



Fostering Social Support: *Accommodating Patients' Family and Friends as Part of the Healing Process*

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Executive Summary

| *Brief Synopsis of Report* |

The overall purpose of this project is to examine potential design dilemmas that arise when planning a medical facility. This specific report thoroughly examines the concept of social support. The first objective was to define social support and understand its key dimensions and facets. For instance, it should be noted that social support can be present in many forms, including emotional support, affirmation, physical aid, or assistance. Furthermore, the report proceeds to investigate the importance of social support in a hospital setting. Many research studies have shown a positive correlation among high levels of social support and improved patient health outcomes. Additionally, this report examines how social support is relevant to the key stakeholders in a hospital - patients, families, friends, care providers, and administrators. Since each group has a different perspective, conflicting views may consequently precipitate a design dilemma. It is then up to designers to attempt to find a solution that balances the priorities for all four groups. After addressing the concept of social support and how it relates to the four key stakeholder groups, this report examines some current solutions used to foster support for patients' families and friends. Each solution is backed by evidence and rationale, and addresses some of the potential implications for various stakeholders. Furthermore, this report examines some innovative solutions that have been taken from a variety of sources but can nevertheless be used in a hospital setting, in order to help achieve appropriate levels of social support in hospitals.

Introduction

| Project Overview and Purpose |

A design dilemma emerges when there is no clear, obvious solution available to address a design problem. Designers, administrators, and planners are often faced with such dilemmas as they strive to improve healthcare environments.

The purpose of this project is to experience applying, interpreting, and selecting relevant research as part of an evidence-based approach to decision-making. Specifically, the goal of this project is to implement evidence-based rational in order to inform the decision-making process at a class innovation workshop, to be conducted November 13-14, 2010. Prior to the workshop, each group spent 4 weeks researching a topic in depth. At the workshop, the class will convene to consider planning, designing, and managing an innovative Med/Surge unit, relying on the class's collective knowledge regarding a range of systems, sub-systems, and issues.

*There are many elements that play a role in sculpting the healthcare experience for a patient. Some of these include wayfinding, communication, supplies, maintenance, and pharmaceuticals. This specific project thoroughly examines **fostering social support by accommodating patients' family and friends**, as it relates to a Med/Surge unit.*

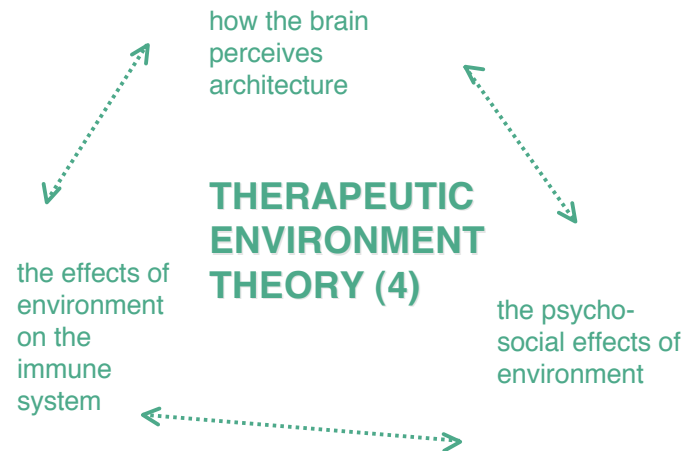
Introduction

| Background and Outline of Approach |

"design is seen as complementary to the healing effects of drugs, policies, and technology and may foster the process of recovery" (6)

Background of Environmental Design Research:

Environmental design research provides insight, feedback, and clues about the implications of one's surroundings on human health, well-being, and behavior. Thus, we become aware of opportunities within the built environment to improve healthcare outcomes. For instance, providing a sense of control, encouraging social support, reducing environmental stressors, and providing positive distractions can help create a therapeutic environment, stimulate patient recovery, and enhance hospital experiences (4). Architects, designers, and planners should take advantage of restorative benefits of environmental design, in order to promote health and well-being (7).



The Approach:

In order to generate effective recommendations to enhance social support for patients by family and friends, the following method will be implemented:

1. *Investigate*: conduct research through literature review and other resources
2. *Analyze*: interpret and organize findings
3. *Recommend*: make evidence-based recommendations

Introduction

| Problem Statement |

- Social support is part of a bigger *paradigm shift* in medical industry to *patient-centered or family-centered care*. Family-centered care recognizes that the family is a constant in the patient's life and a major source of strength and support. It also acknowledges the diversity and uniqueness of each patient and his or her family (2).

- Social support is proven to be beneficial to patients in hospitals (2). Family members feel that it is important to be near to the patient and to be able to see them regularly. However, policies, such as restricted visiting hours, often keep families from spending time with patients (19). Throughout history there have been many changes made in the medical industry regarding hospital visitation policies. In the 1950s and 1960s, there were restrictive visiting policies in children's hospitals, which allowed parents to visit their children for only a few hours each day. Today, most children's hospitals have an open visiting policy for parents that allow them to stay with their children 24 hours a day (20). Although policies have changed throughout the years, there are still many hospitals with limited visitation hours. Regardless, certain aspects of hospital design can make it more or less difficult for families to stay with a patient for as long as they would like. For example, rooms that do not contain a way for parents to sleep comfortably can discourage parents from spending the night. Similarly, another example is when hospitals do not offer quick and convenient healthy food choices or provide a nearby kitchen facility for food preparation. This often forces families to have to go out to pick up food elsewhere, taking away time spent with the patient in the hospital vicinity.

Problem Statement: How can a hospital use design, policies, and technology to provide the most innovative solutions to accommodate and support patients' family and friends?

Social Support

| What is Social Support? |

“Social support is defined as information leading the subject to believe he is cared for and loved, esteemed, and a member of a network of mutual obligations” (1)

What is Social Support?

Specifically, social support is defined as, “intentional human interaction that includes one or more of the following elements: (i) affect, which refers to appreciation, admiration, respect or love; (ii) affirmation, which includes reinforcement, feedback and influencing the individual's way of making decisions; and (iii) aid, such as objects or money and spending time in order to help someone” (8).



Social support consists of several domains, including emotional support, appraisal and affirmation, informational assistance, intimacy, comfort, and physical affection (35). Other supportive behaviors include “expressing to a sick person that he/she is cared about, loved, or esteemed; encouraging the patient to express beliefs and feelings openly; giving the patient a sense of belonging to a social network or support group and providing tangible assistance” (22).

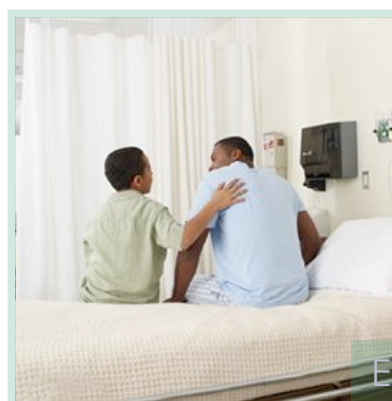
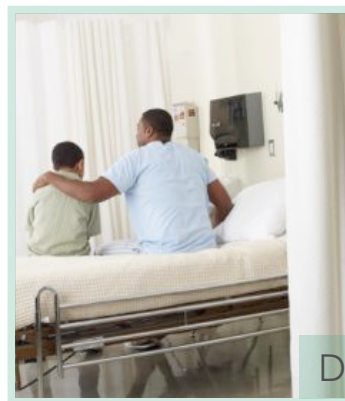
Related to a healthcare setting, social support concerns *healing culture* and *environmental design*. Healing culture encourages relationships among patients, staff, care providers, and visitors. Environmental design either supports or inhibits a hospital's approach to recovery (7).

Social Support

| Why is social support relevant to hospital design? |

“Healthcare facilities are designed not only to support and facilitate state-of-the-art medicine and technology, patient safety, and quality patient care, but to also embrace the patient, family, and caregivers in a psycho-socially supportive therapeutic environment” (4)

“At the same time, patients and families are expressing a desire for a larger role in healthcare decision-making and are asking providers to do a better job of responding to patient and family needs” (7)



Why is it relevant?

Patients and visitors often perceive hospitals as scary, intimidating, and isolating places. Aside from uncertainties associated with illness, aspects of the hospital environment itself may generate feelings of uneasiness and heighten stress levels (4).

Stress can compromise an individual's immune system, which is not ideal for recovery (4). Luckily, available social support may help decrease stress levels and improve a patient's health status (3).

However, being confined in a hospital can diminish access to social support (9). Since the presence of social support helps individuals cope with abrupt changes and stressful situations, *patients, family, and friends will all benefit from social support* (10). In conclusion, enhancing social support is an essential and should be appropriately addressed by healthcare design.

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NOTE: The implications of providing social support for patients and patients' family and friends is discussed in greater detail later on in the report

Social Support

| *Why is social support relevant to hospital design?* |

“Previous results from clinical studies have indicated that social support can improve the health outcome of patients with breast cancer. Epidemiological studies have suggested that social isolation increases the mortality risk from several chronic diseases” (33).

“The main result of our study was that social support and its probable mental health benefits may favourably affect the long-term outcome, including the employment status, of ICU patients who recover from ARDS” (34).

Why is it relevant?

Many studies have demonstrated how social support can improve health related outcomes. Studies have shown “a general positive association between the overall number of social ties or contacts people have and their health status” (22). Research has shown that in a range of healthcare and non healthcare settings, people who receive higher levels of social support, tend to be less stressed and have better health status than more socially isolated people (22).

Intimacy, and more specifically the self-disclosing aspect of intimacy, have been studied in relation to health. In a study, participants with low levels of self-disclosure were more likely to have acute and chronic illnesses. Other studies have demonstrated that that disclosure has been associated with better physical health in cancer patients and people who have experience trauma (35).

Belonging, or the availability of a social network, was shown to influence physical health symptoms. A social support network is different than a support group is a structured meeting run by a mental health professional. Both of these forms of social support are important for reducing stress, but a social support network, you can benefit in a number of ways, including a feeling of belonging, a increased sense of worth, and a feeling of security (36).

In a study published in October 2006, it was found that patients who were successfully treated for acute respiratory distress syndrome (ARDS) were less likely to report symptoms of post-traumatic stress disorder (PTSD) if they felt that they received social support during and after their stay in the Intensive Care Unit (34).

