University of Cincinnati

Date: 3/23/2015

I, Joseph Klingshirn, hereby submit this original work as part of the requirements for the degree of Master of Architecture in Architecture (Master of).

It is entitled:
Creating Adaptable Behavioral Health Patient Environments

Student's name: Joseph Klingshirn

This work and its defense approved by:

Committee chair: John Eliot Hancock, M.Arch.

Committee member: Michael McInturf, M.Arch.
Creating Adaptable Behavioral Health Patient Environments

A thesis submitted to the Graduate School of the University of Cincinnati in partial fulfillment of the requirements for the degree of Master of Architecture in the School of Architecture and Interior Design of the College of Design, Architecture, Art, and Planning

March 2015

By: Joseph Klingshirn

Bachelor of Science in Architecture
University of Cincinnati, 2012

Committee Chair: John Hancock
Abstract

Mental health awareness is a pressing issue globally, as Unipolar Depression alone is projected as the World Health Organization’s second leading cause of disease burden for 2030. Mental illnesses are typically treated through Cognitive-Behavior Therapy, which posits that healing is dependent on understanding and controlling the relationships between behavior, environment, and cognition. Facilities that act as healing environments, like the Lindner Center of HOPE, outside Cincinnati, Ohio, focus on each patient and pay attention to the building’s role in recovery. However, many centers are institutional in character, exacerbate the social stigma of mental illness, and have overly standardized design elements. This thesis proposes a new model that involves architecture in the healing process, to alleviate these institutional, stigmatizing, and standardizing tendencies.

A new model for mental health care facilities can lead the field in effectively treating the growing number of patients. Incorporation of patient and caregiver control over acoustics, lighting, spatial organization, nature, color, and materiality allows for environments attuned to the needs of each patient, and can reduce typical institutional qualities. The project’s location in a public, urban setting, adjacent to medical and research partners, presents mental health treatment as a valuable social resource, helping to combat the stigma of the mentally ill. Coherent spatial organization, a variety of interaction levels, separated patient groups with shared resources, and individual, flexible patient rooms also help to address the standardized nature of existing facilities of this type. A facility that combats these three negative characteristics of mental health care design will ultimately engage its architecture, as environment, in the reciprocal relationship between environment, behavior, and cognition.
Preface

Mental health awareness is a pressing issue globally, as Unipolar Depression is projected as the World Health Organization’s second leading cause of disease burden for 2030, and it was estimated in 2012 that 18.6% of adults in the United States had a mental illness. These illnesses are typically treated through Cognitive-Behavior Therapy, which posits that healing is dependent on understanding and controlling the relationships between behavior, environment, and cognition. Facilities that act as healing environments, like the Lindner Center of HOPE and the Östra Psychiatric Hospital, focus on each patient and pay attention to the building’s role in recovery. However, a holistic model is needed, because many centers are standardized, institutional, and exacerbate the social stigma on mental health.

A new model for mental health care facilities can lead the field in effectively treating the growing number of patients. Coherent spatial organization, a variety of interaction levels, separated patient groups with shared resources, and individual patient rooms will address the standardized nature of existing facility typologies. Incorporation of patient and caregiver control over acoustics, lighting, spatial organization, nature, color, and materiality will allow for environments attuned to the needs of each patient and reduce typical institutional qualities. A location in an urban environment, adjacent to medical and research partners, with a sense of privacy within the public community, would both present mental health treatment as a valuable social resource and provide for the insular needs of a mental health center.

The investigation of design factors in behavioral health treatment centers became an interest of mine after my father spent inpatient time in a Veteran’s Affairs hospital for treatment
of severe depression. I had never considered the factors of healthcare design beyond architectural implications before my experience with his treatment. The idea of condensing overall treatment area square footages has clear benefits for staffing, security, architectural costs, and also presents other efficiencies of scale. Design decisions of this kind may not affect patients in an oncology, surgical, or other relatively long-term inpatient area, but can have negative consequences for behavioral health clients. There are many architectural factors in healthcare design that are not well suited to behavioral health treatment.

Behavioral health relies on the relationship between environment and behavior, investigating how the two can affect each other. ¹ This balance is unique to each patient and therefore understanding each situation is the key to effective treatment. An often important aspect in healthcare projects is designing for condensed patient spaces. In behavioral health, this results in combining patients with a wide variety of disorders in one location, which impacts environmental factors, and thus behavior and treatment. Architecture is also recognized as an impactful variable in the treatment of behavioral disorders. Sensitivity to external stimuli necessitates an amount of control over those stimuli by both patients and their care providers. Six architectural elements can be utilized (acoustics, lighting, space planning, integration of nature, color, and materiality) to achieve a controllable sensory environment for patients. This integrated behavioral health treatment model ensures patients receive the best care, devoid of negative stimuli from other residents. Design decisions like condensed patient spaces and architectural characteristics affect the proper treatment of people with behavior disorders. This thesis offers a restructured approach to mental health architecture, which can help provide a more efficient, beneficial, and expedited recovery.

Table of Contents

Chapter 1 | Identifying the Problem

Chapter 2 | Psychotherapy Research Review
   Behavior Therapy (BT)
   Cognitive Therapy (CT)
   Cognitive-Behavior Therapy (CBT)

Chapter 3 | Design Research Review
   Evidence Based Design
   Integration of Nature
   Sources of Lighting
   Controlling Acoustics
   Designing with Color
   Selection of Materiality
   Strategic Space Planning

Chapter 4 | Precedent Research Review
   Östra Psychiatry Building
   Oregon State Hospital
   St. Charles Medical Center

Chapter 5 | Locating the Site
   Site Considerations
   Aspects of the Site

Chapter 6 | Shaping the Program
   Partner Organizations
   Experiential Characteristics
   Spatial Descriptions

Chapter 7 | Design Description
   Design Aims
   Key Design Concepts

Bibliography
List of Illustrations

<table>
<thead>
<tr>
<th>Figure</th>
<th>Chapter 3 - Design Research Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Comparison of approaches toward nature in design</td>
</tr>
<tr>
<td>2.</td>
<td>Comparison of the qualities of low and high amounts of lighting</td>
</tr>
<tr>
<td>3.</td>
<td>Comparison of uses for the absence or introduction of sound</td>
</tr>
<tr>
<td>4.</td>
<td>Comparison of designs with little to no use of color and the functional use of color</td>
</tr>
<tr>
<td>5.</td>
<td>Comparison of materiality used only as a finish, or to give a space a mood or character</td>
</tr>
<tr>
<td>6.</td>
<td>Comparison of central and decentralized caregiver station designs</td>
</tr>
<tr>
<td>7.</td>
<td>The Patient Safety Risk Assessment (PSRA) matrix</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Figure</th>
<th>Chapter 4 - Precedent Research Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>Östra Psychiatry Hospital residential room</td>
</tr>
<tr>
<td>9.</td>
<td>Östra Psychiatry Hospital patient room</td>
</tr>
<tr>
<td>10.</td>
<td>Oregon State Hospital Salem campus</td>
</tr>
<tr>
<td>11.</td>
<td>St. Charles Medical Center entry</td>
</tr>
<tr>
<td>12.</td>
<td>St. Charles Medical Center reception</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Figure</th>
<th>Chapter 5 - Locating the Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>Progression of aerial site context maps</td>
</tr>
<tr>
<td>14.</td>
<td>Aerial views of existing site conditions</td>
</tr>
<tr>
<td>15.</td>
<td>Historic and current topographic maps</td>
</tr>
<tr>
<td>16.</td>
<td>Progression of maps from site to regional scale</td>
</tr>
<tr>
<td>17.</td>
<td>Historic Sanborn map and current figure ground map</td>
</tr>
<tr>
<td>18.</td>
<td>CAGIS property and topographic maps</td>
</tr>
<tr>
<td>19.</td>
<td>Site conditions at street level</td>
</tr>
<tr>
<td>20.</td>
<td>Site conditions at street level, continued</td>
</tr>
<tr>
<td>21.</td>
<td>Property ownership information</td>
</tr>
<tr>
<td>22.</td>
<td>Weather data with temperature and humidity charts</td>
</tr>
<tr>
<td>23.</td>
<td>Sun shading charts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Figure</th>
<th>Chapter 6 - Shaping the Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.</td>
<td>Behavioral Health Center Program</td>
</tr>
</tbody>
</table>
Chapter 1 | Identifying the Problem

It is important to research the design of behavioral health treatment centers for the purpose of identifying how design factors affect patients in order to create a best practice design that most effectively addresses patient treatment and recovery. Patients being treated in behavioral health centers are highly susceptible to negative external stimuli due to their varied states of mental well-being. Behavioral health is primarily concerned with the reciprocal influence between behavior and environment, meaning disruptive external stimuli are an impediment to proper treatment. In current design standards, the disparate care needs of short-term and long-term inpatient clients are often not considered, and both types of patients are treated in close proximity, causing each group’s presence to negatively affect the others. In addition, behavioral healthcare is responsible for treating patients whose disorders present an array of symptoms. Currently, designs present generalized solutions that are minimally beneficial to every patient. There is a need for a new standard in patient environment design, which considers both the variety of disorders needing treatment, and the individualized nature of effective behavioral healthcare.

Beyond the obvious benefits to individual patients, a new standard for the design of behavioral health patient environments would help care providers, institutions, and the greater mental health community. Many of the ineffective design solutions in current behavioral treatment centers arise from the twentieth century focus on “seclusion, security, and safety” as the driving factors in mental health center design. As treatment environments have been redesigned, patients experience faster recovery and the healthcare institutions receive more

---

1 Morgan M. Carter, "Physical Landscape/Mental Landscape: Mental Health, Architecture and the City" (M.Arch., Dalhousie University (Canada), 2008).
individuals interested in treatment. In addition to delivering a better patient experience, a center that enables quick recovery will allow care providers to support the growing number of people seeking mental health treatment.

