Nature and design: assisting with the healing process

Dee A. Newlin
Iowa State University

Follow this and additional works at: https://lib.dr.iastate.edu/rtd

Recommended Citation
https://lib.dr.iastate.edu/rtd/19020
Nature and design: Assisting with the healing process

by

Dee A. Newlin

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
MASTER OF FINE ARTS

Major: Interior Design

Program of Study Committee:
Cigdem T. Akkurt (Major Professor)
Maruja Torres
Brenda Jones

Iowa State University
Ames, Iowa
2006

Copyright © Dee A. Newlin, 2006. All rights reserved.
This is to certify that the master's thesis of

Dee A. Newlin

has met the thesis requirements of Iowa State University

Signatures have been redacted for privacy
# TABLE OF CONTENTS

## CHAPTER 1. INTRODUCTION 1

- Introduction 1
- Research Questions 3
- Problem Statement 3
- Purpose Statement 3
- General Objectives 4
- Design Objectives 4
- Significance 5

## CHAPTER 2. LITERATURE REVIEW 7

1. Healthcare Facilities (General) 7
2. Healing Environment 8
3. Theories on Built Environment 11
4. Sustainability 17
5. Marketing Opportunities 19

## CHAPTER 3. METHODOLOGY 22

## CHAPTER 4. CASE STUDY OF MARY GREELEY MEDICAL CENTER 23

1. Mary Greeley Medical Center Site 23
2. Analysis of Existing Space 25
3. Design Program 26

## CHAPTER 5. DESIGN OF THE HEALING ENVIRONMENT 30

1. Proposed Design of Interior Space 30
2. Proposed Design of Roof Garden 32

## CHAPTER 6. CONCLUSION 38

## REFERENCES CITED 40

## BIBLIOGRAPHY 42

## APPENDIX A. DRAWINGS OF PROPOSED DESIGN FOR HEALING IN MARY GREELEY MEDICAL CENTER 45

## APPENDIX B. DEFINITION OF TERMS 53
CHAPTER 1. INTRODUCTION

The technology of healing is moving in new directions. In previous years, the functional emphasis of healthcare facilities produced environments that were efficient but often sterile and institutional and are now considered stressful and otherwise unsuited to the emotional or psychological needs of patients, visitors and staff. (Barnes, Marcus, 1999) Today, a desire to explore the concept of healing is emerging and medicine is rediscovering the connection between mind and body. “Healthcare providers are beginning to understand that patients are multidimensional beings. They check in with a body but the body is integrated with an emotional and spiritual entity that needs to be nurtured and healed as well.” (McKahan, 1993)

Because of this, healthcare environments are becoming more holistic. Medical facilities are providing a built environment that is welcoming to patients, improving their quality of life and overall well-being while also supporting the needs of families, caregivers, staff and the community. “A growing body of research shows that building environments that connect people to nature are more supportive of human emotional well-being and cognitive performance than environments lacking these features.” (Heerwagon, 2004)

To embrace the holistic approach and recent research, more nurturing natural elements such as healing gardens are being integrated into healthcare facilities to enhance the healing experience. Hospitals are beginning to recognize the value of nature and outdoor spaces as restorative environments. “Restorative natural environments have the ability to relieve stress, induce relaxation, increase awareness and perception and promote positive physical and emotional states.”
(Stewart-Pollack, 2004) Healthcare facilities can create “a space, a place, an atmosphere, an experience that helps with the healing process” (Purves, 2002) an environment that meets the emotional, physical and psychological needs of patients, families, staff and community who use the space. “We lost our connection to nature because we thought we could solve everything with technology. If a health facility is really community-minded, then the total environment should be about healing.”

(Edge-Gumbel, 1995)

Healthcare facilities communicate many clues about the organization and the medical care being provided. “When approaching a facility, the message should be one that conveys welcoming, caring, comfort and compassion, commitment to patient well-being and safety, where stress is relieved, refuge is provided, respect is reciprocated, competence is symbolized, wayfinding is facilitated and families are accommodated.” (Carr, 2004) Good design in the healthcare setting can create a mood that changes the behavior of hospital users and helps to calm them at times of uncertainty, dependency and stress. Having the hospital look and feel less institutional is an important goal. The key is to find ways to alter the physical environment that are meaningful for the events that take place and the interactions that occur during the healing process. By providing a healing environment for patients, families and staff to rest, relax, rejuvenate and be surrounded by nature, Mary Greeley Medical Center will be addressing them as human beings, considering their souls as much as their bodies. (Schwartz, 1996)
RESEARCH QUESTIONS:

1. What is a healing environment?
2. What are the new concepts in healthcare today?
3. What is the relation between the built environment and health outcomes?
4. What is the relation between natural elements and the healing environment?

PROBLEM STATEMENT:

Based on observation and analysis, Mary Greeley Medical Center does not have a healing environment conducive to physical, emotional and spiritual healing. There is also a need for natural elements in the physical environment that contribute to the healing process. Such an environment for patients, families, and staff at Mary Greeley Medical Center (*) will provide a peaceful escape from the stresses of pain, suffering, illness and the work environment.

PURPOSE STATEMENT:

1. To explore and discuss the definition of a healing environment and the components that define the space.
2. To understand the natural elements and how they contribute and affect the healing environment.
3. To increase understanding of the needs of patients, families and staff in relation to the physical environment.
4. To gain a broader understanding of how to use the physical environment as a tool to support the needs of the patients, families, visitors and staff. 

(*) Mary Greeley Medical Center was formerly known as Mary Greeley Memorial Hospital

GENERAL OBJECTIVES

1. To provide a safe, warm, inviting environment that makes a therapeutic contribution.
2. To provide a restorative environment conducive to physical, emotional and spiritual healing.
3. To provide a space that is sensitive and responsive to human needs and well-being both physical and emotional.
4. To provide an environment that strengthens the hospital’s qualities as a total healing environment.
5. To provide a physical environment in which every experience contributes to the transformative process of healing.
6. To provide an environment that allows Mary Greeley Medical Center to express its individuality.

