Innovation Incubator
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LIFE HAPPENS IN THE GARDEN

Designing Outdoor Spaces for Behavioral Health Facilities

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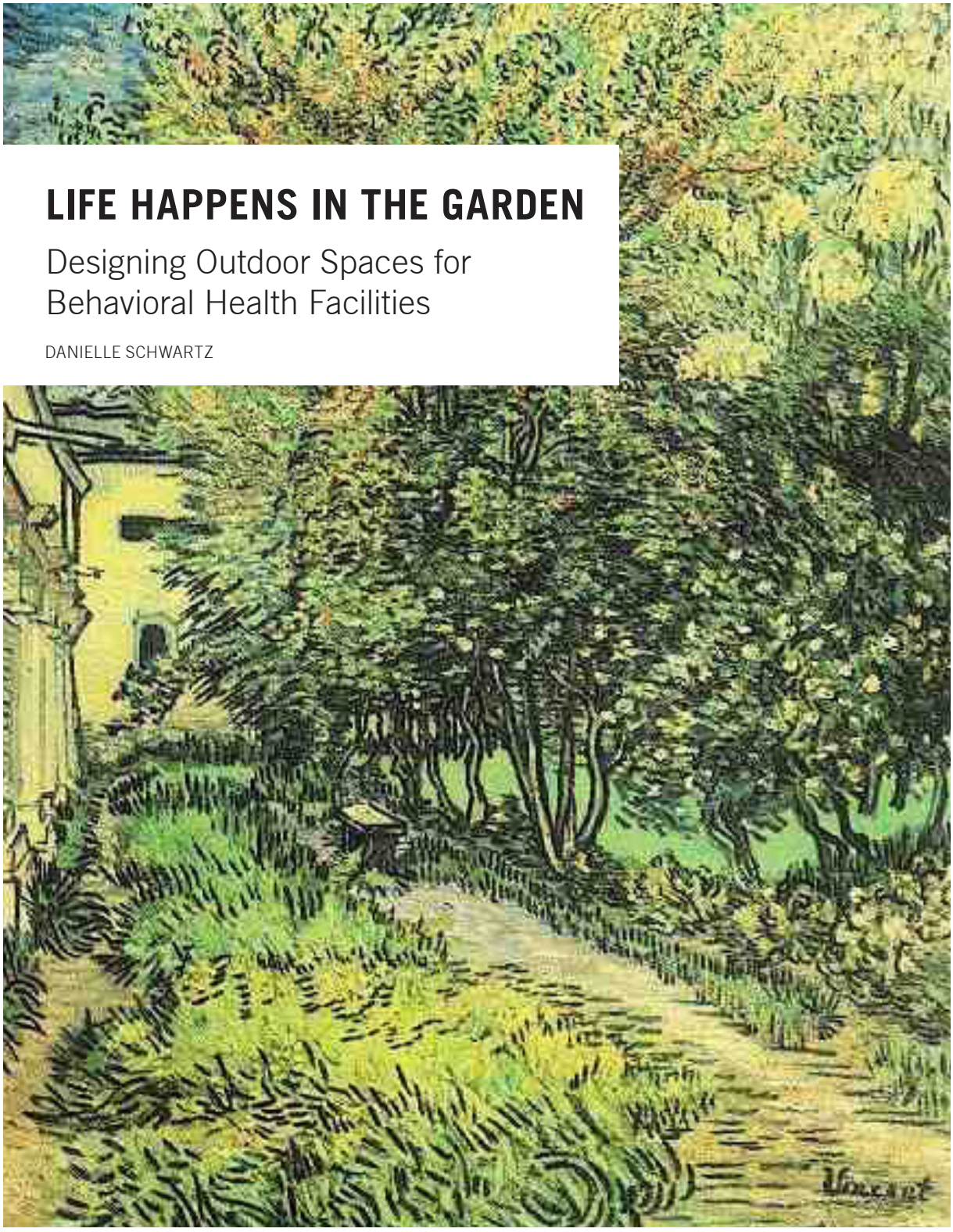


The Garden of Saint-Paul Hospital, May 1889

PERKINS+WILL

Trees in the Garden of the Asylum, 1889

After cutting off a part of his ear in December 1888, Van Gogh committed himself to the asylum of Saint-Rémy de Provence. Though this was probably one of the most difficult periods of his life, in his more lucid times, the staff at the asylum would allow Van Gogh to explore the outdoors and pursue his art. In a letter to his brother he wrote,

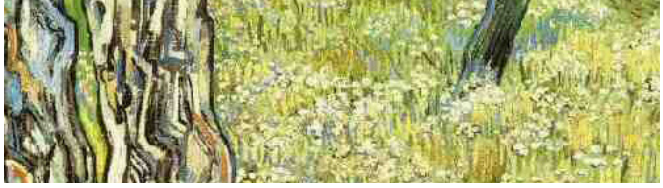
> **“When I send you the four canvases of the garden...you’ll see that considering that life happens above all in the garden, it isn’t so sad.”**

To his mother and sister he wrote,

> **“But precisely for one’s health, as you say—it’s very necessary to work in the garden and to see the flowers growing.”**

Trees in the Garden of Saint-Paul Hospital,
1889

CONTENT



ISSUE

The past 30 years has produced growing documentation of the numerous health benefits of nature. While this has reduced the demand for "proof" of the value of green space in healthcare settings, there remains a critical need for research that focuses on the specific design elements that can best serve specific patient populations.

IMPETUS

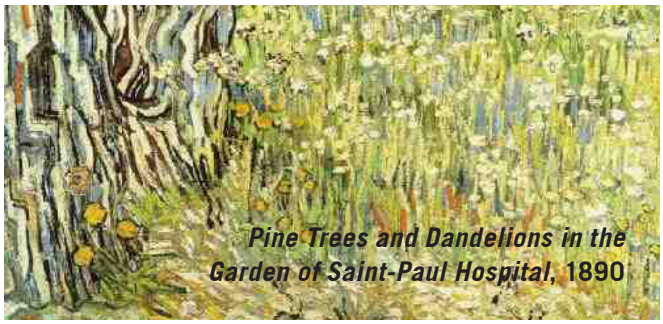
The thoughtful, creative design of space can significantly improve the social, physical, and mental health of our communities. In healthcare environments especially, designers must aspire beyond the Hippocratic Oath to "do no harm," and instead aim to design spaces that are equitable and democratic, that help the most vulnerable patient populations to become more self-confident and independent.

