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Fostering Recovery: Establishing Therapeutic Environments in Behavioral Health Facilities for Adolescents

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FOSTERING RECOVERY:
ESTABLISHING THERAPEUTIC ENVIRONMENTS IN
BEHAVIORAL HEALTH FACILITIES FOR ADOLESCENTS

A Thesis
Presented to
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by
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Accepted by:
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FOSTERING RECOVERY: ESTABLISHING THERAPEUTIC ENVIRONMENTS IN BEHAVIORAL HEALTH FACILITIES FOR ADOLESCENTS
ABSTRACT

The intent of this project is to explore what and how specific architectural features can contribute to a holistic therapeutic environment for adolescents in an inpatient behavioral health care setting.

Mental health facilities in the U.S. historically have been highly institutional spaces designed to restrain and isolate persons with mental health problems from society. These facilities have often been designed under a misunderstanding of the needs of individuals with behavioral health issues, frequently thinking that they are incompetent or criminal and are therefore incapable of participating in the community. This belief is a result of stigma toward behavioral health.

This project is based on the belief that behavioral health facilities have the ability and responsibility to facilitate the care delivery process. Future behavioral health facilities for adolescents need to foster the recovery process to enable these individuals to become productive members of society. This can be achieved through designing spaces to: respect the individual dignity of the patient, allow him or her to connect to the surrounding environment, and facilitate their [re]integration into society.
This research project is designed to explore and promote a well-rounded approach to designing recovery-oriented space through architecture in behavioral health care settings. It explores how the architecture of behavioral health care environments can directly promote the health and wellness of patients within these facilities, promoting opportunities for positive interaction with fellow patients, staff, the community, and exposure to the natural environment.

To this end, the study is composed of two major parts. First, a literature review establishes a knowledge base of the current best practices of the delivery of care to adolescents in inpatient behavioral health care settings and of the architectural strategies that affect this care delivery. In addition, a case study analysis investigates current best case studies for the design in inpatient behavioral health care settings for adolescents throughout the world.

This analysis leads to the development of seven architectural strategies which can be used to develop places that truly foster the recovery process for adolescents with behavioral health problems. These guidelines include:
(1) Orient functions around a central greenspace
(2) Filter light according to function
(3) Eliminate the corridor
(4) Create clear views to and from staff work areas
(5) Provide group and private patient rooms
(6) Create opportunities for small and large group interactions
(7) Use “safe” materials and furnishing

A design proposal for a 36 bed, 47,630 GSF inpatient behavioral health care setting for adolescents in North Charleston, SC forms a test case of these guidelines. Three twelve-bed units compose the facility: one for female adolescents, one for low acuity male adolescents, and one for high acuity female adolescents. The design suggests alternatives and strategies for future growth for the program. This design proposal is intended to be a model of how these ideal principles can be applied in a practical setting.
ACKNOWLEDGEMENTS

Thank you to my advisor, David Allison, for your selfless time and guidance throughout this project. Thank you to Professor Jacques, for your thoughtful mentorship, to Professor Harding, for your clarity and delight, and to Dr. Pruitt, for your pragmatic understanding. Each of you has helped me find a well-rounded approach to this project. Your devotion to excellence allowed me to grow in ways I did not anticipate.

Thank you to the members of CAF and CAAH for enabling me to interact with leaders in the field personally and benefit from their understanding. To John Boerger, Francis Pitts, Jim Hunt, and Lianne Knotts, and others, your willingness to share your expertise has inspired me throughout the research and design process.

Thank you to the many professors and colleagues who were willing to advise me. To my family and friends, thank you for your support. I would like to thank my mother Amy and sisters Amanda and Kathleen. Your love has always motivated and challenged me. Rory, thank you for your constant encouragement and reminders to smile. And to my friends, a much needed source of joy and laughter, this work would not have been possible without your presence.
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INTRODUCTION

Globally, communities lack sufficient facilities to address the needs of behavioral health patients, especially adolescents (WHO, 2005). New and existing facilities of this kind both need to be designed to respect the individual, connect him or her to the surrounding environment, and provide opportunities to [re]integrate into the community. This thesis investigates the current evidence of the relationship between facility design and care models in inpatient adolescent behavioral health facilities and creates a set of design guidelines intended to foster recovery in this setting.
The Importance of Behavioral Health

Behavioral health care is a unique and vital component of the health care field. It differs from the majority of areas of health care in that it is aimed at addressing human action and interactions within society. “Behavioral” refers to, “underlying psychological processes such as cognition, emotion, temperament, and motivation; and to biobehavioral interactions” (NIH, 2010). The practice of behavioral health, therefore, is then concerned with the health, or the “as a state of complete physical, mental and social well-being” (WHO, 2005), of these actions. This field works to provide services that promote healthy human behavior in society. Behavioral health is frequently broken down further into two main areas of care: mental health and substance abuse. This thesis examines in particular behavioral health care, both mental health and substance abuse, for adolescents, as this setting presents arguably the most stringent requirements for the safety and wellness of the patients.

Mental health care addresses disruptions in an individual’s ability to function within society. According to the World Health Organization (WHO), mental health “is related to the promotion of well-being, the prevention of mental disorders, and
the treatment and rehabilitation of people affected by mental disorders” (2013). The National Alliance for Mental Illness (NAMI) frames mental disorders, or mental illnesses, as medical conditions that disrupt “a person’s thinking, feeling, mood, ability to relate to others and daily functioning” (2013). This medical condition can often have drastic effects on the individual’s ability to respond to the typical needs of daily living.

According to the Commission on Youth Membership, when a young person has an extreme inability to cope with these demands, they can be described as having “serious emotional disturbance” (2010). The term “serious emotional disturbance” (SED) is used in a variety of federal statutes in reference to a specific behavioral health problem which affects or prevents an individual’s participation in society socially, academically, and/or emotionally. When an adolescent has an SED, professional health care services work to address this disruption and help them to fully recover. The rate of SEDs globally is alarmingly high. Studies have documented that, depending on the criteria used, somewhere between 4 to 16% between the ages of 9 and 17 can be diagnosed with SED (Commission on Youth Membership, 2010). When a

Figure 3: Percentage of youth with SED (Source: Commission on Youth Membership, 2010; created by Colquhoun)
person with a mental illness, whether or not it is an SED, seeks behavioral health care, this care is oriented towards helping the patient to address this disruption in their thinking, feeling, mood and ability to relate to others. This treatment is not intended to be episodic; it is aimed at helping the patient to develop their mental health to fully recover as part of a lifetime process.

The other primary cause of behavioral health problems is substance abuse. Substance abuse refers to any use of psychoactive substances (alcohol or drugs) that harm the well being of the individual. Frequently, persons who receive treatment for substance abuse problems have developed a dependence syndrome. Dependence syndrome refers to the mental and physical phenomena that result from repeated substance use. It typically results in strong urges to take the substance despite its harmful effects. Substance abuse problems are characterized by the user’s difficulty to control the use of the drug, a priority placed on the drug compared to the other activities of daily life, an increased tolerance to the substance, a tendency to overdose, and withdrawal symptoms when the individual is not under the effects of the drug (WHO, 2013). These symptoms directly affect one’s health and ability to

Figure 4: Components of Behavioral Health Problems (Colquhoun)
function. Therefore, as with mental health care, when a person with a dependence on a substance seeks behavioral health care, this care is aimed at providing strategies to not only heal from this dependence, but also at providing preventative measures to avoid this problem in the future.

Behavioral health care applies the principles derived from behavioral science to persons who no longer express healthy behavior in society, due to either or both of the reasons listed above. The goal behind this care is to help the individual take responsibility for their actions and become active and productive members of society. This aid not only benefits the individuals receiving care, but also their friends, family, and surrounding community by allowing these persons to give back to society as a whole.

Appropriate behavioral health care for adolescents serves not only the individuals being cared for, but also the public good. For the individual, it has a clear and easily discernible benefit as it helps guide them along the recovery process and give them the necessary skills to heal. The WHO recognizes that:

Figure 5: Behavioral Health Care Process (Colquhoun)
“children and adolescents with good mental health are able to achieve and maintain optimal psychological and social functioning and well-being. They have a sense of identity and self-worth, sound family and peer relationships, an ability to be productive and to learn, and a capacity to tackle developmental challenges and use cultural resources to maximize growth” (2005).

By helping those with mental health problems to recover, these individuals can move beyond the potentially crippling path of their illness to become stronger, more competent individuals.

Beyond that, by helping these individuals become productive members of society, this society itself receives the benefits. The WHO notes that “the good mental health of children and adolescents is crucial for their active social and economic participation (2005). It is in the best interest of society itself to invest time and energy into the behavioral health and wellness of all of its individuals. Once these adolescents have learned how to recover, they can go on to participate fully within the larger community.
This thesis project investigates the current conditions of behavioral health care for adolescents both globally and locally. It then looks at the current needs of this care and analyzes how architectural intervention can be oriented to responding to these needs. A new approach to behavioral health care facilities that focuses on the successful recovery of the patient needs to be embraced for these facilities to be truly effective.

The Healing Environment: One of the driving beliefs of this thesis is that the environment in which care is delivered can promote or detract from the healing process. Mounting evidence suggests that buildings can, in fact, influence the ability and willingness of a patient to heal. In the behavioral health settings, one of the key recent findings is that the built environment can reduce aggression. Roger Ulrich, a leader in the field, notes that

“The patient’s acute stress will be lessened after admission if the ward environment has been designed in evidence-informed ways to foster control and coping, mitigate crowding stress, minimize environmental stressors such as noise, and promote exposure to stress reducing or restorative features

Figure 6: Benefits of a Healing Environment (Colquhoun)
Thesis Aims: Despite all of the potential benefits of the integration of the therapeutic environment into behavioral health settings, a wide array of issues prevents behavioral health care from being delivered effectively to those who need the care, especially adolescents. This project aims to understand what these issues are, and to what extent architectural intervention can provide opportunities to begin to address and overcome them. These design strategies should promote recovery for co-occurring disorders (and therefore both mental illness and substance abuse) among adolescents.

These architectural interventions in behavioral health care environments should not be expected to cure patients. However, it is reasonable to assume that they can create opportunities for healing. Once this environment is established, it is then the duty of the patient and their community of support to choose to accept this positive environment and allow themselves to be open to receiving care within it. Greater
attention needs to be paid to what treatments are being provided for these patients and in what context in order for it to be truly positive.

The intent of this study is to identify architectural strategies that can foster recovery in an inpatient behavioral health care setting for adolescents. As can be seen in the diagram to the left, this mission can be understood and achieved through a three part vision:

1. Promote individual dignity of the patient.
2. Foster a healthy connection between the patient and the surrounding environment.
3. Encourage the [re]integration of these individuals into the community.

All architectural interventions should then achieve one or more parts of this vision. To this end, a literature review informs the development of a series of goals for the thesis project. These goals provide the basis by which the guidelines will be developed and tested:

Figure 7: Project Development (Colquhoun)
(1) Orient functions around a central green space. These goals then are used as a tool to analyze the current best practice trends in case studies throughout the world. The techniques implemented in these studies help to form the following seven guidelines:

(2) Encourage place attachment

(3) Provide access to greenspace

(4) Bring natural daylight into interior spaces

(5) Provide opportunities for interpersonal interactions

(6) Create spatial clarity throughout the facility.

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(7) Allow patients to have a sense of control.

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(2) Filter light according to function
(3) Eliminate the corridor
(4) Create clear views to and from staff work areas
(5) Provide both private and semi-private patient rooms
(6) Create opportunities for small and large group interactions
(7) Use “safe” materials and furnishing

A design proposal for a 36 bed, 47,630 GSF inpatient behavioral healthcare setting for adolescents in North Charleston, SC is proposed as a test case of these guidelines. The design will suggest alternatives and strategies for future growth for the program. This design proposal is intended to be a model of how these principles can be taken from the realm of the ideal and applied in a practical setting. Therefore, the guidelines are used to inform all aspects of the design process, including but not limited to: site selection, program development, building massing and envelope, to create a design which cohesively applies these guidelines to foster recovery for adolescents.
The current lack of resources globally means that both the current field of literature and pool of recently constructed case studies for this program are limited. While awareness for this lack of research is growing, the limited body of research on the design of the physical environment for these populations may prevent a truly holistic understanding of how architectural interventions can . Further research and analysis should be conducted outside the scope of this thesis to better understand the implications of this form of health care and to provide the simplest and most effective design guidelines for these settings.
Persons with behavioral health problems have historically had problems finding and receiving care. Even though the percentage of persons (especially adolescents) with mental health and substance abuse disorders is relatively high, barriers such as stigma, lack of transportation to care, a shortage of care providers, and poor quality facilities among other causes prevent adolescents from receiving the care that they need. Recent changes in attitude towards behavioral health recognizing it as a medical condition has begun to combat some of these issues; however, the need is still great.

Figure 10: Persons with Behavioral Health Problems Need Better Access to Care (Colquhoun)
Overview of Past and Current Issues

While it is widely recognized that the rate of mental illness and substance abuse is alarmingly high throughout the world, many forces serve as barriers for individuals receiving adequate (or any) treatment for mental illnesses. Our society is beginning to address behavioral health problems as illnesses instead of personal flaws. However, stigma and the problems that arise as a result of it remain a strong issue for those with behavioral health problems. In addition, little information is available to build an evidence base on how the built environment can positively and negatively affect the recovery process. With these issues in mind, this thesis aims to employ the current information available to promote an architectural approach to behavioral health settings that combats this stigma and promotes recovery.
Mental Health Issues: A high percentage of adolescents throughout the world experience some form of mental illness. These illnesses typically develop at a very early age, and if untreated, they can last an entire lifetime. According to NAMI, as much as one-half of all chronic mental illness begins by the age of 14, and three-quarters of these illnesses develop by the age of 24 (NAMI, 2013). WHO corroborates this, indicating that 10-20% of children and adolescents globally experience some form of mental disorder. In fact, they indicate that the most significant cause of disability for youth is neuropsychiatric problems (WHO, 2013).

Figure 11: Prevalence of Child and Adolescent Mental Disorders, Selected Countries (WHO, 2005)
The United States has a relatively high prevalence of child and adolescent mental disorders. Conservative estimates indicate that there is a 21% prevalence of mental health disorders in society (The United States Department of Health and Human Sources (USDHHS), 1999). The National Institute for Mental Health (NIMH) suggests that this number maybe be as high as 26.2%. Up to 23% of this number may be comprised of persons with severe mental illness. In addition, 45% of those with mental illness have some form of concurrent disorder (2013).

Early treatment and preventative measures for these illnesses can help to significantly reduce mental illnesses across a wide range of ages. By working to address signs of mental illness at an early age, society can invest in these individuals to help them recover and become active participants in the community. However, a multitude of forces discourage or prevent this group from receiving adequate treatment.

Figure 12: Prevalence of Mental and Concurrent Disorders (Source: NIMH, 2013; created by Colquhoun)

- youth with severe mental illness
- youth with concurrent disorders
WHO defined several barriers to treatment for adolescents with mental disorders, including lack of resources, stigma, lack of transportation, inability to communicate effectively in the patient’s native language, and lack of public knowledge about mental disorders in children and adolescents (WHO, 2005).

Stigma toward persons with severe mental illnesses (and substance abuse problems) has affected the availability of care and its quality over time. It is “evident at all levels of society involving children and adolescents, families and treatment providers” (WHO, 2005). Stigma is a prominent barrier to health, and perhaps the most significant barrier, especially in high income countries. WHO documents that 80% of the reasons provided for individuals in high income countries not receiving appropriate care for their mental illness can be attributed to stigma, while a mere 37.5% of those in lower income countries find this to be the predominant barrier (WHO, 2005).

Stigma is the tendency to stereotype individuals that have an illness or trait in a negative manner. It leads people to treat persons with these traits poorly, avoiding
interacting with them at all levels, personally and professionally. Stigma towards persons with behavioral health problems often leads to embarrassment, shame, and despair. These feelings in turn discourage individuals with behavioral health problems from recognizing and pursuing treatment for care. Finally, this stigma prevents the public from being willing to invest in initiatives to treat and prevent these illnesses (SAMHSA, 2006). This stigma has contributed to a lack of value placed on behavioral health services, leading to a shortage in facilities and providers.