DESIGN OBJECTIVES

1. To design a space where patients, families and staff can go to “get away” from the stressful healthcare environment.
2. To design a space that meets the needs of the healthcare users and reduces stressful aspects of the healthcare environment.

3. To design a space that has a positive impact on the health and well-being of patients, families, staff and community as a whole.

4. To design a space that reflects the values of the healthcare facility.

5. To design a physical space that supports meditation, relaxation, conversation, physical activities while also providing stress relievers.

6. To design a space that enhances a sense of restfulness, revitalization, connectedness, a place of restoration and balance.

7. To design a place that is ripe with opportunities for staff and patients to experience the pleasures of nature and being with friends and family.

8. To design a space that provides a supportive patient/staff experience within a technologically advanced environment.

SIGNIFICANCE/BENEFITS

1. Results of this study will help Mary Greeley Medical Center improve its basic functional needs and the emotional needs of those who use the facility.

2. A healing environment will bring a holistic approach to healthcare facilities by serving as a connection between the healing process and nature.

3. Development of this space will assist in reducing patient and family stress, increase patient satisfaction and enhance staff retention, motivation and performance.
4. The addition of a healing environment to Mary Greeley Medical Center can assist in recruiting and retaining talented staff, increase philanthropy, community and corporate support and enhance operational efficiency and productivity.
CHAPTER 2. LITERATURE REVIEW

The literature review of this research focuses on five major areas to create the basis for design development:

1. Healthcare Facilities (General)
2. Healing Environments
3. Theories on the Built Environment and Health Outcomes
4. Sustainability
5. Marketing Opportunities

Hospitals are places for curing, caring and healing. They are also high-stress environments for patients, families and staff. Most institutional settings and medical procedures do little for a person's mental, physical or emotional well-being. In fact, according to Roger Ulrich (1991), these environments and procedures can be stressful in themselves and the effect needed to cope with them can add to the burden of illness. Hospitals are places that function to diagnose and treat what ails the body. They often cure the patient but fail to heal them emotionally. Healthcare facilities should not only support and facilitate state-of-the-art medicine, technology and quality patient care; they should also offer a source of comfort to the mind and spirit of the patients, families and staff in a socially supportive healing environment. Healthcare facilities should understand and appreciate the importance of creating opportunities for meaning and pleasure in the daily experiences of the patients they care for, the families that visit and the staff that spends long hours in the environment. Hospitals today are faced with older patients and a shortage of
professional staff to deliver quality care. Therefore, there is a need to define other factors that can assist in the healing process.

**Healing Environments**

“Curing is scientific, technological, focused on patients as bodies, healing is spiritual, experimental and focused on patients as people.” (Kaiser, 1992) A healing environment represents a healthcare facility’s commitment to blend the science of medicine with the healing of people. According to Judith Walker (1994), a healing healthcare environment provides an opportunity for empowerment and transformation for the patient and family through implementation of techniques that address the mind, body and spirit and can improve the effectiveness of medical interventions and create wholeness and harmony for both staff and patients. Based on research findings, principles of a healing environment include the following elements:

**Control.** First of all, the healing environment should provide a sense of control with respect to the physical and social surroundings. Control is very influential when it comes to stress and health. A study done by Roger Ulrich in 1991 found that the lack of control in a healthcare setting has been linked with depression, passivity, elevated blood pressure and reduced immune system functioning. By providing individuals with choices, they feel like they have control over their situations and are therefore more resistant to life’s challenges. When you know that you have options, even in the most minimal sense, you feel better. (Bilchik, 2002)
Access to Nature. Secondly, the healing environment should provide access to nature. The abundance and diversity of sensory information in nature creates a rich tapestry of complexity not found in the built environment. (Stewart-Pollack, 2004) A growing body of research shows that building environments that connect people to nature are more supportive of human well-being and cognitive performances than environments lacking these features. (Heerwagon, 2004) Restorative influences of viewing nature include reduced stress, improved emotional well-being and positive changes in activity levels. Evidence from studies also show that nature in healthcare environments help to increase patient satisfaction with quality of overall care and increase staff satisfaction with the healthcare workplace. Incorporating access to nature in the physical environment adds another layer of value in the promotion of health.

Positive Distractions. And finally, a healing environment should provide positive distractions. Positive distractions refer to a small set of environmental features or conditions that have been found by research to effectively reduce stress and promote wellness. (Ulrich, Zimring, 2004) Certain types of music and artwork along with laughter are examples of positive distractions. Nature is also an important positive distraction because it reduces stress and diverts individuals from focusing on pain and distress. The use of nature can help to create a space where staff can get some relief from daily stress and anxious, overwhelmed patients and family members can remove themselves from the technologically advanced side of healthcare. “While the connections between nature and healing are important it’s not just the therapeutic value of plants that help patients heal, watching the process
of growth and renewal itself can be healing.” (Carmichael, 1995) A garden is an example of an environment that addresses the well-being of its users by engaging in all the senses such as site, smell, sound and touch.

More healthcare facilities are incorporating gardens as part of their movement to improve the quality of healthcare. Landscaping is often seen as a cosmetic extra, placed only at the hospital’s entrance to create an image. It is rarely viewed as a setting for stress reduction for staff or as a significant adjunct to patient healing. (Barnes, Marcus, 1996) The natural world should not end at the front door. The landscape can, in fact, complement the hospital by providing a healing environment; one that harnesses the powers of nature into a design of simplicity and order, thereby allowing a focused environment for personal healing. (Allison, 1998) A healing garden is just one portion of a landscape plan that considers the needs of patients, families, staff and the community.

