

Health by Design- A Patient Centered Approach in Hospital Design to Create Healing Environment

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Abstract: Hospital design has an influence on performance of the hospital. With globalization and medical tourism healthcare sector has changed enormously in every aspect to cater to the expectations and need of people. Today hospitals are largely working in corporate style for its customer satisfaction, good working environment and patient safety which required architects and designers to change their outmoded hospital design process. Hospital design is about creating physical environment which has its direct impact on the patient recovery and safety. Recent researches advocated that certain design elements should be considered in the design of a hospital building to promote the healing environment which is critical to the patient recovery rate and safety. This proposes the vital role of Hospital Architects and designers to be played in coordination with the hospital administration and staff at the early stage of project conceptualization so that all the required steps can be well preplanned and implemented for a successful design and functional hospital building with a healing environment.

Keywords: Hospital Architects, Hospital Design Principles, Design Parameters, Patient recovery, healing environment.

1. INTRODUCTION

Hospital design has an influence on performance of the hospital. Hospital design is about creating physical environment which has its direct impact on the patient recovery and safety. Recent researches advocated that certain design elements should be considered in the design of a hospital building to promote the healing environment which is critical to the patient recovery rate and safety. Architects and designers need to play vital role in coordination with the hospital administration and staff at the early stage of project conceptualization so that all the required steps can be well preplanned and implemented for a successful design and functional hospital building with a healing environment.

2. PRINCIPLES OF HOSPITAL DESIGN

Involvement of all the stake holders at the initial stages of project development helps in identifying the crucial design factors important in effective healthcare delivery from different point of view. The points raised in common by the

stakeholders will help in preparing the list of design factors which matters them may be considered as the basic guideline of hospital design. Patient-centeredness, Safety, Effectiveness, Efficiency, Timeliness and Equity are considered as the basic principles of the hospital design with focus on different priority areas by individual user.

2.1 Patient-Centeredness

At the end patient is the focus of every hospital. He is the one for which whole hospital is working. Every design parameter must cover the interest of patient. The designed spaces should always respond to the health and psychological need of the patient. This includes providing well designed spaces with open, easy, approachable and accident free layout in all units as well as wards with sufficient space to accommodate family members. Design should ensure easy access to healthcare information and clear signage to find the way in the hospital.

2.2 Patient Health and Safety

Every step in hospital is crucial to the health and safety of the patient whether it is the step of a nurse or a doctor. The design should be focused to the health and safety of the patient. Reducing the movement or steps of the staff is one way of achieving it. The departmental adjacency plays very important role in reducing the steps which can only be achieved by exhaustive meetings with the hospital staff to understand the direct or indirect relationship and interdependencies of different hospital departments. Patient safety involves considering the design which eases the patient transfer or movement and reduces accident like rounded corners, availability of devices that are designed to prevent patient falls, ventilation and air filtration systems for avoiding spread of infections and using eco-friendly products, finished surfaces that can be easily decontaminated and addressing of the sensitivities associated with the interdependencies of care including work spaces and work processes.

2.3 Environmental Control

This includes use of ventilation, air conditioning and lighting. It plays important role in designing the physical environment

as healing environment. Environmental control may be achieved by natural means and artificial means both. Use of lighting is crucial to the performance of the hospital staff. Adequate lighting including under-bed nightlights aid care giving yet not disturb to the patients. Environmental control also implies to the ability to control effects of noise on the patient.

2.6 Efficiency

Efficiency is the key to cater to the health and safety of the patients. It involves the standardization of the spaces such as room layout with respect to the furniture, fixture and medical equipment. It helps in minimizing potential safety threats, and improving patient satisfaction by minimizing patient transfers to different rooms. Standardization of units and ward requires proper understanding of need of patient and staff.

2.5 Timeliness

This includes ensuring rapid response to patient needs, eliminating inefficiencies in care delivery, and facilitating the clinical work of nurses. Design is an essential tool to ensure the timeliness by categorizing the different departments and their adjacency with each other at macro level of planning and decentralization of facilities at micro level for quick response to the need of patients and staff.

2.6 Equity

This is about focusing the patient from every angle of spatial planning of hospital achieved by ensuring that the different care needs of patients are met by the size, layout, and functions.

3. DESIGN PARAMETERS

The physical surroundings have its direct impact from staff to patient. Effective physical surroundings may reduce staff stress and fatigue and increase effectiveness in delivering care. It Improves patient safety and reduces stress and improve outcomes and finally Improve overall healthcare quality.

Findings show that patients are responsive and expressive about their architectural environment. Patients appear to make significantly better progress in new properly designed hospital buildings.

