HOSPITAL ARCHITECTURE AS AN ACTIVE   MEDICINE

Bilyana Docheva

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INTEGRATING ARCHITECTURE AS A VITAL HEALING ELEMENT IN PATIENT TREATMENTS -
BRIDGING THE GAP BETWEEN RESEARCH, USERS AND ARCHITECTS

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CHALMERS University of Technology
Feature Visions for healthcare housing and work

TABLE OF CONTENT

TABLE OF CONTENT

TABLE OF CONTENT

STRUCTURE OF THE MASTER THESIS SHORT OVERVIEW

The structure of this master thesis is in three separate chapters. The following short overviews are meant to guide you, the reader, through the content of these separate books and help you to chose the one which corresponds to your primary interest.

Chapter I: "Hospital architecture as an active medicine- integrating architecture as a vital healing element in patient treatments" *is an exploration of the existing theoretical materials on the matter of hospitals architecture and the possibilities for it to become an active part of the healing process. The chapter contains a short overview of current hospitals trends and a new social expectations and needs. It looks to understands what is the essence of healing environment, and in what way Evidence Based Design (EBD) principles and Person Centered Care (PCC) philosophy could support and strengthen them. It discusses Hospital building as a city theory and looks in the connections to space syntax evaluations used further in chapter two. At the end it outlines a conclusive list of architectural principles(spaces and design elements) which I find strong enough to become leverage points in future physical intervention for two internal medicine wards at the Central Clinic of Ostra Hospital in Gothenburg.*

Chapter II: " Architecture as a vital healing element in patient treatments – design proposal". *The focus is set on using the design principles outlined in chapter one to evaluate the existing wards' spaces. It includes:*
* *an overview of the physical site of the project (Östra CK, Gothenburg, Sweden);*
* *existing floor plan analyses in consideration of: EBD, PCC, and the concept of understanding hospital buildings as a city replicating structures;*
* *evaluation of the space syntax which directs, supports, or prevents, social-communicative interactions;*

The second part of the chapter presents the floor designs proposal. It is a radical reconstruction which aims for an optimal implementation of EBD, PCC, and delivers a redeveloped space syntax according to the given physical frames.

Chapter III: " Linking together research users and architects–learning process" *is what you can consider the appendix, of the master thesis. There are two initial intentions behind the creation of it. First to keep track of my thoughts, experience and daily progress in order to reach the set goals posed in the original MT proposal. The second one is very individualistically oriented, and it holds the essence of understanding myself as a professional. In its context it is a summary of the information gathering methods, evaluations, personal understandings and findings on the presented matter. It includes study visits, interviews,nurses's following, behavior mapping and questionnaires. It is constructed in five main parts, four of which are designated to specific method of research:*
* *the first one is visitation including full review of the institutions, and places visited in relation to the subject of research - healthcare, healing environment, architecture*
* *the second one is interviews which have been conducted through different time through the whole MT and have been summarized briefly in book one*
* *part three reflects over the results of the distributed questionnaires to both employee and patients. Their summary has been presented graphically in this part of the MT and has a short narrative overview in book one*
* *in the fourth part of the book a reflection of free explorative observations, combining various sources of research and study is given*
* *conclusions based on the learning processes are presented in the last part*

To my mother Beata, who is my genuine guide
in understanding the art of leaving healthy

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Please feel free to contact me if you have any questions or concerns related to this master thesis: email: bilyana@student.chalmers.se; de4ko@yahoo.com

Chapter I: "Hospital architecture as an active medicine- integrating architecture as a vital healing element in patient treatments" is an exploration of the existing theoretical materials on the matter of hospitals architecture and the possibilities for it to become an active part of the healing process. The chapter contains a short overview of current hospitals trends and a new social expectations and needs. It looks to understands what is the essence of healing environment, and in what way Evidence Based Design (EBD) principles and Person Centered Care (PCC) philosophy could support and strengthen them. It discusses Hospital building as a city theory and looks in the connections to space syntax evaluations used further in chapter two. At the end it outlines a conclusive list of architectural principles(spaces and design elements) which I find strong enough to become leverage points in future physical intervention for two internal medicine wards at the Central Clinic of Ostra Hospital in Gothenburg.

Chapter II: " Architecture as a vital healing element in patient treatments – design proposal"

Chapter III: " Linking together research users and architects–learning process"

ABSTRACT

The simplicity of the word health holds in its essence the complexity of our lives encapsulated and protected with all its individual meanings. We wish ourselves to be healthy, we do the same for others and we write it on cards, balloons and say prayers for it. But do we really understand the concept of one being healthy, since it is often that we think of health when an illness presents itself in our lives. According to the World Health Organization (WHO, 1946) human health is defined as *"....a state of complete physical, mental and social well-being, not merely the absence of disease or infirmity"*[1]. Decoding the definition a statement can be implied that simply being free from physical disease or illness does not qualify one as being healthy. Maintaining human health depends on a balanced interaction between a number of complex factors. Vital ones are the components of mental and psychological well-being. The power of the individual to perceive the surroundings as factors effecting its physical and psychological comfort is crucial to human health.

" The Hospital as a machine for healing has become an anachronism. As a building type, the hospital remains a curious amalgam, with medical technology often pitted against human concerns…..There is little doubt that architecture can, and should, play a crucial role in humanizing the hospital."[2]

Nowadays there is consensus among healthcare professionals and architects that hospitals' building typology is of significance for provided healthcare. The road map to successful social sustainable healthcare practice begins to unfold when specific goals within the contexts of people centered practices and humanized architecture are identified. Thus one could ask the questions: what are the primary aspects of the medical delivery system which are shaping the current design archetype? ; and what are the new trends in physical and psychological healthcare, in understandings of medicine, technology and patients and how are they profiling the hospital building stereotype? (Gail Vittori and Robin Guenther, 2008)

The overall aim of this master thesis is to move beyond the idea of the hospital as a building whose structural logic is dominated by medical procedures needs and technological dependency, and to propose a design solution which unifies the three main constituents of the hospital: people seeking healthcare (social aspect), new trends and innovation in medical field (technological aspect) and shrinking facilities (structure aspect). The goal set is to deliver a *" Simultaneously functional, technically sophisticated and experimentally rich "*[3] ward's design; one which is all user friendly and supports flexibility, transparency of procedures, safe inspiring and motivating care treatments.

⬤ Key words

healthcare, healing environment, evidence based design, person centered care, space syntax, private, semiprivate, semipublic, public

1. Lee, 1996
2, 3. Verderber and Fine, 2000

1. PREFACE

1.1 The hospital of my childhood: reminiscence

Healthcare and hospitals have been one of my personal interests since my encounters with their procedures in a very early age. Spending quite many hours on being tested and monitored, then subjected to two long hospitalizations was a traumatic experience in my childhood. At the age of five, in Sofia, the capital of Bulgaria, I was admitted to a hospital due to recurrent lung problems. No clear recollections of the numerous procedures, but the memory of my bed in a room with three other kids, two of them with their moms being allowed to stay overnight, had been indelibly printed on my memory. The long corridor with its concrete floor and gray tiles on the walls leading to the nurses' room, two doors down, was quite often a playground for the kids during rainy days. Fluorescent light slipping through the doors' window at night and the constant sound of slowly dropping water from the sink right next to my bed were some of the hardest obstacles to overcome when falling asleep. I was missing my family very much, as it was hard for them to come and visit, considering the distance between cities and the fact that there were no accommodations for visitors.

My second hospitalization was unexpected and prolonged more than anyone could predict. Labeled as a health problematic case which was not fitting under the child department I needed the specialization of the physicians in the adult unit. That is how I found myself in a room on the first floor of the central hospital wing with three other women. My condition required a person watching me through the night who could monitor my sleep. The staff had no extra possible trained personnel on a night shift, so my mom stayed with me through the whole period. Reading books and listening to the radio were time-killing occupations, but when really bored my mom and me used to compete who will count faster all the tiles in the long hallway. This latter could only

have been done at night when there was no movement of any kind outside the room, except from the night duty nurse. Looking through the room window outside was not an option since its base height started way over human average one. However, the exposed heat radiator turned to be quite valuable source in melting colored wax to make figurines from it. The winter was one of the coldest one with so much snow, and walking outside was not an option, and where were we to walk to? The hospital parking and the tram stop across the street were not very suitable playground. The routine morning and night check up did not amuse me as a kid, I guess they were more important to my mom since she was the one to be always talked to. To find a way to keep up with the stress my mom used to embroider, while for me listening to the life stories of my new hospital "friends", and memorizing songs heard on the radio over and over again each day was a treat. It has always puzzled me that I do not have a clear memory of the day I left the hospital, but I remembered all the times I needed to be tested for an electroencephalogram (EEG)- *"is a test that measures and records the electrical activity of your brain. Special sensors (electrodes) are attached to your head and hooked by wires to a computer. The computer records your brain's electrical activity on the screen or on paper as wavy lines. Certain conditions, such as seizures, can be seen by the changes in the normal pattern of the brain's electrical activity"4.*

The impact which my stay in the hospital had on me and my close family members is to be acknowledged, however its value is way beyond the idea of a physically and mentally stressful hospital stay, simply because it turned to be the driving force for lifelong changes in our lives. For me it has been the constant "seed" of interest continuously present in my studies.

2. INTRODUCTION

2.1 Background

Health as a value has long ago passed beyond the personal boundaries of physical and mental well being; it has acquired new social and community values. Major part of which have been debated and stated in policies, dedicated to describe and regulate the healthcare professional sector. The EU Article 152 of the EC Treaty states that a *"high level of human health protection shall be ensured in the definition and implementation of all community policies and activities"[5]*, simultaneously ensuring the excellence of the healthcare systems, aiming to provide a high quality healthcare services, to the expanding earth population. Countries around the globe invest enormous capital in social and communal policies to promote the health state of their citizens. When all the efforts fail and humans become unhealthy the responsibility of bringing one back to wellness is assigned to the hospitals and healing centers as they are viewed by society as primary specialized care providing units. (Wagenaar Cor, 2006)

Here is where the dilemma of our compound society emerges. Common understanding for universal hospital design is: the one which is built upon the principle of acceptance of patients' multiplicity and diversity. As such it strives to provide the equal rights to treatment and health advises for all persons seeking professional medical help. Its definite perception of architectural aesthetics is always colored by the specifics of local characteristics, traditions, believes and enriched with unambiguous social values. Unfortunately, it is often the case that political debates, financial dependency and the need to achieve maximum economical performance are factors which rule the architectural execution of healthcare buildings. The principle associated with modern architecture of the 20th century and repeatedly implemented in the past is that form follows function. Quite often the last one is weaved in the complexity of institutionalized systems' web. In such practices, elements needed to support the person's healing process and employees' necessary work conditions received by default less consideration then they deserve. (Wagenaar Cor, 2006; Kjisik Hennu, 2009)

Recently Sweden and many other European countries are experiencing a rapid growth in the number of hospitalizations. Numerous are the factors influencing the health state of the population with their roots in both ecological and social sectors. What is worrying are the results of a recent medical data research. It shows for instance that 40-60% of chronic hart failure (CHF) patients returns back to the hospital for additional treatments related to the same problem they had been treated for previously. Hospitalization stay accounts for the biggest expense in the budget of healing a patient. For this reason, in planning for the future policies and regulations regarding the healthcare sector, the responsible authorities should take into consideration innovative approaches to care in order to remedy these problems.