GOALS

• Create an empathetic understanding of people's needs to strengthen designers' ability to improve the lives of patients and staff

• Present relevant research that supports and increases the efficiency of design decisions

• Contribute to the discourse of landscape architects as agents of health change



***Pine Trees and Dandelions in the Garden of Saint-Paul Hospital*, 1890**

In the United States, nearly one in five adults live with a mental illness, and only half are estimated to receive treatment. An increased demand for psychiatric facilities coincides with a changing philosophy regarding the treatment of mental illness. As the mindset shifts from one of storage to one of rehabilitation, access to nature is an essential element to constructing truly healing environments.

Unfortunately, very little research focuses on the design of outdoor spaces for behavioral health facilities. While this research does exist for interior spaces, most guidelines only provide brief recommendations pertaining to outdoor environments, often suggesting increased natural light and exterior views…from the inside.

This paper comprises:

- An overview of behavioral health and its common challenges

- A survey of literature that covers the influence of nature on health and recovery

- A review of some of the theoretical underpinnings that guide healthcare design

- A compilation of guidelines, considerations, and opportunities for the design of outdoor spaces at behavioral health facilities

BEHAVIORAL HEALTH

Mental or behavioral health "includes our emotional, psychological, and social well-being" (CDC). Equally important as our physical health, it can change over time and is affected by many factors, including early childhood experiences, ongoing medical conditions, biological factors, and use of alcohol or recreational drugs. According to the World Health Organization, behavioral health illnesses are among the most common health conditions in the US, where more than 50% of people will be diagnosed with a mental illness at some point in their lifetime (Kessler et al., 2007). It is estimated that this costs the US about $193.2 billion in lost earnings per year (Insel 2008). Mental illnesses range broadly in their severity and affect people of all ages and abilities. Often, multiple disorders even occur at the same time within a single individual. With no single cause, there are more than 200 classified types of mental illness that can affect a person's thoughts and feelings, sensory processing, and social interaction. This variability in diagnoses, symptoms, and treatment settings is one of the main challenges in conducting behavioral health research and establishing design guidelines. Nevertheless, this paper aims to ground its design recommendations within the context of some of the main challenges presented by various disorders.

Trees in the Garden of Saint-Paul Hospital, 1889

The behavior of neurodiverse (ND) individuals demonstrates some of the cognitive and sensory challenges that cause them to perceive and experience their environments differently from others. While symptoms vary from person to person, to the right are some of the main obstacles presented by mood and psychotic disorders.

PSYCHOSIS

The process of gathering, arranging, and interpreting information within the brain is extremely complex. Sensory integration is "the process of organizing incoming sensory information that allows an individual to interact effectively with the environment in daily activities" (Gaines et al. 2016). Psychosis causes people to perceive or interpret the same stimuli differently from neurotypical (NT) individuals. This is often presented in the form of "positive" symptoms that are additions to consciousness: hallucinations, delusions, confused thoughts, or lack of awareness. Imagine your own mind trying to play tricks on you, manipulating what you see, hear, smell, taste, and touch.

COGNITION

Executive functioning is "the ability to understand information and use it to make decisions" (Gaines et al. 2016). Poor executive function can affect processes such as attention and planning and lead to impulsive and inappropriate behavior. Cognitive symptoms can also include problems with concentration and memory - difficulty focusing and forgetting things often.

SENSORY

Many people with behavioral health disorders have to overcome sensory issues that cause them to react differently to visual, auditory, and tactile stimuli. Medications can exacerbate this as well, for example many antipsychotic medication causes a sensitivity to light.

COMMUNICATION / SOCIAL

"Negative" symptoms are associated with decreases in functionality such as reduced speaking and expression of emotions and difficulty starting and sustaining activities. While typically used to describe symptoms of schizophrenia, they are not completely dissimilar to the depressive symptoms of mood disorders which can include: loss of energy and decreased activity levels; feelings of loneliness, hopelessness, worry, and despair; loss of interest in activities once enjoyed; thoughts of suicide, and changes in appetite. These symptoms can contribute to difficulty forming and maintaining social relationships, often causing people living with mental health disorders to experience extreme isolation.

PHYSICAL

Stress has multiple effects on the body: disturbed sleep patterns, an elevated heart rate, and a weakened immune system to name a few. Long-term stress can contribute to heart disease and cancer, as well as affect habits (addictions and eating disorders) that in turn contribute to chronic diseases.

On average, US adults with a serious mental disorder die 25 years earlier than the general population as co-morbid medical conditions are highly prevalent (Parks et al. 2006). Markedly higher rates of metabolic disturbance, including diabetes and obesity, are often exacerbated by limited mobility as well as medication. Because some mental health disorders affect motor impairment and a person's ability to navigate everyday environments, people living with mental health disorders are less likely to be physically active. Anti-depressant and anti-psychotic medications further contribute to this problem since many can promote weight gain.

Mental illness is not a personal failure or character flaw.

Unlike other illnesses, people with mental health disorders are often defined by their symptoms. However, when a patient is in the hospital, we are seeing them at their most sick and vulnerable moments. It is easy to forget that how they are now is not necessarily where they have always been. Nor should we assume that they will not get better and be somewhere else in the future. Designers should strive to create dignified spaces that aid people throughout their journey of recovery.

The language we use has real effects on our levels of tolerance. *Dr. Darcy Haag Granello*

INCLUSIVE LANGUAGE

The goal of inclusive language is to avoid using certain words or expressions that could exclude or stigmatize particular groups of people.

While the language we use to describe mental health is constantly changing, the words themselves are not so much the problem as the underlying attitudes behind them. Lawyering over language can be unproductive, but making the effort to be empathetic and tolerant never is. Below are a few guidelines to follow when communicating with or about persons who are neurodiverse.

PERSON-FIRST LANGUAGE

A person is not their mental illness and a single life experience should not characterize their entire being. Recognize everyone as a person first, and speak to their disability second.

For example, avoid: “bipolar person” and try instead, “person living with bipolar disorder”

Avoid: “the mentally ill” and try “people with mental health illnesses”

JUST ASK

Ask people what they prefer. For some it may be “person with a mental health diagnosis,” for others it might be “person who has experienced mental health challenges.” It is often the people living with mental illness who have introduced the alternative terms that health professionals later adopt.

AVOID

• Making people with disabilities out as victims. This is implied when we say a person is “suffering from...” or “afflicted by ...” which can also suggest the belief that one cannot live successfully with a mental illness.