Research findings indicate that there are many advantages associated with healing gardens in healthcare facilities. (Edge-Gumbel, 1995) They are reduced stress and anxiety in patients, reduction in depression, reduced pain in patients, shorter lengths of stay, higher patient satisfaction as well as increased staff effectiveness and satisfaction with the work environment. And with these advantages come many benefits for the healthcare facility that incorporates a healing garden. One benefit is healing. Another benefit is the garden can provide something unique to the facility. It can also be a recruiting tool for staff and volunteers. The garden can be a place to hold meetings, concerts and fundraisers. It can provide a non-threatening environment, enhance the healing process from a
holistic point of view and improve the physical and aesthetic healthcare environment. “Hospital gardens not only provide restorative and calming natural views but also reduce stress and improve outcomes through mechanisms that foster access to social support and provide opportunities for positive escape and a sense of control with respect to a stressful clinical setting.” (Ulrich, Zimring, 2004)

A healing environment should be designed to facilitate access or exposure to physical features and social situations that scientific studies suggest can have a therapeutic stress reducing influence. (Ulrich, 1992) It is successful when it supports clinical excellence in the treatment of the physical body. A healing environment is successful if it supports the physical, emotional and spiritual needs of the patients, family and staff. And it is successful if its environment produces measurable positive effects on patient clinical outcomes and staff effectiveness. “A healing environment supports the wholeness of body, mind and spirit; fosters universal connectedness and personal integration and infuses the healing process with meaning.” (Carlson, 1992)

**Built Environments**

“Our global culture is fast becoming conscious of and dedicated to facets of our overall health and wellness-mental, physical, emotional and spiritual. Our built environments are no exception. It has become increasingly evident that environments influence our behavior and shape our actions, thoughts and emotions. As this new awareness begins to find its way into doctors' offices, clinics and hospitals, the potential for healing and transformation for all who inhabit these
spaces increases.” (Crisp, 1998) Well designed, aesthetically pleasing environments have the ability to redirect attention, provide safety and security, reinforce confidence in professional skills and evoke fascination and a sense of connectedness. Because of this, more and more healthcare providers are looking to the built environment to serve as an active partner in the care giving and healing process.

The built environment is a key component in the quality of care. A well designed, pleasing healthcare environment not only affects patients directly but also indirectly because it also influences employee services, attitudes and behaviors. (Berry, 2004) Nurses, physicians and other healthcare employees work under extremely stressful conditions: the lack of basic physical amenities, lack of personal space, increased patient loads, unsocial hours and limited opportunities for interaction and relaxation. Environmental support for work has become critical. Healthcare settings have not been rethought as jobs have changed. As a result, the design of healthcare settings often increase staff stress which is associated with lower job satisfaction, increased absenteeism, and higher turnover rates, all of which reduces the staff’s effectiveness in delivering quality patient care. (Barnes, Marcus, 1999) In other words, if a health care employee is unhappy in their work environment he or she will most likely take out their frustrations directly or indirectly on the patient. Improving the built environment can be an important tool in reducing staff stress and fatigue, increase effectiveness in delivering care, reduce patient and family stress and improve overall healthcare quality and outcomes. (Ulrich, Zimring, 2004) Reducing staff stress through a healing and supportive environment and
gearing the design of the overall healthcare environment around the needs, the morale and the effectiveness of their staff, sends a message that the health, safety and well-being of staff members is just as important as the health, safety and well-being of the patients and their families. With this message comes increased staff effectiveness, reduced errors and increased staff satisfaction. The medical staff has the ability to reposition the technologically advanced healthcare environment to one that restores peace and wholeness to patients and their families.

One must also look at the many aspects of hospitalization that are stressful to patients. They are impending surgery, pain, unknown diagnostic procedures, depersonalization, and disruption of social relationships and job activities. (www.sciencedaily.com, 2003) The stress of being ill along with the technologically advanced healthcare environment often leaves patients feeling intimidated and uncomfortable. They may also feel helpless, anxious and depressed. Patients should spend their energy fighting the disease not the environment. (Bilchik, 2002)

The built environment should meet both the physical and psychological needs of the patients and staff who use the space rather than forcing them to adapt to or suffer from its demands. (Purves, 2002) Design that makes the healthcare environment more comfortable, more aesthetically pleasing and informative relieves stress among patients and staff. It also increases the satisfaction with the quality of care provided and allows a person to focus energies on healing. An environment that reduces the anxieties that people associate with the healthcare experience can, in fact, improve the therapeutic outcomes.
Today, healthcare providers have a better understanding of the physical environment of healthcare settings and how they can affect the health of both patients and staff. Much of the research being done these days examines how humans respond to environmental spaces, stimuli and changes. In fact, research articles linking the physical environment of healthcare facilities to patient and staff outcomes are appearing more frequently in design journals and health publications. A pioneer in this kind of research is Roger Ulrich, a professor in the Department of Landscape Architecture and Architecture at Texas A & M. He has published several articles regarding his research which focuses on the effects of built and natural environments on people's psychological well-being, stress and health and how viewing nature can have positive effects on health outcomes. (Ulrich, 1991 &1992)

**Health Outcomes.** Health outcomes are measures of a patient's condition or progress and may indicate healthcare quality. There is also patient, family and staff based outcomes in regards to ratings of patient satisfaction with quality of care or staff satisfaction with the healthcare workplace. Another important category of medical outcomes relates to medical errors and patient safety. Economic outcomes such as the cost of care or the expense attributable to staff turnover can also be included. (www.publicartonline.org, 2005)

**Stress.** One key concept in Roger Ulrich's research-based theory of health facility design for promoting wellness is stress. Patient stress. Staff stress. Stress is defined as a process of responding to events and environmental features that are challenging, demanding or threatening to well-being. (Ulrich, 1991) It is a well established concept in health related fields and it has been documented in
numerous studies. Stress is both a negative health outcome in itself and is linked with psychological, physiological and behavioral effects that worsen other outcomes. (Ulrich, 1991) To promote a sense of emotional, physical and psychological well-being and to create an environment that will be effective in reducing stress, healthcare facilities need to be designed with these supportive components in mind:

**Social Support.** The first component is access to social support. This refers to caring emotional support and prolonged contact with family and friends.

