University and Agricultural and Mechanical College*

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HEALING THE WHOLE PERSON:  
A POST OCCUPANCY EVALUATION OF THE  
ROOFTOP THERAPY PARK  
AT  
FORT SANDERS REGIONAL MEDICAL CENTER,  
KNOXVILLE, TENNESSEE

A Thesis

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
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requirements for the degree of  
Master of Landscape Architecture

in

The School of Landscape Architecture

by  
Brad E. Davis  
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## ABSTRACT

This study used a post occupancy evaluation to assess the impact of an existing hospital garden on its users. Previous studies of hospital gardens have been of passive garden use. This study addressed gardens including physical therapy, while also considering the emotional, spiritual, and social aspects. The POE included behavioral observation, interviews with the designer and lead therapist, a staff survey, and a patient questionnaire. In light of historical information and contemporary theory, the results revealed issues to be addressed in the design process of future healing gardens, specifically those including physical therapy. The major issues included: the need for research of similar gardens when designing new ones and the consideration of all users in the design process, visibility of the garden from indoors and a strong indoor outdoor connection, provisions for inclement weather, accessibility, thoughtful plantings, careful maintenance, and volunteer support. These issues and contemporary theories were used to develop design guidelines specifically for gardens including physical therapy. These guidelines included designing goal-oriented spaces, using appropriate plant material, coordinating volunteer groups to support horticulture therapy, and increasing the dialogue between health care professionals and designers. The study concluded with the need for design professionals to be involved with initial design and site planning phases of hospital campuses. Simple landscaped areas and entrance beautification must not be substituted for healing spaces. Indoor gardens such as atriums and solariums need study. Future studies will require studying different populations for more specific garden design. The quantitative relationship between physical, emotional, spiritual and social healing may need defining to establish the permanency of gardens in health care settings and greater society. Landscape

architects have the opportunity to use contemporary research to design gardens that impart healing to the human body in a new and profound way.

# CHAPTER 1

## INTRODUCTION

### THE CULTURAL CONDITION

A culture is forever in a state of metamorphosis. Ideology and movements sweep through a culture to bring about change, but the process is a slow one. The efforts of one individual may take a lifetime or more to become the calling of an entire movement. In this way, culture is much like the human body. One cell may experience pain or even die without the body's awareness. It may take the collective effort of many cells to gain the attention of the entire body. In a similar manner, American culture displays the symptoms of problems within its body, as these problems become the concern of not one, but many individuals.

One such display of cultural illness is the current state of health care in America. Ironically, the quality of health care for many individuals in American society decreases as research increases modern medicine's ability to heal. Health care is in a state of transition and disorder as individuals resist the movement towards managed care. Americans desire care that is personalized, and healing environments that cater to the individual rather than the masses. In this century the movement in health care has been towards speed and efficiency, with personalized care no longer a priority. The cultural perception is that managed health care is even less personal, with concern only for the bottom line. This overriding sentiment is evident in the increased interest in alternative medicine. Alternative medicine often centers around specialized care regimes designed specifically for the individual. Current examples include the popularity of herbal remedies, eastern medicine and philosophy, and even chiropractic medicine. Of particular interest to landscape architects is the recent surge of interest in healing gardens. People in all walks of life are turning to

nature, and often the garden, for an environment that is supportive and caring, when society, and even modern medicine, seems depersonalized and apathetic.

## CALL FOR RESEARCH

What does modern medicine have to offer the emotional and spiritual aspects of healing? The majority of American hospitals are sterile, confusing networks of corridors connecting semi-private rooms which lack character and most certainly have no real connection to nature or the outside world, other than through the television and visitors.

Studies conducted over the past two decades have revealed the benefits of a garden or nature (Marcus, 1995; Ulrich, 1984; Kaplan and Kaplan, 1990). However, research is needed to determine how best to design garden spaces as healing physically, emotionally, and spiritually. Landscape architects need a greater understanding of health care and the hospital environment in order to be able to design not just gardens in health care settings, but gardens for specific patient populations.

## PROBLEM STATEMENT

The contemporary American health care industry is just beginning to incorporate the idea of healing the whole person in the design of hospital campuses. As gardens are included in hospital design, research is needed to determine how effective they are, and how they can be better designed to meet patient and staff needs. Are these hospital gardens meeting a previously unfulfilled need? Do they provide alternative forms of therapy that not only provide physical therapy but are also more emotionally and spiritually uplifting than traditional therapeutic measures? Is the connection to nature that a garden provides a fundamental component to healing the whole person, not just the physical body?

A post occupancy evaluation of the Rooftop Therapy Park at Ft. Sanders Regional Hospital in Knoxville, Tennessee, will assess the success of its Therapy Park in terms of its intended purpose and the resultant uses apparent through the evaluation. The emotional and spiritual benefits of the space will be considered in a effort to provide information about designing spaces for these qualities in addition to designing for physical needs.

## METHOD

Answering questions about the Therapy Park is possible through a multi-method approach termed as a post occupancy evaluation, or POE. POEs are a contribution of the field of environmental psychology and are commonly used in the field of architecture to evaluate built works in terms of the design itself, and user's needs (Bechtel, 1997; Zeisel, 1984). Landscape architects also use POEs to study built works in landscape architecture. The methods that POEs most often consist of include history, behavioral observation, surveys, questionnaires, and interviews. This multi-method approach allows for convergence of results, which lend validity to a qualitative study. Author Robert Bechtel is an expert in the field of environment and behavior and has written prolifically on the use of POEs. In his recent book Environment and Behavior: An Introduction, he states, "... the message of the social scientists had gotten through on the need for convergence of methods, that is, to have more than one method so that if the results are in agreement, one has more certainty of the validity of the results, and if they do not agree, one then suspects that something has gone wrong" (Bechtel, 1997).

In this study of the Rooftop Therapy Park the following tools will be used to evaluate the site: history, therapist and designer interviews, behavioral observation, a patient questionnaire, and a staff survey. Historical information about the park will

give designers insight into the process of introducing the concept of a healing garden to health care professionals, as well as provide information about the design process. Therapist and designer interviews will reveal the original intent of the Therapy Park. Behavioral observation will show how the Therapy Park is used. The questionnaire and survey will ask questions about the physical, emotional, spiritual, and social impact of the Therapy Park, so that landscape architects may better understand how to design for each of these qualities in a garden focused on physical rehabilitation.

## OBJECTIVES

- ø To study the impact of the park's design on users in terms of historical and contemporary theory and the design intentions
- ø To assess the impact of this design on the physical, emotional, spiritual, and social rehabilitation or well being of patients and staff
- ø To identify the design's successes and failures and to communicate the design process necessary for successful healing gardens with programs of physical therapy

## SCOPE

This project will be a detailed study of one garden. Information about the entire process from planning and design, to post occupancy use of the garden will be gathered. This information will be used to inform the design process of future gardens in health care settings. This study is not a comparative and does not include multiple sites, rather the purpose of this study is to add to the body of current knowledge by studying a site with a specific program of physical therapy. Much existing knowledge is based on the passive use of gardens. More active physical use



of gardens needs greater understanding as design professionals seek to create gardens that function with a maximum of uses.

In the next chapter historical and contemporary theories of healing gardens will be presented. This information will provide perspective on the evolution of the healing garden and how its inclusion in health care settings has changed and adapted to the current American model of the hospital.

## CHAPTER 2

### LITERATURE REVIEW

This chapter presents an overview of the history of gardens and their inclusion in health care settings. This historical perspective highlights themes, trends, and differences in healing gardens as they appeared in various cultural contexts and health care settings. It then presents the modern hospital model and contemporary theory on healing gardens, which exist as a part of various disciplines. Contemporary interpretations of the healing garden are reviewed through a discussion of the works of environment and behavior experts within the field of psychology, as well as designers and health care professionals.

#### THE HEALING GARDEN AND ITS INCLUSION IN HEALTHCARE SETTINGS

The concept of the garden itself, minus any purposes other than food production, is thought to date back to ten thousand years ago. Gardens intended for the purpose of healing began appearing with the ancient cultures of Persia and the Orient. The notion of the environment or exposure to nature as having the ability to heal is therefore, an ancient one. Some of the earliest recordings of the history of humanity include references to the restorative and rejuvenating powers of nature.

Historically gardens reflect the differing cultural beliefs and values of the time period. Although gardens for the purpose of healing first appeared at least three thousand years ago, their decline or absence in many time periods since indicates the affect of culture on their prevalence. Certain cultural trends seem to lend themselves to particular interpretations of the garden. These interpretations vary in their degree of emphasis on the physical and aesthetic qualities of the garden, versus the emotional, spiritual, and social qualities. Nancy Gerlach-Spriggs is a registered

nurse and landscape architect and the author of the book, Restorative Gardens: The Therapeutic Landscape. Her duality of professions gives her a unique ability to comment on gardens in health care facilities. She comments on the different historical interpretations of the healing or restorative garden and how these have changed with each culture and time period.

Sun and moonlight and the plants and water of gardens have always afforded human beings psychological orientation and sensations important to maintaining the sense of self. Such personal feelings, however, are forever being modified by the setting of the garden and by the meaning that current culture imposes on the visitor's experience. A garden may afford a familial retreat or offer a theater for social display or serve as a religious link between the visitor and the deity. In some places and eras, gardens have been heavily freighted with intense personal emotions; at other times they have been subjected to the cool winds of science or fashion. During times when intense feelings and the religious experiences of nature receive cultural acknowledgment, gardens are employed as a means of therapy: as places for the relief of pain, places to assist the patients struggle for orientation and equilibrium. Under these conditions, gardens may be properly labeled restorative. (Gerlach-Spriggs, Kaufman, Warner, 1998, p. 7)

Gerlach-Spriggs refers to gardens historically occurring in health care facilities as restorative. For the purposes of this thesis the term restorative may be used interchangeably with the terms healing garden, or therapeutic garden. All of these gardens are intended to improve the quality of the health care environment.

In the early centuries the healing garden was closely associated with the religious institutions of that time. Christian charitable organizations made it their mission to provide treatment and care for the poor, sick, and traveling peoples. In these early centuries little was known about physical illness, and the common belief was that healing would come through exposure to nature and through connection with the creator, God. One of the ways to attain this connection was in the garden. The monastic cloister became a common design for monasteries with buildings enclosed behind walls, surrounding a central courtyard. This courtyard was most often designed to symbolize the Garden of Eden referred to in Genesis of the Bible. As in

the Persian tradition, the garden was subdivided into four squares by four paths, which crossed at the center. These four paths represented the four rivers that flowed from the Garden of Eden. At the center would often stand a well, fountain, or significant planting such as a stately upright juniper, in order to symbolize the tree of life referred to in Genesis as the center of the garden (Warner, 1994).

In the twelfth through the fourteenth centuries, public faith in Christianity was fading, and there was a decline in the number of monasteries and belief in mysticism. As traditional religious and spiritual beliefs declined, the meaning behind the physical form of cloister gardens was changed. “Once divested of their mystical religious meanings, the courtyards and open spaces within and surrounding the hospitals of Renaissance and Reformation Europe became subject to accidents of local wealth and architectural tradition” (Gerlach-Spriggs et al., 1998). It was in this time period that farming practices were changing, and crops that had traditionally been grown in close association with house and surrounding garden began to be cultivated in fields. The need for growing food crops inside the walls or hedges of individual homes decreased and many rural people began to move to the city. The garden became a less essential element to the homestead, and thus other establishments as well (Jackson, 1980). Hospital garden spaces also became leftover spaces, not as important as in previous times, and not worth the investment of maintaining them as a garden.

During the Renaissance humanity became enlightened about many things, as music and art experienced dramatic stylistic changes, and people began making discoveries in the sciences that would eventually lead to the industrial revolution. However, in this time of increased knowledge there also occurred much societal upheaval and strife. “Although Renaissance humanists stressed the influence of

environment on human development, their enlightened ideas did not alleviate the plight of the poor. Moreover, during the fifteenth, sixteenth, and seventeenth centuries, the corruption of old charitable foundations and the emergence of political and religious conflict deprived many of the established foundations of their economic resources” (Gerlach-Spriggs et al., 1998). It appears that gardens of this time period lost much of their cultural significance as places of healing for both the physical and the spiritual realm. “The gardens of the seventeenth and eighteenth centuries reverted to the meaning that they had held in ancient Greek and Roman times. People understood them as places of rest and retreat from the cares of everyday life. This affluent society attitude about gardens would continue well into the twentieth century with the Country Place Era of the late 1880s until the late 1920s.

However, along with the Renaissance attitudes about gardening and nature came the beginnings of modern medicine. Governments of the seventeenth and eighteenth centuries learned that a healthier and more prosperous nation resulted when the government itself took interest in caring for its peoples. As governments ordered the creation of military hospitals and medical services and began imposing national standards on local hospitals and charities, the level of care health care improved dramatically along with helpful discoveries in physics and chemistry. New ideas in the sciences led to experimentation in hospital design, which would lead to the modern model of the hospital. New ideas about germs and the spread of disease allowed hospital design to return to the open-air type of facility that was common in the age of cloister gardens. Gardens once again were given more priority in the health care setting, and once again became a part of the therapeutic regime. It was during this time period that the pavilion style hospital became popular. Florence

Nightingale (1820-1910) wrote about the therapeutic benefits that the new hospital designs provided:

Second only to fresh air...I should be inclined to rank light in importance for the sick. Direct sunlight, not only daylight, is necessary for speedy recovery.... I mention from experience, as quite perceptible in promoting recovery, the being able to see out a window, instead of looking against a dead wall; the bright colors of flowers; the being able to read in bed by the light of the window close to the bed-head. It is generally said the effect is upon the mind. Perhaps so, but it is not less upon the body on that account...While we can generate warmth, we cannot generate daylight. (Nightingale, 1863, pp. 18-19)

Once again, the culture of the time influenced the popular belief in gardens as healing or of therapeutic value. “The therapeutic connection between the nursing and medicine within the hospitals and gardens without came from the eighteenth-century Romantic movement’s revival of pastoralism. With the popular spread of this attitude, nature and gardens came to be thought of once more of as places of bodily and spiritual restoration” (Gerlach-Spriggs et al., 1998). Romanticism was a cultural force that influenced many parts of society. “Romanticism constituted a broad popular movement that flowed into all aspects of life from science and medicine to child-rearing and domestic life. Froebel’s kindergarten, the highly illustrated seedmen’s catalogues, city parks, and hospital gardens were all elements in a pervasive cultural attempt to unite human emotions and morality with nature” (Gerlach-Spriggs et al., 1998). This unity between human emotion and nature became evident in the new cultural attitude about the landscape. Traditionally the landscape held a different meaning. “In its old meaning, landscape had referred to a moralized portrayal of nature in art, as in Milton’s *Paradise Lost* or Poussin’s *Four Seasons* or the Hercules theme of the gardens at the Villa d’Este” (Chambers, 1985). The new cultural attitude about the landscape found meaning in the ability of all people to experience the landscape and interpret it as a personal and unique

experience. "...The new attitude meant that landscape was something everyone experienced, not something that poets and artists constructed for the edification of others. The Romantic landscape, including its gardens, was based on what any person might take at a glance – see from an overlook or contemplate while sitting within the landscape or observe while walking through it" (Chambers, 1985). This new attitude marked a significant shift in the personal beliefs of individuals. This change in attitude brought about a society that became much more focused on the individual and his or her own experiences, rather than relying on others definitions of what one should feel.

Gerlach-Spriggs writes that modern humanity emerged at the end of the eighteenth century. This is evident in the new cultural attitude expressed through the arts, music, literature, and science of the time. "These popular Romantic attitudes toward nature once again endowed garden spaces with heightened emotional force and religious power. So revitalized, gardens rejoined the therapeutic enterprise" (Gerlach-Spriggs et al., 1998). Hospitals of the eighteenth century once again employed gardens as a means of therapy. German author Wolfgang Schepers wrote on theorist Christian Cay Lorenz Hirschfeld's (1741-1792) theory of garden design as the need to site hospitals away from cities and in open rural areas to allow room for gardens, open air, and inspiring views (Schepers, 1980).

## THE MODERN HOSPITAL

It is in this time period that the modern hospital has its roots. Throughout the eighteenth and into the nineteenth centuries hospitals were placed at the edges of urban centers and designed with much open space between buildings, if not with gardens. Mental health facilities in particular were placed in less urban areas and gardens were thought to be especially effective in "curing" the mentally ill. By the

late nineteenth century many of these mental health hospitals that had originally started as private institutions, came under state and government control. As these facilities became overcrowded, under-funded, and thus unsuccessful, the more institutional style of facility became the dominant model and gardens did not frequently appear as part of the design.

As the institutional style of mental hospitals led them to overcrowding and failure, the pavilion style hospital of the nineteenth century prevailed as a successful hospital model and with advances in medicine succeeded in becoming the predecessor of the modern hospital. The pavilion hospital benefited from the popular belief that “clean, airy, well-kept, sunlit hospitals, such as those being established for the military, should promise the least contagion and the lowest mortality.” This proved to be true as medicine perfected the antiseptic practice and the level of patient care increased from treatment of symptoms to possible cures for some illnesses. After the acceptance of the germ theory the pavilion model of the hospital became even more prevalent. Because of the layout of the pavilion design it was easy to incorporate outdoor therapy into the patient’s therapeutic program. An exemplary design in the pavilion style was Johns Hopkins Hospital in Baltimore, which has remained a leader in health care.

While the success of pavilion style hospitals such as Johns Hopkins set the mode for hospital design in the early twentieth century, discoveries in the sciences were creating changes in the way patients received care. “Knowledge of germ theory and antiseptic practice allowed efficiency engineers to replace the land- and heat-consuming low rise pavilion hospitals with compact multistory buildings” (Ochsner & Meyer, 1909). “The stunning advance of medical science from bacteria to vaccines to x-rays to pharmaceuticals, along with the growing safety and complexity



of surgical practice, brought ceaseless demands for ever more-specialized hospital spaces” (Gerlach-Spriggs et al., 1998). Traditionally hospitals were composed of general purpose “wards.” However, with advances in medicine these became replaced with specialized care areas in the hospital, and thus the connection with the outdoors became weak. In the words of Clare Cooper Marcus: “Over the centuries, the connection between healing and nature was gradually superseded by increasingly technical approaches – surgery, medicines, drugs, X-rays. A separation occurred between attention to body and spirit, and increasingly, different parts of the body (eyes, heart, digestive tract, etc.) and different afflictions (cancer, arthritis, etc.) were treated by specialists. The idea that access to nature could assist in healing was all but lost” (Marcus, 1995). Also at work were class influences that kept people of various classes in separate areas of the hospital. These forces together brought about the revolution in the design of hospitals that led to current hospital design.

The steady advance in treatment practices, surgery, and medicines also brought cures where there had been only care. The losses came from the effects of specialization and the focus on the patient as an organism with a specific pathology. As patients thus became components, not entities, the hospital itself more and more resembled the environment of the office and the laboratory. Patients became diseased entities, not self-healing humans who sought the assistance of scientifically trained physicians and nurses in order to recover. In acute-care hospitals, the design emphasis shifted toward saving steps for physicians and nurses, and away from attending to the patient’s environment. Gardens disappeared, balconies and roofs and solaria were abandoned, and landscaping was restricted to entrance beautification, tennis courts for the staff, and parking lots for the employees and visitors. These trends, which so possessed the twentieth-century American acute-care hospitals, spread after World War II, to long term and chronic-care facilities, to the hospitals of the Veterans Administration, to mental hospitals, and to nursing homes. The prestige of the big urban teaching hospitals with their gardenless patient environments set the style for all others. (Gerlach-Spriggs et al., 1998, p. 25)

Hospitals increasingly took on the form of high rise office buildings, and the pavilion style hospital appeared much less frequently as efficiency became the main

concern, especially in urban areas. In the twentieth century the physical design of hospitals has left gardens and the connection to nature with indoor areas almost non-existent. However, the creation of new professions in the twentieth century such as occupational therapy made possible treatment programs that involved the use of outdoor spaces. “Many options were available to hospitals in the later part of the twentieth century, however the focus of health care became cure and not care. “Here was a broad menu of garden settings and activities awaiting adoption by all health care facilities, from the waiting rooms of clinics to big urban general hospitals and state and federal chronic-care hospitals. Unfortunately, such is the dominance of the architectural fashion of the enclosed air-conditioned office and hotel room, and the “cure, not care” focus of American medicine that both garden traditions and garden innovations have been neglected. Everyone has moved indoors” (Gerlach-Spriggs, et al., 1998). Twentieth century architectural tradition has overridden the basic demonstrated needs of hospital patients and staff for a friendlier environment. In spite of new professions such as occupational therapy, physical therapy, horticulture therapy, and recreational therapy, which all lend themselves to the use of outdoor environments, hospital design has continued to leave the landscape to entrance beautification rather than therapeutic benefit. Hospital design in the twentieth century has suffered from the misplaced priorities of the culture.

