The Role of Color in Humanizing Behavioral Healthcare Facilities

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WHITE PAPER

EXCITING TIMES FOR SPACE DESIGN

These are groundbreaking times in the design of behavioral healthcare facilities. Many strides are taking place within these spaces to positively impact the human within. During the past 20 years research on healthcare environments has greatly increased. Healthcare spaces have become visually more interesting, layered and complex. Their goal is to stimulate, but not overly so, and encourage the patient, along with their families, to participate with their treatment. This new trend for design in healthcare spaces is greatly influenced by an appreciable amount of evidence-based research that points to an increase in recovery, shorter stays and a more satisfied relationship with one's environment.[1]

In doing this, it has become increasingly clear the influence of architecture and design on end user outcomes by improving well-being and safety, increasing staff effectiveness and saving costs. When these spaces, particularly those in behavioral healthcare, are designed to calm and normalize, evidence supports a direct link to more relaxed patient populations, safer surroundings, happier staff and improved efficiencies—creating an atmosphere of reduced stress for all. This also allows staff to more readily engage with patients—protect, care for and treat—versus guard and "store." Not to mention, when healing is the focus, emerging research continues to indicate faster patient recoveries, shorter hospital stays, and less need for patient restraint and medications compared to spaces that are not designed with therapeutic principles. Therefore, evidence-based research continues to reveal that "care" and the buildings in which it is administered cannot be separated in order to have optimized outcomes. Whether your role is of an architect, designer, engineer, manufacturer or facilities leader, it is now widely understood that we collectively impact the final outcome of these environments and the humans within.

Much to our delight, interior elements in rehabilitation settings like behavioral healthcare are becoming more human centered and expressive. For these spaces requiring higher safety and security needs, where interior finishes may have to be more robust and clinical, many are leveraging visual cues of nature, nature evoking color and softer furnishings to implement an "intensive-use

facility" that is also humane, harmonious, visually familiar—and aesthetically appealing. Color has become a vital tool for healthcare facilities to use in the healing process and in their efforts to normalize what have historically been considered institutional spaces. But why? And where? And how? This white paper presents detailed research, tools and resources that can be used to assist interior designers, architects and facility managers in their attempts to create harmonious spaces that are appealing to staff, patients and their families.

PLANNING & DESIGN OF BEHAVIORAL HEALTHCARE FACILITIES

As healthcare grapples with the accessibility and financial challenges which are a direct result of the *Affordable Care Act* and new federal reimbursement policies, behavioral healthcare has experienced an insurgence of new beneficiaries who now qualify for government-funded care or care within state insurance exchanges due to the reforms of the *Mental Health Parity and Addiction Equity Act (MHPAEA)*. The Affordable Care Act, in tandem with the MHPAEA, which requires health plan coverage for mental health and substance abuse disorders to be on par with physical health coverage, has removed many barriers for Americans to access behavioral health services. Therefore, there is a consistent message that behavioral healthcare, in many incidences, no longer stands apart from conventional healthcare. Instead, it will be a focus of integration into our delivery systems of care.

With this, it is important to note that the treatment and type of treatment spaces for mental illness and substance abuse disorders are not a "one size fits all." No one type of space serves this need. Variety is necessary, depending on treatment and personal needs of the patient population, including the type and degree of illness, age, gender, tendency for violence and risk for self-harm. In addition, to increase access to behavioral healthcare, home and small-scale clinic treatment centers are now in higher demand and are increasingly providing the services that help serve these populations. There is reluctance for acute-care facilities to provide mental health level services for psychiatric or addiction patients. Practitioners recognize that these patient groups have unique health needs, all of which need to be handled by very experienced healthcare professionals. These patient populations also require a heightened level of security. Self-harm and violence towards staff, other patients, and/or visiting family are significant risk management concerns within behavioral healthcare.

The National Alliance on Mental Health's (NAMI) 2013 Report best illuminates our nation's behavioral health needs[2]:

- 61.5 million, 1 in 4, people experience mental illness within a given year.
- Approximately 9.2 million adults experience co-occurring mental health and addiction disorders.
- 42 million live with anxiety disorders. These can include: panic disorder, obsessive-compulsive disorder (OCD), posttraumatic stress disorder (PTSD), generalized anxiety disorder and phobias.
- 13.6 million live with a serious mental illness such as schizophrenia, major depression or bipolar disorder.
- 14.8 million live with major depression.
- About 20 percent of youths from ages 13 to 18 experience severe mental disorders in a given year. The estimate is 13 percent for ages 8 to 15.
- About 20 percent of state prisoners and 21 percent of local jail prisoners have "a recent history of a mental health condition."

NAMI's 2013 Report also outlines how this collectively impacts our nation and addresses the fact that the impacts of behavioral health conditions are not isolated to the afflicted and their families. NAMI states serious mental illness costs the United States $193.2 billion "in lost earnings per year."[2] While the third most occurring need for hospitalization, for youth and adults from 18 to 44 are mood disorders.[2] As the *Health Care Cost Institute (HCCI)* subsequently reported in the same year, a 19.5 percent increase in substance abuse in-house patient admissions resulted in a 29 percent increase in per capita substance use for inpatient spending.[3] The Affordable Care Act also expands healthcare coverage along with additional parity protections to over 60 million Americans, 4 in which 27 million had never been insured before. With these changes, it is believed that 30 million Americans will have an increased access to healthcare benefits that will encompass treatment for mental health and substance use disorders.[4] As some states are extending Medicaid coverage to low-income childless adults, there is a projection of an increase of more than 2 million people seeking mental health and substance abuse treatment.

More than ever in the history of the U.S., it is imperative we have appropriate treatment opportunities for these populations.