Studies in many healthcare contexts show that more social support improves recovery outcomes in heart attack patients, survival lengths in patients with metastatic cancer and immune functioning in family care givers of Alzheimer's patients (22).

Social Support

| *Diverse Perspectives* |

“There may be personal and cultural differences in spatial behavior: proximity to other people and others, body posture, and movement within a given setting”
(6)

Before exploring stakeholder perspectives, it is important to keep in mind how to accommodate hospital spaces for diverse groups. Social support can benefit the health of people of all different ages, gender, and cultural and ethnic backgrounds.

Although, both men and women benefit from social support, one study demonstrated that contact with family and friends lowered mortality, but this positive impact was much greater for women than men (35). Women tend to be more social support oriented than men (35).

In terms of age, one study, with a sample ranging from 19 to 85, found that “older people do not appear to be as dependent as younger people on receiving social support from diverse sources in order to maintain a sense of well-being” (44). However, another study found that social support was beneficial for health regardless of age, and low levels of social support were particularly detrimental to older patients (45).

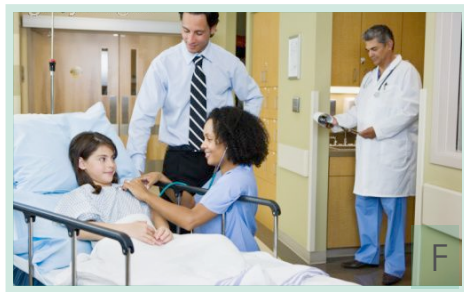
Ethnic and cultural context must be taken into account in regards to social support. In western cultures, families typically follow a nuclear model, consisting of two parents and their children. In American-Indian, Asian, Hispanic, African, and Middle-Eastern cultures, families often consist of an extended network of parents, siblings, grandparents, aunts, uncles, cousins, godparents, and others. For example, in American-Indian families, tribal leaders, elderly, and medicine men/women must be consulted before key decisions are made. In addition, it is the male figure that is in charge of making decisions outside of the home, while in other cultures a female is in charge (23). This must be taken into consideration for the design of the space, as spaces should be able to accommodate large families.

Although there are some variations in the way social support affects health, the general findings from these studies are that social support is beneficial to one's health regardless of age, gender, or culture.

Role of Social Support

| Identifying Stakeholders: For Whom is Social Support an Issue? |

It is important to consider, balance, and prioritize the needs of key stakeholders when evaluating possible design solutions.



Key Stakeholders include...

- **Patients:** individuals coming to the hospital for treatment
- **Family & Friends:** individuals (of all ages) who come to hospital to visit and offer support to patients in the hospital; this includes mothers, fathers, brothers, sisters, sons, daughters, neighbors, coworkers, etc.
- **Care Providers:** physicians (attendings, specialists), nurses, nurse practitioners, physician assistants, nurses aides, and allied-health professionals (social workers, nutritionists, OTs, PTs) responsible for treating medical conditions, helping patients recuperate, and assisting other care providers
- **Administrators:** CEO's, directors, managers, trustees, and businessmen who govern hospital administration

Role of Social Support

| Concerns and Perspectives: Patients |



"Eichhorn et al gathered the first data on patients' attitudes and beliefs after the patients' families had been present during resuscitation and/or invasive procedures. The 9 patients who were interviewed said that they were comforted when family was present and believed that their family acted as advocates and provided important information to the healthcare providers" (13)

Patients

"In 1965, when I was 3 years old, I was hospitalized for 6 weeks following a car accident. I was in a room with five women (all adults). I was confined to bed, and the room had no television. My parents could visit often but not my siblings. Whenever one of the other patients needed a treatment, my parents had to leave. The room has no space for anyone to spend the night, and I was scared" (14).

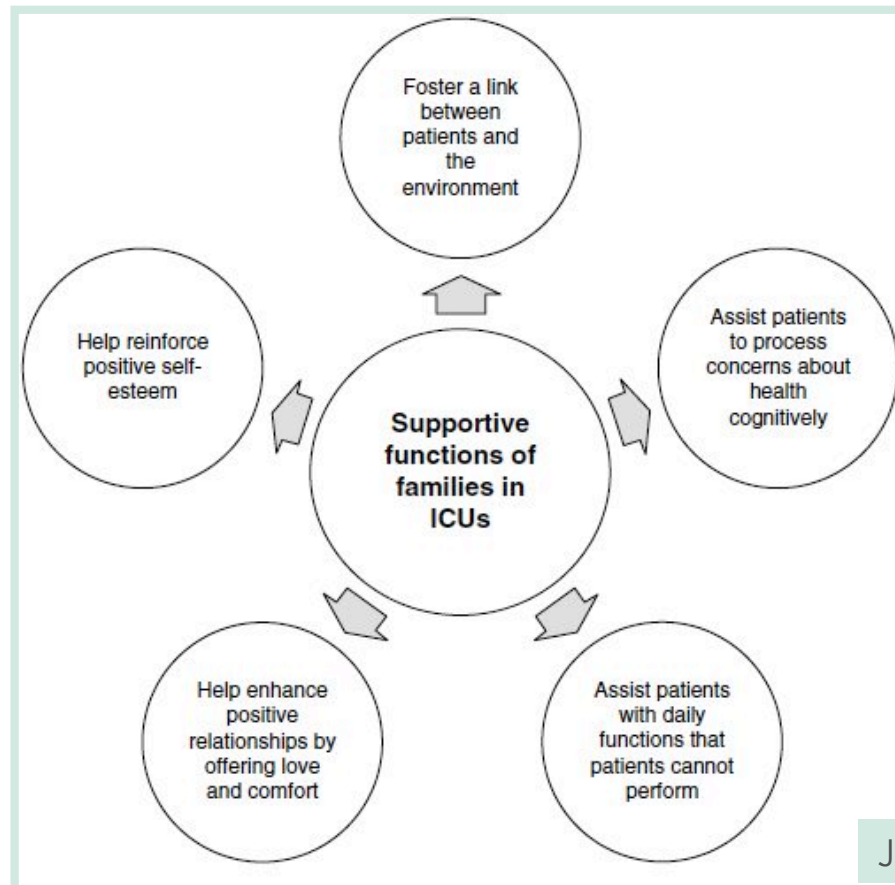
"In 1992, when I was 36, I was hospitalized for a week with some type of virus. I was in a private room, had a television and a window, but my window faced a brick wall. Because they didn't know what was wrong with me, I was not allowed visitors, and I was lonely and scared" (14).

- Patients can come from a variety of different backgrounds and be many different ages; regardless of patient characteristics, social support has been found to be beneficial and desired by patients (45)
- Patients feel safe, comfortable, and at ease when family and friends are present
- Patients feel less isolated when they are surrounded by family; reduced social isolation may lessen stress (1)
- Patients experience better health outcomes when family is present (1, 2, 14)
- Patients often need family to help make health related decisions
- Patients experience feelings of love, hope, comfort, and companionship when family is present
- However, the presence of family and friends may interfere with patients getting adequate rest and overall well-being; noise, crowding, and commotion may elevate patient stress and precipitate feelings of being overwhelmed (12)
- Too much social support can be problematic; Most studies cite the positive benefits of social support, but there are few studies that describe the negative impacts that can occur when there is too much social support, such as excessive phone contact, high expression of emotion, unsolicited advice, information without means for implementation, and aggressiveness (26)

Role of Social Support

| Evidence: Importance of providing Social Support for Patients |

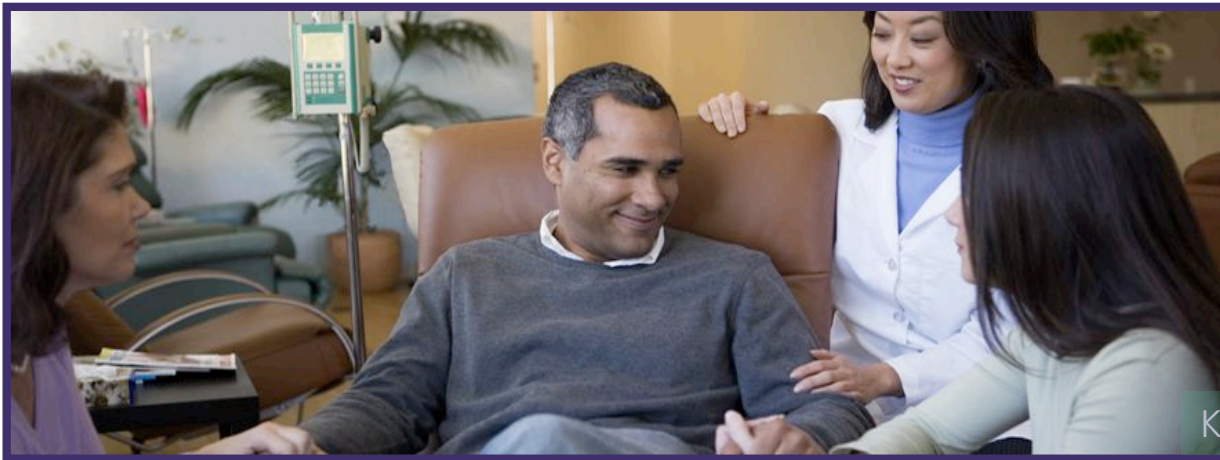
“Support from significant others is associated with a patient's recovery, as patients have reported higher levels of psychological well-being and overall life satisfaction when they have received sufficient emotional and tangible support from their significant others and were satisfied with the support they received” (8)



Providing patients with social support can lessen stress, reduce fear/anxiety, improve outcomes, and stimulate healing. Specifically, “Social support may reduce the amount of medication required, accelerate recovery, and facilitate compliance with prescribed medical regimes” (1). Providing patients with social support may also help patients take their mind off of their serious medical conditions and promote feelings of usefulness (6). Plus, family-centered spaces are associated with decreased length of stay, fewer medication errors, and fewer falls (14). In conclusion, the presence of family and friends during hospitalization is beneficial to the patient's physical, social, emotional, and mental well-being.