To properly prepare to design an improved patient environment, it is important to gather knowledge on the architectural firms, projects, researchers of design strategies, and leaders in the behavioral health field. Array Architects, Behavioral Healthcare Architecture Group, and White Architects provide examples of designers working on behavioral treatment centers and related facilities. Design strategies utilized in these types of buildings include acoustics studied by David Egan, Waldron Faulkner’s thoughts on the use of color, and research on therapeutic landscapes by Clare Cooper Marcus and Naomi A. Sachs. However, before an architectural solution can be arrived at, the theories, history, and practices of behavioral health must first be understood. K. Daniel O’Leary and G. Terence Wilson begin to frame the field in the 1970s, and the definition of behavior therapy is adapted over the next decades by Aaron Beck and his daughter Judith, Jean Cottraux, and Keith Dobson, among many others.

---

3 Ibid., 1.
Behavior Therapy (BT)

Behavior therapy (BT) developed as a response to a variety of previous evolutions in the field of psychology. O’Leary and Wilson briefly describe society’s original views of mental illness as a possession by demons, which progressed to moral therapy, and the treatment of “insanity” by setting a good example for the patient. Scientific advances in the mid-eighteenth century created the disease model, in an attempt to understand psychology medically, and Sigmund Freud shifted the field toward a “preoccupation with hypothetical processes inside the patient’s head over which he had little control.”¹ O’Leary and Wilson go on to explain the evolution of behavior therapy from its experimental responses to the psychodynamic model through the most current methods at the time. The authors promote social learning theory, or “a comprehensive approach to human functioning in which both deviant and prosocial behaviors are assumed to be developed and maintained”² based on the same process of external and internal events. O’Leary and Wilson use this distinction to explain the reciprocal relationship between behavior and environment. This relationship is key to the understanding of behavioral health and the methods that have been developed to support it. The influence of environment on patient behavior means treatment spaces must be adaptable and carefully designed.

Although O’Leary and Wilson summarize the development of behavior therapy up until their publishing date of 1975, the field expanded in several directions in the following decades. The work and research O’Leary and Wilson compile, while partly superseded by later work, is

² Ibid., 11.
still relevant in its focus on reciprocal determinism, or the relationship between environment and behavior. This thought follows through to later theories and can be directly impacted by architectural solutions for treatment centers. The distinction that behavior also affects environment as part of this relationship is a crucial motivation for adaptability in patient spaces. As behavioral health developed after O’Leary and Wilson’s work, many practitioners continued BT, but some, including Albert Ellis and Aaron Beck, developed new research that would eventually be classified as cognitive therapy (CT).

Cognitive Therapy (CT)

Carlo Perris and Jörgen Herlofson collaborate on a chapter in the 1993 text *Treatment of Mental Disorders: A Review of Effectiveness* to describe the principles of cognitive therapy. The authors explain the theoretical differences between cognitive and behavior therapy, stressing that the processes of CT “serve as a mean for eliciting and pinpointing dysfunctional cognitions in the patient and as a tool to guide the patient in correcting them, rather than for the direct training of more adaptive behavioral responses.”¹ The field of cognitive therapy, originally researched by noted American psychiatrist Aaron Beck, does not reject the techniques of behavior therapy aimed at modifying overt behavior, but rather emphasizes the component of cognition as an added domain in which to positively affect disorders. Perris and Herlofson outline cognitive therapy and provide an opinion on the effectiveness of its treatments.

The difficulty with assessing the value of cognitive therapy, as Herlofson and Perris point out, lies in the lack of empirical data, at the time of publishing, to substantiate any claim. The authors agree that the research done up to that time found both behavior and cognitive therapies

---

superior to psychodynamic treatments, but evidence was not balanced towards either of the former methods. Without a clear decision of the best treatment modality, there would be difficulties present in designing an appropriate center. However, as research continued, the psychotherapy field moved more generally toward the combination of both theories in what is called cognitive-behavior therapy (CBT). As Perris and Herlofson steer cognitive therapy towards this middle ground, Jean Cottraux does likewise for behavior therapy in the same text.

**Cognitive-Behavior Therapy (CBT)**

The chapter on behavior therapy in *Treatment of Mental Disorders: A Review of Effectiveness* outlines the characteristics of BT and describes why much of the field was shifting towards a cognitive-behavior therapy model. Cottraux acknowledges that some practitioners at the time were adhering to the traditional model, however, he states “results obtained with classical behavioral methods can be better explained in cognitive terms than in conditioning ones. Even though BT acts to modify behaviors and emotions, its final action is on cognitions.”4 As both fields move towards CBT, it becomes important to define under which theoretical method a practitioner is operating; otherwise patient treatment may not be clear, and care providers may not deliver the best treatment. Cottraux helps to define the criteria for behavior therapy at a transitional time, encouraging effective use of behavioral methods.

While Cottraux’s explanation of behavior therapy is helpful in separating its definition from other methods, he believes the field is better explained as cognitive-behavior therapy, but seems reluctant to fully adhere to that belief. After claiming that “BT has become more and

---

more cognitive, and it would be more realistic today to speak of cognitive-behavioral therapy,” he spends the rest of the chapter discussing behavior therapy as an isolated field. It is easy to apply this critique after it has been shown that psychotherapy has mostly accepted CBT as preferable to either cognitive or behavior therapy alone; however, it is still unfortunate the distinction did not come sooner, perhaps with Cottraux. The author does provide helpful support to claims of the applicability of BT in many cultures and developing countries, which leaves open the geographic possibilities for the proposal of a treatment center. The implications Cottraux makes of behavior therapy becoming more cognitive are realized in later years and the field of cognitive-behavioral therapy is defined and its methods codified.

One source of a detailed itemization of the methods of CBT is the Handbook of Cognitive-Behavioral Therapies, especially the first chapter on the Historical and Philosophical Bases of the Cognitive-Behavioral Therapies. The authors, Keith Dobson and David Dozois, assert that all CBT methods have three common propositions. These state that “1. Cognitive activity affects behavior. 2. Cognitive activity may be monitored and altered. 3. Desired behavior change may be effected through cognitive change.” The overview Dobson and Dozois present shows a field clearly demarcated and firmly situated within psychotherapies. The challenges they see in the research are no longer concerned with separating methods, but rather with quantifying the efficacy of those methods. A constraint present in the design process for a treatment center arises in the role of the architecture in enabling an empirical approach to patient care.

---

5 Ibid.
In addition to providing clear categorizations of the propositions, classes, and models of CBT, the work of Dobson and Dozois presents a direction for the integration of architecture into psychotherapy research. The authors mention the wealth of evidence that now supports both cognitive and behavioral treatments, but stress the difficulty of validating each method’s effect on the other. As the field moves forward with treatment approaches that combine the two, this validation becomes crucial due to the evidence-based nature of CBT. There are resultant architectural implications that the physicality of the treatment space could provide a controlled system of observation for researching combined treatment approaches. A separate direction would be research aimed at how the characteristics of the architectural environment can affect cognition and behavior, and the varying efficacy of each characteristic. In this method, the architecture would actively participate in its role as environment in the relationships among environment, behavior, and cognition. Both research goals would provide value to the cognitive-behavioral field as well as the direction of architecture toward buildings with high levels of functional performance.
Evidence-Based Design (EBD)

Research surrounding the role of architecture in healthcare has shown the value of evidence-based approaches, as studied by Roger Ulrich. A prolific researcher of evidence-based design (EBD), Ulrich outlines the principles of the field in his essay “Evidence-Based Health-Care Architecture.” Three factors are described as crucial to understand EBD, efficiency, clinical outcomes, and safety. These factors determine best practices for the design of a wide range of architectural characteristics. In his essay, Ulrich covers the characteristics of acoustics, space planning, and daylight, among others. Noise in a healthcare environment is described as “a stressful latent environmental condition that increases fatigue and job strain, and in some clinical situations heightens risk of error.”

The material choices in a care facility, which typically consist of mainly hard surfaces, affect not only the staff, but also patients, by reflecting sounds over a long distance. Space planning is especially important when it concerns caregiver stations and their proximity to patient rooms. Ulrich proposes “floor layouts with decentralised nurse charting or observation stations…close to patients’ rooms” to “cut staff time spent walking and…increase time for observation and care of patients.”

Private, or single, patient rooms address both noise problems and caregiver and patient interactions. Roommates in healthcare facilities often provide a negative distraction, and stop care providers from speaking freely with a patient about their treatment. The essay goes on to describe the influence of daylight and views of nature, underscoring the importance of a building’s location on the site and within the surrounding context. Ulrich states, “research convincingly suggests patients experience less

---

2 Ibid.
stress and pain if they can view nature and other pleasant distractions.” In “Evidence-Based Health-Care Architecture,” Ulrich outlines several of the architectural characteristics that research has shown impact patient well-being and staff efficiency.

As an expert discussing healthcare from the architecture point of view, Ulrich provides guidelines for effectively designing health environments. The characteristics he describes as important influencers on patients and staff are key factors around which a healthcare design can be formulated. Acoustics, materiality, space planning, lighting, and nature are all covered in Ulrich’s research. These factors are not presented as best-guess items of focus, but rather as conclusions drawn from numerous studies of healthcare environments. The research provides empirical proof in the form of patient lengths of stay, satisfaction surveys, safety evaluations, observation of staff, and more. The design factors presented by Ulrich are the tools of architectural evidence-based design, and must be employed correctly to achieve the observable benefits.

\[^{3}\text{Ibid.}]^{3}\]
An in-depth source on one design factor, nature, is *Therapeutic Landscapes* by Clare Cooper Marcus and Naomi A. Sachs. Specifically, Chapter 12, covering “Gardens for Mental and Behavioral Health Facilities,” provides clear direction for the design and use of nature for patients with mental disorders. Marcus and Sachs summarize several researchers who have done work involving nature within healthcare environments, and compile a list of design guidelines based on themes from the research. In addition to general guidelines for all facilities, those Marcus and Sachs list specifically for mental health are separated into required and recommended measures. The authors take care to note that, “due to the breadth of issues associated with mental illness, each and every design decision must be specific to the population being served.” The required guidelines for mental health facilities include safety first, balanced security and privacy, social support, areas and outlets for exercise, providing shade, and avoiding glare. These and the other design guidelines are tailored specifically for patients and staff in

---

mental health environments, including considerations for eliminating landscaping elements that could be used for harm, providing furniture that is simultaneously mobile and secure, and avoiding building materials that cause glare. The guidelines provided by Marcus and Sachs are valuable for their comprehensiveness and basis in research.

