Spring 2012

Architectural Healing Environments

Brian Schaller

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architectural healing environments

Brian Schaller
Advisor: Randall Korman
Secondary Advisor: Anne Munly

Spring 2012 | Completion of Undergraduate Architectural Thesis
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1. Statement
Spaces for healing represent some of the most personal and complex services provided: intimate personal information must be shared with strangers; complex and often frightening situations might occur; difficult decisions are constantly made; and the staff speaks an entirely different language. The building itself can help to reduce the stress experienced by patients, their families, and the teams caring for them.

The rehabilitation environment is a work environment for the staff, a healing environment for patients and families, a business environment for the provision of healthcare, and a cultural environment for the organization to fulfill its mission and vision. In order to realize these environments, facility designs must be linked to the organization's goals and objectives (Kellert).

Traditional models of rehabilitation centers bring the people out of their environment in urban areas to the rural areas. This focuses on disengaging patients from the physical complexity and stimuli of an urban habitat. The removal sets a distance between the urban patient and their everyday life. Arguably, this displacement provides a challenge to the longevity of the success the individual has made in rehab. The environment of the rehabilitation center and the patient’s home is comparatively a dramatic difference. Mentally one begins to associate their “healed self” with the facility and their “old self” with their home. The shift sets a possibility of imbalance and even relapse of the issues treated.

Positive distractions of rural environments, the healing process will occur quicker and more effectively. An untraditional approach is to bring these natural elements, from the traditional approach, into the urban environment. Historically, areas for rehabilitation are placed outside of the urban fabric. This focuses on disengaging patients from the physical complexity and stimuli of an urban habitat. The removal sets a distance between the urban patient and their everyday life. Arguably, this displacement provides a challenge to the longevity of the success the individual has made in rehab. The environment of the rehabilitation center and the patient’s home is comparatively a dramatic difference. Mentally one begins to associate their “healed self” with the facility and their “old self” with their home. The shift sets a possibility of imbalance and even relapse of the issues treated.

“The US health system is perfectly designed to produce the results we are achieving.”- Leland R. Kaiser
Why is it important right now in today’s society to hone into this problem? With the growing population and increased employment of medicine to treat illness, it is important to consider natural remedies that are clearly being looked over because a lack in awareness of its successful properties. I strongly believe that if we were to present the evidence of the effect architecture has on healing people and its quality to promote healthy lifestyles, there would be a drastic change in the mindset the world has on architecture and health.

Over the past decade, new attitudes toward health and healing have begun to dictate an increasing number of decisions about how people choose to live (Kellert.). As a result, the commercial, medical, and industrial worlds are slowly being asked to adapt to these new trends. The field of architecture is also being asked to change. How can the built environment support the new directions toward a healthy lifestyle?

"As the baby boomers age, they are going to ask for better hospital environments and expect to see features that make them more friendly and less institutional." says Anjali Joseph, the center’s director of research.

"We build the buildings that end up shaping us"– Winston Churchill
It is the contention of this thesis that a study of the phenomenological approach to how one experiences space and by incorporating evidence-based design criteria that are acknowledged for improving wellbeing, quality of life, and reducing distress in people, a healing environment will emerge. The experienced environment will facilitate a temporal awareness of one's self and the design criteria's attention to the experienced setting will allow for a healing environment to emerge within the architecture. I am not proposing that architecture can heal, but rather the architecture can stimulate a healing environment.
The hope is that phenomenology will allow for spatial awareness, an awareness of one’s own experience, and empathy with other people, and social interaction to occur. Through all of this, the phenomenology will lead to a conscious experience into conditions that help to give the experience its intentionality: to heal.

The project is to introduce a wellness center into the middle of Manhattan. The idea is to take over an underutilized rooftop of a skyscraper in a location that is unexpected. I do not want to make a medical complex, but create an environment that forms its own identity as a place where one goes to rebalance their imbalances. The intended users are people recovering from depression, alcoholism, and drug abuse. The program will be an outpatient center treating people with psychological issues.

The philosophy that guides this concept of healing is rooted in research in the neurosciences, environmental psychology, psychoneuroimmunology, and evolutionary biology. The common thread linking these bodies of research is the physiological effect of stress on the individual and the ability to heal. The goal of all healing environments is to engage patients in the conscious process of self-healing and spiritual growth. Spaces are designed to be nurturing and therapeutic and, most important, to reduce stress. This is a research-based approach to design, aimed at eliminating environmental stressors and putting patients in contact with nature in the treatment setting. The idea behind bringing the wellness center into the most urban of environments in the country is to prove healing can be achieved in a notoriously unhealthy environment. The disparity between the designed space and city is quite evident. However, I believe that treating the subject under two very extreme habitats will test their success and ability to integrate their recovery to their everyday life.

The premise of the center is that the subject can be treated and then allowed back home repeated over a period of time. It’s under the philosophy that slow and steady wins the race. Small repeated intervals of treatment over time have the ability to create healthy habits to emerge in one’s life. The justification behind this structure is that the individual should not feel like they are being treated. The program works like an appointment, fit into their schedule, so that they can sustain their lifestyle while rebalancing their life. This also gives the patients a chance to test out the different techniques and principles they have been taught at the center to rebalance their life. The process also gives the patient a sense of independence placing their personal choices and lives first.