The most recent half-century of vigorous American hospital development and hospital building has constituted an environmental failure. The environments provided for patients, staff, and perhaps even physicians continued the long decline initiated by the efficiency movement...the art and science of medicine flourished, but health care environments failed to keep pace. The environmental failure is particularly frustrating when reviewed from the perspective of the 1990's. After World War II all the necessary elements were in place for the reassertion of the clinical wisdom of providing sunlight, fresh air, and gardens... postwar developments in occupational and horticultural therapy spoke eloquently for the efficacy of gardens, while at the same time popular suburban styles of domestic landscaping offered fresh ways to link indoor and outdoor space.

Such elements could well have been combined to create truly humane environments for patients, staff, and visitors. Unfortunately, hospital administrators and insurance carriers focused on semiprivate and private rooms as the improvement that patients deserved, while physicians focused on putting new procedures into place. As a result, the post-World War II American hospital commonly imitated the air-conditioned office building and failed to realize or even to propose its own unique environmental requirements. (Gerlach-Spriggs et al., 1998, pp. 31-32)

The benefits of gardens in health care facilities continue to be overlooked. There are exceptions, as many public hospitals in America have continued the garden tradition to some degree, and as long term care facilities such as rehabilitation centers and nursing homes have used gardens to create a more home like environment. Where current examples of successful hospital gardens exist, they are often included as part of smaller facilities in the pavilion style, or belong to an institution with at least one influential and extraordinary individual who maintains the importance of a garden.

In the last decade of the twentieth century, more health care facilities have begun to realize the benefits of gardens, and thus an increased number of design professionals have become involved with the design of these spaces. However, much work is to be done in order to convince health care administrations that bottom line dollars are well spent in the creation of gardens and outdoor therapy areas. "Today, the mistake is being repeated. Just as mid-twentieth century hospitals imitated the office building, health care facilities in the closing years of the century are imitating the commercial hotel and retail mall, with their multistory entrance atria, their arcades of shops and restaurants" (Sloane, 1993). Gerlach-Spriggs also comments on such facilities.

To be sure, such spaces are familiar enough to patients, staff, and visitors, and in that sense replicas of the commercial design will make them comfortable. But they ignore the special emotional needs of a health care facility. The patients are anxious, afraid, in pain, and often drugged and disoriented. If they are a resident

for very long, they soon feel alienated from their setting. A garden, even the view of a garden, unlike either an atrium or a mall, can allow patients to make their individual space into their particular image of a home space. Likewise, the staff is inside the institution, often working under stress, all day long. To be outside in a garden, or inside in a glassed-in garden, is a feeling that far transcends the opportunity to grab a pizza or a coffee in the arcade. And so too with the visitors, whose fears and anxieties must be respected. A garden can be for them, too, a place to collect their feelings and thoughts. In the winter, when in many regions the gardens are frozen and it is too cold to linger outside, they still offer sunlight and the marvels of the natural world. (Gerlach-Spriggs et al., 1998, p. 33)

At the brink of the twenty-first century, modern society sits at a point where a balance must be found between the technical and scientific aspects of our culture, and the emotional and spiritual needs of each individual. The modern hospital is unable to meet the emotional and spiritual needs of its users. The modern hospital is a harsh maze of white corridors, sterile linoleum flooring and ambiguous way finding. Nothing about the modern hospital is familiar or comforting. Personal comfort and personalized care are obstacles in the way of shorter stays, sterility, and maximized numbers of patients per square foot of building.

There are exceptions to the overall depressing state of health care design in America. Some hospitals, often those offering long term care, still maintain a garden as part of the therapeutic regime. Many of these hospitals are discussed in current books including Gardens in Health Care facilities: Uses, Therapeutic Benefits, and Design Recommendations, by Clare Cooper Marcus and Marni Barnes, and Restorative Gardens, written by registered nurse and landscape architect Nancy Gerlach-Spriggs. These books were instrumental in spurring not only this thesis, but also much study, debate, and discussion within landscape architecture and other allied design professions.

## EMERGING CONTEMPORARY THEORY OF HEALING GARDENS

In twentieth century, several disciplines began to explore the intimate human connection to the outdoors. As society becomes increasingly urban, and problems such as suburban sprawl and pollution are made the concern of each individual, the interest in nature, gardening, and everything to do with the outdoors has increased dramatically. Environment and behavior experts within the field of psychology, as well as designers and health care professionals have been researching the intimate connection that exists between humans and the natural world.

### SCIENTIFIC AND PSYCHOLOGICAL PERSPECTIVES

One of the most often quoted studies identifying the benefits of outdoor space on healing is Roger Ulrich's "View Through a Window May Influence Recovery from Surgery." In his study Ulrich showed that patients with a view of nature outside their window healed more quickly and required less pain medication than patients with a view of only hardscape elements such as walls and rooftops of other buildings (Ulrich, 1984). This is a landmark study providing scientifically sound evidence that nature indeed does possess the ability to heal or restore the human, and not only the mind or the spirit, but also the physical body itself. This type of research is greatly needed in order to convince health care providers, who have been trained to rely solely on empirical evidence, that money spent on the environment of the hospital, including but not limited to healing gardens, is money well spent. Since his 1984 study Ulrich has published further studies including how design impacts wellness (Ulrich, 1992), and stress recovery during exposure to natural and urban environments (Ulrich, R.S. et al., 1991).

One of the emerging areas of research is discussed in Biophilia Hypothesis. The author Edward O. Wilson suggests that humanity is intimately linked with nature on an evolutionary level, and that our well being as humans is dependent on our continued connection and relationship with the environment from which we as organisms sprang (Wilson, 1995). Ecologists and environmental scientists would certainly agree as the world grows smaller each year and pollution and overcrowding are issues that must continually be dealt with.

Environment and behavior experts Steven and Rachel Kaplan have been researching the psychology of humanity's connection with nature for over twenty years. Together they have published numerous studies on the psychological affects of nature and green space as they are experienced and perceived by individuals. Their studies have included the psychological benefits of gardening (Kaplan, R., 1973), the restorative and healing power of nature (Kaplan & Kaplan, 1990), and the experience of nature (Kaplan & Kaplan, 1996).

Horticulturalists have long been studying the healing powers of nature and gardening, which led to the creation of the profession of horticulture therapy. Charles A. Lewis has researched and written prolifically on topics such as the interaction of people and plants, plants as a healing agent in the urban environment, and the process of gardening as a healing process (Lewis, 1973, 1979, 1990, 1995). Horticulture therapy is a growing profession, which continues to strive to improve the social well being of people (Relph, 1992).

## THE WORK OF DESIGNERS

Design professionals, particularly landscape architects, have joined in the movement to understand how the environment affects humanity. Landscape architecture in America largely began as a means of improving the every day lives

of people through better outdoor environments. This tradition resulted from an understanding that environment greatly affects quality of life. This understanding is what drove F.L. Olmsted, the founder of landscape architecture in America. In recent years this understanding has required explanation, clarification, and research to add validity to this notion. The culturally accepted notion that nature is therapeutic is not enough. This fact is made especially clear as the struggle to include gardens in health care settings continues. Deeper questions are being asked, such as: What makes a garden healing? What is the design process for creating a healing garden? Even more specifically, what elements of a design specifically contribute to the healing process? Several current authors and researchers have formulated design theories for creating therapeutic garden spaces.

Clare Cooper Marcus and Marni Barnes have written prolifically on the importance of good design in the creation of healing gardens. In their 1995 book, Gardens in Health Care Facilities: Uses, Therapeutic Benefits, and Design Recommendations, the documented benefits of healing gardens in health care settings and design recommendations are discussed. Their book outlines the need to “Communicate what is known about successful healing garden design to those professionals responsible for creating and maintaining medical facilities (architects, landscape architects, hospital CEO’s, and facility managers) and those responsible for patient care (doctors, psychologists, medical staff, nurses, and hospital administrators)” (Marcus, 1995). Marcus identifies three different aspects of healing through which a garden may provide therapeutic benefit. These are relief from physical symptoms, stress reduction, and improvement in the overall sense of well being (Marcus, 1995). Marcus provides design recommendations based on her case studies of many hospital healing gardens and interviews of garden users. She

categorizes these design recommendations into three areas which are: A) locational, site planning and way finding recommendations, B) planting, seating, aesthetic, and detail recommendations, and C) policy and maintenance recommendations. Within each of these sections Marcus provides detailed design guidelines. These are outlined in tables 2.1, 2.2, and 2.3.

Table 2.1. Locational, Site Planning, and Way Finding Recommendations. Adapted from Gardens in Health Care Facilities: Uses, Therapeutic Benefits, and Design Recommendations. (Marcus, 1995).

General Goals	Provide a contrasting outdoor environment – calm vs. stressful inside
	Design with awareness of mobility and microclimate issues
	Design for security, serenity, and safety
Specific Design Recommendations	Professional LA on design team from the start
	Plan for variety of spaces for multiple user groups
	Plan visible location of the garden/provide clear directions/convenience
	Include degree of enclosure and separation from outside world
	Design for maximum indoor viewing
	Divide space for varying levels of privacy
	Interior and exterior spaces should be complimentary
	Make balconies and roof terraces accessible for garden viewing
	Garden layout needs to be easily readable and not confusing

Marcus identifies gardens that have both successful and unsuccessful attributes. Her studies include only hospitals in California. She writes about different types of hospital gardens and the possible advantages and disadvantages of each type. Among others, she includes courtyard gardens, plazas, roof terraces, and roof gardens, all of which share attributes in common with the Rooftop Therapy Park. In these studies she identifies both successful and unsuccessful designs and design elements, such as the successful roof terrace Promenade at St. Mary's Hospital in San Francisco, California, the unsuccessful Seating Plaza and Roof Garden at Alta Bates Medical Center in Berkeley, California, and courtyard gardens with varying levels of success such as the Linnaeus Physik Garden in Santa Rosa, California and the Children's Courtyard at Kaiser Permanente Medical Center in Vallejo,



California. In each of these gardens Marcus identifies design flaws and successes, which she later uses to develop the design guidelines that are presented in tables 2.1, 2.2, and 2.3. Many of these same issues will be addressed in the study of the Rooftop Therapy Park.

Marcus excludes the study of gardens that involve physical activity as a means of aiding the healing process. This thesis will attempt to provide further guidelines for those gardens that do include an intense physical regime of therapy, such as the Rooftop Therapy Park. Martha Tyson is another recent author on the topic of healing gardens. She is the author of The Healing Landscape, Therapeutic Outdoor Environments (1998). In her book she approaches designing healing gardens from using a pattern language defined in the book A Pattern Language, by Christopher Alexander. These patterns are described as the elements of the language of design. These patterns are derived from social observation, and are the elements of design that give meaning and form to our images (Alexander, 1977). Tyson uses this pattern language to provide goals and recommendations for the design of healing gardens. Her recommendations appear very similar to those of Clare Cooper Marcus, although less specific. Tyson takes each pattern defined by Alexander and provides design objectives for the person, place, and interaction that are intended for that pattern. For example, for the pattern labeled “Public Outdoor Room,” Tyson includes the quote from Alexander, “In every neighborhood and work community, make a piece of the common land into an outdoor room – a partially enclosed place, with some roof, columns, without walls, perhaps with a trellis; place it beside an important path and within view of many homes and workshops” (Alexander, 1977). Tyson then sets the following design objectives: for the person or individuals needs:

Table 2.2. Planting, Seating, and Detail Recommendations. Adapted from Gardens in Health Care Facilities: Uses, Therapeutic Benefits, and Design Recommendations. (Marcus, 1995).

General Goals	Provide sensory stimuli to draw attention from internal to external
	Facilitate physical and psychological movement with pathways, vistas, through spaces, assisting a shift in perspective
	Create areas for safe seclusion and social interaction to help think and work through issues
Specific Design Recommendations	Provide lush colorful planting to suggest a garden
	Choose appropriate plant material/unhealthy plants – neg. psych. affect
	Provide seasonal change – reminder of life’s rhythms and cycles
	Select trees with foliage that moves in the wind – soothing
	Provide features to attract birds, butterflies, wildlife
	Include contrast and harmony of forms and textures – refocus external
	Provide buffer for indoor rooms immediately adjacent to garden
	Provide meandering paths for strolling and contemplation
	Select paving surfaces smooth enough for wheelchairs and gurneys
	Arrange entrances for easy accessibility and convenient use
	Provide electrical outlets to be used at parties/functions
	Provide nighttime lighting for night use and night viewing
	Arrange seating for social interaction/ fixed seat backs for support
	Provide movable chairs for increases seating options
	Adjustable umbrellas allow users to adjust sun exposure
	Provide panoramic views off site with low or transparent balustrades
	Provide sense of mystery with focal points and small spaces
	Provide eye catching and unique feature, easily identifiable by users

provide for safety and security, promote independence, and allow for privacy. For the place or physical environment design objectives: integrate indoor and outdoor areas, and create comfortable microclimates. The last objective of interaction or behavior is defined as the need to: create an interactive environment, and consider a range of abilities (Tyson, 1998). She also uses the design process of her own healing gardens to develop criteria for the design of new gardens, and to show the process of creating a healing garden. Most of her gardens are located in the Midwest and Northeast, such as The Hearthstone Garden in Brockton, Massachusetts, and Lodi Good Samaritan Center in Lodi, Wisconsin. Refer to Fig. 2.1 for a visual example of her organization.

Table 2.3. Policy and Maintenance Recommendations. Adapted from Gardens in Health Care Facilities: Uses, Therapeutic Benefits, and Design Recommendations. (Marcus, 1995).

General Goals	Garden space is a resource to be used for maximum benefit, awareness and facilitating use will influence the level of benefit
	Considering the garden an essential part of the therapeutic milieu gives support to the entire hospital community
	Quality maintenance contributes to the health of plants, which in turn provides maximum therapeutic benefit
Specific Design Recommendations	Awareness is a critical factor
	Employee education will increase garden use/improve staff
	Encourage staff to promote the use of the garden
	Schedule meetings and events in the garden
	Communication can be easier in a casual space such as the garden
	Keep gardens open, locked gardens are as bad or worse than nothing
	Use of volunteers where money is limited relieves staff and patients
	Approach local garden clubs/volunteer organizations for support
	Maintenance is key to maximum therapeutic potential
	Encouraging wildlife is easier when organic practices are used
	Maintenance important in terms of “someone caring,” not attaining perfection

Nancy Gerlach-Spriggs, together with Richard E. Kauffman and Sam Bass Warner, Jr. published in 1998 Restorative Gardens: The Healing Landscape. In this book is outlined not only a thorough history of the healing garden, but also theories of healing garden design and case studies of more healing gardens all across America, including the Howard A. Rusk Institute of Rehabilitation Medicine in New York, New York, Friends Hospital in Philadelphia, Pennsylvania, and the Hospice at the Texas Medical Center in Houston, Texas. As with the work of Marcus and Tyson, case studies are used to begin to formulate design theory.

Together the work of Marcus, Tyson, Gerlach-Spriggs, and others begin to formulate a sound design process for creating healing gardens. The emerging contemporary theory of healing gardens is apparent in these works, which rely upon behavioral information documented through both their own studies and the many years of study by environment and behavior experts. Much of the study by designers

Pattern 114  
**Hierarchy of Open Space**

"Whatever space you are shaping—whether it is a garden, terrace, street, park, public outdoor room, or courtyard—make sure of two things. First, make at least one smaller space, which looks into it and forms a natural back for it. Second, place it, and its openings, so that it looks into at least one larger space. When you have done this, every outdoor space will have a natural "back," and every person who takes up the natural position, with his back to this "back," will be looking out toward some larger distant view."

Alexander et al., 1977, p. 559



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*A place to sit and think.*

**DESIGN OBJECTIVES**

***Person: Individual's Needs***

Provide for safety and security.

Allow for privacy.

***Interaction: Behavior***

Maximize spatial orientation.

Provide a variety of seating choices.

Fig. 2.1. Example of a Pattern Definition for Designing Healing Gardens  
Image from The Healing Landscape: Therapeutic Outdoor Environments,  
(Tyson, 1998).

has been conducted through observation and other methods often used in the field of environment and behavior. Marcus discusses different approaches to documenting and assessing people's feelings. She states, "When addressing people's feelings or change of mood, three approaches appear in the literature, each with a different level of reliability. The most accurate is monitoring physiological changes as an indicator of emotional shifts (galvanic skin response, blood pressure, heart rate, etc.). Self-reports are considered second in reliability, with the third, behavior observation, seldom used due to the extremely high level of interpretation required" (Marcus, 1995). This study will use methods common in the field of environment and behavior. These will be discussed in the Methods Chapter Four.

The Rooftop Therapy Park is unique as a study site because of its focus on physical rehabilitation. This thesis will attempt to understand how a healing garden with many programmed physical activities is also healing, and in what ways. How are the garden and the design process changed by an intense program of physical activity? Existing contemporary theory will be used as a departure point for formulating new guidelines specific to gardens with intense physical regimes of therapy, such as the Rooftop Therapy Park.

Chapter Three describes the study site, its history, creation, programming, and intent. It also provides insight into the needs of the users based on patients typically in the Rehabilitation Center.

## CHAPTER 3

### THE STUDY SITE

The Rooftop Therapy Park, as it is called, of Fort Sanders Regional Medical Center in Knoxville, Tennessee, was chosen as a study site in order to use a contemporary example of a healing garden in a long-term health care facility as a case study. In this case study it is possible to shed light on both historical and contemporary theories of the healing garden, and to use this example as a basis for developing an overall concept of why healing gardens should be a part of every contemporary long term health care facility.

Research is needed in order to begin to identify how landscape architects can use design to facilitate the healing process. In order to do this, the infinite intricacies of the healing process must be understood. Healing must be understood in its wholeness, not divided and subdivided into ailments and conditions, rather an understanding is needed of how the psyche, the spirit, and the body all work hand in hand. The healing garden may be the doorway for scientists and designers alike to unlock the secrets of the mind, spirit, and body connection.

#### LOCATION

Fort Sanders Hospital serves the east Tennessee region of the United States. The city of Knoxville is located in the ridge and valley geographic region of Tennessee, which includes a steep topography. Note the location of the city in figure 3.1. The urban area of Knoxville is quite hilly, and Fort Sanders is located on one of many ridges that make their way through the downtown. Refer to figure 3.2.



