A Hospital's Contemporary Art Collection: Effects on Patient Mood, Stress, Comfort, and Expectations

Meghana Karnik, BA; Bellamy Printz, MFA; and Jennifer Finkel, PhD

ABSTRACT

OBJECTIVE: It is not firmly established whether an art collection of diverse subject matter, media, and imagery in the hospital environment can play a significant role in mitigating the psychological stresses and physical pain associated with a hospital visit, or whether it improves patients' satisfaction with their care. The variety of contemporary art displayed in the institution investigated in this paper served as a case study to assess the qualitative and quantitative effects of such a collection on patient health and experience. We sought to assess whether the diversity in subject matter, imagery, and media would positively affect patient mood, comfort level, stress level, and expectation of visit.

BACKGROUND: Previous research concluded that nature art (i.e., representational depictions of nature) has positive effects on patient health outcomes. Studies to date have assessed the effects of individual units of artwork rather than that of an art collection as a whole.

METHODS: A survey was sent to 4,376 members of an online Patient Panel, comprised of patients who volunteer to evaluate their experiences

at Cleveland Clinic. For this study, Panel members were screened based on whether they had been to the Main Campus in the past 12 months.

RESULTS: A majority of respondents noticed the artwork, had improved moods and stress levels due to the artwork, and reported that the art collection positively impacted their overall satisfaction and impression of the hospital.

CONCLUSIONS: Our findings demonstrate that this particular collection has a significant effect on the patient experience and on self-reported mood, stress, comfort, and expectations. These results suggest that patients may respond positively to the diversity of the collection, and to other types of art in addition to nature art.

KEYWORDS: Art, healing environments, hospital, patient-centered care, satisfaction, case study

AUTHOR AFFILIATIONS: Meghana Karnik is an MA student at Columbia University. Bellamy Printz is a Curator at Cleveland Clinic Art Program, Arts & Medicine Institute. Jennifer Finkel is a Curator at Cleveland Clinic Art Program, Arts & Medicine Institute.

CORRESPONDING AUTHOR: Jennifer Finkel, PhD, finkelj@ccf.org; (216) 448-0233.

ACKNOWLEDGMENTS: We sincerely acknowledge the contributions made by Michelle Frietchen and Jordan Zivoder of the Cleveland Clinic Market Research

Department, who prepared and distributed our survey to the Patient Panel and analyzed the data; and Amy Moore, Manager of Cleveland Clinic Writing Education Program, who reviewed our paper to ensure that it met the standards of the scientific research community.

PREFERRED CITATION: Karnik, M., Printz, B. & Finkel, J. (2014). A hospital's contemporary art collection: Effects on patient mood, stress, comfort, and expectations. *Health Environments Research & Design Journal*, 7(3), 60–77.

he hospital environment is an essential component of a patient-centered practice. Art in particular plays a significant role in the healthcare setting because it can mitigate the psychological stresses and physical pain associated with a hospital visit or stay, improve patients' satisfaction with their care, provide an opportunity for intellectual engagement, and reduce hospital length of stay (LOS). This study took place at a tertiary care academic medical center with an in-house art program that acquires and installs art throughout the health system, which had over 5 million patient visits in 2012. The program's mission is to enrich, inspire, and enliven the experience of patients, visitors, employees, and community, and to embody the core values of the institution: collaboration, quality, integrity, compassion, and commitment.

This institution's fine art collection is composed of non-representational, abstract, and representational imagery, including nature imagery; an assortment of artistic media; and covers a variety of subject matter. For the purposes of this article a "collection" is defined as multiple units of artwork. The collection comprises more than 5,300 works by artists of all career stages from local, national, and international communities; and includes paintings, prints, works on paper, photography, sculpture, and videos. "Nature art" in this institution's collection is defined as imagery referencing the outside world, depicting nature, and produced through various media. "Abstract art" is defined as non-representational or stylized, in various media.