One such approach is addressed in the research project called Person-centered care. In his PhD (Person-centred care, possibilities, barriers and effects in hospitalized patients), Axel Wolf summarizes the core of the care practice as follows: *".... The need for a person-centered rather than disease-centered approach to care is considered an important part of care today. However, healthcare professionals still tend to focus on the disease within the person rather than on the person with the disease. Envisioning care tailored to each patient's capabilities and needs, the   perspective of this thesis places the person with a long-term illness at the center of the care process. The core concept of person-centered care (PCC)......., is a partnership between the patient (and often relatives) and healthcare professionals that is based on respect and dignity. "[6]*.

The right question to be posed here is which architectural features, floor plan spaces and design elements can support and promote such professional practices?

5.http://europa.eu/legislation_summaries/institutional_affairs/treaties/amsterdam_treaty/a16000_en.htm

6. Wolf, 2012

2.2 Ask the right questions

When refitting an existing hospital structure one should start by understanding its essence. This will mean looking into its past, influenced by development trends and practices in that particular location, in the exact moment of construction.

In many cases the healthcare building stocks, we are facing today, reflect an era of massive building production dated 30-40 years ago. A characteristic of hospital buildings of the past is that relatively little or none attention was given to factors such as how to cope with increased numbers of aging population, increasing workload on the part of healthcare professionals, needs for multitasking, new demands on flexibility in design space solution as well as revised and modified perceptions concerning social communication and interaction. (Kjisik, Hennu, 2009).

Innovations such as the artificial ventilation, air conditioning systems, and the X-ray machine allowed to concentrate the medical knowledge in the early 60s entirely in the hands of the hospital technology. Educator and cultural critic Neil Postman noted *"Technology was to be the weapon with which disease and illness would be vanquished…….1. Medicine is about the disease, not the patient, 2. What the patient knows is untrustworthy; what the machine knows is reliable."* [7]

In the current of these thoughts, a tragic but true fact is pointed out. Architecture of hospitals had at certain point become a dress up for institutionalized healthcare procedures addressing merely biological health problems in our humanity. The result today is that the separation of the human from what is viewed as a patient could not be more accentuated. (Postman, 1992)

Today a global focus in hospital architecture field has already been set on moving towards green and sustainable practices in all their forms. Vital for the demands in healthcare is its ability to: deliver more, better and quicker within the resources provided. Hospitals have to deal with the increase of people seeking healthcare (social aspect), new trends and innovation in medical field (technological aspect) and shrinking facilities (structure aspect). On one hand, hospitals need to be quite large to be financially justifiable, on the other they should manage to be human-friendly. Hospitals' architecture and design needs to be flexible in how to combine the sense of professionalism, security and privacy but quite often these three require contradicting physical solutions.

In consequence, the hospitals' possibility to combine the sense of professionalism, security and privacy depends on the ability of the architect to comprehend three base questions.

The first one is : who are the main actors within the healthcate practise today?
There are five group types that meet in a hospital space (graphic: XXX) , namely: the patients and their visitors, the healthcare professionals, the researchers and the administrative personnel. Each group has its own specific demands concerning the hospital's physical environment, in a way that meets basic medical, social and psychological needs. This diversity of their demands has to be dealt with, architectural decisions need to be taken and administrative approvals reached.

Therefore what is a hospital in its basic structural essence and how could it reflect all the necessities presented? Defined by the law of physics, it is an organized system of spaces, architecturally shaped, identified by lines and located on selected plot. Its building envelope is a combination of a typical rectangular massive structure with interconnected shelter-like units. Repeated use of a box-like main element were considered a successful hospital architecture and were a standard practice for years. In consequence, the majority of such inherited hospital models has been in their essence nothing more than: *"an institution in which sick or injured persons are given medical or surgical treatments"*[8].

Thus the third question comes to life: what are the ways in which architecture and design can support the individual healing process of a person? This question and the answers to it will be central for this MT.

HOSPITAL

2.3 Goals and possible applications

The main goal of my thesis is to explore and to account for the connections between the technicality of physical environment and the sensitivity of the healthcare services in order to make a hospital ward design more user friendly. Architecture and design are in focus for this study, as they are considered to have a relevant and active effect over the users, their actions and interactions. Since the person-centered care is on agenda for an ongoing research project carried at Östra Sjukhus in Göteborg in cooperation with the Sahlgrenska Academy, Göteborg university, there is a common field of interest between the subject of my master thesis and the mentioned project, as the insights gained in the course of this study shed light on those architectural design aspects which can contribute to and complement the healing process.

To approach the subject, two correlated topics are taken into consideration and discussed. The first one concerns social understanding of hospitals as places for healing, whose design and surroundings can ease pain and support recovery. This topic is based on research and studies on Person Centered Care (PCC) practices and Evidence Based Design (EBD) principles. The second one concerns an evaluation of hospital architecture, as a functional, performance driven structure. It aims at understanding the impact and effects of architecture with respect to the professional space syntax and social relationships. Based on both a hospital ward design is delivered which allows the architectural elements and design aesthetics to become active part of the healing environment, supporting and promoting person centered care.

2.4 Approach

Focusing on physicality of hospital facilities is the very first step in revealing the complexity of today's healthcare context. However, human factor is deeply embedded in all physical, professional and social activities taking place within the hospital environment. As such these activities can be evaluated on individual bases differently, thus they can be considered subjective. This master thesis aims to approach the matter in a more objective way by exploring a broader range of methods involving all the users of the hospital space. To widen the scope of information collected theory and field studies are combined.

 The theoretical part deals with PCC, EBD, healing environment philosophy, hospitals architecture from the social point of view (building as a city) and technological trends and challenges.

The practical implementations of these theoretical approaches are analyzed and compared in the course of field studies including educational visits, inquires, interviews and questionnaires. The results are used as a base to create a new set of design guidelines for the internal medicine care units in the Central Clinic of Östra hospital, participating in the PCC project.

2.5 Methods

● Theory, methodology, and science behind the practice: exploration of the existing theoretical material on the matter of hospital architecture and its possibilities to become an active part of the healing process. The study journey continues through discussion of healing environment elements, and in what way Evidence Based Design principles and Person Centered Care could support and strengthen them.

● Related Study Visits

Helthcare practice is an active ever changing sector of constantly developing technology and adaptive human factors. Observation of innovative problem solving solutions implemented in new facilities are always informative as they often reflect certain location's criteria and adaptations to common social problems.

● Physical space observation

Visit to the site selected, access to the wards and in the physical facility are effective informative methods to confront visual understandings created by looking at blueprints and one gained in reality. By observing physical traces in the space, conclusions on activities, routines and specific behavioral preferences can be revealed.

● Employee follow

Having the chance to observe professional nurses during shifts allowed me to gain a better understanding of space syntax and find out valuable information concerning: routines, important physical spaces, repetitions, habits, social and professional hierarchy.

● Interviews:

To reach more accurate understanding on the discussed healthcare practice, I chose to widen the scope of possible opinions collected. Asking the same questions to representatives of different user groups all within the healthcare practice and then comparing the responses was effective solution used.

● Questionnaires:

Considering the time frame of the project, questionnaires for both employees and patients were developed. They were created in a way to allow each interviewed to rate their own surroundings and experiences in the hospital. Multiple choice questions as well as open ended ones were incorporated.

● Webminars

In the past couple of years webminars have become more popular than ever, for the simple reason they provide the ability of professionals to connect all over the globe, and involve in discussions concerning particular preestablished topic. I find them to be a great source of information, knowledge and practice tips exchange platform.

● Blog and self evaluation

Master thesis is always a work in process, with set goals which can change during research phase. The interest shifts according to new information dependant on: social, financial, and structural-administrative factors; discussions; and viewed projects related to the project in consideration. A daily self evaluation turned to be valuable in keeping the goals objectives in focus.
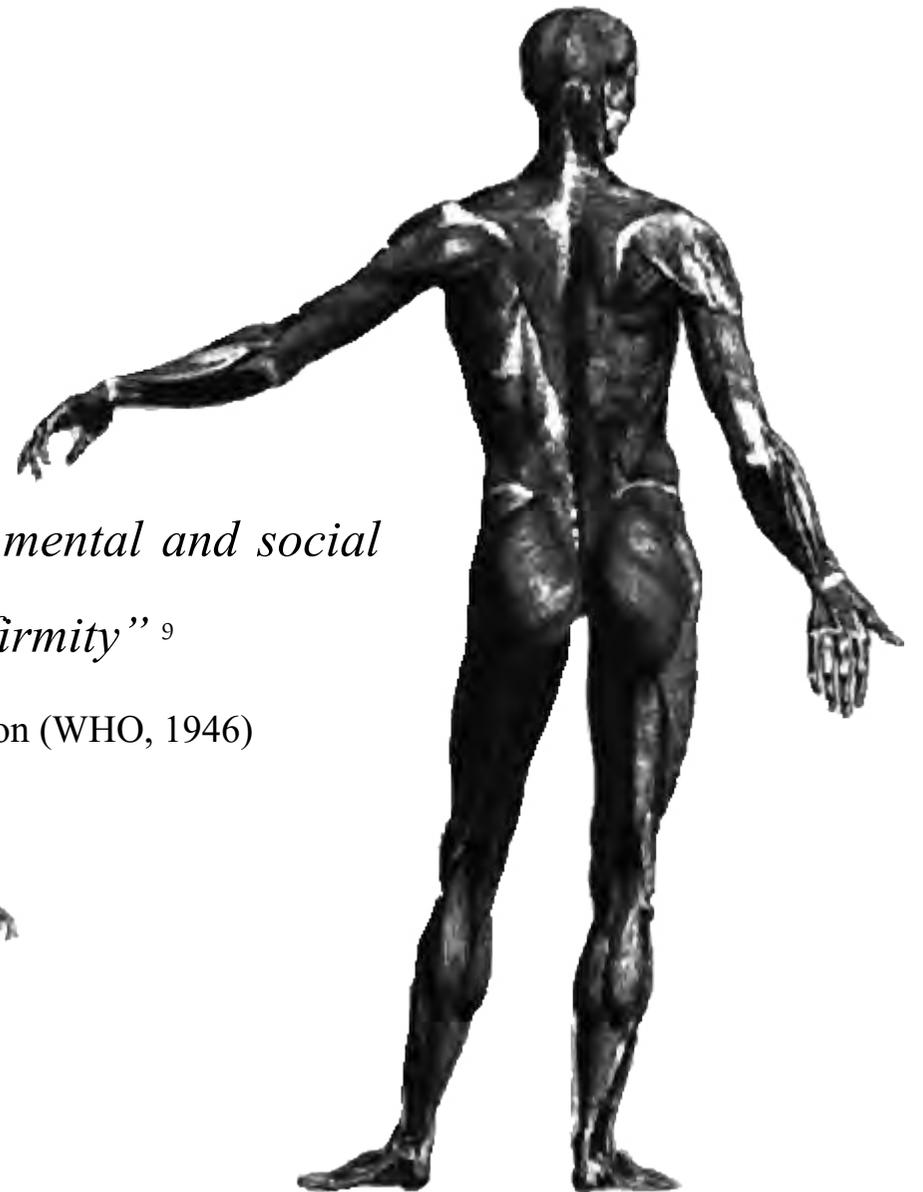
● Search for inspiration

Engage all of the human senses, be innovative, explore, read, listen, smell, touch, walk, communicate, write, talk, draw, sketch.