Fig. 3.1. Location Map of Knoxville, Tennessee. Map from mapquest.com

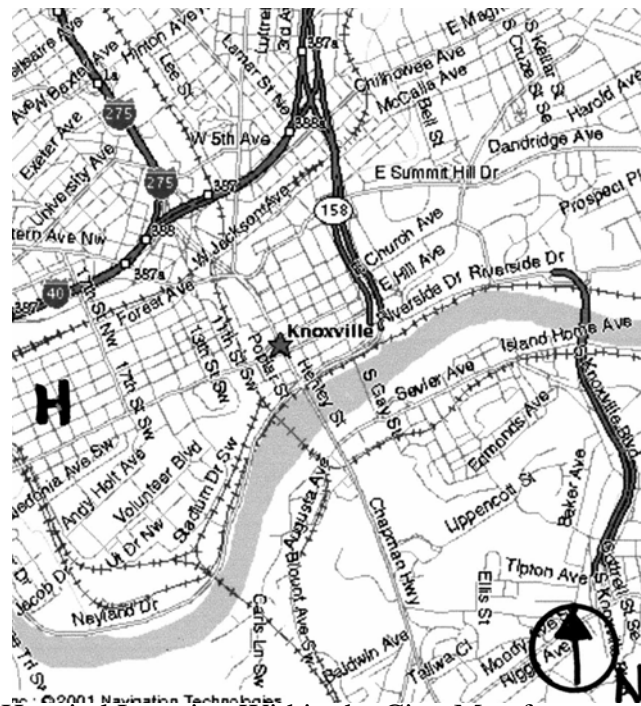


Fig. 3.2. Hospital Location Within the City. Map from mapquest.com

## THE REHABILITATION CENTER

The Rehabilitation Center is one of many clinical areas within Fort Sanders Regional Medical Center. Dedicated in 1978, the Center serves the southern Appalachian region. It uses a team approach to treat patients and help them gain maximum physical functioning, reintegration into society, and a sense of personal accomplishment. It occupies the third and fourth floors of the East wing of the main hospital. The Center's official name is The Patricia Neal Rehabilitation Center, named after the actress Patricia Neal, a Knoxville native who spent time recovering in the facility and subsequently donated money for its perpetuation. The Center's team approach provides physical, recreation, and speech therapy. Therapeutic activities take place in two gyms which have specialized equipment designed for use by patients with staff supervision, a recreation room with areas for social gathering, a pool table, and games, and off site activities at various locations such as a swimming pool, public parks, and areas where staff may help patients practice real life skills. The creation of the Rooftop Therapy Park allowed the Center the option of providing real life skills practice to its patients without leaving the security of the hospital. The center cites its ranking as a "Super Clinic" by Consumer Digest and its accreditation by the Commission on Accreditation of Rehabilitation Facilities and the Joint Commission on Accreditation of Healthcare Organizations.

## THE REHABILITATION CENTER USERS

Patients vary in age from the occasional youth under the age of eighteen to the majority who are middle aged to senior adults in their seventies and eighties. All patients are in the Rehabilitation Center in order to regain physical and mental control of their bodies, which was lost as a result of stroke, vehicular accident or other major trauma. Most patients have already spent time stabilizing in the hospital



before being transferred to the Rehabilitation Center to begin the long process of recovery. At full capacity the center provides care for seventy-three patients. Staff for the Center include physical, occupation, recreation, and speech therapists, doctors specializing in rehabilitation medicine, psychiatrists, psychologists, social workers, rehabilitation nurses and technicians, vocational counselors, case managers, and a chaplain. Families and friends are a constant part of the Center, with most visiting in the evenings after daytime activities are over. These activities are usually over around four or five o'clock.

## THE THERAPY PARK

The park is approximately thirteen thousand square feet. It is bordered on the east, south, and west by hospital buildings; only the north end of the park is somewhat open to the surrounding environment. Refer to figure 3.3, which shows the layout of hospital buildings. The hospital is surrounded by a mix of residential and commercial use, with the campus of the University of Tennessee only two blocks to the east. Figure 3.4 shows the view of the park looking north from atop the southern most building of the hospital complex. Downtown Knoxville can be seen to the north in the photo.

The park is visible from many parts of the hospital, and is officially available for use by anyone at the hospital; however, the park is designed for use by patients and staff of the Patricia Neal Rehabilitation Center. The park is only accessible through the Rehabilitation Center, which is located on the third and fourth floors of the East wing of the hospital. In order to enter the park, users must take an elevator from the fourth floor of the hospital down to the second floor entrance into the Rooftop Therapy Park. Figure 3.5 shows the elevator entrance into the park. Note the layout of the park shown on the park map figure 3.6.

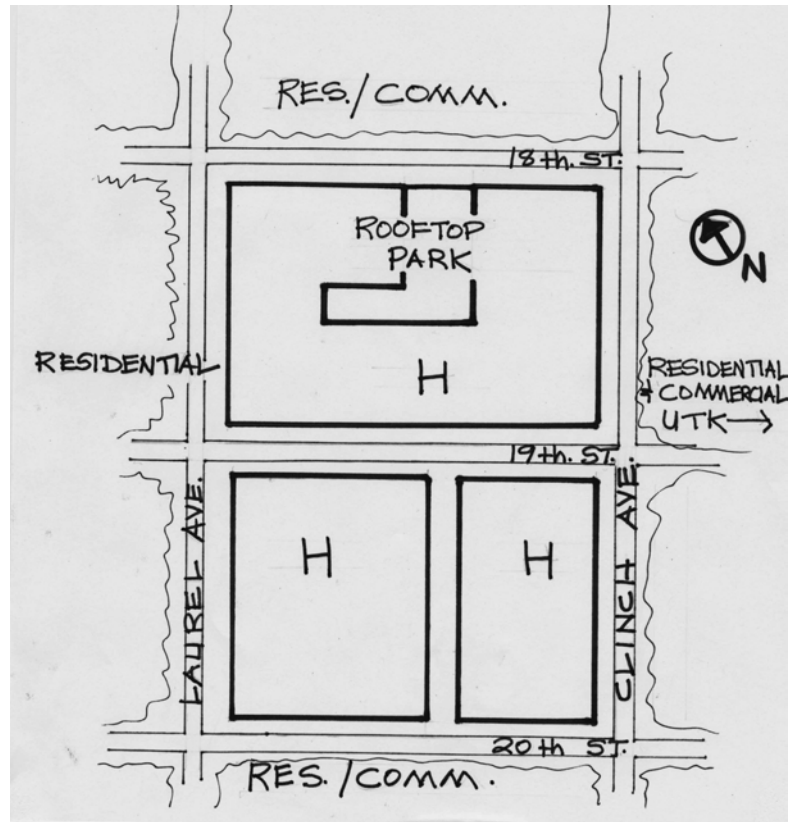


Fig. 3.3. Layout of the Hospital and Surrounding Areas.  
Diagram by the author



Fig. 3.4. View of the Park and Downtown Knoxville to the North.  
Photo taken by the author.

Upon exiting the elevator, the user is invited to stroll, or roll, along curving concrete paths that circulate throughout the park. In addition to concrete paths, various surface textures are used in the park as part of the rehabilitation of patients recovering from physical disability as a result of stroke or other trauma. Surfaces



Fig. 3.5. Elevator Entrance to the Therapy Park. Photo taken by the author

include mulched areas, gravel, rubber, brush-finish concrete, and also Astroturf. Figure 3.7 shows the view of the park upon exiting the elevator and facing south. Figure 3.8 shows the view as a park user proceeds across the rubberized ball court and approaches the therapy walk. Notice the small fountain on the right of the brick path, next to the vine covered gazebo.

## HISTORY

In the early 1990s Fort Sanders Regional Medical Center constructed a new surgery center between and joining two existing buildings, the East wing of the

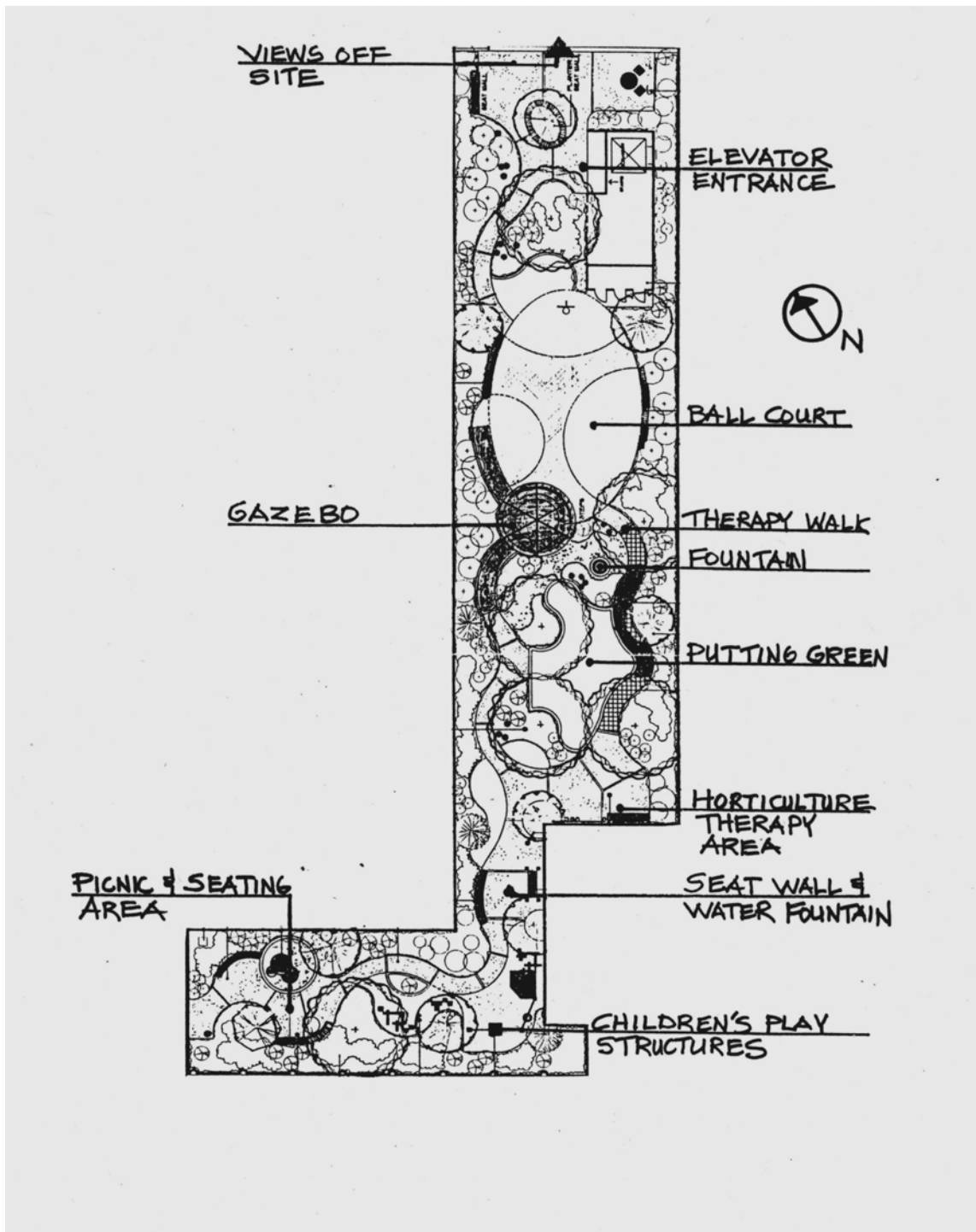


Fig. 3.6. Map of the Rooftop Therapy Park. Map labeled by the author.  
Original map by designer Michael Versen.





Fig. 3.7. View of the Park at the Elevator Entrance. Photo taken by the author.



Fig. 3.8. Ball Court and Gazebo at the Beginning of the Therapy Walk.  
Photo taken by the author.

hospital and a professional building to the west. As the two-story surgery center was being constructed, hospital staff began to realize the possibilities for the rooftop of the surgery center. Since the surrounding buildings were all four and six-story buildings, the rooftop of the surgery center could potentially be an eyesore, or be made into something beautiful for patients and staff to view from the many windows that would look down on to the second-story roof of the surgery center.

Initially the hospital proposed a plan for passive viewing of the rooftop, which would include placing some trees in planters on the roof for greenery. A local landscape architect was hired to complete the plans. With the hiring of the landscape architect, the therapists of the Rehabilitation Center rejected the passive program of the space and instead proposed a therapy park for use by the hospital staff, patients, and patient's families.

## DESIGNER'S INTENT

The therapists and landscape architect hired to design the original plan for the site designed the park as a usable therapeutic space, rather than simply a passive space for viewing (Thompson, 64). This was a risky venture, since convincing hospital administration to spend money on a garden would not be easy. Proving the value of the garden to the hospital was key. By pushing the concept for therapy, the budget swelled from an initial amount of \$120, 000 to approximately \$600,000 at the project's completion. When asked about the reaction of the hospital to the new plan, the landscape architect Michael Versen commented that initially there was much resistance. "The initial reaction? A 15-minute lecture about financial responsibility and designer pie-in-the-sky," recalls Versen (Thompson, 1998). Versen presented both the passive and active plans to the sponsoring foundation.

“They came back and said, ‘we can’t raise the \$120,000, but we will raise \$575,000 for the other garden” (Thompson, 1998).

Versen’s resolve to make the space a healing place led him in the design process. He solicited suggestions from staff and patients at the hospital. A design committee was formed that comprised the head recreation therapist, a physical therapist, occupational therapist, speech therapist, and a nurse. The therapists participating in the design process not only embraced the new plan, but also enthusiastically contributed to the design, and provided research as proof of nature’s role in the healing process. Interestingly, the hospital accepted existing research as proof that nature does indeed have a crucial role in healing. Hospital supporters of the therapy park cited the research of Roger Ulrich, Steven and Rachel Kaplan, and Sam Warner, as well as several others. This is very significant, when many health care providers still question nature’s role in the healing process, making it very difficult for design professionals to include amenities such as healing gardens in the design of health care facilities.

## PROGRAM ELEMENTS

Many activities are programmed into the park as part of the therapeutic regime. Most elements of the park serve multiple purposes in order to maximize use of the limited amount of space. A basketball court and putting green are designed for patients in wheelchairs. The basketball court surface is designed with two colors of rubber and serves as a figure-ground field for patients to practice their visual perception. The putting green also doubles as a bocce court. The curving concrete path is designed as a therapy walk. One path of the garden is designed with two, four, and six-inch curb heights for patients to practice negotiating curb changes. Multicolored play structures are handicap accessible. A wrought iron arbor/gazebo

serves as a place to congregate and rest, while also providing steps and a ramp for patients to practice on. There is a worktable and sink at wheel chair height for patients to participate in horticulture therapy.

Figures 3.9, 3.10, 3.11, and 3.12 show the basketball court and gazebo, therapy walk, children's play structures, and horticulture therapy area.



Fig. 3.9. View of the Ball Court from Under the Gazebo.  
Photo taken by the author.

## SITE CONDITIONS AND ENGINEERING

The roof of the surgery center was only designed to hold one hundred pounds per square foot; therefore all trees were sited above building columns. Soil had to be kept shallow and light. Soils in the park are only ten inches deep and composed of sixty percent soil and forty percent pine bark mixed with Styrofoam. With the surgery center located beneath the park, Versen consulted structural, mechanical,





Fig. 3.10. Curbed Therapy Walk and Putting Green. Photo by the author



Fig. 3.11. Multicolored Play Structures. Photo taken by the author.



Fig. 3.12. Sink and Potting Bench of the Horticulture Therapy Area.  
Photo taken by the author.

and electrical engineers in order to design a three-fold drainage system. The system included a center swale with subsurface pipes and a back-up system that drains off the roof in an emergency. A thermosensor irrigation system by Rainbird is designed to keep the soil at the right moisture content. It is designed to adapt to seasonal changes – opening valves and draining in warmer temperatures and closing valves whenever the temperatures dip below the freezing point (Thompson, 1998). The growing conditions created by the climate, shallow soils, and surrounding buildings create a canyon like environment. The park receives only a few hours of direct sunlight a day, and those are in the middle of the day when sunrays are the most

direct and harsh. However winds are kept gentle by the surrounding taller buildings, with only the north side of the park open to the surrounding environment.

## VEGETATION

Vegetation in the park includes a variety of evergreen and deciduous trees, shrubs, and groundcover all chosen specifically to survive in the somewhat harsh conditions of the rooftop environment. Simple plantings were used in order to keep maintenance costs low. Evergreen trees, shrubs and groundcover were used to provide a green view even in cold winter months, however the dominant overstory trees are deciduous, providing shade in hot summer months and allowing sunlight in during winter months. Table 3.1 categorizes the plant material and plant characteristics such as evergreen versus deciduous. Figure 3.13 exhibits a lush view.

## LIGHTING

Path lights and overhead lighting are used at night. Some uplighting is used on trees and on the supports of the arbor/gazebo. Most of the lighting is in an attempt to provide favorable nighttime views from patient rooms. The lighting would make the park usable at night, however the park is typically locked soon after sundown. The locking of the park at night is for safety, as well as a part of keeping Rehabilitation Center patients on a consistent sleep schedule.

## MAINTENENCE

A local landscape contractor maintains the park. Patients as well as the landscape contractor install new plantings. The landscape contractor periodically brings in flats of annuals for patients to pot and place in the park. The head of recreation therapy at the Rehabilitation Center is responsible for overseeing the maintenance of





Fig. 3.13. Lush View of Park Vegetation. Photo taken by the author.

the park, as well as recommending any major new plantings, such as trees and shrubs.

This chapter has provided an introduction to the Rehabilitation Center and a tour of Rooftop Therapy Park. It has described the purpose and philosophy of the Rehabilitation Center and given an overview of the patient types and other users such as various staff members and visiting family members.

With this site specific information the following chapter will provide the framework for the methods of this study, as they were specifically designed to effectively evaluate the Rooftop Therapy Park.

Table 3.1. Plant Typology

Canopy Level	Plant (Common Name, <i>Botanical Name</i> )	Evergreen/Deciduous
Tree	Flowering Dogwood <i>Cornus Florida</i>	Deciduous
	Canadian Hemlock <i>Tsuga canadensis</i>	Evergreen
	Threadleaf Japanese Maple <i>Acer palmatum 'Dissectum'</i>	Deciduous
	Little Gem Magnolia <i>Magnolia grandiflora 'Little Gem'</i>	Evergreen
	Weeping Willow <i>Salix babylonica</i>	Deciduous
Shrub	Azalea <i>Rhododendron spp.</i>	Evergreen
	Dwarf Fountain Grass <i>Pennisetum alopecuriodes 'Hameln'</i>	Deciduous
	Green Euonymous <i>Euonymous spp.</i>	Evergreen
	Maiden Grass <i>Miscanthus sinensis</i>	Evergreen
	Oakleaf Hydrangea <i>Hydrangea quercifolia</i>	Deciduous
	Rosemary <i>Rosmarinus officianalis</i>	Evergreen
Vines/ Groundcover	Carolina Jessamine <i>Gelsemium sempervirens</i>	Evergreen
	Wisteria <i>Wisteria sinensis</i>	Deciduous
	English Ivy <i>Hedera helix</i>	Evergreen
	Switch Cane Bamboo <i>Bamboo spp.</i>	Evergreen
	Mondo Grass <i>Ophiopogon japonicus</i>	Evergreen
	Moonbeam Coreopsis <i>Coreopsis spp.</i>	Deciduous
	Various annuals planted seasonally	Deciduous

## CHAPTER 4 METHODS

The purpose of this study is to identify elements of the rooftop therapy park that aid in the healing process by providing for the physical, emotional, and spiritual needs of the patients, staff and visitors. As stated in Chapter Three, the Rooftop Therapy Park is a significant study site in that few if any previous studies of gardens in health care facilities have been of gardens designed with the intent of actively aiding the healing process. A landscape architect, as well as a team of therapists from the hospital, designed the rooftop therapy park. The park is an excellent place to explore how healing can be enhanced by a garden-like setting.

In this chapter the framework of methods will be discussed. This framework includes the approval process, interviews, observation, a survey, and a questionnaire. The results to these methods will be presented in the next chapter.

### SETTING UP THE PROJECT

Upon selection of a study site, the process of approval was begun. Institutional Review Board approvals from both Louisiana State University and the Covenant Health System, which is the umbrella company for Fort Sanders Hospital, had to be obtained in order to proceed with the study. This was a lengthy process, however once familiar with the IRB process it would now be easier to receive approval for future studies at hospitals.

### WRITTEN MATERIALS

Historical analysis of the park involved speaking with various hospital staff including the marketing director for the hospital, as well as the head recreation therapist in the Rehabilitation Center. The marketing director provided promotional materials used by the center in the fund raising process. The office of recreation

therapy provided informational brochures about the Rooftop Therapy Park. An article highlighting the park appeared in the April 1995 issue of Landscape Architecture magazine. This article was used for preliminary information about the park and the process leading to its creation.

## INTERVIEWS

Interviews were conducted in order to answer questions about the Therapy Park that could not be easily answered by any other study method. Interviews cast light on the original intent and philosophical goals of both the designer and the hospital, and how these took physical form in the park itself. It was necessary to conduct interviews over the telephone. Distance and time constraints prevented in person interviews.