The standards laid out in Therapeutic Landscapes correctly identify the mental health population as a broad group with many disorders and resulting design implications. The goals Marcus and Sachs provide for nature spaces are best realized by a series of gardens rather than one large space. Staff and care providers should be given a private space, ideally close to a break room, and not visible to visitors or patients. The varied disorders treated in a behavioral health facility also call for a variety of outdoor spaces. Semi-enclosed private space, an open and active expanse, social space for conversation, and areas for patients to be with visitors must all be balanced. An approach where these goals are achieved through a variety of outdoor spaces is ideal because it avoids negative influences of one type of space on a patient utilizing another space. A patient with an anxiety disorder may encounter negative stressors from a wide-open exercise area, even if it is adjacent to an enclosed social space where he is meeting with a care provider. Through separation by goals, or activity type, the outdoor spaces of a mental health facility become rooms within the program, prompting important questions of adjacency and scale.
Lighting, both natural and artificial, is another important design factor in behavioral health facilities. Jean Nayar discusses design aspects of lighting in the article “Healing Light.” Similar to other architectural factors, differences among users and purposes of a space should be considered with lighting. As Nayar affirms, difficulty arises because “part of the problem lies in the diversity of spaces in healing environments. Another part revolves around the often-conflicting needs between patients and hospital staff.”9 These differences can impact desired illumination levels, color rendering, location of light, and type of fixture. Nayar also considers natural light, which includes the questions of view and control. She cites research conducted by Dr. Anjali Joseph, which states, “the changing quality of natural light controls the body’s Orcadian rhythm, which synchronizes our internal clocks.”10 Nayar’s article outlines the importance of both natural and artificial light in healthcare design.

Important light considerations for a behavioral health residential center include the variety of users, experiences in different spaces, and considerations of natural light. Staff,  

---

7 Patrick Tantra, "Vals, Therme, Peter Zumthor," Flickr, www.flickr.com/photos/cmyk100dpi/5094445217/in/photostream/
8 "Operating Room Lighting," German Medical Care & Contracting, http://germancare.ps/?page_id=149
10 Ibid.
visitors, and a diverse group of patients will experience light in the facility very differently. It is crucial to consider the task oriented needs of staff and mediate them with the physical needs of patients who may react negatively to illumination levels or other elements of light. Control is key to adapting for each patient’s needs and to help care providers work efficiently. Some designers cited by Nayar focus on specific healthcare spaces, such as circulation areas, where traditional light strategies negatively affect patients being transported, and decentralized nursing stations produce distracting light outside patient rooms. These problems are minimized with the use of indirect cove lighting in corridors and specially designed nursing stations. Natural light is an important component of a facility lighting strategy. This aspect of light is closely tied to the architectural factor of nature. It is important for patients to not only have an outdoor space, but also to have nature visible from interior spaces, especially patient rooms. The ability to see changes in the exterior environment and to be exposed to natural light decreases depression and reduces agitation. Both natural and artificial light must be carefully considered for all spaces and user groups within a behavioral health facility.
A third important design factor is acoustics. Acoustic considerations are discussed in Michael Rettinger’s *Acoustics: Room Design and Noise Control*. Before expressing his thoughts on the design of different programmatic spaces, Rettinger first describes the mathematical processes used to measure sound transference, and methods to reduce noise throughout a building’s construction. Rettinger outlines a key concept to an understanding of acoustic principles, the different ways sound can be transferred. These include air born and borne, and solid born and borne, where the “born” methods generate the sound, and the “borne” methods carry or transmit sound. The author stresses a focus on solid born and solid borne noise, because in addition to their auditory effect, “we are also concerned with their bodily effect. These are often unpleasant, even when far below a level that could cause damage to a building.” To reduce the negative effect of this noise, Rettinger outlines strategies for a variety of different building types and programs.

The acoustic techniques suggested for “hospitals and sanatoriums” range from construction methods and space planning to finish material selection. Separation is a continuous theme throughout the methods of acoustic control. Layers of barriers between the source of sound and the perceiver give multiple points of noise reduction, whether the barrier is at the scale of a wall assembly or a site plan. Arguably the most important space acoustically in a behavioral health center is the patient room. Although the ideal would be for most patients to spend the majority of their time outside their room in activity or other healing spaces, time spent in the patient room is when individuals are most vulnerable to the negative effects of unwanted noise. Rettinger asserts, “quietness is a therapeutic agent no less powerful than sulfa drugs, penicillin, and insulin.” Rettinger equates the architectural variable of acoustics with these scientific fields. The design of a behavioral health environment should include considerations of sound transference at all scales, and value spatial qualities on a level equal to the treatments of care providers.

\[14\] Ibid.
Color has long played a role in psychiatric diagnostics, but is also a significant variable for facility design. Jain Malkin discusses both roles of color in *Hospital Interior Architecture*. The author begins with descriptions of several psychiatric studies using color, of which the most well known is likely the Rorschach Inkblot Test. Often, these pursuits aim to classify patients as normal or abnormal based on their reaction or preference for a specific color. However, Malkin makes it clear that “because so many tests involving color preference, response, and placement have been made on the mentally and emotionally ill, with such a plethora of conflicting results, it is clear that the data must be interpreted cautiously.”

There is little scientific consensus when it comes to the diagnostic use of color, but there are several generalizations that can be used to improve patient environments with color choices. An example of these is the suggestion to use warm colors in active spaces such as a group therapy room, and cool colors in reflective spaces where individual thought takes place. While specific advice of this type is helpful in the design process, the key idea in Malkin’s section on color is the assertion that “the selection of color..."
must be based on a solid understanding of the symbolic and psychological meanings it may have for individuals.” The importance of color in psychiatric facilities stems from its history as a diagnostic tool, and more significantly, from its individualized effects on patients.

In a behavioral health setting each patient can perceive color differently, but as a design element, it is typically unchanging in the short term. Painted surfaces, which represent the largest presence of color, may be repainted at a certain interval, but do not supply a unique experience for each patient. To achieve this, two steps must be taken in the design of patient floors for a residential inpatient center. In areas accessible to all patients, or used by groups of patients, the approach should be to use neutralizing colors. Malkin calls for desaturated colors in settings like these, to avoid excessive stimulation. The other design consideration to be made is the need for variety in color choices to address the range of patient preferences and sensitivities. This can be achieved in areas accessible to only one, or a small group of patients. Patient rooms need not all be uniform in color, so small clusters of rooms could have similar color profiles that differ from other clusters on the same floor, and patients would be placed based upon preference or sensitivity. The use of color in behavioral health centers is often static and potentially disturbing to patient recovery; so it is necessary to create a design strategy that considers color use in both active group and individual spaces.

\[18\] Ibid.
Selection of Materiality

Closely tied to color choice and its effects on patients is material selection and finish quality. *Hospital Interior Architecture* covers these design variables as well, and Jean Malkin describes their appropriate use in psychiatric facilities. The guidelines Malkin provides establish three goals for materiality. The primary concept is that “interior finishes help create a residential ambience, but their selection must be based on many functional parameters.”

The residential feel of a patient environment is strongly affected by the choice of finishes, and creates comforting spaces that combat the institutional quality common in behavioral health centers. However, this goal must be balanced by concerns for safety, and an appropriate level of visual stimulation. Safety is key for protection of both patients and staff from other occupants and from the building itself. Controlling visual stimulation is important for patients, who “are very aware of patterns and often experience visual distortions” or “have problems with depth perception.”

---

22 Ibid.
Both safety and visual stimulation control can be addressed through a facility’s materiality, and should be integrated in a manner that provides as much of a residential character as possible.

Selecting the material finishes of a behavioral health center should balance the goals supported by Malkin’s writings with the operational needs of the institution. A residential quality, safety, and positive visual stimulation are important materiality aspects for patient health and treatment, but the facility’s needs should be included as well. Primarily, these include maintenance concerns for the lifecycles and janitorial requirements of finishes. Materials should be selected that are durable or indestructible, able to be refinished, and tamperproof. In terms of their day-to-day maintenance, finishes should be easily cleaned, non-toxic, and resistant to vandalism. The materiality of a mental health treatment center requires insight into many aspects of safety, patient sensitivity, quality of finishes, and maintenance. However, successful choices are key to designing a comfortable environment for patient care.
James Hunt and David Sine in “Design Guide for the Built Environment of Behavioral Health Facilities” lay out guidelines for space planning in a behavioral health center. The authors provide a list of detailed suggestions for specific design elements, as well as a strategy for categorizing spaces to facilitate future design decisions. Spaces are given a designation from Level I to Level V, with Level I indicating no patient access and constant supervision to Level IV indicating little to no supervision (Level V is reserved for spaces involving patients with unknown risks). Hunt and Sine place these categories in “a ‘patient safety risk assessment’…that, in a Cartesian matrix, considers the opportunity for a patient to be alone in a particular space (of any name) on one axis and a level of risk of self-harm on the other axis.”

The resulting system enables “the necessary conversation regarding patient safety and design between operators, clinicians, and designers…to encourage a dialog and promote a common understanding of for whom a designed space is intended and the risks of an anticipated patient

---

The current method of room labeling creates a disconnect between architect and facility administrator, which is mitigated by the simplified classification system presented by Hunt and Sine in “Design Guide.”