There are two types of relationship which are highly appreciated to be achieved using design as a tool that is with people and nature. A sensible Hospital design process aims to create healing environment in three main ways as described by Agency for healthcare research and society (AHRQ):

1. Enhance patient safety by reducing infectivity risk, injuries from falls and medical errors.

2. Eliminate environmental stressors, such as noise, that negatively affect patient outcomes and staff performance.
3. Reduce stress and promote healing by making hospitals more pleasant, comfortable and supportive for patients and staff alike.

To achieve this in the hospitals there is a constant need of clear orientation, connection with nature, association with people, proper scale and positive symbolic representation. These are all essential elements for increased rate of healing in patients. To create the healing environment architects need to focus the design issues while planning the healthcare facilities. There are studies conducted on the affect of design involving patient experience which identify the design categories and related design issues of a hospital building.

1. Site planning – Building location or zoning on site with external development or site optimization is the first thing to be worked upon before proceeding to hospital building design. Hospital is all about the movement of the people; it starts with site planning considering the different types of traffic. Entrances need easy approach and separation of traffic like visitors, Out-patient, in-patient, emergency etc. All drop off and parking is required to be categorically provided for all types of traffic with necessary proximity. Relationship between the building and open areas plays important role in creating the common spaces which can be effectively used to create healing environment by providing landscaped interactive spaces which reduces the stress of patient and their family during their long stay at hospital.
2. Departmental adjacency – hospital is a complex building and needs to be studied thoroughly before designing. Hospital departments show strong interrelationship and interdependencies to function. Their adjacency and categorization can be achieved by properly zoning the different departments vertically and horizontally within the building. Zoning reduces the movement of patient and staff and appropriate location helps in controlling the traffic.
3. Spaces and Spatial planning – It deals with the size and layout of the workplace. Spatial layout, privacy, personal control and independence have been found to be particularly important in reducing stress. Design factors that gives patient the feeling of being at home and less institutional, that are barrier free and support patient's self-respect and support family contribution. Today's hospital should provide amenities such as libraries, kitchens, and lounges, with comfortable accommodations for family members. Hospital interiors and exteriors are equally important and include fountains, gardens, fish tanks, and waterfalls, all designed to be nurturing and relaxing for patients.

4. Building fenestrations and envelope - Extensive research has been conducted on the psychological effects of windowless environments and result show windows are not just luxury but it is about comfort, as lack of contact with the exterior environment escalates stress and depression. Windows are a source of light, sunshine, and one get to know about outside weather and generally about what is going on in the outside world. Studies have found that patients prefer rooms with a view. It helps them to connect with the outside visually while remaining in the physical environment of the hospital.
5. Building specifications and FFE (furniture Fixture and Equipments) - The standard of any hospital is displayed by the specifications it uses like any other building. The hospital building specification becomes more important with its special requirements at many places in roofing, flooring, wall cladding and everything over surfaces which creates an enclosure. Special types of flooring which are resistant to skidding and disinfectant agents along with its appearance me reduce the cases of accidents. A proper layout needs to be developed for the furniture fixture and equipments in coordination with the hospital administration for optimum space planning.
6. Lighting – in particular natural vs. artificial light. A large number of studies have shown that exposure to natural light reduces depression and fatigue and improves alertness. Improved lighting allows staff to improve their performance of visual tasks. It also helps support circadian systems and affects mood and perception. The review also showed that exposure to sunlight can decrease the length of hospital stay of patients. Poor lighting contributes to medication errors. Providing abundant natural light also helps cut energy costs.
7. Environmental control, Ventilation and air-conditioning system – The ability to control the environment by individual is one of the important factors which imparts satisfaction to the patients and staff. Research shows that a cause of frustration is the inability of inpatients to control important aspects of their immediate environment, for example to control their own personal environment, to regulate the airflow and temperature, to turn off the radio or light. Staff may also become dissatisfied with their own inability individually to regulate temperature and fresh air. Sufficient ventilation rates and standard cleaning and maintenance of the ventilation system are vital for controlling the level of pathogens in the air. Some special precautions to prevent infection during periods of construction and renovation include using portable HEPA filters and installing barriers between patient care and construction areas.
8. Acoustics/ aural environment – The amount of noise generated in a hospital is crucial to the patients and visitors stress level. Studies in the aural situation have found that noise levels can have an undesirable effect on patients and can develop sensitivity of pain. Lack of sufficient rest and sleep is one of the main causes of stress facing patients in hospitals and the most frequent and important cause is noise. Providing technically specified sound absorbing acoustical treatment considerably reduces the negative impact of sound on the health of patients and increases the audibility between patient and staff avoiding any error. Also, this design measure increases speech privacy as less sound travels into adjoining spaces. In addition, providing single bedrooms and removing noise sources from the unit helps to reduce noise levels at the patient's bedside.
9. Olfactory environment – the element of smell that pervades particular areas of a hospital. Most environments have a particular smell and in hospital environments medicinal smells can bring about a level of anxiety amongst patients. Unpleasant odors are known to increase heart rate and respiration, whereas pleasant fragrances can lower blood pressure and heart rate. Of all the senses, smell is the most intimate and elusive, reaching more directly into memory and emotions. Often the olfactory sense is underestimated both as a cause of stress and, when positive, as a therapy or destressant. Studies have demonstrated that odors impact on people's health and well-being. This can include tasks, mood, perceived health and perceptions of the environment. In terms of design, hospitals have areas of residual bad smells, for example crowded spaces or day rooms where inadequate ventilation has left unpleasant odors. It has been identified that deep plan buildings are even more susceptible to residual smells.
10. Taste – the element of taste that people perceive in hospital by observation through its senses directly to his likings and disliking. Research is indicative of that in addition to the environmental factors such as natural light and pleasant views, artwork and use of certain colors have the potential to change what would else be a extremely traumatic and terrifying encounter into one that imparts a influential healing and healing effect. Definite colors are said to promote activity, while others promote inactive behavior.