• Conversely, try not to imply that someone with a disability is an inspiration simply because they live with one. Suggesting that they are super-human or courageous can come across as patronizing.

• Expressions that create unrealistic assumptions about or trivialize serious mental health conditions. Examples include: “I’m so OCD/ADD,” “My ex is a pyscho,” and “The weather here is so bipolar.”

ROLE OF NATURE

While the link between health and nature may be obvious to landscape architects, communion with the natural world is instinctive to everyone. In 1997, biologist Edward O. Wilson defined biophilia as "'the innately emotional affiliation of human beings to other living organisms'" (Cooper Marcus and Sachs 2014). Since the 1980s, a renewed interest in the impacts of nature on health has led to a growing body of research that proves what we intuitively know: nature is healing. Below are just a few studies with the most compelling or interesting findings.

Nature has been shown to...

BOOST

Immune System

• Green exercise – physical movement in a natural setting – increases the activity of cells that boost the immune system by fighting cancer and enhancing stress resistance. Dr. Qing Li attributes some of the stress reduction to the presence of antimicrobial compounds (phytoncides) emitted by trees, in effect, wood's essential oils that help protect it from rot and insects. *Li et al. (2007); Li et al. (2008)*

General Health

• Vitamin D (sourced from sunlight) is critical for bone health. *(CDC)*

• Gardens and parks facilitate a more active lifestyle and are critical resources for physical activity in minority communities. *American Planning Association (2003); Cohen et al. (2007)*

• Exposure to nature is essential for healthy childhood development. *Louv (2005)*

Cognitive Function

• Live plants have demonstrated the ability to increase concentration and productivity in schools, offices, and hospitals. *Randall et al. (1992); Leather et al. (1998); Dravigne et al. (2008)*

• 20% improvement in memory and attention span for people who walked for an hour in nature (including in the winter) compared to walking in an urban environment. *Berman, Jonides, and Kaplan (2008)*

REDUCE

Anxiety & Stress

• Students about to take an exam had reduced feelings of fear and anger upon viewing slides of plant-dominated nature. *Ulrich (1979)*

• Stress level and heart rate found to be significantly lower for correctional officers after a large nature mural was installed in the inmate booking area. *Farbstein, Farling, and Wener (2009)*

Aggression

• Proximity to nature was found to have a positive effect of the amount of domestic violence in Chicago public housing, inner city crime, and women's ability to manage major life issues. *Kuo and Sullivan (2001a); Kuo (2001)*

• When walking a path through green space, people experienced lower frustration, engagement, and arousal as well as higher meditation compared to their path through a busy commercial area and shopping street. *Roe et al. (2013)*

Depression

• Studies on rats have discovered that certain bacteria found in soil can generate the release of serotonin, a hormone which decreases anxiety and depression while elevating mood. Though yet to be conducted with humans, the study still has exciting implications for how engaging with soil and other natural materials could impact people's health. *Lowry et al. (2007); Jenks and Matthews (2010)*

Pain & Recovery Time

• Surgery patients with views of trees had shorter hospital stays, less postsurgical complications, and needed fewer doses of pain medication. *Ulrich (1984)*

• Prison inmates whose cells looked out onto rolling farmland and trees had 24% fewer sick call visits than those that only had views of the interior courtyards. *Moore (1981-82)*

THEORETICAL UNDERPINNINGS

Designers of the built environment operate on the knowledge that one's surroundings can positively influence well-being and behavior. In addition to understanding the needs of the specific end-user of a space, there are several theories and perspectives that help to inform design solutions, particularly in healthcare settings.

Environment Behavior Theory posits that a person's behavior stems not only from within the individual, but is influenced by their environment, and perhaps more importantly, their perception of that environment. *Lewin (1951)*

Environmental Preference Theory suggests that people prefer scenes that are "engaging and involving rather than simple and boring." Complexity, coherence, legibility, and mystery are characteristics that, together, can create environments that are simultaneously stimulating and comforting for the user. *Kaplan, Kaplan, and Brown (1989)*

Prospect & Refuge Theory proposes that people's aesthetic preferences are derived from perceptions of what is necessary for survival – to see (prospect) from a safe vantage point (refuge). It points to the gravitation towards and need for places where an individual can feel secure, particularly for those who are the most vulnerable. *Appleton (1975)*

Attention Restoration Theory proposes that certain environments, especially nature, are good at fostering recovery through indirect attention. The theory identifies four characteristics of restorative settings:

1. **Being away** from the source of stress (can be physical, visual, or mental)

2. **Extent** of escape. Large or detailed enough to invite the mind to wander and engender exploration

3. **Fascination**. Nature is full of captivating objects and processes; the space should be interesting enough to hold attention

4. Environment needs to be **compatible** with its desired function

Kaplan (1995); Kaplan and Kaplan (1989); *Kaplan, Kaplan, and Ryan (1998)*

Stress Reduction Theory determines four factors that can be incorporated into garden design (and healthcare facilities) to reduce stress:

1. **Sense of control and privacy** (actual and perceived)

2. **Social Support**

3. **Physical Movement**

4. **Natural "positive distractions"**

Ulrich (1999)

Salutogenic Theory proposes that if mental health is fortified by coherence, then coherence is supported when the environment is comprehensible and meaningful. *Antonovsky (1996)*

DESIGN GUIDELINES

Because the built and natural environment can have powerful effects on people's health and behavior, it is critical that their design be carefully considered and well-informed, especially in healthcare settings. Evidence-based design (EBD) is the process of using the best possible research to guide design decisions. However, there are several challenges in conducting (and thus finding) research that focuses on the relationship between behavioral health and the built environment:

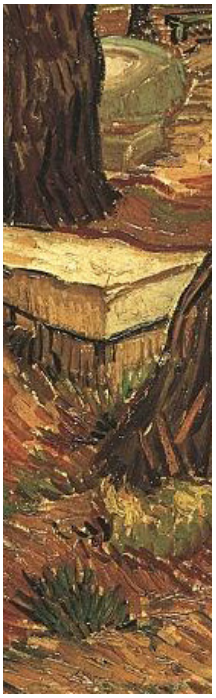
1) Mental health disorders affect people of all ages and abilities and the range of symptoms can present across the spectrum of severity.

2) The variety of diagnoses and potential settings (units in general hospitals, mental health clinics, residential facilities, etc.) makes it difficult to limit the variables when discerning which aspects of the built environment are affecting patient behavior.

3) There are barriers in gaining access to the places and people with mental disorders as well as complications in interpreting the data gathered from those who are cognitively impaired.