The layout of spaces in a behavioral health center is critical for patient and staff privacy and safety. The Patient Safety Risk Assessment (PSRA) is a beneficial tool for organizing the methodology behind design decisions involving materiality, furniture selection, safety equipment, and many other aspects of a mental health facility. However, it can only be one part of a space planning strategy. Circulation, caregiver to patient sightlines, access to nature and light, staff travel distances, program adjacencies, and patient mobility are all key considerations for how spaces are arranged. The combination of these with the PSRA minimizes the possibility for unauthorized access to patient information, improves the efficacy of caregivers, and above all benefits patient recovery. Once a building is constructed, space planning is the most rigid of the

---

26 Ibid.
27 Ibid.
six architectural variables considered for a behavioral health center design. It must incorporate the other five characteristics while also considering factors of circulation, risk management, privacy, and safety.
Östra Psychiatry Building

The Östra Psychiatry Building designed by White Architects for Östra Hospital is an excellent example of positively impacting patient recovery through architectural means. The facility, located in Gothenburg, Sweden, was completed in 2009 to replace an aging facility with an outdated design. The client wanted to break down stigmas of psychiatric care by creating a more open and free building without the long narrow hallways associated with many healthcare centers. The architects came up with three “pillars”: the garden, the heart, and the residential group. The garden brings nature into a controlled space patients can enjoy freely. The heart holds the communal functions of the facility, while the residential groups are rooms for small groups of patients to share while maintaining visibility from care providers in the heart. White successfully utilizes nature, light, and a variety of spatial sizes to architecturally improve the patient experience.

The residential room creates small community space with warm light qualities.  
(The New York Times\textsuperscript{1})

Each patient room utilizes the window wall to create a variety of storage and seating options. (www.white.se²)

Techniques that can be derived from the design of the Östra Psychiatry Building include the use of light and color, the centralized activity region, and the hierarchy of space sizes. The residential group rooms at Östra employ yellow sunshades on the windows that brighten the room, provide a warm glow, and identify these important programmatic spaces from the exterior. These techniques could be adapted and more carefully employed to provide a variety of spaces where patients and care providers can control the light level, temperature, and color to create a comfortable environment for a changing clientele and program. The progression of patient spaces at Östra, from individual room, to residential group, to heart, not only gives patients options of how social to be, but also ensures a level of connectivity between patient and care provider no matter the location. An important aspect of many healthcare spaces is visibility between caregiver and patient, which makes this technique suitable even beyond psychiatric

---

care. There are many strategies that can be learned from White Architects’ design for the Östra Psychiatry Building, including the spatial layout and use of color.

**Oregon State Hospital**

Another precedent of a behavioral health treatment center is the 2011 redesign and expansion of the Oregon State Hospital’s Salem psychiatric campus. The design firm, HOK, was tasked with creating new facilities in line with an overhaul of the center’s treatment process. The existing unit based approach had proved unsuccessful because of the requirement that living and care take place in the same location. A new “treatment mall care model” was developed with a similar hierarchy of spaces as the Östra facility. At Salem, the “house,” “neighborhood,” and “downtown” nodes provide patients with individual living quarters, group resource and therapy areas, and localized amenities. The hospital contains an immense 620 beds, making the urban planning model of design a feasible way to think of patient organization.

The original building of the OSH Salem campus acts as the “downtown.”  
(www.mentalhealthportland.org)

---

3 "State Sez: Controversial Oregon Mental Hospital should be Half as Big as Planned."  
The treatment mall model is efficient for housing a large number of patients, but is not beneficial for smaller populations. One resultant of the mall layout is centralized nurse stations that have visibility down several patient corridors. While the “house” to “downtown” idea separates from the outdated institutional model, this corridor system does not. Although HOK reduces the corridor lengths to ease the situation, it results in a large increase in staffing that is not sustainable for all facilities. The architectural struggle between visibility, operational efficiency, and patient comfort is a delicate balance, which the OSH campus solves well for a hospital of its size. However, not many centers can adopt the same strategies, and characteristics like materiality are often better suited to solve issues like caregiver-patient visibility. HOK creates an effective design for a large hospital, but their methods are not easily translated to smaller facilities.

**St. Charles Medical Center**

One very recent precedent for a behavioral health institution is the addition to St. Charles Medical Center in Oregon, Ohio. The facility is run by Mercy Health System, a faith-based healthcare provider in Northwest Ohio. The addition is designed by Array Architects, a leading healthcare-only architecture firm. Motivations for the project include providing a full spectrum of mental health services to the community and creating one location for regional behavioral health. The facility will include inpatient accommodations as well as partial hospitalization, outpatient, and Electroconvulsive Therapy (ECT). Treatment at St. Charles Hospital is an evidence-based approach and addresses the wide variety of behavioral health disorders.
The behavioral health addition has its own entry separate from the hospital. (www.array-architects.com⁴)

Plantings and a green wall are incorporated into the St. Charles behavioral health addition. (www.array-architects.com⁵)

Architectural factors carefully crafted by Array Architects include color, materiality, nature, and space planning. The architects conducted “visioning sessions to determine inpatient unit adjacencies and building configuration site opportunities,”⁶ which shows thorough attention to issues that may arise from space planning within the building and connection with nature.

⁵ Ibid.
⁶ Ibid.
outside the building. The interior rendering shows consideration of materiality and color, especially on feature wall surfaces. This is supported by comments from Mercy officials, who say, “the design of the facility is based on research that tells us what colors to use and how to use the space to help people recover.” An important consideration in the design of the behavioral health addition is its proximity to the existing hospital. Adjacency to emergency and acute care departments allows for saved space in the new facility and the ability to provide a full range of services to patients. The capability to move patients between departments is crucial because “some of the people may need to be in acute care for a short time so that their symptoms can be modulated and then move into day treatment to stabilize the gains they are making to help them stay on the path to recovery.” The behavioral health addition at St. Charles Medical Center involves design considerations of space planning, nature, materiality, and color.

---

8 Ibid.
Chapter 5 | Locating the Site

Site Considerations

The proposed central Cincinnati branch of Lindner Center of HOPE’s Sibcy House will be located at the corner of Burnet Avenue and Erkenbrecher Avenue in the Avondale neighborhood. This location is well suited to a residential mental health treatment center for several reasons. Many of the existing partner organizations for Sibcy House are located on the University of Cincinnati medical campus, immediately adjacent to the Avondale location. The neighborhood is also near the Uptown region, Cincinnati’s second largest employment center. An urban setting also provides a unique alternative to Sibcy House’s exurban location in Mason, Ohio. Finally, proximity to Uptown ensures access to businesses, hospitality, and transportation services for patients, family members, and employees.

Adjacency to medical partners is a key advantage of locating a residential treatment center in Avondale. The medical centers of the University of Cincinnati, Cincinnati Children’s, and the Veterans Affairs hospital are all clustered in a large medical hub in the Corryville neighborhood, which borders Avondale. The existing research and treatment relationship between Lindner Center of HOPE and UC Health will be strengthened by the geographic proximity, and closer collaborations will be possible. Cincinnati Children’s also has an existing partnership with the Lindner Center of HOPE, and the Veterans Affairs medical center presents an opportunity for the new treatment facility to provide for the three distinct patient groups served by these major medical centers. As a residential treatment center, the proposed facility will serve mental health patients who do not need constant observation for medical or safety reasons, and yet are not ready to enter a self-sustaining role in either a group home or
autonomous setting. This role defines the center as a transition space for patients, between acute care in the hospitals and independent care within society. Locating the site near the medical campuses facilitates patient movement between levels of care, ultimately providing patients with a higher standard of treatment. The site on Burnet Avenue also creates an opportunity for the center to interact with students from the UC College of Medicine during their academic development. The college has an enrollment of 680 with 2,262 faculty members, offering a large medical community that could use the behavioral health center as a training ground while delivering the latest treatment methodologies to staff and patients. A proximity to three major medical partners, acute care facilities, and an academic community make Avondale a persuasive location for a residential behavioral health treatment center.

An urban location for a branch of the Sibcy House at the Lindner Center of HOPE would provide an important alternative to the existing exurban setting of Sibcy House. The two locations would be able to serve a larger population through the wider radius of access created by a central facility. An urban setting would offer a different treatment option, not through changes in care procedures, but through differences in staffing, community reach, and physical setting possible because of the alternative geographic area. A branch of the Sibcy House in another suburban or exurban location would expand the program’s reach, but not change any other aspects of treatment. The Avondale branch also offers both patients and staff a choice of treatment centers for the most convenient location. Patients the Sibcy House is currently serving from central Cincinnati will have a better option for appointments or admittance, and staff living in the city will have an easier commute. Locating the treatment center in a hub of medical employment and education will also benefit recruitment, drawing care providers from the

---

1 "College of Medicine Quick Facts." University of Cincinnati, [http://med.uc.edu/about/college/quickfacts](http://med.uc.edu/about/college/quickfacts) (accessed September 2, 2014).
collection of university graduates. An urban branch for the Sibcy House would help serve a greater population, provide choice in treatment setting, and facilitate current and future staffing.

The urban quality of Avondale makes it a beneficial setting for a mental health center. Through the historical evolution of treatment for mental illness, the sanatorium or asylum has improved into hospital and treatment centers with high quality application of services and focus on patient well-being. One aspect that has often remained the same is the placement of these facilities in exurban locations. The therapeutic benefits of nature and the social stigma of mental illness initially prompted this decision. In modern day health centers it is possible to achieve equal and better patient interaction with nature in an urban setting as opposed to the paradigm of the treatment center in the wilderness. The social stigma of mental health disorders is also broken down by locating treatment in urban centers. City residents become more aware of the stereotype when it cannot be pushed out of society’s collective mind and patients are likely to feel more connected to and included in society. An urban setting also provides opportunities for patients transitioning out of a residential treatment program to a group home or independent living. Community resources available within the urban context will be familiar to these patients, and can bolster an effective reentry into society. Challenges like getting groceries, locating support groups, or finding employment are better met in a dense and walkable urban environment. In the event a patient living independently or in a group setting needs more acute care, a transition to residential or hospital treatment will be more comfortable and less disruptive if all facilities are within the same vicinity. The Avondale site is an especially good urban location in part due to the developing Martin Luther King Drive and I-71 interchange.² A new healthcare focused corridor along MLK will increase visibility and access to the behavioral

health center on Burnet Avenue. As a branch of the major thoroughfare of MLK, Burnet will be quiet enough to create a therapeutic setting for patients while also being easily accessible within the greater Cincinnati region. The urban setting of Avondale will benefit the treatment center by combating stereotypes of mental illness, supporting patient access to community resources, and enabling transportation access to the facility.