In addition to this stigma, very few

Figure 14: Barriers to Behavioral Health Care Treatment (Source: WHO, 2005; created by Colquhoun)
19 countries have any form of structured system in place to address child and adolescent mental health. A survey of available literature in 2004 by Belfer and Shatkin indicated that only 14 out of the 191 countries had a stand alone and clearly articulated mental health facility for children and adolescents.

The lack of a structured system for child and adolescent mental health care has contributed to a lack of mental health services available in high income and low income countries alike. WHO identifies the need for child and adolescent services in high income countries to range between 5 and 20% of the population, placing the care available to this population at the same range as low income countries (WHO, 2005).

In the United States in particular, there is a large lack of mental health providers. According to the Child and Adolescent Health Measurement Initiative, 39% of individuals age 2-17 did not receive help in 2011 for their emotional, developmental, or behavioral health needs in America (YEAR). Not only that, the care being provided throughout the United States for mental health is inadequate. Due to the complexity
of mental health illnesses, the field requires a great deal of staff and resources. However, mental health care facilities receive insufficient funding, and therefore cannot meet the range of needs in their area.

"In 2010, an estimated 22.6 million Americans aged 12 or older were current (past month) illicit drug users, meaning they had used an illicit drug during the month prior to the survey interview. This estimate represents 8.9 percent of the population aged 12 or older. Illicit drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used nonmedically."

Source: SAMHSA, 2012

Figure 16: NAMI's Grading the States (NAMI, 2009)
Substance Abuse Issues: Substance abuse also constitutes a major problem among adolescents. Globally, two of the top risk factors for adolescents are alcohol and substance abuse (WHO, 2004). In 2010, the NSDUH conducted a study in which they discovered that over the past year approximately 22.6 million Americans over the age of 12 had used an illicit drug over the past year (8.9% of Americans) (2011). Typically, when a person is suffering from a substance dependency, they must experience a “turning point” to catalyze the recovery process.

A turning point is a specific moment in the path of an individual suffering from substance abuse issues which results in a marked change in the attitude and motivation of the individual in a lasting way. It frequently is caused by an unusual experience or an altered awareness for the patient (Teruya et al, 2010). Even with such an experience, individuals with substance abuse problems still face significant challenges. As substance abuse affects the brain of the abuser in ways that “foster compulsive drug abuse”, having desire alone is not enough for the recovery process to be successful (NIH, 2013). Recovery requires support from the community and individual alike. The flow in the graph on the left represents the needs of the recovery
process for substance abuse treatment. If any of these parts are missing, the recovery process becomes difficult, sometimes impossible.

The shortage of facilities and providers throughout the United States poses a strong barrier to treatment. A mere 7% of substance abuse treatment facilities are oriented toward an explicitly adolescent client population (DASIS, 2003). Fifty-seven percent of facilities for adolescents currently treat mental health, substance abuse, and co-occurring disorders (DASIS, 2003). The lack of federal and state funding for these organizations means that currently as much as 75% of adolescent facilities are run by non-for-profit organizations (DASIS, 2003).

All of these forces can quickly become obstacles for those suffering from a substance dependency. Programs, systems, and facilities to address these facilities need to be developed to address these needs in a thoughtful and information-based way if they are going to promote the recovery of adolescents with substance abuse disorders.

Figure 18: 75% of adolescent facilities were operated by non-for-profit (Source: DASIS, 2003)
Behavioral Health Services: As has been demonstrated, there is a strong lack of behavioral health services globally for adolescents. However, even when treatment is available to this group, the quality of this treatment is often lacking. In a study of behavioral health facilities throughout Europe, it was noted that, “the degree of coverage and quality of services for the young were generally worse in comparison with those for adults, including for serious disorders” (Levav et al, 2004). The poor quality of facilities can serve to discourage recovery for the individuals in these facilities, becoming in and of itself a barrier to treatment.

Figure 19: Quality of Behavioral Health Facilities (Source: Levav et al., 2004; diagrammed by Colquhoun)
**Medicine and Design in Mental Health:** The lack of strong research to support specific models of care and architectural interventions serve as barriers to the thorough implementation of “evidence-based” practice. In the field of science, evidence based practices have become the standard for guiding the treatment decision process. An evidence based practice is a “treatment or service that has been studied, usually in an academic or community setting, and has been shown to be effective, in repeated studies of the same practice and conducted by several investigative teams” (Gruttadaro, 2007). Evidence based practice is believed to promote well-informed care decisions by parents, care providers, and designers and has therefore been readily accepted by these communities. Evidence based practice and evidence based design share the goal that this increase in knowledge will lead to an increase in accountability and better outcomes.

While the concept of evidence based practice (EBP) is incredibly strong, there still are several issues with EBP. First of all, EBP does not guarantee that treatments will be effective. Not all practices studied are available universally, and practices that are successful in one culture and community may not necessarily be effective in another.
Also, as many adolescents suffer from co-occurring disorders, not all treatments that should be effective for one of their disorder may prove to be so. Finally, as it is a developing field, there is still a significant lack of research to support effective treatment for a number of mental illnesses (Gruttadaro, 2007).

In the realm of design, evidence based design (EBD) faces similar difficulties. First, the field of behavioral health care design lacks a sufficient amount of peer-reviewed resources to facilitate “evidence-based” design. As “design” is deemed as a subjective field, specific information or evidence rarely directly applies to a wide range of highly variable and complex design conditions. In addition, as the field is so young, frequently their are either too few sources or the sources that are available have contradictory results (Sailer, 2009). Shepley notes that for behavioral health design in particular, “the lack of research on the topic is too strong for the evidence to effectively be used to guide the design process” (Shepley, 2013).

Although there is insufficient evidence to support “evidence-based” design, the current literature can inform the design process along with a variety of other forces,
especially through active engagement of the various user groups for the facility. Much of the current literature available supports general trends within behavioral health care. The information derived from these sources should be applied to the designers understanding of their specific design problem and user group. In situations where the evidence base is weak or contradictory, the information available should be carefully understood and used to support the model of care being provided at the specific facility being designed.

For instance, the current evidence regarding single vs. shared patient rooms is contradictory, depending on the groups and illnesses being served. A model of care focused exclusively on connecting the patient with it’s community support system, for instance, in a substance abuse treatment program, may choose to have shared rooms. On the other hand, a mental health facility for individuals with severe anxiety issues that is aimed at helping the patient maintain their individual dignity may choose to assess the current literature and choose to design a private room facility to prevent a feeling of “crowding”. In each of these scenarios, and many more, the lack of an evidence base must be understood to provide the opportunity
for those with behavioral health problems to engage in the healing process. The current research needs to be evaluated and supplemented to determine the most appropriate architectural interventions for behavioral health care settings.
Patient Profiles

This thesis project aims to explore the benefits of the therapeutic environment in inpatient behavioral health facilities for adolescents. To do this, we must first come to an understanding of who these adolescents are and how the environment can best help them. This section will explore the mental and physical characteristics of adolescents entering this facility. It will address what it means to be entering an inpatient facility for their problems, and will address stigma towards these adolescents. It will then explore how adolescents and their families currently receive insufficient funding for behavioral health care and then describe the typical psychosocial and psychopharmalogical treatments currently given to these adolescents. Finally, it will give an overview of the main intent of the care-delivery process for these individuals.
**Physical Characteristics:** Adolescents are defined as individuals ranging from 10-19 years of age (WHO, 2014). The adolescents in the proposed facility will be continent, ambulant, needing minor supervision, and having the ability to have some degree of campus freedom, depending on the patient's acuity, based on the model provided by the Village System (Means, 1973). Care providers will supervise the patients throughout their stay at this facility, which will range from 8-16 days and be no longer than 28 days. However, as patients are more capable of making responsible choices, they will be given more personal freedom within this setting. Because of this, the recovery process will be guided by care providers, but must involve the active participation of the individual. The environment should reflect, respect, and promote the healthy use of this responsibility.

**Reasons for Receiving Care:** These adolescents rarely decide to seek out mental health services by themselves, as can be seen in Figure 23. Adolescents with substance abuse problems are most frequently brought in through the criminal justice system (CBHSQ, 2010). In 2009, NSDUH released a report disclosing reasons that adolescents seeking behavioral health in an inpatient setting believed that they
were receiving care. The top five reasons are as follows:

(1) The patient felt depressed.
(2) The patient thought about killing self/tried to kill self.
(3) The patient was breaking rules or “acting out”.
(4) The patient felt very afraid or tense.
(5) The patient was experiencing problems at home.

The facility proposed by this thesis will offer services to cover a range from substance abuse to mental health problems. Throughout the country,
adolescent facilities are more likely than adult facilities to offer special programs for clients with co-occurring substance abuse and psychological problems (57 vs. 46 percent) (WHO, 2003). This combined program is in part because many of the mental illnesses between the ages of 12 and 17 are results of psychoactive substance use (WHO, 2005). Towards the end of adolescence, psychotic disorders may begin to become more apparent as a leading cause for adolescents seeking out behavioral health care services.

*NOTE THAT THESE AGES OF ONSET AND TERMINATION HAVE WIDE VARIATIONS AND ARE SIGNIFICANTLY INFLUENCED BY EXPOSURE TO RISK FACTORS AND DIFFICULT CIRCUMSTANCES*

Figure 25: Typical Age Ranges of Presentation of Selected Disorders (Source: WHO, 2003; created by Colquhoun)
It is critical to understand that, due to the circumstances detailed previously, patients will typically be entering this facility in an agitated state. The definition of severe mental illness is often associated with violence. Persons suffering from severe mental illness are, in fact, up to three times as likely to be violent, and “when associated with substance abuse disorders, the risk may increase much further” (Insel, 2011). A literature review conducted on violence in psychiatric settings noted that 4.9% of aggressive incidents in facilities were directed towards staff (Bowers et al, 2011). However, Ulrich noted that despite this number, 37% of aggressive
incidents can result in staff injury (2013). While these facts are true, persons with severe mental illness are significantly more likely to be victim of violence.

In reality, the majority of those with severe mental illness (SMI) are not violent. On the contrary, “people with SMI are actually at higher risk of being victims of violence than perpetrators. Teplin et al found that those with SMI are 11 times more likely to be victims of violent crime than the general population” (Insel 2011). Adolescents entering the proposed facility will frequently be victim to some form of physical abuse at home, which will affect their self-respect and openness to engaging in treatment.

The most frequent form of violence typically found in these settings is not towards staff or other patients, but rather towards oneself. Persons with severe mental illness frequently present with suicidal ideations. The most recent global statistic indicates that 6% of deaths can be attributed to suicide (WHO, 2004). In the United States, suicide is in the top ten leading causes of death (see Figure 27). Among adolescents, this ranking is much higher, with suicide being the 3rd leading cause.
of death for individuals 12-19 years of age in 2008 (Heron, 2012). According to Insel, while “it is not possible to know what prompted every suicide, it is safe to say that unrecognized, untreated mental illness is a leading culprit” (2011).

Because of these factors, it is critically important that facilities for behavioral health treatment should be designed to promote “safety”. Too frequently in our current system, safety is confused with loss of respect and individual freedom. While there will be instances in which a patient will be agitated to the point of physical violence, the goal of the space is not only to promote the security of the individuals during periods of agitation and risk, but also to allow patients to have the freedom to choose other ways to relieve their stress. This premise mandates that the designs of these facilities should take great care to provide opportunities for the patient to de-escalate. Designers have a responsibility therefore to design spaces that can reduce tension and anxiety and give each patient a safe and healing environment in which to recover.
The Financial Context of Mental Health

Financial struggles can form an additional barrier to care for many individuals. In the United States, we are currently in a transitional period for insurance coverage. Typical insurance plans provide inadequate coverage for mental health and substance abuse disorders. According to an ASPE Research Brief, 95% of those with small market group coverage have some form of aid for mental health and substance abuse services, 25% of uninsured adults have some form of mental health or substance abuse disorder 33% lack coverage for substance abuse, and 20% lack coverage for mental health (2013). Basically, a large portion of those with mental illnesses are unlikely to have insurance coverage for their treatment. Current facility payment plans typically help to cover a portion of the costs, but these treatments still incur a high cost for the family. Only 4% of facilities offer completely free treatment for adolescents in these facilities. 23.7% offer no form of assistance for treatment, and the remainder of facilities offer some form of assistance whether through partial assistance and a sliding scale (SAMHSA 2008).

The implementation of the Affordable Care Act will lessen, but not eliminate, this overall gap in coverage. Federal parity will soon be offered for mental health
services, meaning that it will receive the same coverage as medical and surgical benefits (ASPE, 2013). ASPE projects up to 95% coverage for mental health (2011), while NAMI much more conservatively projects 70-90% cost sharing for mental health (2013).

This information all serves to indicate that, while current coverage is minimal for mental health, this condition should improve in the near future. This change must be deliberate and significant to alleviate the financial burden that is currently placed on the adolescents needing behavioral health care and their families.

Figure 31: Facility Payment Plans (Source: SAMHSA, 2008; created by Colquhoun)
Patients in behavioral health care facilities typically receive a range of several kinds of treatments for their condition(s) that fall into one of the following two categories: psychosocial and psychopharmological treatment.

Psychosocial treatment is oriented towards the care provider team working with the patient and the family to develop a new mental approach to the typical causes for and difficulties that arise from behavioral health problems. “The success of psychosocial treatment often depends on the therapeutic bond formed between the provider, child, and family” (Gruttadaro et al, 2007).

Figure 32: Mental Health Policy (Source: WHO, 2005; recreated by Colquhoun)
Psychopharmological interventions involve the prescription of medications to treat chemical imbalances thought to be causing the behavioral health issue and to treat its symptoms. There is a much stronger evidence base for the effectiveness of drug therapy as it is much easier to regulate and measure.

Frequently, the best results are achieved through a combination of psychosocial and psychopharmological treatments. “In some cases, a psychosocial treatment may help to reduce the amount of medication that is required for a child” (Gruttadaro et al, 2007).

Through a mixed approach, treatment

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Figure 33: Psychosocial vs. Psychopharmacological Interventions (Source: NAMI, 2007; recreated by Colquhoun)
can deal not only with the immediate problems that the patient is experiencing, it can also help the patient to form healthy habits to avoid future problems. One of the most prevalent trends in care is the developing understanding that recovery is a highly individualized process that requires a unique combination of practitioners, treatment protocols, community support, and individual motivation. Without any one of these elements, the recovery process becomes much more difficult, if not impossible.

To truly help these adolescents recover, treatment providers must continually remember that the goal of recovery is to help adolescents get “back on track with their lives, returning them to the things they enjoy most and thrive on, such as sports, clubs, art, spending time with friends, and more” (NAMI, 2007). It must also be supported by the genuine belief that recovery is attainable for any person who struggles with behavioral health illnesses. This can be best understood through a statement released in the Federal Action Agenda in 2009:

*We envision a future when everyone with a mental illness can recover, a future when mental illnesses can be prevented or cured, a future when mental illnesses are detected early, and a future when everyone with a mental illness at any stage of life has access to effective treatment and supports—essentials for living, working, learning, and participating fully in the community.*
Role of Collaboration

Given the goals of treatment and the variability of individuals and their treatment needs, treatment is strongly tied to the concept of collaboration between care providers, families, and the adolescents receiving treatment. However when studied, this need is not being met in the community. “Emotionally disturbed children and their families have needs that are unmet or inadequately met in almost every region of the United States” (Tarico et al, 1989).

There is a need for stronger, community based systems to provide effective care in the future. As we come to a better understanding of how to promote recovery, family and community members should and will demand the ability to participate in this process. (Koren, 1997). This thesis contends that designers of behavioral health care facilities should become involved in this recovery process by designing spaces that allow for not only the specific care path of the individual patient, but that also provide for this collaborative, community-based process. Facilities should be designed to provide opportunities for various types of community groups to be aware of and involved in the facility.
Behavioral health facility design can impact the effectiveness of this care delivered, both positively and negatively.

This type of design forms a critical component of patient care. It can effect the quality of care, the efficiency of the care, and even the method of service of this care. However, as important as the design can be in the functionality of the building, mental health facility design can just as easily have a psychological impact on its users.

Facility design can support the beliefs, expectations, and perceptions patients

![Figure 35: Facility Design Requirements](Created by Colquhoun)
have about themselves, the staff who care for them, the services they receive, and the larger health care system in which those services are provided. Moreover, facility design can also have a significant impact on the beliefs, attitudes, and behaviors of staff and on how staff identify and interact with patients and the environment (Karlin, 2010).