## DESIGNER INTERVIEW

Both the hospital brochures and the 1995 article in Landscape Architecture magazine proclaim that the park is able to heal in a physical, emotional, and spiritual sense. The landscape architect was interviewed to understand how the park was designed to meet these different needs. What specific steps were taken in the design process to ensure that the park would truly be a healing environment in each of these areas? Also, it was important to understand how the designer altered the standard design process in order to design for specific therapeutic goals set by rehabilitation staff. What expertise did the designer rely on to make the park healing? Specific questions from the interview included: How specifically did you design the space to be healing physically, emotionally, and spiritually? What led your design process? How did you design the space for viewing from hospital windows? Refer to appendix A to read the entire transcript of questions and answers

from the telephone interview with the designer. The results of the interview will be presented in the next chapter.

## THERAPIST INTERVIEW

It was important to have a source of information about the rooftop park, besides the surveys and questionnaires and brochures, as these are designed to provide only certain types of information. Talking to an actual person who has had some control and leadership over the park since its inception was very helpful. This head recreation therapist was able to “fill in the gaps” and help make sense of the big picture. Issues perhaps not apparent through the other forms of information were brought forth and discussed – such as maintenance issues and specifics about the design process. Some of the questions asked include: How did the idea first develop? What were some of the suggestions that were not included in the final design? How was the decision about park access made? What problems have surfaced since the park’s inception? Refer to appendix B to read the entire telephone interview questions and answers. The results of this interview will be presented in the next chapter.

## BEHAVIORAL OBSERVATION

Observation is one of the most powerful tools of designers as it enables them to really see how people use and move through spaces. Good designers rely on research – often their own return trips to past designs to see what design elements were successful, and what were not. This process is critically important when designing healing spaces for people. The intentions of the designer may be very different than the actual experiences of the user. Only careful review of the actual activity in a garden can inform the design process and lead to the creation of improved garden spaces. As discussed in the Literature Review, observations of



many gardens in health care facilities have revealed both successful and unsuccessful garden spaces, as well as reasons for their success or failure. The lessons learned from these observations are an invaluable source of information to designers, and the reason for the inclusion of observation in this study.

The park was observed during regular daytime hours at the hospital. The observation occurred over a one-week period, and included various times of day. Observation times were scattered throughout the day in order to record the most activity, and to determine when most park use occurred. Morning (10:00am – 11:00am), lunchtime (12:00pm – 1:00pm), afternoon (2:30pm – 4:30pm), dinnertime (5:30pm – 7:00pm), and evening (7:00 pm – 8:00pm) observations were recorded. Observations were recorded from the gazebo because of its central location and the view of most of the park from this point. Observations were recorded on maps of the site, in order to accurately place actions at the points of occurrence. Time and weather conditions were also recorded, as these are two of many factors affecting the use of the park. Refer to appendix D to see a copy of the site map. Figures 4.1 and 4.2 are sketches drawn during observation of the park. People were observed using the park, both during the creation of these sketches and while photographing the site. However people were not included in any images to maintain a level of privacy. Figure 4.3 is an actual map used to record behavior during the study. Behavior in the Therapy Park was recorded by drawing movement patterns on copies of the site map, and by noting where people stopped, where people chose to sit, and how long they stayed in the park. Observations were recorded from under the gazebo, as this was the most common gathering place and the least conspicuous. It was important to blend in order to allow people to use the

park as normally as possible. Obvious observation might have skewed the results as users responded to the uncomfortable feeling of being observed.

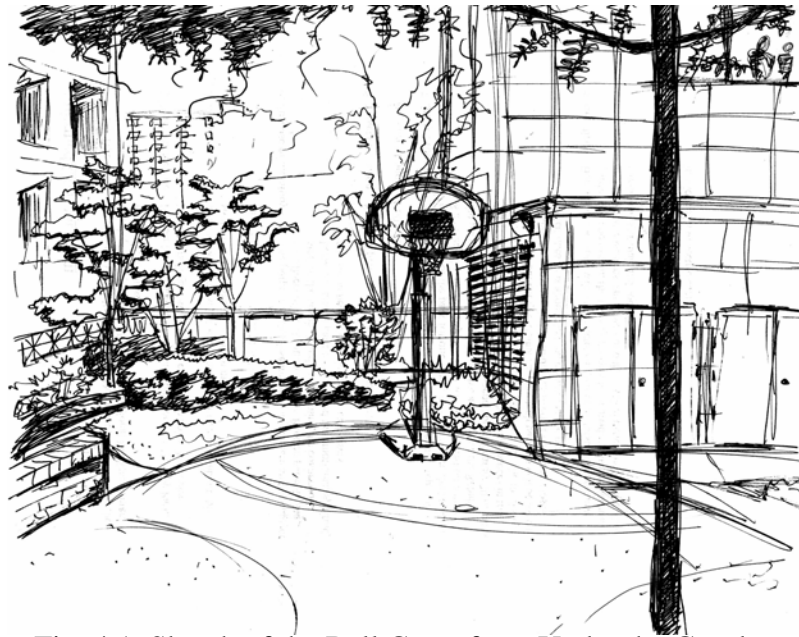


Fig. 4.1. Sketch of the Ball Court from Under the Gazebo.  
Sketch drawn by the author

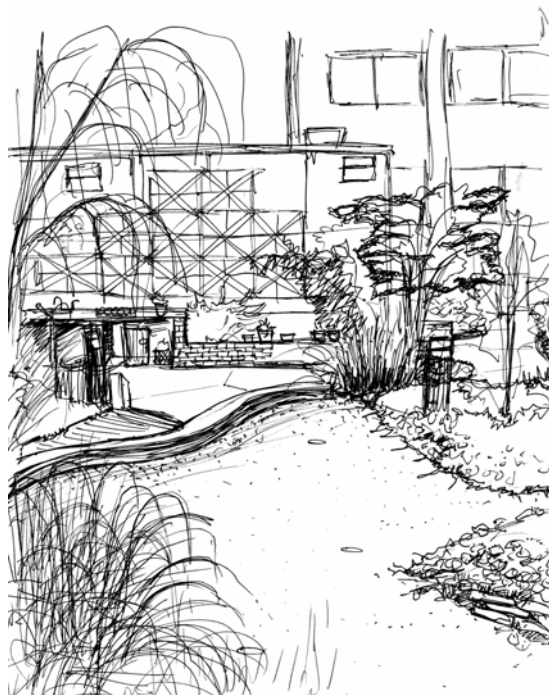


Fig. 4.2. Sketch of the Putting Green and Horticulture Therapy Area.  
Sketch by the author

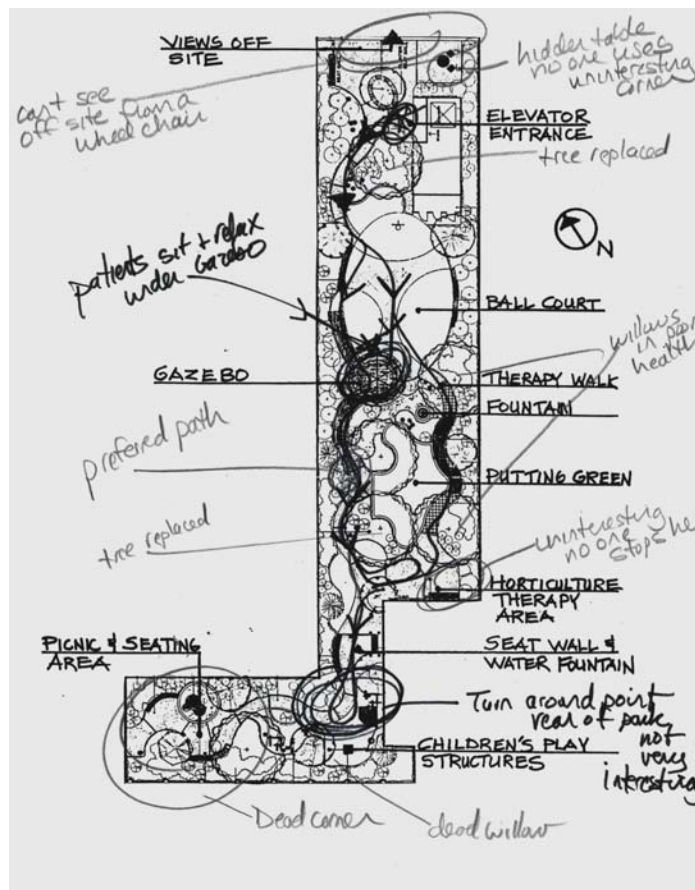


Fig.4.3. Observation Notes. Map and notes by the author

## STAFF SURVEY

The purpose of the staff survey was to determine whether or not the park has a significant effect on the quality of the work environment for hospital staff, and also to gain the staff's perspective on the patients using the park.

The hospital can be quite a hostile, unfriendly place to spend large amounts of time. Many hospitals are understaffed which places increased pressure on individual staff members. Hospital staff experiencing undue amounts of stress cannot be expected to provide the best level of care possible. The work environment for hospital staff needs to offer some form of stress relief, as well as encourage a sense of pride in the institution and the level of care that is achieved there.

In terms of defining the impact of the park on patients, the staff has the advantage of time. The staff sees many patients come and go, which may make them better able to identify the impact of the park on patients. This is especially true of the Rooftop Park at Fort Sanders, since by far the majority of users are Rehabilitation Center patients. The staff was able to comment on the effects of the park on all patients, regardless of the type of patient. The staff survey began with questions about the affect of the park on the work environment for staff, such as How valuable is the Rooftop Therapy Park to your overall work experience in the Rehabilitation Center? Staff was also asked to rate the importance of the park to them personally, in terms of having the park as an option that is different from indoor areas, viewing from inside the hospital, to use for private time, and to use to relax and unwind. The second part of the survey asks the staff open-ended questions about their experiences with patients and whether or not their patients have expressed feelings about the park. These questions were open-ended to allow freedom of response to identify unknown staff perceptions of the patient experience. Some of these questions include: can you identify differences in patients before and after the existence of the park? What are some common patient responses to the park? If you have had a memorable experience with a patient in the park, please write about it. For the consent form and a complete staff survey, refer to appendices C and E. The staff survey was distributed in two ways. Staff break rooms were visited during lunch hours and staff members were asked to participate. This was especially effective in gaining the responses of the therapy staff as they all shared the same lunch hour and only two break rooms. Nursing and other staff members had a much less regular schedule and multiple break rooms. Surveys were left in break rooms and at nurses stations with instructions and a deposit box. The nurses

stations were also visited frequently, however the hectic schedules of the nurses seemed to prevent many of them from participating. Typically the survey took between fifteen and twenty minutes to complete, however staff were encouraged to spend as much time as necessary completing the survey and return it to the recreation therapy office at their convenience. By far the most effective means of gaining completed surveys was through personal contact with the staff member. The results of the staff survey are presented in the next chapter.

## PATIENT QUESTIONNAIRE

The purpose of the patient questionnaire was to determine the effectiveness of the rooftop park in aiding the healing process. The patient questionnaire was designed to record patients' perceptions of the park. The first part of the questionnaire asks patients about their feelings towards the park, and the availability of it, regardless of whether or not the patient has actually used the park. This was to determine whether or not patients valued the idea of outdoor space, and if they considered it vital to their well being. Questions in this section included: How valuable is the park to your overall experience here in the Rehabilitation Center? Also, as in the staff survey, patients were asked to rate the park's importance to them personally, according to various statements such as: having an option that is different for indoor areas, having a view from inside the hospital, using the park for private time and with family and friends, and using the park to be outside and relax, etc. The second section of the questionnaire focuses on patient's perceptions of the park and its different elements as they have experienced them, and how patients feel the park has effected the quality of their stay while in the Rehabilitation Center. Specific questions are asked about the park's ability to provide for the patient's different needs, not simply physical, but emotional, spiritual, and social. The

purpose of these questions was to show a connection between certain park elements and certain types of healing, which could potentially be very beneficial information to designers and health care professionals as they try to create healing hospital environments. These questions were open-ended to allow patients to respond free of direction and to identify possible unknown relationships. Specific questions include: How do you use the park? Why do you choose the park over indoor areas? How well does the park meet your physical, emotional, and spiritual needs? Do you believe your physical well being is linked to your emotional spiritual and social well being? Questions were also asked about specific elements of the park such as the basketball court and the therapy walk, and these elements's ability to offer physical, emotional/spiritual, and or social healing. This question was particularly important in defining the role of each park element in the healing process. The hypothesis behind this question was that typical park elements such as simple benches and ball courts would have significant meanings to patients, beyond their obvious physical function.

It was necessary to consider that approximately fifty to sixty percent of the patients in the Rehabilitation Center at any given time are suffering some cognitive disability, usually as a result of a stroke or other head trauma. This meant that the patient questionnaire could only be given to patients not suffering from cognitive disability. Rehabilitation Center staff was consulted as to which patients should be asked to participate in the questionnaire, based on their condition and ability to answer the questions, and to avoid disturbing patients unable to participate. Refer to appendices C and F to read the consent form and entire patient questionnaire. The results to the patient questionnaire are presented in the next chapter.

This chapter has presented the framework for the study of the Rooftop Therapy Park. The next chapter presents both the results and discussion of each study method.

## CHAPTER 5

### RESULTS AND DISCUSSION

This chapter presents the results of each study method of the post occupancy evaluation, with a discussion of the significance of the results in each section.

#### WRITTEN MATERIALS

The results of the historical analysis of the Rooftop Therapy Park revealed some relevant information for designers. Hospital staff relied on the studies of Roger Ulrich, and Rachel and Steven Kaplan as the factual basis supporting the theory of the environment having the ability to heal. Brochures used in the fund raising process for the park quoted the research by environment and behavior psychologists as factual proof of nature as a healer. The marketing director for the hospital provided documents highlighting the history of the park. This document states:

The link between nature and healing is fact. Other hospitals have landscaped areas. Some even have small therapy parks. But nothing like this exists anywhere in the country. Not a 13,000 square foot rooftop therapy park! It's a daring vision. It is yet another innovation that will set the Patricia Neal Rehabilitation Center apart in what it can offer its patients" (Fort Sanders Health System).

The park was specifically designed to use nature and the outdoors as healing agents for patients of the Rehabilitation Center. The Rehabilitation Center's claims of the park's uniqueness stem from the park's inclusion of physical therapy, whereas other hospital gardens appear to be designed for more passive use. Current brochures about the Rooftop Therapy Park also state the healing ability of the park. Notice the front of the brochure about the park in the following image. Figure 5.1 is one of the informational brochures that patients receive either before or at admission to the Rehabilitation Center. The brochure states that the rooftop park is "Where Science



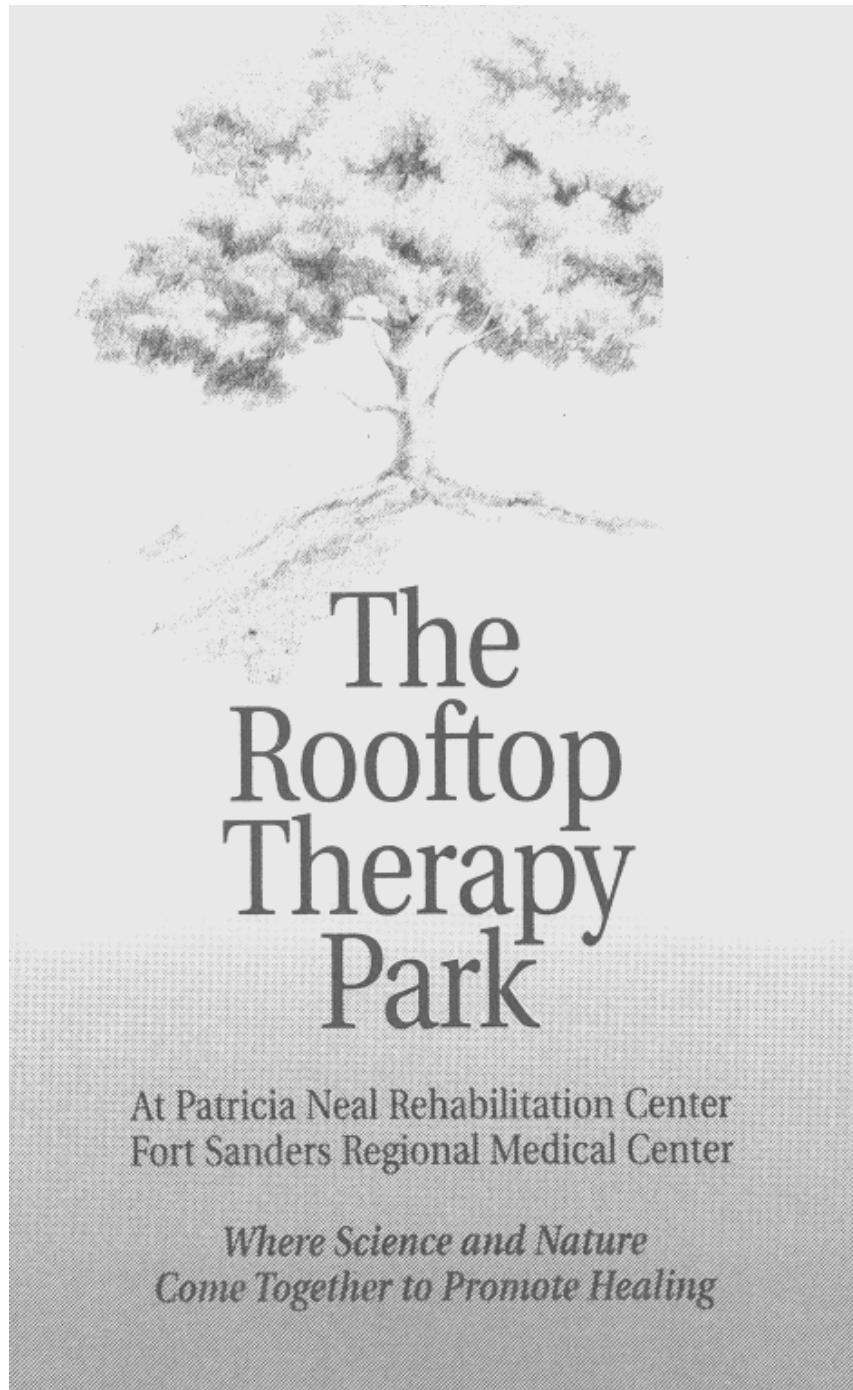


Fig. 5.1. Part of a Brochure Cover for the Rooftop Therapy Park.  
Brochure courtesy of Ft. Sanders Regional Medical Center.

and Nature Come Together to Promote Healing.” The park is described in detail inside the brochure, and it goes on to state that a therapeutic garden was achieved “where science and nature come together to promote healing of the mind, body and

spirit.” This trio of humanity is referred to many times in literature about the park, from brochures produced by the hospital to the written intentions of the designer. The other study methods are more revealing of the park’s ability to meet or not meet the goal of healing the “mind, body, and spirit.”

## DESIGNER INTERVIEW

The designer of the Rooftop Park was a local Knoxville, Tennessee landscape architect, Michael Versen. He is quoted in the 1995 Landscape Architecture magazine article “Healing Gardens.” In this article Versen speaks of the Rooftop Park as a place where one can find physical, mental, and emotional healing (Thompson, 1995). Unfortunately, in this article Versen does not elaborate how the park facilitates these different types of healing. The architect responsible for constructing the new surgery center at Fort Sanders Hospital hired Michael Versen. Originally he was hired to simply draw the plans for a passive space for viewing only from the hospital windows. The therapists of the Rehabilitation Center rejected this passive plan and suggested that the rooftop space be designed for use by the patients. Therapists then worked with Versen to develop a design that would meet the physical and aesthetic needs of the hospital and Rehabilitation Center.

During the interview Versen revealed his intent for the park and how he designed the park to meet the needs of patients and staff. Versen was asked specifically how he designed the park space to be healing physically, mentally, and emotionally. Versen mostly talked about the research he conducted on the construction of a rooftop garden. Versen said that designing a healing garden or therapy park was “no different than designing any other project.” He said that the design process is translatable to any project. He talked a lot about the healing aspects of nature, yet he did not point to any specific research that he relied upon other than his own sense of

the importance of the human connection to nature. His approach to this design was a function of his inventory and analysis of both the site, program, and needs of the users.

When asked about the accessibility of the garden, Versen spoke of the park's design necessitating an elevator for access. He did not mention that there were any other options for access to the park, such as other hospital floors or wings.