While there are many gaps within the literature, this paper seeks to better inform designers and clients so that they can make more empathetic decisions and more restorative spaces for patients. The recommendations, beginning on page 12, are drawn from published guidelines, notable case studies, and the expertise of design and healthcare professionals.

THERE IS NO RIGHT ANSWER.



Behavioral healthcare design is about balance. Sometimes design goals can seem at odds with one another (ie. providing patients some element of control and ensuring safety). One has to understand the options, weigh the risks and rewards, and choose design strategies that make the most sense *contextually*. In short, there is no "right" answer; a decision is only "wrong" if the staff is unable to manage that choice.

A discussion that illustrates this point, is furniture selection.

Some facilities might be opposed to any and all kinds of movable furniture. However, movable furniture can be appropriate for indoor applications where a lot of flexibility is desired. It should be as light-weight as possible (less dangerous) and have a sled base.

Outdoor site furniture becomes trickier, as it needs to prevent the pooling of water and collection of dirt and pollen. To do this successfully typically creates ligature points. Fixed, rounded concrete forms have become a common solution for outdoor spaces at these facilities, but they are not the only option. Here lies an opportunity to work with vendors and furniture designers to fill a gap in the inventory of options. Imagining new ways to meet today's challenges is the charge of the designer, to modify existing or invent unprecedented solutions that can better serve our communities.

GUIDELINES STRUCTURE

The guidelines begin with suggestions for the design process itself and are subsequently classified into three categories: functional needs, psychological needs, and treatment needs. Each category contains several themes for consideration and the overarching vision for or reasoning behind that theme (in italics). The guidelines listed under each theme are clarified by a brief rationale and broken down into various criteria that demonstrate how to overcome challenges or achieve a design objective.

Most of the themes also contain tips under the heading “Design Opportunities” that offer tested solutions and creative ideas that help to meet the guideline’s objective. Finally, included in the guidelines are a couple case studies that illustrate how the guidelines have been applied to different projects.

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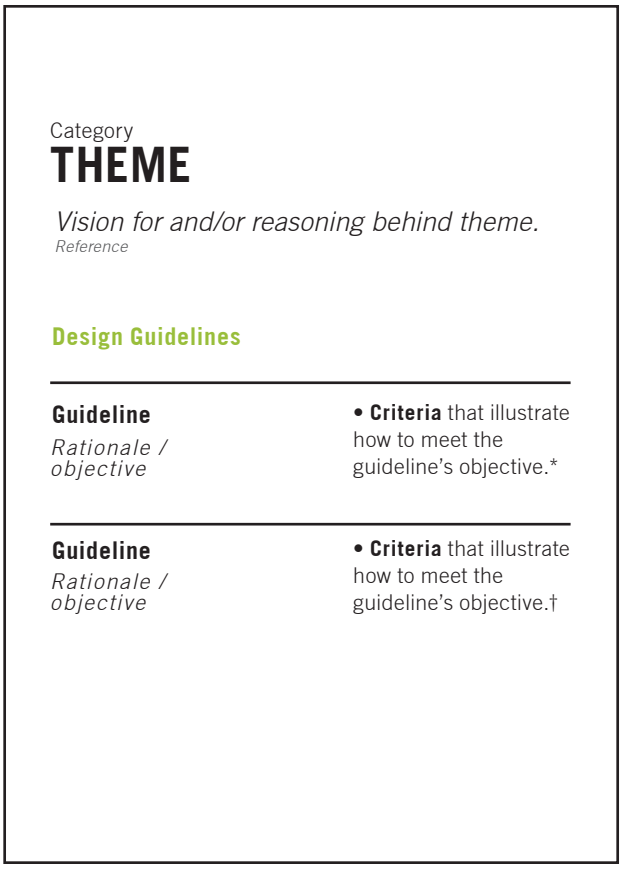


Example of guideline page.

PROCESS

Hospital gardens are not the appropriate setting to value a large artistic expression over its function as a place for treatment and recovery. It is critical to design for the needs of the patients. *Cooper Marcus and Sachs (2014)*

Design Guidelines

Focus on the End User

Design must be tailored to each particular behavioral health situation. What is effective in one can be damaging in another.

• **Design for the specific patient types** (age group, illnesses, and speciality programs) that will be accommodated at the facility. If there is a range of psychiatric disorders or it is unknown who the patients will be, draw from the preferences of a range of psychiatric disorders and design for the most vulnerable.* *Cooper Marcus and Sachs (2014)*

Interdisciplinary

All design endeavors should involve interdisciplinary collaboration. For healthcare gardens especially, the design must be guided by the expertise of all stakeholders. *Cooper Marcus and Sachs (2014)*

• **A committee of specialists** should be consulted and their expertise incorporated into the design from the outset of the project. Hospital staff, administration, and patients can provide valuable insight that's catered to the specific end users.†

- Staff: doctors, nurses, facility personnel
- Administration: board, CEO, COO, CFO, etc.
- Patients and their families
- Designers: architect, landscape architect, interior designer
- Budget director, funders
- Maintenance personnel
- Community members

• **Working with neighbors and educating the public** during the design of the facility can aid in establishing a positive relationship with the surroundings. There are many preconceived notions and concerns when it comes to psychiatric care; involving community members in user-group meetings can alleviate some of their worry.

Sustainability

Therapeutic gardens serve a function, to aid in the treatment and recovery of people who are sick. The longevity and maintenance of a healthcare garden is therefore particularly important since an unhealthy garden can provoke stress and instill a negative outlook. *Cooper Marcus and Sachs (2014)*

• **A post-occupancy evaluation** can help to fine-tune the design so that it successfully serves patients and functions as intended. They also help fill gaps within the research and aid in the design of future projects.

• **Provide a Care Manual.** By supplying the rationale behind design decisions and maintenance practices, a manual or handbook can help to ensure the long-term health benefits of the garden during administrative and staff turnover as well as budgetary fluctuations. It should emphasize the importance and healing contributions of a natural environment and include all garden plans and specifications.

DESIGN OPPORTUNITIES

* Focus Groups

Focus groups can help designers better understand how certain materials might be perceived so that they can make more sensitive decisions. *Sachs (1999)*

† Participatory Design Process

Teresia Hazen's model of the Participatory Design Process (outlined in Chapter 5 of Cooper Marcus' and Sachs' *Therapeutic Gardens*) is specifically crafted for the design of healing gardens. A format of three one-hour meetings efficiently and effectively takes advantage of the limited time of healthcare personnel.