On the bright side, there is a significant paradigm shift in the way society views mental illness. The philosophy regarding the treatment of mental illness is changing from secrecy, stigma, shame and the preference for "securely storing people away," to types of treatment that promote open discussion, social acceptance, empathy, and "treatment and discharge." Society is better understanding the complexity of substance abuse addictions and, with this, placing an appreciable value on the need to fully rehabilitate people with serious addictions to alcohol and drugs (prescription and/or illicit). This is important since it is widely reported that a large percentage of people suffering from behavioral disorders are afflicted with both mental and addictive behaviors. Thus, both should be viewed jointly. This shift in how we socially preside over those suffering from mental illness and substance abuse means, when applicable, "success" is measured by a patient's effective and enduring re-integration into society. The hope is this leads to a productive and safe life for the patient, with the overall goal of these individuals being contributing members of society.

With this expressed need for additional behavioral health facilities, a construction survey sponsored by *Health Facilities Management and the American Society for Healthcare Engineering (ASHE)* stated in 2013 that as high as 11 percent of those who responded reported their hospitals or larger healthcare systems had behavioral healthcare projects currently under construction or projected for the next three years.[5] Of these, 21 percent were for new construction, while 79 percent were expansion, renovation or replacement projects. As many reporting bodies believe, behavior healthcare design and construction is on the rise.[5]

Historically, these very specialized facilities have accounted for a small fraction of healthcare construction and have not yielded the same level of attention from today's top healthcare planners and designers. This is now changing. With increased understanding of this population's specialized needs, continued affirmation of the power of evidence-based design, and the notable need for behavioral treatment services, these projects are now being stewarded and designed by our nation's most talented and passionate professionals. Planners and designers, along with researchers and facility experts, are reviewing the direct needs of mental health and substance abuse populations (and their specialized staff) to reflect on how modern design can foster patient healing rates, reduce environmental stress, increase safety and reduce costs while improving the delivery of care. Thus,

there is a trend to create contemporary facilities that are not only state-of-the-art and award-winning but further modify what most of us imagine behavioral healthcare settings to be.

THERAPEUTIC DESIGN GOALS

Researchers are turning their gaze to this behavioral healthcare subset to better understand these patients' unique needs, while also paying close attention to the specialized staff and buildings where care is administered.

Today's most advanced, modern therapeutic spaces are typically required to excel in three categories:
1. **Provide clinical excellence in the treatment of the body**
2. **Meet the psycho-social needs of patients, families and staff**
3. **Produce measurable positive patient outcomes, staff effectiveness and cost containment**

In can be a challenge to excel in all three categories. However, many clinics and facilities are achieving this by incorporating strong evidence-based healthcare best practices. It should be noted that over the course of the past three decades, there has been a plethora of strong evidence-based research that speaks in specifics to "healthcare populations." Arguably, large portions of these findings also are
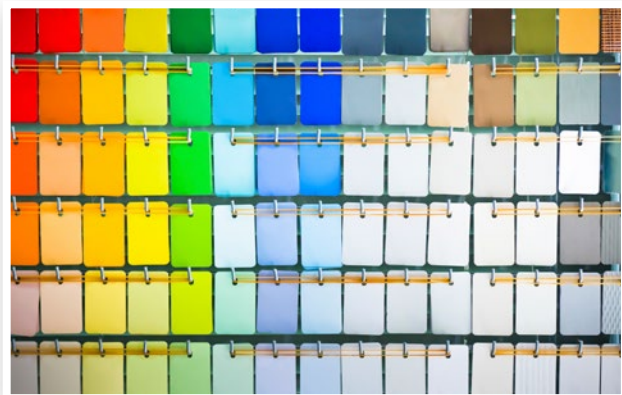
directly applicable for "behavioral healthcare populations." However, there are far less studies on the best model of care for mental health and substance abuse patients. Though healthcare and behavioral healthcare greatly parallel, it should be understood that patients with behavioral disorders are unique and require elevated needs. These include more zealous environmental stress reductions, deterrents for the onset of depression, and a reduction, or removal, of all factors that contribute to patient low self-worth, confusion, fear, increased anxiety and, most importantly, violent outbursts. Thus, studies that focus on space design and behavioral healthcare interests typically target four primary topics: social behavior, harmful behavior, post-occupancy evaluation and staff satisfaction.[6]

These space considerations, as a whole, are not new for the experienced behavioral healthcare planner or designer. There has been a lofty push to transition these environments from the visually plain, institutional and, at times "numbingly sterile," to visually rich spaces that are meant to stimulate, incorporate nature and art, provide positive distractions within, offer appealing outdoor views, and provide an interesting use of color and materiality. In a 2013 Healthcare Design article titled "Rethinking Behavioral Health Center Design," *Don Thomas*, a principal/designer at BWBR Architects in St. Paul, Minnesota, states "Everything that we've learned about how design can influence physical health, we need to be applying to mental health, because in the end, it has the same effect." He further states,

> "What they've been discovering is when they put people in bright, healthy, healing-type environments, they respond better, they're in the hospital less time than expected, and then they can move on to life sooner."[7]

The 2012 research report "Toward a Design Theory For Reducing Aggression In Psychiatric Facilities," by *Roger Ulrich* et al, advocates design for psychiatric environments that is believed to foster a reduction of aggression and violence.[8] The report emphasizes the need, as a basic premise and common thread throughout the paper, to reduce environmental stress factors within behavioral settings. The report's findings strongly point to the ward's physical environment as a major influencer in patient stress due to environmental and psychosocial stressors that directly mediate and trigger aggression. The paper's research further finds, aggression is reduced when spaces are designed with an evidence-based "bundle" of stress-reducing environmental characteristics that are identified and discussed independently.[8] Ulrich et al list these items to include:[8]

1. **Availability of private rooms**
2. **Less crowding**
3. **Movable furniture**
4. **Better acoustics**
5. **Nature window views**
6. **Nature art**
7. **Higher daylight exposure**
8. **Homelike design**
9. **Proximity and visibility of common spaces to the staff station**

We are just beginning to understand the psychological and physical demotions that poorly designed institutional environments can cause to their occupants within. Patient stress, and its resulting aggression in behavioral health settings, particularly psychiatric facilities, is a serious and worldwide problem. Ulrich's et al report shows that incidents of violence cause psychological harm and, often, physical injury to the patients themselves, other patients, staff and to property.[8] A review of 122 studies carried out in 11 western countries found that 32 percent of psychiatric inpatients engaged in aggressive behavior or violence (Bowers et al., 2011) and rates varied by type of psychiatric treatment setting.[8] It further states, on average, international data indicates nearly 50 percent of all aggressive incidents in psychiatric units involve physical violence, while 37 percent of violent or aggressive incidents results in physical injury to staff.8 These are alarming statistics that underscore the seriousness of potential harm to staff, their physical well-being and subsequent job satisfaction.