The fine art is installed in public spaces and public corridors. In addition to fine art, this hospital installs art posters in exam and patient rooms and in clinical corridors. The posters are of a wide variety of subject matter from nature and landscape to abstract imagery, which mirrors the diversified fine art. The majority of the posters in exam and patient rooms feature nature or abstracted landscape imagery. Key curatorial themes of the collection are the human condition,

global connections and diversity, popular culture, innovation, and collaboration. These themes are evidenced by the inclusion of portraiture, still life, landscape, conceptual, and text-based work. The art program identifies contemporary art in particular as encouraging a dialogue on topical interests, fostering an environment of creative excellence, and inspiring viewers to experience different points of view. Contemporary art for this paper is defined as artwork that has been produced within the last 30 years and therefore encompasses a broad variety

The goal is to exhibit a set of diverse artworks that create a cohesive visual impression and narrative—a "patient-centered curatorial practice."

of styles, genres, and media. The collection includes works by artists such as Vik Muniz, Jennifer Steinkamp, Los Carpinteros, Jonathan Borofsky, Willie Cole, and David Levinthal. There are site-specific installations by Iñigo Manglano-Ovalle, Alyson Shotz, Catherine Opie, Jaume Plensa, Sarah Morris, and others. Contemporary art also complements the institution's hospital environment, which is both modern and minimalist. Against this backdrop, the art collection accompanies patients from every entrance to examination room to patient room to discharge (Figure 1).

The art program's curators recognize that art in the medical setting can assist in the healing process and well being of patients and visitors. The curators attempt



Figure 1. Admitting and Registration, Main Campus.

Copyright Thom Sivo Photography.

to identify variables that would affect a viewer's perception of an artwork, such as health conditions, length of stay, demographics, purpose of visit, etc., and each artwork is considered on an individual and collective basis for each particular situation. Curators regularly meet with caregivers, administrators, architects, and construction management to assess the needs of specific patient populations. The goal is to promote a restorative patient experience by exhibiting a set of diverse artworks that create a cohesive visual impression and narrative within the environment—a "patient-centered curatorial practice."

Background and Context

Past research has established the positive effects of one specific type of art—nature art, that is, representational depictions of nature (Ulrich et al., 2008). Some studies measured patient preferences of artwork while others were clinical that measured the impact of certain genres of artwork on patient health outcomes (Ulrich et al., 2008). For example, a preference study of hospital patients and design students concluded that nature art is appropriate for hospital settings because patients consistently preferred nature and realistic content over abstract or stylized content for their rooms (Nanda, Eisen, & Baladandayuthapani, 2008).

In a study done by Ulrich, Lundén, and Eltinge (1993), patients were randomly assigned to rooms that provided exposure to either an image of nature, an abstract image, or no image. Patients exposed to the nature image experienced

less postoperative anxiety and were more likely to switch from strong analgesics to weaker painkillers during their recovery than either of the other groups. Patients exposed to an abstract image experienced more anxiety than those with no image (Ulrich, Lundén, & Eltinge, 1993). The abstract images used in the study were computer-generated, created for the study to represent "abstract art." Some researchers question whether the results would be different if the abstract images had been developed by an artist's hand instead (Nanda, Eisen, & Baladandayuthapani, 2008).

Current research has not analyzed the impact of a variety of genres within one study, or that of a diverse collection of visual artwork on patient well being. This study was initiated to address this gap in research by asking patients to participate in a post-visit, self-reported patient experience survey. The diverse collection of contemporary art at the institution in this study presented an opportunity to collect data on patient experience rather than patient preferences. This is not a clinical study.

Materials and Method

This study was exempted from IRB approval. The institution is a tertiary care academic medical center located in the Midwestern United States. The institution's Market Research and Analytics team implements primary research for various departments, including administrative, clinical, operational, and patient experience. For this study, this department developed a survey with the art program in order to capture and analyze responses to the art collection. The survey was then emailed to all members of the Patient Panel, comprising patients who volunteer to evaluate their experiences at the institution to gain insight on patient experience, awareness, and satisfaction. Patients are recruited for the Patient Panel through a variety of methods, including community meetings, direct mail, and emails. To comply with HIPAA regulations, patients who are interested in joining must double opt in by answering two series of questions that

DEMOGRAPHIC		SAMPLE	
Gender	Male	5.3%	
	Female 63	3.7%	
Age	18–24 0.0	05%	
	25–34	4%	
	35–44	4%	
	45–54 20).7%	
	55–64	5.3%	
	65+).7%	
Race	Caucasian 93	3.9%	
	African American 2.8	8%	
	Other	3%	

help categorize them according to age, gender, race, and ethnicity (see Table 1). Panel members also have the option to list any health issues.