Functional

SAFETY

In any behavioral health facility, the safety of its patients, visitors, and staff is its primary responsibility. While the types of concern and level of security risk will vary according to the population, when designing for vulnerable populations, designers must ensure that every element of the outdoor space protects the physical and emotional well-being of its users. *Cooper Marcus and Sachs (2014)*

Design Guidelines

Avoid Elopement Opportunities

*Do not want to encourage access to roofs or escape.**

• **Climbable elements.** Fencing and building elements themselves should not be climbable (window sills, rain gutters, lighting fixtures, etc.).† Also, do not place anything climbable near a fence or wall (trees, shade structures, light poles, etc.)

Nothing Weaponizable

Do not want to support self-harm or assault.

• **Materials.** Avoid those that can be picked up or broken off and weaponized. For example:

- Loose paving (brick, stone, concrete pavers, gravel, etc.)
- Landscape installation materials (stakes, fabric pins, tree ties, irrigation pipes)
- Plants with thorns or stiff branches

• **Exposed fasteners** should be tamper-resistant (camera housing, light fixtures, furnishings, drainage grates).

• **Plants.** Avoid species that are toxic, cause skin irritation, have thorns or stiff branches (which can become a spear).

• **Furniture** should be safe and anchored or heavy enough not to be moved (to prevent them being thrown, stacked to climb a fence, or used to create a barricade).‡ When selecting materials, be careful of excessive heat retention.

• **Manhole covers, access panels, and area drain grates** should be firmly anchored. Discourage easy removal as a means to escape or use as a weapon.

• **Lighting** fixtures should be impenetrable and could even be low-voltage as an extra precaution.

Nothing Weaponizable

(Continued)

• **Durability** of fixtures, furniture, etc. People with mental disorders tend to unconsciously 'worry' their environment as a stress-reducing technique by touching, rubbing, and physically interacting with it. They may also act out against it.

Visibility

Spaces should feel relatively private and secure to patients but still be visible to staff.

• **Lighting.** Areas where patients, staff, and visitors walk at night should be well-lit (parking areas, courtyards).

• **No hiding places.** Ensure that patients cannot hide behind large plants, furniture, etc.

• **Viewing Positions.** Ideally, everywhere would be visible from everywhere, but this isn't always possible due to structural columns, trees, etc. Instead provide as many spaces as possible from which one can see as much as possible and make those spaces inviting (shade, seating, etc.) Staff are going to move around the garden with patients; there shouldn't be any areas that they avoid because they're uncomfortable. Nor should staff have to worry about blind spots in the garden.

DESIGN OPPORTUNITIES

* Enclosed Courtyards

Enclosed courtyards are more secure than open, fenced areas and are usually nicer aesthetically.

† Two Layers of Protection

Consider a fencing strategy that utilizes two layers of protection. Even if a patient can get past one, it is unlikely that they will be able to defeat both. A combination of techniques from the list below should prove effective.

- Non-climbable material
- Non-graspable top
- Smooth overhang (like a ceiling)
- Non-jumpable height (12-14')
- Contact alarm (the fence would have to be buffered by landscaping to discourage accidental touching since any contact can trigger the alarm)
- Two levels of fencing (while very effective, this strategy can easily start to appear prison-like)

‡ Landscape Features

Mounded turf and play surfacing are some of the only ligature-free seating options on the market. They also provide a lot of flexibility in terms of use (group therapy, exercise, etc.) while giving patients more options in how they choose to sit (lying down, leaning against, sitting on top of, etc.).

Functional

COGNITIVE CONSIDERATIONS

People living with brain disorders can lack certain cognitive functions that are easily taken for granted. Sensory integration is the neurobiological process that allows people to process the various stimuli that they encounter and successfully navigate their surroundings. When the brain is unable to accurately perceive and effectively organize incoming information, unfamiliar environments can be distracting or even frightening. The design of outdoor spaces can thus be modified to aid neurodiverse people to more confidently navigate and interact with the natural world. Gaines et al. (2016)

Design Guidelines

Spatial Organization

A legible layout makes an outdoor space more accessible to people who experience difficulty locating things in space; a readily apparent design is easier to orient.

• **Layout.** The garden's physical arrangement should be easy to read and navigate, though that does not have to equate to boring.*

• **Transition spaces** directly adjacent to the building (preferably protected) should be provided. For some patients, going outside might be a challenge; this provides a place to get their bearings before experiencing something new and engage with the garden if they don't feel comfortable traveling far into it.

Wayfinding

The unknown can be intimidating for people with mental illness; wayfinding can help patients become more comfortable with what's unfamiliar. Cooper Marcus and Sachs (2014)

• **Orientation maps** and wayfinding cues help people know what to expect. Provide at least one place with a map or visual aid that illustrates the layout to help patients comprehend the site.

• **Connections to the indoors**, both visual and programmatic, can provide a sense of comfort by anchoring a patient's outdoor experience to their familiar indoor experience. They feel connected from one experience to another which reduces anxiety. This is especially true for vulnerable populations who are accustomed to anxiety about survival mechanisms like access to food and a safe place to sleep.

Design Guidelines (Continued)

Paths

Large, clearly delineated paths make an outdoor area easier to maneuver through.

- **Wide** pathways for main circulation routes help to eliminate the feeling of crowding. *This gives patients some control over their level of physical proximity to others.*
- **Curvilinear** paths are easier to maneuver for people using wheelchairs or walkers.†
- **Smooth surfaces, clear edges, and appropriate traction** allow people of all mobilities to better navigate the space.‡
- **Frequent resting spots** along the paths provide places for patients to sit and for staff to monitor the garden.

Temporal Cues

People living with mental illnesses can have trouble with their sense of time and are comforted by clues that help them determine the time of day or year. *Cooper Marcus and Sachs (2014)*

- **Vegetation** can give seasonal as well as daily cues of time. Trees with great fall color, flowers that open certain times of day, and grasses that bloom seasonally are a few examples of how plant material can be used to connect patients with the cycles of nature.§
- **Clocks**, sundials, and other features can be used to give a sense of time.

DESIGN OPPORTUNITIES

*** Variety**

Use of different planting, seating arrangements, and furniture can provide visual interest.

† Figure Eight

Pacing back and forth can increase agitation. Providing a circuit in the form of a figure eight allows patients and staff a more calming route to meander while also decreasing the likelihood of becoming lost or confused.