Role of Social Support

| Evidence: Importance of providing Social Support for Patients |



"A qualitative study by Happ et al. (2007) also found that family presence and their social support through touching, talking, and surveillance helped patients to deal with their treatments better and facilitated their clinical progress. The study showed that ICU and stepdown patients with family members present withdrew significantly more quickly from long term mechanical ventilation." (2)

"An experimental study by Chatham (1978) looked at the impact of social support through patient family interaction on a patient's postoperative behaviors... Results showed that patients with specific social interactions with families (such as eye contact, frequent touch, and verbal orientation to time, person, and place) exhibited fewer manifestations of postcardiotomy psychosis." (2)



"Several studies in healthcare contexts have indicated that social support improves, for example, recovery outcomes in myocardial infarction patients, and survival length in patients with metastatic cancer" (3)

Role of Social Support

| Concerns and Perspectives: Family and Friends |



"It is well established that the well-being of people's family member is crucially important to their own health and welfare: if you know that everyone in the family is well, that will make you feel better; whereas concern over the health and well-being of other family members increases anxiety and adversely affects well-being" (11)

Family and Friends

"My son spent the majority of the past year in the hospital. It was a difficult time for our family, but the staff worked together to ensure that our family was taken care of. In addition to making us as comfortable as possible, we were included in the decision-making process and the staff listened to our suggestions for making things easier for other families. Anne K" (27).

"When our 6 year old daughter goes in for her quarterly MRI's we are able to be by her side as she is put to sleep and when she wakes up. It's very important to the child to never feel alone at any time during their hospital stay. Pete B" (27).

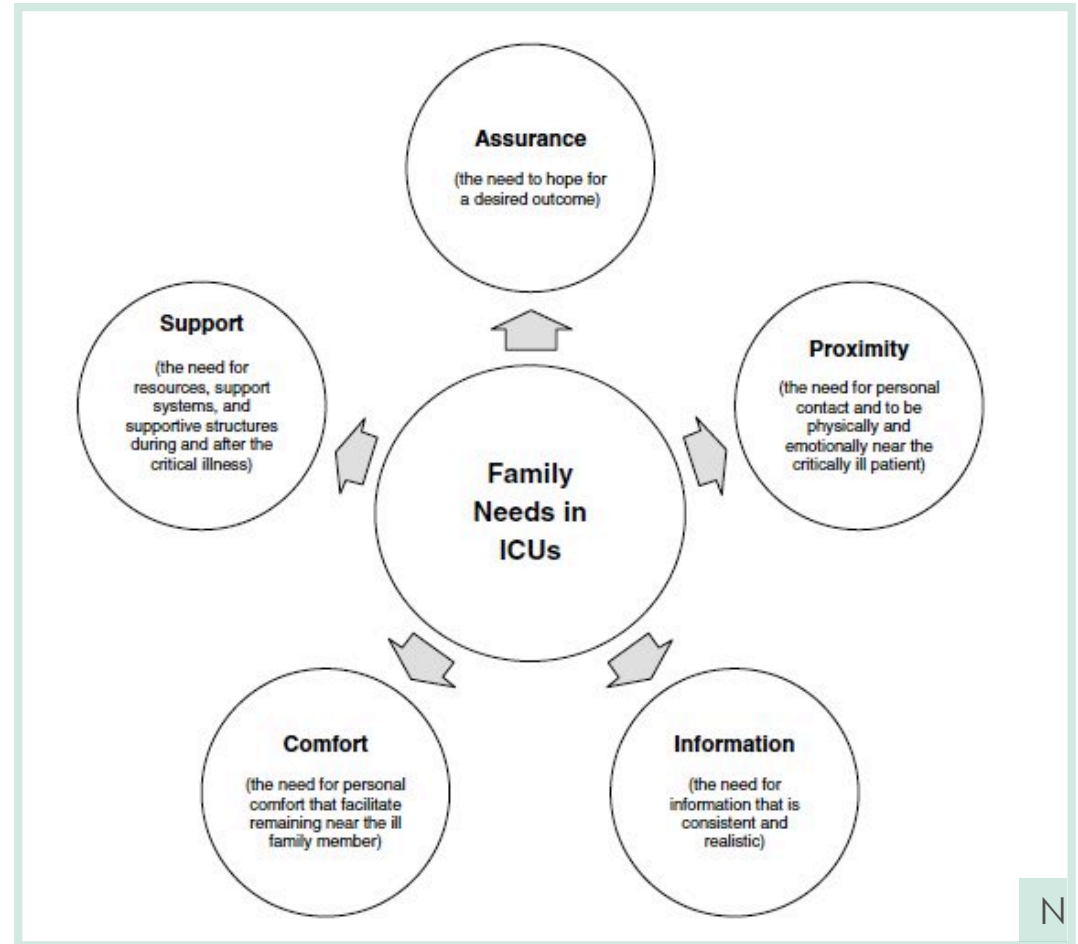
- Family and friends desire to help make health-related decisions for loved ones
- Need for proximity, information, comfort, support, and assurance (7)
- Family members experience poorer sleep (in terms of both quality and quantity) when staying with a patient in the hospital (7)
- Family members change their eating habits and eat more unhealthy "junk" food because it is quicker and often more convenient (in order to minimizing leaving the patient's/loved one's side) (7)
- Experience elevated stress levels (7)
- Are at risk of contracting contagious infections from airborne contamination (7)
- The Critical Care Family Needs Inventory (CCFNI) is a survey used in many studies to address families needs when a family member is in the hospital. It consists of 45 questions rated on a four degree scale from not important to very important. Statements include:
 - To visit at any time.
 - To have comfortable furniture in the waiting room.
 - To have the waiting room near the patient.
 - To see the patient frequently (46).
- Proximity and being able to see the patient regularly are of high importance to families (47).
- Visitation is really important to families. When the need to visit the patient is not met, family members' stress levels rise. When children of ICU patients are allowed to visit, their fears and anxiety lessen (48).

Role of Social Support

| Evidence: Importance of providing social support for Patients' Family & Friends |

"O'Farrell et al. (2000) reported that 66% of spouses of patients undergoing cardiac rehabilitation met the criteria for distress. Distress experienced by a family member may be even greater than that experienced by the patient with cardiac disease." (10)

Hospitalization of a loved one may precipitate symptoms such as anxiety, depression, appetite disturbances, sleeping disorders, and stress (1). Thus, providing patients' family and friends with support is essential, "A family member's long-term illness affects the well-being and health of the entire family. Family members also need support to cope with a long-term illness or the death of their loved one" (2). Social support is shown to reduce stress, anxiety, and depression of visitors (1). Social support involves tangible, informational, and emotional factors (2,3). Providing adequate social support for patients' family and friends requires attention to many overlapping concerns and sub-issues. Patients' family and friends need **proximity, information, comfort, support, and assurance.** (7)



Role of Social Support

| Evidence: Importance of providing social support for Patients' Family & Friends |

"Meyers et al interviewed 39 members of patient's families after members' experience with family presence during resuscitation and/or invasive procedures. The family members reported that presence was beneficial to themselves and to their loved one because it was important to be helpful to their love one...it comforted the family;...it decreased worry and lessened helplessness" (13)



It is important for the patient's family and friends to be well-supported for the patient's behalf as well. "Based on data collected through subject interviews and questionnaires, a study of 417 patient-spouse pairs found that spouse anxiety and depression were correlated with patient psychosocial distress. They found that patients' psychosocial adjustment to illness was worse when spouses were more anxious or depressed than the patients." (2)

Role of Social Support

| Concerns and Perspectives: Care Providers |



"Because of the serious and unstable condition of patients, staff members in intensive care units often direct all of their energy to saving lives and focus mainly on close assessment, observation, monitoring for complications and management of technology. The intention of giving family support may be present, but the reality is often that the needs of family members are largely ignored or forgotten" (18)

Care Providers

"A child critically ill in the ICU must be one of the most stressful situations for a family," Gutierrez said. "I can't imagine anything more stressful. A lot of the anxiety which comes from uncertainty and not knowing what is going to happen can be curtailed through communication." - Juan Gutierrez, MD, at the Goryeb (28)

- Dealing with patients' family and friends is often stressful and may be uncomfortable; procedures (such as resuscitation) may be more stressful to perform under family supervision (13)
- Family members may not be emotionally capable of dealing with certain situations; potential observation of traumatic situations may be detrimental to health and well-being (13)
- Family and friends may disrupt order and structure of system (12)
- Lack of time to deal with visitors, due to increasingly busy schedule filled with responsibilities
- Primary concern is patient recovery; supporting, engaging, and interacting with family and friends is not the top priority for care providers
- Nurses' perceptions of a families' needs often determines if those needs are met
- One study found that "nurses perceived families as not wanting to participate in patient care and perceived family members as uncomfortable asking questions" (47).
- In order for nurses to meet patients and families needs and to be supportive, they need to better understand and identify what those needs are
- Staff-family communication can provide emotional, information, and tangible social support to family members, which can facilitate involvement in patient care (7).
- Centralized nursing stations can limit family access to staff, and decentralized nursing stations can allow nurses to spend more time in patient rooms and visit rooms more frequently, allowing for more interaction (7)

Role of Social Support

| Concerns and Perspectives: Administrators |



Administrators

"This is one of the most important reports we receive," says Beth Houghton, board chair at Moffitt [H. Lee Moffitt Cancer Center]. "Patient assessment as to how we are doing is very important and is something we watch very closely. From a board's perspective, the greater inclusion of patients and families into the care process and operations of the hospital was a natural. This is a group whose feedback we highly value." (29)

"Though the trend is toward increasing visiting hours, many administrators still favor imposing some limits, said Forte, clinical operations manager. The most common argument for limiting visitation is a concern about infection control, she said. The theory is that more people translates to more germs...having extra people around can make treatment difficult for health professionals. Sometimes space is an issue. "It can be hard to get in the room without disturbing anyone," she said. "It can make the work a bit awkward at times" (49).