Often in healthcare facilities, the healers are in power and the patients are aware and feel
that authority. The control is present in every aspect of the center, including the architecture. I am not saying that the dominance isn’t necessary, but the patient’s awareness of its influence subconsciously impedes them from reaching their highest potentials of comfort level. This discomfort is a problem because it increases the risk that the patient won’t return. The outpatient treatment facility must ensure a high level of comfort because it is their responsibility to return for continued treatment in the future. One way in which the individuals can see themselves as an equal occupant of the building is through the concept of framing. Forced perspectives that engage the patient with a framed view of elements like trees or water provide the individual independent moments of self-awareness in the space (Ulrich).

The isolated moments provide a pause and distraction to engage the patients mind off of their own suffering. It is also gives them a reminder that they are an active participant in the facility. It is proven that if someone feels comfortable and relaxed, they can rest easier and heal faster. This can also be achieved by making the patients feel like they are in an environment where they are not being viewed, but rather viewing other things. It tries to stay away from the institutional feeling of many other wellness centers. For instance healing environments should stimulate positive awareness of ourselves, enhance our connection with nature, culture, and people; allow for privacy; do no physical harm; provide meaningful, varying stimuli; encourage times of relaxation; allow us to interact with them productively; balance constancy and flexibility; and be beautiful.

“Patients want to feel in control of their health, to make their own choices while in a health care facility, and to not feel so dependent on staff for help,” says Cynthia Leibrock, a designer who has written several books on the topic including Design Details for Health and heal faster.
2. Methodology
Evidence-based Design:

The use of knowledge on psychologically supportive environments is defined as evidence-based design. Evidence-based design, based on its medical equivalent, evidence-based medicine, refers to guiding design decisions by scientific evidence in order to promote health and well-being (Mchale). For example, use of the evidence-based design on healthcare environments might impact health-related outcomes such as length of stay, pain, medication intake, stress, arousal, mood, or environmental appraisals. These variables are all considered to be relevant outcome measures in assessing the effects of the physical healthcare environment, but most research in this field still needs to be discovered. One example of a subject tested in evidence-based design is stress. Stress can result in more pain and slower wound healing, but it also impacts the immune system. Stress can many times be triggered from the environments we live in (Norman). The breadth of the many statistics that demonstrate how one can begin to design healthy environments are convincing reasons to design spaces that reduce stress and address things like patients’ needs for relaxation and comfort.

The pages that follow will show some of the research that can be used to help design healthy settings for people to heal.
### Sunlight and Patient Satisfaction

Patients were asked to answer these questions each day throughout the course of their stay. Surveys conducted by BMAssociation over a year with several Mental Institutions in UK.

**(Conducted with Depression Patients)**

<table>
<thead>
<tr>
<th></th>
<th>Little to no Sun</th>
<th>Moderate to Ample Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep Performance</td>
<td>80.78</td>
<td>92.35</td>
</tr>
<tr>
<td>Activity Level</td>
<td>51.79</td>
<td>69.23</td>
</tr>
<tr>
<td>Control of Stress</td>
<td>35.46</td>
<td>48.84</td>
</tr>
<tr>
<td>Tolerance of Pain</td>
<td>56.34</td>
<td>61.36</td>
</tr>
<tr>
<td>Contentedness</td>
<td>67.78</td>
<td>74.25</td>
</tr>
<tr>
<td>Willingness to return</td>
<td>89.60</td>
<td>93.09</td>
</tr>
</tbody>
</table>

**(Conducted with Alcoholic Patients)**

<table>
<thead>
<tr>
<th></th>
<th>Little to no Sun</th>
<th>Moderate to Ample Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep Performance</td>
<td>89.09</td>
<td>91.90</td>
</tr>
<tr>
<td>Activity Level</td>
<td>69.36</td>
<td>78.04</td>
</tr>
<tr>
<td>Control of Stress</td>
<td>47.08</td>
<td>57.08</td>
</tr>
<tr>
<td>Tolerance of Pain</td>
<td>35.08</td>
<td>39.59</td>
</tr>
<tr>
<td>Contentedness</td>
<td>46.92</td>
<td>45.39</td>
</tr>
<tr>
<td>Willingness to return</td>
<td>60.56</td>
<td>80.25</td>
</tr>
</tbody>
</table>

**(Conducted with BiPolar Patients)**

<table>
<thead>
<tr>
<th></th>
<th>Little to no Sun</th>
<th>Moderate to Ample Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep Performance</td>
<td>69.99</td>
<td>68.32</td>
</tr>
<tr>
<td>Activity Level</td>
<td>68.53</td>
<td>73.47</td>
</tr>
<tr>
<td>Control of Stress</td>
<td>54.79</td>
<td>59.12</td>
</tr>
<tr>
<td>Tolerance of Pain</td>
<td>65.79</td>
<td>67.24</td>
</tr>
<tr>
<td>Contentedness</td>
<td>45.54</td>
<td>52.98</td>
</tr>
<tr>
<td>Willingness to return</td>
<td>56.75</td>
<td>65.90</td>
</tr>
</tbody>
</table>

**Interview** (Therapist point of view)

In-depth Interview with a therapist from CPEP conducted by Brian Schaller (an outpatient facility for mental health emergencies [Syracuse, NY])

**Question: What would you like to see in a mental health facility to focus on healing?**

She talked most about the internal environment:
- the main entrances and reception areas should be pleasant and welcoming
- the internal appearance should be calming and non-intimidating
- the building should have good acoustics
- temperatures should be comfortable in all seasons
- the air quality should be fresh.

**Question: What about the kind of materials and textures you find work best?**

Materials, finishes, textures:
- materials and finishes should work with the layout to create a set of varied places with degrees of privacy
- finishes, fittings, furniture and notices should be well coordinated and designed to reduce clutter
- selection of finishes and materials needs to take account of infection control issues.

