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Music and Nature at the Bedside: Part One of a Two-part Series

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In her *Notes on Hospitals*, Florence Nightingale stated clearly that hospitals should “do no harm.” It is in the same light that the question of moving from harm to support, from degenerative to restorative, drives the current flood of efforts to provide a healing healthcare environment. *Research Design Connections*, The Center for Health Design, other organizations and researchers have significantly contributed to the establishment of evidence-based design as a higher standard of practice for healthcare architects, designers, and clinicians. At the same time, the substantive ways in which music and nature impact patients has become caught in the conflict between technological and natural therapeutic interventions.

In the beginning...

Healthcare and the earliest hospitals began with the overarching belief in mythological gods protecting the ill, determining death and disease, at times even choosing those who were to survive and those who would succumb. Aesclepien temples have been depicted in art as offering solace and care to patients who seem to be ambulatory, and not yet in the acute stage of illness. These temples were reminiscent of the contemporary spa. Pictures of an environment of nature, natural light, and gentle surroundings tell that tale of what was imagined to be the best place to recover. Nonetheless, the earliest medical journals, documenting the physiology and biology of the human body, portrayed the ill in various stages of disease, often graphically illustrating a dissected body as it was understood and studied.

There remains a conflict between the mechanistic views of the human body taken by science in the name of physiology and biology, on one side, and the ways in which patients experience themselves and their state of health or illness. Science aims at reducing illness to an understandable and, hopefully, controllable form, while the individual and family bring far more relevance to the event. Patients make meaning of their circumstances by including their diagnosis, but only as a part of what is happening to them. Hospitals are challenged to create an environment and organization to support and acknowledge both of these worldviews. In the current scientifically driven medical environment, more research is demanded even while practices of the past are challenged. Furthermore, what makes for humane care and respect for the process of tending the ill is often set aside for what cures: the body is engineered into recovery while the person lives the experience.

The differences between healing and curing have been discussed for well over twenty years, beginning with the onset of AIDS and other incurable conditions where the curative model of care left the medical community wondering if they still had a role to play. Healing modalities, while often marginalized as alternative or complementary, belong to the whole patient experience: the sensory interface between the patient, their condition, and the environment in which they are cared for.

It is here that we will consider the auditory and visual aspects of what patients experience and what has been shown to ease their anxiety, lessen their pain, and assure their families.

What people see and hear

Sounds of the hospital are characterized by beepers, pagers, unknown persons walking down corridors that echo footsteps, chatter, carts, alarms, elevator rumblings, ventilation systems, ringing phones, new construction and reconstruction. Visually, the décor of a hospital is not only typified by design elements, but is most known for IV poles, wheelchairs, gurneys, people walking down endless corridors, televisions, and other medical equipment. However, the view from the pillow of a hospital bed is far different than the view from an adjacent chair or doorway and what is heard by a visitor or staff member is hardly perceived to have the same relevance as the sounds would have to a highly medicated patient, one who may be in various degrees of consciousness, or one fully awake, but wrapped inside a prison of fear for what is ahead of them.

Where the patient is

In his 1997 presentation and article to the Symposium on Health Care Design, environmental psychologist Roger Ulrich used the separate studies he and others had done regarding the healthcare environment to develop the Theory of Supportive Environments. He clearly outlines that the objectives of a healthcare environment should “eliminate environmental characteristics that are known to be stressful or can have direct negative impacts on outcomes (loud noise, for instance) [and include] characteristics and opportunities in the environment that research indicates can calm patients, reduce stress, and strengthen coping resources and healthful processes.” (Ulrich, 1991, 1999, 2000a).

As background to his theory, Ulrich stated that while evidence-informed design strategies have been shown to be effective in reducing stress and improving outcomes, it was worth doing a multidisciplinary review of theory and scientific research in the behavioral sciences and health-related fields. Using the subsequent findings as a foundation, a set of guiding characteristics were developed to define supportive healthcare environments which stated:

- Foster control, including privacy
- Promote social support
- Provide access to nature and other positive distractions (Ulrich, 2000)

It is through these objectives that we can look at nature imagery and music to determine how they each may impact the environment of care and how each may express the qualities requisite for restoration.

