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HUMANIZATION OF HOSPITALS
HOW CAN ARCHITECTURE MEET PSYCHOLOGICAL FACTORS IN HOSPITALS

Introduction

Hospitals have always been known for their cold, impersonal environments: dull colours, plain hallways, fluorescent lighting and few personal amenities. But in today's health care market, that image is beginning to change as some health care executives realize that a relaxing, pleasant environment may play a critical role in a patient's medical experience. A lot of studies have suggested that hospital decor and layout can help patients cope with pain, reduce the rate of hospital-acquired infection and speed healing.

Almost 20 years ago an interesting study was published in "Science" magazine. In the April 1984 issue, Roger Ulrich reported that post surgical patients whose hospital rooms had an outdoor view typically recovered more quickly than those whose rooms did not. While today this may not seem shocking, the article offered some early documentation that there is a connection between healing and the environment. Something as simple as being able to look out a window and see the sky or the leaves on a tree can speed the healing process up. Why? Simply because it helps us relax.

Numerous studies have told us that anxiety affects the immune system and the body's ability to heal. As far back as 1975 we learned that when patients were prepped for heart surgery, a burst of the stress hormone cortisol (stress hormone) was released at four times the normal levels. A later study showed that patients who used guided imagery techniques to reduce anxiety before surgery required half the amount of pain medication after surgery, and their bowel function returned about a day-and-a-half earlier. Another study showed that when patients undergoing back surgery had experienced higher levels of anxiety before the surgery, they suffered more pain, tension and fatigue three months later.

The study by Lawson & Phiri (2003) examines the effects of the architectural environment on the lives of patients in two hospitals, one in the general medical and the other in mental health sectors. Examining two sets of wards, one in acute general medicine and the other in mental health, the study looked at groups of patients before and after the building of new accommodation. In both cases patients were referred in similar ways and underwent similar treatment regimes often by the same staff in both new and old wards. Findings indicated patients are sensitive to and articulate about their architectural environment. They are able to classify between poor and good environments and say clearly what they like and dislike about them. Patients appear to make significantly better progress in the new purpose-designed buildings than in their old parts. There is

considerable evidence that an overall improved atmosphere and quality of life may be one of the benefits of better places. In the mental health sector patient treatment times were reduced by 14% and in the general medical sector by about 21%. Most of the architectural features apparently responsible for these benefits appear to be general place-making features rather than hospital-specific treatment factors.

Beyond the purely aesthetic issues, one very important environmental consideration is to provide the patient with as many choices as possible. This may be in the form of temperature control or lighting levels, or meal and music selections. It's all about having options and the ability to influence or exercise control over the environment, because having options reduces stress and lessens feelings of helplessness. Another consideration is positive distractions, for example waterfalls, aquariums, fireplaces and access to gardens. In addition to the previously mentioned factors, designers nowadays are paying increased attention to the needs of the patient's family. Therefore hospital's layout includes a family lounge area that provides privacy for frightened, angry or overwhelmed relatives.

The successful design of caring environments also concerns the needs of the health care professionals. For these professionals, the most important and fulfilling goals are to provide the best patient care as possible. When that is not achieved because of insensitive facilities, inefficient layouts or inadequate space, frustration levels run high.

By improving an environment to meet the physical and emotional needs of everyone involved, it becomes a win-win situation for both the patients and staff. Good environments make us feel better, and feeling better is the key to getting better. Building design is a key issue for affecting workers, patients and productivity. The design of a building has been shown to affect the health of people who work in it. Poor design can cause "sick building syndrome" and lower productivity, and it can also affect patient's well-being and recovery rates. There is very strong evidence that a whole range of environmental factors, including lighting, colour, aroma, views, art, modulation of space and form, manipulation of scale, proportion and rhythm, sound, texture and materials, ease and flow of movement through space, indoor and outdoor plantscape have a powerful healing and therapeutic effect on patients, which may lead to:

- Faster patient recoveries
- Reduced pain
- Fewer cases of infection
- Greater patient satisfaction



- Reduced stress levels among staff
- Attraction and retention of quality staff
- Increased level of hospital attractiveness
- The positive impact on recruitment of nurse.