**Question: What else do you see helping ease the stress of the patients?**

Use of art to enhance the healing environment:
- art should be an integral part of the design of the interior
- the design should make provision for changing art displays
- the design could make provision for presentations of the performing arts
- the design could allow for art activities to take place for patients and staff.

**Question: Any concluding remarks concerning this topic based on your experience?**

Irrespective of the size of the building the scale should be considered from the point of view of patients, visitors and staff so as to make them welcome.
Interview (Psychologist point of view)

Interview with psychologist from BINGHAMTON PSYCHIATRIC conducted by B.Schaller (an facility for most mental health disorders (Binghamton, NY))

Question: What would you like to see in a mental health facility for the future?

She began by talking about spaces that lift spirits and help recovery:
• the design of the building should aid therapeutic objectives
• the building should engender wellbeing and raise patients’ and visitors’ spirit

Question: What do you hope the design would do?

Express excellence
• the design should express a strong positive image of the health service
• the building should raise staff morale.
the design should embody a clear and coherent vision confidently communicating its function and aspirations through its physical elements.

Question: What areas of the healing environment should be focused on?

Set out requirements for functional content and space standards
• public and entrance areas
• social spaces for patients, staff and public
• children’s areas
• scope for external franchises and other add-ons
• plant and servicing
• exterior terraces, play areas, etc.

Question: Is there any other thoughts you have on this topic based on your experience?

She began talking about Space utilization
• spaces should be capable of being shared where appropriate – seen as a resource, not personal territory.
• dual use of circulation space should be exploited where effective to encourage informal association and gathering.
Interview (Consoler point of view)

Interview with Consoler from Syr. Behavioral Healthcare conducted by B.Schaller
(Inpatient substance abuse facility (Syracuse, NY))

Question: What is one aspect of the built environment you work in that could be changed to help promote the care for patients?

The efficiency of the place and how it runs:
- the inter-departmental relationships should be convenient and help efficient functioning
- there should be clarity about the priority of key relationships
- internal relationship within departments (main rooms, bays, storage, service rooms) should be convenient and help efficient functioning.

Question: Do you have any thoughts about the private vs. public spaces in your facility

For the Privacy, isolation and communality:
- requirements of visual and acoustic privacy
- requirements for gender segregation
- infection control regimes including isolation rooms and beds.
She added additional issues to consider:
- reception areas should enable confidential conversations without embarrassment
- the design should help avoid unintended isolation, allowing patients to communicate with staff when needed.

Question: Do you have any thoughts about the use of color, natural light vs. artificial light, shading, etc. based on the patient’s responses you have witnessed?

Color:
- the contribution of color to providing continuity and variety, stimulation and calmness should be thought through
- color schemes should assist way-finding.
Daylight:
- daylight should be fully exploited to enhance the experience of patients, staff and public
- internal spaces and courtyards should be orientated for optimum sunlight penetration
Artificial light:
- lighting should be used creatively and sensitively to enhance the use and experience of the interiors.
Ward layouts and way-finding

Ward layouts in older hospitals generally provide long corridors organized around a central nursing station, where medication and charts are located. Research has shown that nurses spend much of their time (more than 40 percent in older UK NHS hospitals) walking up and down halls increasing fatigue and stress and sharply cutting the time available for observing patients and delivering direct care.

40% of a nurses day is spent walking up and down halls

Perceptions of sunshine contribution

Study done for the Center for Health Design by the Picker Institute (1999) Included both focus groups and in-depth interviews over a two-year period

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Patients</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considered sunlight to be a nuisance</td>
<td>2%</td>
<td>62%</td>
</tr>
<tr>
<td>Considered sunlight to be pleasurable</td>
<td>91%</td>
<td>31%</td>
</tr>
<tr>
<td>Considered sunlight to be calming</td>
<td>92%</td>
<td>35%</td>
</tr>
<tr>
<td>Considered sunlight to be unfavorable</td>
<td>1%</td>
<td>26%</td>
</tr>
</tbody>
</table>

Importance of the Built Environment

Study done for the Center for Health Design by the Picker Institute (1999)
Included both focus groups and in-depth interviews over a two-year period

What mattered most to People: Space

1. Promotes connections to staff:
   - Visual access to caregivers
   - Quick access in emergencies
   - An effective communication system

2. Is conductive to well-being:
   - Focus on noise reduction
   - Patient control of room temperature, TV, lighting
   - Negative distractions minimized
   - Accommodation for family
   - Adequate space for grooming and daily tasks
   - Internet access
   - Adequate lighting
   - Storage for personal belongings
   - Adequate electrical outlets

3. Is convenient and accessible:
   - Clarity of wayfinding on the campus
   - Privacy at admitting and registration
   - Visible wayfinding directories & visitor info near entry
   - Short travel distances between destinations
   - Clearly marked entrance and drop-off areas

4. Is confidential and private:
   - Quiet areas where patients can be alone
   - Privacy for bathing and dressing
   - Privacy when treatment options/financial issues discussed

5. Shows caring for family:
   - Access to telephones
   - Visiting areas for family with seating in privacy groupings
   - Play space for children
   - Space to accommodate a wide range of users
   - Overnight accommodations
   - Private grieving spaces

6. Is considerate of impairments:
   - Consideration for persons using assistive devices
   - Wheelchair access at information desks and elsewhere
   - Adequate space to move around room using wheelchair
   - Bathrooms large enough for wheelchair

7. Facility’s connection to outside world:
   - Exterior gardens and opportunities to connect with nature
   - Views from the bed
   - Keeping in touch via Internet
   - Television

8. Is safe and secure
   - Well-lit parking lot
   - Safe path from public transportation
   - Adequate handrails within facility
   - Slip-proof bathrooms

"The Ecology of the Patient Experience"

Weill Cornell Medical Center

Research hypothesis: The design of the environment impacts the perceived time spent waiting in a doctor's office and the perceived quality of care provided.