The Avondale branch of the Sibcy House will strengthen partnerships with adjacent medical centers, provide a contrast to the established exurban setting, and afford proximity to urban resources for patients, visitors, and staff. The center’s clients will have acute and independent care programs available as their treatment needs evolve. The facility will be able to recruit professionals from the university while serving a larger region. An urban setting will also combat long established social stigmas surrounding mental health and treatment. These benefits support an urban residential treatment center and propose Avondale as the most suitable site location.
Avondale, bounded by I-71 to the east and Vine Street to the west

Site at the southwest corner of Burnet Avenue and Erkenbrecher Avenue
Aerial view from the south of the vacant site and adjacent existing structures

Aerial view from the east with existing turnaround at the site’s northeast corner
Historic USGS map of the Avondale and Clifton neighborhoods

USGS Topographic Map of Avondale
Sanborn map describing the construction type and features of the demolished residential block

Figure/ground with existing site boundaries and access points
CAGIS property map with frontage dimensions and property boundaries

CAGIS topography map showing a high point of 794’ descending to 764’ at the site boundary
Street view of the existing vacant site with slight hill in the foreground and steeper rise beyond

Street view of the site from the southern border at Catherine Street
Street view of site frontage along Burnet Avenue

Street view approaching the site from the east along Erkenbrecher Avenue
<table>
<thead>
<tr>
<th>Tax Dist</th>
<th>001 CINTI CORP-CINTI CSD-001110</th>
<th>Year Built</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Dist</td>
<td>1 CINCINNATI CSD</td>
<td>Total Rooms</td>
<td>0</td>
</tr>
<tr>
<td>Land Use</td>
<td>500 Residential vacant land</td>
<td># of bedrooms</td>
<td>0</td>
</tr>
<tr>
<td>Finished Square Ft.</td>
<td>0</td>
<td>Full Bathrooms</td>
<td>0</td>
</tr>
<tr>
<td>Acreage</td>
<td>0.075</td>
<td>Half Bathrooms</td>
<td>0</td>
</tr>
<tr>
<td>Appraisal Area</td>
<td>AVONDALE 01400 AVONDALE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Property Information**

<table>
<thead>
<tr>
<th>BURNET AVE</th>
<th>30.41 X 108.42 IRR</th>
<th>3333 BURNET AVE</th>
<th>CHILDRENS HOSPITAL MEDICAL CENTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT LOTS 6-7 W F IRWINS</td>
<td>TIF ABATEMENT</td>
<td>3333 BURNET AVE</td>
<td>3333 BURNET AVE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Board of Revision</th>
<th>No</th>
<th>Other Assessments</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rental Registration</td>
<td>No</td>
<td>Front Ft.</td>
<td>138.00</td>
</tr>
<tr>
<td>Homestead</td>
<td>No</td>
<td>Mkt Land Value</td>
<td>13,500</td>
</tr>
<tr>
<td>Owner Occupancy Credit</td>
<td>No</td>
<td>Cauv Value</td>
<td>0</td>
</tr>
<tr>
<td>New Construction</td>
<td>No</td>
<td>Mkt Impr Value</td>
<td>0</td>
</tr>
<tr>
<td>Foreclosure</td>
<td>No</td>
<td>Mkt Total Value</td>
<td>13,500</td>
</tr>
<tr>
<td>Date</td>
<td>2/5/2013</td>
<td>Total TIF Value</td>
<td>1,800</td>
</tr>
<tr>
<td>Conveyance #</td>
<td>$0</td>
<td>Abated Value</td>
<td>0</td>
</tr>
<tr>
<td>Sale Amount</td>
<td>$0</td>
<td>Exempt Value</td>
<td>0</td>
</tr>
</tbody>
</table>

Example property audit for 3354 Burnet Avenue. Cincinnati Children's owns 56% of the site's land.
Cincinnati weather data summary

<table>
<thead>
<tr>
<th>MONTHLY MEANS</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Horiz Radiation (Avg Hourly)</td>
<td>71</td>
<td>71</td>
<td>87</td>
<td>110</td>
<td>111</td>
<td>126</td>
<td>127</td>
<td>113</td>
<td>107</td>
<td>77</td>
<td>74</td>
<td>51</td>
</tr>
<tr>
<td>Direct Normal Radiation (Avg Hourly)</td>
<td>109</td>
<td>70</td>
<td>79</td>
<td>90</td>
<td>70</td>
<td>101</td>
<td>93</td>
<td>80</td>
<td>100</td>
<td>73</td>
<td>106</td>
<td>63</td>
</tr>
<tr>
<td>Diffuse Radiation (Avg Hourly)</td>
<td>29</td>
<td>40</td>
<td>42</td>
<td>52</td>
<td>62</td>
<td>54</td>
<td>61</td>
<td>60</td>
<td>48</td>
<td>39</td>
<td>30</td>
<td>28</td>
</tr>
<tr>
<td>Global Horiz Radiation (Max Hourly)</td>
<td>173</td>
<td>208</td>
<td>264</td>
<td>303</td>
<td>300</td>
<td>305</td>
<td>312</td>
<td>286</td>
<td>263</td>
<td>230</td>
<td>180</td>
<td>146</td>
</tr>
<tr>
<td>Direct Normal Radiation (Max Hourly)</td>
<td>271</td>
<td>302</td>
<td>285</td>
<td>279</td>
<td>271</td>
<td>268</td>
<td>279</td>
<td>278</td>
<td>260</td>
<td>263</td>
<td>247</td>
<td>255</td>
</tr>
<tr>
<td>Diffuse Radiation (Max Hourly)</td>
<td>90</td>
<td>128</td>
<td>125</td>
<td>135</td>
<td>188</td>
<td>138</td>
<td>180</td>
<td>178</td>
<td>127</td>
<td>111</td>
<td>83</td>
<td>76</td>
</tr>
<tr>
<td>Global Horiz Radiation (Avg Daily Total)</td>
<td>682</td>
<td>752</td>
<td>1023</td>
<td>1449</td>
<td>1577</td>
<td>1857</td>
<td>1844</td>
<td>1521</td>
<td>1310</td>
<td>849</td>
<td>738</td>
<td>480</td>
</tr>
<tr>
<td>Direct Normal Radiation (Avg Daily Total)</td>
<td>1043</td>
<td>733</td>
<td>933</td>
<td>1181</td>
<td>1005</td>
<td>1146</td>
<td>1343</td>
<td>1074</td>
<td>1231</td>
<td>803</td>
<td>1059</td>
<td>593</td>
</tr>
<tr>
<td>Diffuse Radiation (Avg Daily Total)</td>
<td>286</td>
<td>419</td>
<td>506</td>
<td>679</td>
<td>892</td>
<td>802</td>
<td>884</td>
<td>817</td>
<td>589</td>
<td>435</td>
<td>296</td>
<td>267</td>
</tr>
<tr>
<td>Global Horiz Illumination (Avg Hourly)</td>
<td>2204</td>
<td>2287</td>
<td>2758</td>
<td>3501</td>
<td>3568</td>
<td>3990</td>
<td>4046</td>
<td>3600</td>
<td>3368</td>
<td>2446</td>
<td>2312</td>
<td>1619</td>
</tr>
<tr>
<td>Direct Normal Illumination (Avg Hourly)</td>
<td>2915</td>
<td>1949</td>
<td>2252</td>
<td>2589</td>
<td>2074</td>
<td>2922</td>
<td>2724</td>
<td>2324</td>
<td>2869</td>
<td>2054</td>
<td>2894</td>
<td>1680</td>
</tr>
<tr>
<td>Dry Bulb Temperature (Avg Monthly)</td>
<td>31</td>
<td>32</td>
<td>42</td>
<td>56</td>
<td>63</td>
<td>68</td>
<td>77</td>
<td>73</td>
<td>65</td>
<td>53</td>
<td>47</td>
<td>36</td>
</tr>
<tr>
<td>Dew Point Temperature (Avg Monthly)</td>
<td>24</td>
<td>22</td>
<td>31</td>
<td>45</td>
<td>52</td>
<td>59</td>
<td>66</td>
<td>65</td>
<td>57</td>
<td>47</td>
<td>40</td>
<td>27</td>
</tr>
<tr>
<td>Relative Humidity (Avg Monthly)</td>
<td>75</td>
<td>68</td>
<td>66</td>
<td>69</td>
<td>71</td>
<td>77</td>
<td>77</td>
<td>79</td>
<td>81</td>
<td>78</td>
<td>70</td>
<td>percent</td>
</tr>
<tr>
<td>Wind Direction (Monthly Mode)</td>
<td></td>
<td></td>
<td>220</td>
<td>230</td>
<td>220</td>
<td>220</td>
<td>60</td>
<td>200</td>
<td>200</td>
<td>60</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

**LEGEND**

- Dry Bulb
- Humidity
- Comfort Zone

Dry bulb temperatures charted with relative humidity
Sun shading chart December 21 - June 21, sun needed 76% of the time, shade 11%

Sun shading chart June 21 - December 21, sun needed 46% of the time, shade 38%
Chapter 6 | Shaping the Program

Partner Organizations

The treatment of mental health disorders takes place in a wide variety of settings in the modern world. Hospitals alone can be private, public, research focused or teaching institutions, for-profit or not-for-profit, Veterans Affairs operated, religiously affiliated, or have a myriad of other factors structuring their business model. Aside from giving patients options for their healthcare, these determinants begin to suggest successful partnerships between institutions. A mental health residential treatment program with a focus on architecture’s role in healing is best suited to partner with providers with established mental health programs, a focus on research, ties to an educational institution, and no affiliations that may deter certain clients.