In 2013, "Stressed Spaces: Mental Health and Architecture," an additional supporting peer research report by *Kathleen Connellan*, et al, begins with the question, "How does the intersection of mental healthcare and architecture contribute to positive mental health outcomes?" Connellan's report is comprised of 165 peer articles relating to health and architecture, with 25 articles containing relative data from empirical studies, and seven that are defined as review articles.[6]

Her team's findings strongly support and further discuss the research reported in Ulrich's et al "Toward a Design Theory For Reducing Aggression In Psychiatric Facilities." In addition, their findings dive deep into the subject of the positive, contributing impacts of "therapeutic milieu." Connellan specifically defines therapeutic milieu as a term "interchangeable with patient-centered design and healing environments."[6] In a 2011 study (Novotna, Urbanoski, and Rush) she and her team reviewed, it is stated that between 2007 and 2009 three years of focus groups were conducted, pre- and post-occupancy, to evaluate the cause and effect of the healthcare environment on patients, delivery of services and staff. The research was conducted at a large mental health Canadian facility with "using mixed method evaluation of clinical programs."[6] In summary, the focus groups made reoccurring comments and positive references "to comfort, abundance of natural light, freedom, reduced stigma with new spatial designs that mimicked a 'normal' community setting, and an enhanced sense of well-being."[6]

Connellan's et al paper also reviews a 2010 study (Golembiewski) that peers into architectural built environments in psychiatric care facilities and reports on how their individual space elements may impact mental health.[6] Golembiewski explores Antonovksy's salutogenic theory which proposes there will be "better health results from a state of mind which has a 'fortified sense of coherence' from an architectural perspective."[6] The salutogenic theory, from a psychiatric perspective is that the relationship of a space and its patient within is recognized "as being transactional and not fixed."[6] With salutogenic, it is believed the primary focus should not be on a patient's specific disease, its subsequent cause and effect, but rather a holistic, human centered treatment approach.[6] Golembiewski further

suggests, "the environment should ensure that perceptual cues are present to assist perceptual processes; clear textures, objects and lines should prevent the possibility of perceptual distortion and ambiguity" and through our "filters of memory, culture and epistemology," a psychiatric healing space should help with "comprehension and delusion" and be recognized by psychotic patients as familiar.[6] The report states this can be partly achieved by providing a therapeutic space which repetitive sounds are reduced and where the design simulates "a safe and cozy home"[6] In addition the salutogenic approach encourages daily "outside domestic tasks."[6] This is in the spirit of providing the patient with a sense of control and further negating the patient from feeling overly separated from their outside world.[6] With this in mind, the report recommends for these environments to have access to nature, healthy communication with family and friends, "sensory gratification" and even suggests the inclusion of pets.[6] Golembiewski believes these spatial stress reducers to be a foundational requirement for rehabilitation.

A 2006 evidence-based design report, by Karlin and Zeiss, that supports Golembiewski's paper, *"Environmental and Therapeutic Issues in Psychiatric Hospital Design: Toward Best Practice,"* outlines best design practices based on their review and compilation of anecdotal reports, clinical findings and a gradually increasing body of empirical data.[9] Their report focuses on many architectural variables of consideration within a psychiatric hospital design and further provides guidance on best design practices in an attempt to ensure optimal outcomes with patient and staff. Karlin and Zeiss classify these considerations into five categories:[9]

1. **Ambient features**
2. **Architectural features**
3. **Interior design features**
4. **Social features**
5. **Specific issues**

With each category discussed independently, applicable and of interest, it is the "interior design features" category that stands out because Karlin and Zeiss specifically address color. Considered to be too complex to independently research with depth within already complex space environments, color is often opportunistically omitted by modern day researchers who fail to address it in either positive or negative terms. In a departing approach, Karlin and Zeiss recognize color as a contributing "design element" and report that while studies have yielded inconsistent results relating to specific appropriate wall color choice, their findings demonstrated enough consistencies pulled from a large cumulative body of reports that allowed for "fairly consistent general recommendations."[9] The Karlin and Zeiss language is quite specific and proposes: "monochromatic, bland color palettes" and overly-fashionable, high-trend palettes should not be used.[9] Though "brighter colors" may be well received by patients, both young and mature, or those with depression, higher chroma palettes could be over-stimulating for highly agitable patient populations.[9] Karlin and Zeiss further classify warm blue tones to "often have a soothing or sedating effect, presumably because of their shorter wavelengths," which they believe lends warm blues to be ideal for patients and space areas that need a calming effect.[9] In regards to blues as a wider category, Karlin and Zeiss caution that if blue hues are "too cool" they may produce a counter, possibly negative effect, on patients. Particular patients with depressive mood disorders or who suffer

from low energy.[6] They further propose that a usage of "closely related colors of the same value and intensity (analogous palettes)" have been accounted to provide a "harmonizing, calming effect."[9] Then Karlin and Zeiss conclude their proposals with color to recommend seclusion room walls should express a "calm, but definitive color, never white or gray."[9]