The more attractive the environment, the higher the perceived quality of the medical care and the lower the anxiety.

Perceived Experience of Patient: (based on average comparisons)

<table>
<thead>
<tr>
<th>Environment</th>
<th>Staff Interaction</th>
<th>Wait Time</th>
<th>Quality of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attractive</td>
<td>Positive</td>
<td>Less</td>
<td>Positive</td>
</tr>
<tr>
<td>Unattractive</td>
<td>Negative</td>
<td>More</td>
<td>Negative</td>
</tr>
</tbody>
</table>

(Stokols, D. and I. Altman (Eds.), Handbook of Environmental Psychology, New York: John Wiley, 571-610.)

Single versus Multiple Occupancy Room Design

Study conducted by the Coalition for Health Environments Research (CHER)

| First costs and operating costs | Single occupancy can match the per diem cost of multibed rooms due to higher occupancy rates  
Operating costs are reduced in single patient rooms due to reduction in transfer costs  
Patients' length of stay is shorter in private rooms  
Medication errors are reduced in single occupancy rooms |
| Infection control and falls prevention | Infection rates are lower in private rooms with proper design and ventilation systems  
Private rooms make it easier to isolate infected patients or Patients requiring constant supervision do better in a private room due to increased surveillance |
| Therapeutic Impacts | Patients in private rooms use less pain medication  
More private conversations with healthcare professionals can occur in private rooms  
Patients prefer single bed rooms because of greater privacy, less noise, reduced embarrassment, better sleep, and not having to be concerned about disturbing the other patient  
Patient stressors in the hospital include perceived lack of control, lack of privacy, noise, and crowding perception  
Crowding can contribute to higher blood pressure |

This study assigned patients either a walk through a rural setting or an urban landscape. While they were in these environments, the blood pressure levels were measured. The study showed that the blood pressure on average was reduced while walking through the natural landscape as opposed to the urban environment.

Another important aspect of the study was analyzing the emotions while integrated in their assigned surroundings. On average, the rural landscape had positive affects on the human being while the urban landscape had negative affects on the person.

The study actually found a difference in the sadness recorded between men and women. Many times the mood is triggered by associations made in the built environment. This could be the result for the difference in moods. On average, the men might have different perspectives on the built environment when the emotion of sadness is experienced.

The integration of natural physical environments into treatment for human sufferers has always proven to be an effective course of action. Elements in nature emulate qualities of calmness and serenity that are necessary for a healing environment. Studies have shown that simple changes like a view to a green landscape becomes a mental focusing tool of distraction allowing recovery to manifest quickly. The capacity of the mind to heal suffering is overwhelmingly neglected in modern facilities in America. Generally, American healthcare facilities are designed to hold the tools to heal, not be the tool to heal. If one were to begin to think of architecture as just important as the medicine, there could be a major shift in how people are treated for the future.

Roger Ulrich (1984) began to change this line of thinking with his pioneering study of the effects of hospital window views on recovery from abdominal cholecystectomy surgery. Ulrich’s study focused on patients who could see trees, rather than a brick wall through their patient-room window. The study found that these patients subsequently required less narcotic pain medication, experienced a shorter hospital stay, and had fewer negative evaluative comments in nurses’ notes.

### Noise Level Impact on Patient

<table>
<thead>
<tr>
<th>Study performed</th>
<th>outpatients psychiatric ward</th>
<th>Data obtained from patient surveys</th>
</tr>
</thead>
</table>

#### (ACC) in Sweden

<table>
<thead>
<tr>
<th>Level 1 Patient</th>
<th>Healthy level avg.</th>
<th>Level 3 Patient</th>
<th>Healthy level avg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Addiction)</td>
<td>(1 out of 10 being the best)</td>
<td>(Sev. Depression)</td>
<td>(1 out of 10 being the best)</td>
</tr>
<tr>
<td>Symptoms</td>
<td>40-50 dB, 50-60 dB, 60-65 dB</td>
<td>Heart Rate</td>
<td>40-50 dB, 50-60 dB, 60-65 dB</td>
</tr>
<tr>
<td>Respiration</td>
<td>7 7 5</td>
<td>Respiration</td>
<td>7 5 3</td>
</tr>
<tr>
<td>Sleep</td>
<td>9 7 5</td>
<td>Sleep</td>
<td>7 4 4</td>
</tr>
<tr>
<td>Stress</td>
<td>8 8 5</td>
<td>Stress</td>
<td>6 5 4</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>9 7 6</td>
<td>Blood Pressure</td>
<td>8 6 3</td>
</tr>
<tr>
<td>Oxygen Sat.</td>
<td>8 6 5</td>
<td>Oxygen Sat.</td>
<td>7 5 4</td>
</tr>
</tbody>
</table>

#### Level 2 Patient

<table>
<thead>
<tr>
<th>Healthy level avg.</th>
<th>Level 4 Patient</th>
<th>Healthy level avg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Depression)</td>
<td>(1 out of 10 being the best)</td>
<td>(Critical Disorder)</td>
</tr>
<tr>
<td>Symptoms</td>
<td>40-50 dB, 50-60 dB, 60-65 dB</td>
<td>Heart Rate</td>
</tr>
<tr>
<td>Respiration</td>
<td>7 7 5</td>
<td>Respiration</td>
</tr>
<tr>
<td>Sleep</td>
<td>8 6 4</td>
<td>Sleep</td>
</tr>
<tr>
<td>Stress</td>
<td>8 6 4</td>
<td>Stress</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>8 6 5</td>
<td>Blood Pressure</td>
</tr>
<tr>
<td>Oxygen Sat.</td>
<td>9 7 5</td>
<td>Oxygen Sat.</td>
</tr>
</tbody>
</table>

### Exposure to Daylight on Depression

A 2001 study by Benedetti et al. with patients treated for depression.