- Hospital administrators have control over hospital policies, such as visiting hours
 - Open-door visiting policies may make clinicians feel like they are always being observed
- Dealing with family and friends may negatively affect staff retention and employee satisfaction
- Will patient satisfaction be improved by providing social support for family and friends? Increased satisfaction can increase likelihood of recommending hospital to future patient
 - In a few studies, families expressed greater satisfaction when there were increased visiting hours and increased patient control over visiting hours (47)
- Efficiency of the system is a priority (7)
- Budget is an issue; how much will it cost? (7)
- Resources (economic, time, energy) are limited (7)
- Is it safe to have family and friends in the hospital? (7)
- Increased risk of infection for patients, family, and friends (7)
- Will family presence increase lawsuits and litigations? (13)
- Without family support, patients may experience increased healing and recovery time; this may be more costly due to longer hospital stays for patients (49)

Role of Social Support

| What's the Dilemma? What are Key Issues? |

Evidence reveals that patients benefit from receiving social support from families and friends. Additionally, research suggests that families and friends benefit from receiving accommodations while visiting loved ones in the hospital. However, although evidence clearly demonstrates that patients, families, and friends benefit from receiving social support, this issue is somewhat controversial due to different priorities of stakeholders. Accommodating the desire for social support comes at what cost to care providers and administration?

What's the *dilemma*? What are key issues to be addressed?

- *If administration must invest in supporting visitors, this means less resources (time, space, energy, money) will be directly available for patient care. Since resources are limited, should resources be used directly for patients or to comfort their families and friends? Are there enough resources to accommodate this additional demand (ex. is there space?)?*
- *What is the best way to balance the needs of patients and families with the needs of different stakeholders?*
- *What is the best way to provide support for families and friends of patients?*
- *How does a space accommodate multiple families at once?*



Recommendations

Guideline #1: Spaces should be flexible and easily controlled by patients and families in order to adjust to situational needs.

Guideline #2: Provide patients with single rooms, with designated family areas.

Guideline #3: Provide family lounges and waiting areas near patients.

Guideline #4: Create a comfortable environment by incorporating “soft” finishes, furnishings, and materials into the design.

Guideline #5: Create an environment that reduces negative noise but allows for positive stimulation, such as music.

Guideline #6: Use technology to foster social support.

Guideline #7: Provide natural gardens for patients and families to use.

Recommendations

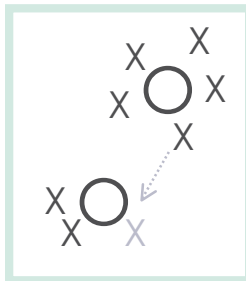
| Guideline #1 |

“Families who can control the temperature and lighting in their rooms, the amount of privacy they have, the number, frequency and length of visitation, the type and volume of music, and the timing and content of meals will experience less stress and will likely be more satisfied” (7).

Guideline #1: Spaces should be flexible and easily controlled by patients and families in order to adjust to situational needs.

Evidence & Rationale:

- Sociopetal features encourage social interaction (4) while side by side seating inhibits social interaction (7)
- The ability to control one's surroundings leads to feelings of competency and may lead to positive patient outcomes (4); uncontrollable situations are stressful (7)
- Opportunity to personalize a space may lend a sense of familiarity to an otherwise foreign environment (7)
- Lots of different activities which require different conditions occur in a single setting (i.e. socializing, sleeping, examinations, etc. all take place in a patient room); environmental conditions should be appropriate to activity
- In order to respect the emotional rollercoaster of emotions often associated with hospitalization, it is important that spaces offer access to privacy and interaction (7)



Possible Design Responses:

- Non-fixed seating accommodates groups of various sizes (4)
- Temperature controls in patient room
- Adjustable lighting
- Partitions, dividers, curtains (7)
- Transformative furniture
- Allow families to personalize the environment through artwork and other items

Recommendations

| Guideline #1 |

Guideline #1: Spaces should be flexible and easily controlled by patients and families in order to adjust to situational needs.

Implications for Stakeholders:

Patients

- Feel in control; experience reduced stress levels (7)
- Can adjust setting to fit different activities that the patient may participate in, such as sleeping or socializing
- Patients can have more control over the level of social interaction as desired; this will help eliminate feelings of being overwhelmed or isolated (12, 26)

Family and Friends

- Feel in control; experience reduced stress; more satisfied with the hospital visiting experience
- Can accommodate different cultural and familial contexts more readily

Care Providers

- Space can adapt for different types of activities performed by various care providers in the patient room, such as physical therapy sessions or daily examinations
- If patients and families can control the spaces themselves, they may not ask for nurses to help them as often

Administrators

- Having more control options can be more expensive, but will also increase patient and family satisfaction; increased satisfaction may increase the likelihood of patients, family, and friends recommending the hospital to other
- If space can adapt to different activities and patient does not have to be moved to different space, this may help to alleviate and address transportation, space, and temporal constraints

Recommendations

| Guideline #1 |

Guideline #1: Spaces should be flexible and easily controlled by patients and families in order to adjust to situational needs.

Potential Innovative Solutions:

Flexible Furniture

- Furniture that is capable of transforming (i.e. a chair may be transformed into a table) can serve different functions
- Depending on the orientation, the same piece of furniture may serve different purposes
- Multipurpose furniture adapts to situational needs

Murphy beds

- Beds can be easily accessed when needed; beds can be easily put away when not needed
- Helps save space and is efficient



Chair converts to a table to accommodate different activities.

Nuovolio by Resource Furniture



Couch transforms into a bunk bed. This would allow family members to have a place to sit during the day and also accommodate multiple family members at night.



Recommendations

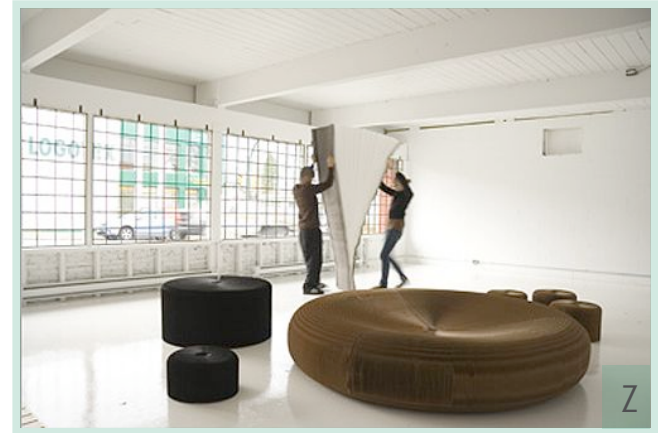
| Guideline #1 |

Guideline #1: Spaces should be flexible and easily controlled by patients and families in order to adjust to situational needs.

Potential Innovative Solutions:

Multifunctional Dividers

- The partition height and width can be adjusted as desired to create a designated family zone easily
- This can allow the patients and the family to decide how much privacy there will be between the patient and family zone



Recommendations

| Guideline #2 |

"Being able to sleep in the patient room also provides social support and reassurance for both patient and family members" (7)

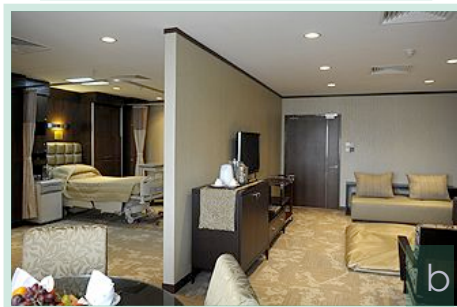
Guideline #2: Provide patients with single rooms, with designated family areas.

Evidence & Rationale:

- Spaces that are private help facilitate patient-family-staff discussion, communication, and disclosure, increasing family participation in patient care (2)
- Single rooms are associated with higher patient and visitor satisfaction; multi-bed rooms may detract visitors, resulting in less available social support (2)

Possible Design Responses:

- Family zones within patient room, equipped with furniture for sleeping, areas for relaxing (4)



Emory University Hospital neurosciences ICU provides a family room adjacent to the patient room

Emory University Hospital's neuroscience ICU incorporated family space directly adjacent to the patient room. Family and patient zones are divided by a partition. This particular design enhanced communication, privacy, and convenience (15). "Such [family] visits may also help reduce length of stay, cost and liability from errors" (16). After this new design way implemented, length of patient stay was cut in half and medication errors dropped significantly (16).

Recommendations

| Guideline #2 |

“When patients in one University of Michigan study were asked whether they would like a family member or friend to be able to spend the night, over 85 percent responded positively” (6)

Guideline #2: Provide patients with single rooms, with designated family areas.

Implications for Stakeholders:

Patients

- Increased privacy for patient; family is available if desired (7)
- Increased degree of acoustical privacy allows patients to sleep better (2)

Family and Friends

- Increased privacy and comfort
- Family is easily accessible to patient and care-providers; this helps facilitate participation in patient care decisions
- If a patient is in a private room, the family will stay longer (2) and will not be asked to leave as often compared to if the patient was in a double, where another patient may be receiving treatment in the same room

Care Providers

- Since family will be able to offer the patient with assistance, such as getting in and out of bed, staff will not have to check on patients as often (2)
- Having family present all of the time may interfere with some work or activities; the sense of being observed may potentially create some uneasiness and anxiety amongst care providers

Administrators

- Single rooms reduce infection rates, which help save money in the long term (5)
- Single rooms with family areas will take up more space than multi-patient rooms or rooms without a family zone
- Do you justify the extra space and cost with the increased satisfaction it provides? After all, increased visitor satisfaction is key for a profitable business (14)

Recommendations

| Guideline #2 |

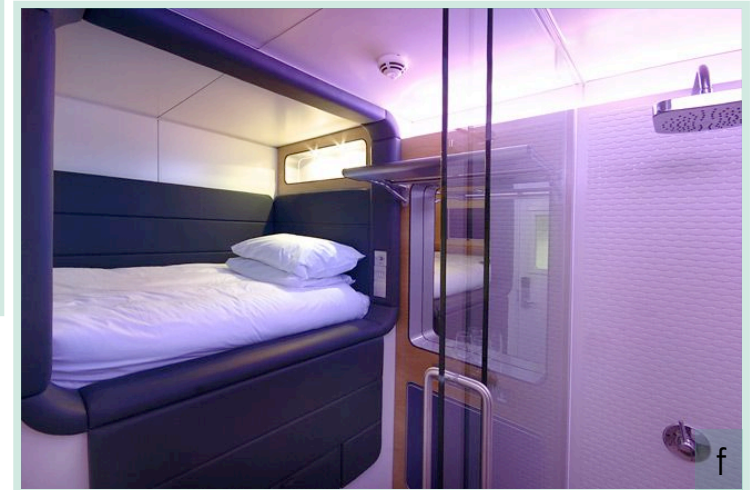
Guideline #2: Provide patients with single rooms, with designated family areas.