Versen talked about viewing the garden from the hospital windows as important, and he remembered placing the children's play structures outside of the maternity wing of the hospital, so that expectant mothers or mothers in labor could be distracted by children playing outside the window.

Lastly Versen discussed the health care industry and the changes he has seen over the past ten years. He said health care facilities are becoming very interested in the concept of healing gardens or therapy parks from a marketing standpoint. Versen said that gardens are another way for a health care facility to stay ahead of its competitors, and provide better service.

It would be unfair to critique Versen's design process in terms of contemporary theories, as these were not available at the time of this garden's creation in 1993. It is true that "the design process" is translatable, however it seems that a more specialized process is necessary to create a truly successful healing garden. It seems from the words of Versen that while the research of environment and behavior experts was used in the initial stages to gain funding support, that same research was not taken a step further and used in designing the actual spaces of the Rooftop Therapy Park. Several design issues such as accessibility, viewing, and details became apparent through the behavioral observation, staff survey, and patient questionnaire. Some of these issues may have been beyond the control of the

designer, as this Rooftop Park was a retrofit to the existing hospital campus and newly constructed surgery center. These issues will be discussed further in the following sections. Refer to appendix A for a transcript of the telephone interview with Versen.

## THERAPIST INTERVIEW

Al Kaye, the head recreation therapist in the Patricia Neal Rehabilitation Center, was interviewed to gain insight into the hospital's perspective of the initial design process, to understand the life of the park since implementation, and to assess the therapeutic value of the garden to the hospital. Maintenance issues were discussed as these have affected the park in various ways. Al Kaye was particularly informative as he chaired the hospital's design committee, which worked closely with the landscape architect to design the park. The following is a summary of the issues discussed both over the course of the study at the Rehabilitation Center, as well as in a telephone interview with Kaye.

The hospital's design committee was comprised of a recreation therapist, an occupational therapist, a physical therapist, a speech pathologist, and a behavioral medicine psychologist. A nurse or other staff member was not included on the design committee. The reason for the exclusion of other staff members is unclear. As the surgery center was being constructed, suggestions were volunteered from both the patient and clinical sides to do something with the bare space on top of the new surgery center. An architect was already involved and a landscape architect was brought on board. Kaye stated that "We gave Mike [the landscape architect] an education on access...our design committee gave suggestions to Mike...he came up with three drafts for which we gave cost figures and presented to the foundation." The foundation approved the plan and agreed to raise the \$575,000 necessary. Of

this figure, approximately \$405,000 would go for structural improvements, with \$170,000 for the garden. Design suggestions were extremely diverse and included an old car placed on the roof for patients to practice getting in and out of a car. Kaye stated that eighty-five percent of the design suggestions were included.

Access to the park was debated. Original plans called for the entrance to be off of the second floor of the north tower of the hospital. The entrance was moved to the fourth floor of the Rehabilitation Center, which is the southern border of the park, in order to have a closer access point for patients. This change made an elevator necessary for access to the second story park from the fourth floor.

Kaye identified the need for a greenhouse. Winter weather conditions prevent patients from using the park in the winter. A greenhouse would allow patients to participate in horticulture therapy regardless of the season. However, Kaye stated that insurance carriers would not reimburse for Horticulture Therapy, so a greenhouse would have to be self sufficient and environmentally controlled, as well as handicap accessible. The insurance issue has prevented the Rehabilitation Center from making horticulture therapy a major aspect of the therapeutic regime. Horticulture therapy is left as an aside to the other program elements, and money is not available to hire a Horticulture Therapist.

Kaye commented on the fact that park doors are locked around 9:30 PM each night. Patients have a full day of various therapies and by about 10:00 PM patients are going to bed. The day is very tiring and night use of the park is very little, although the park is lit.

Kaye spoke of the major benefit of the park being the patient's opportunity to sample real life, while in the safety of the hospital care. Patients have always been

taken off site for various activities, and they still are, but now they have the option of staying at the hospital.

Kaye had the most to say about park maintenance. An independent landscape contractor, who is also responsible for maintaining the entire hospital grounds, handles general maintenance of the park. The Rehabilitation Center administration is responsible for overseeing the maintenance of the park. Specific decisions, such as plant replacement, are often left to Kaye. This is largely due to the recreation therapy department's use of the therapy park, which is by far the greatest of any therapy group, and Kaye's leadership over the recreation therapists. \$8500 is budgeted each year for maintenance of the park, including the delivery of flats of annuals every couple of weeks for patients to pot or plant in the soil of the park. Kaye stated that the first few years were testing years. Originally the park included some grassy areas that have since been replaced with mulch. Mowing the grassy areas became problematic because the maintenance staff was using gas-powered mowers to trim the grass. Gas fumes were complained of in the operating rooms, whose air intake vents are on the roof. This problem has also prevented the Rehabilitation Center from grilling in the park. The irrigation system has also been a problem. Kaye stated that pipes must be replaced every year because they freeze and burst in the winter. Kaye has been told that shallow soil and pipes without enough slope for positive drainage have caused the yearly freezes. Certain plant choices have been a problem, especially the bamboo used in several locations. The bamboo (Bamboo spp.) has multiplied vigorously and grossly overgrows its original areas. The main canopy tree of the park is Weeping Willow (Salix babylonica), and several of these have died or are near death. Kaye pointed to the need for better root maintenance, recalling the loss of at least one tree to termites. Treating plant pests

and diseases is a problem since pesticides and insecticides must not be harmful to people. Two of the weeping willows have been replaced with little gem magnolias (Magnolia grandiflora 'Little Gem'). Other willows will soon need replacing and a better tree replacement may need to be identified.

Kaye summed up his comments about the park by stating that overall the park has had a very positive impact. It seems that this comment is in relation to the overall positive attitude towards the idea of the park, but not a fact that is documented by any studies or attempts to evaluate the real impact or experience of using the park. A key statement from Kaye was that “the park is an amenity, and people look at amenities as opportunities.” That may be true, however deeper issues about the quality and usefulness of the park remain. The following paragraphs provide some discussion of the information provided by Kaye.

The fact that a nurse was not included on the design committee is informative. It became evident through the observation and staff survey that nurses very seldom use the park. The park is not designed for convenient use by staff, other than those therapy staff whose specific job is to take patients into the park for therapy. Nurses commented that understaffing by the hospital makes their jobs even more stressful, with little or no time to use the park. A stronger indoor-outdoor connection could have helped this problem. This leads to the next issue, accessibility. To say the least, getting in an elevator and traveling down two floors is not the most natural or logical progression into a garden. Not only is access difficult, but also the indoor-outdoor connection is lessened more by the separation of floors. A greenhouse would be a great benefit, possibly extending the use of the garden into the cold months of the year. Currently the park is used very little when the weather is not “perfect.” A possible solution to the problem of no reimbursement by insurance

companies for horticulture therapy would be greater community and volunteer involvement. This could also help alleviate maintenance issues and increase the health and “greenness” of the park. Some of the problems with certain plant choices could possibly have been avoided with more careful plant selection and planning. Careful planning might also have provided a means of venting fumes such as those from grilling off the park level, so as not to disturb interior areas whose air intake vents are located at park level. Grassy areas might return to the park with the use of electric mowers and trimmers. The issue of pipes freezing in winter might be avoided through better planning, design, implementation, and maintenance. Pest and disease problems are a maintenance issue, and need to be addressed organically, to protect the health of all users. Refer to appendix B for the transcript of the phone interview with Kaye.

#### SITE OBSERVATION

The initial site analysis took place in March of 2001. Additional analysis occurred on a second site visit in June of 2001. These two visits allowed viewing of the site under different seasonal conditions. On the March visit spring was just beginning and the trees were beginning to leaf out. Azaleas and pansies were in bloom, and patients were beginning to use the park with daytime temperatures reaching into the lower seventies. By the June visit summer had commenced and the park was fully leafed out with evidence of many more users. Plants had been potted and placed in the ground in various park locations. Observations of site conditions were recorded in the inventory. Analyses were conducted based on the observations.

The park’s design is successful in providing an option for outdoor physical therapy to the Rehabilitation Center’s patients. However, access to the park is very limited by the elevator. As stated previously, clearly a stronger indoor-outdoor



connection could have been achieved with an entrance to the park at park level. A person interested in visiting the park must exit through the dining room of the Rehabilitation Center to the elevator, and travel down two floors. The elevator also slows down accessing the park. Only two wheelchairs will fit in the elevator at one time, and the distance and time separation of the park from the inside prevents any patients on gurneys from using the park. No signs are posted instructing someone of how to find the park. The park is officially for use by anyone at the hospital, however finding the way to the park would prove very difficult. As in studies by Marcus, staff at the front desk of the hospital has no idea that a therapy park even exists. Apparently this is not completely accidental. The Rehabilitation Center claims a degree of ownership over the park, since monies from its founders and supporters were used in the park's construction, and the park was designed with the program of physical therapy for Rehabilitation Center patients in mind. Therefore signs advertising the park to the entire hospital are not used, even though it is officially open to anyone at the hospital. The park was created with a dual purpose, to provide outdoor therapy to Rehabilitation Center patients, as well as provide a green view from hospital windows for non Rehabilitation Center patients. It might be said that the park is fulfilling the stated goal of an "improved view" for general hospital patients, certainly it is an improvement over concrete, however many regular hospital patients probably are never aware of its existence. Rehabilitation Center patients learn about the park from the recreation, occupational, and physical therapists actually taking them into the park for therapy. For other hospital patients, the park is barely visible from the interior of the hospital. This is largely due to the sunken nature of the space, and to pre existing conditions before the park was constructed. Unfortunately, many of the few rooms of the hospital with good views

of the park are used for offices and laboratories. This is not to say that staff should not be able to enjoy views of the park, however it seems that the prime rooms for viewing the park might best be used by patients, who may have difficulty seeing out of the high windows. Figure 5.2 is a photo taken from a staff office. A patient that is lucky enough to have a room with a view of the park must move all the way up to the window in order to see down into the park. Viewing the park from a hospital bed is impossible. Windows in patient rooms are high, especially for individuals who are bed ridden or wheel chair bound. Notice the views photographed by standing next to patient's windows in figures 5.3, 5.4, and 5.5.



Fig. 5.2. View of the Park from a Fourth Floor Office. Photo taken by the author



Fig. 5.3. View from a patient room. Photo taken by the author



Fig. 5.4. Open Window View from a Patient Room. Photo taken by the author





Fig. 5.5. View from a Third Patient Room. Photo taken by the author

Also, when looking out of many windows, large rooftops and terraces without green are directly in view and more at eye level than the park itself. It would seem that from the perspective of viewing green out of hospital windows that some of these other terraces and rooftops might have been more effective in providing a desirable view for patients. Notice the barren rooftops in figures 5.6, and 5.7.



Fig. 5.6. View of the Park from the Elevator Terrace. Photo taken by the author



Fig. 5.7. View from a Patient Room, Blank Terrace to the Right.  
Photo taken by the author



It would seem that the best views of the park would be from the Rehabilitation Center itself, since its patients are the primary users, however this is not the case. The views from patient's rooms as well as group rooms, such as the Rehabilitation Center's gym, do not take advantage of a good park view. In fact, the windows are covered in murals painted on the window glass, as seen in figure 5.8.



Fig. 5.8. Second Floor Gym Windows. Photo taken by the author

Upon opening one of the gym windows pictured above, a wonderful sliver of a view of the park is achieved. Refer to the photo figure 5.9. Unfortunately, windows in the gym would only open slightly, as seen in figure 5.9. Also, with the windows closed, only a slight view of the park is possible. This is for two reasons: first, hospital windows are tinted to block out glaring sun, second, mini blinds are encased between the panes of glass, so that it is only possible to open the blinds, and not raise them to the top of the window for increased clarity and outdoor viewing



Fig. 5.9. View of the Park from Open Second Floor Gym Window.  
Photo taken by the author

Many aspects of the hospital and therapy park design point to the importance of designing the indoor and outdoor environments together. Adding gardens to a hospital many years after initial construction inevitably becomes a band-aid approach to fixing a problem, rather than a visionary effort to make the indoor and outdoor spaces work together to rehabilitate the patients, and provide a more pleasant work environment for staff.

The park itself does have a protected, enclosed, somewhat intimate feel, though the heights of the surrounding buildings tend to dwarf the space and give the feeling

of being in a fish bowl, as stated by Marcus in some of her case studies of hospital roof gardens and courtyards (Marcus, 1995). Some parts of the park feel sterile, and appear a bit unfinished, perhaps in need of more plant material to soften and humanize the scale of the space. Refer to photo figures 5.10, and 5.11.

Programmatically, the park is designed to provide an outdoor option for therapy. Patients in the Rehabilitation Center have an extremely busy daily schedule, full of various therapeutic activities. Therapists working in the Rehabilitation Center have the option of taking patients into the park for therapy. In good weather, patients often have the opportunity to use the park as part of their daily regime of treatment.



Fig. 5.10. Exposed Feeling on the Putting Green. Photo taken by the author





Fig. 5.11. Bare Corner of the Park. Photo taken by the author

Patients may also use the park in evening hours after scheduled activities are over. These times for use are not bad, however the park becomes a special place to go instead of being fully integrated with the hospital and Rehabilitation Center. Instead of being a place that is easily enjoyed any part of the day, such as viewing while participating in other activities, or waiting for the next activity, the park is like a room that can only be visited when time and weather permits.

Vegetation on the site is fairly lush, however there are several questionable plant choices. Weeping willows are the dominant shade tree used in the park. Several of the willows are in extremely poor health - near death. Willows are particularly water hungry trees, so their use on a shallow soiled, hot and dry rooftop is questionable,

even in the presence of an automatic watering system. It appears that willows may have enjoyed good health and growth for their initial years in the park, but as their root systems expanded to the maximum allowable space in the ten-inch deep soil, they began their decline. Notice the near death willow in the photo figure 5.12.



Fig. 5.12. Weeping Willow in Poor Health. Photo taken by the author

It is also questionable whether or not plants in poor health should be allowed to remain in a space designed to be uplifting and healing. Two dead weeping willows have been replaced with little gem magnolias. Magnolias have notoriously sensitive root systems, so their success in the park is uncertain. Also, the choice of magnolias may not be in keeping with the original intent of the design. The extensive use of bamboo is also notable. The running bamboo has covered large areas of the park, overgrowing its originally intended areas and becoming a maintenance problem.

The park is lit at night, however the doors to the elevator are locked at approximately 9:00 PM each night. During summer months lights are not needed

before 9:00 PM with the long hours of daylight, though in the spring and fall lighting is needed earlier in the evening. Lighting also provides a night view of the park, however limited the view may be. The problem of inaccessibility at night would be worsened if non Rehabilitation Center patients were really able to use the park. The locking of the park is yet another statement to the fact that the park really is only for the use of the Rehabilitation Center.

## BEHAVIORAL OBSERVATION

The park was observed a total of approximately ten hours over the course of six days, from Monday, June fourth through Saturday, June ninth. Observations were conducted in one to three hour intervals at various times of day in order to record park activity over a range of times and gain a reasonably good idea of the average amount of daily activity. Observations were recorded in writing as well as on a site map. Refer to appendix D to refer back to the site map. Tables 5.1 through 5.5 exhibit the daily observation data.

Table 5.1. Observation Monday, June 4<sup>th</sup>

10:00 am – 11:00 am						
Weather Conditions: Rainy, windy, overcast, mid 60's						
Users	Sex	User Type	Time	Time Spent	Activity	Comments
None						
General Observations						
1. Noticed 2 food staff members using the observation deck area outside the dining room doors to take a break and cool off. Also, a staff member exited the elevator from another floor and entered the dining room.						

Table 5.2. Observation Tuesday, June 5<sup>th</sup>

11:00 am – 12:00 pm, and 1:30 pm – 2:30 pm						
Weather Conditions: Sprinkling rain, overcast, warmer, low 80's						
Users	Sex	User Type	Time	Time Spent	Activity	Comments
None			11:00am-12pm			
3	3F	1 patient 2 family	1:45pm-2:30pm	45 min.	Therapy walk, gazebo	Mostly used the gazebo to sit, talk, and smoke
General Observations						
<ol style="list-style-type: none"> <li>6 staff members used the elevator to travel up or down to other floors</li> <li>Not many patients can access and use the garden alone and only two wheelchairs will fit in the elevator at one time.</li> <li>Elevator is very slow and the button lights inside do not light up when pressed making it difficult to determine if the elevator is working.</li> <li>Fountain is never on</li> <li>The park is not visible from public areas of the hospital, mostly private rooms, special treatment rooms, and offices/labs.</li> <li>The park is not integrated into the hospital. It is treated as a special place to go under certain circumstances.</li> <li>Staff has mentioned that “just knowing the park is there” is significant. Is that enough?</li> <li>Staff wants ashtrays removed and the no smoking policy enforced. Patients and families want to be able to use the park to smoke.</li> </ol>						

Table 5.3. Observation Wednesday, June 6<sup>th</sup>

2:30 pm – 5:00 pm						
Weather Conditions: warm and sunny, mid 80's						
Users	Sex	User Type	Time	Time Spent	Activity	Comments
3	3F	1 patient 2 family	2:50pm-3:10pm	20 min	Therapy walk	Family wheeled patient around walk
3	2F 1M	1 patient 2 family	3:00pm-3:15pm	15 min	Therapy walk	Family wheeled patient around
General Observations						
1. 3 men stepped out on the observation deck for a few minutes.						
2. 2 men came out on the observation deck to take a look.						

No people were seen using the park at the time observations were recorded on Thursday, June seventh. Rain prevented park use the entire day.

Table 5.4. Observation Friday, June 8th

3:30 pm – 6:00 pm, 7:00 pm – 8:00 pm						
Weather Conditions: Intermittent rain showers, upper 70's						
Users	Sex	User Type	Time	Time Spent	Activity	Comments
1	M	family	3:30pm-4:15pm	45 min	basketball	Young boy playing ball while father received outpatient treatment
2	1M 1F	1 patient 1 family	7:10pm-7:30pm	20 min	Therapy walk	Wife wheeled husband around
3	3F	1 patient 2 family	7:40pm-8:00pm	20 min	Therapy walk	Mother and daughter wheeled other daughter around
General Observations						
1. Turned fountain on again, noticed it not functioning well. Could hear the loud noise of the pump. Apparently as the fountain runs it splashes its water out, eventually drying itself out. Needs adjusting.						

Table 5.5. Observation Saturday, June 9th

10:00 am						
Weather Conditions: Sunny at last, upper 70's						
Users	Sex	User Type	Time	Time Spent	Activity	Comments
None						
General Observations						
1. Doors out of the dining area leading to the elevator and park are still locked from the night; nobody can use the park yet.						

The summary of the observation data is as follows. A total of twenty-eight users were seen using the park during the hours of observation. This number includes the thirteen people who simply stepped out on the observation deck. The actual number of people who exited the elevator and used the park was fifteen. Refer to the following table 5.6 of observation data totals for the fifteen actual park users.

Table 5.6. Demographics of Park Users

Park Users	15
Average Time Spent	25 minutes
Sex: 12 Female 3 Male	80% Female 20% Male
Total Staff Use of Park	0
Total Staff Use of Elevator and observation deck	11
Total patient users	5
Total family users	10

Table 5.7 summarizes the activities that park users participated in during observation. Therapy walkers typically used the walk from the elevator doors around through the park, passing the gazebo and turning around in the horticulture therapy area. Many patients and families did not venture into the southwest portion of the park, which is where the children's area and bare corner of the park are located. Park users sat, relaxed, and smoked under the gazebo. Basketball players stayed on the rubber court, however the ball was frequently chased throughout the park.

Table 5.7. Activity Summary

Activity	Users	User type	Avg. Time
Therapy Walk	14	5 patients 9 family	26 min
Sitting and Relaxing	3	1 patient 2 family	45 min
Basketball	1	family	45 min
Smoking	1	patient	20 min
Other activities	0		

Several things are notable from the behavioral observation. Most patients and family quickly strolled along the paths, and then returned indoors. This illustrates a lack of destination points in the park. Patients quickly take in the layout of the park, at which point there are not enough interesting areas or features to hold their attention and presence in the park. Most areas for sitting and gathering are designed

as group areas, with no real places to have privacy. The absence of movable chairs prevents families and other groups from personalizing seating areas. Also, the available seating is all planter edge or other backless seating that is uncomfortable for long periods of time. Without a doubt the poor health of many of the trees and the barren areas in need of more vegetation leave park users feeling a bit exposed and on display.