Hospitals in Slovakia

The problem with Slovak hospitals is that most of them are not very hospitable. After the fall of socialism we inherited a lot of hospitals, which are presently in insufficient conditions.

Currently if you are a first-time patient, like the nursing department, the outpatient department and the treatment and examination departments are located next to each other, so they are not dependent on each other. That offers give more opportunities for flexibility of hospitals in the future. The current Slovak health care system has to solve difficult financing problems what has also the main influence on obsolete architectural solution and insufficient amenities of hospital buildings. The Slovak Republic has decided to reinstall system of statutory health insurance after the fall of communism. Such a decision has been influenced by historical experience before 1948 nt, for example, you may already be feeling fairly anxious when you arrive at the hospital car park. So if you cannot even find the main entrance because it is badly signposted, or if, once you have got into the building, you cannot find the department you want, your anxiety level will probably increase. And if, during your wanderings, you pass through corridor after corridor choked with beds, trolleys and bags of waste, you are going to start wondering whether a hospital that can let its public spaces get into this state is really going to look after you properly.

The situation is largely due to a historical lack of design awareness in the socialist countries, resulting in hospital designers often putting functional efficiency before everything else. However, this has meant that Slovak hospitals have sometimes been designed for the convenience of staff rather than patients, and design features that might have made the patients feel more at home have been neglected. This design reflects the culture of the socialistic system, where patient is not an individual person with different requirements, but one part of an impersonal group. The problem has been made worse by the growth in demand for hospital care. Buildings that were unfriendly designed in the first place have become even more inhospitable because the spaces are not used efficiently and adaptation for new conditions is very difficult, because of unsuitable layout. We have now reached a position where far too many hospitals succeed in making people feel worse than they did when they came through the main entrance. Materials used in that period were of low quality. The structure of the buildings cannot be used easily for other purposes. Up 'till now should be renovated some of those buildings completely and some should be pulled down.

Organisation of hospitals in Slovakia was mainly based on the classical organisational model according to medical specialist

departments and separate centralized diagnostic and medical treatment facilities. Due to the mainly overall-disciplinary approach, nearly every specialism had the same beds within the nursing departments and the same facilities at the outpatient department.

This resulted in different types of hospitals like:

- The mono-block type
- The pavilion type
- The comb type
- The passage type
- The atrium type
- The branching type.

Very apparent over the past years is that the nursing departments have moved from the centre, the heart of the hospital to the periphery. If you compare the mono-block model, with the nursing departments in the high storey central section of the building, with the newer branching-type models, where the nursing departments have moved to the periphery and the diagnostic and treatment facilities in the centre, it is clear that design has followed medical developments and practice.

Most of the hospitals from the past 30 years didn't put enough emphasis on flexibility, because the developments in healthcare weren't as fast as the technical lifetime of hospital buildings. The branching-type buildings show examples of flexibility in which the main function and by example of neighbouring German-speaking countries. It also represented an understandable reaction to the shortages of communist national health system. Suggested changes in roles of institutions will lead to efficiency improvements. Main forces leading to desired changes will be:

- *Increased financial responsibility of payers and providers stemming from their new legal status.*
- *Competition among price providers and awareness of patients will lead to restructuring of provider's offers and increase of their productivity.*

The proposed reform of financing will support changes through pressure of Consumers. Citizens equipped with finances from their personal health accounts and with information on provider and payer performance will select and use health care best responding to their needs. All these changes have a great impact on the developments in the medical specialist care and the ongoing shift from clinical care to outpatient and day-surgery care resulting in the fact that the clinical care will be more and more reserved for the difficult cases. In the same period of time the average length of stay in a hospital has decreased dramatically and far more is done on an outpatient basis.

These days, however, architects in Slovakia are also far more aware that sickness is not specially a physical problem but is also influenced by psychological factors. In other words, patients in hospitals may also feel bad not just only because



they are ill, but also because they have been taken away from their familiar environment of their homes and placed in an institutional setting.