Hospitalization radically changes the daily lives of patients. They are fearful and anxious about their health, impending surgeries and unknown diagnostic procedures. Patients are also isolated from social relationships. “When you hospitalize a patient, you hospitalize a family as well.” (McKahan, 1993) For these reasons, access to emotional support from friends and family is very important. Encouraging social interaction not only reduces stress and increases the comfort level for an individual dealing with the emotionally and physically trying experiences of a medical setting but it also makes friends and families feel as if they are part of the care and healing process.

**Sense of Control.** The second component is a sense of control with respect to the physical environment. Control refers to a person’s perceived or real ability to affect their surroundings and circumstances. (www.publicartonline.org, 2005) People have a strong need for control and a related need of self efficiency with respect to their environments and situations. Loss of control is a major problem for both patients and staff and negatively affects outcomes. The negative consequences for patients include anxiety, depression, elevated blood pressure,
reduced immune system and social withdrawal. The negative consequences for staff include stress and burnout due to work that is characterized by low control and high responsibility. The physical environment should reduce sources of negative stress on both patients and staff to optimize their sense of control.

**Positive Distractions.** A third component is access to positive distractions in the physical environment. Positive distractions refer to a small set of environmental conditions or features that have been found by research to effectively reduce stress and improve emotional well-being. (Ulrich, Zimring, 2004) Distractions include music, laughter, certain art and especially nature. The abundance and diversity of sensory information in nature creates a rich tapestry of complexity not found in the built environment. (Stewart-Pollack, 2004) Nature should be incorporated into the healthcare environment to reduce stress and improve outcomes. "Upon being admitted, patients are deprived of their ability to control their environment. Their lives are disrupted as they are removed from their social support and network of friends and family and with the intrusion of medical procedures the need for psychological escape and a desire for positive distractions are intensified." (Barnes, Marcus, 1999)

Roger Ulrich also presents results from scientific studies that reveal that certain design choices or strategies concerning the physical environment can work for or against the well-being of patients, families and staff. His research linked poor design with such negative consequences as anxiety, elevated blood pressure and a reduced immune system and good design is linked to significantly reduced stress levels. Healthcare facilities can be psychologically supportive and promote wellness
as long as they do not contain features that are in themselves stressors and they facilitate access or exposure to physical features and social situations that have stress reducing influences. An important step toward improving health outcomes is to identify stressors in the existing healthcare environments and remove them. Good design in healthcare starts by recognizing basic functional and emotional needs of those who use such facilities at times of uncertainty, dependency and stress. (Carr, 2004)

SUSTAINABILITY

As the economy and population continue to expand, our built environments devour a large amount of the world's natural resources. Modern technology and construction methods have also played a critical role in the disappearance of those natural resources. As designers we must respect and nurture the environment. Rather than give up technological advances architects, designers and builders should combine them with the best traditional methods and the new environmental concepts of "green" design established by professionals. Sustainability is about working with community partners (architects, designers, contractors, owners etc) to increase awareness of environmental issues. It is also about integrating the use of technologies and environmental concepts available now into organizations to enhance their environmental and economic performance and to assist them in achieving even greater success. In summary, the challenge is to meet demands for new and renovated environments that are accessible, secure, healthy and productive while minimizing their impact on the environment (www.wbdg8.htm,
Sustainable design should be a shared social responsibility among architects, designers, contractors, clients and manufacturers.

Healthcare facilities should also consider their social responsibility to protect the environment and conserve resources. They are seen as important institutions in our society. Healthcare facilities must demonstrate that they are a source of health and well-being for the community and one way to do this is by incorporating sustainability into their built environment. This is important because according to Jens Mammen and Paul Strohm (2004), healthcare facilities differ from their commercial counterparts in several ways:

1. Hospitals are the fourth highest consumer of energy of all building types, accounting for 10 to 15% of all commercial consumption and totaling more than $3 billion per year.

2. The healthcare industry contributes 5 million tons of solid waste annually to the nation’s landfills.

3. Hospitals must function at high performance levels 24 hours per day, seven days per week.

4. Energy demands include not only emergency and uninterrupted power requirements, but also the assurance of “clean” electricity for optimal performance of diagnostic and therapeutic equipment.

5. Clinical demand may require both heating and cooling throughout the year.

6. Finish materials must perform to very high expectations either from a safety or maintenance perspective.
There are many potential benefits of sustainable design. Green products are energy efficient, durable, resource efficient, non-toxic, recyclable or contain recycled content. Every product currently used in a building can be replaced by one that is recycled or natural. There are many important sustainable building products on the market today. By specifying durable long lasting products, facilities will reduce the need for replacement, creating less environmental waste and reducing life-cycled costs. (Mammen, Strohm, 2004) There will also be a reduction of maintenance and energy consumption. Sustainable products also protect the health of occupants by improving indoor environmental quality. It also complements the healing process. If an organization or healthcare facility is not using green products then they are missing a big opportunity especially since sustainable design can only strengthen an institution’s presence in a highly competitive healthcare market, and enhance their public image as a responsible environmental steward in the community. Green design is good business. (Mammen, Strohm, 2004) It gives sponsors and users the peace of mind of a lasting investment.