## STAFF SURVEY

Surveys were distributed to the therapy and nursing staff members of the Rehabilitation Center. The total number of staff members in the Rehabilitation Center was approximately sixty. Approximately twenty of these staff members were therapists of some sort: occupational, speech, physical, or recreation. Almost one hundred percent of the therapy staff responded to the survey, while only a few nurses responded. This fact makes the survey information biased towards the therapist's point of view, however the lack of response from the nurses is itself informative. The total number of staff participants was twenty-five.

The first questions of the staff survey inquired about the value of the park to staff members in terms of its ability to enhance their work environment. Staff members were also asked about the length of their employment at the Rehabilitation Center, and whether or not they had actually spent any time in the park. The following table 5.8 shows the percentages of staff members rating the value of the park in terms of its affect on their work environment.

Table 5.8. Value of the Park to the Staff Work Environment

Extremely Valuable	32% (n=8)
Valuable	40% (n=10)
Only Somewhat Valuable	28% (n=7)
Not Valuable at All	0%

Staff responding that the park is extremely valuable, or valuable, typically explained their valuation with statements like “The park is a nice place to get out of the hospital and work with patients.” Staff members who responded less positively explained that their job prevented them from using the park and that the park was not convenient for them to use. There was a clear division in responses between therapy staff, who use the park as a part of their job, and nursing staff, who didn’t seem to have time to use the park, even on breaks.

After evaluating the park, the staff was asked to rate how important the park was to them for various uses. Staff was asked to rate each statement from one to five, one meaning not important, and five meaning very important. In the following chart, responses of four or five were grouped together as a positive rating. Responses of three or less were grouped together as a negative rating. Refer to table 5.9.

Table 5.9. Staff Preferences for Personal Use of the Park

Uses	Positive rating	Negative rating
An option different from indoor areas	88% (n=22)	12% (n=3)
View from a window while inside	40% (n=10)	60% (n=15)
Use in good weather	80% (n=20)	20% (n=5)
Use with others	80% (n=20)	20% (n=5)
Use for private time	52% (n=13)	48% (n=12)
Use to be outside and relax	60% (n=15)	40% (n=10)
Use to feel the sun and wind	56% (n=14)	44% (n=11)

Most staff members responded positively to the idea of the park as an escape from the inside. The negative response to viewing the park from inside the hospital reinforces the fact that the park is not easily enjoyed from the indoors. The mixed rating for private time indicates that many staff members do not personally use the park.

Staff members responding to the survey ranged in their years of employment at the hospital from as little as one month to as much as twenty years. The average time of employment for the twenty-five respondents was 7.9 years. Out of the



twenty-five who responded, all but one had spent time in the rooftop park. The staff member responding “no” explained that “there is little time to go there and I like going outside where it is more spacious.” This staff member also reported being an employee there for over seventeen years.

Staff members were asked to continue with the survey if they had actually spent time in the therapy park. The twenty-four staff members who indicated that they had spent time in the park continued with the survey. The next section of the survey asked questions about frequency and types of use. Staff was asked how often they used the park in good weather. Refer to table 5.10 to see the results.

Table 5.10. Frequency of Staff Use of the Park

Less than once per week	48% (n=12)
Once per week	24% (n=6)
Several times per week	24% (n=6)
Daily to more than once daily	0%

Most staff responded that they use the park less than weekly. It appears that the only staff members that use the park with any regularity are the recreation and physical therapists, who use the park for patient therapy.

Next staff members were asked how they spent their time in the park. Several options were provided, as well as space for staff to write in other uses. Staff was asked to mark all of the options that applied to them. See table 5.11.

Table 5.11. Time Spent in the Park by Staff

Patient therapy	64% (n=16)
Patient activities	68% (n=17)
Personal time, sitting and relaxing	28% (n=7)
Socializing with others	20% (n=5)
Staff and hospital functions	64% (n=16)
Other: putting green	4% (n=1)
Other: gardening	4%
Other: Time with child from enrichment center	4%

The majority of staff members only use the park for patient therapy or staff functions that are scheduled in the park.

Questions eight through eleven of the survey asked staff members several open-ended questions about their feelings and perceptions of the park. Question eight asked staff members what they liked best about the park. Their responses to this question were grouped into four categories. These were responses reflecting a change of mood or feeling induced by the park (emotional/spiritual), a physical response to participation in activities (physical), a social response (social), or a response to the design or aesthetic characteristics of the park (aesthetic). All of the responses categorized as emotional/spiritual referred to a positive change of mood, such as a bad mood becoming good after time in the park. Refer to table 5.12.

Table 5.12. Staff Responses of the Personal Impact of the Park

Emotional/Spiritual	76% (n=19)
Physical	32% (n=8)
Social	4% (n=1)
Aesthetic	8% (n=2)

Question nine asked staff if they chose the park over an indoor area such as a break room. Refer to the following table 5.13.

Table 5.13. Staff Choice of the Park Over Indoor Areas

Yes	40% (n=10)
No	60% (n=20)

Responses of “yes” were frequently accompanied by the explanation that the park was relaxing and a chance to get away from the hospital. The sixty percent of the staff that responded “no” typically explained that they either did not have a break, or that they worked during breaks doing paper work. Park conditions and location were noted as not favorable for doing paper work.

Question ten asked staff if they felt any different after using the park, and how. Staff members who responded “yes,” typically explained that they felt more relaxed,

less stressed, and optimistic. Staff answering “no” did not qualify their response.

Refer to table 5.14.

Table 5.14. Staff Responses of a Different Feeling After Park Use

Yes	80% (n=20)
No	12% (n=3)
No response	8% (n=2)

Staff members were asked in question eleven if the park affected the quality of their work environment. Seventy-five percent responded “yes”, explaining that the park was a nice option and that it was “nice just knowing it was there.” Twenty-five percent responded “no” with no explanation of why, however it appeared that those responding “no” also responded that they did not have time to use the park.

The staff was asked staff to rate the park’s ability to meet personal needs, such as physical, emotional/spiritual, social, and other. Staff members were asked to rate each quality from one to five, with one meaning the park was unable to meet that need, and five meaning the park did an excellent job of meeting that need. The results for this question have been categorized into positive and negative, with positive responses being a numerical rating of four or greater, and negative responses being three or less. Refer to table 5.15.

Table 5.15. Staff Personal Needs Met by the Park

Personal Need	Negative	Positive
Physical	28% (n=7)	72% (n=18)
Emotional/Spiritual	28% (n=7)	72% (n=18)
Social	32% (n=8)	68% (n=17)
Other	8% (n=2)	28% (n=7)

Positive responses of “other” were typically physical in nature, such as the park’s ability to provide real life skills for patients. Negative “other” responses were not accompanied by an explanation.

Staff were asked how they would normally classify themselves, as an outdoors person or more of an inside type. This question was asked in order to establish a

possible link between positive responses to the park and personal preferences for the outdoors, and vice versa. See table 5.16 for the results.

Table 5.16. Staff Preferences for Indoor Versus Outdoor

I like to be inside all of the time	0%
I like to be inside, but occasionally go outside	4% (n=1)
I like to be outside, as long as it is comfortable	68% (n=17)
I like to be outside all the time and enjoy various outdoor activities	28% (n=7)
Other	0%

The next section of the staff survey focused on the staff's perspective of the patient experience in the park. This was important since staff members see many patients come and go and experience the garden, and since many of the patients in the Rehabilitation Center were inappropriate candidates for the patient questionnaire. The first question of this section, question fourteen, asked the staff how patients are informed about the park, or in other words, how patients find out about the park and their ability to use it. The staff's answers to the question fell into six categories: admission orientation, staff, other patients or family, written materials, not sure, and signs. Refer to table 5.17 for the results.

Table 5.17. Staff Perception of How Patients are Informed About the Park

Admission Orientation	12% (n=3)
Staff	68% (n=17)
Other Patients/Family	20% (n=5)
Written Materials	8% (n=2)
Not Sure	8% (n=2)
Signs	4% (n=1)

The staff members were then asked to identify any general differences in patients since the creation of the park. This question was not applicable to many staff members who had not been staff of the Rehabilitation Center before the park's installation. Those who did respond to the question gave somewhat vague answers, however most responses were of the calming and relaxing affect of the park on

patients. Six staff members, or twenty-five percent of the staff, responded that the park had a calming affect. One staff member answered “no,” that the park had no affect. Fourteen staff members, or fifty-eight percent, were not employees of the Rehabilitation Center long enough to answer the question.

Question sixteen asked the staff if the park helped patients to regain life skills, such as mobility an self confidence, in a way different from indoor areas. The response was overwhelmingly positive and eighty-eight percent of staff members reported that the park was unique in that it provided real life situations, rather than simulated situations in indoor areas such as the gym or recreation room. Only two staff members reported that they were unsure. One staff member did not respond.

Question seventeen asked the staff to report common patient responses to the park. The staff reported all positive patient responses to the park, and many gave multiple responses. These responses fell into six categories, which are displayed in table 5.18.

Table 5.18. Staff Recollection of Common Patient Responses to the Park

Aesthetic (how nice or pretty, pretty flowers, etc...)	52% (n=13)
Emotional/Spiritual (positive mood change)	24% (n=6)
Physical (positive change of environment, being outdoors, fresh air and sunshine)	36% (n=9)
Social (gathering with family)	21% (n=7)
Glad to Know it Exists	8% (n=2)
Unsure	4% (n=1)

In order to find out what types of experiences staff had with patients in the park, question eighteen asked staff to write about a memorable experience with a patient in the park. Unfortunately, sixty-seven percent of the staff either did not respond to this question, or reported no memorable experiences with patients. Eight staff members, or thirty-three percent reported one to several memorable experiences with patients. The responses fell into three categories. The first category includes

memories in which staff participated with patients in physical activities. These activities included basketball, gardening, putting on the golf green, and events such as Bar-B-Q's, musical concerts, and Easter egg hunts. Many of these activities were meaningful to patients who had participated in these activities in their own lives, prior to the trauma placing them in the Rehabilitation Center. The second category includes memories in which staff had a meaningful emotional encounter with a patient, through some activity in the park. These memories involved participating in an activity that led to an emotional breakthrough, such as a gain in self-confidence, a more positive or optimistic outlook, or time of reflection and meditation. One staff member reported simply giving a prospective patient a tour of the park. Refer to table 5.19 for a summary of the results.

Table 5.19. Staff Reports of Memorable Experiences With Patients

Return to a Physical Activity	21% (n=7)
Meaningful Emotional Encounter	21% (n=7)
Administrative Duty	4% (n=1)
No Memorable Experience	68% (n=17)

Next, staff members were asked what improvements they would suggest for the park. Many staff members suggested some of the same improvements. Their suggestions are displayed in table 5.20. Staff members were asked in question twenty if there were any elements of the park that did not get used. As with many of the questions, this question was important in determining the real uses of the park, since the time of observation was limited to one week. The staff responses are displayed in the table 5.21. When asked for any additional information, most staff members did not respond. Eight staff members did respond, and their comments were generally reiterations of previous responses, such as the park's relaxing affect

Table 5.20. Staff Suggestions for Improvement

Better access	24% (n=6)
Better maintenance	20% (n=5)
Creation of grassy areas	16% (n=4)
More plants	12% (n=3)
Larger area	8% (n=2)
More coordinated activities	8% (n=2)
More Community involvement and awareness	4% (n=1)
Range hood for grilling outside	4%
Greenhouse for year round use	4%
New sprinkler system	4%
More areas for patients to plant	4%
Larger water feature with pond and goldfish	4%
More chairs, tables, and benches for eating outside	4%
Easier access to more equipment	4%
Plants that attract more nature, birds, butterflies	4%
More accessible emergency phone	4%

Table 5.21. Staff Reports of Unused Park Elements

None	56% (n=14)
Not sure	12% (n=3)
Children's area	20% (n=5)
Golf course	4% (n=1)
Corner next to elevator	4%
Depends on the weather/heat/sun	4%

on patients, the benefit to families, and the therapeutic benefits. Two staff members commented that the park was a great marketing resource.

Questions twenty-two and twenty-three were demographic questions. The majority of the staff who responded to the survey were female and over the age of twenty-five. Refer to table 5.22.

Table 5.22. Staff Demographics

Under 25	16% (n=4)
Over 25	84% (n=21)
Male	16% (n=4)
Female	84% (n=21)

Sixteen percent of the staff was under twenty-five and sixteen percent were male, however these percentages do not refer to the same groups of people.

Some general conclusions may be drawn from the results of the staff survey. It appears that most staff members do not use the park personally. The park is too inconvenient to quickly use on a break, or to use doing paperwork. Most staff responded positively to the idea of the park, however when it comes to their actual use of the park, the truth of the matter is evident. Staff suggestions for improvement fall directly in line with modern theory of healing gardens. Their suggestions point to the need for easier access, better seating, more plants and greenery, more community involvement, and year round use of the park with a greenhouse. The park may have been designed with too narrow a focus. It seems that the idea of the park was that it would be for everyone to enjoy, however it was designed as a place specifically for Rehabilitation Center patients to practice “real life skills.” Perhaps this could have been accomplished while also meeting the needs of staff members and non Rehabilitation Center staff, patients, and families

## PATIENT QUESTIONNAIRE

Patients were recruited for inclusion in the patient questionnaire by the request of the author. First, the therapy staff of the Rehabilitation Center was asked which patients were appropriate to include in the questionnaire. This was in order to not disturb patients experiencing cognitive or other impairments that would make answering the questionnaire difficult or impossible. At the time of study, there were approximately forty-five patients in the center. According to center staff, approximately fifty to sixty percent of the patients at any given time have some level of cognitive impairment. This cut the number of subjects available for inclusion in the questionnaire to approximately twenty. Out of these twenty patients, thirteen were asked to participate, based on recommendation by staff and availability of the patients. The questionnaire typically took between thirty and



forty-five minutes to complete. The author sat with patients and verbally asked each of the questions and then recorded the verbal answers of the patient. The author answered any questions that patients had and clarified anything not understood by the patients. In general, patients were very articulate about the therapy park and were enthusiastic about giving their input.

Many questions from the staff survey were repeated in the patient questionnaire in order to establish credible information about the therapy park. As in the staff survey, the first part of the patient questionnaire asked questions that patients could answer regardless of whether or not they had ever used the therapy park. This was to establish the perception of the park as an option or amenity of the Patricia Neal Rehabilitation Center; for this is one of the ways the facility regards its therapy park.

After obtaining the consent of the patient, the first question asked patients how long they had been in the Rehabilitation Center. This was important as new patients might respond to the questionnaire differently than patients who had been there for as long as a couple of months. Of the thirteen patients questioned, lengths of time in the Rehabilitation Center ranged from as little as two days to as long as two months. The average length of time in the center was three and a half weeks.

The following question asked if the patient was aware of the Rooftop Park, and how they were informed of its existence. All thirteen, or one hundred percent of the patients were aware of the park. When asked how they became aware of the park, different answers surfaced. Refer to table 5.23 for the results.

Table 5.23. Patient Awareness of the Rooftop Park

Told by other patients or family	46% (n=6)
Told by staff	42% (n=5)
Advertisements: website or brochure	8% (n=1)
Not sure	8% (n=1)

Question four asked patients how valuable the park was to their overall experience in the Rehabilitation Center. Patients could still answer regardless of park use. The results are displayed in table 5.24.

Table 5.24. Patient Perception of the Park's Value

Extremely valuable	54% (n=7)
Valuable	38% (n=5)
Only somewhat valuable	8% (n=1)
Not Valuable at all	0%

Next in question five patients were asked to rate how important the park was to them based on several statements about the park. Patients were asked to rate each. The overwhelming patient response to the idea of the park was positive. Patients expressed how important it was to them to be able to “get away.” The patient response to viewing the park from inside was similar to the staff response –a mixed response. The question may have been unclear to patients, who may have understood the question as the actual ability to see the park from indoors rather than the idea of being able to see the park from inside, which was the intended question. statement from one to five, one meaning the statement expressed something about the park not important to them at all, and five meaning the statement expressed something very important to them personally. Refer to table 5.25.

Table 5.25. Patient Perception of the Park's Importance

Statements	1-3 Rating	4-5 Rating
To have as an option different from indoor areas	0%	100% (n=13)
To view from a window while inside	56% (n=7)	54% (n=6)
To use in good weather and when you feel well	0%	100% (n=13)
To use with family and friends	0%	100% (n=13)
To have some private time	8% (n=1)	92% (n=12)
To participate in physical therapy	8% (n=1)	92% (n=12)
To be outside and relax	0%	100% (n=13)
To feel the sun and wind	8% (n=1)	92% (n=12)
Other: Fresh air	0%	8% (n=1)
Other: To return and see changes while here	0%	8% (n=1)
Other: To get away from hospital smells	0%	8% (n=1)
Other: To see green	0%	8% (n=1)

Finally in question six patients were asked whether or not they had actually spent any time in the Rooftop Park. All but one of the patients had, and the patient that had not spent time in the park yet had only been in the Rehabilitation Center for two days. Therefore the results to the remaining questions include twelve respondents instead of thirteen.

Once park use was established, specific questions about the park could be asked. The first of these was question seven, which asked patients how often they used the park. See table 5.26 for the results.

Table 5.26. Frequency of Park Use by Patients

Less than once per week	17% (n=2)
Once per week	17% (n=2)
Several times per week	33% (n=4)
Daily	25% (n=3)
More than once daily	8% (n=1)

Over half of the patients responded that they use the park daily to several times per week. Once introduced to the park, patients are eager to use it. For many patients this is their only chance to get outside, after being in the hospital for as long as a month or more.

Question nine asked patients how long they typically stayed in the park. See table 5.27.

Table 5.27. Length of Park Use by Patients

Less than ten minutes	8% (n=1)
10-19 minutes	0%
20-29 minutes	0%
30+ minutes	33% (n=4)
1+ hours	58% (n=7)

Patients were then asked an open-ended question of what they liked most about the park. Their responses were grouped into categories whenever possible. Refer to table 5.28 to see their favorite park aspects. The response of the gazebo as a favorite

park element is most likely because it is the only place in the park where a person can sit protected and view other areas. All other areas of the park are unsheltered and open to the rest of the park.

Table 5.28. What Patients Like Most About the Park

Gazebo	42% (n=5)
Walkways for wheelchair use	25% (n=3)
Being outside in the fresh air	33% (n=4)
Sitting and relaxing	8% (n=1)
Flowers	8%
Golf course (putting green)	8%
Horticulture therapy area	8%
Peace and quiet	8%

Question ten asked patients how they used the park. Patients were given predetermined choices, as well as the opportunity to respond with other uses. Table 5.29 displays their responses. The patient who responded that the park was useful for entertaining friends explained that she liked to have people over to her home and had in her life entertained on a regular basis. She felt like the park was a place she could invite friends to visit and not be confined to the hospital room. The park was

Table 5.29. How Patients Use the Park

Sitting and relaxing	100% (n=12)
Participating in a group activity	25% (n=3)
Physical therapy	25% (n=3)
Talking with Family and Friends	83% (n=10)
Private time to think and be alone	75% (n=9)
Other: to be outside	8% (n=1)
Other: to use the walkways	8%
Other: to entertain visiting friends	8%
Other: to smoke	8%
Other: to let children play basketball	8%

satisfying a social need for her. Most patients responded that the park provided a place to relax, away from their hospital room.

Question eleven asked an important question for landscape architects, which was whether or not patients chose the park over an indoor area such as the gym or recreation room. Eleven out of the twelve patients responded “yes,” that they would

rather spend their time outdoors in the park. When asked why, most patients responded that they preferred the outdoors to the monotony of the four walls of their hospital room.

Question twelve asked patients if they felt any different after spending time in the park. Ten of the twelve patients responded “yes” with the other two responding “not sure.” All twelve, even the two patients responding “not sure,” explained that they felt better, refreshed, rejuvenated, and relaxed.

The next few questions were designed to explore the affect of the park on patients in three main areas: physically, emotionally/spiritually, and socially. The first of these questions was question thirteen, which asked patients to rate the park’s ability to meet their personal needs in terms of these three areas. The question also included an “other” category. Patients rated each quality from one to five; one meaning the park did not meet their needs in that area, five meaning the park was more than adequate in meeting their needs in that area. See table 5.30.