Senses and perceptions

We perceive our environment through our five senses: **sight, smell, touch, taste** and **hearing**. Our sensory system is constantly at work registering our surroundings. All of our senses sweep the world around us, providing the brain with information at an unperceivable rate. At a basic level, we are unconsciously registering our environment's effects on our nervous system. All stimulus like heat, light, smell, noise, touch are continually supplied to the brain via our sensory systems so we can "experience" spaces. These experiences are combined with past memories to create perceptions. The information we pick up from our senses is relayed to the brain which, in turn, will affect our physiological, emotional, psychological and, ultimately, physical condition. Understanding the senses is the key to good design. It allows designers to create better responsive healing environments.

Sight

Our physical environment can have a huge effect on the way we feel. Natural light, pleasant views, works of art and particular colours can all enhance our sense of well-being. Light and colour are the two aspects of sight that have great impact on a patient's overall well-being.

Light: The therapeutic value of light has been recognised for thousands of years. The Assyrians, Babylonians, Egyptians, Romans and Victorians all understood the healing properties of light. The effect of light on health is critical. Long ago hospitals had large windows that allowed light to penetrate deep plans. Solariums were used as healing environments. Essentially, we require for light. Light is life. With little or no natural light, melatonin (*all-natural nightcap helps our bodies regulate our sleep-wake cycles*) tells the body to log off, and even causes illnesses such as seasonal affective disorder.

How can we bring light into our buildings? We can introduce more windows by reducing mechanical and electrical interstitial space. We can manufacture it. We can even control its colour and intensity to influence our behaviour. The quality of natural or artificial light has a major impact on the body's healing processes. Careful attention to this factor alone may help to reduce length of stay for inpatients. Other benefits of full spectrum lighting include:

- *Better visual perceptiveness*
- *Improved body's motor skills*
- *Less physiological fatigue*
- *Overall improved tasks performance.*

Particular attention should be paid to the lighting at the bed head and in patient examination, treatment and recovery areas.

Designers should develop high quality lighting schemes in public and ward areas that create a harmless and relaxing environment. They should also avoid equally spaced light fittings along corridors and hospital streets, as this may have a stroboscopic effect on patients moving along a corridor on a trolley or in a bed. A reflected, diffused light is a better option. Lights should not be installed on ceilings immediately above patients in incubators, cots, beds, trolleys or couches. Lights should be designed to reflect off walls and ceilings. Where appropriate lighting should be dimmer controlled. Indirect lighting should be used extensively.

Colour: Colour is an extremely powerful, and potentially inexpensive, medium. Appropriate use of colour within healthcare settings can make a significant contribution to patients' well being and can evoke certain reactions or influence people's moods. Certain colours slow one's perception of time and others accelerate it. Our reactions to colours are led by a combination of biological, physiological, social and cultural factors. When it comes to emotions, there are differences between warm colours such as reds, oranges and yellows, and cold colours such as blues and violets.

Reds and oranges, for example, are high-energy colours used by fast-food franchises in their restaurant interiors. Both hues stimulate digestion and sometimes cause restlessness, which is fine for fast-food restaurants, where quick client turnaround is desired. They are not the colours to use in sickroom settings, however, because they have been proven to raise blood pressure, quicken the pulse and increase breathing rates. Softer oranges and reds, such as peach or apricot hues, are more appropriate for restoring spent energy to body and mind without overstimulating. Vibrant burnt oranges and rust colours retain the influence of orange but temper it with the stability of brown, which symbolizes reliability.

The use of blue as a therapeutic colour is widely known. It's calming and promotes physical and mental relaxation, stimulates healing and creativity, relieves pain and lowers blood pressure. This is why health care settings feature lighter shades of blue in their decor. Dark blue, on the other hand, has a sedative effect, and can make some people feel melancholic and dejected. So while it can be successfully employed in bedrooms to encourage sleep, it may be wise to use it sparingly in other areas.