At the time of the current study (April 2012), there were 4,376 active panelists consisting of patients who had received care at the institution within the previous 2 years. No more than 10% of the panel consisted of current employees. A soft launch was deployed to 350 Patient Panel members before sending the survey to the entire Patient Panel population. The soft launch ensures that all questions were programmed correctly and no panel members had any confusion answering the questions. An email was sent to all 4,376 members of the panel inviting them to take the survey. The survey was open for one full week (April 9–16, 2012). The email also stated that those who completed the survey would be entered into a lottery to win one of four \$50 checks. We employed a screening criterion where respondents had to have been to the institution's Main Campus within the previous 12 months. Respondents were disqualified if they indicated that this had not been the case and were screened out. The Main Campus comprises both inpatient and outpatient buildings, including specialty centers.

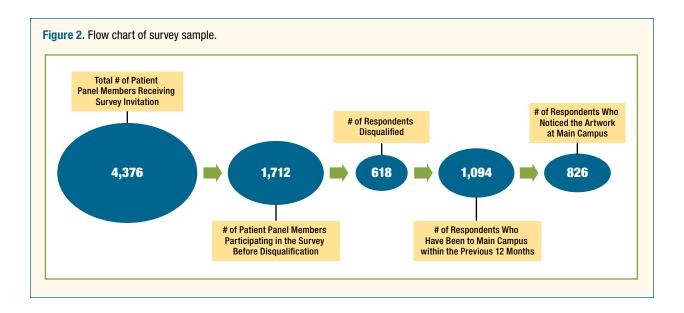
Survey Design & Data Analysis

All panelists were first asked to answer a set of questions about the environment of Main Campus and then asked to report whether they had noticed the artwork. Only those who answered "yes" were asked to proceed with the rest of the survey. The survey included qualitative, quantitative, and open-ended questions. For the quantitative questions, the panelists were asked to score a number of descriptors using a 5-point Likert scale. All the questions on mood, comfort/pain, and stress were scored on an anchored scale ("significantly worsened," "somewhat worsened," "no effect," "somewhat improved," "significantly improved," N/A). The anchored scale was used to have a negative side and positive side with "no effect" in the center. The descriptors were not accompanied by definitions but respondents had the option of reporting "not sure." The results in this article are reported as percentages based on top box scores (4 or 5 on the Likert scale). Demographic and previous medical history was not collected from the survey, rather the data was collected when the participant joined the Patient Panel. The survey did include questions relating to length of stay (1 day, 2 to 3 days, more than 3 days), type of appointment (outpatient, outpatient procedure/ surgery, inpatient), and type of visitor (employee, patient, family member).

Using SPSS version 19, cross-tabulation and frequencies were used to examine the percentage of patients' responses for each question. Statistically significant differences (p value < 0.05) between subgroups were calculated using the Chi-Square Test of Independence. Under identical survey conditions, 95% of the time, the results of this survey should fall within a +/-2.96% margin.

Results

Figure 2 illustrates how participants qualified for the study. Among these 1,094 respondents who noticed the art on Main Campus, 81% of those in the 35–44

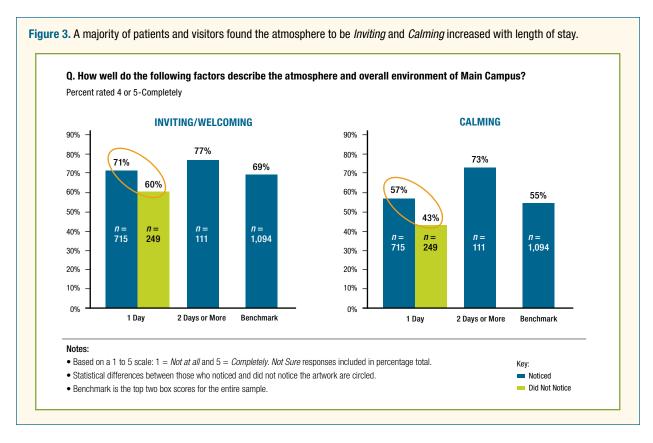


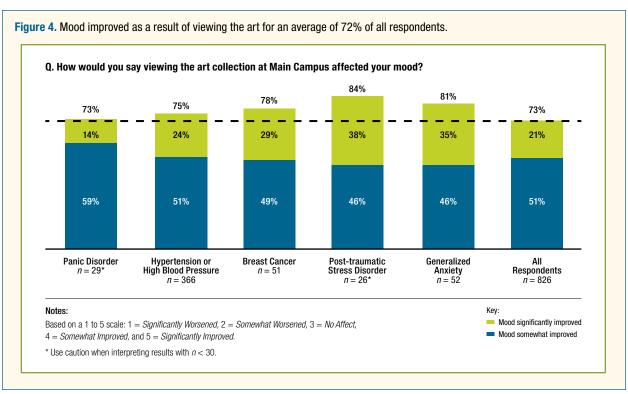
year age group were most likely to notice the artwork, versus 78% in the 25–34 and 45–54 age groups; 74% in the 55–64 group; and 73% in the 65 and up group. Of the female respondents, 76% reported that they noticed the artwork, versus 74% of the male respondents.