"Human health is ...a state of complete physical, mental and social well-being, not merely the absence of disease or infirmity" [9]

World Health Organization (WHO, 1946)

This particular part of the master thesis aims to take a closer look at some significant elements of healing environment, occurrence and reasons for physical and psychological stress, influential factors along the hospitalization process, their effect over the users of the space, and the possibility to bridge the PCC work methodology with the EBD principles in a search for multi-disciplinary architecture-design process.

3.1 Healing environment

" The range, delicacy and complexity of meanings which exist in a multivalent work have an analogous effect on the mind that interacts with them. Ultimately we are transformed by what we experience……" [10]

Charles Jencks

● Healing environment main components

Persons' physical state of health is a broader true reflection of his/her psychological status, intellectual willingness to accept life changes, individual perception of empowerment, sense of belonging, control of his bodily function and the surroundings. Entering the hospital one willingly relinquish is self-body control into the hands of the professionals, without questioning their superiority in knowing what is best for his/her health. Still many associate their stay in a hospital as stressful, intimidating and within unfamiliar surroundings. General understanding of healing environment suggests that physical setting can encourage the healing process and ones' well-being, improve staff work satisfaction, and lower the overall level of stress. Recognizing the matter of body stimuli, an architect could establish well based, motivated, and systematic work process woven around human physical senses. In her book *(Hospital interior architecture; creating environment for special patient population)* Malkin underlines certain components which she finds vital in creating therapeutic healing environment. Amongst them are: air quality, temperature, noise, light, privacy, views of nature, and visual pleasing environment. Translated through the biological prism each corresponds to one of the five essential human senses: smell, touch, hear, see, and taste.

● The Hospital Experience = physical and psychological stress

The level of stress is an essential factor used in process of evaluating hospital environments. Feeling tired, weak, and living with pain is the condition of many admitted in the hospitals. Self perception of helplessness, confusion, and coping with a state of unknown health future rises the level of psychological anxiety. General Adaptation Syndrome is used in the profession to account for bodily reactions to both positive and negative stimuli. When human is subjected to too much of negative direct or indirect influence the body feels overwhelmed and a state of fatigue sets in. Continuation of stress usually is recognized in physical symptoms such as, higher blood pressure, migraines, disorientation, and dizziness. Certain psychological symptoms are recognized as well: depression, irritation, anger, confusion, etc. Subjected to too much stress human body shuts down and no interventions can return it to neutral state. In case that nothing is done to reduce or eliminate the stress sources, the recovery process becomes slow and unstable. Listed under are some of the main factors resulting in higher stress level in hospitalized people and staff: (McCullough Cynthia , 2011)
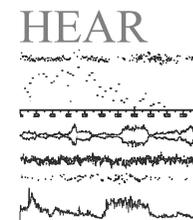
HEAR Hospital floors are busy hectic areas. Nurse's and physicians' discussions; movements of medical equipment; noise from supporting life equipment in the room; the voices of others if in multiple bed set; and communication alarm system are among some of the main noise producing sources that can directly affect the one who is sick. *"Unnecessary noise, or noise that creates an expectation in the mind, is that which hurts a patient. It is rarely the loudness of the noise, the effect upon the organ of the ear itself, which appears to affect the sick. How well a patient will generally bear the putting up of scaffolding close to the house, when he cannot bear the talking, still less the whispering, especially if it be of a familiar voice, outside his door."* [11] It was the year of 1898 when Florence Nightingale underlined the basics in concerns

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10. Jencks, 1991
11. Nightingale , 1898

thing you may be certain, that anything which wakes a patient suddenly out of his sleep will invariably put him into a state of greater excitement, do him more serious, aye, and lasting mischief, than any continuous noise, however loud. It is a curious but quite intelligible fact that, if a patient is waked after a few hours' instead of a few minutes' sleep, he is much more likely to sleep again. Because pain, like irritability of brain, perpetuates and intensifies itself. If you have gained a respite of either in sleep you have gained more than the mere respite. Both the probability of recurrence and of the same intensity will be diminished; whereas both will be terribly increased by want of sleep. This is the reason why a patient waked in the early part of his sleep loses not only his sleep, but his power to sleep. "[12] . Unnecessary noise then becomes the cruel absence of care in any situation provided. (Nightingale Florence, 1898)

SMELL
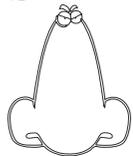
Smell is one of the strong sense evoking memories. Unpleasant odors in the hospital air can cause nausea, irritation, vomiting and extended migraines in very sensitive people. It is often that cleaning procedures require the use of specific chemicals, which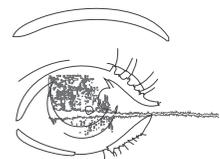 can contain harmful elements to a certain level and often employees become involuntarily overexposed to such. The results are irritation, lack of concentration, headaches and problems with vision. (Nightingale Florence, 1898; McCullough Cynthia , 2011)

SEE

"Where there is sun there is thought. ...Where are cellars and the unsigned sides of narrow streets, there is the degeneracy and weakliness of the human race--mind and body equally degenerating. Put the pale withering plant and human being into the sun, and, if not too far gone, each will recover health and spirit." [13]
The main essence of daylight importance can be summarized in four objectives: enabling performance of visual tasks, controlling the body's circadian system, affecting mood and perception, and facilitating direct absorption for critical chemical reactions within the body. There is no doubt that sensitive to light people should be provided the option to adjust the sun light coming to the room. It is often the case that the sick tries

to lay with their head turned towards the window and in a way to see the day, and it is well proven by now that the sight of bright day changing the darkness of the night can relief stressful moods, wariness, and nausea. From staff perspective day light can help them orient in space and time; account for external changes; relief the notion of the eyes constantly working under artificial light sources; and help with reduction of medical errors. (Anjali Joseph, 2006)

TASTE

Taste, similar to smell is a strong memory evoking sense,and medication can often be a cause for a bad one. Each individual has various perception of satisfactory needs concerning food habits as well as times when they feel hungry. Not being able to follow one's routine in eating can cause irritation in some cases, as well as dissatisfaction and malnutrition for the simple reason of disliking the food sources available in the hospital and refusing to eat.

TOUCH

Being in pain, sensitive skin, and irritation are only some of the bodily symptoms when hospitalized. Human touch is essential to our survival, still when in hospital one is quite often subjected to numerous procedures such as blood samples, temperature monitoring, urine catheters, etc. Mostly unnatural for the body they are consider sometimes as invasive, and as a result a stress point can be reached where in certain cases one can develop fear and nausea from being touched. Awareness of existing body borders is essential, since irritation and aggravation can occur if they are violated too often by the hospital professionals. On the other hand the absence of touch can have damaging effect as well. *" In 1915, pediatrician Dr. Henry Dwight Chapin, in a report on children's institutions in 10 different cities, reported that these children were literally dying, and in fact, all but one child under the age of two died. After eliminating nutrition problems and diseases as the cause, those examining the problem found that sanitation rules prohibited caregivers from touching or even handling the children, and most died.* "[14]. (McCullough Cynthia , 2011)

12, 13. Nightingale, 1898
14. Chapin, 1997

◉ Summary of healing environment components

SMELL

strong memory evoking sense

strong stress factor

can cause irritation

headaches

visual problems

lack of sleep

vomiting

supports understanding

HEAR   supports communication

strong stress factor

strong mood control factor

can cause:

- high blood pressure
- lack of sleep
- irritation
- vomiting
- dizziness
- disorientation

HEALING ENVIRONMENT

AIR QUALITY

NOISE

TEMPERATURE

PRIVACY

LIGHTS

NATURE VIEW

TOUCH

strong memory evoking sense

can cause fear and nausea

essential to our psychological state

supports awareness of bodily borders

SEE

supports visual tasks performance

facilitating direct absorption for criti-
cal chemical reactions within the body

controlling the body's circadian system

affecting mood and perception

TASTE

strong memory evoking sense

Bitter

Sour   Sour

Sweet

Salty

healing environment components related to human

" Evidence-based design (EBD) is a process used by healthcare professionals in the planning, design, and construction of healthcare facilities. An evidence -based designer, along with an informed client makes decisions based on the best information available from research, from project evaluations and from evidence gathered from the operations of the client." [15]
Cynthia S. McCullough

3.2 Evidence Based Design philosophy

More than 1500 case studies directed towards understanding and tracing the effect of physical environment of hospitals have been produced, documented, and evaluated in the past years. The impact of Evidence Based Design (EBD) has increased rapidly. Changes directed by the philosophy are seen mainly in the physical sector of hospital buildings. In his overview of EBD principles, Roger Ulrich underlined the importance of improving design characteristics of hospitals in connections to a number of following objectives.

⦿ Improve Safety of the healing process: One of the main goals for EBD is to increase the hospital performance. In order to do that an urgent issue of hospital acquired bacterial infection has to be addressed. There are three main paths of transferring bacteria in a hospital setting, namely by air, touch and water. To prevent bacteria transferring and improve safety, reevaluation of room amenities needs to be undertaken concerning: number of beds, position of the sink, fresh air access, access to single bathrooms and showers. Even other design elements and surfaces need to be revised and changed in order to meet new regulation for providing safer hospital environment for both the employees and the hospitalized ones. (*Nightingale Florence, 1898; McCullough Cynthia, 2011*)

⦿ Creating clear architectural borders separations: Separate traveling paths for staff, hospitalized one and logistics are essential for well functioning hospital system. To underline the ability of serving highly specific care, separation of services had has a very positive outcome in later hospitals designs. It is one of the considerable improvement by which the stress level and visual impression for the sick is minimized through avoiding clustered areas, disturbing sounds, smells, and unpleasant scenes.