Mint green seems to pop up in hospital settings primarily because it's proven to be calming and comfortable to look at, perhaps because people associate green with nature. Some researchers believe green can help balance physiological functions of heart, lungs and blood circulation. Natural shades of green, such as apple green, or olive green, are often used to add a serene look. While health is often improved using natural sunlight or light therapy, light colours don't always make us feel good. For example, a pure lemon yellow is a very cheerful colour and is an excellent choice for decorating areas where creativity is encouraged. It's important to balance an energetic yellow with



a calming blue in order to avoid too much stimulation to the nervous system. This is particularly true when using bright yellows in bedrooms of young children. Mauves and purples can be used where productivity is important because they seem to inspire new ideas and fuel original thinking. Adding a rosy red to violet to create a strong, assertive magenta may help to increase self-confidence in shy, overly sensitive people.

Black or white enhances the psychological effects of colour. Used sparingly, these can add excitement and impact. Overdone, they can overwhelm the eye and waste energy. Colour speaks to us in a way that only we, as individuals, can hear. And in a world where things seem terribly imperfect at times, the art of colour can make us feel good again.

Views: Patients recover faster when they have pleasant and interesting **views** of the outside world. It is required that all patients' wards and patient social support areas have outside views.

Arts: The arts can enrich the healthcare environment. They help to reduce patients' stress levels by offering visual stimulation and distracting them from their health problems. A study by P. Scher (1999) "The Exeter Evaluation – Evaluation research project of Exeter health care arts" (*Manchester Metropolitan University*) reported that 75 percent of patients, visitors and staff respectively found that the hospital's programme of visual and performing arts

diminished their stress levels, changed their mood for the better and helped to distract them from their immediate problems.

The arts contribute to the healing environment in three ways:

- Visual arts
- Performing arts
- Participation arts.

Visual arts may be expressed in many forms such as painting, murals, prints, photographs, sculptures, decorative tile, ceramic, textile hanging and furniture. Art can celebrate life, calm patients' fears and anxieties, amuse, encourage, educate and indeed distract for long periods of time. Artwork images should impart and evoke messages of hope, joy, love, dignity, peace, energy, comfort, security, safety, growth and life. Works of art can be used as landmarks for wayfinding in hospitals in the form of icons, sculptures and water features. Artwork in a healthcare environment can:

- Mitigate the stress of the environment
- Educate
- Be integral part of wayfinding.

Researches found out that in terms of positive distraction, the **performing arts** have a better effect on patients than visual arts (*P. Scher and P. Senior, The Exeter Evaluation, 1999*). This form of art includes puppetry, musicians, opera, theatre, cinema, dancing, story telling, poetry reading, and singing.

Flexible design of single rooms enable accomodation of patient's family memebers.





Touch

Touch is known as the confirmatory sense. By touching, we confirm what we pick up from our other senses, which are what we see, hear, smell or taste. The skin is the largest sensory organ. Touch collects information and confirming data received by the other senses. It is the haptic sense of living and acting in space.

Textural surfaces form an integral part of a child's world of learning. They can help a partially sighted patient to navigate through space, imagine a blind person's total environment, and support a mental health patient's shift from an unreal world to reality. Patients with sensitive burnt, cut, bruised or blistered skin will experience their environment with their feet, elbows, backs, bottoms, lips, noses etc. as well as their hands.

Useful: Touch is particularly important to people with visual impairments. Tactile floor and wall surfaces can be used to convey important information about their environment. Changes in texture can also warn of potential hazards or provide directional information. Children need tactile experience to develop their sensory receptors. Where possible, designers should introduce textured surfaces, which can create an integral part of a child's play and learning process. This is a useful tool for a child's developing sensory receptors.

Comfort: The careful specification of varied texture and tactile surfaces is necessary. It introduces interest, variety and comfort and assists in wayfinding for visually impaired people. Furnishings should be selected with comfort in mind, for example soft bedcovers, fabrics, rounded corners and ergonomically designed furniture. Placing controls for nurse call, lighting, telephone, television, and radio within easy reach of a patient enhances self-reliance and increases patient safety. In multi-bed rooms, each patient should also have equal access to controls such as windows, blinds, curtains and television. An environment scaled for young children and elderly or disabled people will enhance their sense of independence.

Harmful: Very careful attention should be paid to the detailing of furniture and fittings. The design should minimise the risk of users trapping their fingers and toes etc. Where possible sharp corners should be avoided and redesigned to prevent predictable injury. Furniture that can't be moved may cause patients to feel stressed or anxious and may contribute to a patient's sense of helplessness and dependence. Fixed tables and chairs should be avoided where possible.

