

# FORCE OF NATURE:

Encouraging Therapeutic Design And Healing  
Through Social, Sensory And Seasonal Planning  
For The Stanford Broadway Medical Center

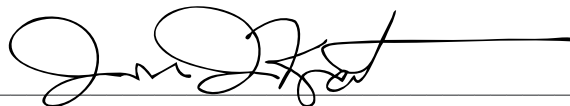
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FORCE OF NATURE:  
Encouraging Therapeutic Design And  
Healing Through Social, Sensory And  
Seasonal Planning For The Sanford  
Broadway Medical Center

A Design Thesis Submitted to the  
Department of Architecture and Landscape Architecture  
Of North Dakota State University

By  
Elizabeth Czeck

In Partial Fulfillment of the Requirements  
For the Degree of  
Bachelor of Landscape Architecture



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Primary Thesis Advisor



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Secondary Thesis Advisor

May 2018  
Fargo, North Dakota

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## THESIS ARCHIVAL NOTE

The following thesis project, entitled *FORCE OF NATURE: Encouraging Therapeutic Design And Healing Through Social, Sensory And Seasonal Planning For The Stanford Broadway Medical Center*, was composed over the course of the 2017-2018 academic school year. The Thesis Program, as contained here, was initiated and completed in the fall semester as a part of the LA 563: Programming and Thesis Preparation course. Supplemental material, including the Thesis Boards and the Thesis Presentation documents, were generated in the spring semester as a part of the LA 572: Design Thesis studio. Any inconsistencies between the different documents, in terms of research and design, should be excused per the evolution of the project across the two semesters.



## ABSTRACT

Hospitals are revered as the epicenter of health and some doctors are even equated to gods. Modern medicine has come a long way and many lives have been spared due to medical advances of the 20th century. Yet most patients complain of lack of sleep, depressive moods, reduced appetite, and fatigue. Are these symptoms due to their treatment or the hospital environment? Historically, hospitals were designed around open-air halls and courtyards with walking paths and plantings. This design offered patients a chance to walk around, access to fresh air and views of nature. As the 20th century evolved medical professionals became increasingly aware of the benefits of sterilization and as a result “form followed function”. Gray walls and incandescent lights replaced nature views and natural sunlight. While these new environments provided positive results in reduced infection rates, elements of mental and environmental health were increasingly deteriorated. The purpose of this thesis is to explore how landscape architects and medical professionals can work together to influence and create environments that promote **all aspects** of healing.

## [ THE NARRATIVE OF THE THEORETICAL ASPECT OF THE THESIS ]

The healthcare field is a vast and rapidly advancing. As landscape architecture moves further into the mainstream, the two fields begin to merge, forming the sub-genre of healthcare design. The stress of illness and injury can have negative effects on healing, extending patient recovery time spent in the hospital. Many patients today spend excessive amount of time recovering in hospitals because they do not have access to healing environments. By immersing patients in nature, I intend to reduce patient recovery time and hospitalizations. Public best interest, health and wellbeing has long been the responsibility of Landscape Architects. Like physicians, landscape architects are held to the same standard of "first, do no harm". If this is true, it is the duty of landscape architects to work with healthcare professionals to ensure that both medicine and surrounding environments have positive impacts on patient health.

As a recent cancer survivor, I have a strong passion and empathy for the ill and suffering. After receiving lifesaving treatment and surgeries I am eternally grateful to the medical professionals who fought so hard to keep me alive. I made it a goal to contribute to health care in the only way I knew how, through design. For the past 5 years Fargo has been my home and to show my appreciation I intend to create a comprehensive plan to revamp Sanford Health Broadway Medical Clinic and Hospital. Located downtown near restaurants, shopping, and historic neighborhoods the site is prime real-estate. With money and tax incentives offered for redevelopment the renaissance zone of downtown Fargo is rapidly evolving. Currently home to the largest cancer treatment center in North Dakota, Roger Marris Cancer Center, the site has continued to adapt and expand to meet local healthcare needs. Sanford Health clinic network provides 60% of all medical care in North Dakota, Northern South Dakota, and Northwestern Minnesota. With large populations of people seeking care it is important that Sanford create a healthy environment for the patients and the community they serve. By utilizing nature in the healing process hospitals can treat more patients faster and cheaper to help build a stronger and healthier community.