The gap between music and noise: absolute or subjective?

While musicians and music lovers may claim that what is beautiful in music and what is healing is universal, research has shown that listener preference trumps the narrow boundaries of any genre. Generation, culture, religion, education, and socio-economic factors have been shown to be determinants in what kind of music we are exposed to and, hence, what we prefer. Salamon measured the role of preference on how music impacted anxiety and thus demonstrated that musical preference was the strongest indicator of effectiveness. Similarly, it was found that when the listener is not educated in the ways that music may be used therapeutically, listening might create preference rather than a response. (Salamon, Bernstein, Kim, Kim, & Stefano, 2003). Perretti further showed that one piece of music, even selected for its affective quality, would elicit significant differences between varying populations (male vs. female, young vs. old, music student vs. non-music student) (Peretti & Zweifel, 1983)

While the issue of preference has been consistent for therapy-patient interaction, the challenge remains regarding the use of music as environmental design, a concept I developed in 1987. *Music as environment design* “expands the common use of background music from being an ‘add-on,’ or distraction, to being a proactive component in an intentionally designed environment. It also takes into account the whole auditory environment.” (S. Mazer & Smith, 1999) This practice considers all ambient components, both auditory and visual, to integrate seamlessly into the patient experience. In support of this theory, there have been studies that have looked at the relationship between music and ambient noise to quantify the perceived relationship between the two by patients. Looking at measures of Acceptable Noise Levels (ANL) defined as “the maximum level of background noise that an individual is willing to accept while listening to speech,” the question was whether this level varied with the quality or content of the background noise. The study compared music background (various styles) to a babble equal to 12 talking people, also considering preferences for the music samples. The results showed that listeners were more willing to accept music as background noise than speech babble and, further, that the ANL for music samples were not correlated to music preference. The researchers concluded that music was heard and perceived differently than speech background. (Gordon-Hickey & Moore, 2007)

There are several issues of significance in this study. First, that acceptable noise levels behind speech (which could also, for this discussion, include talk television and other programming) are increased for music in comparison to other kinds of sounds. That music as background is considered positive without regard to personal preference supports more flexibility in designing an appropriate sound environment. I must add here there have been other studies that have shown that different kinds of music can impact behavior. There is an assumption that the music is not experienced without some other activity/dialogue/focus going on simultaneously.

Person-Environment Theory: The power of the environment

Person-environment theory clearly states that the context in which individuals find themselves bonds with environment through their sensory and cognitive perceptions. “...The whole (person-in-environment system) [can be defined/described as] people embedded in their physical, interpersonal, and socio-cultural environments. One must treat the totality rather than deal with one aspect of the whole (person or environment) without treating the other.” (Walsh, Craik, & Price, 2000, p. 26). This supports the concept that music as environmental design must consider the whole auditory environment, not merely a single music recording or performance, and the concept that music has a complex pluralistic function, not merely one of entertainment or distraction.

Health Care Design is about more than one person...

Beyond the issue of music therapy for the individual, if we consider the hospital room as a pluralistic space, one that holds patients, their families, and various clinicians and caregivers, then music needs to meet substantially different considerations. Creating a whole environment needs to shift from the preference of the individual to the purpose of the space. In the case of the church that historically has been the most prominent of all patrons of the arts, music has the singular purpose of moving the parishioners into a spiritual frame of mind, to support prayer and peace. So unique are the church services, that liturgical music has become a specialty both academically and musically. Furthermore, the basis of choice in music used by various religious denominations is to support the belief system and to help move attendees into a spiritual mood. In Synagogues, the Talmud is read in chant and the music is inherently part of the prayers that hold to traditional melodies. The Catholic Church, who has only allowed group singing and songs since Vatican II (1966), has carefully scrutinized all music to conform to the belief system and intent of the Mass. In both cases, listener choice was not an issue, nor was it questioned.