It is therefore imperative that the design of behavioral health care facilities carefully consider the needs of both the patients and staff using these facilities to create environments that are efficient, safe, and therapeutic. An efficient environment allows for staff to quickly see and care for patients, especially in moments where the patient is highly agitated. It is important that the environment also promotes the safety of all users. As stated earlier, patient violence leads to staff injury in up to 37% of incidents (Ulrich, 2013). Facilities should be designed to reduce this potential by using materials, finishes, and furnishings that are difficult to break or dissemble. Finally, the environment should be designed to help the patient naturally deescalate during these moments. A therapeutic environment can help to create positive distractions and allow patients to find balance throughout their stay at the facility.
MISSION, VISION, AND GOALS

In order to create a framework through which specific architectural strategies for the proposed environment can be defined, it is first necessary to understand the nature of these facilities and to what extent the architecture of the environment can impact its needs. To do this, the mission, vision, and goals of the facility and of this thesis must be clearly defined.

Figure 37: Conceptual Framework (Source: SAMHSA, 2009; adapted by Colquhoun)
As previously mentioned, the primary mission of the proposed facility is to foster recovery in an inpatient adolescent behavioral health setting. According to SAMHSA, the main goal of recovery is to “improve their health and wellness, live a self-directed life, and strive to reach their full potential (SAMHSA, 2011). Basically, individuals must engage in a healing process which allows them to overcome their illness and become active members of society.

To achieve this goal, recovery must be a truly holistic process. First, the setting in which recovery takes place must be one that is supportive to the individual. SAMHSA addresses this by defining four major “dimensions” to recovery: health, home, purpose, and community. Health refers to “overcoming or managing one’s disease(s) or symptoms... and for everyone in recovery, making informed, healthy choices that support physical and emotional wellbeing”. Home is understood as an environment that promotes healthy interactions. Purpose refers to having the incentive and opportunity to partake in daily activities that hold meaning to the individual. Finally, community refers to all persons surrounding the individual who provide hope, guidance, and friendship (SAMHSA, 2011). These four elements come...
together to truly address the many areas of life that behavioral health problems affect. By working to attain the proper physical and mental health, a strong living environment filled with compassionate persons to support, and a strong drive for the recovery process, individuals with behavioral health problems can truly begin to heal.

Figure 39: Four Driving Forces of Recovery
(Source: SAMHSA, 2009; created by Colquhoun)
Once a setting is established that embraces the four driving forces of recovery, the recovery process itself has many characteristics, or “dimensions”. SAMHSA describes these “dimensions” through a series of guiding principles (SAMHSA, 2009). They are as follows:

“There are many pathways to recovery.
Recovery is self-directed and empowering.
Recovery involves a personal recognition of the need for change and transformation.
Recovery is holistic.
Recovery has cultural dimensions.
Recovery exists on a continuum of improved health and wellness.
Recovery emerges from hope and gratitude.
Recovery involves a process of healing and self-redefinition.
Recovery involves addressing discrimination and transcending shame and stigma.
Recovery is supported by peers and allies.
Recovery involves [re]joining and [re]building a life in the community.
Recovery is a reality.”
From these guiding principles, we can begin to understand that recovery is a multi-faceted process that requires not only the dedication and motivation of the individual, but also a system of supportive individuals and resources to help this individual to identify, attain, and maintain their goal. The question for design professionals then following this concept of recovery is: how can architectural strategies promote the recovery process?

This thesis purports that the built environment can have a positive impact on the recovery process. While the process of recovery is one that must be undertaken by the individual and supported by the network of people surrounding the individual, the built environment can be designed to support the individual and their peers in this process, promoting opportunities for positive action and interaction.
Vision

A design that effectively fosters recovery not only understands what recovery is, it also how considers how the built environment can impact these dimensions. First, the twelve dimensions were associated with three main factors: respecting the individual dignity, connecting the individual to the environment, and [re]integrating the individual into society.

This three-part vision can be seen implemented successfully in several different models of care, three of which will be discussed in this thesis. The first model, known as the “wraparound” model, is a care-giving process which looks at the recovery process as a holistic approach which relies on the dedication of the individual and their entire support system. Burns and Goldman note that the wraparound process is “a team-driven process involving the family, child, natural supports, agencies, and community services working together to develop, implement, and evaluate the individualized service plan” (14). With this model of care, the need for community bonds and supports are clearly emphasized.

In addition to the need for community supports, the wraparound model also
highlights the importance of the individual pursuing care (Figure 42). The National Wraparound Initiative notes that to fully recover, the individual must be actively engaged in the care process (2013). Each healing process is completely individualized and relies on the strengths of the individual receiving care as well as their commitment to success.

The wraparound process also strongly focuses on the need of the family to be involved in the patient care team (see Figure 43). According to this model, the successful recovery of an individual requires that the members of the individual’s home environment willingly assist him or her in the recovery process, both as care givers and recipients of care. Burns and Goldman refer to families as “the most important resources of any child” (30). Therefore, one of the primary objectives of the wraparound model of care is to strengthen the support system within the family unit, strengthening the already natural support system for the patient (National Wraparound Institute, 2013).

For designers, this model of care has a primarily programmatic effect on the design of
a facility. The wraparound model of care demands that the designer provides spaces that engage the community, families, and various members of the patient’s support team in the program of the facility.

The Village System is another model of care which recognizes the strong need for community support. This model, however, deeply roots the care process into the individual’s physical environment. The intent of this system was to establish a series of interactions between the patient and their surrounding physical and social environment to assist the recovery.

Figure 44: Village System Stages of Recovery
(Source: The Village System, recreated by Colquhoun)
process and help individuals become healthy members of the community.

The first main premise of the village system is that the first step of the recovery process is the establishment of a relationship with oneself. This is followed by the relationship with the surrounding environment. Then, the patient must be able to establish a healthy relationship with other patients and staff.

The system was then designed to provide moments of interaction at stepping levels, leaving from the shared patient room to group activity spaces. These group activity spaces then lead to larger community spaces. Staff members would be present throughout these levels of interaction, having work stations in pods and in group work spaces. Patients were carefully accompanied throughout this process to guide this process.

The final “level of interaction” for the patient in this process then becomes the establishment of a relationship with entire community in the facility. Once the patient has become sufficiently self-aware and capable of handling small scale interactions,
he or she is then capable of interacting at this larger scale. This ultimately prepares him or her for reintegration into the community outside of the system. The end goal of these levels of interactions was that they led to the reintegration of the individual into society as a healthy individual.

Similar to two models of care discussed before, the house-neighborhood-downtown model emphasizes the relationship between the individuals of the community with each other. Once again, the general concept is that by encouraging interactions first at a small scale and then intersecting these groups with each other, the patients will be able to elect to participate as they are able in the recovery process.

First, at the house level, patients must be given their own individual environment. As the patient leaves this space (their room), the space provides opportunities for them to begin to interact with the other members of the facility in varying levels. Within each “house”, small clusters of patients (typically around 8) have their living space and share both quiet and loud activity spaces. This model, developed by Francis Pitts of architecture +, “capitalizes on a patient’s innate ability to manage
relationships within a smaller community” (6). The “neighborhood” portion of the facility is designed to be a transition space from the “houses” into the surrounding community. It is comprised of shared treatment spaces. It is designed to be a space where patients can “test their competencies” with less direct staff supervision. At the same time, it efficiently allows several units to share these programmed spaces with each other. The “downtown” area is placed at the intersection of neighborhoods and has large scale, group activities resembling the fullness of the entire community.

Each of these models support the concept that the recovery process must support the individual recovering through different levels of healing: as an individual, with the surrounding environment, and in relation to society as a whole. They inform the three part vision of this thesis: to respect the dignity of the individual, to connect the individual to this surrounding environment, and to allow for the [re]integration of the patient into society. With this vision established, a series of design goals based on the current literature needs to be established.
Goals

With these “levels of interaction” identified as critical to the recovery process, a literature review on therapeutic environments in behavioral health facilities provides information needed to determine what design interventions tend to have a positive effect on the patient healing process. This literature review generated the information necessary to determine the following six avenues through which the built environment can support the recovery process:

1. Create spatial clarity
2. Provide access to greenspace
3. Allow patients to have a sense of control
4. Bring natural light into interior spaces
5. Encourage place attachment
6. Providing opportunities for interpersonal interactions

The provision of healthcare must be in a friendly, safe environment that respects individual autonomy and fosters independence (O’Conner et. Al, 2012)

These goals are intended to collectively respond to the three-part vision of this thesis and foster the independence of the individual, connect them to the surrounding environment, and allowing them to interact with their “society” in the facility. These
goals can begin to define how the design of inpatient behavioral health facilities can begin to impact the quality of care delivered for adolescents.

Figure 49: Design Goals (Developed by Ashley Colquhoun)
Create spatial clarity throughout the facility: As a therapeutic environment, one of the major aims of the project for this thesis is to design a space that reduces anxiety. Therefore, several of the goals of this project will be created to increase understanding for the individuals in the facility. This first goal encourages simplicity in the massing and layout of the facility. The main premise of this goal is that clearly defined spaces will lead to a sense of comfort for the user. By encouraging an innate understanding of the functions of each space, patients will not have the burden of confusion placed on them.

Studies of behavioral health centers indicate that tension occurs for patients in areas of confusion. For instance, Shepley’s study of a behavioral health center for adolescents found that “transitional zones without territorial definition, such as hallways and entries, are sites of a significant number of negative behaviors”(Shepley, 1995). From this study, the researchers developed a unit in which visibility was high and functions of the spaces were clear. A post occupancy review was conducted on this facility, which found that, while there was a higher number of incidents, they were of noticeably lower intensity in the new facility. The patients in the new facility...
facility had a better understanding of their environment, and were therefore less aggressive. Karlin and Zeiss support this notion, indicating that spaces should be functionally differentiated, whether through color, lighting, and/or furnishings. By creating clear and simple distinctions between spaces, patients are able to engage with their environment with less difficulty.

This goal suggests that the components of each facility should be designed in a manner which clearly distinguishes one space’s function from the next, conveying a clear sense of meaning for each space to the user. Spaces that are intended to be more active, louder spaces should be designed to accommodate these actions without compromising the quality of the surrounding environments. Particular attention should be paid to the acoustics, scale, and visibility of each space. Then, transitions between these spaces should remain open and highly visible while still remaining secure.
Provide access to greenspace: This goal promotes both visual and physical access to the natural environment. This access to greenspace not only permits opportunities for daylight within the facility, it also can be used to create a strong sense of place, encouraging comfort and simplifying wayfinding within the facility. This goal speaks directly to the vision of connecting the individual to the surrounding environment.

Visually, connections to nature can serve to reduce tension, create a positive distraction, and raise the spirits of patients and staff alike. Researchers such as Nanda have noticed this effect, saying that views to nature, “affirm the notion of lifting the spirits and instilling hope” (Nanda, 2009). A report released by Ulrich in 1984 indicates that views to nature may in fact reduce the length of stay for surgery patients. This report goes on to connect views to nature with patient and staff satisfaction, reduced length of stay, and reduced cost of patient care in general practice. When applied to behavioral health care facilities, the potential of these views to positively impact patients is great.
Physical access to nature takes these effects a step further and provides not only an opportunity for physical activity but also a sense of separation from treatments spaces within the facility. Ulrich notes that these garden spaces can have a positive effect on patient’s mental state by providing the patient with a sense of control and an “enticing getaway from familiar interior ward spaces” (Ulrich, 2012). This sense of peace and control can help behavioral health patients to relax and open themselves to the recovery process.

In addition to this, accessible gardens for patients can also provide the opportunity for safe outdoor physical activity. It has been shown that physical exercise can have positive effects on the patient, including but not limited to “increased self efficacy, a sense of mastery, distraction, and changes of self-concept” (Strohle, 2009). This can lead to an improvement of the patient’s mood and a decrease in their anxiety levels (Strohle, 2009). This effect can have a significant role in the recovery process for adolescents with behavioral health issues, providing healthy outlets for energy and anxiety and providing them with positive distractions during their recovery process.
Encourage patients to have a sense of control: This goal strongly relates to the concept of respecting the individual dignity of the patient. It aims to provide options for the patients within each space where they will spend the majority of their time. By allowing multiple opportunities for patients to choose how and where they spend their time, the facility can help to reduce aggression by providing spaces for patients to retreat to and release stress in tense situations.

The premise behind this goal is that patients will, given the option, choose an environment which supports their needs, which can allow them to naturally de-escalate in tense situations. This way, in the event that a patient feels uncomfortable in a given situation, he or she can choose to separate themselves from that environment. Patients with a sense of control over their environment have historically had reduced or eliminated stress (Evans, 2003). Adolescents in particular can benefit from perceived autonomy in this setting. Huffcutt notices that throughout an interview process with adolescents in a behavioral health facility, “adolescents mentioned a desire for options in seating to fit desire activities such as group interaction solitude, or watching television” (2010). On the other hand, patients

Figure 54: Sense of Control (Developed by Ashley Colquhoun)
who do not have this sense of autonomy in their environment are likely to perceive more anger and aggression and be subject to more coercive measures (Middelboe, 2001). By providing intimate spaces that the patients can “own”, designers can begin to speak directly to the needs of the patients in these facilities.

Simple strategies for providing patient control over their environment, such as control over temperature (Winkel & Holahan, 1985) and ability to pursue personal interests and hobbies (Lawton, 1979) can serve to reduce patients’ stress levels. In addition, providing spaces that “belong” to the patient speaks directly to the wishes and needs of the patients themselves. A study conducted by Gulak in 1991 indicates that adolescents have a noticeable desire for “private space”. By providing them environments that they can “own” patients are more likely to feel secure and be satisfied in their environment, once again opening them to the recovery process.

Figure 55: Sense of Control Reduces Stress
(Source: Winkle & Holahan, 1985; diagram created by Ashley Colquhoun)
**Bring natural light into interior spaces:** Patients typically enter inpatient behavioral health facilities because their mental illness is preventing them from participating fully as an individual within their society. Many of the primary symptoms of patients in behavioral health facilities involve anxiety and depression (NSDUH, 2009). If the built environment can alleviate these symptoms, even to a small degree, then this environment can begin to truly foster the recovery process. Providing daylight not only connects the patient with the surrounding environment and provides a sense of control naturally but it also serves important biological functions for all users of the facility. It has been found to have three effects of interest to this thesis: managing circadian rhythm, reducing stress, and reducing depression.

The circadian rhythm refers to biological events that happen to the body in regular 24-hour intervals. If one’s internal rhythms contradict the physical rhythms of the individual (for example, working a night shift), he or she can begin to feel tired, distracted, and depressed (Joseph, 2006). One primary area where this can be evident is when the body does not secrete the correct amount of melatonin, a hormone which regulates the body’s sleep cycle. An inadequate amount of daylight

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*Figure 56: Spatial Clarity (Developed by Ashley Colquhoun)*
in an environment prevents the body from suppressing the release of melatonin to the body, causing drowsiness and depression (Lewy et al, 1985) Natural daylight has been found to help balance the chemical reactions within the body, which helps to regulate the body’s circadian rhythm.

Natural daylight has also been shown to reduce stress. Ulrich has noted a trend in natural views in interior spaces promote stress reduction (Ulrich et al., 1991; Raanaaset al., 2011, as quoted by Ulrich, 2012). In this same article, he notes that patient studies indicate that high exposure to natural light can reduce length of stay and combat depression among both psychiatric and non-psychiatric patients (Ulrich et al., 2008b; Ulrich 2012, as quoted by Ulrich 2012). Simply by having natural daylight alone, patients are better prepared to fight their illnesses.

Daylight in interior spaces has been shown not only to reduce stress, but also to reduce depression. By providing patients with daylight in their care setting, they are likely to have reduced length of stay for their visit, both in mental health and general health care facilities. Beauchemin & Hays in 1998 found that more positive health

Figure 57: Daylight Reduces Depression and Length of Stay (Source: Ulrich, diagrammed by Ashley Colquhoun)
outcomes resulted from patient stays in sunny rooms than rooms with limited access
to sunlight. In addition, mortality rates were found to be higher in rooms without
strong access to daylight. In the field of mental health, a study by Benedetti in 2001
found that patients suffering from bipolar depression had a 3.67 day shorter length
of stay in east-facing rooms (with ample sunlight) than those with west-facing rooms.
This reduction in the severity of depression cannot be underestimated, especially
in a behavioral health care setting. By helping to alleviate some of the immediate
stressors and pains associated with mental illness, the provision of natural daylight
can allow for the patient to be free to focus on the root of their illness.