Table 5.30. Patient Personal Needs Met by the Park

Personal Needs	1-3 Rating	4-5 Rating
Physical	25% (n=3)	75% (n=9)
Emotional/Spiritual	8% (n=1)	92% (n=11)
Social	17% (n=2)	83% (n=10)
Other	0%	0%

Patients were very positive and enthusiastic about the park in general. They all felt that the park helped meet personal needs. The biggest need the park was able to meet was an emotional or spiritual need. Most patients did not seem to mind whether or not their physical therapy was inside in the center’s gym, or outside in the park. The important thing to patients was just being outside, and being able to get a better sense of their own personal identities, which got lost in the difficult process of recovery. Being able to get outside helped them maintain a sense of self,

a sense of well being, and a more positive outlook. The change of place provided by the park helped them gain greater perspective on their own lives.

Question fourteen asked a crucial question; did patients believe that their physical well being was linked to their emotional, spiritual, and social well being. All twelve responded “yes.” When asked to explain why they believed this, most patients philosophically expressed the need for balance in life, and the affect they believed that each of these qualities had on the others. They talked about the importance of having a good attitude and a positive outlook, and the affect they believed this had on their physical health. One patient explained, “When you dwell on sickness – you will be. When you feel better mentally, emotionally and spiritually you do physically. I’ve got my heart where it needs to be – if I never walk again it’s not the end of the world – I’ll keep trying.” Another patient explained that “spiritual well being helps emotional problems which in turn has an affect on physical well being. I think they are all interwoven.” Several of the patients also referred to their personal faiths as sustaining them through their illness and time in the Rehabilitation Center.

Question fifteen asked a closely related question: Does the park meet needs that cannot be met inside the building? Ten of the twelve or ninety-two percent responded “yes,” that the park fulfilled their need for the outdoors, and a connection to nature. One patient commented, “you sense a different feeling by observing something growing. There’s no way to get that inside those four walls.” Two, or seventeen percent, of the patients responded “no.” One patient did not have an explanation while the other explained that “I like one on one time anywhere – it doesn’t make a difference where.”

Questions sixteen, seventeen, and eighteen asked patients to verbalize which of the park elements helped meet their physical, emotional/spiritual, and social needs. It was interesting to record patient's ideas about how park features should be classified. Many times patient's responses were directed by their own past experiences and their personal preferences. This was evident when patients would respond, for instance, that the basketball court met an emotional need, because that patient had once been a basketball player. Designers need to be aware of the multi-layered interpretations of the various elements of a healing garden. Refer to table 5.31 for the results to these three questions. The fact that patients categorized material park elements such as the basketball court or seating as meeting all three areas of personal needs points to the importance of considering the cultural and personal variables that exist when designing a space for people. Space, which is

Table 5.31. Park Elements That Meet Specific Patient Needs

	Physical Needs	Emotional/Spiritual Needs	Social Needs
Ball Play Court	83% (n=10)	33% (n=4)	42% (n=5)
Seating	75% (n=9)	50% (n=10)	67% (n=8)
Fountain	33% (n=4)	50% (n=6)	42% (n=5)
Trees/Shrubs/Greenery	67% (n=8)	83% (n=10)	50% (n=6)
Sun and Sky	67% (n=8)	83% (n=10)	58% (n=7)
Gazebo	67% (n=8)	50% (n=6)	58% (n=7)
Horticulture Therapy Area	42% (n=5)	58% (n=7)	50% (n=6)
Putting Green	67% (n=8)	25% (n=3)	25% (n=3)
Views/Scenery	42% (n=5)	67% (n=8)	42% (n=5)
Playground	58% (n=7)	42% (n=5)	42% (n=5)
Walkways	67% (n=8)	42% (n=5)	33% (n=4)
Other	0%	0%	0%

shaped by patterns in design, has a direct behavioral and psychological affect on people using the space. As is obvious from this study and the works of others, something as simple as the design of a bench may have enormous implications in the functionality of a space.

Question nineteen asked patients if there was anything preventing them from using the park as much as they like. Their answers are displayed in table 5.32.

Table 5.32. Factors Preventing Patient Use of the Park

None	42% (n=5)
Weather	42% (n=5)
Schedule	25% (n=3)
Accessibility	8% (n=1)
Personal Health	8%
No Restroom	8%

Weather was an obvious significant factor affecting the use of the park. Clearly steps need to be taken to increase the use of park space to times of poor weather, especially in geographic regions that experience long winters or other weather not suitable for outdoor activities.

Patients were asked in question twenty if anything about the park needed to be changed. Four patients, or thirty-three percent, answered “no,” that the park did not need any changes. The remaining eight patients, or sixty-seven percent, answered “yes,” and offered several suggestions for improvement. One patient commented that the back corner of the park looked unfinished and needed more work. “It looks like they ran out of money,” the patient exclaimed. Another patient pointed out that the dead weeping willows needed replacing, and that something fitting for the east Tennessee region needed to be put in their place. Three patients pointed out the need for more blooming plants and more color. One of these patients said,

The park is pretty dull and plain green. There are too many bare walls – maybe if you put ivy on them - and hanging baskets around the windows might help the view from inside and soothe those penitentiary walls. The golf and basketball are good. Maybe if there was a pond with fish because everybody likes to see something alive.

As with the staff responses, patients were pretty good at pinpointing areas for improvement in the design of the park. Patient suggestions were also in line with some of the main concepts behind modern theory, such as cultural and regional



sensitivity, regional plant selection, the need for lush greenery, contrasting public and private spaces, a strong indoor-outdoor connection, and a connection to nature and living things.

Question twenty-one asked patients if there was anything else they would like to say or tell the investigator about the park. Five, or forty-two percent, said “no,” that they did not have anything to add. The other seven, or fifty-eight percent, offered a few more comments. One patient reiterated the need for better maintenance. One patient mentioned the nice variety of greens in the park, and said the park would look pretty lit at night. Another patient commented on the unique way of getting to the park, and that it was a nice place to take a sack lunch with family and friends. One patient pointed out the safety of the park and how by being on the rooftop it keeps uninterested people and vandals out.

A few more key issues surfaced with this question, such as the need for better maintenance, and the chance to use the park at night. The point of park safety is important. A healing garden most certainly needs to be a safe haven in which people feel very comfortable using the space. This particular garden may err on the side of ‘too safe’ as access and viewing is so impeded.

Questions twenty-two and twenty-three were demographics questions. Demographic questions included patients who had not yet used the park. Therefore the results to these questions include thirteen patients. Refer to table 5.33.

Table 5.33. Patient Demographics

Male	69% (n=9)
Female	31% (n=4)
Age: 18-25	15% (n=2)
Age: 26-64	46% (n=6)
Age: 65+	39% (n=5)

Question twenty-four ended the patient questionnaire by asking how the patient would normally classify his or herself. Patients were given five statements to choose from, depending on their preferences for the outdoors.

It is obvious from the patient questionnaire that patients are simply happy to have an opportunity to spend time outside. Refer to table 5.34. Spending an average of three and a half to as long as several months in the hospital makes people

Table 5.34. Patient Preferences of Indoor Versus Outdoor

I like being inside all the time	0%
I like to be inside, but occasionally venture outside	0%
I like to be outside, as long as it is comfortable	15% (n=2)
I like to be outside all the time, and enjoy various outdoor activities	85% (n=11)
Other	0%

appreciative of any “escape.” The overwhelming benefits seem to be psychological. This is evident from patient’s responses to the emotional and spiritual benefits of the space. However, it is within this realm that areas for improvement also exist. The physical functionality and success of the space is directly linked to the psychological impact that the form of the space creates. Issues that have become apparent through this post occupancy evaluation, such as accessibility, views, and seating options, present psychological, social, and physical barriers to those people for which the space is intended. These issues must be addressed in the design process. Emerging modern theory for designing healing gardens presents guidelines that aid in making a healing garden meaningful to many different user types, yet gardens with a specific focus such as physical rehabilitation have not been studied. Are changes in the design process necessary for such a focused space?

The results of this study indicate that a healing garden with a focused program of physical therapy must be designed with a rigorous level of guidelines and planning. The design concerns of passive gardens serve as a starting point, however even

greater sensitivity may need to be applied in the design process in order to provide for the needs of active as well as passive users. The design process for gardens such as the Rooftop Therapy Park should include using guidelines specialized for gardens with programs of physical therapy or a therapeutic component. These guidelines do not replace existing ones; rather they are additional concerns for designing gardens that include physical therapy. These guidelines were developed based on the issues that have been raised by each of the methods of this study, and by building upon the existing guidelines defined in contemporary research and discussed in the Literature Review

## LIMITATIONS

There are limitations to this study. It is difficult to quantify qualities such as emotion and spirituality. However, qualitative data is valuable information, not only to the design profession, but also to the health care industry, as an increasing number of hospitals are seeking the expertise of landscape architects in creating a more healing hospital environment. As with Marcus' study, time and monetary restraints precluded the use of physiological measurements, although these are the most reliable method. Nonetheless, self-reports are reliable and in many cases they are the only way of obtaining information, such as in questions about people's preferences in the garden (Marcus, 1995). Another possible limitation is the difficulty in determining whether or not patients really understood questions about emotion and spirituality. Were they answering in order to please the interviewer? Did they understand the difference between emotion and spirituality?

In addition to using self-reports, other limitations existed such as the weather and patient types at the time of study. Time was also a limitation, as the study could not be conducted over a long time period, which might have allowed for statistical data.

Also, the study was of only one site, whereas a study of several sites might have produced information that could be generalized to a greater population. However, finding sites that are similar enough for strict statistical comparison is virtually impossible – too many variables are inherently present when dealing with a garden, and gardens in different health care settings. Therefore, this type of qualitative investigation is both appropriate and useful as it yields information that is valuable to people in the design profession. There are many lessons to be learned from each healing garden that may be applied in designing new ones. Furthermore, as more gardens are studied, landscape architects will realize common components necessary for designing successful healing gardens, and specialized healing gardens for specific populations.

## GUIDELINES FOR HEALING GARDENS WITH PROGRAMS OF PHYSICAL THERAPY

1. Accessibility takes on increased importance, as more garden users are physically impaired. Entrances to the garden, as well as pathways throughout, need to be designed so that multiple users in wheelchairs or gurneys may enter the garden together or use garden paths side by side.
2. The need for contrasting spaces increases with programs of physical therapy. Separating areas of high activity from areas of quiet reflection and meditation is important in meeting the needs of both passive and active users. Planning is necessary for transitional areas between active and passive spaces.
3. The outdoor space needs to be goal oriented, with visual rewards for users who negotiate pathways through the garden. Using physical skills recently regained through physical rehabilitation to move through the garden should

be rewarded with destination points that are unique and inspiring, either through the character of the space or with inspiring views or vistas.

4. Visibility from indoor areas has increased importance, as users testing new physical skills need staff supervision and assistance. Visibility from indoor areas is also important in terms of rooftops surrounding courtyards. Surrounding rooftops need to be considered as part of the space in the design of the garden. These rooftops should be used visually as well as functionally whenever pedestrian access is possible.
5. Plantings should reflect the character of each garden space. Active areas should be planted with stimulating and energetic plant combinations, while passive areas need a quiet and meditative plant palette. Design theories should support the character of the space by using bold color combinations and complex energetic plant forms in active areas of the garden. Passive spaces should use more soothing colors, and simple combinations with textures that encourage close inspection and thoughtful meditation.
6. Gardens with programs of physical therapy should include areas for seasonal plantings, such as fast growing annuals, vegetables, and perennials. Seeing growth and change in plants is particularly relevant to those seeking to increase their own physical ability. The use of perennial gardens is particularly relevant as carefully planned perennial gardens accented with annual plantings change almost weekly
7. Participation in gardening activities is especially relevant. Health care settings with programs of physical therapy should maximize the use of the garden by including horticulture therapy. Many health care organizations will need to recruit volunteer and community involvement in order to

provide horticulture therapy, since many insurance companies will not currently reimburse for this type of treatment.

8. Fixed back or other comfortable seating is necessary for those resting after participating in physical therapy. Seating should be available in both sun and shade to provide a maximum level of comfort based on weather conditions. Traditional seat walls are uncomfortable for any user, and especially so for patients in rehabilitation. The use of seat walls should be limited.
9. Including a source of drinking water is important so that users who are thirsty after activities do not have to return indoors for refreshment. Bathroom facilities should also be located on level with the garden.
10. There is an increased need for protection from heat and cold as those participating in physical therapy experience heightened discomfort with physical exertion.
11. As garden user groups become more diverse, there is an increased demand for designers to consider the needs of all users, and include members of each of these groups in the design process. Working conditions and schedules of all staff, patients, and families should be considered so that the garden's site planning within a hospital complex, and the form of the garden space may be designed to most effectively meet the needs of the users. The garden should be easy to pass through during the daily routine for staff, not a special place to go that will never be used when schedule become hectic.
12. There exists a greater need for collaboration between health care professionals and designers, as gardens for physical rehabilitation need to meet not only physical needs, but also aesthetic, psychological, emotional, spiritual, and social needs.

Chapter six draws some general conclusions based on the results and discussion of this study. It presents general considerations for designers, as the process for designing healing gardens is refined. It closes with suggestions for future study and a call for designers to strive for deeper meaning in the spaces they create.

## CHAPTER 6

### CONCLUSIONS

The need for a connection with nature is perhaps never more clearly demonstrated than in the lives of those who must spend great lengths of time in a hospital. Each health care setting offers its own unique requirements for a healing garden that effectively meets the needs of its users. This study has explored the efficacy of a healing garden with a focus on physical rehabilitation. This study began with the following objectives:

- ø To study the impact of the park's design on users in terms of historical and contemporary theory and the design intentions
- ø To assess the impact of this design on the physical, emotional, spiritual, and social rehabilitation or well being of patients and staff
- ø To identify the design's successes and failures and to communicate the design process necessary for successful healing gardens with programs of physical therapy.

In light of historical and contemporary theories, the Rooftop Park is similar to both the medieval courtyards of the mid centuries and the recently studied hospital gardens by Marcus, Tyson, and Gerlach-Spriggs. Like the hospital gardens from centuries ago, The Rooftop Park is a relief to those patients who must spend a great amount of time recovering within the sterile walls of the hospital. However, as in gardens studied by contemporary designers, the Rooftop Park suffers from the conditions produced by the modern hospital and the current American health care system. Retrofit garden designs are many times inadequate at meeting the needs of garden users as access is complicated, viewing from indoors is minimal, and careful research and planning are too often not included in the design process. The stated



intentions of the Rooftop Park were good ones: “to provide a peaceful, restful respite, a place to visit with family or friends – to renew the spirit while still remaining within the safety of the hospital campus” (The Patricia Neal Rehabilitation Center, 2000), however the park’s purposeful isolation from much of the hospital is questionable. The design intentions seem to have been so focused on offering physical therapy in the park, that the healing properties a garden can offer were compromised. So much of the park space is taken up with hardscape features that the park’s appearance is more that of a “landscaped area” than an actual park or garden. Plantings should be much more lush, with much more seasonal variation. The design could have been much better, had the designer used available research to design each of the garden spaces with deeper meaning. The designer spoke of a standard design process applicable to any project, however it is clear from this and other studies that there are specific design issues that must be addressed when designing healing gardens, and these issues are beyond the scope of the design process for a garden outside the health care setting. Also, designers must recognize that research is part of the standard design process. Research should never be excluded from the design process. A perfect example of the need for research is the elevator used for access to the Therapy Park. This elevator was viewed as an innovative way of achieving access to an otherwise unusable space. However in discussions with the lead recreation therapist, it was clear that other options were considered, options that would have created park entrances on level with the park. Clearly entrances that are level with a garden encourage an easier flow between indoor and outdoor areas. The elevator may be innovative, however it also acts as a separation and impediment to park access. This, added to the poor visibility of the

park from hospital windows, and no signage advertising the park creates a very obscure, uninviting atmosphere.

The impact of this garden on the physical, emotional, spiritual, and social well being of staff and patients was revealed in the observation, staff survey, and patient questionnaire. With the exception of therapy staff, which uses the park with patients in treatment, most staff members are too busy and do not have time to use the park personally. The staff did respond positively to the idea of the park, although it is clear that personal use of the park is seldom. Part of this problem lies in understaffing at the hospital. If the park was not such an isolated space, even busy staff could pass through it even when traveling from one building to another, and receive some benefit and relief this way. The park is treated as a special place to go, rather than being truly integrated into the hospital campus. This is true for patients as well. Were the park a place that could be at least viewed or even visited in between therapy appointments, patients could enjoy much more exposure to the park. As it is now, patients must wait for a day with perfect weather when therapists will escort them down into the park for physical or recreation therapy. In the case of this park, most of the year the park is not usable because of in climate weather. The use of atriums, solariums, and greenhouses needs further study for use in areas of the country where winters are long and cold. Even with the stated problems, once patients are exposed to the Therapy Park, their response is overall positive. Even a small chance to get outside is much appreciated. Patients were also very articulate when asked to suggest improvements. Most commented on the need for improved access, and for more plantings. One of the most fascinating results of the patient questionnaire was the response to questions about park elements and the needs each element could meet. Park Elements as diverse as benches, the ball court, and the

gazebo were each perceived as being able to meet physical, emotional, spiritual, and social needs. This may be very significant information to designers, who may be thinking only in terms of the physical attributes of a space. Designers need to consider the full implications of their designs, as simple objects of design like a park bench may fulfill a very deep meaningful need for patients or staff in need of a quiet escape. There will no doubt be various cultural differences as gardens are designed for different areas of the country and the world. Cultural interpretations of space and various elements of design need to be studied and considered. For example, design that is appropriate for southern Appalachia, as in the Rooftop Park, may not be applicable to other areas such as the Midwest, Pacific coast, or the Northeast, where traditions, architecture, and the division of space may be subtly or greatly different. Designing healing gardens for other types of health care facilities will require studying different populations. What different guidelines need to be developed for other programs and specific populations, such as in gardens for assisted living centers, gardens for specific mental illnesses, and gardens for children living in shelters or children's homes where healing and therapy can be facilitated through the landscape?

This study began to identify issues relevant to designing healing gardens for health care settings with programs of physical therapy. Design guidelines for this type of healing garden became apparent through observation of the site, the staff survey, and the patient questionnaire. These specific guidelines will help designers create healing gardens including physical therapy that meet more than simply the need for outdoor practice space. These healing gardens should offer all of the benefits of a passive space as well.

This, as well as other studies of healing gardens, points to the need for landscape architects to be included in the initial site planning and design phases of health care settings. Hospital campuses need to be arranged in such a way that gardens and views off site can be enjoyed by a maximum number of people. Current mainstream hospital architecture in America does not interact with the outdoor environment in a way that is sensitive to the needs of hospital patients, families, and staff. The inclusion of gardens after the fact can never provide the level of indoor-outdoor connection that is necessary for gardens and outdoor space to offer their full potential for healing. As hospitals use outdoor space as a marketing tool, designers must be careful that simple landscaping and entrance beautification, or landscaped areas, are not substituted for actual healing spaces. Integrity in the design profession must include designing spaces that have a meaning deeper than aesthetic improvement. This can only happen with further research of how gardens impact the healing process. Much evidence already exists. This study and others have demonstrated the perceived connection between physical, emotional, spiritual, and social healing, and the garden's ability to contribute to the healing process in each of these areas. Future study will further reveal the quantitative relationship between these, and redefine the role of gardens in health care settings, and society.

Landscape architects have an opportunity to use the existing research, and study of the impact of existing healing gardens to convince health care organizations that the garden is an essential part of the healing environment. Landscape architects need to strive for inclusion in the planning of hospitals. Equipped with knowledge gained through research, landscape architects will be able to design healing environments that impart healing to the human body in a way that is as profoundly deep and meaningful as the relationship between nature and humanity.