#### Solar Orientation

<table>
<thead>
<tr>
<th>Number of days spent in the facility</th>
<th>East Facing</th>
<th>West Facing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean: 10.1 days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean: 13.8 days</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Calculations:

- West Facing: 13.8 days
- East Facing: 10.1 days

<table>
<thead>
<tr>
<th>Difference</th>
<th>Days saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7 days</td>
<td></td>
</tr>
</tbody>
</table>

Found that patients hospitalised for depression stayed an average of 3.7 fewer days if they were assigned east-facing rooms exposed to morning light, compared to patients in west-facing rooms with less sunlight.

---

|--------------------------------------------------|
Phenomenology:

In phenomenology, the environment is concretely defined as “the place”, and the things which occur there “take place”. The place is not so simple as the locality, but comprises of concrete things which have physical substance, shape, texture, and color, and together join to form the environment’s personality, or setting. It is this setting which allows certain spaces, with similar or even matching purposes, to embody very diverse properties, in accord with the unique cultural and environmental situations of the place which they exist (Bachelard). Phenomenology is considered as a “return to things”, maneuvering away from the abstractions of science and its unbiased objectivity. Phenomenology engages the concept of partiality, making the thing and its unique conversations with its place the pertinent topic and not the object itself. The man-made constituents of the setting become the settlements of opposing scales, some large - like cities, and some small - like the house. The trails between these settlements and the many features which make the cultural environment develop the secondary defining characteristics of the place. The difference of natural and manmade offers one the principal stage in the phenomenological approach. The second is to succeed inside and outside, or the connection of earth-sky. The third and final step is to measure character, or how things are complete and occur as participants in their environment (Palasmaa,).

The pages that follow describe the way in which Phenomenology can be used to help design healthy settings for
Spaces that must be learned activate the mind and become challenging for the occupant to occupy. The nature of this type of environment also makes it atypical to the average spaces one occupies on a regular basis in the real world. Thus the person arranges their own mental construct of the space giving them the opportunity to engage with the built environment and utilize their mind. Exercising the mind in this way is an important way to stay mentally sharp and healthy, while also giving a distraction to their ailment. These diagrams illustrate the effect of the tilted surface on the body. One can observe that the first mode of perception is necessarily occurring as gravity forces the body's parts to interact with the architectural surface’s parts. However, in the difference of architectures which proceed only with flat floors, in the Oblique Function, gravity imposes an additional effect on the bodies, a directionality.

Any movement of the body in any direction will exercise on it, a degree of acceleration. This acceleration will be negative if the body attempts to climb up the surface and it will be positive if the same body attempts to go down the slope. A negative acceleration imposed on the body creates a fatigue on the body whereas a positive one triggers an exhilaration. One could thus argue that only half of the potential movements on this surface provide a joy when the other half provokes sadness. The slope is expressing its power of existence.

...It is not the rectangle which is the problem, but its life-sapping characteristics. Where materials, textures, colours, light, living line and human activity can reinvest such forms and spaces with life, the materially practical and culturally normal characteristics of rectangles can be used to advantage. None the less, in general, one feels on much safer ground with non-rectangular or shape-moderaed spaces." -Roger Ulrich
The language of forms in architecture also has a correlation to the feeling one obtains from the space. For example, the natural environment has soft edges, but no right angles (Red-stone). However, the right angles in our everyday life are endless in the built environment. The architecture of a healing environment can take on the qualities of natural conditions through imitation in form. While one might feel constrained and boxed in rectilinear spaces, the fluidity of an organic space creates no such feeling. Without right angles, the spaces become seemingly less harmful and comforting to the human eye.
responsive

The integration of all the senses helps complete the highest potential of an environment to allow for healing to emerge. For example, the sound of moving water is one aspect of a space that can elicit emotions for relaxation and tranquility. Thus, the architecture can integrate the water as an aspect of the design to allow for a healing environment to emerge. Lighting design in healthcare environments is a major factor in creating healing situations. It is proven that people who are surrounded by natural light are more productive and live healthier lives. When patients are sick, and surrounded by medical equipment and white walls, the last thing they need is a dark, stuffy room. This is why it is important for every room to have a window for natural light to come in and help create a healing environment for the patient (Tyson). Also by bringing nature indoors, it has many psychological benefits. Plants are soothing and restful. Plants represent life, growth, and hope. They can provide interest and diversion. Plants are used as a therapeutic tool.