MARKETING

At most hospitals there is nothing extraordinary to see. In order to win a greater share of the increasingly competitive healthcare market, a healthcare facility must improve their image as a medical facility that not only offers excellent care and state-of-the-art technology but is also willing to go that extra mile for the comfort and well-being of its patients. For this reason, healthcare facilities are actively promoting themselves and the patient is now the marketing target. Their opinions will be
formed by measurable impressions of how the hospital image is presented and promoted. When consumers have a choice among healthcare providers and facilities image becomes very important. Image plays an important role in attracting and keeping top clinical staff. An attractive environment fosters pride in the workplace, enhances self-esteem and a sense of well-being is reflected in interactions with patients, their families and staff. Messages about pride in the establishment and whether it is valued and well-maintained all matter in the competition stakes. (www.coopergraham.htm, 2004)

How does a healthcare facility set itself apart from the competition in today's market place? It must treat its patients like informed retail consumers. With more choices than ever before, individuals are looking for products and services that are customized for the achievement of their personal balance and harmony. According to Hein, Hudson, Swain and Townsend (1998), looking at the similarities between the retail market and the healthcare market can provide an organization with strategies for staying on the cutting edge of healthcare trends and designs. Both markets face "the same contingent of customers, the same pool of consumer dollars and the same customer demanding choices." (Hein, Hudson, Swain, & Townsend, 1998) In their research, Hein, Hudson, Swain and Townsend (1998), found that retailers that continue to grow and thrive have realized several important things:

1. Understand who your customer is.
2. Differentiate yourself from the competition.
3. Make the experience meaningful.
4. Don’t make the shopping process hard for the customer.
5. Never underestimate the power of a brand. The inherent strengths that are created in a positive brand association can provide a retailer with unlimited possibilities for growth.

"By looking at the way successful retailers are positioning themselves to succeed in this market, healthcare can presumably learn more about ways to secure their own survival in this increasingly competitive market." (Hein, Hudson, Swain, Townsend, 1998)

Mary Greeley Medical Center can improve its image by incorporating a healing environment into their organization. It would give patients something extra for their money: comfort and a place for the mind, body and spirit to heal. A healing environment can increase consumer satisfaction, make a provider more competitive and most importantly, it can be a measure of a facility’s commitment and sensitivity to the mental, physical and emotional needs and well being of all its users. People who see this built healing environment will realize Mary Greeley Medical Center provides exceptional care. The healing environment can play an important role in attracting people to the hospital.
CHAPTER 3. METHODOLOGY

The information in this thesis can be divided into three major areas. The literature review is to establish a theoretical basis for design development. The discussion involves healing environments and how incorporating nature and healing gardens into health care facilities provides therapeutic benefits and assists with the healing process. The literature review also addresses the built environment in relation to health outcomes for both patients and staff. This information will be applied to the analysis of Mary Greeley Medical Center relative to its development potential. The literature review also involves general information about health care facilities including significant issues such as sustainability and marketing opportunities. The related knowledge will be utilized as a guideline to analyze and designate the components of the architecture and interior space planning of the healing environment.

The second area involves the analysis of the proposed building based on observations and photographic documentation which includes the physical condition of the selected spaces and their accessibility. A survey was also distributed and completed by those who use Mary Greeley Medical Center. This information will be useful for the design and construction of the healing environment. The third area concentrates on the interior design process which will be developed based on the literature review and space analysis.
CHAPTER 4. CASE STUDY OF MARY GREELEY MEDICAL CENTER

On November 8, 1866, Mary Victoria Young and Wallace Greeley were married. Two years later, they moved to a farm in Ames, Iowa and had two children, both of whom passed away in infancy. In 1881, Wallace Greeley founded Ames' first corporate bank which today is known as US Bank. He was the mayor of Ames from 1881 to 1890. He served three terms in the Iowa legislature, on the Ames school board and on the Ames Public Library board with his wife.

On December 31, 1914, Mary Greeley died in her home of pernicious anemia. After Mary’s death, Wallace developed a dream for a memorial hospital, which he announced on July 29, 1915. In that year, there were 10 medical physicians and two osteopathic physicians in Ames. Mr. Greeley consulted with these physicians about where to locate the new hospital and what to include in the building. He also brought in a medical specialist out of Chicago who was nationally known as a consultant in design and construction of hospitals.

The Iowa Agricultural College, now Iowa State University, ha a small hospital on campus that was open half days beginning in 1885. But prior to 1916, Ames had no hospital facilities for its citizens. Greeley purchased land between Eleventh and Twelfth Streets on the east side of Douglas. Among the advantages of that site was that it would provide the opportunity for future expansion. On December 29, 1915, construction began on the Mary Greeley Memorial Hospital building.

On September 24, 1916, with more than 2,000 people in attendance, Greeley’s dream came true as the Mary Greeley Memorial Hospital was dedicated as a gift to the city of Ames (population 5,000). In his comments at the dedication,
Greeley eulogized his wife by saying, “It affords me great pleasure, more than words can express, that I contribute something towards the welfare of not only those now in need, but also for those who will be here long after we have passed away.”

(www.mgmc.org, 2005) Four months after the opening of Mary Greeley Memorial Hospital, Wallace Greeley passed away in his home on February 15, 1917, of a stroke.

Today, Mary Greeley Medical Center is a 220-bed regional referral center based in Ames, Iowa. The facility has more than 1,400 staff members coupled with more than 150 physicians offering more than 50 specialties and subspecialties and serves an 18-county region in central Iowa. Mary Greeley Medical Center provides its patients with the kind of high quality, compassionate care and services usually reserved for major metropolitan areas.

The services which are provided include: Ancillary Services, Behavioral Health, Cancer Services, Cardiac Rehab Diagnostic Services, Dialysis, Emergency Services, Heart Services Hospice, Hospitality Shop, Insurance/Billing, Nursing Units, Patient/Visitor Rehabilitation, and Surgical Services.

Mission: We provide high quality, cost effective healthcare and related services that improve the health status of people in Central Iowa.