The longer the respondents were on Main Campus, the more likely they were to notice the artwork. Of patients or visitors who were there for only 1 day, 74% noticed the artwork. For respondents who were in the hospital for 2 to 3 days, 78% noticed the artwork. Of the respondents who were in the hospital for 3 or more days, 95% noticed the artwork (p < 0.05).

Atmosphere

Respondents were asked to evaluate the overall environment and atmosphere using five descriptors: Healing, Inspiring, Stark/Bare, Inviting/Welcoming, and *Calming* (see Figure 3). These descriptors are the top five commonly used terms in previous patient testimonials to describe the overall environment. Of patients who visited for a single day, 50% of respondents who noticed the art felt that the environment was Inspiring, compared to the 31% who did not notice the artwork. If the patient stayed for 2 days or more, 60% of those who noticed the art described the environment as *Inspiring*. Of the patients who visited for a single day, 71% of those who noticed the art described the environment as *Inviting*/ Welcoming, versus 60% of those who did not notice the artwork. If the patient stayed for 2 days or more, 77% of those who noticed the art described the environment as *Inviting/Welcoming*. Patients who visited for a single day found the hospital setting Calming (57% who noticed versus 42% who did not notice the art). If the patient stayed for 2 days or more, 73% of those who noticed the art described the environment as Calming. The surroundings of the hospital were also described as Healing by patients who visited for a single day (53% who noticed versus 42% who did not notice the art). If the patient stayed for 2 days





or more, 67% of those who noticed described the environment as *Healing*. Of patients who visited for a single day, 21% of those who noticed the art described the environment as *Stark/Bare*, as opposed to 20% who did not notice the art.

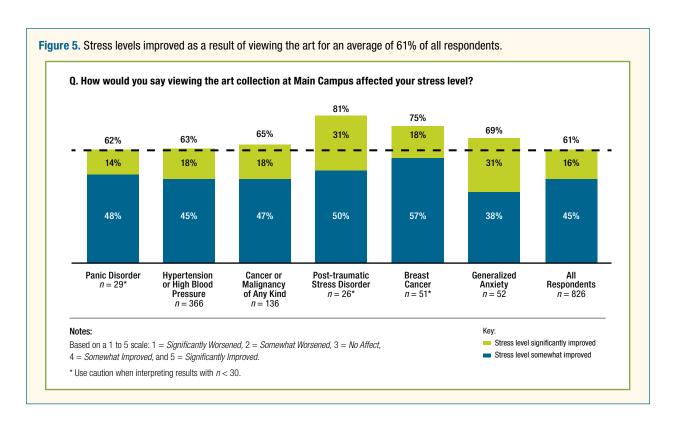
Mood

Of the 826 respondents who noticed the artwork, 73% said that their mood somewhat or significantly improved. Patients who reported having hypertension, breast cancer, panic disorder, post-traumatic stress disorder (PTSD), or generalized anxiety, in particular, indicated that their mood somewhat or significantly improved, ranging from 73% (panic disorder) to 84% (PTSD) (Figure 4). Of the 56 respondents who were at Main Campus for 2 to 3 days, 91% reported that the artwork improved their mood versus 71% of the 715 single-day visitors.

Of the 826 respondents who noticed the artwork, 73% said that their mood somewhat or significantly improved.

Stress Level

Of the 826 respondents, 61% said that the artwork somewhat or significantly reduced their stress levels. Of patients with cancer or a malignancy of any kind, 65% reported an improvement in their stress levels; 75% of breast cancer patients experienced improvement in their stress levels. Additionally, 69% of patients with generalized anxiety and 81% of patients with PTSD saw an improvement in stress level. Among patients with PTSD and generalized anxiety who noted an improvement in their stress level, 31% noted a significant improvement rather



than describing it as "somewhat improved" (Figure 5). Of the 56 patients who were at Main Campus for 2 to 3 days, 72% said the artwork somewhat or significantly improved their stress levels in general, compared with 60% of the 715 single-day visitors. Of those respondents who spent 2 to 3 days at the hospital, 27% reported that their stress level significantly improved.