sensory experience
Colors in architecture provide visual stimuli for the occupant that can elicit positive and negative emotions based on its environment. Whether the emotions one experiences are through acquired knowledge and/or personal history, there is evidence that colors provoke emotions on average in the same way with few exceptions. Whether these associations were learned in childhood or not, our culture transcends these messages of color associations early in one’s life. Sometimes colors guide us through life both literally and figuratively. For example, in our country a stoplight on green means go. In most cases the green light is associated with positive emotions because of the action that follows. Very rarely would a green provoke negative emotions. A red light can sometimes elicit frustration and anger. This proves the power of color to guide actions and emotional responses. It gives some insight at how colors become engraved in our minds to manifest reactions. Why do these associations occur with colors? An example to explain this answer is the concept of warm and cool colors. Some might answer that cool and warm colors are the way they are because it just is. However, this concept can be traced back to nature. The associated properties describing the colors relates back to the physical environment in which we live in. How does color become integrated into the design? Due to the power of color to evoke emotion, it can become a tool integrated in the architecture to highlight and instigate the individual through a sequential experience in the architectural healing environment. The properties of the color can also set the tone for spaces as well, eliciting certain emotion were necessary. According to color therapy, colors are capable of influencing many aspects of our lives, including our mood, mental state and energy level. Each color is thought to be associated with one of seven energy centers, or chakras. If a person’s is thought to be out of balance or weak, the color it’s associated with is believed to help strengthen it. The concept of color therapy is based on the fact that our physiologic functions respond in predictable manner to colors.

Healing Environments should...

- stimulate positive awareness of ourselves;
- enhance our connections with nature, culture, and people;
- allow for privacy;
- do no physical harm;
- provide meaningful, varying stimuli;
- encourage times of relaxation;
- allow us to interact with them productively;
- balance constancy and flexibility;
- be beautiful.
Originally, the island of Manhattan was a haven for all sorts of vegetation and a wonderful habitat for an assortment of wildlife. Since the urban sprawl, the natural habitat has been greatly reduced.

Every small effort that is made to bring back the natural elements lost from the construction of the city is crucial to the recovery of a habitat. The hope is that this rooftop can become one more green spot on the map that highlights green spaces in Manhattan.
The natural elements that were lost from the original habitat on the island range from ferns to flowers that sometimes hold very beneficial qualities. For instance the common elderberry is high in Vitamin C and could be used for its nutritional value. Other plants were edible and were high in nutrients. These plants and others could integrate themselves back into habitat while also provide healing properties for the center.
The quest for getaways from the urban life was a concept realized many years ago for the people that could afford it. For instance, the Turkish royal family had their palace in the city. Yet, during the summer months they would cross the river to their other palace in the countryside that employed views of the landscape and natural environment. It was their time to rest and rejuvenate their health. It was a time of relaxation and self-meditation. In Italy, the Medici family also had a similar concept. The Palazzo Pitti was their main home for the cooler months. Then, during the summer months they would retreat to their villa in the countryside for the beautiful landscapes and serenity away from the hustle and bustle of the city. Still to this day there are families that have their house in the city, but a summer place outside of it. The desire for relaxation and relief from the city life has always been sought over. It gives a personal retreat for their minds to relax and focus on their lives to rebalance. The wellness center will act similarly as a retreat for the patients to obtain these qualities of a getaway from the

Historical Reference

city. It will give the person time to self-reflect, engage with nature, and rebalance their lives away from the busyness around them in the city. The desire to create healing environments can be traced back to the vestiges of European medicine. The hospital, built in ancient Epidaurus, a small city in Ancient Greece, in the sixth century BCE, included patient rooms that faced eastward (toward the sun) to promote healing and was the most celebrated healing center of the Classical world. Until recently, building infrastructure was regarded as a sunk or overhead cost; rather than a revenue-producing variable. This view resulted from the inability to link facility resources with the heart of healthcare business, providing safe, quality patient care and family support, and a positive and safe work environment for staff.
Why choose a site in a city besides creating a new and untraditional model for wellness centers to exist? It is proven that mental illnesses like depression and suicide rates are statistically higher in urban areas as opposed to rural areas. Why choose New York as the urban area to test the thesis? Compared to the rest of the country, New York’s population is the highest. This creates the perfect binary to stage the wellness center in. It was crucial that the city was densely populated to show how that the concept could work anywhere.

Manhattan was chosen out of the other boroughs because it has the most issues with mental illness. For instance, Manhattan has the highest suicide rates comparatively to the other boroughs. Also based on density per square foot, Manhattan ranks the highest. This once again is the ideal situation to test the thesis.
Manhattan Grid
From the beginning, the issue was finding a site in an urban environment. The obvious choice was to construct this architectural healing environment in a rural area where the light and views of the landscape would be optimal. Traditionally, this is where one would find rehabilitation centers for people dealing with depression, alcoholism, drug abuse due to the fact that it was removed from society so that they could just focus on themselves and their issues. However, to create this healing environment in a place where it was unexpected and accessible to the patient’s everyday life, proved to be difficult. The next obvious choice would be to create a new center in an unoccupied space somewhere in the urban context. Nonetheless, I wanted the site to have even more of an impact on society, making its presence known.

The solution then became to go up rather than down. The site then would become open to light and views, no longer obstructed by other buildings. The underutilization of skyscraper rooftops became the launch for why it would become important to place a wellness center on top of a building. Not only would the green elements integrated in the center help heal the occupants; it would now give back to the lost natural habitat of NYC. The hope was that the concept could now become a model for other city’s to employ into their urban fabric. Additionally, the rooftop of a skyscraper performs many healthy aspects that cater towards a healthy environment because it travels up and away from the noise pollution, air pollution and overcrowding in the streets. The green roof concept also has the ability to become a sustainable feature for the rest of the building, too. Sustainable features like rainwater collection and thermal mass cooling.
Site: 1166 Avenue of the Americas
District: Southern Midtown
Intersection: 6th and 45th
Monumental Structures of Height in Manhattan as seen from site.