Smell

In hospitals, medicinal smells can produce anxiety. Unpleasant odours increase heart rate and respiration. One forgets that some of the smells that inhabit hospitals are formaldehyde, formulin, iodine, glutaraldehyde, bone dust, urine, burnt skin, testosterone, disease, body odour etc. Fear is communicated through smells. Good ventilation systems and appropriate building's layout are

sufficient to eliminate odours and smells but we have to pay attention to these factors from beginning.

Taste

Today's dining spaces can be clinical and sterile spaces delivering regenerated and hermetically sealed food sustenance. Young children will pop anything in their mouths. They may drink bath water, suck plugs, eat crayons and swallow other small objects. Teething infants sometimes find relief in licking the glass on windows and mirrors, and biting stainless steel handles and other cold surfaces. Children may lick and chew furnishings. Designers must check the toxic nature of materials during specification and avoid products containing formaldehydes, wood preservatives, arsenic, white spirit, benzene and other toxic substances.

Hearing

Sound has a fundamental effect on us, both psychologically and physiologically. Sounds such as rain, a breeze, the sea, moving water and songbirds can calm and create a sense of wellbeing. Courtyards and landscaped gardens close to patient areas should include plants that encourage songbirds.

Music can have an analgesic or painkilling effect, and can also reduce blood pressure, heart and respiration rates. Patients should have the opportunity to listen to music via headphones and live performances. It is important to remember that some people will view music as noise. Therefore, people should have a choice as to whether they have to listen to music. Music therapy is used to treat depression, to reach autistic children and to calm and relax agitated psychiatric patients.

Reduce patients stress and improve outcomes

Increase staff effectiveness by designing better workplaces

Jobs by nurses, physicians, and others often require a complex choreography of direct patient care, critical communications, charting, filling meds, access to technology and information, and other tasks. Nurses, physicians, and other healthcare employees work under extremely stressful physical conditions. Many hospital settings have not been rethought as jobs have changed, and, as a result, the design of hospitals often increases staff stress and reduces their effectiveness in delivering care. There is a growing and convincing evidence suggesting that improved designs can make the jobs of staff much easier.

Nurses spend a lot of time walking. According to study McCorick&Scheve, (1990), almost 28.9 percent of nursing staff time was spent walking. This came second only to patient-care activities, which accounted for 56.9 percent of observed behaviour. The main factor, which influences amount of walking among nursing staff in hospital, is type of unit layout (e.g. radial, single corridor, double corridor).



Time saved walking may be translated into more time spent on patient-care activities and interaction with family members. Fewer trips are made to patient rooms in radial units as nurses are able to better supervise patients visually from the nursing station, though the average time spent with patients is the same in radial as well as single corridor designs. Nursing staff in the radial unit walked significantly less than staff in the rectangular unit (4.7 steps per minute versus 7.9 steps per minute). Furthermore, radial designs might provide less flexibility in managing patient loads. That's why if we decrease in the percentage of time spent walking by staff in radial units, we will increase in the percentage of time spent in patient-care activities. Also, more of the staff surveyed preferred to work in the radial units.

We can also reduce staff walking with decentralized nurses' stations and increased patient-care time, especially when supplies are also decentralized and placed near the nurses' station. But for some technical and treatment departments (like surgical departments, diagnostic and service departments, X-ray departments) are required to be centralized however could double staff walking, because of technical support and specific layout requirements, where is necessary to provide smoothly processing flow. Workplace design that reflects the physical setting, such as redesign of a hospital's layout, has been shown to improve workflow and reduce waiting times, as well as increase patient satisfaction with the service.

Poor ergonomic design of patient beds and nurses' stations leads to back stress, fatigue and other injuries among nursing staff. Thus, reducing staff stress by ergonomic interventions, as well as careful consideration of other issues such as air quality, noise, and light, can have significant impact on staff health. In addition, health and safety of staff members is also an important goal for the healthcare organization.