Easily recognizable visual borders cues clarifying which are common and which are dedicated areas can be supported by chosen space organization and design material implementation. Clear borders can contribute also to a better physical transparency between hospital employees and the ones being treated and in consequence can prevent risk for patient's confusion, disorientation and frustration. They are instrumental in creating a friendly, person centered healing environment. In addition , decentralization in the work process results in creating small teams of professionals working together, setting goals and following the progress. Such teams need to be supported by planing for decentralized office spaces which architectural borders allow for improving of work performance with less stress. (*Wagenaar Cor, 2006; McCullough Cynthia, 2011*)

⦿ Convenient person-friendly room surroundings control: Elements important to be under individual's control are room temperature, air control, light, sound and safety. When a person can easily control them from the bed side, there is no need to call for a nurse, which relieves the staff's work load. It also reaffirms one's dignity and ability to make his/hers own decisions as he would do in his/her ordinary life settings. (*Ulrich Roger, 2008; McCullough Cynthia, 2011*)

⦿ Lower the stress factors in both practitioners and treated: Sources of stress in hospitals can be addressed in numerous ways. Observations have shown that allowing the sick to get in contact with nature, either by having access to a balcony or a view to the outside can reduce medication use, stress, and anxiety. A visual contact with nature is positively associated, however physical one is recommended. For instance a possibility to have an outdoor garden, walking path space or an indoor nature oasis.

Security and privacy concerns are two of the high profile issues to tackle, especially when looking in a high-rise building type hospital wards facades with internal and external windows. New technologies which would provide for the necessity of safeguarding and still allow for fresh outdoor air intake should be considered.

Ability for patient's close family members to get involved in the treatment and recovery process had so far proven to be valuable and very positive. The emotional support, the relief of not being alone and the ability to share fears, hopes and bring back memories in hard moments could only reduce the stress in the treatment. For that reason providing the necessary amenities in the ward room for relatives to stay close becomes a very essential architectural element.

Design planned in a way to allow employee's visual contact towards patients rooms provides better monitoring over the environment through the whole time. Windows in the staff areas over viewing the outside helps the employees to: stay focus, keeps account of time, and have better overall work process. (*Nightingale Florence, 1898; McCullough Cynthia, 2011; Ulrich Roger 2008*)

◉ Promote the vital importance of visual experience for both staff and treated: The essence of visually pleasant physical surrounding is still often underestimated in many hospital settings. It has been considered, unrelated and insignificant for the healing outcome to have colorful setting, design variety or personalized options in a ward room. Nevertheless in recent times it has been proven that the effect over physical and psychological states in both the hospitalized one and the staff is more than just a celebration for the eyes. Professional self-reflection and sense of appreciation are rated higher when working in a pleasant physical set. For one who needs to stay in the hospitals, the ratings of facilities' safety, professionalism, competence and satisfaction with the services provided become inseparable from the visual impression of the space.

Being able to have a way to keep track of time is very important for patient's peace of mind, especially if they will follow the created day schedule, look forward for coming actions and be prepared for them. Thus they feel in control and always have something to look forward. Windows provide day light and ease the biological clock, but small design elements like clock which can be easy removed if there is such a need, bookshelves, interactive art, etc. are to be considered as a part of interior fitting in the ward rooms.

Hospitals settings often create the illusion of frozen time. Positive distractions implemented through the environment are an inseparable part of today's hospital architecture. Until recently they were mainly in the form of art pieces decorating hospitals interiors, but this practice is taking now a new path. Today's patients are encouraged to perform certain tasks with their hands, to communicate in verbal or artistic expressive way. Such activities are considered to have positive effects in the healing process, as they can take the patient's mind off their unfortunate health situation and thus introduce a new element in the healing process (*Ulrich Roger, 2008; McCullough Cynthia, 2011*)

◉ Summary of Evidence Based Design practices

The strenght of implementing EBD when building new or renovating is based on the knowledge that such principles have been tested and documented, and indeed they do deliver the results which they are intended to. Having the opportunity to visit hospitals which have implemented EBD principles in their renovation in order to improve the safety of all users, lower the financial costs of operating and secure more technologically sustainable structures, I have created a list of EBD design elements which implementation was vital for sucessful transformations.

- Private single rooms for all patient; or at least one special for infected cases

- Bathrooms in each ward room: convenient and safer

- Consider the location of the rooms' sink, especially if there is no private restroom If the sink is facing the bed in close distance the spread of bacteria, as well as crossing one self body boundary become higher risk

- Sanitary stations for staff, along the corridors, as well as in each ward rooms, examination stations, etc.

- It is common perception that hospitals are places having work environments exposed to dangerous bacteria. Breaking the ward physical space into small volumes and separating them by air pressed doors minimizes the chance of bacterial contamination

- *"The very first canon of nursing, the first and the last thing upon which a nurse's attention must be fixed, the first essential to a patient, without which all the rest you can do for him is as nothing, with which I had almost said you may leave all the rest alone, is this: To keep the air he breathes as pure as the external air without chilling him"[16]* Windows which will provide substantial fresh air intake, directly from the outside, without directing the flow of cold air straight in to the bed, need to be prioritized

- In his publication of EBD Principle summary Roger Ulrich states that: *"……..by filtration, the physical removal of particulates from air, is often the first step in ensuring good air quality. One experimental study of a commercial air purifica-tion system found that a chemical-coated filter demonstrated 61.46% efficiency in destroying pathogens, and reached 99.99% efficiency when used in conjunction with ultraviolet lamps."* [17] In recent hospitals practices, there is one filter with a good performance, namely the HEPA filter, which can be at least 99.97% efficient in removing particulates as small as 0.3 μm in diameter

- Ceiling tiles and materials with high sound-absorption rating. When around patient areas, one should try to lower the tone of speaking to 35 decibel from the the average conversation tone of 60 decibel. Low sound notification personalized communication system can reduce the noise in a hospital environment which contributes to increased work performance, improved concentration and higher efficiency

- Daylight sources, and the quality of light in often used such as restrooms, laboratories, pharmacy rooms, and nurses' stations is essential to lower the risk of medical errors, and staff fall related injuries.

- Adequate light sources in ward rooms. Their proper placement and possibility of adjustments are indispensable for visual comfort and safety in satisfying multiple tasks by both patients and staff. Consider glare and noise from the light sources and their negative effect on the ability to relax. Light fixtures in wards' rooms should have the necessary quality to outline areas where slips and falls can occur as: corners, sharp edges, etc.

- Medical lifts are necessary in order to perform safe work practices . Higher initial cost they prevent patients and employees injuries and thus minimizing financial cost

- Clear wayfinding, creative visual markings by means of art, colors or use of material, can reduce confusion and ease the memory associated with pathfinding. One needs to consider the spatial relationship between the places' forms and the experience they create. For examples, in what way a long straight corridor clearly bordered can support or hinder the experience of one who is walking all the way to its end

(Ulrich Roger, 2008; McCullough Cynthia, 2011)

16. Nightingale , 1898

17. Ulrich, 2008
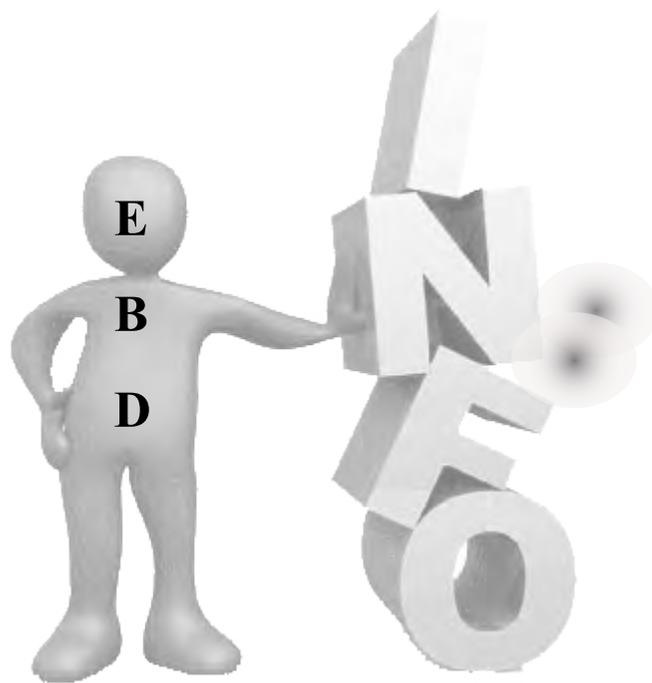
recognized and significant Evidence Based Design elements

SINGLE PATIENT ROOMS/BATHROOMS

    prevents spread of bacteria

    minimizes injuries

CEILING LIFTS

    prevents individual injuries

    prevents employees injuries

SOUND REDUCING MATERIALS

    reduce stress

    improve night sleep

    improved communication
    reduce medication use

HEPA AIR FILTERS

    reduce hospital infections

    improved air quality

ROOMS' ENVIRONMENT CONTROL

    reduce stress

    increase comfort

    reduced injuries

VISUALLY PLEASING ENVIRONMENT

    reduce stress

    increase comfort

ADEQUATE LIGHT SOURCES

    increase comfort

    reduce stress from light

    improve night sleep

    reduce medical errors
    reduce personal injuries

OUTDOOR SPACES

Analyzing EBD implementations through theory and study visitations, a conclusion made was that: **EBD practices are based on implementation of architectural design elements** which initial cost in hospital design can relatively easy be compared to the outcomes they deliver:

- minimizing hospital infections
- positive financial effects
- improved work conditions
- improved patient environment