Figure 58: Daylight Reduces Length of Stay
(Source: Beauchemin et al, 1996; Created by Colquhoun)
Encourage place attachment: “Place attachment” alludes to the concept that any individual who feels safe in and responsible for their environment will naturally treat this environment with care. Behavioral health facilities have historically been designed as detention centers with prison-like security. Rather than promoting the idea that behavioral health facilities are about “containing” or “subduing” patients, this goal endeavors to support the concept that these facilities are designed to allow the patient to heal. The most advanced leaders in the field of behavioral health have historically fought for a more humane treatment and greater trust placed in patients. Even leaders from as early as Dr. Kirkbride in the 1840s became known for cultivating confidence from the patients in his facilities and their families (Dowdall, 1996).

Instead of creating a space that sends the message, “I expect you to fail, the intent of the facility proposed by this thesis is to create spaces that sends the message, “you are capable of making healthy choices”. Karlin notes that this message can be attained through “warm, welcoming, and familiar environments” (2010). This concept is reinforced by Carr’s list of qualities for a therapeutic environment, which is “to create a warm and home-like environment” (2011). A study conducted by Day et al.
in 2002 indicates that there may be a connection between home-like characteristics in a facility and reduced aggression.

To design these “home-like” spaces, designers must first have an understanding of the best qualities of the home life and culture of the individual and how the built environment can incorporate these elements. Care should be taken throughout the design of these facilities to understand the particular patient group being served and to identify their wants, needs, and previous life experiences. This attention will lead to spaces in which the patient is able to feel safe and comfortable, thereby reducing anxiety and allowing them to participate more fully in the recovery process.

Figure 60: Characteristics of a home-like environment (Created by Colquhoun)
Provide opportunities for interpersonal interactions: One of the most critical components of recovery is the patient’s ability to interact positively with the surrounding members of society. As a part of this, opportunities should be provided for the patient to control their interactions with others, providing moments for interactions at both a large and small scale. This goal calls for the dedication of specific spaces throughout the facility that allow for a range of positive and constructive interactions between staff, patients, and visitors. This goal can speak to issues of spatial arrangement of the “departments” of the facility, “social” spaces within these facilities, and variety of interaction levels within each of these spaces.

First, the facility itself should be broken down into understandable “levels of interaction” based on the nature of both programmed and spontaneous activities and events. Patients should be able to preview and understand the spaces they will engage in before they reach them, thereby promoting a greater understanding of their environment and allowing them to decide whether or not to participate, observe, and/or avoid unwanted interactions. The scale of each of these places should be designed to match the level of activity and interaction that is intended

Figure 61: Interpersonal Interactions
(Developed by Ashley Colquhoun)
to occur within the space. This gives the patient a clear understanding of their role in each part of the recovery process in the facility.

Then, once a patient has entered into each department, the space itself should be immediately understandable. Social spaces and secure points (entries, exits, staff spaces) should remain highly visible to create a sense of safety within the environment and corridors should remain wide and clear. This strategy will help to avoid the feeling of “crowding” which can induce aggressive actions and attitudes (Ulrich, 2013).

Figure 62: Crowding Induces Aggression (Created by Colquhoun)
Within the social spaces of each “department”, patients should have the opportunity to choose to what degree they interact with the large group. For instance, in large group social gathering spaces, Gabb recommends clustered seating, suggesting that it simultaneously provides sufficient private space for the individual while at the same time fostering higher levels of social activity (1992). This position is supported by Devlin, who noticed after a renovation in a facility that “behavioral data showed a significant decrease in patient stereotypy and a preference for more private seating areas in the day hall” (Devlin, 1992).
GUIDELINES

The design goals, derived from the literature review, can then inform the analysis of a series of facilities worldwide to develop a better understanding of how design is currently used to foster recovery. Case studies from a variety of scales, locations, and types of architectural practice both well versed in behavioral health and with little experience in the field (see Figure 65) are compared to determine which architectural interventions can be applied globally to the design of these facilities, as can be seen from the case study map below.
<table>
<thead>
<tr>
<th>PROJECT NAME</th>
<th>LOCATION</th>
<th>ARCHITECT</th>
<th>YEAR COMPLETE</th>
<th>NO. OF BEDS</th>
<th>SERVICES OFFERED</th>
<th>BUILDING FORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bessboro House Child &amp; Adult Psychiatric Unit</td>
<td>Cork, Ireland</td>
<td>McCullough Mulvin Architects</td>
<td>2011</td>
<td>20</td>
<td>Inpatient-Psychiatry- All Ages</td>
<td></td>
</tr>
<tr>
<td>Center for Prevention and Rehabilitation</td>
<td>Vlaardingen, Netherlands</td>
<td>EGM Architects</td>
<td></td>
<td>36</td>
<td>Inpatient-Substance Abuse- Adults</td>
<td></td>
</tr>
<tr>
<td>Residential Care Unit</td>
<td>Hokkaido, Japan</td>
<td>Sou Fujimoto Architects</td>
<td>2006</td>
<td>20</td>
<td>Inpatient Psychiatry</td>
<td></td>
</tr>
<tr>
<td>Lesotho Child Counselling Unit</td>
<td>Mazenod, Lesotho</td>
<td>Article 25</td>
<td>2008</td>
<td>20</td>
<td>Inpatient Behavioral Health-Child &amp; Adolescent</td>
<td></td>
</tr>
<tr>
<td>Morris Village</td>
<td>Columbia, USA</td>
<td></td>
<td>1975</td>
<td></td>
<td>Inpatient Substance Abuse- All Ages</td>
<td></td>
</tr>
<tr>
<td>Nye Vardheim Helsecente</td>
<td>Bergen, Norway</td>
<td>NORD Architects, 3RW Architects</td>
<td>competition</td>
<td>50</td>
<td>Nursing Home, Primary Care, Behavioral Health</td>
<td></td>
</tr>
<tr>
<td>STARS Sub-Acute Adolescent Treatment Facility</td>
<td>San Leandro, USA</td>
<td>The Design Partnership</td>
<td></td>
<td></td>
<td>Inpatient Behavioral Health-Adolescent</td>
<td></td>
</tr>
<tr>
<td>The Village</td>
<td>Beer Sheba, Israel</td>
<td>PRAUD</td>
<td>2013</td>
<td>0</td>
<td>Outpatient Day Care-Adults</td>
<td></td>
</tr>
<tr>
<td>Worcester Recovery Center and Hospital</td>
<td>Worcester, USA</td>
<td>architecture +</td>
<td>2012</td>
<td>320</td>
<td>Inpatient Behavioral Health- Long Term Adult, Adolescent, Forensic</td>
<td></td>
</tr>
<tr>
<td>Ferndene Mental Health</td>
<td>Pruchoe, UK</td>
<td>medical architecture</td>
<td>2011</td>
<td>40</td>
<td>Inpatient Mental Health-Adolescent</td>
<td></td>
</tr>
<tr>
<td>Building #20</td>
<td>Columbus, USA</td>
<td>Stanley Beaman &amp; Sears</td>
<td>2014</td>
<td>0</td>
<td>Inpatient Behavioral Health- Adult, Forensic, Group Therapy Spaces</td>
<td></td>
</tr>
</tbody>
</table>

Figure 65: Case Study Chart (Created by Ashley Colquhoun)
Each of these case studies is studied to determine how the design goals inform design decisions for the development of these facilities. This analysis leads to the development of the following “design guidelines” aimed to foster recovery in an behavioral health care setting drawn from behavioral health centers globally. The intent of these guidelines is to define specific architectural strategies which facilitate the recovery process in behavioral health facilities. Once these strategies are defined, they can be applied to a local context.

The design guidelines are as follows:

1. Orient functions around a central greenspace
2. Filter light according to function
3. Eliminate the corridor
4. Create clear views to/from staff work areas
5. Provide both private and semi-private patient rooms
6. Create “levels of interaction” in daytime spaces
7. Use “healthy”, “safe”, and “respectful materials and furnishings

Figure 66: Design Guidelines (Colquhoun)
A centralized, open, and accessible greenspace not only provides a space for physical activity and interaction with nature, but also brings daylight into the core of the design. This design element can be used for wayfinding, improved visibility, and positive distraction. This guideline is rooted deeply in the goals of providing access to greenspace and bringing daylight into the facility. Because of this, a strong evidence base supports this guideline. Studies, such as one conducted by Akridge in 2005, indicate that having secure visual access to nature can create a positive distraction for the patient. As patients in behavioral health facilities are dealing with behavioral illnesses, this kind of positive distraction can serve to help the patient open their mind to the possibility of a life outside of their current condition and allow them to engage more fully in the recovery process. Not only this, but by placing a greenspace at the center of the program, the buildings themselves can form the security element and outer boundaries for the space, eliminating the need for fencing disrupting the space.

Joseph, in 2006, noted that access to natural light has a plethora of benefits to the individual. Daylight has been demonstrated to improve mood, chemical reactions...
within the body, and the body's circadian rhythm. In addition, it promotes one's ability to perform tasks effectively. Ulrich notes that exposure to daylight can reduce stress for both psychiatric and non-psychiatric patients. By providing a centrally located accessible greenspace, patients can see and experience daylight throughout their daily experience, allowing them to more comfortably focus on the recovery process.

A central greenspace not only has these biological effects on the individual, it also provides a secure space for patients to have physical access to the surrounding environment. This in itself provides several benefits to the individual. Not only does it create a more accurate image of the functions of a society (this facility, after all, does form the patient's society for the length of their stay), it also provides a venue for physical activity, which, as discussed previously, can increase positive mood and decrease anxiety.

The majority of the successful health centers studied had a prominent central greenspace as a major design driver for the facility. STARS Sub-Acute Treatment facility, seen in Figure 68, uses the central courtyard as an activity field including
a half-basketball court. The Lesotho Child Counselling Unit (LCCU) seen in Figures 69-70 uses the central courtyard as the main circulation element for the building. The edges of the courtyard space form a covered walk that is connected to every room in the facility. This allows patients and staff alike to continually connect with their surrounding environment. Finally, Nye Vardheim Helsecenter uses the central gardens pace as a way to connect the three levels of the facility by having it bridge the levels. Seating is integral to the architecture of the facility and is located along the perimeter of the garden space.

As designers begin to create this greenspace, several considerations should impact its development. To serve as a wayfinding element, it should be placed not only central to the facility, but in such a way that it provides visual access to the various components of the facility (e.g. circulation pathways, therapy spaces, community gathering spaces, patient wards). This space should be seen as an area with medium to high levels of activity. Special consideration should be given to ensuring the safety of these areas. Because of this they should be highly visible from staff work areas, activity spaces, and main circulation routes. The space should be landscaped carefully...
with foliage that is safe and maintains vibrance year-round. In addition, special care should be taken with the design of this space to avoid an institutional or caged feel. Therefore, the greenspace should not only be a focal point for the facility, it should also serve a functional purpose. This space can be designed to accommodate group activity space, group therapy, and/or patient recreation activities among other things, depending on the unique needs of the population served.
Once a central greenspace has been established, care should be taken in how this daylight is delivered to each space. The next guideline, “filter light according to function”, speaks to the idea of bringing daylight into each treatment space in a manner which respects the activity occurring within the space.

This guideline is tied both to the thesis objectives of bringing daylight into interior spaces and providing privacy for the individual. As stated earlier, abundant and undistorted light can help to establish a positive mood and maintain a healthy body (Joseph, 2006). However, at the same time, varying levels of privacy are needed for the different parts of the recovery process. Adolescents in particular have demonstrated a strong desire for privacy (Gulak, 1991, Gabb, 1992). When these adolescents engage in the therapy process, a sense of privacy is vital to allow patients to feel capable of being open to the recovery process.

Therefore, visibility into and out of patient care spaces should be carefully considered in order to successfully implement this guidelines. Spaces where patients might feel particularly vulnerable (such as private therapy spaces) should bring in daylight in a
way that respects the privacy of the therapy occurring. Strategies such as clerestory windows, frosted windows, or blind/louver systems in these spaces can provide a method of bringing light into these spaces without compromising the privacy of the individual. Choosing when and to what extent the light should be filtered allows for control of visibility both into and out of spaces according to the functions occurring within the space.

Anecdotally, therapists at an outpatient behavioral health facility found that windows with clear glazing created unwanted distractions during the therapy session, both because patients were distracted and because patients walking in could also see into the session. (Interview at Adamsville Regional Health, 2013).

Areas for private and/or clinical activity should use indirect natural light to encourage a feeling of safety and intimacy in the space. Patient spaces should be designed so that views do not open to other rooms or gathering spaces. If patient rooms must be visible from other spaces, they should have some degree of separation, either through distance, foliage, or window treatments.
In contrast to these very private spaces, areas for large group, non-clinical activity can have high levels of visibility and natural light. This can help to establish positive energy and draw strong connections between the individual and their surrounding community and environment.

In reality, many spaces will fall somewhere in between providing daylight and privacy and daylight and visual connections. Design solutions should respond to this gradient of need with varying degrees of exposure to light in these spaces. Architectural interventions such as fully or partially clouded windows or fixed or operable screens may be employed to help filter views in and out of critical spaces.

Figure 75: Bessboro House_Active, Well Lit Space (Source: Mccullough Mulvin Architects)
Primary circulation should be simplified to create direct pathways without awkward transitional spaces. Spaces with poor visibility or feeling of isolation should be avoided. Shepley’s study of physical incidents in a behavioral health care setting for children and adolescents found that the main spaces which promoted caused tension in this facility were awkward transitional spaces. She notes that “transitional zones without territorial definition, such as hallways and entries, are sites of a significant number of negative behaviors” (Shepley, 1995). Additional studies of health care facilities, have noted that problems with wayfinding are a contributing factor to persons in health care facilities (Carpman & Grant, 2002). Finally, “crowding” in behavioral health facilities is strongly linked to patient aggression. Therefore, proper treatment of transitional spaces within these facilities can help to reduce violence and promote a truly healing environment.

To design a space that responds to this evidence, the needs of the patient as they travel from one space to another must be carefully considered. Long, narrow, double-loaded corridors should be avoided. Corridors should be open and clear to minimize blind spots from nurse stations (Hunt, 2013). Similarly, any form of transitional space
should remain wide and have visual access to multiple functions at any given point. These transitional spaces should provide the patients with cues to the types of zones that patients will enter as they travel through the facility.

Patient rooms should open onto these clear and open spaces. Certain precedents have even oriented patient rooms around a central living space. Other facilities provide transitional space between the units and the main transition space. With this strategies, it becomes critically important to consider the amount of sound generated from this living space or transition spaces and how it will affect the quality of space within the patient room. Blind turns into or away from patient spaces should be avoided. These architectural interventions will allow for a high degree of visibility in the space and an avoiding of “crowding”.

Figure 77: Double Loaded Corridor Contributes to Patient Aggression (Source: The Design Partnership; diagrammed by Colquhoun)

Figure 78: New Facility Design (Source: The Design Partnership; diagrammed by Colquhoun)
By providing open nurse stations along primary circulation and gathering spaces, the safety of the environment can be promoted. One of the main components of the vision for behavioral health facilities is that these environments help to [re]integrate into society. As was seen in the wraparound model, community support is critical to the success of this concept. The staff of the behavioral health care facilities are the patient’s primary contact with “society” during the recovery process. Not only this, the staff also aims to be a mentor figure to these patients and a guide along this process. Therefore, patient to staff connections must be handled thoughtfully and sensitively. Karlin notes that, “when patients feel connected to staff, they are more likely to respond to or seek out these individuals in moments of distress, which can prevent or de-escalate personal crisis… facilitate staff interaction and connection with patients and discourage isolation or detachment” (2010).

For the patient, the nurse station should not be seen as a barrier to the staff, but rather a “checkpoint” space that helps the staff to deliver care (Hunt, 2010). Staff should be encouraged to engage with the patients outside of this space as much as possible. This strategy will enable the patient to have the comfort of knowing that

Figure 79: Camino State Hospital, Axon Diagram (Source: The Design Partnership)
the staff members form members of their recovery “team”, further reducing feelings of alienation and isolation that can accompany behavioral health problems. Once a patient feels safe in their environment, they are then able to open up to the staff and begin to participate fully in the care delivery process.