‡ Repetition

Consider repeating some materials as an element of consistency to help designate different circulation routes or specific functions.

§ Look Locally

Look for regional temporal or seasonal indicators of traditional significance to use in the design.

Functional

STAFF AREA

The cost of hiring and training nurses is immense. As stressful environments and burnout lead to high turnover rates, it is economically beneficial to support staff health and happiness. Because staff are often the predominant users of many hospital gardens, it is worth considering how a garden can improve retention and reduce medical errors. *Cooper Marcus and Barnes (1995; 2008); Cooper Marcus and Sachs (2014)*

Design Guidelines

Refuge

Nurses, especially in psychiatric care, concentrate on taxing activities for most of the day. Having a space that is therapeutic for staff extends the healing mission of a healthcare facility to all who are affiliated with it.

• **A separate outdoor area.** Since nurses have to be "on" most of the time, a place to "escape" can be particularly restorative. *Cooper Marcus and Sachs (2014)*

• **Easily accessible** (ie. near the break room) but *not* visible to patients or visitors. A private place of respite gives staff the chance to relieve stress and fatigue, improve their ability to concentrate, encourage professional communication, and improve overall job satisfaction and morale.* *Pati, Harvey, and Barach (2008); Shepley and Pasha (2013)*

DESIGN OPPORTUNITIES

*** Garden "Rooms"**

If it is not possible to have a separate staff area, garden "rooms" can allow both patients and staff to have a degree of privacy and occupy separate spaces.

CASE STUDY #1:
Midpark Hospital
Dumfries, Scotland

The Midpark Hospital's concept 'Learning to Live' focuses on creating a homely environment where patients can develop the skills to return to independent living. The building is laid out around a series of courtyards, each designed to serve the specific clinical needs of its respective ward.

Inclusive Design Process

Regular collaborative discussions amongst stakeholders, patient representatives, the clients, and design team allowed ideas to be tested early on to meet many people's needs. Because of this process, the staff felt engaged and a sense of ownership over the building by the time they moved in.

Key Design Challenge

The project site contains a 14 meter grade change. The team decided to step the building over three levels, creating a series of single-storey wards that could see over the top of their neighbors. This strategy opened up views to long vistas and provided high natural daylight. The layout also ensured that one is less aware of the rest of the facility, bringing down the scale and making it feel less institutional.

Courtyards

The courtyards offer patients opportunities for exercise, gardening, and fresh air. Most of them are not fully enclosed which increases sunlight and reduces the fishbowl effect. The open, fenced end of the court is partially screened by trees but gives patients views into the rural landscape beyond the facility.

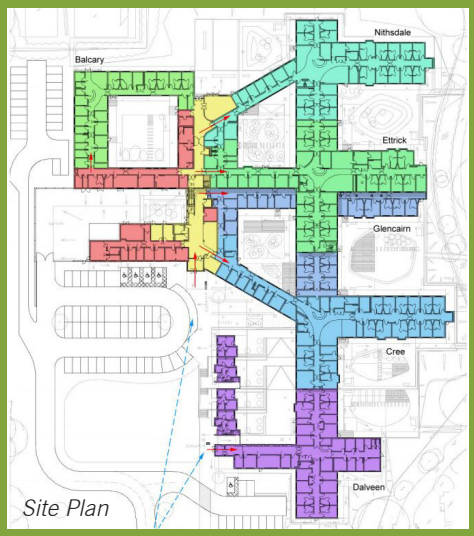
Project Brief

Client:	NHS Dumfries and Galloway
Architect:	Archial NORR
Landscape architect:	ERZ
Value:	£26.4 million
Area:	6930 sqm
Size:	Six wards, 85 beds
Opening Date:	January 2012
Type:	In-patient, acute psychiatric, and dementia care

References & Image Sources

Architecture and Design Scotland. "Midpark Hospital: A Case Study." https://www.ads.org.uk/wp-content/uploads/10170_cs-midpark-hospital.pdf.

ERZ Studio. "Mid Park Hospital Dumfries." Accessed May 6, 2019. https://www.erzstudio.co.uk/projects/mid-park-hospital-dumfries.



Site Plan

Each color is a different ward. Yellow shows the facility's entrance.

Charles Jencks' landscape sculpture 'Doublewalk' greets patients and visitors at the site's entrance. Its engaging and whimsical nature sets positive expectations as one enters the hospital and provides a setting for exercise, fun, and contemplation.

The landscape incorporates a variety of spaces: memory walks, growing spaces, sensory planting, gathering and activity spaces, shelters, sports facilities, intimate seating, woodland walks, and views to the wider landscape.

Psychological

CONTROL, CHOICE, AND PRIVACY

People with mental health disorders are often stripped of control. First, of their own body and mind. If they are in a facility, they have even less control—of what they can eat or wear; where they can go; what they can do; who they can see; and even what others can do to them (ie. frequent exams). However, research has demonstrated that people who feel a sense of control (even if only perceived) experience less stress and are more capable of coping with it when it does arise.

Cooper Marcus and Sachs (2014); Evans and Cohen (1987); Glass and Singer (1972)

Design Guidelines

Variety & Flexibility

Providing environmental flexibility (furniture, temperature, lighting) can help contribute to a sense of control over one's surroundings.

• **A variety** of spaces, destinations, and experiences should be created to draw people into the garden and prevent overcrowding.*

Seating: nooks for solitary reflection, nodes where a few people can talk, and swaths of open area where larger groups can participate in group therapy, active or passive recreation. Patients should be able to control their level of social contact, therefore a variety of options is particularly important since moveable furniture may be prohibited.

Circulation: pathways for meandering or discovering, pathways that vary in their length and difficulty.

Program: soothing areas for recuperation, sheltered areas for dining or crafts, areas that support games or encourage physical activity, etc.

• **Incorporate fixed and non-fixed elements.**† Unpredictability can be disconcerting for people with mental illnesses, fixed elements can provide a sense of security near the entrances to the garden. Further into the garden, more changeable elements, such as moveable furniture provide patients with a sense of control. *Sachs and Vicenta (2011)*

Design Guidelines (Continued)

Prospect & Refuge

Appleton's theory proposes that people gravitate towards places that imitate what is necessary for survival – to see (prospect) from a safe vantage point (refuge).