PATIENT CENTER CARE

PERSON CENTER CARE

sick

confused

unwell

stressed

frightened

in pain

worried

well

confident

healthy

relaxed

understanding

feeling good

in charge

PATIENT   PERSON

PATIENT   PERSON
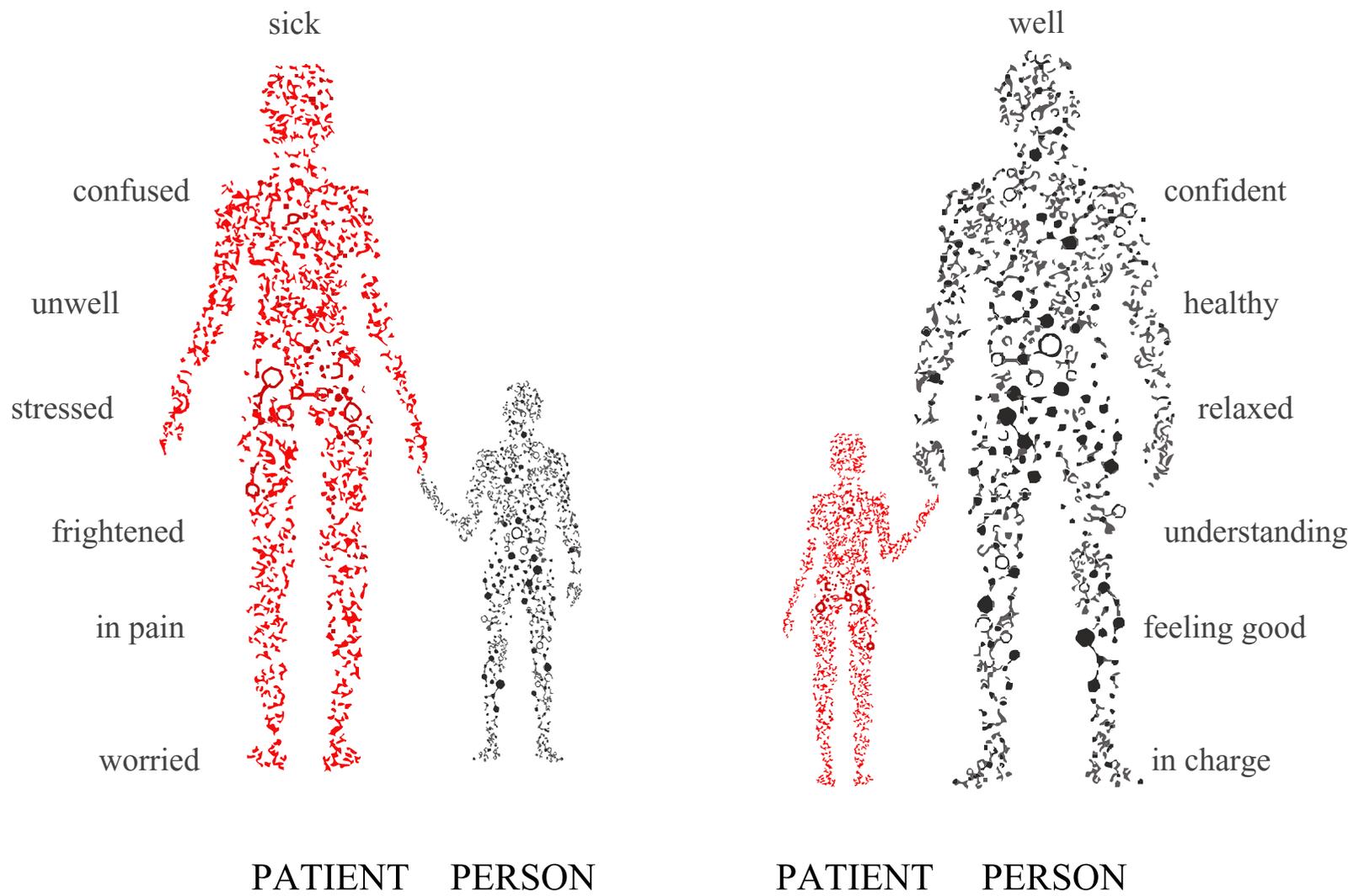
3.3 Person Centered Care– new or forgotten old essentials

Person in the center of the professional care is not entirely new as a concept. It was the essence of establishing hospitals in the Greek Empire. However, technological and pharmaceutical development influenced the process by stripping the human of his psychological characteristics and focusing entirely on the biological phenomena of body healing. Today it is not the medical quality that is under question in the profession, neither is the level of provided education. It is the care part that needs to be in focus and in particular Person-centered care practices. Characteristic for understanding the idea of PCC practice is the recognition and appreciation of three main links in the health process, namely between physicians, nurses and the patients. These three needs to be seen as partners involved in cooperative processes with the main goal set on creating a clinically approved and suitable for the health treatment plan. In the following, certain fundamental objectives for patient centered care practices are outlined.

● Decision making process: Treatment in a hospital is often complex, multi leveled process. Professional teams can only evaluate and address the physical symptoms of sickness. Physician and nurses know what is best when treating a certain sicknesses; they have the medical knowledge and experience; and can act accordingly. But those being treated need to be included in a decision making process, because they are the only ones who know themselves best. By means of communication with the staff they can influence the treatment plan set for them, by letting the professionals know how much effort they can devote to maintaining their health state after leaving the hospital premises. Only by allowing the patient voice to be heard and to come front in discussion, the goals set from the staff will have a meaningful effect on the patient's life in a long term. (Wolf Axel, 2012; Lars-Eric Olsson, 2013)

● Transparency of the treatment: The ability of the treated to understand the process of professional help he/she is being subjected to is of relevance for the treatment. Treating liver diseases, diabetics and CHF diagnoses is a lifelong process. The symptoms can be short-term warning signs or long-term medical problems preventing one to live life to the fullest. Having a transparent health plan in place, clearly communicated, could relief stress for all involved, give better results, keep track of the treatment process and allow for minimizing of medical errors. (Lars-Eric Olsson, 2013)

● Continuity: Ensuring the staff continuity and their daily practices is fundamental for the treated person's state of mind. One can feel insecure, worried, uncomfortable and confused in a hospital and this feeling can be reduced if one is able to recognize the medical staff involved in the patient's daily care. Creating such relationship allows the patient to: follow the treatment more closely, adjust better to the unfamiliar hospital environment, build the sense of thrust, redevelop the comfort to ask for help, maintain cooperative communicative skills and rebuild one's social connection skills. (Lars-Eric Olsson, 2013; McCullough Cynthia , 2011)

● Feeling of safety: In a hospital ward, the patient's sense of security can be strengthened if necessary information on how to address the patient's problems, fears and health issues is provided. Feeling safe can simply have stronger presence when supported by interaction with staff members and making the patient to understand aims of the treatment as well as being familiar with and having certain control over the hospital surroundings.

⬤ Respect: The desire for respect and dignity is a predominant human need. However, it might be stronger when a person becomes ill or disabled and thus more dependent on the caregiver's help. To ensure the possibility for one to make its own decisions on daily routines; personal care; or socializing, is a way of showing respect. For those patients whose mobility is restricted or completely absent, situations such as going to the restroom, taking shower, brushing their teeth, in common areas may be perceived as intrusion in their privacy and effects their comfort. The hospital environment should promote for all possibility to socialize, that is, to see other people, to be engaged in various activities, if they are willing to and able to participate. It has been medically proven that those who are subjected to different activities during their hospital stay recover faster. They improve their social abilities to communicate and express their feelings, pains, fears and needs. Activities also tend to introduce a greater variety in the daily program, be a positive distractions and set something to look up for. (*Wolf Axel, 2012; Lars-Eric Olsson, 2013; McCullough Cynthia , 2011*)

⬤ Understand the person in need: All of the listed above hospital practices are dependent on and build upon a basic application rule: understand the person in a need of hospital care as an intricate, balanced physical and psychological personality. The information about patients which is usually missing concerns their lifestyle, believes, understanding and willingness to get healed. The lacking information can be a hinder in achieving the set goals. By gathering such information and evaluating it, physicians and nurses can alter the medical treatment plan to better suit the patients seen as individuals. (*Nightingale Florence, 1898; Wolf Axel, 2012*)

⬤Patient centered care verses person centered care: It is a practice today to address the one being treated by a room number, when the staff discusses their conditions. Such practice is implemented in order to protect ones' privacy. It is also an example of a hospital institutionalized culture by which the human is ranked merely as a patient subjected in the first place to physical healing processes. According to Cambridge dictionary patient is *"someone who is being treated by a doctor, nurse, etc"*.[15] What is missing in the definition is clarification of what has been treated, and it seems that majority of hospitals are operating under the presumption of healing the body. This view has been predominating in health care. Patient Centered Care in that matter is still only directed towards healing the biological problem, and looks at the one in need as human matter buried down in a sick body. The responsibility acquired in that case is for the body material, while the human side is often disregarded. In contrasts person-centered care focus on taking into account the person as a whole, as an individual responsible for his/her own physical and mental health and well-being. PCC shifts the perception towards improved understand and focus on the human who in its complexity is carrying certain unhealthy conditions.

◉ Summary of Person Centered Care

Implementation of person-centered care work practices is based on the ability of a hospital to transition from architecture which structure is dominated by medical procedures needs, towards one focusing more on personal human aspects. The philosophy encourages design consideration for all in need of medical treatment, their relatives, visitors, as well as the employees. Most successful architectural outcomes in regards to person Centered Care are:

- Single patient rooms which can enhance patient's privacy and allow for family comfortable stay. In a single room, a patient can control the environment to suit best his/her own needs and make some individual adjustments. The interior of the room needs to be interactive, permit changes and visual variety

- Separate bathroom included in the room space - can stimulate a patient to make the effort to use it, and thus minimizes the necessity of using a catheter. This is relevant for a patient's self-respect and sufficiency to perform simple biological tasks. It can also contribute to a positive budget impact

- Outdoor spaces, gardens, roof terraces as a daylight source and visual and physical access to nature are part of the architectural design which has the strongest impact on a patient's state of mind. Being able to see the changes in surroundings as the time goes by or simply to hear sounds from the outside could make a patient to track or kill time, to relax with the help of positive distractions and remind him/her of the life he needs to return to

- Physical transparency of the space allowing for supportive visual connection

- Private family areas where relatives can spend time together, consult with staff, or just stay overnight. Such spaces provide comfort by reducing the stress of traveling for relatives, and at the same time give a peace of mind to a patient who feels safer surrounded by them

- Decentralization of areas for staff and relatives: the vision of logistic environment in which staff, patients and their relatives could function without disturbing each other is a must for stress-free, flawless operation of hospitals

- Specifically designated areas for staff, relatives and patients. Access to kitchen, living rooms and stress relieving rooms in which all the groups can feel comfortable and safe are desirable, as part of the stress for all these groups comes from crossing the invisible borders of spaces. Certain areas are considered by staff as their own work territory, while patients and their relatives could see them as common places; other areas with no clear boundaries are unspecified as to who has the right to be in the space and who has responsibility for it

- Possibility for the patient to control his/her immediate surroundings such as blinds on windows, sound system, temperature of the room, etc.

- Designs with maximum flexibility, and standardization permits for future readjustments when expansions or additional services are needed. One of the most common believes in the past was that same handed rooms allow the staff to adjust faster, develop a routine, and lowers the stress of encountering unfamiliar work environment. However today rationalization of the room settings allowing for better implementation of PCC, while still ensuring safe EBD environment have brought fresh ideas to be considered.