Comfort or Pain Level

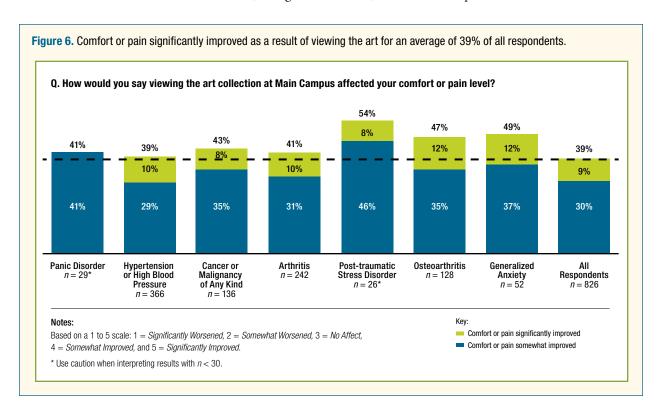
Of the 826 respondents, 39% said that the artwork somewhat or significantly improved their comfort or pain level. Fifty-four percent of patients with PTSD and 49% of patients with generalized anxiety noted that their comfort/pain level improved. Forty-seven percent of patients with osteoarthritis and 43% of cancer patients responded with an improved pain/comfort level (Figure 6).

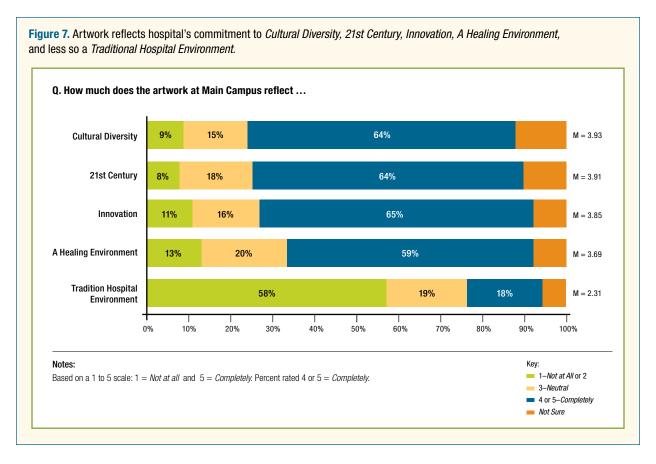
Descriptors of Environment

Of the 826 respondents, 65% reported that the artwork reflected *Innovation*, 64% said it reflected *21st century* or *Cultural Diversity*, 59% said it reflected *A Healing Environment*, and 18% said that it reflected a *Traditional Hospital Environment* (Figure 7).

Descriptors of Artwork

Respondents were asked to rate a list of 24 descriptors of the artwork on a scale of 1–5 (see Figures 8a and 8b). Of the 826 respondents, 73% described the art





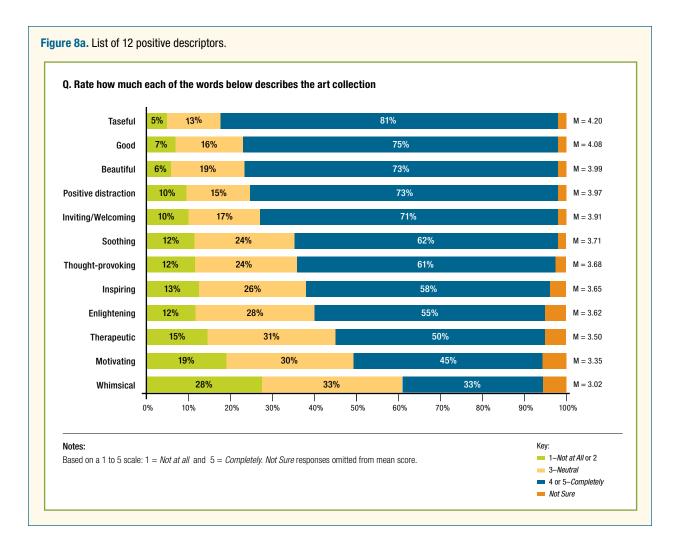
collection as *Beautiful*, 81% as *Tasteful*, and 73% as a *Positive Distraction*. In addition, 7% described the artwork as *Cold*, 6% as *Unnecessary and Boring*, and 5% as *Ugly*. In the section where respondents could write their own descriptors, words like "nice," "interesting," "variety," and "enjoy" were commonly used.

Overall Impressions

Of the 826 respondents who noticed the artwork 78% reported the art collection had a positive impact on their overall impression of our institution; 61% said that viewing the art collection at Main Campus improved their overall satisfaction with their experience; 68% reported that they did not expect to see this kind of artwork in a hospital.