This capstone project will focus on how the connection to nature can be reintroduced into the healing process. Can responsible landscape design have a positive impact on mental and physical stress due to illness? What elements of landscape design can help create a positive healing environment? This project intends to act as the basis for future healthcare design in landscape architecture. The techniques explored through this process are intended to be applicable and formable to many different healthcare design projects such as nursing homes, hospital, and physical rehabilitation centers.

## [ PROJECT TYPOLOGY ]

This project will predominantly focus on healthcare design within the realm of landscape architecture. I intend to explore the various elements of healing that can be implemented through landscape design. Healthcare design is centered around patient healing, stress reduction, safety, and both patient and staff wellbeing. ADA accessibility will be a large area of the design emphasis as most patients will have experienced some loss of mobility and strength. Biophilia, salutogenic design, human

psychology, therapy and healing gardens are a few topics of research that may be helpful to developing my thesis program and design later on. With the proposed expansion to the Roger Marris Cancer Center there is some potential to work within the architectural realm to help create a cohesive environment and design. Healthcare design is centered around patient healing, stress reduction, safety, and both patient and staff wellbeing. ADA accessibility will be a large area of the design emphasis as most patients will have experienced some loss of mobility and strength.

## Advocate Lutheran General Hospital Patient Tower

Conservation Design Forum | Park Ridge, IL | 2 acres | 2009

The Advocate Lutheran boasts 12 different healing garden spaces throughout their hospital campus. The 6,300-sf offers a connection between the existing structure and the new patient tower. The garden uses different types of seating to create spaces for both conversation and solitary activities. This project also offers different healing garden typologies with various green roof and ground level gardens.

The Children's garden offers 1,300-sf of interactive play without compromising safety. With a specific area for children to run wild patients are able to experience the relaxation they were longing for. With various gardens to choose from, hospital sponsored activities can be reserved for events while still offering other spaces for relaxation.

Designers also made it a goal to incorporate green building practices. Rainwater retention is maximized by the use of over 24,610-sf permeable pavers resulting in the use of minimal salting during the winter months. The Spiral Garden's rainwater detention pond functions aesthetically as a relaxation element as well as dampening street noise. The designers did a great job of integrating healing and healthy environments and has been met with very little negative criticism.



# Randall Children's Hospital

Zimmer Gunsul Frasca Architects LLP | Portland, OR | 5.5 acres | 2011

Randall Children's Hospital debuted one of the more successful healing gardens for children in 2011. At their facility observers have recorded 52% of in-patients and 23% of out-patients utilizing the spaces. Each day they average around 40 patients and 25% of visitors spending time in the courtyard. Surprising to the observers, 92% of the activity recorded were social activities.

Nurses and staff are also benefiting from the healing spaces as researches recorded an 8% decrease in on the job stress and emotional stress within 6 months of being at the new facility. Storm water infrastructure was also heavily incorporated into the design of the new facility. The smart design has saved 6.7million gallons of run-off from entering the city's sewer system.

With the added vegetation the site stores 5,263 lbs of carbon and eliminates 973 lbs by utilizing the new tree plantings. While I find this site to be a step forward in healing garden design, the sources I have found focus more heavily on the sustainability of the project rather than the healing aspects of the design. While I find that there is room for both design typologies, as a hospital I think that patient care should be the number one priority.





# Lady Cilento Children's Hospital

Lyons, Conrad Gargett | South Brisbane, AU | 28.45 acres | 2014

After researching numerous hospitals from the 1980's the design team noticed a pattern of "medico-centric" design. Utilizing a "salutogenic" approach the team began to incorporate design strategies with direct positive effects on patient wellbeing. Elements of design included clear wayfinding, exterior connection, nature views and sustainable environments. T

he radical healthcare design served almost 38,000 inpatients, saw 63,634 emergency cases, performed 14,113 operations and provided 188,765 outpatient care appointments within its first year of opening.