Vision: We are committed to advancing the health of Central Iowan individuals and communities by providing regional leadership and creating collaborative partnerships.
Analysis of Existing Space

The purpose of this thesis is to explore the literature on health care environments and their impact on patient and staff health outcomes. The purpose of this thesis is to also design a healing environment with a holistic approach integrating the concept of the physical environment as a therapeutic resource and the use of nature in the healing process as discussed in Chapter Two. In regards to the previous chapter, the existing site is analyzed pertaining to its location, circulation and surroundings. The goal of the analysis is to select the appropriate space location and to establish spatial organization for the interior and exterior spaces of the healing environment. The design solution discusses the architecture and interior design process of the healing environment which includes spatial planning, accessibility, circulation, ambiance and the relationship of interior and exterior spaces and materials used.

Physical Characteristics. The existing space is divided into two areas...the interior healing environment and the roof as an extension of this space. The space is currently used as the Cardiac Rehab Center. The space will now be used for a healing environment that reflects health, healing, caring and compassion. The surrounding area consists of the following departments: Pulmonary Rehab, Case Management, Quality Management, Medical Social Services, EEG and Sleep Disorders. The roof that is located next to this space will now be used for a roof garden. The area surrounding this roof consists of the William R. Bliss Cancer Center, Cancer Resource Center, Cardiac Rehab and ICU.
Selection of Space of the Healing Environment. The proposed space is located on the second floor of Mary Greeley Medical Center. The space was carefully selected with considerations based on location, circulation, accessibility and concept. The healing environment will be located at the north end of the medical facility. Its location will not interfere with patient care. From the space, one can appreciate the view and solitude.

Design Program

The design program is formulated based on the theories from the literature review, prior projects, site observations and the needs of patients and staff as determined by the survey conducted. As part of my research process, a questionnaire was developed for the patients and staff at Mary Greeley Medical Center. The survey was given to the Director of Community Relations of Mary Greeley Medical Center and distributed to different departments throughout the medical facility. Participants were asked to fill out the questionnaire and to discuss in detail their thoughts and feelings on incorporating a healing environment into Mary Greeley’s health care setting. Patient and staff responses indicated preferences regarding the physical environment of the health care facility were for the following:

1. Patients and staff wanted the environment to be warm, welcoming, pleasant, peaceful and soothing.
2. They wanted the environment to feel calming, comfortable, warm and accepting, quiet and soothing.
3. Patients and staff wanted the environment to include warm, calming colors, soft textures, natural materials, pleasant artwork, soothing music, subdued lighting and most importantly, access to nature.

4. The activities they anticipated for this kind of space were healing, relaxation, meditation, reflection and communication between patient, family and provider.

5. Patients and staff stated that they would use this healing environment when tired, during stressful times when clear thinking is needed and possibly on a daily basis for wellness purposes.

The healing environment is proposed to serve patients, family, staff, caregivers and community. In addition, the healing environment is to be a rich, multisensory, interactive environment that provides for the following activities: relaxation, meditation, conversation, revitalization and restoration. The design of this healing environment was driven by the desire to create a place of warmth, sensitivity and responsiveness to the human needs and well being of all its users, mentally, physically and emotionally. This space will provide patients, family and staff with a place to “get away” from the stressful health care environment. There was also a desire to connect the traditional elements of nature while providing a functionally efficient space for patients, family and the health care providers.

The spaces are designed on the basis of my research findings and the needs of patients and staff as determined by the questionnaire and my own personal experience as both a patient and staff member at Mayo Clinic, Rochester, Minnesota, McFarland Clinic, Ames, Iowa and Mary Greeley Medical Center also in
Ames, Iowa. I am drawing on my own medical experiences for inspiration and applying my personal knowledge of health issues to the design process. The design addresses issues of stress reduction, physical control, accessibility, distraction, and escape from the chaotic hospital experience as these can be common issues among patients, family and staff. Concepts of healing and nature are applied to the space to provide a viable, tangible, intimate, caring environment. The design of the interior and exterior space introduces the users to an appreciation and understanding of natural elements and their positive therapeutic contributions to the healing process through their experience of the space. All aspects of the environment were considered for maximum healing potential.

The design program of the space was developed as a neutral entity, possessing a holistic environment, simple in design, tasteful in materials. From the point of view of fulfilling the design objectives, the design calls for the incorporation of supportive design elements that studies have shown facilitate the healing experiences for patients and family and boost morale of staff. One element is the overall design of the space. The design should emphasize the clarity of the space and the forms in plan. A second element is the color scheme. Colors have a profound impact on visual experiences of interior and exterior spaces. Therefore, the color scheme should be appropriate to the atmosphere of the environment. A third element is the flexibility of furnishings. Seating that facilitates social interaction promotes a sense of community and support. Another element is access to natural light. Natural light can play a vital part in the healing process. And finally, access to nature is a significant supportive element. Current research exists to support the
idea that environmental features or characteristics of nature play a role in improving health outcomes and that visual exposure to nature in health care facilities have restorative effects on emotional, psychological and behavioral components of stress. All of these elements are the basis for creating a healing environment that is comfortable, welcoming, supportive, aesthetically pleasing and symbolizes the notion of health and healing. The most significant part of this design program was the characterization of the kind of stimuli the design of the healing environment wanted to achieve.
CHAPTER 5. DESIGN OF THE HEALING ENVIRONMENT

The final part of this study consists of the design. The proposed design for the new healing environment was intended to be an example of how the study derived from the research of previous chapters and personal experience could be implemented in the design process of the two existing spaces chosen within Mary Greeley Medical Center. The design focuses on how the principles of healing and nature have been reflected and applied to the interiors of the new spaces in a contemporary way. The goal was to design a healing environment on the second floor of Mary Greeley Medical Center. With regards to the element of nature, a garden was incorporated on the roof adjacent to the interior space as an extension of this healing environment.

Proposed Design of Interior Space

In support of the design process, the interior space of the healing environment carefully blends together colors, materials and design features inspired by nature so that the patient, family and staff experience the space on a peaceful, calm and holistic level. Simplicity and functionality was the basic premise for the design of this space. A space that is attractive, welcoming and conducive to free movement is essential for establishing a sense of peacefulness. And a peaceful atmosphere allows the mind and body to rest undisturbed from the barrage of stimuli that overwhelms the senses in the outside world.