Strong connections between the staff and the patients is also desirable from the vantage point of the care providers. In the behavioral health care setting, the patient to staff relationship is a critical component of the recovery process. As staff are the patient’s primary point of contact with society and a guide along the process, it is important that patients are able to see and interact with them as necessary. Therefore staff in these facilities have a primary focus of visual and acoustic connection with patient gathering and circulation spaces (Duffy & Huelat, 1989). Additionally, encouraging nurse interaction with patients can help staff members to successfully moderate patient interactions and better notice trends in patient behavior.

Nurse stations should ideally be located along major circulation paths and group areas, promoting the staff’s ability to engage with patients while remaining
unobtrusive and non-threatening. By placing the nurse station at critical intersection points of the facility, this function can not only open up potentially stressful points in the facility, they can also promote staff’s ability to provide care. Clear views to both gathering spaces and points of exit/entry for the patient spaces are critically important for the promotion of a safe environment.

There are several “back of house” functions that staff need private access to (for instance, medication storage, linen, and even utility functions). Nurse stations should have support functions nested on the “back” side of the station to allow a protected zone for private staff interactions, medications, etc (Figure 82). Functions that support the unit but are not needed frequently by the nursing and technician staff (mechanical, electrical, and IT support) can be located outside of the main care delivery space to facilitate ease of access without compromising patient spaces.
By providing both private and semi-private (two person) rooms, the facility can accommodate a variety of patient needs. Little evidence supports either private or shared rooms for this group and setting. The evidence that does exist is contradictory. Therefore it is proposed that a mix of private and semi-private is the most appropriate solution for flexibly meeting constantly changing needs and patient profiles.

Private rooms, while the typical space of choice in general medical facilities, have both strong benefits and disadvantages in a behavioral health care setting. They can provide a completely private and secure de-escalation point for the patient (Grosenick and Hatmaker, 2000). Additionally, they can provide a sense of control for the patient (Novonta, Urbanoski, & Rush, 2011). However, many strongly argue against the use of private rooms, arguing that they foster a lack of connection to other patients and staff. Researchers such as Wilson, Soth, and Roback (1992), Ulrich (2012), and Chou (2002) argue for the potential of large semi-private rooms in clustered layouts to promote a sense of familiarity and collegiality among patients.

Unlike the majority of acute inpatient health care, behavioral health facilities
frequently use shared rooms for the patient. Sharing a room between at least two patients is considered to promote connections between the individual patient and their surrounding community. In addition, they can shorten corridor lengths in patient units. Even more importantly, it has been argued that semi-private rooms foster a sense of responsibility among patients (Shepley, 2013). Patients with suicidal ideations are less likely to have the opportunity to act on these tendencies, and roommates can notice trends in behavior that may otherwise be unnoticeable to the staff. Shared rooms are used more frequently in substance abuse situations than in mental health. These rooms are perceived to foster a sense of community for the inhabitants and allow them to develop a sense of responsibility for their behavior in this community.

However, there are also several arguments against a shared bedroom. Wolfe notes that anxious patients may find the social intimacy required in a semi-private space to actually be detrimental to the recovery process (1975). Considerable research on residential settings and prisons has shown that the number of persons sharing a bedroom, bathroom, or cell strongly correlates with higher crowding stress and...
lower privacy, perceived control, more disagreements with roommates, more illness complaints, and social withdrawal (Proshanski & Rivlin, 1970, Ulrich, 2012). In any configuration, adolescents with strictly substance abuse disorders should not share a room with adolescents with severe mental illness as this anecdotally does not foster recovery (Morgan, 2013).

To this end, this thesis supports the use of a variety of private and semi-private rooms in each unit. Upon entry into the unit, the patient should be assessed to determine the nature of space they need/desire. Staff should assess not only the patient’s acuity level, but also their home environment to determine which setting would provide the most natural recovery process.

Like the private rooms, semi-private rooms should be designed to give each patient a space that “belongs” to them within the room. Each patient should have his or her own window, and the beds should remain visible from the entrance to the room (see Figure 85). Strategies such as dropped ceilings over the patient beds can help to reinforce this notion of privacy within a shared setting. There should be a clearly
defined transitional space in the room in which the two patients are capable of interaction with one another. This helps to ease the transition from the individual patient space to the facility as a whole.

Several design strategies can be employed in both the private and semi-private rooms. In both scenarios, patients should be provided with ample built in, open storage space. Additionally, patients should have a sense of control over their particular space. This feeling can be reinforced by giving the patient as much control as they are capable of (which will vary per patient). Hunt recommends the use of integral blinds in patient room windows (2014). As patients are capable of greater degrees of responsibility during their stay, they can be given control over these blinds, letting daylight into the space as desired. These strategies are meant to reinforce the notion that each patient deserves respect and as much control over their space as they are capable of while still maintaining an open and safe feel.

Figure 86: Integral Blinds (diagrammed by Colquhoun)
Create “levels of interaction” in daytime spaces

The facility should be able to accommodate a range of activities in daytime program areas, ranging from individual/small group activity to large group activities. This guideline is a response to the nature of the care being provided. The concept of “fostering recovery” using a wraparound model leads to the need for spaces that can accommodate interactions at the individual, family, group (neighborhood), and community level. By creating a variety of “levels of interaction” in daytime program areas, the environment supports patients willingly selecting to choose a setting that will help them to “de-escalate” in stressful situations. To genuinely respect individual dignity, promote connections to the environment, and facilitate [re]integration into society, the patient must have the ability to choose to participate in each aspect of this vision as needed. Based on the wraparound model, “services and supports must be individualized, built on strengths, and meet the needs of children and families across life domains to promote success, safety, and permanence in home, school, and community. The process must be culturally competent, building on the unique values, preferences, and strengths of children and families, and their communities” (Burns & Goldman, 1999).
This guideline suggests “dedicating space for social interaction; clearly indicating a room’s intended use; making areas visually distinct so intended use of different parts can be delineated from their appearance; using colors to enhance activities and spaces; using various materials to provide different tactile and visual experiences; using lighting to help define space; and finally, making the spaces that have special meaning to patients stand out” (Gulak, 1991). Figure 88, an outdoor patio at Worcester Recovery Center, begins to speak to these levels of interaction. A variety of seating options give the patient the dignity and respect to control how and where they interact with the space. The environment of this space is clearly understood, as the building wraps around the central garden space. The clustered seating is grouped together to create a larger group space, and the central field permits large scale group activities. In this manner, the space can appropriate environmental cues to the user that they are able to engage in the recovery process as fully and completely as they are capable.

To develop these “levels of interaction”, it is important to have a clear understanding of what these levels are and can be. The first level is respect for the individual. (see
This level provides moments for reflection and de-escalation for the individual. It is necessary throughout the facility, (or especially) in larger group activity spaces. The patient room can be seen as the initial point of individual freedom for the adolescent, but the ability to have privacy must extend past this space, as “residents are often not allowed free access to bedrooms [during the day] due to safety concerns” (Hunt, 2013). This can often be achieved through small scale places, such as pocket gardens, individual benches or seating. It is important to maintain visibility to these spaces, especially from staff work areas. As in the patient rooms,
ceiling heights and massing can serve to reinforce the notion of privacy within these spaces. Figure 91 demonstrates how a private moment can be highly visible while still providing a sense of control, individuality, and connection to the environment. These niche seats provide an individual space for either caretakers or patients that allow them to “own” their space while still having visual access to the main circulation and a quiet garden space.

The second “level of interaction” establishes a connection between the individual and their surrounding environment. This “environment” refers both to the built structures and to the surrounding landscape in which they are situated. Comfort with this level implies that the individual has an understanding of the space they are in, and feel free to engage with the environment to the degree which they are capable of, whether it be through sitting in a window seat or through active use of a community or outdoor space. This “level of interaction” also implies that the patient has an understanding of their physical environment. This suggests that the facility
is designed to encourage this understanding by providing “previews” of the spaces patients will enter and use before they reach them. Circulation should be, open, and direct. The building should be massed and articulated to represent the kind of interactions that take place on the interior of the space.

The next “level of interaction” is the first level of person to person interaction. This level engages the individual with one or two other individuals. This level refers to small scale, intimate conversations among equals, and might include counsellors, family members, and other patients, among others. The development of these healthy bonds helps to set the stage for the patient’s recovery by helping them begin to connect with their surrounding network of support.

As the “levels of interaction” continue, the individual then begins to participate in progressively larger groups in the community. First, within the patient unit (for this thesis, sized at about 12 persons). This number should be based on both the demographics and acuity level of the patients within the facility. As this facility is oriented towards adolescents on a short term inpatient basis (12-21 days, typically),

Figure 92: Small Group Interaction (Source: EGM Architecten)

Figure 93: Ferndene Mental Health Garden Bench (Source: medical architecture)
the number of patients per unit is relatively high. Older patient units may require a smaller group for this unit to be effective.

Once the patient is comfortable interacting within this mid-size group, they are then prepared to interact with the rest of the community at the facility. To maintain a de-institutionalized program, the facility for this thesis is organized to accommodate 36 patients. These patients can interact among each other in the “community” space of the facility, and outside in a variety of garden spaces. It is critically important that this space remains highly visible to the patients and staff alike. Also, in spaces with a higher degree of interaction, patients should have the option to remove themselves from the intensity of this environment as necessary.

The “levels of interaction” system should provide an opportunity for the patient to engage in their environment and community to the degree that they are able. Therefore, the built environment should provide ample opportunities for the individual to rest, see, and interact with people at varying levels. Larger community areas should be comprised of both spaces for larger groups to interact and smaller
moments of interaction for those individuals who need to de-escalate or regroup. In the same way, areas for smaller interactions should have at a minimum visual connection to areas of larger group interactions. This strategy not only allows patients engage at these levels, it also simplifies wayfinding and provides a system to which the other guidelines can be applied.
Use “healthy”, “safe” and “respectful” materials and furnishing

Spaces should be designed using materials and structures that promote a safe and comfortable environment to promote “place attachment”. This guideline is rooted in the concept that when an individual feels a connection to and/or responsibility for the environment, they are more likely to choose healthy actions in it. “To the extent that the environment of care in inpatient and other mental health settings is healing and recovery-oriented, it is likely to enhance patient safety” (DGMH, 2013).

For this guideline to be effective, the environment must be both “safe” and “respectful”. This concept counters the traditional American model for these facilities, which associates the idea of “safety” with a minimal, durable, and prison-like setting. Rather, true and healthy safety in an environment means giving the patient freedom to the degree that they are capable of using it. In an inpatient adolescent behavioral health facility, the environment has many opportunities to reflect this idea. Spaces should be designed to create a safe environment for the patient with the strongest immediate needs (for instance, a patient with suicidal ideations), while not impinging on the freedom of a patient who is capable of a much higher level of responsibility for their environment.
To this end, Hunt proposes that the facility can be thought of as a range of spaces falling into five different levels. Each level requires that a different amount of attention be spent on the safety of the environment. A space that is at level 1 on this scale is inherently secure either because it is only used by staff or because patients are highly supervised in this space. A space that is at level 5 requires the highest degree of concern during the design phase to ensure the safety of the space, as patients may be spending longer amounts of time unsupervised in these spaces.

The breakdown of facility spaces under this model is as follows:

**Level 1:** staff and service areas

**Level 2:** spaces where patients spend little time in and are highly supervised, i.e., counseling rooms, interview rooms

**Level 3:** Spaces where patients spend a great deal of time with little supervision, i.e., day rooms, lounges, activity rooms.

**Level 4:** Spaces such as patient rooms where patients spend a great deal of time with little to no supervision

**Level 5:** Admissions rooms, examination rooms, and seclusion rooms where staff
interact with newly admitted patients that present potential unknown risks and/or where patients may be in a highly agitated condition (Hunt, 2013).

Higher levels should provide a much higher level of security and ability for staff to observe patients. Design features should allow spaces in the intermediate levels to vary according to the needs of the patient. Simple strategies like giving patients choice for water temperature in their bathroom and operable blinds within the window (which can be monitored by staff) can allow those patients who are capable to have a choice in their environment.

Throughout the facility, anchor points should be avoided. Anchor points are places in the design of the building which could be used as for ligature attachment by suicidal patients. They are most frequently found in doors, windows, and at intersection points between furniture and the structure of the building. Special doors and windows can be used to allow for operability and safety (Hunt 2013). All furniture should be built-in, stationary, or difficult to dissemble, while still being of enduring quality. Furniture from heavily trafficked places that need to be safe and highly cleanable, such as
in nightclubs, can be used to maintain a de-institutionalized appearance while still providing respecting the safety of the environment. All materials should be chosen as long-term choices. Therefore, materials should be “healthy”, meaning that they do not emit toxins such as VOCs, and “clean”, reducing the spread of infection (for instance, anti-microbial carpeting). As a holistic environment, care should be taken to maintain the air quality of the space. As this space is treating mental rather than physical illnesses, designers have more flexibility with the design of HVAC system. This design should reflect the intent of the thesis and provide as much connection to the environment (fresh air) as is reasonably possible. It is critical that furniture and materials are chosen which avoids stigma and promotes the dignity of the individual.
Several different forces guided the development of this program. First, the baseline for the program was formed by comparing the requirements for psychiatric hospitals set forth by FGI, SpaceMed, and the VA Guidelines. Both designers and medical staff were consulted both through literature and personal conversations to develop an understanding of patient numbers, staffing, and support for this kind of facility. Staffing was further modeled after recommendations from the American Academy of Child & Adolescent Psychiatry. Phasing for the program reflects the future growth of behavioral health care indicated in the provisions in the Affordable Care Act. Therefore, the inpatient portion of the project will be limited to 36 beds. Future growth for the facility should take the form of an outpatient day center. This center would provide both day long treatment programs and hourly sessions for individuals as they leave the inpatient facility. This allows for the comprehensive care for each patient, giving them a “step-down” program to facilitate their re-integration into society. Finally, the goals of the facility impacted the proportion of daytime activity spaces and their use.

The intent of this program is to provide opportunities for the recovery process
to holistically address the needs of the adolescents’ user of the facility. Services in the facility are oriented towards the three-part vision of the thesis: respecting the individual dignity of the patient, connecting the patient to the surrounding environment, and [re]integrating the patient into the community. These spaces were designed and proportioned to allow for these levels throughout the facility.

To respect the individual dignity of the adolescents, patient spaces are programmed to accommodate the patient’s ability to determine the use of the environment. Sufficient space is provided for individual activities in each social space. Staff spaces are programmed to be support spaces, encouraging staff members to go beyond the nurse station and interact personally with the patients in these “social spaces”. To do this, the staff stations should be as small as possible and remain open to the facility.

A facility that connects the patient to the surrounding environment must begin to consider the site it is located on as a key factor in the development of a program. An urban site will necessitate a tighter program with less points of physical connections.
to the exterior (See Figure 102). Facilities such as Nye Vardheim Helsecenter therefore rely more greatly on interior courtyard spaces as integral to the development of the project, having specific access points for the public. A more secluded site, like the one selected as the test site for this thesis, can explore many more moments along the program to connect to the surrounding environment. In either case, the inclusion of outdoor space in the program is critical to the success of the project. For this project, there are four categories of programmed outdoor space. Each inpatient unit has a small scaled garden which is intended to be a highly intimate and landscaped space. It provides views from the patient rooms and allows for a transitional space between the patient unit and the rest of the facility. A central courtyard is intended for medium sized groups to engage with the space (up to 15 persons) at a more active level. This space serves as the main point of orientation for the facility. It is intended to be a transitional space between buildings and to provide a controlled outdoor activity space. The next form of outdoor activity space speaks to the highest level of interaction for the facility. This space is designed to be an active playing field that can be used during recreation periods. It can be an open playing field or a specifically designed court or field. The final form of outdoor space is meant to be a
staff courtyard. It should be collocated with the staff break areas and be designed as a space of respite for the staff members during their day.