Karlin and Zeiss' findings also further recommend the need for the design team to keenly accommodate, with a bundle of visual design features, "the competing goals of stimulating patients who are withdrawn and depressed without over stimulating patients who are manic and agitated, while simultaneously fostering a sense of optimism about hospitalization."[9] They recommend the differentiation of the various space functions/areas in a facility through "color, lighting, carpeting, wall graphics and furnishings."[9] Additionally, the incorporation of natural wood veneers removes institutional nuances and softens the appearance of institutional architectural features.[9]

Closely relating to color regarding design trends for healthcare interiors, because typically we do not view our natural world in bland monochromatic palettes of grey or in high-whites, is healthcare's passionate incorporations of both literal and simulated nature. For healthcare interiors, many view color to be foundational to evoking nature, and arguably both are contributors to a visually interesting, stimulating space. When nature applications are literal they include: water walls, aquariums, plants, therapeutic animals, views to outdoor landscapes and access to outside gardens. When nature applications are simulated, they often include: color inspired by nature, art and large graphic interpretations of figurative nature, music of outdoor sounds, and materiality representing nature, such as, woods, stone and embedded acrylics. Surprisingly, research indicates simulated references of nature, even brief encounters as short as three to five minutes, are equally impactful, and with speed, as literal examples of nature with reducing stress and restoring equilibrium.[10] This research and reporting predominately began with landmark 1984, 1991, and 1999 woods, stone and embedded acrylics.

Surprisingly, research indicates simulated references of nature, even brief encounters as short as three to five minutes, are equally impactful, and with speed, as literal examples of nature with reducing stress and restoring equilibrium.[10] This research and reporting predominately began with landmark 1984, 1991, and 1999 Roger Ulrich studies that clearly demonstrated positive distractions and exposure to nature significantly impacted patient outcomes.[10,12]

In the 1984 study, Ulrich analyzed and compared two post-surgical control groups who were matched with parity. It was reported patients in rooms that had views to trees versus a brick wall experienced more satisfaction with their comments, required less pain killers and shorter hospital recover stays.[10,12]

Notably, in 2004, *"The Role of the Physical Environment in the Hospital for the 21st Century: A Once-in-a-Lifetime Opportunity,"* published by Ulrich and Zimring et al, further reported adult patients who viewed upwards at a ceiling implemented with installed nature scenes while experiencing a distressing and painful bronchoscopy showed signs of a higher pain tolerance than patients who peered at a ceiling, with no visual interest, during the same procedure.[10,12]

Ulrich and Zimring et al further cite an experiment with control groups of volunteers within a hospital setting in which patients who watched a blank screen were reviewed against patients who viewed (without sound) a video depicting nature. The experiment reported that the control group who gazed at the nature video had a better ability for sensing pain and a greater tolerance for pain compared to the control who viewed only a blank screen.[10,12] Ulrich and Zimring et al research cites an additional study conducted on patients with severe burns. This study found when these patients watched video scenes of nature, while their dressings were being changed, they experienced an appreciable reduction in both anxiety and pain intensity. The report states the nature scenes were of "forests, flowers, oceans and waterfalls."[10,12]
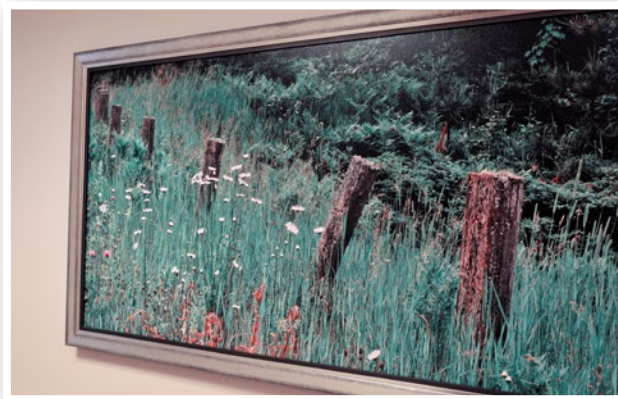
As time has passed, we further are provided credible research that indicates the important association with access to nature, as a calming aid and positive distraction, within clinical healthcare spaces. "Health Environments Research and Report," by Roger Ulrich and Zimring et al (2008), offers an interesting theory. The report outlines American biologist and researcher *Edward O. Wilson's* Biophilia theory. Wilson's biophilia hypothesis, published in 1984, states "that humans have a partially genetic tendency to respond positively to nature."[11] This theory believes there is an instinctive bond between humans and other living systems.[11] Through Wilson's research, Ulrich et al (1993) and Ulrich (2008) have provided theoretical explanations that state through the course of man's development, the survival of early humans favored those with a "rapid recovery from stress" following "challenging episodes," which translates to a "partially genetic proneness for a restorative response to nature."[11] Ulrich et al (1993) and Ulrich (2008) further explains this theory by explaining, "this restoration theory implies that modern humans, as a genetic carryover, have a capacity to derive stress-reducing responses from certain nature settings and content (e.g., vegetation or water) but have no such disposition toward most built or artifact-dominated environments and materials (e.g., concrete, glass, and metal)."[11] While admittedly these ideas are theoretical, they equally are compelling.

Best practice evidence-based design studies such as these continue to affirm the powerful impact of natural elements, which many feel cannot be separated from "an interesting, harmonizing incorporation of color" on patient recovery and stress reduction. In addition, emerging behavioral healthcare research indicates institutional psychiatric facilities with stressors in the environment obstruct coping, a sense of

control, increase patient behavioral discord and needs for patient restraint, and, most importantly, place staff at appreciable higher risk for harm.

Likewise, environments that are aesthetically pleasing and designed with a "bundle" of patient-centered therapeutic principles positively modify behavior, speed healing rates and create safer working conditions for staff. This bundle must be represented in totality, and addresses issues such as crowding, noise, privacy, control, humanness and familiarity. This also leads to staff experiencing a reduction in job strain and injury, and fostering higher satisfaction, leading to lower turn-over rates.