Music as environment design: Basis of programming

In the hospital, it is not so different. The music needs to support the objectives of the hospital and the hospital room. Referring to Ulrich's Theory of Supportive Environments, he clearly states that “... supportive design [emphasizes] ...the inclusion of characteristics and opportunities in the environment that research indicates can calm patients, reduce stress, and strengthen coping resources and healthful processes” (Ulrich, 1991, 1999, 2000a). In this vein, appropriately used, music has been shown to be a positive distraction and, in addition, to mask unwanted

noise. (Dijkstra K., 2006; Gordon-Hickey & Moore, 2007; McCaffrey, 2008; White, 1999; Zimmerman, Pierson, & Marker, 1988

Choices or Decisions: When it helps to not have to...

The concern about patient control forces the question of why most of us do not question selections played at church on Sunday. There are times in our lives when our control is demonstrated by showing up or not showing up; however, once in the Church, or in the hospital, there are aspects of what we are offered that we turn over to those to whom we trust with our hospital experience. In acute-care facilities, the higher the acuity of the patient, the more difficult it becomes to deal with multiple options. For this reason, television content for patients is provided, with control belonging to the patient, with the caveat that the channel line-up is generally screened by the hospital (family-appropriate movies, for example). Music channels may well be offered.

When considering the repertoire for programming developed for public areas in the hospital, one can take the commercial route, selecting a genre according to age, ethnicity, and culture of the population. However, this would follow the objectives of commercial providers, creating bias to one specific population. Given today's patient may be surrounded by up to four or more generations of family, providing an environment that is directed to a specific population is a questionable practice. Furthermore, this kind of discrimination would not fulfill Ulrich's theory of providing social support that would, by its definition, be inclusive rather than discriminating.

Designers and architects: What is our role?

The question for the design community is where their responsibility stops and that of the hospital starts. Because music lives in time and not in space, it is unlike other elements that may be installed and fixed until changed. Further, based on the stated diversity in preferences and the lack of definitive research that isolates one kind of music as being the most effective across all parameters already mentioned, it is possible for the designer to be the educator, addressing the questions of the sound environment on the basis of physical design (acoustics) and auditory outcomes. "Auditory outcomes," for our purpose, includes noise, necessary distractions, positive distractions, quality of communications, risks of miscommunication, speech privacy, and direct clinical risks of high pain, stress, and anxiety. The sound environment has been affected by each of these factors that are controllable within the scope of a well-designed auditory environment. (Baker, 1993; Baker, Garvin, Kennedy, & Polivka, 1993; Berlet & Binet, 1979; Biley, 1994; Busch-Vishniac, et al., 2005; Kangogaku, 1966; Lally, 2001; S. E. Mazer, 2006; Susan E. Mazer, 2008; Topf, 1992)

In a study done by Busch and Vishniac at John's Hopkins (Busch-Vishniac, et al., 2005; Orellana, Busch-Vishniac, & West, 2007), it was clear that acoustics play an active role in how the sound environment in its totality affects patients, staff, and families. If the sound literally bounces off the walls, then what could be appropriate? Necessary sounds move from being pleasant or at the least, acceptable, to being noise, and the subsequent outcomes fit the data: agitation, sleep deprivation, increased pain, staff stress, and more. Working with noise control engineers, it is possible to not only mitigate poor acoustics, but can help avoid poor auditory outcomes (www.inceusa.org).

Summary

If I were to summarize salient points outlined here, I would list them as follows:

- (1) Music is a positive and proactive participant in therapeutic processes
- (2) There is ample data to support the use of music as therapy
- (3) Music as environmental design moves music from an individual experience to a collective and organizational context along with other sounds.
- (4) The role of the designer and architect is to prepare the space to minimize noise or unpleasant, erratic sounds, and to support positive ones, such as music, necessary communications, patient privacy, and to facilitate staff effectiveness.