To [re]integrate the adolescent into the community, any space outside of specific treatment areas, patient rooms, and support space must be designed to accommodate various levels and types of interaction. These interactions can range from small, informal conversations among peers to much larger group therapy sessions (15 individuals), from one-on-one therapy sessions to a dinner for all of the patients in the facility. Therefore, space in the program is needed for small, medium, and large groups both formally and informally. Circulation space in patient areas will require much more than the minimum allowance according to code in order to truly “eliminate the corridor”. This strategy helps to avoid pinch points in the corridors and maintain visibility between spaces in the facility. It also begins to allow the corridor to become a programmed space of the building instead of a simply transitional space, permitting interaction spaces of varying sizes along the perimeter. Currently the code requires that halls in an I-2 setting be a minimum of 6 feet in width (FGI, 2012). To avoid crowding, this program was developed with the understanding that patient corridors would be no less than 8 feet in width at any one point.
The “wraparound” model of care demands a wide range of staffing to support the treatment process. Each inpatient unit will have at least one nurse and one technician with the patients at all times. Therefore the nurse station was sized to accommodate two individuals comfortably, and three if necessary. In addition, a full time psychiatrist and three full time social workers will be employed. Private (2-3 person) and family (4-6 person) therapy spaces were specifically designed as cellular, visually and acoustically private spaces that can be located along the central greenspace for the facility. A special education director guides educators in assessing patient needs and guiding their academic progress. To support this role, three class rooms were placed in the treatment center of the facility. Finally, a therapeutic recreation services director will guide the recreational therapy component of the recovery process. The art therapy space is designed to accommodate the needs of this component of the treatment process. In addition, the outdoor spaces will play a key role in the delivery in this form of care. Medical consultants will be brought in as needed to conduct occupational therapy and speech and hearing assessments, particularly as part of the admissions process. Admission rooms are therefore designed to also function as

Figure 106: Wraparound Model Staffing Requirements (American Academy of Child & Adolescent Psychiatry, 1990)
primary care exam rooms, allowing the space to become flexible and serve multiple needs. These spaces are designed to provide opportunities for patients to develop their wraparound community support as they recover.

Education forms an important part of the recovery process, as it is one of the strongest links to their former daily pattern of life that the patient experiences in their recovery process. Therefore, the education component is placed as a part of the “therapy” unit. It is also designed to be a bridge between the patient and the community both in location and function. The spaces can be located and designed so that community members can use the space in the early evening for organization meetings. A gym has a similar relationship with the community and can be used by various groups and neighborhood members when not being used by patients. Facilities such as Ferndene Mental Health by medical architecture have successfully implemented this strategy to raise community awareness for the facility and simultaneously support a healthy physical lifestyle. In this facility, community members are given access to the gym at specific times of the day, both for recreation and for larger meetings (see figure 107). Through these simple strategies, the facility can begin to raise awareness

Figure 107: Ferndene Mental Health Gym Use
(Source: medical architecture, diagrammed by Colquhoun)
for the importance of proper behavioral health care in a local context.

The program for this can be understood in three primary components: community space, therapy space, and inpatient units. These three elements begin to speak to the notion of developing various “levels of interaction”. Each component should represent a different kind of interaction while also allowing for the flexibility to accommodate other levels of interaction, both socially and therapeutically.

<table>
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<th>x</th>
<th>DGSF</th>
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<td>1.29</td>
<td>2348</td>
</tr>
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<td>94380</td>
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Figure 108: Space List Summary (Colquhoun)
Figure 109: Daily Schedule for the Typical Patient (Colquhoun)
The Inpatient Unit

The space requirements for the inpatient units can be seen as accommodating the first levels of interaction. This space consists of patient rooms, a gathering space for the members of the unit, a satellite nurse station, a consult room, a workout room, and laundry space. The typical patient will be on the unit in the morning for breakfast and then after 8pm at night until bed time. The inpatient unit, therefore, becomes a “home base” for the adolescents in the facility. Three spaces in this unit require particular attention: the patient room, the hall, and the living area.

The program is based on patient units of 12 beds (See Figure 110). This number is determined based on Baum & Davis’ observation that “smaller population sizes on floors, corridors, or units (approximately 12-18 persons at full occupancy) are associated with lower perceived crowding and more interpersonal contacts and helping behavior, than floors or units of comparable spatial density but large populations” (1980, as quoted by Ulrich, 2012). As hospitals serving over forty patients tend to become highly institutionalized, this thesis project is designed to accommodate 36 patients (in three patient units of 12). The patient room is the space designed to “belong” to the patient while they are recovering. Therefore, the
program provides sufficient space for each patient to have a bed, desk, personal storage, and a window bench looking out onto a private courtyard, even in the shared patient rooms.

The next space requiring special attention within this unit is the “hall” space, or the space that immediately follows a patient leaving their room. The guideline “eliminate the corridor” mandates that this space cannot be the typical double loaded and narrow space. As mentioned before, this space should be changed into an actual programmatic element of the space, whether it be through opening the corridor visually to a garden space or through providing moments of rest with seating areas or alcoves as intimate conversation areas along the space. In the inpatient unit, the hall becomes the transition space from individual respite to higher levels of interaction.

The final part of the inpatient unit requiring specific attention is the living area. This space comprises the largest moment of interaction in the patient unit. Because of this, particular attention should be paid to the quality of this space and how it relates
to the rest of the spaces in the unit. It should be visible from the nursing station, and ideally from the patient rooms as well. The room should be designed to minimize sound travel, especially if patient rooms open directly onto this space. Finally, this space ideally opens onto a therapeutic landscape, increasing the calm atmosphere of the living space and increasing a sense of freedom, and bringing in the second level of interaction, connection with the surrounding environment.

Figure 113: Small Patient Living Area (Source: Architecture +, 2013)
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**Patient Unit 2**

### Patient Room

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<tr>
<td>patient room (double)</td>
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<tr>
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</tr>
<tr>
<td>bathroom</td>
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### Living Space

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<tr>
<td>nourishment center</td>
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<td>60</td>
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<td>interview/consultation room</td>
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<tr>
<td>laundry room</td>
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### Staff

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### Support

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<td>emergency cart storage</td>
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<td>20</td>
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Figure 114: Patient Unit Space List (Colquhoun)
The next collection of spaces in the recovery process is the therapy unit. This area is critical to providing the patient with the necessary support and tools for recovery. The unit is comprised of education rooms, private therapy rooms, family therapy rooms, and group therapy rooms. The typical patient will be spending between 5 and 6 hours in these spaces each day. The therapy rooms in this space require attention as they are perhaps the spaces where the patient may be the most vulnerable in the care delivery process. These spaces should receive daylight without impinging on the privacy of the therapy session. In addition, the family visit spaces will be addressed.

Private therapy rooms are designed to serve two individuals: the patient, and the therapist. This moment in the recovery process is intended to be an intense, individualized conversation between the adolescent and his or her therapist, and is typically where highly specialized forms of therapy (typically cognitive behavioral therapy) are conducted. This form of therapy is primarily discussion based and is dependent on a trusting relationship between the therapist and the patient. Therefore, this space should be furnished to encourage this form of casual
intimacy, with two or three comfortable chairs (and/or couches) and an open setting (approximately 100 sf). This means that tables should be low and small (like coffee or end tables) so as not to form a barrier between the counsellor and the patient. As with all of the therapy spaces, the patient will be vulnerable in these spaces, and therefore acoustic and visual privacy is critically important. Daylight should be filtered or incorporated in such a way that it does not provide views into and out of the room to other patients, visitors, or staff members.

Family therapy is basically a private therapy session between the patient, one or more family members, and the therapist. It should be designed to accommodate 4-5 persons, including the therapist (140-160 sf). Like the private therapy units, visual and acoustic privacy are required. Furniture should be oriented to foster discussion between these individuals (circular instead of linear). Again, daylight should be brought into these spaces in a thoughtful way which does not provide views into or out of the space to main circulation and congregation spaces. This seeming contradiction between privacy and daylight can be accomplished through clerestory windows, screened views, and operable blinds in these rooms.
Finally, group therapy spaces involve a group of peers suffering from similar illnesses participating in a counselling session mediated by one or two therapists. Gladding recommends that this group range in size between 10 and 14 patients (1994). Therefore, the spaces in this thesis were designed to accommodate up to 15 persons, including staff (about 15 sf/person). Seating should be inwardly focused and all inclusive, typically in a circle or ovular form to incorporate all of the members of the group into the session. Therefore, this room will typically be close to a square in form. For this form of therapy, acoustic privacy is necessary. Unlike the private and family sessions.

Figure 117: Therapy Unit Space Configurations (created by Colquhoun)
however, this group can be more open to visual connections with the surrounding environment. Care should be taken that these spaces do not lead the patients to feel “exposed” so that they can be open to the care delivery process. At the same time, this space can also have an outdoor component easily accessible for garden therapy sessions.

The final space to be discussed in this unit is the family visit space. This space will be used for social visits between parents, siblings, close friends, and the patients in these settings. They should be designed to accommodate a similar amount of people to the family therapy spaces-about four to five persons. The shape of this space can be much more flexible that the other spaces within the therapy unit (80-120 SF). Unlike the family therapy spaces, this space should be highly visible, especially to staff members. Therefore, family visit spaces are often located either near staff work areas or along major points of visibility, such as primary circulation and garden spaces.

Figure 118: Location of Family Visit Space (Created by Colquhoun)
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### Treatment Center

<table>
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<td>Education</td>
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<td>Interview/Consultation Room</td>
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<td>Art Therapy Room</td>
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<tr>
<td>Art Therapy Storage</td>
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<tr>
<td>Family Therapy Room</td>
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<td>140</td>
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</table>

| Support | Equipment Storage | 200 | 1 | 200 |

Figure 119: Therapy Unit Space List
(Colquhoun)
The community unit forms the final piece in the program for this facility. This zone is designed to provide an area for the individual patient units to come together and interact with each other. The community unit should be a celebratory space for the facility. It is comprised of a group living and dining space, a gymnasium (which can also be used by the public), nurse station and support, and kitchen. Patients will typically be using this portion of the facility for lunch, dinner, and recreation periods in the afternoon and early evening. The living/dining area, nurse station, and gymnasium have special requirements for this zone.

The living and dining area in this zone offer the largest scale of interaction for the individuals in the facility. Therefore, these areas should accommodate all levels of interaction. Space should be provided both in the living and dining areas for not only the larger group, but also for one to four individuals. Clustered table and seating arrangements will help to establish these “levels of interaction” within the environment. In this manner, if a patient becomes agitated, he or she will have several opportunities to find ways to de-escalate from the situation. For instance, if a patient feels intimidated by one member of the facility sitting in one of the clusters.

The Community Space
of seating, he or she can choose to avoid close interaction with this individual simply by sitting in a different cluster of seating. Attention should be giving to the acoustics of this area, as it will be a naturally noisier environment.

The nurse station should be positioned to overlook both the entry/exit and the living and dining room areas. This station should have a large amount of support attached, including medication/dispensing, staff work room, staff break room, conference room, and staff toilets. Like all other nurse stations in the facility, this should be a clearly visible but not domineering element. Nurse stations

<table>
<thead>
<tr>
<th>Living Area</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>day room, loud</td>
<td>720</td>
<td>1</td>
<td>720</td>
</tr>
<tr>
<td>day room, quiet</td>
<td>300</td>
<td>1</td>
<td>300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gym</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>gymnasium</td>
<td>4200</td>
<td>1</td>
<td>4200</td>
</tr>
<tr>
<td>locker room (public, women)</td>
<td>300</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>locker room (public, men)</td>
<td>300</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>locker room (patient, men)</td>
<td>360</td>
<td>1</td>
<td>360</td>
</tr>
<tr>
<td>locker room (patient, women)</td>
<td>180</td>
<td>1</td>
<td>180</td>
</tr>
<tr>
<td>concessions</td>
<td>60</td>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>office</td>
<td>80</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>equipment storage</td>
<td>400</td>
<td>1</td>
<td>400</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dining</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>dining room</td>
<td>720</td>
<td>1</td>
<td>720</td>
</tr>
<tr>
<td>serving line w/ pantry storage</td>
<td>500</td>
<td>1</td>
<td>500</td>
</tr>
<tr>
<td>kitchen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cooler</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Meeting Space</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>visitor room</td>
<td>140</td>
<td>2</td>
<td>280</td>
</tr>
<tr>
<td>conference room</td>
<td>260</td>
<td>1</td>
<td>260</td>
</tr>
</tbody>
</table>

Figure 123: Community Unit Space List (Colquhoun)
<table>
<thead>
<tr>
<th>Room Type</th>
<th>Area (sq ft)</th>
<th>Units</th>
<th>Total (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>conference room</td>
<td>260</td>
<td>1</td>
<td>260</td>
</tr>
<tr>
<td><strong>Nursing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nursing station</td>
<td>300</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>nurse workroom</td>
<td>120</td>
<td>1</td>
<td>120</td>
</tr>
<tr>
<td>staff break room</td>
<td>400</td>
<td>1</td>
<td>400</td>
</tr>
<tr>
<td>copy room</td>
<td>80</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>medication/dispensing room</td>
<td>300</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>team conference room</td>
<td>150</td>
<td>1</td>
<td>150</td>
</tr>
<tr>
<td><strong>Staff Support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>staff toilet</td>
<td>60</td>
<td>2</td>
<td>120</td>
</tr>
<tr>
<td>secure staff closet/cabinet</td>
<td>120</td>
<td>1</td>
<td>120</td>
</tr>
<tr>
<td><strong>General Support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>patient toilet room</td>
<td>70</td>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td>clean supply storage room</td>
<td>80</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>soiled holding room</td>
<td>80</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>equipment storage</td>
<td>200</td>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>wheelchair alcove</td>
<td>40</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>emergency equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Departmental Grossing Factor (Colquhoun):

- DNSF: 1074
- Total: DGSF: 13854.6

Figure 124: Community Unit Space List
(Colquhoun)
throughout the facility should remain open so that the space becomes an icon of the safety for the patients rather than a barrier between the patients and staff.

Finally, the gym in this space provides unique benefits to the facility. Not only does it promote physical activity for the patients on a daily basis, it also provides a space in the facility which can be used by the surrounding community. This space should be designed to have separate and controlled entries both for the public and for the patients. Ideally, this space can be used both as a gym for surrounding neighborhoods and as a larger meeting space for organizations in the area (particularly for behavioral health organizations).

Figure 125: Ferndene Mental Health Gym Plan
(Source: Medical Architecture; diagrammed by Colquhoun)
Finally, as these units begin to connect to each other, the natural environment must begin to filter into these spaces. Whether the site is rural, suburban, or urban, the facility should respect this environment and provide appropriate connections between the facility and the surrounding nature. This program allows for three primary types of outdoor spaces. First, small, well manicured, garden-style spaces provide moments of quiet respite. Next, slightly larger spaces allow for groups of ten or more patients to gather, perhaps for group therapy or activities. Finally, a large scale open space should be provided to promote a high level of physical activity for the patients. These gardens should be placed appropriately for the facility to respect the interior functions of the environment and respond appropriately to the nature of the site itself.