- Medical supplies storage, if placed in the ward room can become contaminated, and for that reason it is more efficient if the sterile medical supplies and pharmaceutical elements enter the room from clean paths

(*Ulrich Roger, 2008; McCullough Cynthia, 2011*)
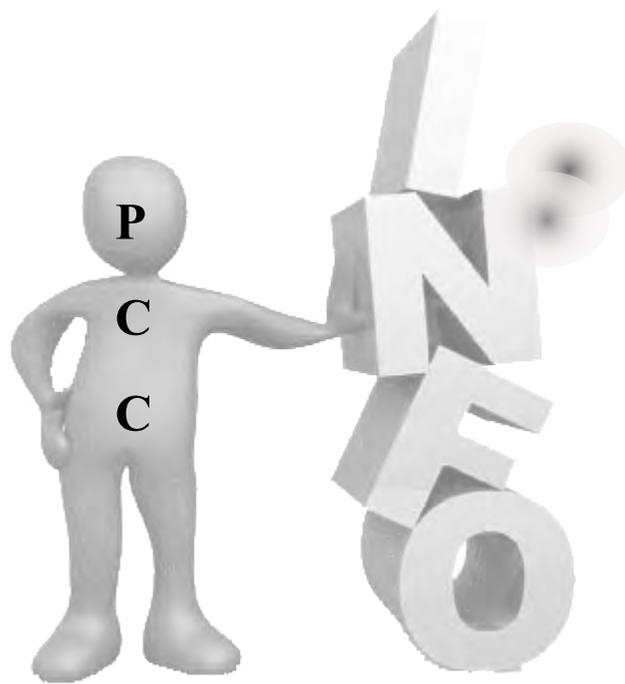
vital spaces for Person Centered Care successful implementation

SINGLE PATIENT ROOMS/BATHROOMS

provides privacy/ allows for relatives to stay over

creates safety feelings

minimizes stress

FAMILY AREAS

allows for visitors to be engaged more in the healing process

reduces stress for patient

minimizes the work load for employees

ROOMS' ENVIRONMENT CONTROL

provides personalization

reduce stress

increase comfort

EMPLOYEES DESIGNATED AREAS

allows for concentration

reduces stress

better work flow

PATIENTS AND VISITORS DESIGNATED AREAS

creates comfort

separation of movement flows-reduces stress

PHYSICAL TRANSPARENCY

increases communication

better work practice

WELL CONNECTED SPACES

reduce stress

increase comfort

increase work performance

COMMON AREAS

improves communication

increases safety

improves overall work and patient stay

Analyzing PCC practices through follow–ups in the hospital, interviews, question-naires, and study visitations, I came to the conclusion that: **PCC practices are very much dependant, and supported by a specifics of the space syntax allowing:**

- for one to be seen and see as well
- to keep its privacy and dignity
- to concentrate and reduce the work stress
- to understand and follow the treatment

(needs a transparency of the physical space, as well as transparency and continuity of the health plan processes)

"Hospitals need new packaging, brand new dress that bespeaks health and happiness rather than sickness and suffering, hope instead of despair....What is being done to create for the patient surroundings that make him want to live, that restore to him the old fight to regain his health? "[18]

Dorothy Draper, In the Pink

3.4   Hospital– building as a city

In a webminar presentation from 2011, David Allison briefly discussed a relatively new understanding of hospital buildings' functional organization comparing them to the city and its functional structure. When planning for the city, numerous considerations for the well being of the population are accounted for. Among them are: providing the necessary private and public areas, administrative offices and governing institutions, city roads and public connection, places for relaxation and enjoyment, places which will support the sustainable lifestyle, etc. When living in the city one is used to recognize spaces such as private, semi private, semi public and public. The city presents the ability for the individual to choose where in these places he/she needs or wants to be, as well as what routs should he take. Movement patterns and directions, as well as the possibility to take short cuts and to orient in unfamiliar environment are essential when a city is planned. Humans have the ability to adjust their lives around the changes in the city surrounding. However all of theirroutines and habits are very individual. At the same time when one becomes sic their ability or willingness to readjust to unfamiliar place 9 hospital ward) could be significantly low. That is one of the reasons in considering evaluating the hospital space based on a city "fabric" elements. The second one is the believe that is the city slowly migrates in the hospital , softening the borders of the institution it will actually minimize the negative perception which such places are associated with.

Evaluating each hospital floor plan as a unique city-like structure changes the understanding for its architecture. Planning for such, is a complex process involving a number of sensitive ethical and aesthetic matters. To positively affect employees' work and to meet patients' expectations I looked closely at space syntax and the current internal social communicative patterns. A short overview of a daily routines and what happens to them once you are in a hospital is used to point out some of the reasons for why this comparison. (for the purpose of evaluation I am using an average person living in Sweden and the environment in Östra hospital CK ward 235A, 235B)

◉ private places

The standard of life involves providing each resident with at least basic living necessary accommodations. The apartment which is considered the *private* of the spaces mentioned, includes kitchen, bedrooms, bathrooms and living room. To compare it to the hospital environment the social expectation for the patient room is to be a miniature reflection of the apartment including all the necessary elements: bed (the bedroom); toilet, sink, shower (the bathroom); table and chair (the kitchen); and some kind of entertainment possibilities-TV (the living room). The perception of which one of these could be eliminated in the room without bringing a stress factor for the patient is entirely individually based. However it has been pointed out that it is vital for the patient to know they are provided with their own private room and bathroom which surroundings they can control. From employee's point of view, there is the need of an area similar to the representation of a private apartment serving as the work office. Its possibility to provide environment enabling one to concentrate while still delivering comfort and with visually pleasing design are evaluated.

◉ semiprivate places

One may not have a clear understanding of the *semiprivate places* in its daily life however in the hospital environment such place is related to the ability of patient to escape their worries and leave the privacy of their room. Design of a place like that will depend on factors such as: age, and diagnostics of patients. An example of such a place is a small reading area. Considering the employees work organization, a semiprivate place could be their break room or employee's kitchen area. When such are present they do tend to be very positively associated since they provide the ability for the staff to step off stage and distress, take a rest, refresh.

◉ semipublic places

When living in the city one usually belongs to various clubs, organizations or work

groups. The places where the members gather are considered semipublic. It is the communication and exchange of information which is valued, as well as the knowledge of whose responsibilities such places are. For the patient a place with similar values could be the common gathering area, quite often the kitchen where all of the treated and their visitors could meet. Such a place provides great opportunity for communication, interaction, and it is a positive distraction, a reason for one to get out of bed and move. The conference rooms can be considered as semi public places for the employees. For a busy hospital ward it is vital to have such places planned in an order to allow for an effective communication between nurses, physicians, visiting doctors, researchers, educators, student or relatives.

● public places

In the city there are always places where the social context meets one quite often in an unexpected and unplanned ways, where new people are met, contacts established and the exchange of information is open for everyone to join. The public spaces are usually marked somehow by existing physical or easily recognized visual borders, with specific characteristics. It is often that some of them are landmarks, and are quite often used to orient; others are assigned specific roles in the public sector. The city, its roads, paths, and highways are considered city elements securing connections between city nodes. For this discussion they are under the same public category. Looking at he hospital wards today the role of a public spaces is played entirely by the corridors. This is the place where most of the movement happens, and it is the architectural element which replicates a road in its essence of connecting various point. Possible areas which could be included for better services are: reception area, waiting areas, and outdoor areas-balconies.

◉ Summary of hospital – building as a city

Hospitals are unique city-like structures and in order to positively affect employees' work and to meet patients' expectations, there is the need for building solutions where the fabric of the hospital reflects the fabric of the city with its complexity, strengths, and goals. By doing so one could truly achieve softening the borders of the healthcare institution and allowing the city to slowly migrate in to the hospital building. (Allison, Davis 2012)

Below is a list of places which are with a significant meaning from a city point of view and their corresponding spaces in a hospital ward. To the right the spaces listed are evaluated by their privacy in a relation of supporting PCC practices.

	CITY	HOSPITAL
private	home	patient room employee's office
semiprivate		patients relax room employees' kitchen
semipublic	clubs, organizations	patients kitchen area employee conference room
public	parks, streets	corridors, reception area balconies

PRIVATE PATIENTS AREAS
    single patients rooms
    private bathrooms
    private visitors areas

SEMI PRIVATE PATIENTS AREAS
    tv, work room
    read relax room
    common rooms

SEMI PUBLIC PATIENTS AREAS
    patient's kitchen open to visitors

PRIVATE EMPLOYEES AREAS
    flexible offices spaces
    decentralized nurse's station

SEMI PRIVATE EMPLOYEES AREA
    kitchen
    relax room

SEMI PUBLIC EMPLOYEES AREAS
    conference rooms
    meeting room
    visiting doctors offices

PUBLIC ALL USERS AREAS
    reception areas
    corridors
    outdoor garden

Space Syntax provides strategic, evidence-based consulting services in economics, planning, design, transport and property development.

"I know that these techniques work from the tough environment of practice. I love the world of analysis, observation, of research, but also passion, imprecision, the hunch. Space Syntax is the testing of the interaction of these opposing worlds."[19]

Norman Foster

3.5 Space syntax as related to building design

In "Architectural Configuration and time space in hospital ward", (2012) Jesper Steen and Daniel Koch discuss the term spatial practice in relation to **space syntax configuration**. More clearly they look in to the understanding of how does a work program and space interacts to formulate a spatial practice, and what does such spatial practices supports or what problems does it encounters. Through their studies they point out that a spatial practice understanding in a hospital ward is vital in the process of outlining what is expected, wished, or demanded in the redesign process. (Koch, Steen 2012)

The importance of evaluating a space using space syntax lays in the possibility of such analyze to outline points and poses questions which are usually not a first priority when focusing only on EBD or PCC architecture. Space syntax is human based study approach. Its main object of interest are the spatial layout of a place and social, economical and environmental phenomena occurring there. As its origin was to help architecture understand the likely effect of the designs on people who occupies and moves in them, space syntax is a valuable tool in analyzing public buildings.

Used as a research tool space syntax implements various sets of theories and methods, it is quantitative based and it is time consuming. Main approaches used for data collection are:
- movement patterns
- patterns of security and insecurity

- analyze of interactive nods
- analyze of high and low activity areas

The data collected allows to outline:
- the interactive culture which the specific study place carry;
- hierarchy in the organizational structures;
- central and peripheral areas;
- areas with need of security improvement;
- high or low dense areas;

When architects and designers are supplied with such information in the pre-design phase they have the possibility to evaluate the design features of problematic areas and reconsider suitable solutions. Such practice is not only economically sustainable but it is socially sensible in a long run.

With their complex context of social, economical and physical elements and the need of architecture to create a balance in all three, hospitals design could benefit from implementing space syntax analyze in their design preface. Valuable evaluations will be:
- the movement patterns of employees, patients and visitors;
- high and low activity areas separate by users;
- cross paths and interactive nods positions

In 1999 business writers Pine and Gilmore note that " *....sick patients want more than pharmaceutical goods, medical services, or even a hospital "experience"- they want to be well....*" [20]In an effort to deliver such outcomes, new hospital architecture based on the EBD principles has embedded the core ideology of healthcare sustainability in a number of already proven cases. The notion however is that **EBD delivers knowledge and practices based on measurable factors which can be documented and proven by extensive research. Their main characteristic is that their initial cost of implementation in hospital design can relatively easy be compared to the outcomes they deliver and thus justified as economically sustainable**:

- minimizing hospital infections
- positive financial effects
- improved work conditions
- improved patient environment

Based on that, EBD principles are evaluated as addressing specific problematical areas in design and architecture which are mainly connected to the physical improvement of a patients.