Reduce patient falls

This is an area of great importance because patients who fall incur physical injuries and psychological stress, with the result of greater lengths of stay in the hospital. According to research (Ulrich&Zimring 2003) the great majority of falls occur when disabled patients get out of bed or move around unassisted. The 'geography' of falls indicates that most occur at the edge of patient beds to a lesser extent falls in front of chairs and at doorways to toilets.

Doorway falls, can happen when the door is too narrow to enable staff or family to assist the patient through. The design solution is to provide wide doorways that make it possible for staff or family to stay at the patient's side when going through a door, and not be pruned off by a narrow gap.

Other design features that reduce falls include handrails along communication spaces and appropriate flooring. The most critical

part of an effective architectural strategy for preventing falls is designing patient rooms and nurses' stations to make it much easier for staff and family members to be present and assist patients when they get up from bed or move around the room. In this regard, decentralized nursing stations compared to centralised stations place staff closer to patient rooms and shorten response times to patient calls. Also, well-designed decentralized nursing stations enable staff to keep direct line-of-sight surveillance of those patients at high risk from falling. Further, providing large single-bed patient rooms with comfortable furniture is very important for supporting the ongoing presence of family who are there to assist the patient and prevent falls. Changing from centralised nursing stations and multi-bed rooms to decentralised staff workstations and single-bed family-centred rooms reduced falls by two-thirds (lecture of Ulrich on NHS symposium, 2003).

Reduce Depression

Using light as an intervention to reduce depression in clinically depressed as well as not depressed patients is a relatively inexpensive intervention that has been shown to bring consistently positive results. Bright light (both natural and artificial) can improve health outcomes such as depression, agitation, sleep, circadian rest-activity rhythms, as well as decrease length of stay of patients and persons with seasonal affective disorders (Brain Lawson, 1997).

There is also strong evidence that exposure to morning light is more effective than exposure to evening light in reducing depression. If we compare the effect of morning and evening light on patients with winter depression found that morning light was twice as effective as evening light in treating (Lewy et al., 1998).

Café as a part of the hospital.





Exposure to bright morning light has been shown to reduce agitation among elderly patients with dementia. It has also been shown that patients in bright rooms have a shorter length of stay compared to patients in dull rooms. Beauchemin and Hays (1996) found that patients hospitalised for severe depression reduced their stays by an average of 3.67 days if assigned to a sunny rather than a dull room overlooking spaces in shadow.

The amount of sunlight in a hospital room modifies a patient's psychosocial health, quantity of analgesic medication used, and pain medication cost. Patients exposed to an increased intensity of sunlight experienced less perceived stress, less pain, took 22 percent less analgesic medication per hour and had 20 percent less pain medication costs. Thus, an important consideration while designing hospital layouts may be to optimise exposure to morning light in patient rooms by using an east-facing orientation. Depression might be worsened by architectural designs that block or sharply reduces natural daylight in patient rooms.

Reduce exposure to negative distraction

One of the most frequent negative distractions in Hospitals is noise. Hospital buildings often have sound-reflective surfaces that reverberate noise instead of absorbing it. This can lead to sleep loss and high blood pressure in patients and to fatigue and stress in staff, resulting in more errors. It can also reduce speech intelligibility, again causing more errors. People have to be able to talk and understand each other properly, reducing possible misunderstandings. Noise reduction is vital in such areas as intensive therapy units, critical care units, neonatal intensive care units, wards etc. Good acoustics mean positive staff and positive patients. Hospitals are used to be excessively noisy for two general reasons. First, noise sources are numerous, often unnecessarily so, and many are loud.

Second, environmental surfaces floors, walls, ceilings usually are hard and sound reflecting, not sound absorbing, creating poor acoustic conditions. Sound reflecting surfaces cause noise to propagate considerable distances, travelling down corridors and into patient rooms, and adversely affecting patients and staff over larger areas. Sound-reflecting surfaces typical of hospitals cause sounds to echo, overlap, and linger or have long reverberation times.