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## APPENDIX A

### DESIGNER INTERVIEW

1. Q. "How did you get involved in health care design, specifically this project?"  
A. "I was working on an elaborate residential project, and the owner was involved in hospital construction. I was brought on board for the Fort Sanders project. That was my first hospital garden to design, and from that project, I have designed fifty facilities all over the country."
2. Q. "What led your design process?"  
A. "Research of roof gardens was one source, programming needs identified by the therapists was another, and finally the design process I learned while at Louisiana State University helped me pull together all the necessary information to complete the design."
3. Q. "How specifically did you design the space to be healing physically, emotionally, spiritually, and socially?"  
A. "Certain aspects of human nature bring elements into a garden, the beauty of nature creates an environment that is social and a place to go by yourself. Designing a healing garden is no different than designing anything else, the design process is the same. I remember the head of the hospital telling a story of being in the hospital recovering from an accident that left him paralyzed from the waist down. He said that as he was laying in the hospital bed he could see a tree outside his window, and he drew strength from seeing that bit of life."
4. Q. "How did you deal with access to the garden?"  
A. "Initially I looked at only the therapy concept, and the garden generated the need for an elevator."
5. Q. "How did you design the space for viewing from hospital windows?"  
A. "I placed the playground so that it could be viewed from the labor room and mothers in labor could be distracted by the sight of children playing."
6. Q. "Do you have any comments on the healthcare industry today?"  
A. "The healthcare industry is a business and part of staying ahead of the competition is by providing services. One way to change and gain a competitive edge is by offering features like healing gardens, so I think we are going to see more and more gardens in healthcare settings in the future."

## APPENDIX B

### THERAPIST INTERVIEW

1. Q. "How did the idea for the park first develop?"  
A. "A new surgery center was going in and during the construction process both patients and staff began suggesting that we do something with the space. We researched the idea – an architect and a landscape architect were already involved with the project. We gave Mike (the landscape architect) an education on access – We had a design committee. I served as the design chair. We gave our suggestions to Mike and he came up with three drafts to which we gave cost figures, and then we went to the foundation."
2. Q. "Who composed the design committee?"  
A. "Myself (recreation therapist), an occupational therapist, physical therapist, a speech pathologist, behavioral medicine psychologist, I don't believe a nurse was included on the committee."
3. Q. "What were some of the suggestions that were not included in the final design?"  
A. "Suggestions included vestibular swings, which help patients regain balance; we couldn't do these because we could not drill holes in the roof. One suggestion was for an old car to be placed on the rooftop so that patients could practice getting in and out of a car. We were able to include about eighty-five percent of the design concepts."
4. Q. "How was the decision about access to the garden made?"  
A. "The original entrance was going to be off the second floor of the north office Tower. Patients would have had to go around to the north tower just to access the garden. With an elevator we could get patients directly from the rehab center into the garden."
5. Q. "Have you ever considered a greenhouse?"  
A. "Yes, that would extend the use of the garden. I have received cost estimates of around \$15,000 for a small greenhouse. The problem is with access. It must be handicap accessible, and it would need water, so it would need to be located by the sink in the horticulture therapy area."
6. Q. "Have you considered hiring a horticulture therapist?"  
A. "Insurance companies do not reimburse for horticulture therapy, so we need volunteers to coordinate these activities. There's no money in the budget here to hire a horticulture therapist. A greenhouse would have to be self-sufficient and environmentally controlled."
7. Q. "Can patients use the garden at night?"  
A. "The doors are locked between 9:30pm and 10:00 pm each night. The schedule here is pretty demanding and we encourage our patients to be in bed about that time."



8. Q. "Did therapists in the rehab center use outdoor therapy before the park?"  
A. "We have always had to go offsite, and we still do that. The garden is an option and a sample of real life."
9. Q. "Who maintains the garden?"  
A. "The hospital has a contract with a landscaper who does all of the hospital grounds. The rehab administration oversees the maintenance of the rooftop park."
10. Q. "Was a maintenance plan included from the beginning?"  
A. "Yes, we budget \$8,500 a year for landscape maintenance. We recommend plant choices internally."
11. Q. "What problems have surfaced since the park's inception?"  
A. "The first few years were testing years. The initial planting scheme included grass areas. Maintenance crews used gas-powered mowers and gas fumes were complained of in the operating rooms because their air intake vents are on the rooftop. We had the same problem with grilling in the park. We've had problems with the sprinkler system. I've been told that the soil depth is too shallow and that pipes are not able to properly drain so they end up freezing and bursting in the winter. Every year we have to replace pipes. The bamboo has taken over and has sprouted everywhere. The weeping willows need root maintenance. We lost one to termites. The problem with using sprays is the toxicity to humans. We have to be careful of what we use on the rooftop."
13. Q. "Are there any other comments you would like to make?"  
A. "Overall the park has made a very positive impact. From a marketing standpoint, people look at opportunities as amenities and the park is an amenity."

## APPENDIX C

### CONSENT FORM

1. Study Title: Healing the Whole Person: A Post Occupancy Evaluation of the Rooftop Therapy Park at Ft. Sanders Regional Medical Center, Knoxville, Tennessee
2. Performance Site: Patricia Neal Rehabilitation Center and Rooftop Therapy Park, Ft. Sanders Regional Medical Center, Knoxville, Tennessee
3. Investigators: The following investigator is available for questions about this study, M – F, 8:00 a.m. – 5:00 p.m.  
  
Brad E. Davis (225) 381-7240
4. Purpose of the Study: The purpose of this research is to investigate and document the affects of the Rooftop Therapy Park on patients and staff of the hospital, and to determine the connection between various park elements and the emotional, spiritual, and social healing experienced by park users.
5. Subject Inclusion: Staff and patients of the Rehabilitation Center.
6. Number of Subjects: 60 - 100
7. Study Procedures: The study will be conducted in three parts. The first step will be observation of the park for one week, M – F between the hours of 8 a.m. and 5 p.m. Activity observed will be recorded on a map of the park. The second step will involve a survey of the Rehab Center staff. Staff will be asked to spend approximately 20 minutes answering open-ended questions about their experiences in the park, as well as recollection of patient experiences. The third step will involve patient questionnaires, in which patients will be asked to spend approximately 15 minutes answering open and close-ended questions about their experiences in the park.
8. Benefits: Benefits of the study will be to society a greater understanding of how gardens can be used in the therapy process for individuals in the hospital, and how these gardens can serve not only physical patient needs, but also emotional, spiritual, and social needs.
9. Risks: There are no known risks to individuals of this study. Survey and questionnaire responses are anonymous and the consent forms will be kept in a locked and secure cabinet.
10. Right to Refuse: You may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which you might otherwise be entitled.

11. Privacy: Results of the study may be published, but no names or identifying information will be included in the publication. Subject identity will remain confidential unless disclosure is required by law.

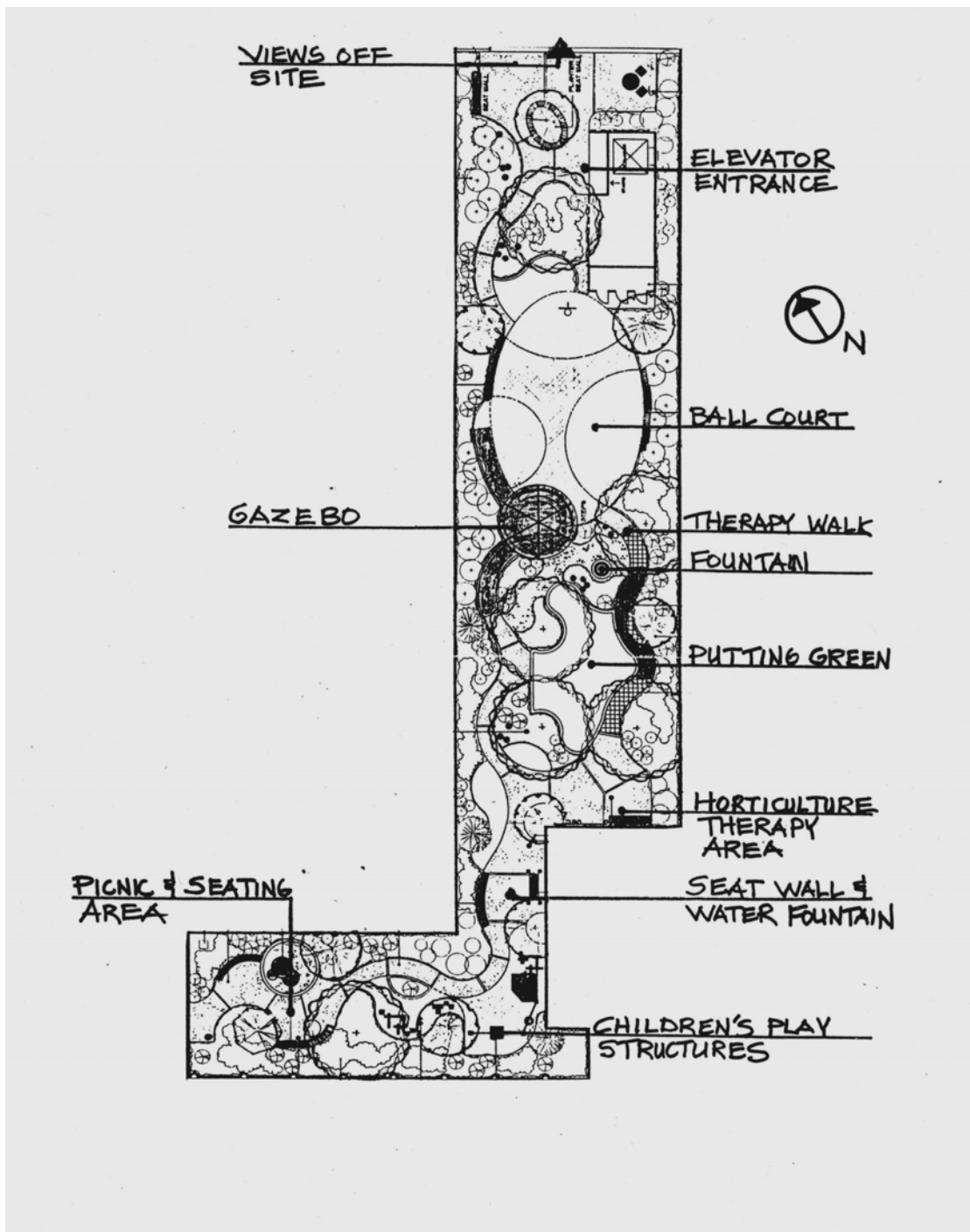
12. Signatures:

The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dr. Robert C. Mathews, Louisiana State University Institutional Review Board, (225) 578-8692. I can also contact locally Doug Bailey, Pharm. D., Chairman of the Covenant Health System Institutional Review Board, located at 1915 White Avenue, Knoxville, TN 37916. The office phone number is (865) 541-1814.

I agree to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of the consent form.

\_\_\_\_\_. Signature

APPENDIX D  
ROOFTOP THERAPY PARK MAP



Map of the Rooftop Therapy Park. Map labeled by the author.  
Original map by designer Michael Versen.

## APPENDIX E

### STAFF SURVEY

**Section I: Staff Information** In this section you will be asked questions about your personal thoughts and experiences in the Rooftop Therapy Park.

1. Have you read and signed the consent form?

(Your identity will be kept completely confidential.)

☐ Yes

☐ No

2. How valuable is the Rooftop Therapy Park to your overall work experience in the Rehab Center?

☐ Extremely valuable

☐ Valuable

☐ Only somewhat valuable

☐ Not valuable at all

Please explain \_\_\_\_\_

3. Rate how important the park is to you in terms of each of the following statements.

Rate each statement from 1 to 5

1 = Not important at all, 5 = Very important

\_\_\_\_\_ to have as an option that is different from indoor areas

\_\_\_\_\_ to view from a window when you are inside

\_\_\_\_\_ to use in good weather

\_\_\_\_\_ to use with others

\_\_\_\_\_ to have some private time

\_\_\_\_\_ to be outside and relax

\_\_\_\_\_ to feel the sun and wind

\_\_\_\_\_ other \_\_\_\_\_

\_\_\_\_\_ other \_\_\_\_\_

4. How long have you worked in the Rehabilitation Center?

Years \_\_\_\_\_ Months \_\_\_\_\_

5. Have you spent any time in the Rooftop Therapy Park?

☐ Yes

☐ No (If no, please explain why and stop here.)

6. How often do you use the park in good weather?

☐ Less than once per week

☐ Once per week

☐ Several times per week

☐ Daily

☐ More than once daily

7. How do you use the park? (Mark all that apply.)

☐ Patient therapy

☐ Patient activities

☐ Personal time, sitting and relaxing

- 🍏 Socializing with others
- 🍏 Staff and hospital functions
- 🍏 Other \_\_\_\_\_
- 🍏 Other \_\_\_\_\_

8. What do you like best about the park?

9. Do you choose the park over an indoor area such as a break room? Why or why not?

10. Do you feel any different after spending time in the park? How?

11. Does the park affect the quality of your work environment?

- 🍏 Yes
- 🍏 No

Please explain.

12. Rate these qualities on a scale of 1 to 5 in terms of how the park meets your personal needs.

1 = does not meet my needs

5 = very fulfilling to me personally

	1	2	3	4	5
<b>Physically</b> (i.e. exercise, fresh air)	🍏	🍏	🍏	🍏	🍏
<b>Emotionally/Spiritually</b> (i.e. private time, meditation)	🍏	🍏	🍏	🍏	🍏
<b>Socially</b> (i.e. meeting with others)	🍏	🍏	🍏	🍏	🍏
<b>Other</b>	🍏	🍏	🍏	🍏	🍏

13. How would you normally classify yourself? (When you feel well and are not at the hospital?)

- 🍏 I like being inside all the time
- 🍏 I like to be inside, but occasionally venture outside
- 🍏 I like to be outside, as long as it is comfortable
- 🍏 I like to be outside all the time, and enjoy various outdoor activities
- 🍏 Other. (Please explain.) \_\_\_\_\_

**SECTION II: Patient Information** In this section you will be asked questions about the patients and their reactions to the park.

14. How are patients informed that the park exists?

15. If you have been a staff member long enough, can you identify differences in patients

before and after the existence of the park?

16. Does the garden help patients to regain life skills (i.e. mobility, self confidence, etc.) in a way that is different from indoor areas? How?

17. What are some common patient responses to the therapy park?

18. If you have had a memorable experience with a patient in the park, please tell me about it.

19. What improvements, if any, would you suggest?

20. Are there elements of the park that do not get used? (i.e. playground, ball court, etc...) If so, why not?

21. Is there anything else you would like to tell me about the park or how patients respond to it? Feel free to use the back of this sheet to answer.

22. What is your age?

☐ Under 18

☐ 18-25

☐ 26-64

☐ 65 +

23. Gender?

☐ Male

☐ Female

*Thank you* so much for your time! This information will be very helpful and your identity will be kept completely confidential. Have a great day!

## APPENDIX F

### PATIENT QUESTIONNAIRE

1. Consent form has been read and signed by the patient?  
☐ Yes      ☐ No
2. How long have you been a patient here in the Rehab Center?
3. Are you aware of the Rooftop Therapy Park? How were you informed of its existence?  
☐ Yes      ☐ No
4. How valuable is the park to your overall experience here in the Rehab Center?  
☐ Extremely valuable  
☐ Valuable  
☐ Only somewhat valuable  
☐ Not valuable at all

Please explain. \_\_\_\_\_

5. Rate how important the park is to you in terms of each of the following statements.  
Rate each statement from 1 to 5.  
1 = Not important at all, 5 = Very important

- \_\_\_\_\_ to have as an option that is different from indoor areas
- \_\_\_\_\_ to view from a window when you are inside
- \_\_\_\_\_ to use in good weather and when you are feeling well
- \_\_\_\_\_ to use with family and friends
- \_\_\_\_\_ to have some private time
- \_\_\_\_\_ to participate in physical therapy
- \_\_\_\_\_ to be outside and relax
- \_\_\_\_\_ to feel the sun and wind
- \_\_\_\_\_ other \_\_\_\_\_
- \_\_\_\_\_ other \_\_\_\_\_

6. Have you spent any time in the Rooftop Therapy Park?  
☐ Yes      ☐ No  
(If no, explain why and stop here.)

7. How often do you use the park?  
☐ Less than once per week  
☐ Once per week  
☐ Several times per week  
☐ Daily  
☐ More than once daily

8. When you use the park, how long do you usually stay?  
☐ Less than 10 minutes  
☐ 10-19 minutes



- ☐ 20-29 minutes
- ☒ 30 + minutes
- ☒ 1 + hours

9. What do you like most about the park?

10. How do you use the park? Mark all that apply.

- ☐ Sitting and relaxing
- ☐ Participating in a group activity
- ☐ Doing physical therapy
- ☐ Talking with family and friends
- ☒ Private time to think and be alone
- ☒ Other \_\_\_\_\_
- ☒ Other \_\_\_\_\_

11. Did you choose the park over an indoor area (such as the recreation room?) Why?

12. Do you feel any different after spending time in the park?

- ☒ Yes
- ☒ No
- ☒ Not Sure

Please explain. \_\_\_\_\_

13. Rate these qualities from 1 to 5 in terms of how the park meets these personal needs.

1 = does not meet my needs,  
5 = very effective in meeting my personal needs

	1	2	3	4	5
<b>Physical needs</b> (i.e. therapy, fresh air)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Emotional/Spiritual needs</b> (i.e. private time, prayer, meditation)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Social needs</b> (i.e. interaction with others)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Other</b> _____	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

14. Do you believe that your physical well being is in any way linked to your emotional/spiritual and social well being?

- ☒ Yes
- ☒ No
- ☒ Not Sure

Please explain. \_\_\_\_\_

15. Does the park meet needs that cannot be met inside the building?  
Is there a comparable area inside?

- ☒ Yes
- ☒ No
- ☒ Not Sure

Please explain. \_\_\_\_\_

16. In the following chart, please mark all the park items that help meet your physical needs. (i.e. therapy, exercise, fresh air, etc.)

	Physical Needs
Ball play court	
Seating	
Fountain	
Trees/Shrubs/Greenery	
Sun and Sky	
Gazebo	
Horticulture therapy	
Putting Green	
Views/Scenery	
Playground	
Walkways	
Other	

17. In the following chart, please mark all the park items that help meet your emotional/spiritual needs. (i.e. private time, prayer, meditation, etc.)

	Emotional/Spiritual Needs
Ball play court	
Seating	
Fountain	
Trees/Shrubs/Greenery	
Sun and Sky	
Gazebo	
Horticulture therapy	
Putting Green	
Views/Scenery	
Playground	
Walkways	
Other	

18. In the following chart, please mark all the park items that help meet your social needs. (i.e. interaction with others, etc.)

	Social Needs
Ball play court	
Seating	
Fountain	
Trees/Shrubs/Greenery	
Sun and Sky	
Gazebo	
Horticulture therapy	
Putting Green	
Views/Scenery	
Playground	
Walkways	
Other	

19. Is there anything that prevents you from using the park as much as you would like?

20. Is there anything you would like to see changed?

☐ Yes ☐ No

Please explain. \_\_\_\_\_

21. Is there anything else you would like to tell me?

22. What is your age?

☐ Under 18 ☐ 26-64  
☐ 18-25 ☐ 65 +

23. Gender?

☐ Male ☐ Female

24. How would you normally classify yourself? (When you feel well and are not at the hospital?)

☐ I like being inside all the time.

☐ I like to be inside, but occasionally venture outside.

☐ I like to be outside, as long as it is comfortable.

☐ I like to be outside all the time, and enjoy various outdoor activities.

☐ Other. (Please explain.) \_\_\_\_\_

*Thank you* so much for your time! Have a great day!

## VITA

Brad E. Davis was born in Winston-Salem, North Carolina, on December 1, 1975. He moved with his family to Memphis, Tennessee, at age seven, where he grew up learning to love the outdoors, gardening, and the arts. He attended college at East Tennessee State University, with plans of becoming a medical doctor. He received a bachelor of science in biology in 1998. However, no longer desiring to enter the medical profession, he began to pursue his lifetime loves by enrolling in the Master of Landscape Architecture program at Louisiana State University in the fall of 1998. While pursuing his masters he married his college love, Amanda L. Clark, on January 6, 2001.

Together Brad and Amanda have future plans of working with underprivileged children through counseling, healing gardens, and other forms of therapy. They currently live and work in southern Florida where Brad works for a public and private garden design firm and Amanda works at a children's shelter.