Providing viable and effective options for environmental use of music, while, at the same time, accepting that the television and personal music players (MP3 players, for example) will offer patients ample control, supports that the hospital is taking responsibility for the sound environment. The stakes for the hospital are not just about music preference; rather the sound environment holds within it patient privacy and confidentiality, pain management, palliative care, staff effectiveness, and quality of care. Therefore, the healing environment involves not only fixed components, but lives as a dynamic, changeable space that merges with the culture of the hospital and with those who reside and recover within it.

Susan Mazer is acknowledged as a pioneer in the use of music as environmental design, she is the President and CEO of Healing HealthCare Systems (www.healinghealth.com) which produces the C.A.R.E. Channel. In her work in health care, she has authored and facilitated educational training for nurses and physicians and is well published in the field of the effects of noise on patients. She can be reached at smazer@healinghealth.com

Baker, C. F. (1993). Annoyance to ICU noise: a model of patient discomfort. *Crit Care Nurs Q*, 16(2), 83-90.

Baker, C. F., Garvin, B. J., Kennedy, C. W., & Polivka, B. J. (1993). The effect of environmental sound and communication on CCU patients' heart rate and blood pressure. *Res Nurs Health*, 16(6), 415-421.

Berlet, M. H., & Binet, F. (1979). [Environment and quality of sleep in the hospital milieu]. *Soins*, 24(23), 35-39.

Biley, F. C. (1994). Effects of noise in hospitals. *Br J Nurs*, 3(3), 110-113.

Busch-Vishniac, I. J., West, J. E., Barnhill, C., Hunter, T., Orellana, D., & Chivukula, R. (2005). Noise levels in Johns Hopkins Hospital. *J Acoust Soc Am*, 118(6), 3629-3645.

Dijkstra K., P. M. P. A. (2006). Physical environmental stimuli that turn healthcare facilities into healing environments through psychologically mediated effects:

systematic review. *Journal of Advanced Nursing*, 56(2), 166-181.

Gordon-Hickey, S., & Moore, R. E. (2007). Influence of music and music preference on acceptable noise levels in listeners with normal hearing. *J Am Acad Audiol*, 18(5), 417-427.

Kangogaku, Z. (1966). Noise in the hospital. *The Japanese journal of nursing*, 30(9), 65-73.

Lally, J. F. (2001). Hospitals and the culture of noise: whither the sound of silence? *Del Med J*, 73(6), 243-244.

Mazer, S., & Smith, D. (1999). *Sound Choices: Designing the Environments in Which You Live, Work, and Heal*. Carlsbad, CA: Hay House, Inc.

Mazer, S. E. (2006). Increase patient safety by creating a quieter hospital environment. *Biomed Instrum Technol*, 40(2), 145-146.

Mazer, S. E. (2008). *Sound Management for Better Patient Outcomes: Ten Steps to Improve the Sound Environment of Hospitals: Practice Green Health*.

McCaffrey, R. (2008). Music listening: its effects in creating a healing environment. *J Psychosoc Nurs Ment Health Serv*, 46(10), 39-44.

Orellana, D., Busch-Vishniac, I. J., & West, J. E. (2007). Noise in the adult emergency department of Johns Hopkins Hospital. *J Acoust Soc Am*, 121(4), 1996-1999.

Peretti, P. O., & Zweifel, J. (1983). Affect of musical preference on anxiety as determined by physiological skin responses. *Acta Psychiatr Belg*, 83(5), 437-442.

Salamon, E., Bernstein, S. R., Kim, S. A., Kim, M., & Stefano, G. B. (2003). The effects of auditory perception and musical preference on anxiety in naive human subjects. *Med Sci Monit*, 9(9), CR396-399.

Topf, M. (1992). Stress effects of personal control over hospital noise. *Behav Med*, 18(2), 84-94.

Ulrich, R. S. (2000). *Effects of healthcare environmental design on medical outcomes*. Paper presented at the DHCP 2000.

White, J. M. (1999). Effects of relaxing music on cardiac autonomic balance and anxiety after acute myocardial infarction. *Am J Crit Care*, 8(4), 220-230.

Zimmerman, L. M., Pierson, M. A., & Marker, J. (1988). Effects of music on patient anxiety in coronary care units. *Heart Lung*, 17(5), 560-566.

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