THERAPEUTIC DESIGN TENETS + BEST PRACTICES

Roger Ulrich's et al, *"The Role of the Physical Environment in the Hospital for the 21st Century: A Once-in-a-Lifetime Opportunity,"* established best practice therapeutic design tenets for healthcare environments. This report was further backed and expanded in 2008 with Ulrich's et al "Health Environments Research and Report." In a culmination of evidence-based research, teams found five design principles that contributed significantly to achieving therapeutic, patient-centered design goals essential for the psychological and physiological well-being of patients, families, and staff:[10,11,12]

1. **Provide access to nature**
2. **Provide positive distractions**
3. **Provide social support spaces**
4. **Give a sense of control**
5. **Reduce or eliminate environmental stress**

To place these in context for all healing environments:

Access to Nature—Substantially discussed above, studies indicate that nature might have the most powerful impact in helping patient outcomes and staff effectiveness. Nature can be literal or figurative – natural light, water walls, views to nature, large prints of botanicals and geography, materials that indicate nature (wood, stone, stuccos) and stimulating colors that evoke nature. In addition, numerous studies also demonstrate the restorative impacts of exposure to day-lighting and cheerfully illuminated interiors. This, combined with references to visual cues of nature, can dramatically improve health outcomes, such as depression, agitation, sleep, circadian rest-activity rhythms, seasonal affective disorders (SAD), as well as decreased pain, reduction of aggression and shortened length of stays.

Positive results linked to exposure to nature have been widely researched and repeatedly shown to yield measurable positive effect. This even includes patients with late-stage dementia, including Alzheimer's disease.[12] Another experimental study observed patients agitated aggressive behavior that sometimes occurs with showers and baths. The study reported when patient's were exposed to "sounds of nature (birds, babbling brook) and color nature pictures" their anxieties reduced.[12]

Studies such as these continue to affirm the powerful impact of natural elements on patient recovery and stress reduction.

Positive Distractions—These include environmental features that provide the patient and family with a positive diversion from "the difficult" and, in doing so, also negate an institutional feel. These can be views to nature but can also include: music, informative or graphically interesting feature walls, captivating art, literal or a/v aquariums, plasma screens, etc. Ideally, these should be focused on nature and, when applicable, an interesting use of color to add visual richness to the environment. Therapeutic environments that provide positive distractions are believed to directly aid both patients and visiting family members, even if temporarily, in mentally "letting go" of their current stresses and anxieties. Positive distractions are also believed to provide patients with feelings of confidence in their environment and in delivery of care by staff. This helps in opening lines of communication between patient and caregiver.

Social Support Spaces—These are spaces designed for patients and for the comfort and socialization of family members and friends. Therefore, day rooms, family lounges with kitchenettes, resource libraries, chapels and consultation rooms all play a role. These spaces are designed to be comfortable and encourage families to play an active role in the rehabilitation process when appropriate. Furthermore, research indicates family participation is more supportive and visitations are longer when spaces are designed with visual interest, comfort, variety in choice of moveable furniture and floods of day-lighting. This is shown to further normalize and offer mental equilibrium for the patient.

Sense of Control—When patients and their families feel out of control, the facility design and staff should provide a sense of calm. Depending on the patient population type and risk assessment qualifiers, these can range from the space delivering perceived notions and feelings of environmental control to space elements being fully within the patient's jurisdiction to manipulate at will. Although this cannot always be done suitably in severe mental healthcare facilities, it is a positive therapeutic design doctrine when possible.

These design features include optional lighting choices within patient rooms, options with type and location of movable furniture, access to informational resource libraries, food menus with enhanced options, private patient rooms that allow pin-up and personalization, areas to congregate with fellow patients or quiet secluded respite spaces. A few well-appointed studies in psychiatric wards and nursing homes have found that providing options for moveable seating in dining areas enhanced social interaction and improved eating disorders. When patients feel partially in control of their healing program, their dignity and self worth increase. Fears diminish as the environment feels more familiar. In behavioral healthcare, this can have a direct correlation in soothing patient equilibriums and lowering tensions.

Reduce or Eliminate Stress—For all healthcare, and especially for behavioral healthcare, the success of these healing environments (length of stay, patient and staff injury, delivery of care costs, and readmission rates) overwhelmingly rests on the reduction or elimination of environmental stressors. The success of the first four discussed architectural tenets, designed and effectively implemented as a "bundle," are required for a harmonious, familiar, human-centered environment that reduces stress. Overwhelming

research continues to reveal that we cannot pick and choose which healing tenets we indoctrinate and expect any measurable favorable results. In addition to an additive approach of healing milieu, there is a need to reduce or remove exponential environmental stress, such as random and jarring acoustics, harsh artificial lighting, disruptive staff chatter (especially when these elements interrupt a patient's sleep) and all visual, auditory, tactile, and olfactory references to the institutional and "unnatural."

> Regarding color, palettes are purposefully tying back to local nature, and designers are applying color with intent, creating more expression via surface paints, flooring products, furnishings and even large mural artwork.

HOW HUMANIZING COLOR PLAYS A SIGNIFICANT ROLE

In doing so, these same professionals are creating interiors that are no longer neutral, but instead rich in color and designed to stimulate patients to the right degree. Taking cues from healthcare's people-centered interior findings, behavioral healthcare planners and designers are recognizing a need to incorporate dignity, boost patient morale, encourage positive social engagement, lower patient tensions, improve staff safety and reduce America's readmission rates.