Research of Ulrich, Lawson, & Martinez (2003) clearly shows that patients in single-bed rooms, compared to those with a roommate, are vastly more satisfied with the noise levels in and around their room. Noise levels are much lower in single-bed than multi-bed rooms. Studies of multi-bed rooms in acute care and intensive care units have shown that most noises stem from the presence of another patient (staff talking, staff caring for other patients, equipment, visitors, patient sounds such as coughing, crying out,



In multi-bed rooms, noises stemming from the presence of other patients often are the major cause of sleep loss. Far higher satisfaction with noise levels in single rooms is evident across all major patient categories and types of unit and across different age and gender groups.

Design of corridor spaces reminds of a gallery.





A recent study by Blomkvist et al. (in press, 2004) examined the effects of poor versus good sound levels and acoustics on coronary intensive-care patients by periodically changing the ceiling tiles from sound reflecting to sound absorbing tiles. When the sound-absorbing ceiling tiles were in place, patients slept better, were less stressed, and reported that nurses gave them better care and incidence of rehospitalization was lower if patients had experienced the sound-absorbing rather than sound-reflecting ceiling during their hospital stay.

Environmental interventions seem to be most effective for reducing noise in hospital settings include: providing single-bed rather than multi-bed rooms, installing high-performance, sound-absorbing ceiling tiles, using sound-absorbing flooring where possible, and eliminating or reducing noise sources (for example, use noiseless paging, locate alarms outside patient rooms). Designers also should ensure that patient areas are located away from external sources of noise, such as road traffic. Noisy spaces, such as restaurants and day rooms, should not be located next to quiet spaces, such as bed areas. Noise should be controlled at source.

Reduce spatial disorientation and improve wayfinding

Wayfinding and legibility is the first advantage of hospitals for casual visitors, who are usually unfamiliar with a hospital and otherwise disoriented. Problem of wayfinding in hospitals is very stressful and have particular impacts on patients and visitors.

While almost all hospitals strongly feel the problems associated with a complicated building and poor wayfinding system, it is usually difficult to solve this problem with a piecemeal approach. A wayfinding system is not just about better signage or coloured lines on floors. Rather, hospitals are trying to provide integrated systems that include coordinated elements such as visible and easy-to-understand signs and numbers, clear and consistent verbal directions, consistent and clear paper, mail-out and electronic information and a legible physical setting. A wayfinding system includes four main components that work at different levels: administrative and procedural levels, external building signs, local information and global structure.

People use to move toward spaces and through corridors that are more accessible and to move along more "integrated" routes that are, on average, more available because there use to be fewer turns from all other routes in the hospital. Well-designed signs are likely to be quite ineffective in a building that has highly complicated layout and does not provide simple orientation that enables natural movement.

Increase control of the environment

Control over the environment refers to a person's real or perceived ability to determine what to do, to affect their situations and to

determine what others do to them. Sense of control is an important factor affecting a person's ability to cope with stressful events or situations, including stress associated with illness and hospitalization. Control theory contends that stress is calmed by the provision of real or perceived control over intrusive environmental stimuli, on the other hand, uncontrollable environmental stimuli should often have stressful influences. Design considerations to provide control include enhancing accessibility, way finding and enable a variety of spaces for privacy and contemplation.

One cause of frustration is the inability of inpatients to manipulate 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.

Provide nature and positive distraction

Positive distractions refer to a small set of environmental features or conditions that have been found to effectively reduce stress. Distractions come in many different forms and involve a variety of techniques therapy, social support and visual distraction (paintings, sculptures, waterfalls, aquariums, fireplaces access to gardens). Laboratory and clinical studies have shown that viewing nature produces stress recovery quickly evident in physiological changes, for instance, in blood pressure and heart activity.

By comparison, considerable research has demonstrated that looking at built scenes lacking nature (rooms, buildings, parking lots) is significantly less effective in fostering restoration and may worsen stress.

Nature in hospital environment not only provide restorative or calming nature views, but also can reduce stress and improve outcomes through other mechanisms, for instance, supporting access to social support and providing opportunities for positive escape and sense of control with respect to stressful clinical settings.

Many nurses and other healthcare workers used the nature and hospital gardens for achieving pleasant escape and recuperation from stress. It was found out that patients and family members who use hospital gardens report positive mood change and reduced stress.