4. ASPECT

There is a tool designed by the University of Sheffield called ASPECT. A Staff Patient Environment Calibration Tool (ASPECT) is a staff/patient environment calibration tool designed by University of Sheffield and now in general considered to offer the best chance of linking design issues in healthcare design to the known research on the impact on staff and patients. It has eight sections which deal with:

- Company
- Privacy and dignity
- Views, nature and outdoors
- Legibility of place

- comfort and control of the environment
- appearance
- facilities
- staff

5. EVIDENCE BASED DESIGN

Already familiar with evidence-based medicine, today's healthcare administrators are increasingly comfortable with a growing base of evidence-based design research that supports the idea that the "built environment" can affect patient clinical outcomes. Evidence-based Design is defined as the deliberate attempt to base design decisions on documented research and well-established best practices. Evidence based design seeks to provide a higher quality experience to patients and their families.

Center for Health Design (CHD) Texas, which, since 1993, has been actively engaged in initiating research to promote evidence-based design to create healing environments in Hospitals, Clinics, Physician offices, Nursing homes, and other healthcare facilities. CHD is dedicated to the idea that evidence-based design can enhance the quality of healthcare through the creation of environments that are:

- Therapeutic
- Supportive of family involvement
- Efficient for staff performance
- Restorative for workers under stress.

The Center for Health Design developed a research program that allows innovative healthcare providers to team with CHD in producing research and documenting examples of "how the built environment can positively affect the quality of healthcare and the financial performance of the organization.

6. COMPONENTS OF HEALING ENVIRONMENT

The components of a healing environment can best be defined as those that look after and reinstate balance to the mind, body, and spirit through each of the five senses. Light and color, for example, are two aspects of sight that can have the greatest overall impact on a patient's wellbeing. Research suggests that artificial light, in the absence of natural light, can lead to fatigue, depression, and elevated systolic blood pressure. Conversely, exposure to natural sunlight is associated with improvement in mood and sleep, as well as decreased use of pain medication and possibly even shorter lengths of stay for some patients. Use of color is also a powerful component of the healing environment and dates back to ancient times. the arts can also contribute to the healing environment through imagery that celebrates life,

amuses, and imparts messages of peace, hope, tranquility, comfort, and dignity. Art in the form of gardens, sculptures, and water features such as waterfalls and ponds can also be effective. Sense of personal space advocates Single-bed rooms for operational benefits of better communication with staff, minimization of transfers, fewer medication errors, decreased infection rates, and comfortable inclusion of the family.

7. CONCLUSION

Healing environments, which provide comfortable, attractive settings and home-like surroundings, have been shown to be a therapeutic intervention in the reduction of stress. The same healing elements that provide a calm and reassuring environment for patients and families are also beneficial to staff, administrators, and clinicians. For example, natural light and a less noisy environment can help decrease distractions and minimize medical errors. Health providers may benefit from improved lighting and efficient design that eliminates the need to walk long corridors and distances for supplies and medications. The components of a healing environment can best be defined as those that nurture and restore balance to the mind, body, and spirit through each of the five senses.

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