Other

Of the 826 patients who noticed the art, 77% read the didactic labels that accompany the artwork at some point during their visit; 14% of respondents read most of the labels; and 63% read some of the labels. Only 8% of respondents indicated that they were with children during their visit. Among the individuals with children, 58% were able to recall that the child had noticed the artwork.

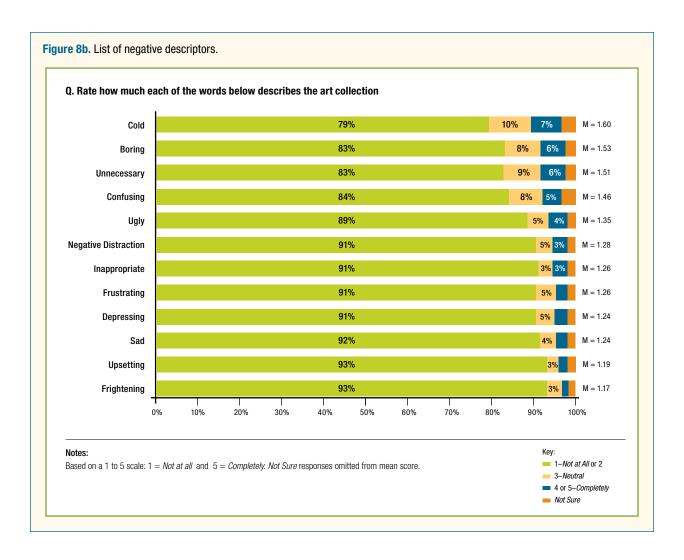


Discussion

The results of this post-visit study can serve as a primer for further research and clinical trials. The institution at hand is a fertile testing ground to assess the qualitative and quantitative effects of a diverse contemporary art collection on patient experience.

One of the key findings of this study was that most of the respondents (76%) noticed the artwork after a visit to Main Campus, which may be due to the art program's use of a patient-centered curatorial practice. In this practice, part of the goal is to create a collection of artwork that is broad in scope rather than homogenous. This variety is one possible explanation for why the majority of the respondents remember noticing the artwork after their visit. As expected, the longer respondents were on Main Campus, the more likely they were to notice the artwork.

Through length of stay and frequency of visits, patients can develop familiarity with or interest in the artwork and the environment. In the qualitative responses



in this survey, patients frequently mentioned specific artworks that they return to each time they come to Main Campus. One respondent wrote, "I cannot tell you how much of a positive effect it has. I remember when I would I accompany my aunt who was coming for cancer treatment... Although she had terminal cancer, was experiencing discomfort, and was in a wheelchair, I would wheel her around to view various pieces of art and read the descriptions. She enjoyed it and found it comforting. She particularly liked to sit and watch the projected tree that changed with the seasons." The speaker is referring to *Mike Kelley 1*, (2007) a video work by artist Jennifer Steinkamp (Figure 9). This projection of a digitally animated tree, located in the main lobby of the hospital, continuously cycles through the seasons and has become a primary destination for visitors, patients,

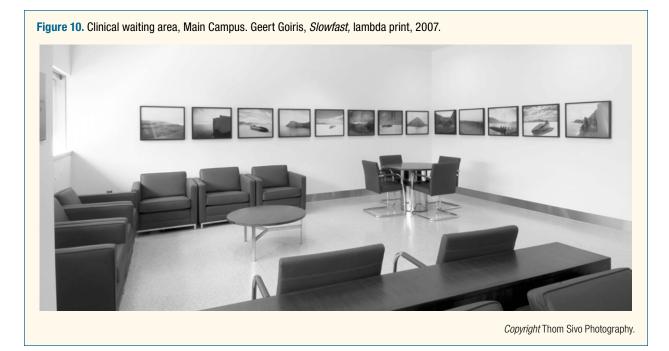
and employees to view, interact with, and contemplate. In this work, the tree's movement diverges from reality; its branches spin, sway, and undulate in an artificial but fluid way. The impact and popularity of this work is particularly notable to consider, as permanent seating has been added to accommodate the number of viewers and length of the video.

The goal is to create a collection of artwork that is broad in scope rather than homogenous.

Figure 9. Artwork in main lobby, Main Campus. Jennifer Steinkamp, *Mike Kelley 1,* 2007, video installation.