The design concept is based on the idea of a 'living tree'. 'This parti was developed in the early planning stages through a series of workshops with the hospital's users and stakeholders', said Lyons. Various different healing aspects of design were implemented throughout the entire hospital grounds. To date, this may be one of the most successful implementations of healthcare design.



## [ MAJOR PROJECT ELEMENTS ]

### [01] ADA accessibility & compliance

Many of the patients will be fatigued and possibly wheelchair bound. Patients will be attached to IV poles that can be difficult to maneuver.

### [02] Active and passive spaces

Spaces that all active and passive activities help patients experience the space how they want to. Example, if a patient is having a rough day they may enjoy a more secluded space to sit in peace.

### [03] Comfortable seating variety

Variety of seating typology so patients can recline, sit at a table, bench, etc.

### [04] Gentle water element

A gentle stream, pond, or trickling fountain add to a serene atmosphere.

### [05] Low odor plant pallet

Many patients undergoing rigorous treatment experience a heightened sense of smell. Plants with high pollen content and fragrance can make a space uncomfortable.

### [06] Street noise reduction screen

Reducing street noise can help create a tranquil environment

### [07] Wind protection

Without wind protection the site may be rendered useless on one of Fargo's many windy days.

### [08] Shade structure

Having spaces that offer refuge from the sun will be a key element as many patients may have photosensitive treatment (chemotherapy)

### [09] Smooth walking surface

Variability in patients balance can cause serious fall risks. Smooth even surfaces allow patients stability and make it easier to push wheelchairs and IV poles.

## [ USER/CLIENT DESCRIPTION ]

The regional healthcare giant Sanford Health will be acting as the client for this project as it would be developed through them using current property. This project will embody the Sanford Health slogan "dedicated to the work of health and healing" by providing comprehensive healing in combining clinical medicine and the natural environment.

Users of the site can be broken down into a few different sub categories to better represent the diverse populations who will be utilizing the space. The patient population, specifically cancer, trauma and long term rehabilitation patients, are the main target audience of the site and will be the most impacted and influenced by design. A person's relationship with the physical environment is dependent on his/her subjective experience of well-being, shown in the Triangle of Supporting Environments (Bengtsson, 2014). The Triangle of Supporting Environments demonstrates both active and passive engagement with nature. From figure 01 we can conclude that when a patient has low well-being they experience their environment with heightened sensitivity.

Patient visitors and families are also under immense pressure and spending time with ill loved ones in the healing environment can help reduce stress of their own. Involving patient friends and family can help with patient feelings of loneliness and inclusivity resulting in healthier attitudes towards the healing process.

Though not directly designed for healthcare staff, a healing environment can also

help reduce their on stress and help facilitate relaxation while out on breaks. Working with very ill patients can emotionally drain care workers and can cause mental health issues of their own. Reducing worker stress can directly help create a stronger focus on patient health and wellbeing leading toward reduced recovery time.

## [ SITE INFORMATION ]

Specific criteria must be met when choosing a project site. The proposed site must be attached to a hospital, must have a cancer ward, urban context, and be 1-2 acres in size. The target users of the site are long term hospitalized patients, specifically patients battling cancer. I chosen Sanford Broadway Medical Center located at 801 Broadway, Fargo, ND 58102. This site meets all aforementioned criteria, as well as contributes to the vibrancy of the downtown Fargo Renaissance Zone. Though the site is located in Fargo I do not personally know much about it and will have to explore the site more thoroughly. I have been in contact with the design team and am hoping to secure a tour of the facilities over winter break.



Region | E. North Dakota / N.W. Minnesota Boarder



City | Fargo, ND



Site | Downtown Fargo

## [ PROJECT EMPHASIS ]

This capstone project will explore two main areas of emphasis. It is intended to use the five main human senses, touch, smell, sight, noise, and taste, to influence the healing process. The second area of emphasis will be in ADA compliance. Most of the patients and users will have serious mobility restrictions and it is important to ensure their safety through smart design.