Potential Innovative Solutions:

- Provide dividers that are multifunctional
- This divider was designed for office space (39), but can be applied to hospital rooms, creating division of space between the patient and the family area; it also serves other purposes, such as a place for storage or for displaying items to make the space more personalized



- In the hotel industry, pod hotels are becoming more and more popular. These rooms are just 50 square feet (38), so they would not take up a lot of room in a hospital where space is very valuable



Recommendations

| Guideline #3 |

"The location of family waiting spaces in ICUs is very important. It defines visual and physical access of families to patients in ICUs. It also signals the degree to which families are integrated with patient care...Family spaces located outside the unit may suggest that families are not integrated with patient care in the unit. On the other hand, family spaces provided within the patient room may indicate that families are well integrated with patient care" (7).

Guideline #3: Provide family lounges and waiting areas near patients.

Evidence & Rationale:

- Physical access and being in close proximity to the patient are important (7)
- Family members consider the waiting areas as a place where they could obtain emotional support- a place where "one family consoles another family" and "where you can be with people in similar situations" (7)
- However, family perceptions of traditional waiting room are mostly negative; people feel that the space is cold, dirty, and small; the furniture is commonly uncomfortable and too close together (7)

Possible Design Responses:

- As illustrated by the *Planetree* model of care, a family kitchen on patient wards allows individuals to enjoy family meals, helping maintain some degree of normalcy (4)
- Activity areas, equipped with computers, internet, access to healthcare information, allow individuals to communicate with life outside the hospital and keep up-to-date with other obligations (7)
- Accommodations such as kitchens, bathrooms, and laundry areas are often desirable
- Provide age-appropriate activities and services, such as play rooms for young visitors or child care centers for parents to leave their children



Recommendations

| Guideline #3 |

Guideline #3: Provide family lounges and waiting areas near patients.

Implications for Stakeholders:

Patients

- Family remains nearby; patient can also maintain some privacy and individual space, since family may spend time in lounges (visitors may spend time in areas other than patient rooms)

Family and Friends

- Families will feel more integrated into the patient's care regime (7)
- The space should be large enough to accommodate all family members comfortably (7), taking into account ethnic and cultural variations (23)
- Can prepare simple meals, so don't always need to eat "junk" food or whatever is available (7)
- Provides a space for families to use outside of the patient room for a break or chance to get away
- Can different families use the space at different times?

Care Providers

- Can serve as a space for care providers to talk to families away from patients if they do not want the patient to hear
- The family can wait in the lounge or waiting area; this is ideal if visitors may interfere with a treatment provided by care provider

Administrators

- Takes up valuable space in the hospital- how do you determine how much space is necessary for visitors (How many visitors are expected at once? Can more than one family use the space at the same time?)?
- If the family is happier, they will be more likely to recommend the hospital to other people, which may make it worth spending money on family lounges and waiting areas

Recommendations

| Guideline #3 |

Guideline #3: Provide family lounges and waiting areas near patients.

Potential Innovative Solutions:

- These indoor playgrounds are found in malls; these types of play areas can work in a building in any climate
- Providing a waiting area space that is more fun and entertaining, can give patients who are able a positive distraction
- The space can also benefit families, who come to visit a patient with a young child; if the playground serves as a daycare area, families can leave their children with supervision, while visiting a patient
- If providing a space like this, should also provide a more quiet and intimate resting areas (7)



Recommendations

| Guideline #4 |

"A novel study by Harris (2000) found that family and friends stayed substantially longer during visits to rehabilitation patients when patient rooms were carpeted rather than covered with vinyl flooring." (2)

Guideline #4: Create a comfortable environment by incorporating "soft" finishes, furnishings, and materials into the design.

Evidence & Rationale:

- A "soft" ambience can increase disclosure; individuals in "soft rooms" (rug, decorations, indirect lighting, upholstered furniture, more homelike) participated in more intimate conversations compared to individuals in "hard rooms" (barren, tiles, simple furniture) (6)
- Home-like decorations increase communication and comfort (17)

A study by Miwa and Hanyu (2006) "...showed that dim lighting yielded more pleasant and relaxed feelings, more favorable impressions of the interviewer, and more self-disclosure than did the bright lighting...thus, the pleasant and relaxed feelings related to dim lighting may well enhance the perceived attractiveness of a counselor and self-disclosure from clients. The results imply that interior design could influence communication and other relationships in counseling rooms." (17)

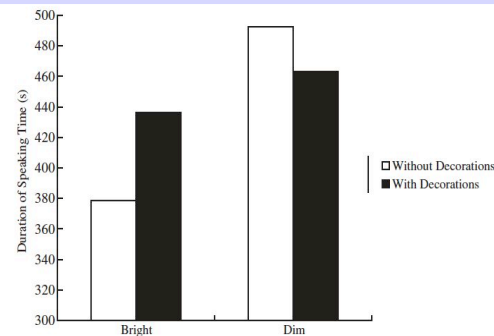
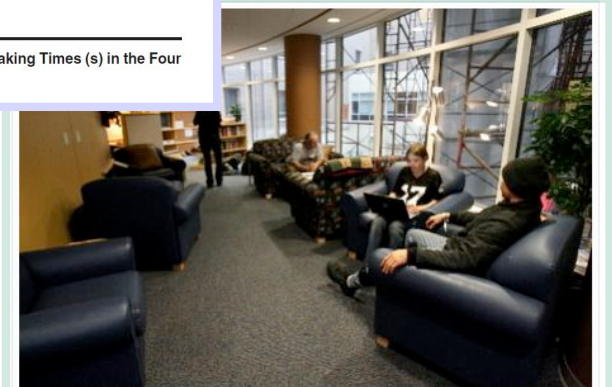


Figure 3: The Mean Duration of the Participants' Speaking Times (s) in the Four Conditions

Possible Design Responses:

- Home-like décor (rugs, artwork, etc.) (17)
- Carpeting (2)
- Soothing, muted colors create calming spaces; bold patterns and bright colors could be misinterpreted as threatening (7)
- Dim-lighting (17)



Gus Chan/The Plain Dealer
After being organized, the furniture was arranged into private groupings, making the room feel less like a sterile waiting room.

Recommendations

| Guideline #4 |

Guideline #4: Create a comfortable environment by incorporating “soft” finishes, furnishings, and materials into the design.

Implications for Stakeholders:

Patients

- This type of environment is more home-like, making patients stays more comfortable
- Individuals in “soft rooms” are more willing to discuss personal details that those questioned in a “hard” room (6); for instance, research indicates that self-disclosure is higher in counseling rooms with dim lighting, as opposed to counseling rooms with bright lighting (17)

Family and Friends

- This type of environment is more home-like, which can increase family and friends comfort levels
- Carpeting instead of vinyl flooring in patients room increases the length of a family or visitor's stay (2)

Care Providers

- Materials, such as carpet, can make it more difficult to perform certain activities, such as rolling a cart or other things with wheels

Administrators

- Certain soft finishes are more difficult to clean and maintain, increasing costs of maintenance
- Carpeting may increase infection (2)
- Family satisfaction can increase likelihood that they recommend hospital to others, which is important in terms of financial concerns

Recommendations

| Guideline #4 |

Guideline #4: Create a comfortable environment by incorporating “soft” finishes, furnishings, and materials into the design.

Potential Innovative Solutions:

The AglON Upholstery Collection is a safe, antimicrobial technology that actively targets bacteria on the protected surface of the upholstery. This used silver ion technology that is already in place in other medical devices and products, such as cell phones. The antimicrobial will not wash off. The soft material is available in a variety of patterns and colors (32).



Carpet can also have other benefits in addition to increasing social support through being more homelike and comfortable to patients and families. Interface, a producer of carpet squares used in hospitals and other commercial buildings has begun to produce carpet tiles with RFID tags woven into them. These tags are able to track equipment as they roll over the carpet, which can help administrators and hospital staff to keep track of important equipment in large hospitals (50).

Recommendations

| Guideline #5 |

"Music therapy addresses the physical, emotional, cognitive and social needs of the patient," says Music Therapist Brian Schreck. (37)

Guideline #5: Create an environment that reduces negative noise but allows for positive stimulation, such as music.

Evidence & Rationale:

- Reduced noise can improve sleep and reduce stress for both patients and families (7)
- Nature sounds and soft, classical music can produce a calming effect for families (7)
- Having more sleep and being more calm can improve the interaction with the patients
- Noise can be a health hazard, as it can increase blood pressure (20)
- Music therapy can promote better verbal communication and socialization for patients with Alzheimer's disease (25)
- Music therapy also shown to foster social interaction in other cases
- At Cincinnati Children's Medical Center, sick children can participate in music therapy, which promotes storytelling through music and allows the patients families to be involved; the music therapy sessions are also done with groups of patients, encouraging social interaction (37)

Possible Design Responses:

- Use of carpet and other sound reducing materials (7)
- Allow family to have direct control over music (7)
- Use white noise to mask undesirable noises
- Retrofit carts with wheels that create less noise (20)
- Wireless nurse call systems to eliminate noisy nurse pages (20)



Recommendations

| Guideline #5 |

"When the sound absorbing ceiling tiles were in place, patients evidenced lower physiological stress, slept better, reported better care from nurses, and had lower incidence of rehospitalization in the weeks following discharge" (2).

Guideline #5: Create an environment that reduces negative noise but allows for positive stimulation, such as music.

Implications for Stakeholders:

Patients

- Decreased level of bothersome noise increases sleep and decreases the amount of unintended awakenings from rest (2)
- Decreased level of bothersome noise increases privacy; this may increase satisfaction, and decrease stress

Family and Friends

- Families will be less stressed when exposed to less bothersome noise, and therefore can offer better social support to patients

Care Providers

- Staff can be distracted by noise, which can increase medical errors and stress (2)
- Staff voices and equipment is a big source of noise (2)

Administrators

- Less noise can increase patient and family satisfaction, making a more desirable healthcare setting
- Less stress for staff, so lower turnover rate

Recommendations

| Guideline #5 |

Guideline #5: Create an environment that reduces negative noise but allows for positive stimulation, such as music.