Recognizing color as a high-powered, expressive and inexpensive design tool, that costs no additional expense than choosing white paint and furnishings, many designers are leveraging color for impact. Designers are turning to interesting hues combined in interesting combinations to brighten spaces, soothe souls and remove institutional bleakness. Often designed by true colorists, these palettes are becoming savvy and are purposefully implemented to remove the drab and add visual interest to harmonize, dignify and visually soften institutional settings. They are exploring splashes of grounding earth colors, pops of expressive chromas, and balancing, soothing hues to calm the senses. These palettes often mix varying degrees of saturation and values of the same hue families. They are uplifting color arrangements designed with well-being and mental equilibrium as the core intent.

These behavioral healthcare designers are on the right track. Science may not yet explain the total extent to which color contributes in these environments. However, researchers studying the subject agree color's role in providing a more visually interesting and expressive interior that directs an individual's attention outwardly and provides a diversion that relieves tension and stress. With this knowledge, and one's own sensory, it is hard to consider how the use of feel-good color in behavioral healthcare would not play a key role in negating an otherwise white, bleak and institutional space. In a 2011 dissertation paper by *Moamer M. Gashoo* regarding healthcare healing environments, Gashoo reports color as an important design element in these interiors because it can be leveraged, with ease, to improve the feel of an environment and assist "healthcare organizations to generate a favorable effect."[13] Gashoo further states that color's value to built environments is more then aesthetic and the attention to empirical data research in the field of color is implicitly weak. He states peers acknowledging that there are existing problems with the application of color in built healthcare environments is the first step to us understanding and discussing more about it.[13]

It is easy to identify that color continues to be a design phenomena, weighted with many opinions, and until it's deeper reviewed with controlled studies that focus on space design, designers do not have objective, free of debate, best practices guidelines on how to apply it. It is also important to understand color is not a pigment or a dye. It is light, with each color having a unique wavelength, which is received via our retinas, and which in return sends electrical impulses to our brains. Regardless of more empirical color data regarding individual hue responses within spatial environments, there are a plethora of controlled color research studies that indicate color has a physiological impact on humans (Torrice 1989, Elliot 2007, Küller et al 2009, Zhu 2009, Elliot 2011). Not regarding its application, but color as a subject to research is undeniably complex. For researchers, with merit, to lay any claims regarding color's influence in built environments, research teams need to start with addressing color as a physical materiality, light, versus an object, such as paint. Studies need to also take into foundational consideration that a human rarely to never receives color experiences with one hue. Instead our color experiences are that of layered hue combinations, with each palette having degrees of each hue's proportion and saturation levels.

Regardless of this, as we look further into color's contributions, designers know this design tool plays a foundational role in materiality, art work, and furnishings that tying into patient rooms, staff areas, and inviting home-like social support settings, such as day rooms and kitchenettes. Many believe colors role within these architectural and ancillary design items to be a must for any interior that has the goal of harmonizing and lifting spirits. It is also believed a successful combination of these elements, in partnership with additional elements such as natural lighting, reduced acoustics, and a sense of control, can further negate institutional nuances and reduce tensions.

We are also seeing color play a more functional role in managing way-finding needs and "migrate-able" furnishing allocations. In simpler terms, color also is being used to visually script key areas of designation such as floors and wings. In doing so, this gives a sense of direction and highlights when portable furniture has been faultily relocated.

Additionally, an important topic not to be overlooked is the necessary staff. Behavioral healthcare professionals often spend more time within these facilities then their patients. Struggling with same economic and demographic issues as general healthcare, retaining these specialized health practitioners has become a nationwide problem. Baby boomers are retiring, employees can yield more benefits in other sectors, and job satisfaction diminishes significantly when fear and stress are present. Also, studies report that staff personnel need to feel a more direct sense of care from supervisors, and mounting levels of research studies indicate that one's surroundings play a key role in these feelings.[8,10,11] For years, the corporate sector has recognized the role the environment plays in employee recruitment and retention and how this directly impacts the functions of an office or facility. It is now time for institutional sectors to quickly recognize the same because this need is dire and of great significance.

In parallel to patient areas, this has translated into the introduction of nature-centered color, softer furnishings and, at times, artwork being incorporated in staff support areas to boost their moral and sooth the psyche, making them feel cared for and ultimately safer.

WHY THESE COLORS?

After working closely with Norix Furniture since 2008, it can be said with confidence that Norix believes in the power of architecture and design to promote better user and facility outcomes. Norix Furniture listens intently to A+D and facility experts' needs and strives hard to be a partner and furniture manufacturer that creates working solutions that provide positive impacts.

It can be argued that we designers are only as strong as our tool box, and Norix Furniture wants to be the tool box for colorful, attractive, comfortable, durable and safe intensive-use furniture. The company's sales throughout all of its markets, including behavioral healthcare, show an increasing shift from monochromatic neutrals to true colors and a mix of complimentary hues.

With the variety of space types, demographics and regional aspects that fall within U.S. behavioral healthcare facilities, Norix Furniture's *Naturals Collection* gives you solid color choices with wide reach. These are complex space designs and no two projects share the same programmatic needs or replicate identical aesthetics. Only the immersed planning and design teams know the best solutions for their spaces and the *Naturals Collection* is designed to empower you with appropriate choices.

With this, the *Naturals Collection* provides soothing hues, grounding earth tones, enduring regal colors, and even expressive vibrant pops – all are inspired by nature and are timeless, classic, enduring, while also "on trend." The *Naturals Collection* is also designed with population type, gender, age and region in mind. Whether your project is male or female, adult or youth, or in Miami as opposed to Kansas City, or urban opposed to smaller township, you have choices that are responsive to these variables. As we healthcare designers know, the concept of "one size fits all" does not apply in these healing spaces.

| Canyon | Wild Berry | Meadow | Mojave | Pine Cone | River Rock | Lagoon | Sea Syrey | Graphite | Raven |

The *Naturals Collection* responds with these 5 primary considerations:

1. **Patient Population Type**
2. **Gender: Male versus Female**
3. **Age: Adult versus Youth**
4. **Space Location: Within the Facility**
5. **Geographic: Region of Facility**

Patient Population Type –

Gender—It is a fair consideration that men and women, generally speaking, prefer different interior color palette expressions. This is due to the sensory of certain colors and a culture's positive or negative stigma with color regarding gender. When selecting colors, men's facilities should be void of palettes that feel overtly female and with an intent to control and demote. Lean to grounding colors like camels, navys, eggplants and tabascos are good choices. With female populations, there is a push to ensure these interiors retain their gender identities. Woman routinely express themselves with color and often have a closer connection with color as society more readily accepts female expression through the application of color. This can often be witnessed in the choice of hair color, nail polish, apparel, and even down to the footwear and accessories. There are many directions an appropriate feminine palette can take. The biggest goal is to provide expression, a degree of softness and interest, and not to over-stimulate.