Two organizations in the Cincinnati region that match these criteria are the University of Cincinnati Neuroscience Institute (UCNI) and the Lindner Center of HOPE. The Neuroscience Institute is under the umbrella of the UC Health system, giving it a mission based in both healthcare and education. One program of the UCNI is the Mood Disorders Center, which covers conditions like depression, anxiety disorders, and bipolar disorders. Part of this group’s mission is “creating the future of personalized medicine…to decrease the amount of time between the onset of a mood disorder and successful diagnosis and treatment for the patient.”¹ An important part of accomplishing this goal is the many research trials undertaken by UCNI’s Mood Disorders Center as part of the UC College of Medicine. One of several collaborators in the Mood Disorders Center is the Lindner Center of HOPE. This facility, located in Mason,

Ohio, is a psychiatric treatment center combining inpatient, outpatient, and residential services with advanced research. Patients are part of the:

evidence-based treatment programs provided at Lindner Center of HOPE. Historically, there has been a 17-year lag time before research findings are integrated with the diagnosis and treatment of patients. However, at Lindner Center of HOPE, research informs patient care each and every day.²

The range of services provided at the Lindner Center of HOPE gives patients certain flexibility in the design of their treatment, which ultimately accelerates recovery and avoids confusion from separate diagnoses at many different institutions. The research focuses, ties to the University of Cincinnati, and evidence-based approaches of the University of Cincinnati Neuroscience Institute and the Lindner Center of HOPE make these programs excellent partners for designing a mental health treatment center.

The major hindrance to the partnership between the Lindner Center of HOPE and UCNI is their geographic distance. The Center is located in Mason, Ohio outside of Cincinnati, which provides a good natural setting to administer patient treatment. UCNI and the departments of the UC College of Medicine are located in Corryville as part of the University of Cincinnati medical campus, close to downtown Cincinnati. This location is necessary for access to the hospitals, educational facilities, and large employment regions of central Cincinnati. While both locations provide benefits to each individual institution, their separation does not stimulate the partnership they have created. A second location for the residential treatment portion of Lindner Center of HOPE, located close to downtown Cincinnati, would generate a stronger research connection with UCNI and allow for greater access to the center by researchers, care providers, students, and residents.

The history of society’s treatment of mental illness is a bleak record of ostracism and medical ignorance. People suffering from mental disorders were thought to be possessed by demons, classified and treated as subhuman, and imprisoned in asylums or workhouses. As medical knowledge progressed, conditions improved in the institutions that housed these social outcasts, and treatments began to focus on strengthening the moral character of inmates. Eventually, the asylum archetype evolved into a hospital setting and the inmates were referred to as patients. This developed from the gradually altered view of mental disorders as medical conditions, not possessions or moral deficiencies. The hospital setting continues in most treatment methods today, though focus has started to shift from a secure, clinical environment to a more relaxing and calming building type. The archetype of the contemporary mental health treatment center can be seen as a mixture of a hospital and a meditation retreat, or spa. The clinical necessities of the hospital setting are joined with the calming elements of a retreat to
create a comfortable environment for clients with the essential tools of treatment. This combined building type is the best foundation on which to develop a new standard for mental health treatment, because although a relatively modern archetype, it is the only humane precedent in the history of mental health treatment that supports current medical views on the best treatments for mental disorders.

The residential treatment program at Lindner Center of HOPE aligns with the goals of the combined archetype. Named Sibcy House, it is a component of the larger Lindner Center of HOPE, where:

state-of-the-science technology, extensive diagnostic evaluations, individualized treatment, internationally recognized research and renowned physicians – are integrated into a facility where patients, families and clinicians work in synch to create long-lasting solutions.  

The model that Sibcy House provides is one of whole body health, both mentally and physically. All patients first experience the Comprehensive Diagnostic Assessment, which results in a treatment plan applicable at Sibcy House, or in another institution. In the 28-day program at Sibcy House, care is highly individualized and the patient’s treatment plan is reviewed and updated daily to reflect and adapt to the progress being made. This individual care, access to the resources of Lindner Center of HOPE, and the residential setting make Sibcy House an excellent example of the modern archetype for mental health residential treatment.

---

The connection to research, evidence-based treatments, residential program, and connection to other healthcare institutions define Sibcy House within the field of mental health treatment. The medium length 28-day program period, and the individualized treatment program are unique aspects at Sibcy House. With only 16 rooms and a residential atmosphere, the diverse group of care providers can manage the individualized design of the program. The treatment methods used at Sibcy House are evidenced-based, which is common in psychiatric facilities, but they are also connected with the research conducted by Lindner Center of HOPE and its University of Cincinnati partners. This link to the most up to date research is a unique asset for patients and care providers. While the location of Sibcy House outside of an urban center can be tied to the tradition of isolating mental health patients away from society, an urban branch of the program would tie the center’s mission to its partner institutions and create further distinction for Sibcy House in the field of mental healthcare.

The creation of a counterpart to Sibcy House located closer to downtown Cincinnati would benefit many of the organizations involved with Lindner Center of HOPE. The research conducted by the UCNI, Cincinnati Children’s Hospital, and Lindner Center of HOPE’s own staff could be expanded in the new location, with a closer connection to the facilities of the other

---

major institutions. The complicated political details of this network of entities have already been resolved in the current situation, and would support the more intimate partnership possibilities of a new location, such as the involvement of UC College of Medicine students. In this type of partnership, involving more stakeholders increases the success of the program and ultimately will improve the patients’ treatment. A second Sibcy House in central Cincinnati would strengthen the established partnerships and could benefit each of the involved institutions.

Despite the advantages of another treatment center, there would be some parties that would not benefit. The specific nature of the multi-institute partnership currently part of Sibcy House would mean other healthcare organizations in central Cincinnati would not be able to participate in establishing a new treatment center. These groups would also lose out on research collaborations that may have resulted if the center were unaffiliated with the UC Health system. Although the new center would be in closer proximity to the potential patient base of central Cincinnati, the current private-pay operation of Sibcy House would exclude a significant portion of these clients. The financial structure of the treatment center is one of many reasons for the quality of care provided at Sibcy House, and this factor could be seen as exclusionary in a more urban setting, where a center would be more connected with the local community. Although there are advantages for the institutions currently working with Sibcy House, a new urban treatment center could make necessarily exclusionary factors more apparent to those not involved.

The Sibcy House at Lindner Center of HOPE is an excellent partner for a new mental health residential treatment center in central Cincinnati because of its focus on research and connections to several institutions in the UC Health system. As an established mental health program, Sibcy House provides a model for the new center to expand upon with a greater focus
on research, direct connection to the University of Cincinnati medical campus, and an emphasis on studying the ways in which the center’s architecture can support healing. It is important to connect a new treatment center with an established program like Sibcy House because of the wide variety of mental healthcare options available. Healthcare providers can be public, private, for-profit or not-for-profit, research focused, religiously affiliated, or have a number of other indicators. Providing a plan for a direct partnership gives the benefit of rooting a new institution within the framework and characterizations of an established entity.

**Experiential Characteristics**

The mental health residential treatment program located in the Avondale neighborhood of Cincinnati will include a variety of program areas to achieve successful patient recovery. The more private of these spaces will include patient rooms, small group areas, therapist offices, staff resource spaces, medical exam and treatment rooms, and support spaces such as storage and maintenance rooms for different programs. The public spaces include visiting areas, care provider stations, common rooms, dining facilities, exercise areas, activity rooms, and the library. Representing the full range of public and private rooms, the activity classroom, care provider station, and individual patient room will have many disparate characteristics in terms of size, user type, architectural features, and qualities of experience.

The public spaces of the center will accommodate the general public, visitors for patients, and some staff and patients. A mostly public space in the center will be the activity classrooms. Imagined as bright and active spaces to encourage patient interaction, these spaces will be approximately 800-1200 square feet, and located on the second level of the treatment center. Large window expanses will provide abundant natural light while the second floor location will provide views to nature in the center’s courtyards or urban activity around the site. HVAC and
lighting controls individual to each room will be important to accommodate a variety of activities. Programs in the activity rooms will range from physical exercise (yoga, stretching, meditation, general exercise classes) to goal oriented (lectures, crafts, discussion groups). A mix of staff and outside personnel will lead patients in these activities. Due to the involvement of outside staff, the rooms will need to be in an area accessible to the exterior without passing through private patient and care provider only zones. The separation will be accomplished through multiple points of vertical circulation with different levels of privacy. Within the classrooms, each space will be open and free of obstruction to accommodate all activity types, and a significant amount of storage will be easily accessible from each room to keep equipment necessary for the range of programs. The successful use of the activity classrooms will rely on adaptability, which will be provided partly through isolated environmental controls, storage, and multiple access points.

Example activity room with mobile furniture

www.upmc.com

---

Other public spaces in the center will include:

- **Visiting areas** – For patients’ friends and families to gather, wait for patients, and spend time with the patient.

- **Dining facilities** – Cooking and serving functions as well as a dining area for patients and staff.

- **Common rooms** – Accessible to all patients and a hub for entertainment, socialization, and large group activities.

- **Exercise areas** – outdoor and indoor areas for recreation, including necessary equipment: exercise machines, fitness aids, benches, etc.

A mostly private space within the treatment center will be the care provider stations. Each station will be the hub of their respective patient group: adolescent, adult, and geriatric. The stations will encompass 200-400 square feet of open and private space to be used as an information center for patients and a touchdown space for care providers. An open front reception area will foster patient/caregiver interaction and maintain visual connection to patient rooms while enclosed spaces behind will house frequently used resources for care providers. Office appliances and technology, various medical carts, and large work surfaces will be characteristic of each care provider station. Since the stations will be centrally located within patient zones, there will be significant activity and noise in these spaces, and acoustic controls will be employed. Lighting levels will need to be bright to preserve visualization of patients and task lighting will reinforce caregiver work areas. The care provider stations will be crucial to the daily tasks of both caregivers and patients, and as such will be equipped with several resources to improve the care environment.
The private spaces of the center will be limited to access by patients and their care providers. The most private space will be the individual patient room to accommodate one or two patients. Depending on whether the space will have one or two beds, the patient room area will be 200-250 square feet. This room will have to convey a sense of personalization and privacy while also being fully accessible to care providers. The patient rooms will be organized in clusters around a small group area limited to the patients in that section of the center. A sense of communal ownership of the group area will balance the personal zone of the room. Patient rooms will include customizable elements to further individualize patient care and reinforce the sense of ownership over a space that cannot have full privacy for safety reasons. These elements include the lighting level, temperature, and source; acoustic features of sound isolation or use of sound therapy; and environmental controls of air flow, temperature, and velocity. Each patient will be able to collaborate with their doctors and nurses to establish an ideal environment based on their specific disorder and personal preferences. Furniture will also have a large impact in the

---

7 Goelst Medical Casework, *Nurse Station Design Manual* Goelst International,[2009]).
patient rooms and will include beds, built in seating and storage, chairs, tables and desks, and the components of each room’s bathroom.