## [ PROJECT GOALS ]

### Academic Goals

The intent of this capstone project is to act as an example to the landscape architecture community as how to facilitate healing through the design processes. I would like to create a comprehensive list of program elements and design insights for designers to use when creating healing environments.



## Professional Goals

Professionally I would like this capstone project to be an introduction into healthcare design. I intend to pursue a career in this sector of the landscape architecture profession and would like to use this project to demonstrate my understanding of the sector in my job search.

## Personal Goals

As a recent cancer survivor I have experienced many of the same challenges that these patients face every day. I want to create a healing design model that can be easily replicated and applied to different healthcare settings to help ease patient burdens and promote healing. I feel that I was given the chance to live and it is my duty to provide patients with quality environments to ensure their chances of successful treatment. The Roger Marris Cancer Center is the biggest cancer facility in the area and creating a healing environment here would have the greatest impact on the community.

## [ PLAN FOR PROCEEDING ]

In order to ensure a successful outcome for this capstone project I will need to continue my research in various areas and implement it in my design solution.

I intend to continue my research into hospitals that have recently constructed healing environments. I am curious to find a site that was deemed unsuccessful in order to learn from their mistakes.

That being said, to continue to move forward sometimes you need to look to the past. In regards to historical hospital structures and courtyards, I will gather in-depth research relating their design strengths and weaknesses. I would like to find out when exactly there began a shift in the “dulling” of hospital design.

To better understand the site I intend to contact a Sanford Health representative to orchestrate a meeting with the design group. I would like to make them aware of my intentions and my research findings once the project is complete. I am interested in their point of view and any insightful information they may have. I would also like to tour the facility to better understand the spatial relationship and patients I will be designing for.

Most importantly, I intend to compile a list of programmatic requirements that I find necessary to the success of a healing environment. Creating a strong program is the backbone of this capstone research. A strong programmatic list will ultimately help me achieve my goal of setting a strong precedent for future healthcare design.

### Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations

By Clare Cooper Marcus, MA, MCP and Marni Barnes, MLA, LCSW  
University of California Berkeley

As stated by the authors, their vision for their research is “To create a future where the built environment supports the highest level of human health, well-being, and achievement in all aspects of life and work”. I strongly feel that this mission aligns with my personal, professional and academic goals for my capstone project. This research report will include historical and typological design research and concludes with evidence-based design recommendations.

Studies of existing healing gardens in northern Californian healthcare facilities were used to evaluate their effectiveness and limitations surrounding healing gardens. Of the dozen of healthcare facilities they evaluated, it became evident that private hospitals fell short on healing spaces when compared to public hospitals. It also proved that any garden does not equate to a healing garden. Challenges of nearly every hospital was staff education and wayfinding. Unfortunately, many of the medical staff were unaware of their hospitals healing gardens and its location. With proper promotion and education of staff members healing gardens can serve a greater number of patients and loved ones.

After the authors' conclusive research, a pattern of key features and design issues of existing healing spaces became apparent. From these findings, design recommendations were compiled to make implementing healing spaces into healthcare design more beneficial to the users. In the majority of the case studies, healing gardens were not a part of the original healthcare facilities design. The retrofitting of a healing space provided some patient accessibility and unforeseen site issues. Recommendations for a more well-rounded healing design were categorized by three different subgroups: Proper planning, Elements of healing design, and maintenance.

#### Proper Planning

The majority of the reviewed case studies were additions to existing hospital structures. While many of the sites were still effective, their effectiveness was hindered by poor site selection/availability, unfavorable conditions that affected comfort levels, noise disturbance, and issues with access to the healing spaces. Recommendations to mitigate these issues include:

- Involving a Landscape Architect in the planning of new healthcare facilities so proper site evaluation and selection can occur. (i.e. drainage, solar and wind patterns)
- Providing proper wayfinding and educating the staff on the healing spaces' location.
- Proper security and safety measures should be in place (i.e. fences, gates) as stress of medical treatment can cause mental deprecation that often causes issues with judgement.
- Spaces should provide a calm contrast to the high-stress hospital environment
- Provide sensory stimuli (i.e. appropriate plant selection, wildlife attraction, plants with elegant movement)