Potential Innovative Solutions:

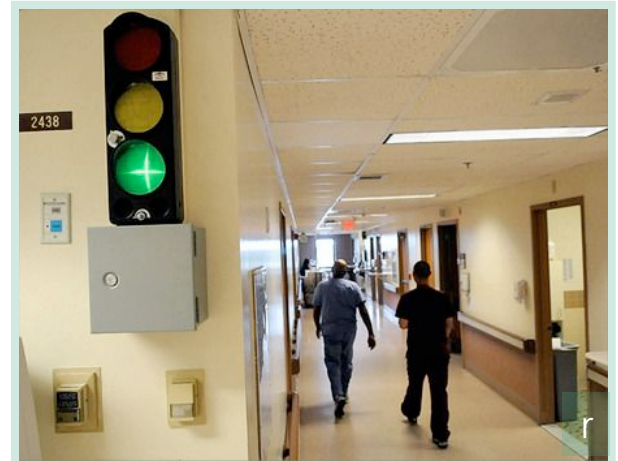


Some hotels have begun to offer noise canceling headphones and ipods that can be rented. This can help to cancel out excess, unwanted noise in the environment, and also allow patients to pick the type of music they would like to listen to. Music has calming and positive effects on patients and giving patients control over music

The Yacker Tracker is a device that measures sound levels. When the space gets too noisy and exceeds a decibel level of noise set by the user, the traffic light turns red and the overhead lights in the space dim to alert doctors and nurses. This device was originally designed for schools but is now increasingly being found in hospitals (20).

Other changes to hospital policies and employee training can be made to make staff more aware of the importance of not creating too much noise. Rather than a overhead paging system, each staff member can wear a small hands-free personal communicator that operates like a cell phone, where each staff member can be paged directly.

"One medical center in Ohio is utilizing a hands-free communication system to enable clinicians to call for assistance or answer pages by utilizing voice recognition. This system helps nurses effectively manage multiple tasks while increasing inter-departmental communication" (40).



Recommendations

| Guideline #6 |

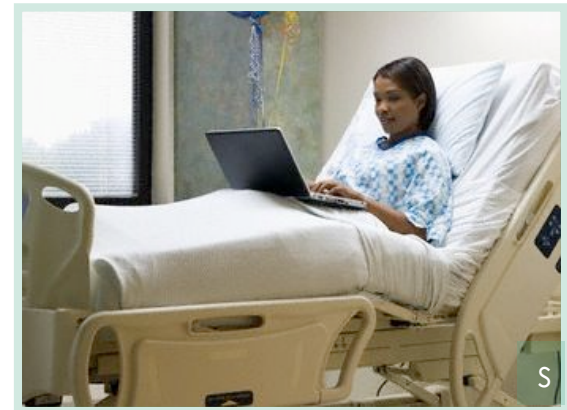
Guideline #6: Use technology to foster social support.

Evidence & Rationale:

- Online support groups offer a way for patients to interact with other patients or people; this is important if patients' health limits or restricts them from face to face contact (24)
- Social support groups allow patients to have a safe outlet to express their feelings and emotions to peers who have been or are currently in the same position as them. Sometime patients prefer this to placing an extra burden on their family and friends (24)
- Groups can provide patients with a feeling of empowerment, as they can also help other people (24). Online support groups require limited material resources and can overcome issues of time and proximity constraints (24).
- Online groups, as opposed to weekly meeting groups, can free patients of the constraint of only being able to participate in a group on a specific day and time, especially if their condition makes them too weak or ill to participate (24).
- Some hospitals have had issues with nurses and other staff members posting private information or photos of patients on their personal Facebook accounts (42). As more people begin to use Facebook and other social media sites, hospitals have to become more stringent with their patient privacy policies. Many hospitals have a no tolerance policy and block employees from using Facebook and similar sites while at work (42).

Possible Design Responses:

- Provide computers, laptops, and wireless access for patients and family and friends to use in patient rooms, family lounges, and waiting areas.
- Provide patients with information to websites where they can join an online peer group or read about other people's experiences through blogs, such as Patientslikeme.com
- Hospitals should dedicate resources to keeping patients and families informed on hospital initiatives through Facebook, Twitter and other commonly used social media
- Smartphones



Recommendations

| Guideline #6 |

Guideline #6: Use technology to foster social support.

Implications for Stakeholders:

Patients

-Not all patients will be able to use certain types of technology due to limited experience with technology; some older users may not understand how to use the technology and/or may find it frustrating

Family and Friends

-This can provide families with access to health related information, so they can research and better understand a loved one's medical condition and potential treatment options

-By integrating technology into the hospital environment, this may allow visitors to stay in better contact with the outside world (7); if visitors can communicate and work in the hospital rather than in the office, they can remain by the patient's side longer

Care Providers

-Can use technology to interact with patients and to communicate with the family

Administrators

-Do you put a computer or laptop in every room versus allowing people to rent them on a need basis? Could this affect the spread of infection?

-How do you protect privacy and security of patients?

Other Implications:

- Does this take away from face to face support?

Recommendations

| Guideline #6 |

Guideline #6: Use technology to foster social support.

Potential Innovative Solutions:

The University of Minnesota Medical Center has new phones that use wireless internet technology to integrate with the equipment already in place at the hospital. In a typical hospital, when patients press the call button in their room, someone at the nurse's station answers and relays the request to the nurse through page, which can take up to ten minutes. In this new system, when patients push the call buttons on their room, it directly dials their nurse, so that the nurse can respond immediately. If the nurse can't respond, the call gets forwarded to two other nurses. This new system has greatly increased patient satisfaction at the hospital, and can increase the social support that the patient receives from the nurses (41).



A computerized device, known as COACH, is being developed in Canada and Scotland to help people who suffer from dementia. This device consists of a camera and a video screen and helps these patients do simple everyday tasks that they have trouble remembering, such as washing their hands. Although a machine like this would help to relieve some burden from the care giver, this could take away face to face contact and could cause more social isolation than it was intending (43).

Recommendations

| Guideline #7 |

Guideline #7: Provide natural gardens for patients and families to use.

Evidence & Rationale:

- Gardens can support social interaction and support (7)
- They are restorative through reducing stress and improving emotional well-being
- View of nature or gardens, even for less than five minutes, produces many positive responses, such as pleasantness and calmness, and decreases negative emotions, such as fear, sadness, or anger (21)
- Gardens can reduce stress through encouraging social support and privacy, and allowing a chance to escape stressful hospital settings.

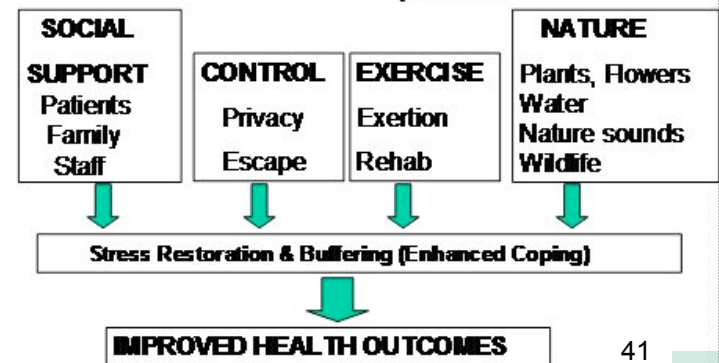
Possible Design Responses:

- Green roofs can serve as a space for patients, families, and staff to go. As they are located on the roof, they do not take up a lot of valuable space that can be used for other revenue generating space. They are also sustainable and can produce other benefits for the hospital.
- Garden features should include a variety of spaces for sitting with comfortable and moveable seating arrangements, a location close to waiting areas and patient rooms



THEORY: How Gardens Can Improve Outcomes

(Ulrich, 1999)



Recommendations

| Guideline #7 |

“gardens are a useful component of the healing design. They are probably most effective in congested urban conditions, where families often have no access to nature. However, in big cities, hospitals are built on expensive real estate. It is not easy to convince the administrators that gardens can be as cost effective as, for example, ten additional patient rooms or one additional diagnostic lab in terms of hospital earnings” (7).

Guideline #7: Provide natural gardens for patients and families to use.

Implications for Stakeholders:

Patients

- It can be difficult for all patients to access a physical garden, but view of nature and natural elements indoors, can also produce positive benefits; this is especially a concern for patients who are bed-ridden or mobility impaired
- Can be unhygienic and possible risk of infection (22)

Family and Friends

- Gardens are a good setting for families to go with the patients to interact outside of the patient room or indoor lounges
- Nature may help relieve stress

Care Providers

- Staff can also use gardens as a means to escape the stressful work environment (21)

Administrators

- May feel that it is more beneficial financially for hospital to build extra patient rooms or labs than a garden, since a garden it is not a revenue generating space (7)
- Gardens may increase patient and family satisfaction, which may increase the likelihood that patients and visitors will recommend the hospital to others
- Views of nature can lead to shorter lengths of stay (2), which can reduce cost and lead to great patient satisfaction

Other Implications:

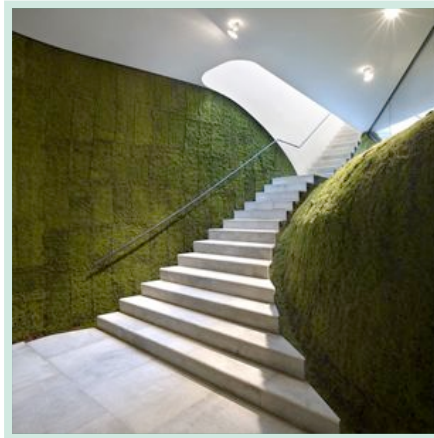
- Weather can be an issue, as climates that are too cold or too hot can prevent families from using the space

Recommendations

| Guideline #7 |

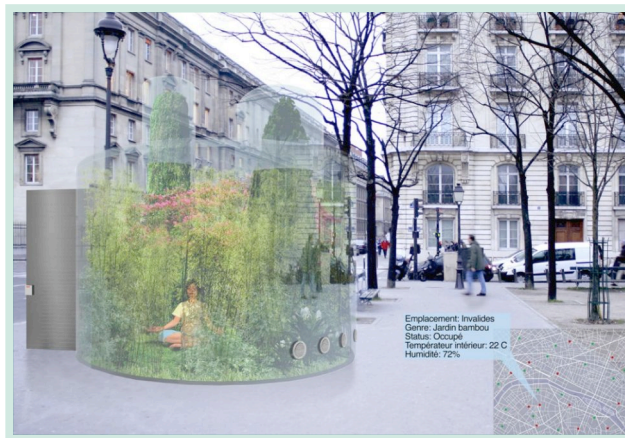
Guideline #7: Provide natural gardens for patients and families to use.