One way to create a sense of peacefulness is by offering an aesthetically pleasing environment. The colors and materials for this space were chosen to compliment the comfort of the space and to help set the patients, family and staff at
ease. A simple palette of restful colors consisting of shades of cream, off-white, and beige, terra cotta, along with pale blues and washes of green will be incorporated to give the impression of health and well being. The natural colors bring a warmth, intimacy and feeling of continuity to the space. With a neutral scheme no element is allowed to unbalance or overwhelm the others and it provides a nice backdrop for splashes of color from the natural elements incorporated into the space. Soft, luxurious, durable fabrics, elegant wood furnishings and carpet to absorb sound also help in the creation of a subdued environment appropriate for relaxation.

Lighting is an essential feature in the creation of a peaceful environment, helping generate energy, amplify space and nurture the soul. The lighting scheme for this space is based on a combination of flexible fixtures. It is also a subtle lighting scheme because in most healthcare environments, spaces are over-lighted creating hot spots and harsh illumination. The overall lighting will consist of recessed fixtures which light the general areas of this space with a uniform level of brightness. Other lighting features include dimmable wall lights, overhead spotlights and low-wattage portable lamps positioned in areas of activity and interaction. Up lighters are also incorporated to produce soothing patterns of light and shade. A dimmer atmosphere provides continued tranquility in the space. Windows also fill the space with natural light. The flood of sunlight provides a connection to the natural world which together with the use of greenery is essential for attaining a feeling of peacefulness.

Flexibility and comfort within an environment is important for communicating, relaxing and appreciating nature. To ensure comfort and maximum privacy without
closing off the space, the space is divided into several intimate seating areas. The flexible seating allows the users to re-arrange to embrace the best views of either the garden or of other natural elements provided.

Upon entering the space, I wanted to use a unique design element to greet users of the space and to create an inviting, comfortable initial impression. To achieve this, the glass from the windows will be removed to allow nature from the roof garden to overflow into the interior space. By doing this, the two spaces are connected physically as well as visually. I want the first and lasting impression to be exciting, non-institutional and supportive of the healing environment.

**Proposed Design of Roof Garden**

Central to the design concept of the healing environment, a roof garden was added adjacent to the interior space on the second floor of Mary Greeley Medical Center. It pierces through the west wall window and physically connects the two spaces to create an environment that reinforces their connection to nature. According to Theodore Osmundson, a roof garden is any planted open space, intended to provide human enjoyment or environmental enhancement that is separated from the earth by a building or other structure. Its primary purpose is to provide a place to be among or to view plants. This garden, with its tranquil and simple design, has a therapeutic function providing an accessible, safe, quiet, relaxing environment that encourages healing, community and a sense of compassion that is personalized. It becomes a template for restoration, recovery, reflection and acceptance.
A roof garden was chosen for the design based on the following economical, social and environmental reasons. Economically, a roof garden enhances the worth and overall aesthetic appearance of the structure it occupies. It can also attract and keep valuable employees and impress clients. Socially, it promotes community and helps maintain a connection with nature that might not otherwise be possible. It brings individuals together with others for support. Environmentally, a garden can help reduce energy usage by adding insulation to the roof. An insulated structure absorbs and retains heat energy from the sun rather than reflects it thereby reducing energy costs. A roof garden is a great option when open land is scarce.

This particular roof was chosen for the design based on the following elements. If an outdoor space is to be designed to optimize therapeutic benefits, it must provide a degree of separation from the outside world. This roof is protected by buildings on each side. The buildings create a frame around the outdoor space to provide a sense of enclosure, security and separation from the hospital environment. The roof is also located in such a way that it does not interfere with the main activities of the site. It is flat and provides enough open space for easy circulation and seating. The roof is adjacent to the interior space of the healing environment being designed and it is accessible by several means.

Because many of the gardens visitors will be hospital patients, families, and staff, the garden’s design has to accommodate their special needs. An important consideration in its design is the need for access. Hallways, landings and staircases constitute the transitional zones of the space. They connect the different areas together mediating movement between inside and outside. Access to the roof
garden can also be done via an elevator from the first floor of the facility as well as a stairwell (lift) leading from the second floor of the facility. The space is also designed for the safety, security and serenity of its users with the strategic placement of plants, defined seating areas, readable pathways and clear destinations. In addition, the garden can be monitored through the windows of adjacent hospital rooms.

Design intent here was to use nature to blend the interior and exterior spaces into a pleasing therapeutic whole while at the same time providing contrast between the interior and exterior environment to facilitate a sense of getting away. The following design principles were incorporated to create a healing environment. The first principle is to provide sensory stimuli that are non-invasive in character to draw attention away from an individual’s initial concern. A second principle is to facilitate physical and psychological movement. Another principle is creating areas for safe seclusion as well as social interaction.

The garden comprises two principle areas. The first area upon entrance into the space contains a fountain wall feature. This feature of flowing water energizes the space and supports a theme of invigoration as well as relaxation and reflection. It also acts as an important focal point. It is visible from all the windows and it provides something inspiring on which to rest your gaze during a time of reflection.

The hardscape of this area is primarily concrete, which is used throughout in appropriate paving patterns. Brick walls surround the perimeter of the outdoor space and provide a backdrop for the fountain wall feature as well as for raised beds located throughout the space. Embedded on these walls is strip lighting which
provides a wash of indirect lighting over the garden floor. Earth colored precast planters hold trees, plants and flowers for seasonal color. Chairs with backs provide flexible seating and add human scale to the imposing features.

The second area, at the opposite end of the entrance, has similar paving. Intended as a separate, more intimate setting for patients, family and staff to use for reflection and relaxation, it is furnished with a small pool, trees, plants and comfortable seating. The placement of trees and plants in this area create a meandering walkway, one that provides its users with variety and changing perception. Along the path are cozy protected nooks that give individuals a place to relax out of the mainstream. All of these elements invite people to use this space as a destination.