- contrasting and harmonizing design elements (i.e. texture, form, color)
- Ease of movement through a variety of pathways and spaces, specifically meandering patterns.
- Safe seclusion spaces as well as those that facilitate social interaction
- White noise can be very useful in that it provides a psychological "screen"
- Quality maintenance to ensure the space will have a positive affect
- Educating staff on the benefits of healing gardens and encouraging promotion of the space
- Scheduling social events and meetings in the healing garden

These are the design recommendations that I am most interested in implementing into my project. I will be including some of my own design elements that I found to be lacking during my time spent hospitalized. Properly executed healing spaces will likely attract a variety of users. Research and analysis done by professionals is extremely important to any field of study. For myself, firsthand experience added an element to healing design that could not be obtained through studies and observation but through personal experience alone.

Qualitative data from their studies concluded that 95% of patients felt more relaxed and less pain when spending time in the healing garden. Medical staff reported being more productive and focused after spending time in the gardens. Conclusions were made that gardens do in fact provide physical, emotional and mental healing to a wide variety of users. Moving forward the authors call for a more qualitative approach and narrowing their studies to specific types of healthcare facilities to better service key demographics.

## [ PROJECT JUSTIFICATION ]

Design has evolved tremendously over the past century, evolving and becoming more inclusive among social classes. Innovative design is no longer just for the few that can afford it and can now be seen in transit hubs, wellness centers, and educational projects. The project will embody the salutigenic design and contribute to the health and wellness of all its visitors. This project will demonstrate analysis techniques and design principles taught throughout my time at NDSU. I will be required to work independently to develop a design solution based on the research I have conducted. My goal is to create a healing environment that will make for a happier and healthier community. On a larger scale, society as a whole can benefit from continued education and implementation of healing practices.

## [ HISTORICAL, SOCIAL & CULTURAL CONTEXT ]

Restorative gardens first began to be incorporated as arcaded courtyards in hospital and monasteries during the Middle Ages. Lush plantings and dappled shade provided sick patients with fresh air and an escape from their sick beds. But like any trend monastic care began to decline in the 14th and 15th centuries. Monastic care facilities became overpowered by famine, increased migration, and periodic plagues and care for the sick was largely adopted by the Roman Catholic Church. Which focused more on the inclusion of religious aesthetics rather than palatine care. An example of this can be seen in Ospedale Maggiore in Milan (1458) who's

formal gardens could not be viewed due to the obnoxiously high windows.

Centuries later, garden environments in healthcare began to reemerge due to the combination of Romanticism and scientific medicine. Cross ventilation and hygiene were incorporated into hospital design to reduce the spread of secondary infections. Plymouth, England's Royal Naval Hospital became a prime example of these design implementations. In the 19th century outdoor spaces were again included into design and located between the pavilion style wards. The pavilion style buildings were then connected to form a chain that provided cross ventilation to the patient wards.

In more recent times nurses began to wheel hospital beds outside to provide patients with fresh air and sunlight. This practice provided significant relief and treatment to patients suffering from tuberculosis furthering the practices popularity. Evidence of this can be found in images from St. Mary's catholic hospital in San Francisco, California. The design of psychiatric facilities underwent major reforms in the late 18th and 19th centuries. Asylums began to include peripheral grounds, landscape vistas, and gardening to encourage psychological nurturing over physical punishment.

With the start of the new century high rise construction, cost efficiencies and advances in medical sciences developing building trends began to favor multistory medical complexes. Design that included natural elements began to disappear and were replaced by practical measures such as reducing the number of steps for physicians and nurses. This new American style of care began to spread after WWII into every typology of patient care facilities. Rehabilitation facilities were one of the only patient care typologies to continue utilizing garden environments. Patients with physical care needs began to benefit from occupational therapy which was spurred by the veterans returning from deployment during WWI. The rising mortality rates of patients with AIDs and cancer began to influence hospice facilities to integrate natural environments back into their design. By the 1970s hospitals began to resemble "air-conditioned office buildings" with lower ceilings and fluorescent lighting. Seizing a lucrative opportunities hospital administrators and insurance companies began to transform hospitals into resembling hotels in the 1990s. But developers and designers still largely ignored the idea of garden spaces.