Appleton (1975)

• **Previewing opportunities** – being able to see into a space before entering it – can satisfy a need for control and security. This can be accomplished by:

- Windows in doors
- Subdividing larger spaces into smaller ones
- Making entrances and exits more visible once in an open space
- Allowing one to have a view from a distance

• **Sanctuary settings** should be designed where a person has ample protection at their back and a clear view forward.‡

Privacy

Privacy is a universal human need. Choosing one's level of privacy allows for personal autonomy, emotional release, and a sense of security and esteem.

Westin (1967)

• **Avoid the fishbowl effect.** Where buildings surround a courtyard, it is important to allow in light and views to the outdoors but these should be buffered for the privacy of those both in and outside.§

• **Outdoor lighting** should not shine into patient rooms.

• **Avoid over-crowdedness.** Extra-wide paths and plentiful "rooms" can help to alleviate any feeling of congestion.

DESIGN OPPORTUNITIES

*** Hierarchy**

Consider a hierarchy of spaces that allow patients to build upon skills and comfort levels the further they venture into the garden. The areas more removed from the building may become less formal and programmed for instance. Garden elements can also be sequenced to correspond to stages of recovery or levels of interaction and engagement.

† Rockers & Spinners

There are various types of seating (often used in playgrounds) that are anchored but allow the user to rock or spin slightly in a soothing motion. As both a fixed and non-fixed element, they provide patients and staff a greater assurance of safety while giving patients more freedom.

‡ Sanctuary Settings

Outdoor "rooms" with seating and low plants or planters can help to create a sheltered environment.

§ Buffers

Changes in grade (where the outside is slightly lower than the interior) and buffer planting aid in lessening the fishbowl effect without compromising staff visibility.

Psychological

SENSORY CONSIDERATIONS

People with mental disorders can have an over- or under-responsive sensory system which causes them to perceive and react differently to environmental stimuli. Being cautious not to overwhelm the senses while providing opportunities to become familiar with different stimuli in a controlled environment can aid in the recovery process.

Design Guidelines

Materials

While it is impossible to avoid everything that's potentially viewed as threatening, it is important to keep in mind that people with mental disorders can be more sensitive to particular patterns, shapes, and textures. *Sachs (1999)*

- **Cautious of patterns.** Be cognizant of the ways in which materials might be perceived as seemingly ordinary objects can become disorienting and scary. For example, the knots and patterns in wood or the shadows from uplit trees can become frightening faces. *Cooper Marcus and Sachs (2014)*
- **Warm, natural materials** (ie. wood veneers) can soften an institutionalized setting and provide a subtle connection to nature. *Karlin and Zeiss (2006)*

Heightened Photosensitivity

Many anti-psychotic and antidepressant medications have side effects which cause people to be more susceptible to the sun's brightness and UV rays. *Cooper Marcus and Sachs (2014)*

- **Shade** (dense and moderate) should be plentiful. However, be cautious of creating strong shadow patterns which can be disturbing or disorienting. For example, the strong linear stripes created by pergolas can cause seizures.
- **Avoid glare.** Paving, building materials, and site furniture can create glare. Be wary of shiny or light-colored paving (including gray cement) and highly polished or reflecting surfaces (ie. glass).*

Visual

People with mental disorders can have difficulty organizing various visual stimuli. For someone with cognitive processing issues, they may only perceive an object as its individual pieces rather than recognizing it for its whole. *Gaines et al. (2016)*

- **Avoid strong contrasts of light and dark on the ground plane.** Visual cliffing – a phenomenon where dark areas of pavement are perceived as steps or holes – is especially common in the elderly as well as people with traumatic brain injury or other sensory processing disorders. *Cooper Marcus and Sachs (2014)*

Design Guidelines (Continued)

Visual

(Continued)

• **Color.** Avoid dull monochromatic color schemes as well as bright, highly-saturated colors. Warm blue tones or other tranquil colors of similar value and intensity are calming in effect. *Karlin and Zeiss (2006)*

• **Lighting.** Support patients' circadian rhythm through ample, natural daylight. Use soft, indirect and pervasive lighting, which helps avoid strong, contrasting patterns created by shadows. Be careful not to direct exterior lighting into patient rooms. *Karlin and Zeiss (2006)*

Auditory

Whereas the general population can adjust to variances in acoustics, people with mental disorders are more likely to detect slight variations of decibel. *Gaines et al. (2016)*

• **Avoid highly reverberant materials** and long, echoic corridors which can cause perceptual distortions. *Karlin and Zeiss (2006)*

• **Auditory privacy.** Avoid creating situations where patients cannot see the source of a sound. This can increase stress and anxiety and provoke paranoia.

Olfactory

Neurodiverse people can have a stronger reaction to pronounced smells. *Gaines et al. (2016)*

• **Good air quality and ventilation** (both in and outside the building) is an essential health component. *Karlin and Zeiss (2006)*

• **Avoid strong odors.** *Karlin and Zeiss (2006)*

DESIGN OPPORTUNITIES

*** Tinted Concrete**

Colored concrete in earth tones reduces glare and is less institutional in character.

Psychological

COMFORT

A hospital's design should reinforce its treatment goals and instill positive expectations within its patients and staff.

Design Guidelines

Homeliness

A non-institutional environment provides a sense of normalcy and can even enhance "emotional and intellectual well-being and improved patient behavior." *Sachs (1999)*

- **A more human scale** helps to downplay an institutional setting. Vegetation and other design features (furniture, shade structures, etc.) can bring a larger space to a more comfortable scale. *Cooper Marcus and Sachs (2014)*
- **Consider cultural and regional aesthetics** which can be reflected in vegetation and other material choices. One community's definition of nature can look quite different from another's.

Inviting

While furniture, fixtures, and materials need to be safe and durable, they can still look and feel pleasant.

- **Quality.** Be cognizant of the meaning and messages sent by the quality of a design and its ability to endure. *Karlin and Zeiss (2006)*
- **Subtle methods of securing furniture** can make a space more welcoming rather than reminding patients of their lack of control. *Sachs (1999)*

CASE STUDY #2:

Östra Psychiatric Hospital

Göteborg, Sweden

White Arkitekter, the designers of the Östra Psychiatric Hospital wanted to erase the notion that mental health facilities were bleak, institutional places. They felt that the more beautiful and welcoming they made the space, the more likely it was that it would be respected and enjoyed by patients and staff. To achieve this, multiple strategies were implemented to support connections with nature while adhering to the safety needs of the facility.

Neighborhoods

The hospital is structured by "neighborhood" units with one garden for every 14 patients. Each cluster of rooms also has its own sunroom that brings light into the surrounding communal spaces.