Potential Innovative Solutions:



Left: This is an attempt to incorporate as much nature as possible into the building. The spaces are perceived to be a part of the outdoors (30).

Below: Stefan Gzyl's project Pac Disponible is part of an international competition on ways to originally incorporate nature into the urban environment. The idea is a condensed park, located in 15 square meters, has sealed glass and is able to control the temperature and microclimate so that the space stay green all year (31).



Recommendations

| Guideline #7 |

More Innovative Solutions

Cooperative Care is a potential solution, related to resort/hotel type hospitals. Specifically, Cooperative Care is a model that requires patients to have a close friend or family member as a care partner in the healing process. The care partner assists the patient with daily activities and helps nurse the patient back to health. The patients and their care partners reside in private, home-like suites with at least two beds, a living room, and a kitchenette. This model is frequently used for the care of transplant, cancer, and rehabilitation patients. It can help patients transition from the hospital to the home much easier. Although this idea has been around for many years, it does not appear that many hospitals implement it (14). However, space constraints and the high cost of space must be taken into account.

Examples- NYU, Lied Transplant Center in Omaha Nebraska



Benefits: (14)

- Improved patient outcomes
- Fewer falls
- Improved staff morale
- Less staff turnover
- Faster recoveries
- Easy transition from hospital to home
- Fewer medication errors

Future Considerations

| Looking Forward: Surpassing Current Limitations |

Although Environmental Design Research is extensive in some arenas, there are niches which have not received sufficient attention. For instance, "...a lack of research in many areas concerning patients and families has been a significant barrier to healing design. For example, regarding human senses, studies on the role of tactile qualities of architecture in the process of healing has not been reported in the ED research literature...This is an important limitation concerning healing design." (7) Other aspects of human experience such as memory and spirituality have not yet been adequately explored. (7)

Limited knowledge may be problematic, slowing the progress of creating more effective healing spaces. As more thorough research is conducted, the availability of new insights offers opportunities for making a difference through the built environment, especially in the context of healthcare design.



Conclusion

Available social support is important for patients in a hospital. Regardless of age, gender, ethnicity, or cultural background, patients experience positive health benefits and an increased speed of recovery when they receive social support from their families and friends (22, 35, 36). In order to foster social support, families and friends must be comfortably accommodated when they visit the hospital. This could mean that policies, such as visiting hours need to be reconsidered in order to provide families with more flexible hours; this may allow visitors to spend more time with a loved one in the hospital. There are also many design elements that can be incorporated into a med/surge setting in order to support families and friends when they are visiting a patient in the hospital. For example, spaces that are flexible and can be easily controlled by patients and visitors increases satisfaction and provide more opportunities for interaction (7). Additionally, private patient rooms with an included family zone increases the amount of time that families spend with the patient (2). Gardens also provide an environment outside of the room that encourages social interaction among patients and families (7, 21).

Although all of these things promote social support and lead to better patient outcomes, they are not always included in hospital redesign. Often issues arise when there are different priorities from the various stakeholders: the patients, family and friends, care providers, and administrators. For example, administrators often don't see the value in providing a garden when they could use that valuable space for more patient rooms or other revenue-generating space (7). Thus, differing priorities, perspectives and concerns often generate challenging debates, such as design dilemmas. As designers and planners approach such dilemmas, they must consider how to best balance differ stakeholder priorities while developing innovative solutions at the same time.

References

1. Eward, A. M. (1995). *Toward an integrated medicine: classics from psychosomatic medicine 1959-1979*. Washing D.C.: American Psychiatric Publishing, Inc.
2. Ulrich, R.S., Zimring, C., Zhu, X., DuBose, J., Seo, H-B., Choit, Y-S., Quan, Z., and A. Joseph (2008). A review of the research literature on evidence-based healthcare design, *Health Environments Research & Design Journal*, 1(3), 61-121.
3. Ulrich, R. (2000). Evidence based environmental design for improving medical outcomes. *Proceedings of the Building for healthcare in the 21st century*, http://muhc-healing.mcgill.ca/english/Speakers/ulrich_p.html
4. Smith, R, & Watkins, N. (2010). Therapeutic Environments. *Whole building design guide: daylighting*. Retrieved October 28, 2010, from <http://www.wbdg.org/resources/therapeutic.php>
5. Saint Alphonsus Regional Medical Center. (2010). *Center for advanced healing: top 10 list of evidence based design features*. Retrieved from http://www.saintalphonsus.org/CenterforAdvancedHealing_design.html
6. Carpmann, J, & Grant, M. (1993). *Design that cares: planning health facilities for patients and visitors*. American Hospital Publishing, Inc.
7. Rashid, M. (2010). Environmental design for patient families in intensive care units. *Journal of Healthcare Engineering*, 1(3), 367-398.
8. Rantanen, A., Kaunonen, M., Astedt-Kurki, P., & Tarkka, M. (2004). Coronary artery bypassgrafting: Social support for patients and their significant others. *Journal of ClinicalNursing*, 13, 158-166.
9. Koivula, M., Tarkka, M. T., Tarkka, M., Laippala, P., & Paunonenilmonen, m. (2002). Fearand in-hospital social support for coronary artery bypass grafting patients on the day before surgery. *International Journal of Nursing Studies*, 39(4), 415-427.
10. Tarkka, M.-T., Paavilainen, E., Lehti, K., & Astedt-Kurki, P. (2003). in-hospital social supportfor families of heart patients. *Journal of Clinical Nursing*, 12(5), 736-743.
11. Astedt-Kurki, P, Paunonen, M, & Lehti, K. (1997). Family members' experiences of their role in a hospital: a pilot study. *Journal of Advanced Nursing*, 45, 908-914.
12. Henneman,, E, & Cardin, S. (2002). Family-centered critical care: a practical approach to making it happen. *Critical Care Nurse*, 22, 12-19.
13. Duran, C.R., Oman, K.S., Abel, J.J., Koziel, V.M., & Szymanski, D. (2007). Attitudetoward and beliefs about family presence: a surveyof healthcare providers, patients' families, and patients.*Am J Crit Care*, 16, 270-279.
14. McCullough, C. (2010). *Evidence-based design for healthcare facilities*. Indianapolis, IN: Sigma Theta Tau International.
15. Cadenhead, C.D., & Anderson, D.C. (2010). *Critical care design: trends in award winning designs*. Retrieved from <http://www.worldhealthdesign.com/Critical-Care-Design-Trends-in-Award-Winning-Designs.aspx>.

References

16. Landro, L. (2007, July 12). Icu's new message: welcome, families. *Wall Street Journal*.
17. Miwa, Y., & Hanyu, K. (2006). The effects of interior design on communication and impressions of a counselor in a counseling room. *Environment and Behavior*, 38(4), 484-502.
18. Bijttebier, P, Vanoost, S, Delva, D, Ferdinande, P, & Frans, E. (2001). Needs of relatives of critical care patients: perceptions of relatives, physicians, and nurses. *Intensive Care Med*, 27, 160-165.
19. Verhaeghe, S. et al. (2004). The needs and experiences of family members of adult patients in an intensive care unit: a review of the literature. *Journal of Clinical Nursing* 14, 501-509.
20. Crocker, Joy. "Syracuse-area Hospitals Aim to Reduce Noise Syracuse.com." *Syracuse.com*. 28 July 2009. Web. 03 Nov. 2010. <http://blog.syracuse.com/healthfitness/2009/07/syracusearea_hospitals_aim_to.html>.
21. Ulrich, R. (2002). Health Benefits of Gardens in Hospitals. Plants for People. International Exhibition Floriade. <<http://greenplantsforgreenbuildings.org/attachments/contentmanagers/25/HealthSettingsUlrich.pdf>>.
22. Marcus, Claire Cooper., and Marni Barnes. "Theory and Research." *Healing Gardens: Therapeutic Benefits and Design Recommendations*. New York: John Wiley, 1999. Print.
23. Carteret, Marcia. "Culture and Family Dynamics - Dimensions of Culture." *Cross-cultural Communications In Health Care*. 2009. Web. 03 Nov. 2010. <http://www.dimensionsofculture.com/home/culture_and_family_dynamics>.
24. Bambina, Antonina. *Online Social Support: the Interplay of Social Networks and Computer-mediated Communication*. Youngstown, NY: Cambria, 2007. Print.
25. "Social Interaction and Music at Dolan Dementia Care Centers." *Alzheimers Care Facility-Assisted Living – Dolan Dementia - St Louis Missouri*. Web. 03 Nov. 2010. <<http://www.dolancare.com/Page.asp?Id=52>>.
26. Boutin-Foster, Carla. "In Spite of Good Intentions: Patients' Perspectives on Problematic Social Support Interactions." *Health Qual Life Outcomes* 3.52 (2005).
27. "Testimonials." *Penn State Hershey*. Web. 3 Nov. 2010. <<http://pennstatehershey.org/web/pfcc/home/testimonials>>.
28. Malaga, Nancy. "Family Centered Care." *Advance: Respiratory Care and Sleep Medicine*. Merion Matters, 25 Oct. 2010. Web. 3 Nov. 2010. <<http://respiratory-care-sleep-medicine.advanceweb.com/Features/Articles/Family-Centered-Care.aspx>>.
29. Meyers, Susan. "Take Heed." *Trustee*. Apr. 2008. Web. 04 Nov. 2010. <http://www.trusteemag.com/trusteemag_app/jsp/articledisplay.jsp?dcrpath=TRUSTEEMAG/Article/data/04APR2008/0804TRU_FEA_Advisors&domain=TRUSTEEMAG>.
30. "Ann Demeulemeester Shop." *City Dirt: Adventures in Urban Gardening*. 15 Jan. 2008. Web. 04 Nov. 2010. <<http://www.citydirt.net/2008/01/>>.