In addition, some inpatients reported that the artwork increased their motivation to get out of bed to view the artwork in the corridors. One patient wrote, "[The artwork] made you want to get out of your room with your bedmate. Also made you think about getting to the art museum, which I haven't been to in years." Both patients and their caregivers commented on their experiences of walking the corridors and areas of the hospital to view art.

The architecture, lighting, interior design, and artwork together inform patients' experiences with the hospital environment, which was described by a majority of respondents as *Inviting* and *Calming*. The institution's design approach is organized, such that every object has its place and there is no clutter. There is a conscious effort and practice to reduce stimulation: there are no extraneous colors, patterns, or textures in the interior design. Natural light is emphasized and where possible, views to the outdoors are maximized. In the open-ended, qualitative questions of this survey, patients frequently used words such as "clean," "pleasant," and "helpful" to describe the atmosphere and overall environment (Figure 10).



Most respondents reported that interacting with or about the art, either by seeing it, reading the didactic labels, or having a conversation about it, improved their mood. The artwork presents a moment of distraction or diversion that elevates the moods of our patients, regardless of the condition of their health. The fact that patients with post-traumatic stress disorder and generalized anxiety in particular reported a significant positive change in mood due to the artwork indicates that further research should be completed on these specific patient groups. According to one visitor, "It takes you away—you seem to transcend into another world. From the rocks being caressed by the clear water; to the tree showing off its leaves in an endless cycle, to the radiance from pictures, the medias come together and offer peace and joy on some level, allowing us—if just for a moment—to transcend their anxieties and smile."

A hospital is an inherently stressful environment for almost everyone who steps over the threshold. Most respondents found that the art significantly improved their stress level. Architects and planners at our institution have considered alleviating stress to be an important part of the patient's first impression of the hospital. Likewise, the selection of the art reflects this principle. Patients with post-traumatic stress disorder, generalized anxiety, and breast cancer, positively identified the artwork as improving their stress level in significantly higher percentages. These results imply that further research about the impact of art on stress should be completed on these particular groups. A patient wrote, "You go to an art museum to be uplifted by the art. The same happens when you see fine art in appropriate settings. This is a stilling experience for those feeling the stress of illness."

Most respondents found that the art significantly improved their comfort or pain level. This result suggests that there is a need to examine the potential for palliative responses to art in the clinical setting. Further research about the effects that visual art can have on comfort or pain level should be completed on patients at the bedside. Moreover, further studies monitoring patients with post-traumatic stress disorder, generalized anxiety, and osteoarthritis (the most positive responses to the art) should be conducted.

In one of the scaled sections of the survey, patients ascribed more positive descriptors to the artwork than negative. In addition to this, the open-ended questions that allowed for written responses showed similar language, such as

These survey results suggest that patients respond positively to this diversity and these qualities of contemporary art.

"interesting," "calming," "beautiful," and "inspiring." These descriptors reflect the viewers' overall impression of works in the collection. Beyond this, most respondents found the artwork reflected the descriptors *Innovation*, 21st century, Cultural Diversity, and a Healing Environment. The artwork seems to echo the mission of the institution. As previously stated, the art program identifies contemporary art as encouraging a dialogue on topical interests, fostering an environment of creative

excellence, and inspiring viewers to experience different points of view. These survey results suggest that patients respond positively to this diversity and these qualities of contemporary art.

Another interesting finding was that most of the respondents read the didactic labels accompanying the artwork. The didactic labels, an educational component of the art collection, exist to make the art more accessible. One visitor commented, "Makes me think of art in a different way, not all to my taste but I see myself as being able to learn something from art...I like to see 'real art' as opposed to merely decorative artistic paintings or drawings that are 'typical' or art as décor...." (Figure 11).

Finally, most respondents found that the art positively improved their satisfaction with their experience and their overall impression. The patients' perceptions and expectations of their hospital visit were changed from negative to positive through their physical and intellectual engagement with the environment. If the artwork improved patients' satisfaction, they may have felt more nurtured in the environment and therefore more committed to a positive outlook about their visit, which consequently affects their recovery. By infusing the environment with opportunities for positive intellectual, emotional, and compelling distraction, the presence of the artwork encourages a sense that Main Campus is a space for healing.

To date, research on art in the healthcare setting does not account for the diversity and complexity of experiencing visual art. These findings show that patients respond positively to a diverse collection, one that is made up of a broad selection of subject matter, media, and imagery. This study also shows that patients respond positively to different genres including nature art. Some researchers believe that art improves health by creating a positive distraction—an environmental feature that elicits positive emotions and captures attention without

Donald and Shelley Rubin (November 19, 2011–March 30, 2012).