Other private spaces in the center will include:

- Small group areas – Each room cluster will center on this space for a smaller, quieter version of the common room, where patients can spend time with only those patients in their section of the center.
- Therapist offices – Personal space for doctors to conduct research, see individual patients, and use for administrative activities.
- Staff resource spaces – For care providers to store personal items, spend time on breaks, and prepare before and after work.
- Medical exam rooms – Fully equipped to administer routine types of medical examinations.

---

• Medical treatment rooms – Specialized spaces with equipment for specific medical treatments, including Electroconvulsve Therapy (ECT) and Transcranial Magnetic Stimulation (TMS).

• Storage – Needed in several program areas including: dining, kitchen, staff resource, patient records, medical supply, and administrative spaces.

• Maintenance – Storage and workspace for maintenance staff equipped with appropriate cleaning supplies and tools.

The building will be generally organized as a progression from semi-public on the lower level to very private individual patient rooms on the second level. However, all of these spaces will include some similar architectural features to aid in healing and create the most restorative atmosphere. Qualities of lighting, acoustics, and materiality as well as elements of nature will be introduced in several different ways to both create a variety of space types as well as tailor the phenomenological experience of each space to its specific function in patient recovery. The qualities of public spaces will be more static; brighter general lighting, fixed air supplies, and higher noise allowances. Private spaces will have more variation in these characteristics; subdued task lighting in offices and work areas, changes in air velocity and temperature, and more acoustic control to reduce noise transference. The outdoor spaces of the center will also be balanced between both public and private. There will be small public areas on the center’s perimeter to blur the boundary of the property lines, and large private courtyards at the heart of the center for patient use. The experience of this mental health center will vary by user; but it is intended to be welcoming to the community, remarkable to visitors, therapeutic to patients, and fulfilling to staff.
<table>
<thead>
<tr>
<th>Room Name</th>
<th>Count</th>
<th>Square Feet</th>
<th>Users</th>
<th>Key Factors</th>
<th>Key Adjacency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditorium - Gym</td>
<td>1</td>
<td>4200</td>
<td>A, P, V, CP, S</td>
<td>A, L, M</td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>5</td>
<td>800-1200</td>
<td>C, P, CP</td>
<td>A, L, C</td>
<td>Lobby/Reception</td>
</tr>
<tr>
<td>Office</td>
<td>6</td>
<td>150</td>
<td>A, V</td>
<td>L, N, M</td>
<td></td>
</tr>
<tr>
<td>Private BR</td>
<td>2</td>
<td>100</td>
<td>A, S, CP</td>
<td>M, SP</td>
<td>Lobby/Reception</td>
</tr>
<tr>
<td>Therapy</td>
<td>3</td>
<td>120-150</td>
<td>CP, P</td>
<td>A, N</td>
<td>Office</td>
</tr>
<tr>
<td>Patient Room</td>
<td>48</td>
<td>150-200</td>
<td>P, CP</td>
<td>A, SP, N, C, M</td>
<td>Residence</td>
</tr>
<tr>
<td>Nurse Station</td>
<td>3</td>
<td>300</td>
<td>CP</td>
<td>SP, L, C</td>
<td>Activity Lounge</td>
</tr>
<tr>
<td>Charts</td>
<td>3</td>
<td>50</td>
<td>CP, A</td>
<td>L, SP</td>
<td></td>
</tr>
<tr>
<td>Bathroom</td>
<td>3</td>
<td>100</td>
<td>CP</td>
<td>M, SP</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>3</td>
<td>100</td>
<td>CP</td>
<td>L, SP</td>
<td></td>
</tr>
<tr>
<td>Dining Room</td>
<td>1</td>
<td>500-1000</td>
<td>P, CP, S</td>
<td>A, C, M</td>
<td>Activity Lounge</td>
</tr>
<tr>
<td>Kitchen</td>
<td>1</td>
<td>1500</td>
<td>S</td>
<td>L, M, SP</td>
<td>Dining Room</td>
</tr>
<tr>
<td>Freezer</td>
<td>1</td>
<td>100</td>
<td>S</td>
<td>L, M, SP</td>
<td></td>
</tr>
<tr>
<td>Cooler</td>
<td>1</td>
<td>100</td>
<td>S</td>
<td>L, M, SP</td>
<td></td>
</tr>
<tr>
<td>Loading Dock</td>
<td>1</td>
<td>400/1200 ext</td>
<td>S, A</td>
<td>L, M, SP</td>
<td></td>
</tr>
<tr>
<td>Waiting Room</td>
<td>1</td>
<td>200</td>
<td>V, S, C, A, CP</td>
<td>A, L, N</td>
<td>Lobby/Reception</td>
</tr>
<tr>
<td>Lobby/Reception</td>
<td>1</td>
<td>200</td>
<td>V, S, C, A, CP</td>
<td>L, M, A</td>
<td>Public Bathroom</td>
</tr>
<tr>
<td>Group &quot;Residence&quot;</td>
<td>4</td>
<td>400-600</td>
<td>P, CP</td>
<td>SP, L, A, N</td>
<td>Nurse Station</td>
</tr>
<tr>
<td>ECT Room</td>
<td>1</td>
<td>400</td>
<td>CP, P</td>
<td>L, N, C</td>
<td>Exam Room</td>
</tr>
<tr>
<td>Exam Room</td>
<td>3</td>
<td>300</td>
<td>CP, P</td>
<td>L, M, C</td>
<td>Pharmacy</td>
</tr>
<tr>
<td>Activity Lounge</td>
<td>2</td>
<td>1500-2000</td>
<td>P, CP, V</td>
<td>A, L, SP, N</td>
<td>Garden</td>
</tr>
<tr>
<td>Storage (Maint.)</td>
<td>3</td>
<td>100</td>
<td>S</td>
<td>L, SP</td>
<td>Loading Dock</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>1</td>
<td>600</td>
<td>CP</td>
<td>SP, L, M</td>
<td>Loading Dock</td>
</tr>
<tr>
<td>Staff Lockers</td>
<td>2</td>
<td>2000</td>
<td>CP, S, C, A</td>
<td>A, M</td>
<td>Break Room</td>
</tr>
<tr>
<td>Break Room</td>
<td>3</td>
<td>250</td>
<td>CP, S, C, A</td>
<td>N, M, A</td>
<td>Garden</td>
</tr>
<tr>
<td>Public Bathroom</td>
<td>6</td>
<td>300</td>
<td>V, S, C</td>
<td>M, SP</td>
<td>Waiting Room</td>
</tr>
<tr>
<td>Library</td>
<td>1</td>
<td>2000</td>
<td>S, P, V</td>
<td>L, A</td>
<td>Library</td>
</tr>
<tr>
<td>Technology Center</td>
<td>1</td>
<td>800</td>
<td>S, P, C</td>
<td>L, A</td>
<td></td>
</tr>
<tr>
<td>Garden</td>
<td>4-6</td>
<td>Varies</td>
<td>P, CP, V, S</td>
<td>N, SP, C, A</td>
<td>Patient Spaces</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>97-132</strong></td>
<td><strong>18920-20600</strong></td>
<td></td>
<td><strong>13850</strong></td>
<td></td>
</tr>
<tr>
<td>+ Circulation, etc.</td>
<td></td>
<td><strong>28380-30900</strong></td>
<td></td>
<td>All</td>
<td>All</td>
</tr>
</tbody>
</table>
Chapter 7 | Design Description

Design Aims

The field of Cognitive-Behavior Therapy has evolved over the past six decades and continues to change as more research is undertaken. A result of the long evolution of the domain is the variety of methods and theoretical models. However, several binding factors exist, and these include an evidence-based approach to research, an understanding that behavior and environment display reciprocal determinism, and an agreement that cognition plays an important role in that relationship. These factors support an architectural argument for adaptability in patient environments to change surroundings based on specific disorders or treatment techniques. It also follows that the design solutions employed should have an empirical means of data collection to support further research on the effects of cognition and behavior on each other, or on the effects of architectural characteristics on patient recovery. As the field of Cognitive-Behavior Therapy is codified and its evidence-based methods are validated through research, the architecture of treatment centers can play a role in expanding the possibilities for both research and patient recovery.

An adaptable model for behavioral health patient environments would provide opportunities for clients to assert some control over their surroundings, encouraging involvement and ownership of other treatment modalities. Individual patient rooms could be constructed from modular elements for efficient construction, but with adaptable components for factors such as acoustics, lighting, color, and integration of nature. These aspects must be adjustable in order to individualize patient spaces, which will facilitate treatment. Better patient comfort will prevent reversion in order to treat more patients and serve a larger percentage of the community in need.
of mental health care. As well as an opportunity to use specific environmental aspects to affect behavioral health recovery, a system could be designed to measure the effects for validation and repetition in other evidence-based treatment centers. The adaptability of environmental factors like color and acoustics is crucial to positive patient response to these aspects of design.

A variety of features could be considered for patient control in treatment surroundings. For research purposes it is important to be able to isolate specific factors to validate their individual effectiveness; however, each patient room could still be equipped with a full range of controls. Due to safety requirements for furniture and other elements of patient spaces, a certain amount of moving parts is not desired for affecting the environmental changes. This suggests a digital system, with control over a series of screens as well as the lighting, HVAC, and shading systems. Digitally controlled screens could perform a variety of functions, from filtering visibility to other spaces, to simulating color or materiality changes, to modifying the noise transfer from adjacent rooms. The adaptability of the patient room could be a strong factor in promoting self-direction in patients. The ability for care providers to control which factors are adaptable in a given patient room has implications for treating clients with varying levels of self-control as well as for isolating individual factors for research.