References

31. J, Sebastian. "Parc Disponible/Stefan Gzyl." *Arch Daily*. 7 Sept. 2010. Web. 3 Nov. 2010. <<http://www.archdaily.com/76779/parc-disponible-stefan-gzyl/#more-76779>>.
32. "2007 Nightingale Award Winners | Articles & Archives." *Healthcare Design*. 1 Jan. 2008. Web. 06 Nov. 2010. <<http://www.healthcaredesignmagazine.com/me2/dirmod.aspsid=&nm=&type=Publishing&mod=Publications::Article&mid=8F3A7027421841978F18BE895F87F791&tier=4&id=E48FC4A9ECDE44EB841E9FF3FA26A2DE>>.
33. Nauert, Rick. "Social Support Improves Cancer Outcomes." *Psych Central*. 30 Sept. 2009. Web. 06 Nov. 2010. <<http://psychcentral.com/news/2009/09/30/social-support-improves-cancer-outcomes/8673.html>>.
34. Savin, Juliette. "Social Support Improves Mental Health After A Traumatic Health Care Intervention." *Medical News Today: Health News*. 18 Oct. 2006. Web. 06 Nov. 2010. <<http://www.medicalnewstoday.com/articles/54244.php>>.
35. Hale, C.J., Hannum, J.W. & Espelage, D.L. (2005). Social support and physical health: the importance of belonging. *Journal of American College Health*, 53 (6), 276-284.
36. "Social Support: Tap This Tool to Combat Stress." *Mayo Clinic*. 23 July 2010. Web. 6 Nov. 2010. <<http://www.mayoclinic.com/health/social-support/SR00033>>.
37. "Music Therapy" *Cincinnati Children's Hospital Medical Center*. Web. 06 Nov. 2010. <<http://www.cincinnatichildrens.org/svc/alpha/c/child-life/families/programs/music-therapy.htm>>.
38. Huet, Natalie. "Pod Hotels in a Bid to Take New York by Storm." *AFP*. 27 Sept. 2010. Web. 06 Nov. 2010. <http://www.google.com/hostednews/afp/article/ALeqM5hNV7LM8_3tqyXFXr0Kh3C49tDuLA>.
39. Labarre, Suzanne. "You're Paying Too Much in Office Rent. Try Redesigning." *Co.Design*. 20 Sept. 2010. Web. 06 Nov. 2010. <<http://www.fastcodesign.com/1662334/youre-overpaying-for-office-space-try-a-redesign>>.
40. "Wireless Technology Changing the Face of Nursing." *Navilyst Medical*. 10 Nov. 2009. Web. 06 Nov. 2010. <<http://info.navilystmedical.com/Blog/bid/23254/Wireless-Technology-Changing-the-Face-of-Nursing>>.
41. Olson, Rob. "U of M Nurses Respond to Patients with Smartphones." *FOX 9 News*. 23 Sept. 2009. Web. 06 Nov. 2010. <http://www.myfoxtwincities.com/dpp/health/Nurses_Respond_with_Smartphones_sept_23_2009>.
42. Hennessy-Fiske, Molly. "When Facebook Goes to the Hospital, Patients May Suffer." *The Los Angeles Times*. 08 Aug. 2010. Web. 06 Nov. 2010. <<http://articles.latimes.com/2010/aug/08/local/la-me-facebook-20100809>>.
43. Devereux, Theresa. "Camera Talks Patients Help Lighten Dementia Burden." *Mail Online*. 3 Feb. 2009. Web. 6 Nov. 2010. <<http://www.dailymail.co.uk/health/article-1134442/Camera-talks-patients-help-lighten-dementia-burden.html>>.

References

44. Segrin, Chris. "Age Moderates the Relationship Between Social Support and Psychosocial Problems." *Human Communication Research* 29.3 (2003): 317-42. Wiley. Web. 6 Nov. 2010. <<http://onlinelibrary.wiley.com/doi/10.1111/j.1468-2958.2003.tb00842.x/abstract>>.
45. Sherbourne, CD. "Social Support and Stressful Life Events: Age Differences in Their Effects on Health-related Quality of Life among the Chronically Ill." *Qual Life Res* 1.4 (1992): 235-46. Pub Med. Web. 06 Nov. 2010. <<http://www.ncbi.nlm.nih.gov/pubmed/12994>>.
46. Molter, NC, and JS Leske. "Critical Care Family Needs Inventory (CCFNI)." Web. 6 Nov. 2010.'
47. Kleinpell, Ruth M., and Marjorie J. Powers. "Needs of Family Members of Intensive Care Unit Patients." *Applied Nursing Research* 5.1 (1992): 2-8. Print.
48. Davidson, Judy E., Karen Powers, Kamyar M. Hedayat, Mark Tieszen, Alexander A. Kon, Eric Shepard, Vicki Spuhler, I. David Todres, Mitchell Levy, Juliana Barr, Raj Ghandi, Gregory Hirsch, and Deborah Armstrong. "Clinical Practice Guidelines for Support of the Family in the Patient-centered Intensive Care Unit: American College of Critical Care Medicine Task Force 2004-2005." *Critical Care Medicine* 35.2 (2007): 605-22. Print.
49. Federwisch, Anne. "Longer Visiting Hours." *Nurseweek*. 18 June 1998. Web. 07 Nov. 2010. <<http://www.nurseweek.com/features/98-6/visit.html>>.
50. Brown, Stuart. "Computer Power Yields Radical Ideas." *CNNMoney.com*. 17 Dec. 2009. Web. 07 Nov. 2010. <http://money.cnn.com/2009/12/17/technology/invention_machine.fortune/index.htm>.

Image References

- A. Image: <http://www.babyboomercaretaker.com/senior-health/elderly-disease/heart-attack/index.html>
- B. Getty images
- C. <http://www.dailymail.co.uk/health/article-1134442/Camera-talks-patients-help-lighten-dementia-burden.html>
- D. Getty images
- E. Getty images
- F. Getty images
- G. Getty images
- H. Getty images
- i. <http://www.dailymail.co.uk/health/article-511598/Half-hospital-patients-risk-deadly-blood-clot--NHS-fail-1-life-saving-drug.html>
- J. Rashid, M. (2010). *Environmental design for patient families in intensive care units*. *Journal of Healthcare Engineering*, 1(3), 367-398.
- K. <http://www.promisehealthcare.com/>
- L. Getty images
- M. http://www.charlestonnanny.com/family_guide.htm
- N. Rashid, M. (2010). *Environmental design for patient families in intensive care units*. *Journal of Healthcare Engineering*, 1(3), 367-398.
- O. Getty images
- P. Getty images
- Q. <http://www.doctorsearchengines.com/service.htm>
- R. <http://www.embersstaffing.com/businessfaqs.html>
- S. Getty images
- T. <http://www.rascalsofabed.co.uk/healthcare-4.html>
- U. Getty images
- V. <http://www.theresidentarchitect.com/2010/02/furniture-design-5-random-transforming-and-convertible-furnitures.html#axzz13KFhEW7b>
- W. <http://www.resourcefurniture.com/space-savers/queen-space-saving-beds/nuovoliolÃ%C2%A0>
- X. <http://norobots.net.au/?p=123>
- Y. <http://www.allmodern.com/Mio-Culture-NAS-0X-MOC1004.html#ProdDetails>
- Z. <http://blog.ounodesign.com/tag/room-dividers/>

Image References

- a. <http://l2designsinc.com/wordpress/wp-content/uploads/2009/12/bottom.png>
- b. http://www.straitstimes.com/BreakingNews/Singapore/Story/STISStory_503967.html
- c. <http://www.dartmouthengineer.com/2009/09/just-one-question-summer-2009/>
- d. Cadenhead, C.D., & Anderson, D.C. (2010). *Critical care design: trends in award winning designs*. Retrieved from <http://www.worldhealthdesign.com/Critical-Care-Design-Trends-in-Award-Winning-Designs.aspx>.
- e. <http://www.fastcodesign.com/1662334/youre-overpaying-for-office-space-try-a-redesi>
- f. <http://travel.ninensn.com.au/blog.aspx?blogentryid=411130&showcomments=true>
- g. <http://childrencantwait.org/explore/>
- h. <http://www.albertkahn.com/clientDetails.cfm?clid=13>
- i. <http://childrencantwait.org/explore/>
- j. <http://www.dbgg1979.com/2009/08/kids-section-at-ayala-center-cebu-cebu-malls/>
- k. <http://blog.petaflop.de/wp-content/uploads/2007/10/spielplatz-playground-breakfast-sausages-sunny-side-up-eggs-bacon-spiegeleier-wuerstchen-speck-waffeln-waffles-mall-shopping-center-denver-colorado-usa-dscn7218.jpg>
- l. <http://www.albertkahn.com/clientDetails.cfm?clid=13>
- m. http://www.cleveland.com/insideout/index.ssf/2009/01/ronald_mcdonald_house_family_r.html
- n. <http://www.healthcaredesignmagazine.com/me2/dirmod.asp?sid=&nm=&type=Publishing&mod=Publications%3A%3AArticle&mid=8F3A7027421841978F18BE895F87F791&tier=4&id=E48FC4A9ECDE44EB841E9FF3FA26A2DE>
- o. <http://www.apple.com/ipodtouch/gallery/>
- p. <http://www.hardwaresphere.com/2009/08/20/bose-noise-canceling-headphones-launches/>
- q. <http://www.cincinnatichildrens.org/svc/alpha/c/child-life/families/programs/music-therapy.htm>
- r. http://blog.syracuse.com/healthfitness/2009/07/syracusearea_hospitals_aim_to.html
- s. <http://www.corbisimages.com/images/67/A01AD014-906C-4F97-9292-45B5689E3545/42-19366497.jpg>
- t. http://www.myfoxtwincities.com/dpp/health/Nurses_Respond_with_Smartphones_sept_23_2009
- u. <http://www.healinglandscapes.org/blog/2010/10/a-running-hollering-skipping-playing-place-guest-blog-post-by-addie-hahn/legacy-benches/>
- v. <http://greenplantsforgreenbuildings.org/attachments/contentmanagers/25/HealthSettingsUlrich.pdf>
- w. <http://www.citydirt.net/2008/01/>
- x. <http://www.archdaily.com/76779/parc-disponible-stefan-gzyl/#more-76779>
- y. http://www.nebraskamed.com/transplant/pdf/Solid_Organ_Transplant_Unit_Photo_Tour.pdf
- z. Getty images