Certain architectural proposals such as specially designated areas for patient's relatives, staff relaxation rooms, nature outdoor spaces, and decentralized nurse stations still have not gained sufficient measurable data being strong enough to be evaluated on the same level as EBD principles. Their initial cost value is hard to justify because the positive healthcare outcomes of their implementation:

- are deeply embedded in the values of social communication,
- are highly individually perceived
- have a wide span of physical effects which if measured have to be traced to their emotional and psychological roots

Their overall initial aim is directed towards the social and psychological sustainability of personal healthcare practices rather than addressing the physical, economical factored ones. Thus they are strongly presented in the emerging PCC philosophy and at the same time changing established spatial programmed workplace practices. Analyzing PCC practices through follow–ups in the hospital, interviews, questionnaires, and study visitations, I came to the conclusion that: **PCC practices are very much dependant, and supported by a specifics of the space syntax allowing:**

- for one to be seen and see as well
- to keep its privacy and dignity
- to concentrate and reduce the work stress
- to understand and follow the treatment

(needs a transparency of the physical space, as well as transparency and continuity of the health plan processes)

In the context of the main theme of this chapter-healing environment, it is imperative to view Person Centered Care Philosophy and Evidence Based Design Principles as two complementing each other sides of the same desired outcome. Designs solutions based on EBD principles tend to be strong in technological executions and their reasoning is based in hard proven facts. While PCC practices aims are directed in re-introducing the human factor back in to healthcare practices. Thus the reasonings for the architecture needed to support such practices looks mainly in to overall human experiences. For example the single patient rooms and restrooms are present for both EBD and PCC. However EBD supporting argumentations are minimizing bacteria spread and improving sleep patterns, while PCC points out the ability for one to have privacy, supporting dignity of the individual, to adjust better, to feel safe, to allow better work performance

and possibility for relatives engagement in the healing process.. In such a way the argumentation of implementing single patients rooms and private bathrooms become stronger and more valuable for the hospital to consider.

It is in many cases that EBD and PCC complement each other, in a way that the principles of the one grow further in the understanding of the other. Example is the EBD principle of light and quality air are the main argument for wide windows and HEPA filters in hospital wards. However they are not quite strong enough to become a valuable reasonings when deliberating on investing in an outdoor areas. However PCC takes the argumentation a step further by showing that areas such as balconies and gardens could be beneficial in calming anxieties, stimulating for a patient to leave the room and their bed and thus physically positive and at the same time emotionally restorative, create possibilities for communication and allow for opportunity to understand better the treatment goals.

It is not always that EBD and PCC outline the same architectural solutions. As mentioned EBD is very much connected to design elements while PCC is supported by thoughtfully planned spaces in consideration of functional spatial practices and optimized patients personal experiences. Understanding that main argument for EBD principle quite often is a financial benefit in a long run could possibly contradicts with certain PCC desired architectural changes.

However for an architect to accent on elements in the design supporting one without implementing the other will result in less than suitable outcomes. Collaborative approach including PCC supported architectural interventions and EBD principles could introduce a new professional practice into the architectural healthcare culture, improve the human experience and support better overall healing results. Such set of goals should become a fundamental part in hospital architecture which is coming to grips with the need not only for durable building packages but for overall financial and social sustainable practices.

20. Pine and Gilmore, 1996

4. SELECTION OF DESIGN CRITERIA

KRANKENHAUS

SZPITAL

SJÚKRAHÚS

SLIMNICA

HÔPITAL

SYKEHUS

SAIRAALA

LOPITAL

NEMOCINE

ISPTAR

OSPITAL
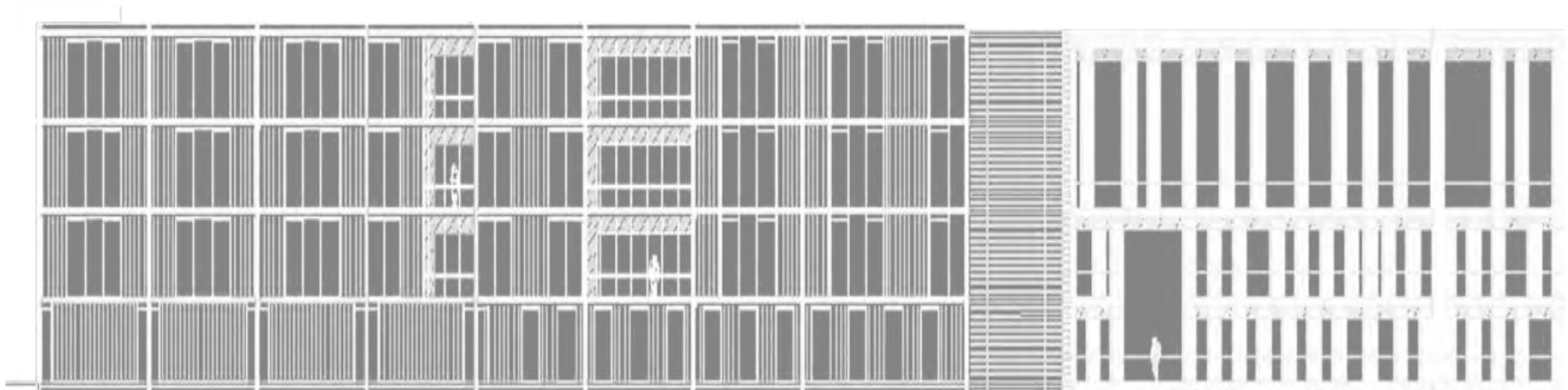
RUMAH SAKIT

OSPEDALE   HOSPITALI

BOLNIŠNICA

KÓRHÁZ

MALSANULEJO

HAIGLA

OSPIDÉAL

ZIEKENHUIS

HOSPITIUM

Given the possibility to gain a firsthand information right at the place of work, helped me put a realistic perspective to all the theoretical fundamental knowledge base. The study visits created the opportunity for me to get introduced to various working philosophies and design outcomes based on decisions given a selected number of prioritized principles from EBD and PCC. Additional to that I was able to get a first hand users evaluations of the undergone changes and outline positives and misess in the design solutions. Combining all of it: the conclusion from the theory outlined in chapter 4, the impressions, the reflections on interviews and the statements of employees and patients I have drown out a set of architectural elements and spaces (EBD, PCC based), which I will use as a main evaluation principles when looking in the existing hospital wards.

All have been selected based on their importance of delivering significant changes in the healing environment along with consideration of the presented theory of the hospital building as a city and the importance of space syntax .

The first is a selection of architectural elements which as of today have been accepted and proven by EBD researchers to be effective and front running implementations of safe healthier hospital environment:
• patients lifts
• adequate light sources
• convenient room environment control
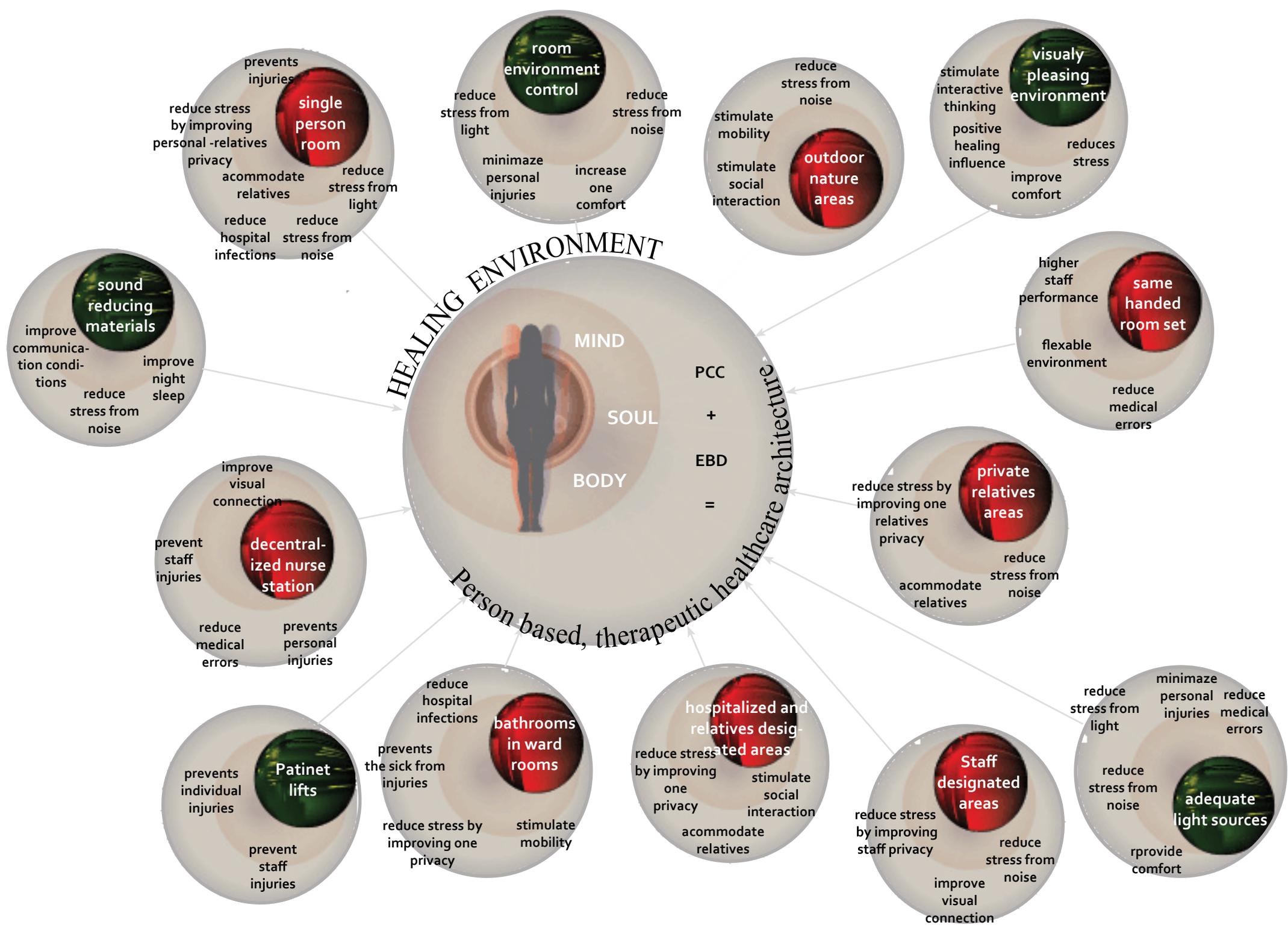• sound absorbing materials
• visually pleasing environment

The second set represents architectural spaces whose evaluations are based on PCC philosophy and science-based, human-focused approach that investigates connections between spatial layout and a range of social, communicative, work and care relationships .
• private patient rooms
• private bathrooms
• sleep over relatives areas
• patients and relatives designated areas (separate from the patient room)
• private office areas flexible office spaces
• decentralized nurses stations/
• same handed room set
• outdoor nature areas

The next visualization presents them thoroughly and in details.