Behavioral health treatment centers have the potential to engage their architectural features in the recovery of patients due to the reciprocal nature of the relationship between environment and behavior. Factors such as acoustic quality, light levels, furniture layout, air quality, and integration of nature can positively impact a patient’s treatment and recovery. Patient rooms, group and individual therapy spaces, visiting areas, common resources, and a central nature space are all key components to this type of treatment center. Not all spaces are necessarily user/staff controlled, but all incorporate the primary architectural factors. These are
the focus of the formal architectural design, while traditional CBT methods generate the programmatic characteristics of the center.

Theoretical and formal design goals for the treatment center revolve around the selection of environmental factors and the sequencing of spatial elements. There are a multitude of architectural aspects that could be used to benefit patients, and several have already been described. One goal for the project is the selection of specific factors that can be integrated in a cohesive manner. These factors will be closely studied in the patient rooms, but will also be present in other spaces. Rational spatial sequencing is another design goal. It will be heavily influenced by visibility between spaces and questions of security between public and private domains. All design decisions are rooted in a patient-centric approach that combines effective existing design strategies with the benefits of increased implementation of architectural factors.

**Key Design Concepts**

The formal design of a behavioral health treatment center in Avondale, Ohio is derived from the history of psychotherapy, the involvement of architecture in treatment, work done in the behavioral health architecture field, guidelines concerning patient environments, and the strategies of institutions like the Sibcy House at the Lindner Center of HOPE. The culmination of this evidence is a three-story facility serving the mental health needs of central Cincinnati, with adult and adolescent units, and medical, learning, and administrative zones. The center has close ties to local institutions, and the architecture balances a public face with the insular needs of the organization. The design reflects the nature of the center through its layout, circulation, and cladding systems.

The layout of the Avondale treatment center is influenced by the program, the need to separate adult and adolescent patient populations, and the spatial relationships of patient rooms.
The program of spaces necessary for a residential inpatient center can be clearly divided into administrative, learning, medical, and support spaces. The patient rooms are organized in units of 18 beds, including caregiver and activity spaces, and these units can be considered as a fifth category. The center’s design separates the program into three buildings, with one administrative and two patient buildings. The patient floors are on the third level, one unit in each building, which provides separation for adult and adolescent populations, as well as vertical seclusion from more active spaces on the second floor. The second floor is divided into learning and medical zones, with adolescent patients residing above learning and adults above medical. A partially subterranean first floor holds service functions. The vertical delineation of programmatic areas provides a clear organizational strategy for both patients and staff to navigate the facility. Within the patient floors, the layout is influenced by the pinwheel relationship of patient rooms to caregiver stations. Groups of roughly nine rooms are arranged in four room clusters around a central station to allow visual access for care providers into each patient room. Two of these groups are on each patient floor, bookending the central activity, circulation, and outdoor spaces. The layout of these floors benefits both caregivers and patients through the variety of interaction spaces for individual, small group, and large group treatment functions. The behavioral health center’s layout is a key design feature that is a product of the program, patient separation, and patient room adjacencies.

Circulation among the three buildings of the facility is important for the design’s clarity, functionality for users, and the center’s image in the community. Movement is organized largely through a “crystal” at the center of the site. The building volumes are arranged around this object, enabling connections to each building and between all levels. Creating a central circulation volume aligns with the separation of the facility into zones of activity. The vertical
coherency described previously is joined by horizontal clarity with the addition of the crystal. Wayfinding for occupants also benefits from central circulation. Drawing users through the crystal provides a common point of reference and combats the confusion present in many healthcare settings. The visual impact of the crystal surrounded by more massive building volumes creates a specific character within the urban community. The mental health center is a resource available to all, but with an insular need to protect its occupants. By referencing this juxtaposition with the architectural forms, the design situates itself within the community and challenges the long-standing social stigma against mental health. Circulation for the behavioral health center occurs mainly through the central crystal, which provides spatial clarity, improves wayfinding, and creates a strong presence in the facility’s urban setting.

The exterior cladding of the design fuses the various building forms, improves patient environments, and strengthens design clarity. The building volumes are sheathed in a rainscreen with a finish face composed of horizontal wooden slats. The central crystal is enclosed by glazed curtain walls and a perforated screen that enhance the crystalline appearance of the circulation volume. As the crystal meets each building it cuts through the more massive volume and reveals a metal panel rainscreen lining the voids. The cohesive construction system of the rainscreens and the flexibility provided by their layered nature allow the building volumes and crystal to read at once as uniform facility and singular volumes. The multiple layers of a rainscreen assembly also enable the introduction of a high amount of insulation and create a series of barriers between patient environments and the exterior. Both the thermal and acoustic qualities of the interior spaces benefit from this system. The facades of the patient buildings are wrapped in wood to introduce warm tones to the facility’s materiality and contrast with the cold glazing of the crystal. The wooden slats read as individual members at a close distance to break
down the size of the buildings, but combine to read as a massive form at farther distances, which strengthens the image of the crystal cutting into the volumes. This language also references the notion of a public resource with insular needs, as the vivid crystal can be seen only in glimpses from the surrounding area, protected and enclosed by the large building masses. The rainscreen and curtain wall claddings of the facility unite the various forms, enhance patient settings, and reinforce the design language.

The design of the behavioral treatment center reflects the character of the center itself through the programmatic layout, circulation volume, and cladding systems. The facility’s mission and position within the regional community are strengthened by elements of the design. While the interior patient environments are shaped by the six architectural variables of acoustics, lighting, nature, color, materiality, and space planning, the center’s larger scale architectural language shapes the local and regional impression of the facility. Ultimately the residential inpatient behavioral health treatment center is a product of the involvement of architecture in treatment, work done in the behavioral health architecture field, guidelines concerning patient environments, the history of psychotherapy, and the strategies of institutions like the Sibcy House at the Lindner Center of HOPE.
Bibliography

Architectural Design Solutions


• Article describing acoustic disturbances in healthcare settings.


• David Egan provides a basic description of acoustics and the architectural means for adjusting a building’s sound quality.


• Explains the functional uses of color in buildings and material selection. Color theory is also covered.


• Covers sustainability in healthcare in terms of economics, health aspects, and justifications.


• Guidelines for the planning of behavioral health environments and the specification of equipment for those spaces.


• Specifics of material selection, building type, electroacoustics, outside noise pollutants, and mechanical system noise.


• Description of research proving that architecture has an impact on patient healing.

- Discussion of the use of color as a diagnostic tool in psychiatry and the possible effects of color in patient environments.


- Discussion of materiality and finishes in psychiatric environments and their effects on patients.


- Outlines research on the benefits of introducing nature in health environments and lays out guidelines for designing these nature elements.


- Thesis exploring the use of light and color to enhance healthcare experiences.


- Article explaining research on the benefits and methods of light in healthcare environments.


- Discussion of tools and strategies for quantifying the performance aspects of building components.

- Explanations of the mathematic calculations for acoustics, construction considerations, and suggestions for suitable acoustic room design.


- A study researching the impacts of natural versus urban views on psychophysiological states.


- Article describing research on evidence-based design and common design themes.


- Article discussing evidence that design impacts patient stress levels, including aspects of control and family contact.

**Architectural Precedents**


- Senior living community with precedents for activity and common spaces.

Array Architects. "Behavioral Health Addition."

- Array Architect’s project description of the addition at St. Charles Medical Center.


- Product supplier design guide for care provider stations.


- Newspaper article discussing the design of the Mercy St. Charles Hospital behavioral health addition.

- Architect’s description of design goals for the Miami Valley Hospital, with emphasis on patient room design.


- Architect’s overview of several projects to revitalize mental health treatment in Oregon.


- Description of large-scale mental health institution design.


- Architect’s description and photos of completed psychiatric hospital.


- Article discussing architecture as a “treatment mall”, or large service based treatment housed in architecture modeled after a town structure.


- Article about the Östra Hospital and the architectural techniques White used to create a healing environment.

**Cognitive Behavior Therapy**


- Webpage for research arm of the Lindner Center of HOPE.

• Statistics for residential treatment program Sibcy House at Lindner Center of HOPE.


• Ongoing research at the University of Cincinnati Mood Disorders Center.


• Explanation of the expansion of behavior therapy through cognitive therapy methods. Advocates for the combination, Cognitive Behavior Therapy (CBT).


• Discussion of the current field of CBT.


• Structuring of the characteristics and methodologies of CBT.


• The evolution of cognitive therapy from social learning theory through the cognitive revolution.


• This chapter gives an overview of behavior disorders and a history of behavior therapy.

- The full source of the previous citation provides in depth discussions of treatments for specific mental disorders.

**Behavioral Health Architecture**


- Description of the new facility to enhance treatment at Sibcy House.


- Masters of Architecture thesis focused on the relationship between mental health and the physical and social environments of the city.


- Overview of a literature review involving mental health facilities and their impact on patients.


- Article covering services offered and expansion plans at Linder Center of HOPE, including basic hospital facts and figures.

**Healthcare Architecture**


- Publication from interior designer on healthcare design

- Differences in design between urban and sub-urban facilities.


- Interview with Don Thomas of BWBR about good and bad solutions and next generation facilities.


- Sustainable practices and components for healthcare design.


- Exterior spaces, interior renovation, programmatic and construction components of hospital design, color and art, human sensory factors.


- Mostly photographic documentation of abandoned institutional architecture. Short history of the facility.


- Patient desires, hospital environment’s impact on stress and safety, economic justifications, environmental responsibility.


- Specific to design resources and guidelines for assisted living facilities. Discusses humanistic and research based design.


- Thorough guidelines for Veterans Affairs mental health facilities.


- Conference proceedings covering the shift from technology centered medicine towards a patient-centric approach.


- Analysis of the architecture of Erik Asmussen, regarding his seven principles including harmony with nature and site, and color luminosity and color perspective.

**Site Documentation**


- Satellite map of the Avondale neighborhood in Cincinnati, Ohio.


- Overview of the College of Medicine at the University of Cincinnati.


- Report detailing a five-year plan for the Avondale neighborhood.


- Avondale’s census demographic data.


- Article describing future transit development in Avondale.