The overall layout of the garden is open with the exception of large trees located at the south end of the space. The trees provide a sense of depth and spatial definition. They also provide protection from the sun for those individuals with medical conditions and sun sensitivity while enabling the creation of more intimate spaces throughout the garden. Trees along the garden border provide a visual buffer between the roof garden and connecting buildings. And to add a dramatic touch to the space, mercury vapor lights will be embedded in the soil and will direct light up through the branches casting a glow through the trees in the evening hours.

The space also encompasses a variety of plants. Plant materials include small multi-textured plants that grow in varying heights. Perennials, low shrubs and ground cover provide a pleasing contrast to the open space. Plants such as Indian
Hawthorne, Hahns Ivy, New Zealand Flax and Rosemary were chosen for their low maintenance qualities. Plants such as gerberas, chrysanthemums, spider plants and areca palms were chosen for their purifying qualities. And plants such as rose, jasmine, lavender and chamomile were chosen for their soothing qualities. The garden also highlights the healing nature of its setting by containing plants with medicinal qualities.

The colors and materials for this space were chosen to complement the comfort of the space and to help set patients, family and staff at ease. Natural colors have been used to provide a canvas for textural contrasts. Texture adds depth and interest without closing in a space. Wood in a smooth rich hue adds warmth and character to the space. The use of stone helps ground the space. Water energizes the space. And plants signify regeneration and promote spiritual well-being. Colors, materials, and natural elements illustrate a space that is alive and reinforces the transformative process of healing.

In this project, the relationship between the built environment and natural elements is characterized by the play off between colors, materials, textures, sounds and smell. Combining simplicity with natural materials helps to create a remedy to the stresses and strains of life. The contrast between the silence of the space and the noise of the fountain, the fragrance of different flowers and plants around the garden, the smooth textures of stone, the roughness of bricks and the soft and gentle ripples of water all add up to transmit a rich, peaceful sensation that helps us feel as if we are in a special place. The variety in plant material, colors, sounds and
spatial relationship all blend to create an environment that contrast sharply with the sterile environment of the hospital.
CHAPTER 6. CONCLUSION

The study of this thesis originated when I had an opportunity to work in Mary Greeley Medical Center's healthcare environment during the documentation process. I had an opportunity to explore Mary Greeley Medical Center and discovered this existing second floor space with visual access to the adjacent roof and its potential to be developed into a healing environment. The location of this space created an appropriate space for this new design.

The task of this thesis was to propose a new design for the second floor interior space and the adjacent roof which could be beneficial to the healing environment. The thesis objective was to provide Mary Greeley Medical Center with an environment that is sensitive and responsive to the physical and emotional well-being of those who use this facility and to strengthen the hospital's qualities as a total healing environment.

The outcome of this thesis is subjected to the conditions and limitations of this study. The scope of this thesis focused on nature and the built environment and their contributions to the healing process. Beyond the boundaries of this thesis, the following could be considered as further research topics: how many healthcare facilities currently have healing spaces incorporated into their physical environment to assist with the healing process and how many healthcare facilities in development are incorporating healing spaces which are cohesive with the surrounding environment as part of the design program.

In conclusion, the study resulted in invaluable information for providing design solutions to ensure that the healthcare environments created by interior designers,
architects and hospital administrators contribute to and promote the healing process. Designers and planners of healthcare facilities have an opportunity to act as advocates for the needs and concerns of patients, staff and others who use healthcare facilities, but who may lack input at the planning stage of the design process.
REFERENCES CITED


BIBLIOGRAPHY


Mary Greeley Medical Center. (2005). www.mgmc.org


APPENDIX A. DRAWINGS OF PROPOSED DESIGN FOR HEALING SPACE IN MARY GREELEY MEDICAL CENTER
Figure 5-1. Mary Greeley Medical Center

Figure 5-2. Existing Plan
Figure 5-3. Proposed Design for Interior Space

Figure 5-4. Perspective View of the Proposed Interior Space
Figure 5-5. Interior Space Annotations

Figure 5-6. Roof Garden Annotations
Figure 5-7. Proposed Design for Roof Garden

Figure 5-8. Elevations of Proposed Design for Roof Garden
Figure 5-9. Perspective of Proposed Design for Roof Garden

Figure 5-10. Perspective of Proposed Design for Roof Garden
Figure 5-11. Section of Proposed Design

Figure 5-12. Section of Proposed Design
Figure 5-13. Materials for Proposed Design

Figure 5-14. Furnishings for Proposed Design
APPENDIX B. DEFINITION OF TERMS

Healing: to restore (a person) to spiritual wholeness; the act or process of curing or of restoring to health.

Health: the state of being well in body or mind; freedom from disease; condition of optimal well-being.

High-tech: employing, requiring or involved in high technology; the use of highly advanced technology or devises.

High technology: technology that involves highly advanced or specialized systems or devices.

Holistic: emphasizing the importance of the whole and the interdependence of its parts.

Institutional: characteristics or suggestive of an institution, especially in being regimented, uniform, dull or unimaginative.

Reflection: mental concentration; careful consideration.

Rejuvenate: to restore to youthful vigor or appearance; make young again.

Relaxation: make or become less tense or anxious; make or become less formal or strict.

Renew: to regain or restore the physical or mental vigor; restore to freshness.

Restorative: promoting recuperation; a medicine or other agent that helps to restore health, strength or consciousness.

Spiritual: of or concerning the spirit as opposed to matter; refined, sensitive.

Sterile: free from living microorganisms; lacking imagination, creativity or vitality.

Technological: relating to or involving technology.

Therapeutic: contributing to mental well-being; having or exhibiting healing powers.

Tranquility: a disposition free from stress or emotion; a state of peace and quiet.

Well-being: state of being healthy, happy or prosperous.