Figure 126: Small, Manicured Garden (Source: Medical Architecture)

Figure 127: Open Playing Field at John George Pavilion (Source: John George Psychiatric Hospital)
Complete Space List

<table>
<thead>
<tr>
<th>Area</th>
<th>Room</th>
<th>NSF</th>
<th>Qty</th>
<th>Total</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administrative</strong></td>
<td>reception desk</td>
<td>60</td>
<td>1</td>
<td>60</td>
<td>adjacent to waiting area</td>
</tr>
<tr>
<td></td>
<td>copy room</td>
<td>80</td>
<td>1</td>
<td>80</td>
<td>attached to reception desk, room for printer/copier, work desk, supply storage</td>
</tr>
<tr>
<td></td>
<td>workstations</td>
<td>60</td>
<td>2</td>
<td>120</td>
<td>desk, chair, small file storage</td>
</tr>
<tr>
<td></td>
<td>physician dictation</td>
<td>60</td>
<td>1</td>
<td>60</td>
<td>desk, chairs (2), small file storage</td>
</tr>
<tr>
<td></td>
<td>therapist's office</td>
<td>60</td>
<td>3</td>
<td>180</td>
<td>desk, chairs (2), small file storage</td>
</tr>
<tr>
<td></td>
<td>supervisor's office</td>
<td>100</td>
<td>3</td>
<td>300</td>
<td>desk, chairs (3), file storage</td>
</tr>
<tr>
<td></td>
<td>conference room</td>
<td>200</td>
<td>2</td>
<td>400</td>
<td>seating for ten, table</td>
</tr>
<tr>
<td></td>
<td>financial planner's office</td>
<td>100</td>
<td>1</td>
<td>100</td>
<td>desk, chairs (3), file storage</td>
</tr>
<tr>
<td><strong>Support</strong></td>
<td>equipment storage</td>
<td>200</td>
<td>2</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td></td>
<td>staff toilet</td>
<td>60</td>
<td>2</td>
<td>120</td>
<td>adjacent to conference room</td>
</tr>
</tbody>
</table>

Subtotal: DNSF 1820

Departmental Grossing Factor: 1.29

Total: DGSF 2347.8

Admissions

<table>
<thead>
<tr>
<th>Entry</th>
<th>NSF</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>entry vestibule</td>
<td>50</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>waiting area</td>
<td>300</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>secure entry</td>
<td>300</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>admissions room</td>
<td>150</td>
<td>2</td>
<td>300</td>
</tr>
</tbody>
</table>

Subtotal: DNSF 1420

Departmental Grossing Factor: 1.29

Total: DGSF 1831.8

Figure 128: Department Program Summary
(.created by Colquhoun)

Figure 129: Space List (created by Colquhoun)
### Community Space

#### Living Area

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Square Feet</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>day room, loud</td>
<td>720</td>
<td>20 sf/person, 36 persons</td>
</tr>
<tr>
<td>day room, quiet</td>
<td>300</td>
<td></td>
</tr>
</tbody>
</table>

#### Gym

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Square Feet</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>gymnasium</td>
<td>4200</td>
<td>basketball court</td>
</tr>
<tr>
<td>locker room (public, women)</td>
<td>300</td>
<td>15 sf/person, 20 women</td>
</tr>
<tr>
<td>locker room (public, men)</td>
<td>300</td>
<td>15 sf/person, 20 men</td>
</tr>
<tr>
<td>locker room (patient, men)</td>
<td>360</td>
<td>15 sf/person, 24 men</td>
</tr>
<tr>
<td>locker room (patient, women)</td>
<td>180</td>
<td>15 sf/person, 12 women</td>
</tr>
<tr>
<td>concessions</td>
<td>60</td>
<td>soda/snack machine, trash receptacle</td>
</tr>
<tr>
<td>office</td>
<td>80</td>
<td>desk, chair (3), small file storage</td>
</tr>
<tr>
<td>equipment storage</td>
<td>400</td>
<td>shelving</td>
</tr>
</tbody>
</table>

#### Dining

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Square Feet</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>dining room</td>
<td>720</td>
<td>20 sf/person</td>
</tr>
<tr>
<td>serving line w/ pantry storage</td>
<td>500</td>
<td>Kitchen, supporting dining room</td>
</tr>
<tr>
<td>cooler</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Meeting Space

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Square Feet</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>visitor room</td>
<td>140</td>
<td>Can serve as quiet room</td>
</tr>
<tr>
<td>conference room</td>
<td>260</td>
<td>Visible from nurse station; accessible from day room; 20 sf/person</td>
</tr>
</tbody>
</table>

#### Nursing

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Square Feet</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>nursing station</td>
<td>300</td>
<td>Centrally located in daytime spaces</td>
</tr>
<tr>
<td>nurse workroom</td>
<td>120</td>
<td>Adjacent to nurse station.</td>
</tr>
<tr>
<td>staff break room</td>
<td>400</td>
<td>Includes kitchenette</td>
</tr>
<tr>
<td>copy room</td>
<td>80</td>
<td>Adjacent to nurse station.</td>
</tr>
<tr>
<td>medication/dispensing room</td>
<td>300</td>
<td>Adjacent to nurse station; includes automated medication unit and prep space</td>
</tr>
<tr>
<td>team conference room</td>
<td>150</td>
<td>Adjacent to nurse station.</td>
</tr>
</tbody>
</table>

#### Staff Support

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Square Feet</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>staff toilet</td>
<td>60</td>
<td>Part of staff break room</td>
</tr>
<tr>
<td>secure staff closet/cabinet</td>
<td>120</td>
<td>Part of staff break room</td>
</tr>
</tbody>
</table>

#### General Support

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Square Feet</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>patient toilet room</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>clean supply storage room</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>soiled holding room</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>equipment storage</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>wheelchair alcove</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>emergency equipment alcove</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

#### Subtotal: DNSF 10740

| Departmental Grossing Factor: 1.29 | 123 |

Figure 130: Space List, cont’d. (created by Colquhoun)
### Patient U X

#### Patient Room

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>Space (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>patient room (single)</td>
<td>180</td>
<td>720</td>
</tr>
<tr>
<td>patient room (double)</td>
<td>300</td>
<td>1200</td>
</tr>
<tr>
<td>patient toilet</td>
<td>70</td>
<td>560</td>
</tr>
<tr>
<td>seclusion room</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>anteroom</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>bathroom</td>
<td>70</td>
<td>70</td>
</tr>
</tbody>
</table>

#### Living Space

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>Space (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>day room</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>nourishment center</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>interview/consultation room</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>exercise room</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>laundry room</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

#### Staff

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>Space (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>nurse station</td>
<td>80</td>
<td>80</td>
</tr>
</tbody>
</table>

#### Support

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>Space (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>linen storage alcove</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Laundry room</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>wheelchair alcove</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>emergency cart storage</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Subtotal: DNSF = 3820
Departmental Grossing Factor: 1.29
Total: DGSF = 4927.8

### Treatment Center

#### Treatment Space

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>Space (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>group therapy room</td>
<td>225</td>
<td>675</td>
</tr>
<tr>
<td>exam/treatment room</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>education</td>
<td>600</td>
<td>1800</td>
</tr>
<tr>
<td>interview/consultation room</td>
<td>100</td>
<td>600</td>
</tr>
<tr>
<td>art therapy room</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>family therapy room</td>
<td>140</td>
<td>140</td>
</tr>
</tbody>
</table>

Subtotal: DNSF = 4173
Departmental Grossing Factor: 1.29
Total: DGSF = 5385.73

Figure 131: Space List, cont’d. (created by Colquhoun)
Figure 132: Space List, cont’d. (created by Colquhoun)

<table>
<thead>
<tr>
<th>Building Support</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>housekeeping room</td>
<td>50</td>
<td>5</td>
<td>250 One per 'area'; exception: community space</td>
</tr>
<tr>
<td>central housekeeping</td>
<td>120</td>
<td>1</td>
<td>120 In community space</td>
</tr>
<tr>
<td>IT closet</td>
<td>120</td>
<td>6</td>
<td>720</td>
</tr>
<tr>
<td>electrical closet</td>
<td>80</td>
<td>6</td>
<td>480</td>
</tr>
<tr>
<td>main electrical room</td>
<td>200</td>
<td>1</td>
<td>200</td>
</tr>
<tr>
<td>building and grounds</td>
<td>80</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>maintenance office</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>building and grounds</td>
<td>300</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>maintenance storage room</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mechanical</td>
<td></td>
<td></td>
<td>1000 divided into smaller boiler rooms per unit</td>
</tr>
<tr>
<td>laundry</td>
<td>200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subtotal: DNSF 2150
Departmental Grossing Factor: 1.29
Total: DGSF 2773.5
Space Development in Connection to Goals and Guidelines

To conclude, the development of programs for this user group should not be a “cut and paste” activity. Rather, careful attention should be paid to the site, neighborhood, target population being served, and needs of the model of care being provided. With these ideas established, this ideals of this program can be applied to a variety of settings to create unique spaces in which adolescents can recover.

Throughout the design process, the placement and configuration of program elements should be informed by the design goals and guidelines. Therefore, care should be taken in regards to provision of space for individuals, small groups, and large groups. A sufficient number of nurse stations should be provided to support the staff and allow them to remain visible. Light should be brought into these spaces in a way which provides a sense of freedom to the users while not compromising their privacy in sensitive situations. Circulation should be sized and placed generously to provide opportunity for, but not force, interactions among patients and staff.
The following graphs propose a series of spatial flows and relationships of particular importance to the development of this facility. These relationships tend to support the notion of “zones” of activity, lining areas used by patients along greenspace and avoiding adjacencies with the support functions of the space.

Figure 133: Public to Private Many to Few Users Adjacencies (Colquhoun)
The differing needs between these functions begin to suggest that multiple types of greenspace may be needed to accommodate the full range of activities occurring within the facility.

Figure 134: Public to Private_Low to High Security Adjacencies (Colquhoun)
SITE SELECTION

This thesis project aims to respond to the current need for behavioral health services in America, and more particularly within South Carolina. The city for this thesis project was chosen as a response to South Carolina’s current available resources and as a continuation of the ideals of the Village System, raising awareness for the need for behavioral health in the state while simultaneously serving as many persons in need as possible. Following this, a site selection process was developed which responded to the mission, vision, and goals of this thesis. To this end, a series of site selection criteria was designed and implemented to speak to the needs of a facility which truly fosters the recovery of the individual.

Figure 135: Thesis Project Site (Colquhoun)
South Carolina is the target test area for this thesis for several reasons. The state of South Carolina is very underserved. In terms of funding, South Carolina is far beneath the national average per capita in investment. “Between FY2009 and 2012, South Carolina made the largest percentage cut in funding to behavioral health initiatives of any state in the nation” (NAMI, 2011). This budget cut is ill-timed for South Carolina, as the quality and availability of care in the state is lacking.

Of South Carolina’s 4.5 million residents, close to 170,000 adults live with serious mental illness.

![Figure 136: South Carolina Behavioral Health Funding (Source: NAMI, 2011; edited by Ashley Colquhoun)](image-url)
mental illness and close to 48,000 children live with serious mental health conditions (NAMI, 2010). While this number is high, the amount of available care in the state is low. South Carolina received a “D” from the NAMI scorecard due to their lack of behavioral health service availability (2011).

Despite the unavailability of the care, the need for behavioral health services persists. “Of the total adolescent male admissions, 74.4 percent (7,492) reported marijuana use and 32.1 percent (3,231) reported alcohol use. Of the total adolescent female

![Figure 137: South Carolina Mental Health Services (SOURCE)](source)

SC's spending per capita compared to national average

SC criteria met for mental health below national average
admissions, 56.6 percent (2,022) reported marijuana use and 29.9 percent (1,069) reported alcohol use” (SAMHSA, 2009).

These adolescents with behavioral health problems affect the health of the entire community. For instance, between 2006-2007, 61% of adolescents suffering from mental illness and receiving some form of special education services dropped out of school (NAMI, 2010). Additionally, approximately 31% of women and 14% of men in jail suffer from some form of mental illness as of 2008 (NAMI, 2010). Programs addressed to helping adolescents recover from behavioral health issues at an early age can help to lower these numbers, allowing these individuals to become healthy and productive members of society.

Figure 138: Percent of Admissions with Drug Dependency (Source: SAMHSA; diagrammed by Colquhoun)
The site for this project is intended to be in a city which could serve a large community and also raise awareness for the importance of appropriate behavioral health care within the state. This project will be designed as a continuation of the Village System. The Village System was intended as a state-wide response to the great local need for behavioral health care. As a part of this initiative, several locations were selected as opportunities to develop the system to both raise awareness for behavioral health care and serve the neediest of the population (Means, 1973). Therefore, its site needs to accommodate a variety of “levels of

Figure 139: South Carolina Mental Health Needs (The Village System, 1973; diagrammed by Colquhoun)
interaction”. Additionally, as a test case for this thesis, the site needs to provide for the needs of the “wraparound” model of care. Following the initial plan of the Village System to locate a hospital in each of the four regions of the state (Figure 139), this facility will be sited in Charleston County. This siting provides several advantages. First, it is a widely recognized location, and can therefore begin to gain awareness for behavioral health from the community.

Secondly, the high population in Charleston County provides a strong opportunity for the facility to serve patients who live nearby. This proximity allows the facility to provide a level of cultural comfort for the individuals using the space. The design of this space can begin to incorporate the local culture into the scale to create a truly “home-like” environment, as has been done in case studies such as the Lesotho Child Counselling Unit (see Figure 140). This location also helps to carry out the “wraparound” mission of integrating families in the care process. By locating the facility in close regional proximity to families, educators, and friends of the adolescents using this facility, these society members will be more likely to be able to visit adolescents and engage in the recovery process.

Figure 140: Home-Like Environment (Source: Article 25)
Selection Criteria

With Charleston County chosen, site selection criteria which support the mission, vision, and goals of the thesis are used to identify a site within the county. These three criteria are as follows: locate the site in an environment in which a connection to nature can be established, locate the site so that it is accessible to the community of the adolescent, and locate the buildings so that it can accommodate future growth either on site or on adjacent sites.
Connections to Nature: This criterion speaks to the vision of connecting the individual to the environment and the goals of providing physical and visual access to nature. It follows the understanding that, in order to foster recovery, a strong connection between nature and human must be possible. This can be accomplished on two major levels, interior and exterior access.

Interior access to nature refers to spaces that are completely embedded in the facility itself. These spaces belong exclusively to the users of the facility, and can be seen very explicitly as therapy rooms. These elements relate to site selection in that they require a great deal of square footage proportional to the facility in order to be usable spaces, and will therefore require a larger footprint than the typical facility. Additionally, these spaces will require acoustic privacy and responses to the climate. The climate itself must be sufficient to allow patients to spend time physically in the space, weather permitting, and strategic spaces in the building should surround them. Therefore, strategies should be employed in this space to make it amenable to the environment in which it exists. For example: in Charleston County, the summer sun can be quite oppressive. Therefore, sufficient shading and access to coastal...

Figure 142: Environment Criteria (Colquhoun)
breezes should be provided to encourage the space to be used even during these conditions. Additionally, these spaces can be used to bring daylight in a controlled manner into the interior of the space.

The second form of connection to nature is external access. This refers to relationship that the edges of the building have with the surrounding environment. It considers approach, proximity to adjacent buildings and functions, and response to physical features of the site. One aspect of this form of connection that deserves particular attention is patient and family approach to the facility. These individuals will frequently be in an agitated state upon arrival at the facility. Therefore, the facility itself should be designed to welcome individuals into the facility. It should also celebrate the nature of the care being provided. The entry sequence should be a proud, safe, calming, and delightful experience. This component of external connections to nature requires careful consideration of the surrounding buildings and where entries to the facility could be designed. Ideally, the entry to a facility will either be placed alongside entries to other facilities in a clearly marked manner or be completely integrated into a peaceful, natural setting. This entrance should not
be placed along compressed commercial corridors or in areas that are known to be or feel “unsafe”. Additionally, special care should be taken to note how individuals outside of the facility use the adjoining space. Especially in an urban setting, entries should be placed to engage the public safely, and functions for the building should be placed to respond to the surrounding noise and activity levels. It should be located away from service entries and private residences.

*Accessible to Community:* This criterion is rooted deeply in the wraparound model of care. It follows the vision of providing the opportunity for the individual to “[re] integrate into society”. The aim of this criterion is to ensure that, along with the concept of family centered care, the facility remains accessible to the families being served.

This criterion is grounded in the concept that, by placing the facility along the pattern of daily life for the individual lends an air of familiarity to the space and encourages families with adolescents receiving care to be active participants in the treatment process. In addition, by placing the facility near the home environment of
the individuals, the surrounding environment can begin to de-stigmatize the care process within.

Along with the needs of the "wraparound" model of care, creating strong adjacencies with other forms of community support necessary in the care process encourages those members to be more aware and involved participants in the process. Again, this should be a reflection of a sense of pride and respect towards behavioral health care. Close proximity to related community services and settings such as educational facilities, libraries, and health care facilities should be heavily favored while proximity to potentially negative locations such as bars should be avoided. The adolescents in this facility will need to continue their schooling while in this facility. By locating the facility near the schools at which the patients are being educated, it becomes easier for teachers to maintain a link with these facilities. Locating the facility near primary care services reinforces the notion that behavioral health is just one aspect in the growth and development of the adolescent. By situating the building near primary care facilities, the community itself can begin to promote the concept of "holistic" care. Finally, it is vitally important to connect the inpatient facility with an

Figure 145: Desirable Site Adjacencies
(Colquhoun)
outpatient program to facilitate the recovery process once the adolescent leaves the thesis facility. If the site chosen does not have a strong link to one of these facilities, an outpatient facility should be included in the master plan for the project.