Age—As we mature, our eyes and psyche respond more positively to very sophisticated color combinations and palettes with a variety of contrast, typically with neons eliminated. Our eyes search for varying shifts in value and seek refinement, which can be achieved by adding tints, tones and colors that are tempered with white and grey undertones. However, children with their more energized psyche can easily find comfort in and often search for color with vivid saturation – what many adults would consider "super brights." When applied properly, this can provide a sense of familiarity for youths who may feel out of control and placed in drab institutional settings that are administered by adults. As with all interiors, one wants to be sure to not randomly or over apply brighter saturations, which can be powerful if not respected. Therefore, restraint may be required for certain behavioral populations like autism. Also, brighter colors applied in furnishings versus large architectural planes are also a way to incorporate expressive hues and not over-stimulate. However, for a youth to gain confidence in a facility, which includes its healthcare practitioners, it is important that their surroundings feel catered to them, not overly mature.

Space Location within Facility—Also essential to reflect upon is the length of stay in a particular space/zone, because shorter term stays in visiting centers, cafeterias, and some social support spaces may allow for more color freedom and visual activity than a longer-term stay such as in an inmate's cell. Spaces that are more transitional, along with walls, floors, ceilings and upholsteries can all be richly saturated and balanced with neutrals and natural materials. In areas where occupants spend more extended periods of time, the walls and ceiling are most suitable in softer tints and tones, while the floor, upholsteries and accent wall may receive pops of interesting color. Yet, it is important that areas do not feel clinical or drab, but instead inviting and visually interesting. In holding areas, consult rooms and

programming areas, great sensitivity should be given to not over stimulate with color. Therefore, it is advised to utilize soothing tones and have less contrast.

Geographic Region of Facility—The geographic region of a facility must be considered when using color as a tool. Color and nature play a heavy role in familiarizing the patient so they can re-enter society with ease. Also, when spaces feel familiar, inmates subsequently feel more human and normal. Since we now know that nature aids in reducing stress, the outdoor landscape in which an occupant is accustomed to plays a big influence on how they respond to color that is inspired by nature. An inmate living in Seattle would most likely have a different color response than an inmate who lives in Miami. From region to region, flora and fauna and their supporting effects can be quite different. One region may have polychromatic botanicals and tourmaline blue waters, while another region has forest colors and grey skies, likely influencing an occupant's perception of color and their preference for color saturation. For example, it is not unusual for inhabitants of the Southeast to prefer spring greens while Midwesterners favor deeper, more muted greens. This partiality is indicative of the type of greens they experience in their surrounding nature.

Though the healing/human component is case critical when selecting color for a collection that serves rehabilitative interests, there are more requirements that this color collection must deliver. The following is a list:

1. **Color Inspired by Nature**
2. **Timeless Classic Color**
3. **Color that is Current + Resonates w/ A+D**
4. **Color that Enhances the Material of the Product**
5. **Bring Innovation to the Design Market Place**

Type of Treatment of Patient Population—This should always influence palettes chosen for rehabilitation. Designers/colorists should consult firsthand with top facility practitioners, per patient population type, to thoroughly understand the illnesses and treatments the facility will be administering before choosing colors. Though research continues to provide conflicting data regarding universal responses to color within interior environments, color professionals, as their architectural colleagues agree, are not painting emergency exam rooms and surgery pods, floor to ceiling, in bright mangos. Nor are they painting autism rooms and corridors in acidic yellows. Why? Because, regardless of contradicting research reports, most colorists intuitively feel this would do great harm to the patient population within. Instead spaces with populations that have high tension, fear, and a lack of trust should look to soothing, receding hues, with shorter wavelengths like contemplative blues or uplifting, cheerful greens. Both of these color groups tend to remind us first of our connection to nature. In appropriate and non-competing values and saturations, these colors can be soft, soothing, livable, and promote healthy socialization and mental equilibrium. Some of these include: topaz, robin egg blue, sage, mint, moss, spring green, lemongrass and Caribbean blue. Red hues proceed, have longer wavelengths, and overall are closer to infrared and more fire-y and expressive. Appropriate shades can be brick, crimson, tabasco, autumn leaf and garnet. With ease these chromas can add visual stimulation and negate institutional nuances. Many believe their warmth can assist with deterring "the blues." These hues have a strong voice that should be recognized, but when used sparingly and with purpose, they can be the perfect addition for populations struggling with lethargy and depression.

Pops and accents are perfect. Grounding colors like camels, slates and deep wild berry are handsome, sophisticated, and dignified. These are colors of interest, which behave like neutrals, and are perfect for populations that warrant an aesthetic interior but that require a quieter voice. In summary, working with autistic children you may choose less intense, potentially distracting colors, while a substance abuse clinic you may choose brighter, cheerful colors to lift and inspire. Either way, your patient population plays a role in these decisions.

Color Inspired by Nature—Behavioral healthcare colors want to resonate nature, be found in nature, and typically reflect the regions indigenous flora and fauna. It's critical for treatment and re-assimilation into communities that these interiors feel visually familiar and grounding. For The *Naturals Collection*, colors have been selected and provided that widely appeal to regional landscapes across the U.S. Whether the facility is in Miami with springtime colors or in Colorado with woodland colors, The *Naturals Collection* has appropriate options.