Courtyards

Each of the three enclosed courtyards differs slightly, but they all offer abundant vegetation (including flowering plants that bloom spring through fall), several seating choices, and shade. In one of the courtyards, garden plots were introduced to provide occupants with the opportunity to take ownership over their environment. This form of treatment proved to be so successful that patients asked for them to be incorporated into all of the courtyards.

Outcomes

Data collected from before the move to Östra (2005) compared to a year after the move (2007) showed noticeable improvements in the number of compulsory injections and restraints per quarter. The number of staff who took sick leave also decreased.

Project Brief

Client:	Västfastigheter
Architect/ landscape architect:	White Arkitekter
Area:	18,000 sqm
Value:	$50-100 million
Completion Date:	Completed 2006
Type:	Inpatient and outpatient treatment for children and adults

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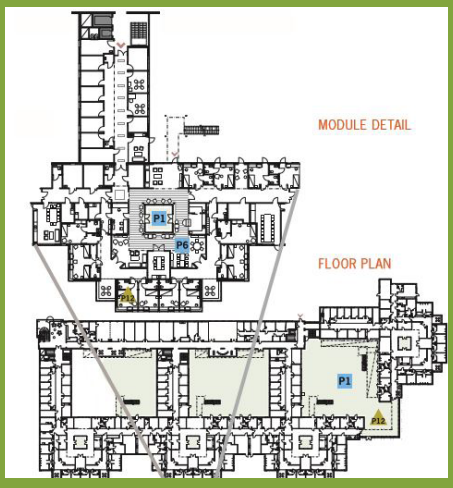
Terrapin Bright Green. "Östra Hospital: Psychitaric Facility." Last modified 2017. https://www.terrapinbrightgreen.com/wp-content/uploads/2015/11/Ostra-Psychiatry-Case-Study.pdf

White Arkitekter."Östra Hospital-Emergency Psychiatry Ward." Accessed May 06, 2019. https://whitearkitekter.com/projectostra-hospital-emergency-psychiatry-ward/

At Östra, patients are able to access the courtyards and sunrooms at their own leisure, providing a sense of independence and control. With multiple opportunities to view elements of living systems and natural processes, the designers sought to cater to the variability in user preference and increase the likelihood that the space would have positive health effects on its patients.



The building is comprised of four L-shaped modules that surround three courtyards.

Treatment

CONNECTION TO NATURE

Many people seek out nature-dominated spaces to reduce stress even if they are not consciously aware of its healing qualities. The attraction and attachment to living things is often as powerful as its effects. Time and again nature has proven to be a transformative medicine that counters the effects of stress, isolation, and fatigue. *Francis and Cooper Marcus (1991, 1992); Rainey (2010)*

Design Guidelines

Accessibility

In order for the garden to be used, it must be open at regular hours and people must know it exists.

- **Provide visual access** to the outdoors from as many spaces as possible, especially in gathering areas or main circulation routes that many people frequent. This is particularly important when physical access is limited by mobility, weather, or regulations.*
- **Use strategic wayfinding and marketing** to encourage patients and visitors to use the facility's green space and ensure that it is easy to find.†

Being Away

Escaping to a "different world," away from the source of fatigue or stress can help foster recovery. This can be physical (stepping into a different space), visual (looking out a window), or mental (imagining a place). *Kaplan (1995); Kaplan and Kaplan (1989)*

- **3:7 Rule**. To create a space that *feels* like a garden and contrasts with the interior, follow the ratio of about 30% hardscape to 70% vegetation. *Cooper Marcus and Barnes (1995)*

Positive Distractions

A positive distraction is "an environmental feature or situation that promotes an improved emotional state in the perceiver, may block or reduce worrisome thoughts, and fosters beneficial changes in physiological systems." *Ulrich (1999)*

• **Holistic sensory experiences** like the processes and systems found in nature, are positive distractions that help divert the mind. While looking at scenes of nature alone can have healing benefits, its regenerative influence is amplified through its sights and sounds, smells and tactile sensations.‡

• **Balance the needs of patients** who prefer complexity – including those with schizophrenia *Larsen (1992)* – without overstimulating those who are manic or agitated. *Karlin and Zeiss (2006)*

DESIGN OPPORTUNITIES

* Bring Nature Indoors

Besides windows, other indoor opportunities to experience nature include indoor plants, green walls, solaria, greenhouses, glassed-in porches, etc.

† First Impressions

Having the garden visible from the main entry demonstrates to patients and staff not only that this special asset exists, but that it's a source of pride and plays a significant role in treatment at the facility.

‡ Double Duty Plants

Choose plants that are pleasing in more than one sense. They can also be used to attract wildlife, such as birds or butterflies.

Treatment

THERAPIES

A garden can encourage various activities that boost resilience, build autonomy, and form community. As a tool that teaches and reinforces the practices that shape a balanced lifestyle, gardens can support a more holistic approach to health.

Design Guidelines

Physical Movement

Gardens offer an incentive to venture outdoors. Their design can promote even mild forms of exercise which besides the obvious physical health benefits, eases stress and symptoms of depression as well and aggressive behavior.

• **Provide opportunities and outlets for exercise.** Walking paths and exercise loops, play and exercise equipment, sports fields and courts are just a few examples. Helping patients build an exercise routine gives them a critical skill in managing stress and maintaining health.* *Cooper Marcus and Sachs (2014)*

Creative Outlets

A study on the impact of art therapy on the pathological behavior of schizophrenic patients found that the artistic process helped them gain a stronger sense of self and improved social competencies. *Teglbjaerg (2011)*

• **Incorporate artwork and opportunities for creative expression.** The presence of artwork can be a positive distraction and help to increase social interaction, however patients tend to prefer realistic, naturalistic art - not exciting abstract work within which patients can more easily see disturbing images. *Mehrabian and Diamond (1971)*

Social Support

Gardens facilitate social interaction which in turn lowers levels of perceived isolation and improves recovery. *Ulrich (1999)*

• **Seating arrangements and the presence of art** or sculpture can increase social interaction.† *Mehrabian and Diamond (1971)*

* Horticultural Therapy

Gardening activities increase motion while providing a connection to nature. At the Langenfeld Country Hospital in Germany, a psychiatric facility, horticultural therapy was also noted to improve patients' sense of responsibility, communication skills, response to work obligations, perseverance, and stamina. *Neuberger (2008)*

† Intimate Arrangements

Small, circular configurations of furniture can promote socialization and the formation of relationships that provide support. *Karlin and Zeiss (2006)*

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