The modern rediscovery of the healing natural environments has largely been influenced by a resurgence in complementary and alternative medicine. When combined with medical science the natural environment can be used as a tool to boost healing qualities and reduce inpatient stays. Fargo, North Dakota is a rapidly developing city whose expansion has been largely influenced by community input. Fargoan's have a huge interest in creating a healthy and happy community environment. This can be seen through the redevelopment of Fargo's Renaissance Zone, an effort to draw people back into the downtown area. As the city began to grow Fargo's downtown became an area to be avoided and property values plummeted. During the late 90's and early 2000's plans to redeveloped downtown began to circulate. Over the past decade the downtown area has flourished thanks to new design techniques and resident interest. Now bustling with people, residents enjoy holiday festivals, farmers markets, food truck park and many more new activities. Fargo is host to numerous 5K and marathons which draw participants from all over the tristate area. The downtown has numerous wayfinding signs that encourage walkability and physical activity further exemplifying citizen interest in wellness. The Sanford Broadway Medical Center serves the downtown and north Fargo areas medical needs. By implementing healing spaces, residents

can continue to strive for community wellness.

## [ SITE ANALYSIS ]

I have been in contact with the design team and am hoping to secure a tour of the facilities over winter break.

## [ REFERENCE LIST ]

Bengtsson, A., & Grahn, P. (2014, October 05). Outdoor environments in healthcare settings: A quality evaluation tool for use in designing healthcare gardens. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1618866714001022#fig0005>

Cooper-Marcus, Clair, and Marni Barnes. Gardens in Healthcare Facilities - Health Design. The Center for Health Design, 1995.

## [ THESIS APPENDIX ]

### PREVIOUS STUDIO EXPERIENCE

#### 2ND YEAR

##### Fall 2013 | LA 271 Intro to Landscape Architecture | Kathleen Pepple

Entry-level design generation methods involving concept formation, site inventory and analysis, programming, and simple site organization and planning. Problem solving through rendering and model development; oral and written communication skills.

##### Spring 2014 | LA 272 Parks & Open Spaces Studio | Dominic Fischer

Continued design development in site organization and planning. Design issues in natural resources, land reclamation, construction technology, and rural development are explored. Intermediate problem solving through 2D and 3D graphic techniques both hand rendered and digital.

#### 3RD YEAR

##### Fall 2014 | LA 371 Site Planning & Design Studio | John Harper

Visual problem solving and large-scale site planning issues. Two-part focus involving the comprehensive visual inventory and analysis along with the immediate application of site planning and design skills. Client communication and design workflow are expanded upon.

##### Spring 2015 | LA 372 Community Planning & Design Studio | Kathleen Pepple

Cultural and environmental design issues are related to large-scale land planning and site design involved with residential communities. Emphasis within the studio on site engineering and design detailing. Course includes a field trip.

#### 4TH YEAR

##### Fall 2016 | LA 471 Urban Design Studio | Jason Kost

Regional systems inventory, visual survey, analysis techniques, and methodologies for design problem solving through graphic, computer, and modeling development. Graphic analysis of a site continues to be expanded upon. Focus on urban studies and site planning.

##### Spring 2017 | LA 472 Remediation & Planting Design Studio | Matthew Chambers

Natural resource and land reclamation management techniques within contemporary design of landscape architecture. Remediation techniques and flood zoning codes are explored. Emphasis on presentation and communication skills.

#### 5TH YEAR

##### Fall 2017 | LA 571 Environmental Planning Studio | Dominic Fischer

Environmental systems development and implementation of a complex design problem solving skills. Emphasis on landscape architecture design development through graphic, computer, and modeling techniques. Ethics of historical and cultural sensitivity within landscape design.

## PERSONAL IDENTIFICATION



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"Grow through what you go through"

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