Timeless Classic Color—Many research papers on healthcare, and especially behavioral healthcare, advise that these interiors do not want to be faddish palettes spurred from the latest runway fashion trends. When fresh and current, at best, a trendy metropolitan palette can feel out of norm for many patients, and as faddish palettes fall out of fashion grace, they cause healthcare interiors to feel tired and cliché. The *Naturals Collection* is designed, and inspired, from every day wonders we see in nature. From small robin eggs, to topaz gemstones, large lagoons, spring grasses, fall leaves and grand canyons, sun-kissed wheat fields and beach sands, pinecones and barks, to slate and river rocks. Nature is the palette's foundation that ensures the colors are familiar, not overly trendy, timeless and have staying power. With an added benefit, they also diminish the need for any near future product obsolesce.

Color that is Current + Resonates w/ A+D—Even with timeless classic color there are color trends. Enduring colors are not as likely to shift from year to year, but color in design still presents style and can slip in and out of vogue. Today's A+D color trends in behavioral healthcare are continuing to shift and, at times, become more expressive. The more we understand that color is an aid to our therapeutic designs, the more we are realizing we have had it form many years only in "first gear." Color is now being kicked into high gear for institutional environments, and it is exciting to be part of. Again, space type and population type plays a big role in the appropriateness of tint, tone and saturation. But, we are seeing colors become more expressive, weighted in nature and fall "warmer." The fleshy beige has turned more camel, the pastel greens moved to sages and spring grasses, the persimmons to vermilions, and grey-ish steel blues have pushed to clearer topazes and warmer robin eggs. We are seeing a loftier play on tertiaries, both soft and expressive. With The *Naturals Collection* inspired by timeless, classic natural hues it also incorporates A+D friendly, current trending.

Color that Enhances the Material of the Product—Since Norix's main products are polymer moldings and vinyls, The *Naturals Collection's* colors are also designed to remove any "synthetic material feel" and enhance Norix's materiality that provides superior durability in rugged applications. More natural, expressive, and at times, very saturated tones enrich the quality of Norix's materials. The aid of color removes institutional nuances, adds play and interest, and even visually softens. No one is suggesting that users will be deceived into believing a chair is of a natural, organic origin or upholstered where it is not, but the palette choices bring an undeniable sophistication and interest to Norix's materiality.

Bring Innovation to the Market Place—Norix has a big feather in its hat – this is its "big ears" and "innovation." This is a perfect marriage in market places that are dynamic, about the human and being designed by science. A goal for The *Naturals Collection* is for the color and science behind this series to resonate with designers and contribute to innovative approaches, forward design and keen understandings. Forward in color, forward in knowledge, forward in quality and performance. Obviously color in itself cannot deliver all of these attributes. But it can be a big contributor in designers' awareness, respect and willingness to partner with Norix to humanize challenging environments.

CONCLUSION

Many find the trends towards human-centered behavioral healthcare design to be compelling, of great interest, socially responsible and of large need. Many designers are now shifting their attention to behavioral healthcare's potential for positive outcomes through evidence-based design so behavioral healthcare is uniquely suited for exciting explorations. Since these environments are very complex and performance based, it is presumably understood that there is no silver bullet solution for challenges that must address delivery of care, efficacy, cost and staff. Instead, research indicates a need for a bundle of elements, all working in tandem, serving as contributors for needed outcomes and color is a critical element in this milieu. This shift in advocacy is to be understood, as not solely a plight to humanize the patient, but in very real terms, as a combined effort to protect and promote staff, reduce readmissions, add to our communities and lower expenditures. With access to behavioral health more available now than any time in our nation's history, it is imperative we build and design spaces that produce healing results. As evidence-based researchers qualitatively continue to demonstrate the influence of environmental elements on mediating stress, anxiety, and aggression, we expect a deeper dive into evidence-based research specific to behavioral healthcare populations. Until then, as with all emerging design and thought leadership subjects, there will continue to be trail blazing planning and design professionals that, when challenged to apply their knowledge and make a difference, will apply healthcare's evidence-base best practices to provide improved, patient-centered—and simply, people-centered—spaces.

ABOUT THE AUTHOR

Tara Hill is a full-scope, state registered interior designer, and the founder and principle of *Little Fish Think Tank*. Before founding Little Fish, Ms. Hill was an Associate + Senior Designer at HOK, and the Director of Interiors at Stanley, Beaman & Sears. She has implemented award-winning, innovative design solutions for commercial and institutional interiors. Ms. Hill also has significant experience regarding the science and theory of color, both as a design tool and a promoter of healing. She has conducted extensive research in evidence-based design regarding color and its profound impact on the human spirit. Prior to her work with Norix, Ms. Hill developed the Healing Colors Collection for Corian® solid surfaces, by Dupont®, for the healthcare environment. *www.golittlefish.net*

ABOUT NORIX

Norix designs innovative, robust furniture that meets the real-world need for humanizing challenging environments. For more than 30 years, the company has served the behavioral healthcare, corrections, higher education, fire/rescue, military, shelter, public safety and variety of commercial industries by providing uniquely reliable furnishings for every application. All furniture is designed for safety, security and extreme durability. Norix furniture is extraordinary by design, surpassing industry standards for strength, safety and long-term performance. Aside from its durability, Norix products also come in aesthetically pleasing designs and colors and are made especially for facilities that require furniture that can humanize their environments. The privately held company is headquartered in West Chicago, IL with consultative sales representatives and dealers throughout the U.S. In 2012, Norix launched Safe Environments, a news and information blog serving architects, designers, administrators and facility managers involved in the design, construction, and operation of challenging environments. For more information, call *800-234-4900* or visit *www.norix.com.*

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