Provide social support and leisure facilities

People who are staying in Hospital consistently reported having little or nothing to do during the day, with little recreational facility or distraction activity available, causing them to get fed up and bored. Suggestions for improvement included adapting the layout of beds to facilitate interaction between patients and



also provision of recreational hospital facilities. Recreational facilities for the wider hospital setting included provision of:

- Shopping areas
- Cafés and restaurant
- Cinema
- Swimming pool and Keep-fit facilities
- Personal services such as hair and beauty treatments
- Games and video hire
- Alternative therapies including aromatherapy, reflexology and massage.

Provision of such facilities was seen as an opportunity to keep a sense of normality and would provide for family activity where the patient could spend time alone or in the company of their family and friends.

According to NHS research (2002) respondents were asked to comment on their views on each of these facilities. The facility, which received the most praise, was the shopping area, with 31.7 percent describing this facility as very good and a further 40.4 percent as good. In contrast, just sixteen respondents (2.3 percent) were negative. The second most popular facility was the cafes or restaurant, with similar numbers as with the shopping areas rating this facility as very good 29.5 percent and good 40.2 percent. Those, who rated this facility as poor or very poor accounted for just 4.1 percent. In comparison, most of the other facilities were generally rated as being satisfactory, ranging from 33.4 percent in relation to the garden outdoor areas, to 10.6 per cent for the TV facilities 33.0 percent and car parking 31.2 percent.

Enable family members to be a part of healing process

Today's health care designers simultaneously recognize that welcoming the family member, as a part of the patient care team, is a positive consideration for all parties. In fact, some studies have indicated that it is common for family members to suffer more psychological distress than the patients themselves and also, a family member's distress can be contagious to the patient and it is possible that distressed family members might get in the way of professionals caring for the patient.

Therefore a design of hospital's spaces is including a family lounge area that provides privacy for a frightened, angry or overwhelmed spouse, parent or child is an important consideration from a clinical and healing standpoint. We can also make overall patient experience less isolating by increasing the size of patient room, what enables family members to be accommodated together with patient.

In fact single rooms are markedly better than multi-bed rooms for supporting or accommodating the presence of family and friends. Single rooms in supporting social support provide more space and furniture than multi-bed rooms to accommodate family presence.

Conclusion

The main aim of this article has been to investigate the role of hospital environment in healing process of patients and

understand architectural impacts, which may bring contribution to hospital humanization. This better understanding of architectural impacts will hopefully help us create even more appropriate health care environments. With the growing wealth of information and understanding, health care designers, , can create the more sensitive environments that will address the physical and emotional needs of the patients, their families and the caregivers. Humanization of hospitals is not about to create simply nicer and pleasing buildings, it is more about hospitals that actually help patients recover, be safer, and help staff do their jobs better. Hospitals are complex systems where it is difficult to isolate the impact of single factors. There are aspects, which play a great role in terms of humanization of environment:

Entrance hall of hospitals remind often of hotel lobbies.





- Adaptable single-bed rooms should be provided in almost all situations. Based on an extremely large and varied body of research there can be no doubt that single-bed rooms have numerous major advantages over multi-bed rooms.
- New hospitals should be much quieter to reduce stress and improve sleep and other outcomes. Noise levels should be substantially lowered.
- Provide patients stress reducing views of nature and other positive distractions.
- Develop way-finding systems that allow users, particularly outpatients and visitors, to find their way efficiently and with little stress.
- Improve ventilation through the use of improved filters, attention to appropriate pressurization, and special vigilance during construction.
- Improve lighting, especially access to natural lighting and full-spectrum lighting.
- Design ward layouts and nurses stations to reduce staff walking and fatigue, increase patient care time, and support staff activities such as medication supply, communication, charting, and respite from stress.
- Having facilities where patients could meet with their family and friends, e.g. café, restaurant, outdoor walks where they could talk and have something to eat together.

Humanization in these points leads to speedy patient recoveries, reduced pain, reduced medication, successful surgical and medical outcomes, better-quality care, fewer infection cases, greater patient satisfaction, and de-stressed staff, which in turn lead to treating more patients with quality care, at least cost.

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