Image Citation: http://www.orkposters.com/manhattan.html

- Bank of America Tower
- W.R. Grace Building
- Empire State Building
- 500 5th Avenue
- Chrysler Building
- MetLife Building
- Bear Stearns World HQ
- Madison Av - E 47 st
- Citigroup Tower
- Olympic tower
- 30 Rockefeller Plaza
- 1255 Avenue of Americas
- 155 W 48th St
- Calenece Tower
- Worldwide Plaza
- 100 W 63rd St
- One Astor Plaza
Views from within the skyscraper...

...to the East River...

...and Central Park.
The Existing Floorplan of the Office Tower

Image Citation: http://www.orkposters.com/manhattan.html

Rendered view within the tower from the top floor. The perspective shows the importance of the skyline for the perspectives looking out of the building.
The integration of the natural world into the design is paramount in order to successfully develop a healing environment. Thus, the site's environmental conditions need to be addressed in order to fully understand the complete natural character of the site. Aspects like the sun exposure, prevailing wind patterns, Fall and Spring equinox, winter and summer solstice, average monthly temperatures, etc. The contrast of New York from summer to winter is large, so it is important to understand the diversity within the weather in order to design a successful year-round business.
Prevailing Winds
Wind Frequency (%)
Location: New York, USA (40° N, 73° W)
Date: 1st December - 20th February
Time: 00:00 - 24:00
© Weather Tech

Spring

Summer

Winter

Autumn
HEALTH: A dynamic state of complete physical, mental, and spiritual wellbeing

Program is a crucial aspect in architectural healing environments. The different programs the center provides for its patients determines the success of its healing environment. In order to ensure a setting that encompasses all of one’s health, there must be stimulation to the mind, body, and spirit. Consequently, the center will be split between the overarching program titles of Body, Mind, and Spirit.

The associated spaces under these titles will have programmatic relationships with the other spaces in order to form a complete stimulation to the body, mind, and spirit.
### Body

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<td>Music Therapy</td>
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<tr>
<td>Counseling Room</td>
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### Spirit

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<td>Clinical Programs</td>
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The body plays an important role to the recovery or sustained balance of a patient’s well-being. Studies have shown that exercise increases the ability of the body to produce chemicals to reduce the likelihood of depression and other mental illnesses (Waxman). Not only is physical exercise important for recovering patients, but also for healthy individuals as well. The positive aspects of physical movement should become integrated to centers that care for the entirety of an individual’s well-being.

Individual physical activity is one way of releasing endorphins into the body (Zielke). However, group physical activity is another form of physical activity that can force the interaction between other patients inside a comfortable and social common space. Social interaction and physical exercise together create an excellent combination for an optimal healing environment engaging physical activity (Waxman). The body must be fed in order to survive the world. Through proper nutrition the person can balance their health and feel good. Thus, the program must integrate spaces where individuals can choose nutritious meals to feed their physical form. Spaces focused on teaching people how to cook and eat nutritious balanced diets should also be integrated. Their knowledge of how to cook for themselves healthy meals at home provides them the power to help treat themselves outside of the center as well.
Spaces that allow the individual to connect with their spirituality are a crucial part of treating the person’s overall wellness. First, it gives them the education of personal meditation to employ in their own lives outside of the center. Second, it engages the awareness of their body and mind, making them present in the moment.

The process of centering one’s self helps the person shift their focus on the importance of their health and simplicity of life. Thirdly, it is a way to strip the mind of all the unnecessary thoughts that confuse the mind into oblivion. The spiritual programs should be both intimate and collective, defined fluidly with natural elements that transcend peacefulness to the solitude of the space (Ulrich).

All aspects of each program must provide the individual the tools to integrate into their lives to sustain their equilibrium in life. This can only be completely achieved by educating the people. Thus, each space must have ways in which the individual can have “take-home” knowledge in order to improve their life without the center’s presence in their life.
5. Precedents
A half-barrel-vault skylight illuminates the whole of the main patient floor, while layered and curved walls further diffuse light into the space. Rooms are designed with views oriented from the perspective of the patient, lying down and looking up. Key to the concept for the center was incorporating family into the treatment environment. Thus, individual rooms in the chemotherapy atrium open onto main social spaces for gathering and interacting with relatives, allowing patients to determine their own level of privacy. As a whole, the project represented a profound exploration of architecture’s potential for communicating compassion and instilling confidence in patients’ ability to fight a life-threatening disease.
“a centre of vitality and well-being without a trace of institutional feeling”

The design consists of a number of free-form units in which rooms are arranged around internal courtyards. The rooms face the outside of the building, while the space around the inner gardens functions both as circulation space and common living space.
Normality has been the keyword when the architects tried to work their way away from institutionalisation. The possibility to choose between solitude and social interaction has been made possible by single bedrooms and small patient units with adjoining common rooms. The patients can gradually increase their personal space. All the care units have direct contact with a courtyard garden space which contributes to an increased sense of freedom and offers the recreational powers of nature.
Maggie’s Centres rely on the fundamental precept, often overlooked, that exceptional architecture and innovative spaces can make people feel better – thereby kindling the curiosity and imagination fundamental to feeling alive. Grand in their ambitions, but designed on a small scale, Maggie’s Centres provide a welcome respite from typical institutional hospitals, but serves as a haven for those receiving treatment. In creating a place to connect and learn from others who are going through similar experiences, Maggie’s help patients to develop their sense of confidence and resourcefulness.