Figure 11. Art exhibition space, Main Campus. *Building Identity: Contemporary Cuban Art from the Private Collection of Donald and Shelley Rubin* (November 19, 2011–March 30, 2012).

stressing the individual (Ulrich et al., 1991). Answers to the open-ended questions in the research suggest that patients are intellectually engaging with the artwork in the collection. Though patients may prefer abstract art to nature art, or vice versa, viewing a carefully curated collection and reading didactic labels provide a unique experience in the hospital. This sense of curiosity or novelty could be what improves their stress, mood, overall satisfaction, and overall impression of the hospital. Rollins (2011) has theorized that the intense curi-

osity aroused in the viewer by art brings about cognitive and perceptual change, potentially improving patient health outcomes. In future studies, theories and research on human curiosity could be used to better understand the impact of art on patients in the healthcare environment.

Limitations

It is important to note that the study asked respondents to reflect on their experience at this institution and respond to the environment post-visit, meaning this data is based on patients' recollection of their visit rather than on direct observation.

This survey was designed to capture the responses to a collection and the institution's Patient Panel was deemed the best method for capturing this data. The Patient Panel comprises patients who volunteer to participate in online surveys and are solicited to do so no more than two times per month. Though the respondent pool was representative of all health conditions, 94% of the respondents in this study were Caucasian, meaning that the results are not confirmed in a representative sample among other racial and ethnic categories. Because the results of this study indicate significant impacts on patient health, future studies at this institution should target responses from a more racially and ethnically diverse respondent pool. Future studies should also involve interviews with in-patients

By infusing the environment with opportunities for positive intellectual, emotional, and compelling distraction, the presence of the artwork encourages a sense that Main Campus is a space for healing.

and direct observation of the artwork in the rooms, corridors, and public spaces to better understand how different types of artwork in specific settings can impact patients.

Implications for Practice

- The impact of a diverse collection of contemporary artwork in a patient setting clearly has positive results, which can improve mood, alleviate stress, and increase comfort and overall patient satisfaction.
- This study's findings validate the methodology that the curatorial team
 has used with a patient-centered curatorial practice, and the commitment of the institutional leadership to include art as part of the hospital
 environment.
- The potential for using art as a method for increasing positive patient experiences is dependent not on the amount of artwork, but on the diversity and quality.
- It is essential to have a curator with expertise in collections management, knowledge of contemporary art and art history, an aesthetic and practical understanding of a hospital environment, and familiarity with art markets and budgeting when considering an institutional commitment to an arts program.
- A successful art collection stems from curators working with architects, administrators, and users to gain a full and comprehensive understanding of how the patient experiences the environment, whether this is through the patients' particular medical condition, medications, or cultural demographic. This in turn engages the employees and staff to consider the positive affects of artwork in the hospital setting.
- Using art images as a navigational tool is a particularly effective way to direct patients and familiarize staff with the often confusing hospital layout.

References

- Harris, P. B., McBride, G., Ross, C., & Curtis, L. (2002). A place to heal: Environmental sources of satisfaction among hospital patients. *Journal of Applied Social Psychology, 32*, 1276–1299.
- Hathorn, K., & Nanda, U. *Guide to evidence-based art.* (2008). A position paper for The Center for Health Design's Environmental Standards Council.
- Lankston, L., Cusack, P., Fremantle, C., & Isles, C. (2010). Visual art in hospitals: Case studies and review of the evidence. *Journal of the Royal Society of Medicine*, 103(12), 490–499.
- Nanda, U., Eisen, S. L., & Baladandayuthapani, V. (2008). Undertaking an art survey to compare patients versus design student art preferences. *Environment & Behavior*, 40(2), 269–301.
- Rollins, J. (2011). Arousing curiosity: When hospital art transcends. *Health Environments Research & Design Journal*, 4 (3), 72–94.
- Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science*, 224, 420–421.
- Ulrich, R. S., Lundén, O., & Eltinge, J. L. (1993). Effects of exposure to nature and abstract pictures on patients recovering from heart surgery. Paper presented at the Thirty-Third Meetings of the Society for Psychophysiological Research, Rottach-Egern, Germany. Abstract published in Psychophysiology, 30(1), 7.
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, 11, 201–230.
- Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H. B., Choi, Y. S., ... Joseph, A. (2008). A review of the research literature on evidence-based healthcare design. *Health Environments Research & Design Journal*, 1(3), 61–125.