Accommodate Future Growth: This criterion strives to respond to the growing need for behavioral health. As discussed earlier, more efforts are being made in the field of behavioral health, especially through the Affordable Care Act. This criterion assumes that this facility represents a commitment to the community to respond to the need for behavioral health care, and that, as this facility takes root, it will eventually need to expand the range of services offered. Therefore, space should be designated for the development of an outpatient behavioral health center in close proximity to the inpatient center, providing a location where patients can return for treatment as they [re]integrate into their community, further enforcing the wraparound model of care. This center should be prepared to accommodate a larger pool of clients at a given time than the inpatient center, and therefore could be sized as large as 50,000 to 60,000 sf. However, as there will be significantly fewer security concerns,

Figure 146: Future Growth Criteria (Colquhoun)
the center could be a several story facility, reducing the building’s footprint.

An ideal site would respond fully to each of these criteria. However, as designers examine these criteria in the future, they will note that each available site may favor one or more of these ideas over the others, as can be seen in the site selected for this study. A performance metric, seen on page 142 (figure 148) takes these needs and develops a system by which to quantify how well a given site responds to them.
Figure 148: Site Selection Metrics (Colquhoun)

- Site Address
  Charleston, SC <Zip Code>

- Median household income: XX
- Population: XX
- Households: XX

Figure: Site Map

Final score: ??

-2 -1 0 1 2

- Proximity to schools
- Proximity to residential
- Proximity to health services
- Safety
- Opportunity for future growth
- Proximity to public transportation
- Walkability
- Visual access to nature
- Physical access to nature

Figure 148: Site Selection Metrics (Colquhoun)
The first site, the remote location, located on Ashley River Rd., is a wooded site outside of the main community (see Figure 149). It has a strong and peaceful connection to the surrounding environment. Additionally, it has ample room for future growth of the program, and is closely located to a heavily residential area.

However, it is lacking in many of the services required for the idea of “wraparound” care. It lacks public transportation and is not located near other behavioral health care services.
Based on an analysis of the relative climate, adjacencies, and safety of the surrounding buildings using the “walkscore”, “city-data”, and “crime reports” along with a mapping analysis of the surrounding area, this site received a score of “5”. This site has a strong natural tendency to connect the individual with the surrounding environment and has plenty of room for growth in the future. However, its strong lack of adjacencies to healthy community functions severely detracted from its overall score, as it does not provide sufficient opportunity to raise awareness for local behavioral health needs.

Figure 150: Site Metrics: Remote (Colquhoun)
The second site represents a site in a more suburban area of the community (see Figure 151). It is located on Dorchester Rd. along the Ashley River, meaning that the site has long open views to the river. It is a large wooded site, providing a peaceful atmosphere and acoustic privacy from the neighboring areas.

At the same time, it is located along a major public transportation route in the area and has access to several key services in the “wraparound” model of care.

The third and final site is located in the
Based on an analysis of the relative climate, adjacencies, and safety of the surrounding buildings using the "walkscore", "city-data", and "crime reports" along with a mapping analysis of the surrounding area, this site received a score of "10". This score was so high because it responded to all three site selection criteria. The site already has a strong link to the environment by reaching out to the river. It encourages community connections with the many community services within a mile radius of the site, and has plenty of room for expansion in the future. Its primary weakness is that it is not a pedestrian friendly area.

Figure 152: Site Metrics: Edge (Colquhoun)
Site No. 3

heart of downtown Charleston on Bee St. (see Figure 153). It has excellent connections to many wraparound functions. It is also located on MUSC’s campus, directly adjacent to the current inpatient behavioral health building, which can link the two programs.

However, it has little opportunities for future growth. The size of the site requires the building to be more than one story in height, which can compromised the safety of the care being delivered. Finally, all connections to the environment will be through highly controlled urban gardens.

Figure 153: Site Analysis: Heart (Colquhoun)
Based on an analysis of the relative climate, adjacencies, and safety of the surrounding buildings using the “walkscore”, “city-data”, and “crime reports” along with a mapping analysis of the surrounding area, this site received a score of “5”. This site’s primary strength was its innate connection to healthy community functions as an urban site. This gives the facility a strong chance of benefitting from the community and raising awareness for behavioral health care. However, it’s lack of room for growth and exterior connections to the natural landscape served to detract from the overall score of the site.

**site: heart**

Bee St.  
Charleston, SC 29403  
Median household income: $39,038  
Population: 1,407  
Households: 99

Figure 154: Site Metrics: Heart (Colquhoun)
This project is designed as a test case of the design principles developed in this thesis. It aims to explore how these principles can be applied to support the main mission and vision of this thesis: to foster recovery by respecting the dignity of the individual patient, to connect the individual to the surrounding environment, and to facilitate the individual’s [re]integration into society. These themes are explored on a variety of levels, beginning at site selection. They continued into the master planning of the site, and then into the massing, structure, and building envelope. This section explores to what degree the guidelines were carried out in this test case. The intent of this section is to demonstrate a practical application of the ideals presented in this thesis project.
Introduction

Following the project goals established for the thesis and the site selection criteria and analysis outlined in the previous chapter, the second site (“edge”) provides the strongest balance between all of the needs of the site for this program. The author contends that each of these sites can be used to develop a strong behavioral health program that serves the needs of the community in a completely unique way. However, due to the results of the analysis, the second site will be used as the test case for the guidelines and program developed in this thesis.
As “connection to the environment” is part of the vision for the thesis project, this facility’s integration into its site becomes an important part of the design of the facility. The site is nearly 25 acres of wooded land along the Ashley River in North Charleston. Therefore, there are several edge conditions along this site. The water meets marsh. This marsh is met by a bluff, bringing the majority of the site above the floodplain. The bluff meets a small clearing, typically between 10 and 20 feet along the edge of the site, which immediately runs into a densely wooded area. These woods
encompass the majority of the site, broken only by a sewage line running transverse through the site. The right of way for the sewer line is 20’ wide, and then immediately returns to its densely wooded nature until it meets the edge of the site, where it meets man-made structures (Dorchester Rd. and a small fire station recently built). Past the edges of the site to the northwest and southeast two neighborhoods edge the site, providing opportunities for local connections with the individuals in the neighborhood as well as a library, assisted living facility, and even a dentist office. The master plan for the site responds to these influences through a series of strategies.

Figure 157: Site Connections (Colquhoun)
First, the sewer line running across the property is used to create a pedestrian link across the site and between the two adjacent neighborhoods (See Figure 158). This line also becomes the division point for the site, placing the inpatient facility between this line and the river to take advantage of the long views on the site and simultaneously provide pedestrian access to the facility. The property to the north of this line is then subdivided for an outpatient center and retail (See Figure 159).
Vehicular access to the facility was situated by two main drivers. In Charleston, plantation homes such as Middleton Place are typically designed with a long, straight, proud entry leading to the main house and allowing for decompression as a part of the approach experience (See Figure 160). This method was adopted in the design for the approach to the facility from the road, using a straight path leading directly from the road to the facility. Then, this path was made into a loop. This responds to several needs of the site and facility itself. First, the position of the fire station at the north end of the site prevents the path from centering on the building itself. A loop provides responses to this and also creates a sense of progression through the recovery process, allowing patients and family to leave through a new path. Parking is placed along the interior end of this path, helping with wayfinding through the site.
Program Analysis

The program for the facility is broken into five bars of space: a “therapy” bar, a “community” bar, and three “inpatient” bars. (See Figure 162) This breakdown of space provides opportunities for the multiple user groups of the facility to engage with the spaces and each other in a healthy, safe setting. Each bar is used for a different basic set of uses and individuals, and therefore requires different orientation and massing.

The community bar forms the spaces for large groups of individuals to gather together, typically for recreational purposes. It is therefore massed and detailed as the most expressive unit in the facility. The therapy bar hosts a range of groups from 2-15 persons and is primarily used for consultation and meeting space. It requires a great deal of flexibility as different user groups will be using this area at different times of the day. Finally the inpatient bar is comprised of the individual patient rooms, small living areas, and support space. This space is designed to be the most introspective space in the facility, designed to give the patient a maximum amount of autonomy within this environment. The intersection of each of these bars require the careful integration of views and physical access to nature.

Figure 162: Departments (Colquhoun)
The adoption of the “wraparound” model of care requires the careful integration of community members into the facility without them having direct access to private patient spaces. This led to the development of a “community” zone as the first threshold of the facility (See Figure 163). This zone overlaps with, but is not exclusive to the “community” bar seen in Figure 162. The “Community Bar” refers to spaces where patients will be interacting typically with the largest “level of interaction” within the facility.

Family members enter a step further than community members into the facility, being involved in the therapy...
and some garden spaces (Figure 165). The patients (and corresponding staff) use the majority of the facility during the course of the day. Areas that are used by both community members and patients (see Figure 157) need to be organized carefully to maximize safety both in physical design and in scheduling. The benefit of the dual circulation and loop shaped flow is that parts of these paths can easily be used by different groups without compromising the security of the other spaces.

Next, the patients entering the facility needed a secure and welcoming entry. This led to the development of two
main entry paths for patients. Voluntary patients are admitted through the northeast end of the site at the main entry, and involuntary admissions enter through a sallyport on the southeast end of the building (See Figures 158-159). This allows for patients to have an “admissions zone” at the southeast corner of the facility which leads directly into the patient units. As the newly admitted patient follows the path to their room, they are allowed a preview of the other units of the facility as they walk along the southeast end of the courtyard, giving them an early understanding of the facility.

Finally, the circulation for the patients

Figure 168: Patient Entry (Colquhoun)
once they have entered the facility can be understood as a loop. This is a direct benefit from the presence of a central courtyard in the facility. This courtyard becomes a wayfinding element for the facility, providing both visual and physical access to the various components of the facility (See Figure 169). This loop connects spaces intuitively for the patients and prevents the feeling of “dead-end” spaces. It also provides an opportunity for spaces used by patients throughout the building to be permeated with natural daylight. The circulation is placed along the edges of the building, and private spaces receive secondary light through this hall.

Figure 169: Daylight Analysis (Colquhoun)
An integral concept to the design of the facility was the integration of "porch" spaces into the facility. These spaces, reminiscent of the Charleston south facing porch, are intended to provide a transitional space between the program of the building and the surrounding environment. This helps to clearly define edge conditions for building and allow secure spaces for patients to enjoy the beauty of the surrounding landscape. These spaces are screened in and provide shading for the interior of the building, especially along the south and west façades. (See Figure 161).
Levels of Interaction - Individual

The patient room is the environment in which the patient has the most personal control over the space. The design for this facility aims to maximize this control, providing a variety of seating (window seat, desk, and bed) and providing each patient with a thermostat and a window (See Figure 172). The windows and doors to this environment are designed to have operable blinds. Finally, each room has a view onto a highly manicured, quiet garden space surrounding the unit (See Figure 171).
The bathrooms for the patient unit are placed to provide a “transitional” space for the patient as they leave their room. This allows for the patient to see the circulation space before needing to become actively involved in it. Seating lines this hall. At either end of the hall, gathering spaces with views onto the surrounding landscape provide a buffer from the hall and the exterior. This allows protected visual access to the landscape, giving the patient the opportunity to choose to what degree they interact with that environment. Screened patio at the south-west end of the facility provide a sheltered environment with views of both the Ashley River and to the smaller gardens belonging to the patient unit.
Levels of Interaction: Group

The therapy unit provides an opportunity for community members, family members, and patients to share space. Therefore, two separate lines of circulation run along the northeast and southwest sides of the facility. Therapy takes place between these areas and along the edge of the interior, allowing for spaces both that can be shared by the community and spaces that are strictly intended for group therapy for the patients. The form is intended to maximize daylight along these paths and still provide for privacy for therapy sessions.

Figure 176: Therapy Unit (Colquhoun)
The incorporation of daylight into all spaces in this unit, therefore, becomes the driving force for the design of this space. The roof, therefore, becomes an inverted truss, allowing clerestory windows to bring light into the main circulation elements and family therapy rooms. To maintain a sense of privacy, frosted glass is used to bring in borrowed light into private therapy spaces.

A serene water feature collects water rainwater from the sloping roofs throughout the facility and irrigates the landscaping. It brings a peaceful ambiance to the central courtyard and provides views to the therapy spaces.
Levels of Interaction: Community Space

The community unit is intended to be the most active and robust portion of the facility. This portion of the design is where all the patients can gather together to share a meal or participate in group recreation. This space was designed as a pier to project out on to the marsh and celebrate the community in the facility. Therefore, the massing and design reaches out to open onto the marsh, providing panoramic views of the river. The living area is again surrounded by a porch space, providing a sense of transition into the environment. Acoustic ceiling panels help to provide...
acoustic relief to the large volume of the space, helping to establish a more peaceful and intimate atmosphere even in this larger venue. This tone is reinforced by the seating arrangements for the space. The seating arrangements is designed to allow for intimate moments while still celebrating the communal aspect of the recovery process (See Figure 181). A variety of seating types and forms break the larger volume of the space into smaller, more private components. This also helps to lend a feeling of flexibility to the environment, providing the patients with ample opportunities to choose how they interact with their environment. The nurse station is located centrally to the functions. It is located to allow for close proximity to back of house functions, like soiled utility and clean linen, to be highly visible to patients entering and using the space, and to open up views to the Ashley River.
Levels of Interaction: A Broader View

While each of these units is intended to provide a clear sense of function to the patient and therefore favors one level of interaction, this thesis suggests that the environment must respect and provide visual and physical connections to multiple levels throughout the facility. An analysis of this facility as a whole shows that these connections can be established, providing opportunities for patients to interact to the level that they are capable throughout the facility (See Figure 171).

Figure 182: Levels of Interaction (Colquhoun)
CONCLUSIONS

The intent of this document is to propose an informed and respectful model of care for adolescents with behavioral health problems. It is based on the understanding that these adolescents are capable of true recovery through self respect and positive connections with the surrounding environment and community. This understanding was then used to inform the development a series of guidelines which can be universally applied to the design of these facilities to promote recovery. Again, this thesis roots itself in the understanding that while the built environment cannot cure, it can provide opportunities in which people can open themselves up to the recovery process. To this end, the program for this facility was developed to respect the three part vision of the facility. Spaces were designed to provide safety and privacy for the individual, links to nature, and places for various group interactions.

Following the development of a program, the site was determined based on three criteria: connections to the community, access to nature, and room for future growth. All of these elements were designed to promote opportunities for the patient to recovery from their behavioral health problems.
Several limitations prevented this study from reaching its full potential. The field of literature concerning architectural interventions in behavioral health facilities, especially for adolescents, lacks rigor. Many of the studies that do exist on this subject contradict one another. Therefore, anecdotal evidence from psychologists, architects, and therapists supplemented the information gathered from the literature review to inform design decisions. Because of this, some of the assumptions used in this analysis to inform the development of guidelines are influenced by bias. Additionally, further study needs to be conducted outside of the scope of this thesis project to assess the validity of the assumptions made by this thesis.

In conclusion, while the current field of evidence is lacking in opportunities to definitively support specific architectural interventions, the need for attention to the design of behavioral health spaces is clear and growing. With careful attention, the built environment can begin to promote the healing process for patients within this setting.
FOSTERING RECOVERY

INDIVIDUAL. ENVIRONMENT. COMMUNITY.

SITE SELECTION CRITERIA

1. There are many pathways to recovery
2. Recovery is self-directed and empowering
3. Recovery involves a personal recognition of the need for change and transformation
4. Recovery is holistic
5. Recovery has cultural dimensions
6. Recovery exists on a continuum of improved health and wellness
7. Recovery emerges from hope and gratitude
8. Recovery involves a process of healing and self-redemption
9. Recovery involves addressing discrimination and transcending shame and stigma
10. Recovery is a reality

CONTEXT

RESOURCES
COMMUNITY
SCHOOL
TRAVEL TO
TRAVEL TO

Figure 183: Board 1 (Colquhoun)  
Figure 184: Board 2 (Colquhoun)
Figure 187: Board 5 (Colquhoun)

Figure 188: Board 6 (Colquhoun)
Figure 189: Board 7 (Colquhoun)

Figure 190: Final Presentation Model Marsh (Colquhoun)

Figure 191: Final Presentation Model Road (Colquhoun)


Center for Behavioral Health Statistics and Quality. “Fewer than one in eight adolescent substance abuse treatment admissions are referred to treatment by schools.” CBHSQ, 2012.


This article promotes private patient rooms in a clustered layout.