Instead of a series of isolated rooms, the building is designed as a sequence of interconnected L-shaped figures in plan that create clearly distinguished areas – an arrangement that minimises the need for corridors and hallways and allows the rooms to flow. The plan has been organised for the spaces to feel casual, almost carefree, allowing one to feel at ease and at home, part of an empathetic community of people.

At the same time the design also provides spaces for more personal moments – either in the intimate setting of the counseling rooms.
Richard Keating Architecture | JACOBS University of Washington Surgery Pavilion | Seattle, Washington

The pavilion incorporates the natural landscape and built landscape as a way of mediating between the two in a space of healing. The formal moves within the interior spaces such as the stairwell, begin to dictate natural forms as a way of referencing nature. The literalness of this translation is not what I am interested in, but rather the notion of generating form derived from a more humanistic form.
The design of this house is an interactive experience between the user and the built environment. The floor of the house is almost like a hilly terrain that requires the user to go up and down, constantly recognizing their body with the ground floor plane. The house is also said to oppose death by making the user actively participate in the understanding of the space. It is unconventional on purpose in order for the occupant to think and memorize the space in which they live.
This project sets up a very distinctive environment in which the user begins to navigate the space through the series of walls and curves that push one in and out. The space is integrated with the landscape to stimulate the senses while experiencing this designed environment of multiple stimuli to activate the mind.
The building incorporates color as a way of directing people throughout the building and generating interest. The combination of the light with the color becomes an integral part of the materiality that is addressed. The strategically placed color applications also provide a means of distraction, bringing the viewer into the built environment.
The design of this wall, as an interactive feature within the built environment, becomes an interesting diversion from the typical wall with paint. The user begins to design the wall with their own personality, and it changes the face of the space just by the touch of a finger. The role of the user is now an active participant within the space.

Akihisa Hirata | Commercial building in Daikanyama | Tokyo

Part of the healing process for patients dealing with psychological illness is the interaction between peers. Spaces like this, activated by the dynamic architecture, are critical to the patients' healing treatment.
Light becomes a material in this setting. The strategic planning of all the openings to the outside, and the angles of these cutouts to force the light in the desired angle is stunning. The space has an ethereal quality about it that is only achieved by the light.
Materiality and its affects on the healing environment

Materiality has a direct influence on the overall sense of the environment. Materials have the ability to affect the sound environment, circulate movement, increase / decrease comfort, and various other actions. With this, the form in which the material becomes a part of will also determine the powers of its placement. The associated dimensions of the material also will play a factor in the design. For instance, wood is a material that retains heat, is soft and comforting, and can be associated with the concept of natural environments. Another material like sand has a therapeutic value to it, soft to touch, and gentle on feet. However, stone is cool and smooth to touch, but hard on feet. When the materials become integrated in the program, the quality of the materials will embody the vision of the space and become another dimension in the healing environment. Other, not usually thought to be materials, like light, sky, water, and vegetation will be manipulated with the built environment to evoke specific responses in order to stimulate the mind and its perceptual visioning of a space.
The following perspectives provide a vision for the “garden.” These are intended to be spaces that integrate all the senses: vision, taste, smell, hearing, and touch. The study is done through a phenomenological lens, designing with a multiplicity of textures, materials, and interests to engage the mind in a playful manner of distraction. The awareness of these physical things in the space and their properties provides the necessary information for the occupant to draw their own conclusions. This awareness of one’s self is the beginning to any healing process in the mind.
This massing studies begin to discover the possibilities of the site with the principles from the contention. Major moves, like the central courtyard, begin to open up many possibilities for internal views towards a natural landscape and internal natural daylight for the interior spaces.

Cutting away the tower to see the connection of the addition to the rest of the tower. The attention of the internal and external surfaces will prove to be important. The disparity between the two zones is abundant. For example the exterior zone looks out to the city while the other looks internally to a designed environment.
The site will become a beacon and destination visible from multiple viewpoints over the city. The potential of the project is to impact other cities, becoming a model of how architecture can be utilized as a tool to create architecture that helps sustain the healthy lifestyles everyone strives for. An environment constructed through architecture that has a positive passive effect on our health and lives is an extraordinary leap in the way people can begin to see buildings.
architectural healing environments
Architectural Healing Environments
Glossary

Environment: that which environs or surrounds; surrounding conditions, influences, or forces, by which living forms are influenced and modified in their growth and development.

Heal: to restore or be restored to health

Health: the general condition of the body or mind with reference to soundness and vigor

Well-being: a good or satisfactory condition of existence; a state characterized by health, happiness, and prosperity

Psychology: the scientific study of the human mind and its functions, esp. those affecting behavior in a given context.

Flexibility: responsive to change; adaptable

Meditation: a stylized mental technique... repetitively practiced for the purpose of attaining a subjective experience that is frequently described as very restful, silent, and of heightened alertness, often characterized as blissful

Urban: Characteristic of the city or city life.

Evidence-based: entails making decisions about how to promote health or provide care by integrating the best available evidence

Therapeutic: having or exhibiting healing powers

Spirit: the principle of conscious life; the vital principle in humans, animating the body or mediating between body and soul.

Body: the physical part of a person

Mind: the element of a person that enables them to be aware of the world and their experiences, to think, and to feel; the faculty of consciousness and thought

Habitat: the natural home or environment of an animal, plant, or other organism

Sequence: a set of related events, movements, or things that follow each other in a particular order

Sequence: a set of related events, movements, or things that follow each other in a particular order
Works Cited