Architectural spaces -PCC supported leverage points

Architectural elements -EBD supported leverage points

single person room
prevents injuries
reduce stress by improving personal -relatives privacy
acommodate relatives
reduce stress from light
reduce hospital infections
reduce stress from noise

room environment control
reduce stress from light
reduce stress from noise
minimaze personal injuries
increase one comfort

outdoor nature areas
reduce stress from noise
stimulate mobility
stimulate social interaction

visualy pleasing environment
stimulate interactive thinking
positive healing influence
reduces stress
improve comfort

sound reducing materials
improve communica-tion condi-tions
improve night sleep
reduce stress from noise

same handed room set
higher staff performance
flexable environment
reduce medical errors

decentral-ized nurse station
improve visual connection
prevent staff injuries
reduce medical errors
prevents personal injuries

private relatives areas
reduce stress by improving one relatives privacy
reduce stress from noise
acommodate relatives

Patinet lifts
prevents individual injuries
prevent staff injuries

bathrooms in ward rooms
reduce hospital infections
prevents the sick from injuries
reduce stress by improving one privacy
stimulate mobility

hospitalized and relatives desig-nated areas
reduce stress by improving one privacy
stimulate social interaction
acommodate relatives

Staff designated areas
reduce stress by improving staff privacy
reduce stress from noise
improve visual connection

adequate light sources
minimaze personal injuries
reduce medical errors
reduce stress from light
reduce stress from noise
rprovide comfort

HEALING ENVIRONMENT

MIND

SOUL

BODY

PCC + EBD =

Person based, therapeutic healthcare architecture

Chapter I: "Hospital architecture as an active medicine- integrating architecture as a vital healing element in patient treatments"

Chapter II: " Architecture as a vital healing element in patient treatments – design proposal". *The focus is set on using the design principles outlined in chapter one to evaluate the existing wards' spaces. It includes:*

- *an overview of the physical site of the project (Östra CK, Gothenburg, Sweden);*
- *existing floor plan analyses in consideration of: EBD, PCC, and the concept of understanding hospital buildings as a city replicating structures;*
- *evaluation of the space syntax which directs, supports, or prevents, social-communicative interactions;*

The second part of the chapter presents the floor designs proposal. It is a radical reconstruction which aims for an optimal implementation of EBD, PCC, and delivers a redeveloped space syntax according to the given physical frames.

Chapter III: " Linking together research users and architects– learning process"

1. PREFACE— WARDS 352A, 352B INTRODUCTION

1.1　Östra Hospital–structure, current paths, future goals

⬤ Current path and future developments and goals: Östra Sjukhuset is part of the public healthcare system and is managed by Västra Götalands Regionen. In the region's vision for the Good Life it is stated that all decisions must take into account the long-term social, environmental and economic consequences. Östra Sjukhuset is a part of Sahlgrenska Universitetssjukhuset, which is the northern Europe's largest hospital and the most highly specialised one in the region. It provides approximately 50% of the regions health care. Sahlgrenska Universitetssjukhuset SU is closely connected with Sahlgrenska akademin at the University of Gothenburg and is responsible for the clinical training of nurses and doctors. Its geographical position, in combination with fast changing social demographics presents certain challenges for the practice. The hospital is in operation 24-7-365 days a year; it is a place where complex significant life events, birth, death, communication, occur on daily bases; its physical environment and surroundings provides "room" where multiple events take place: healing, eating, sleeping, meeting, working, learning, transport, service and distribution; its practice and administration respond and depend on complex political and economical changes.

Setting their future goals to work towards sustainable practices Östra Sjukhuset have turned to human rights, being already legally binding rules. As a hospital and a part of the public sector they are not only striving towards but are also obligated to reconsider the existing physical structures and surroundings and achieve a state where the right to the best attainable health for all are respected, protected, promoted and implemented. To facilitate such an architectural outcome, one should consider comparing the fabric of the hospital with that of the city carrying all its complexity, strengths, weaknesses, and goals. (*Lynch Kevin, 1960; Allison David, 2011*)

⬤ Understanding Central Clinic building structure: Evaluated by its physical components the Central Clinic of Östra is a typical representative of the Tower and Base hospital structure. Horizontal part for diagnostics, in this case along with emergency floor forms the base. Inpatient floors stacked vertically is the second joining element. Such an arrangement creates the following long term possible physical challenging areas.


CK building　　　　　　　　　　　　　Östra Hospital area
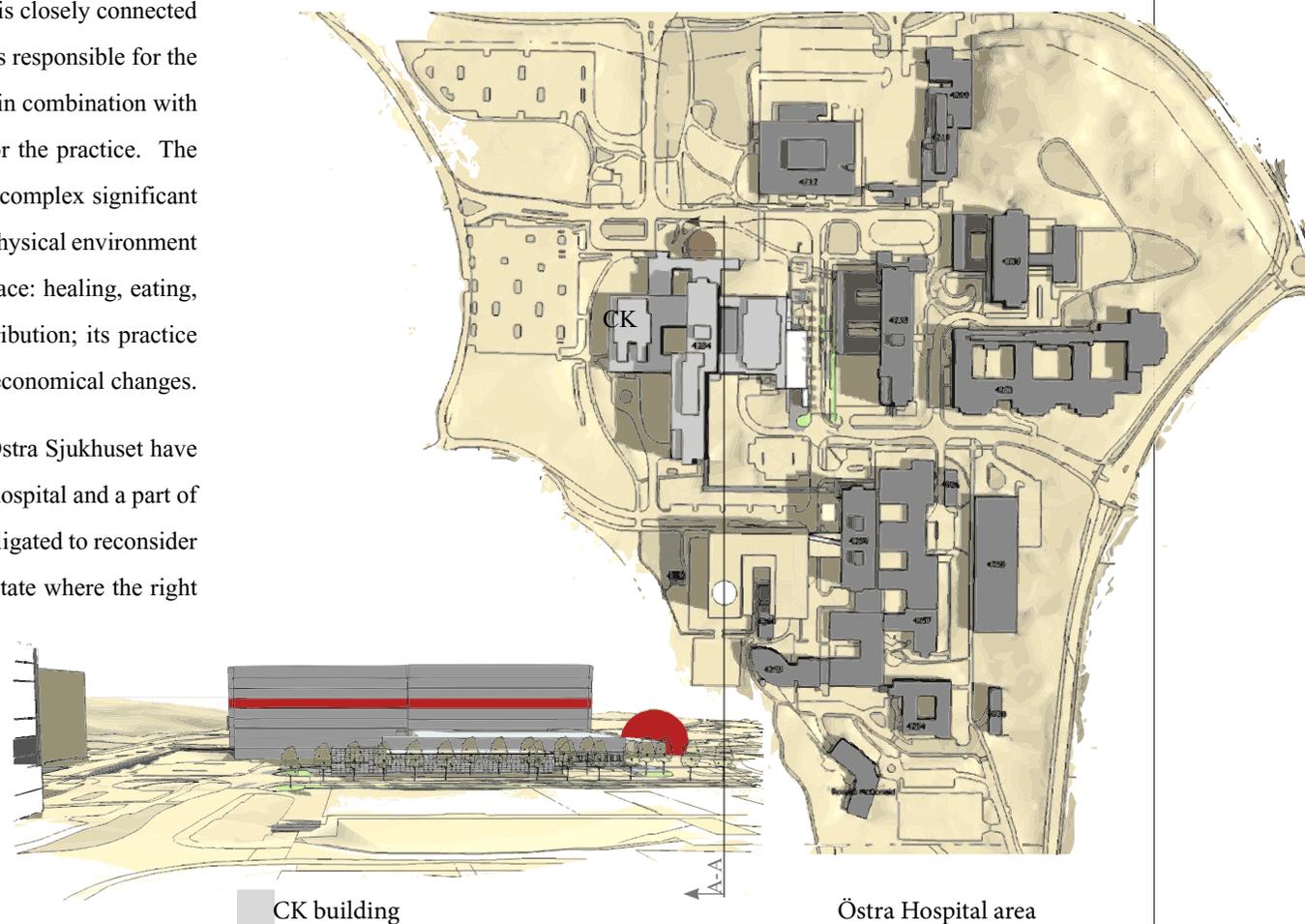
The thick main "body" of the building is often compared to a fortress that imposes control more than creates comfort. Each particular element is intended to serve certain technical procedures, specifically localized, often planned with strict budget. Limited physical flexibility: - horizontal expansion for diagnostic and operation units, vertical one for inpatient wards. Strong presence of structural logic entirely based on medical procedure's needs dominated the architectural outcomes. Years of operation highlight certain problems which I need to be conscious off, while working with existing design:
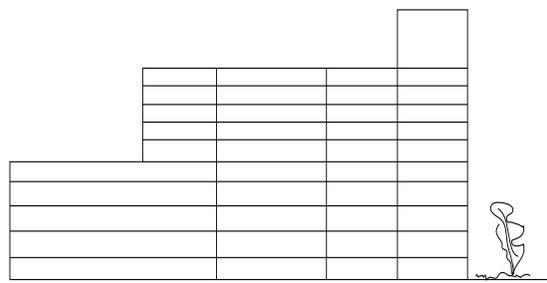
rare connections to nature
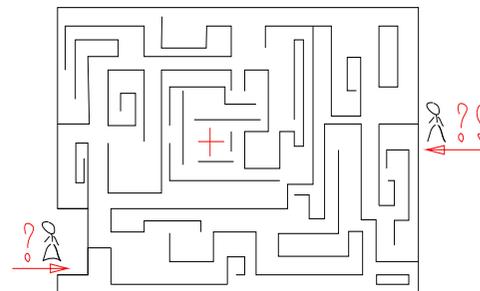
insufficient wayfinding
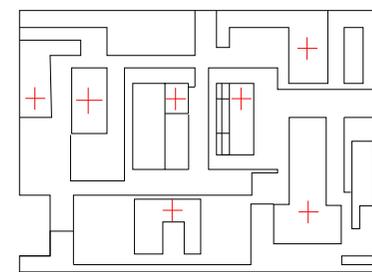
landlocked lots surroundings

high level of stress
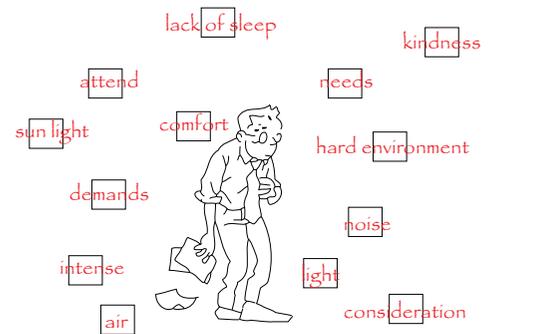
challenging physical work environment, in combination with unpleasant hospital wards physical set
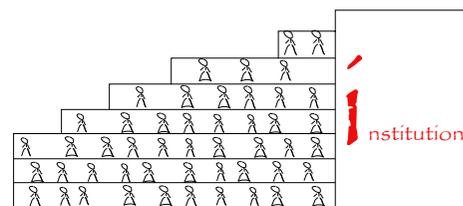
strong institutionalization

insufficient engagement of patient and relatives in decision making processes, treatment plans, and healing procedures

1.2 Central Clinic- ward 352A, 352B introduction
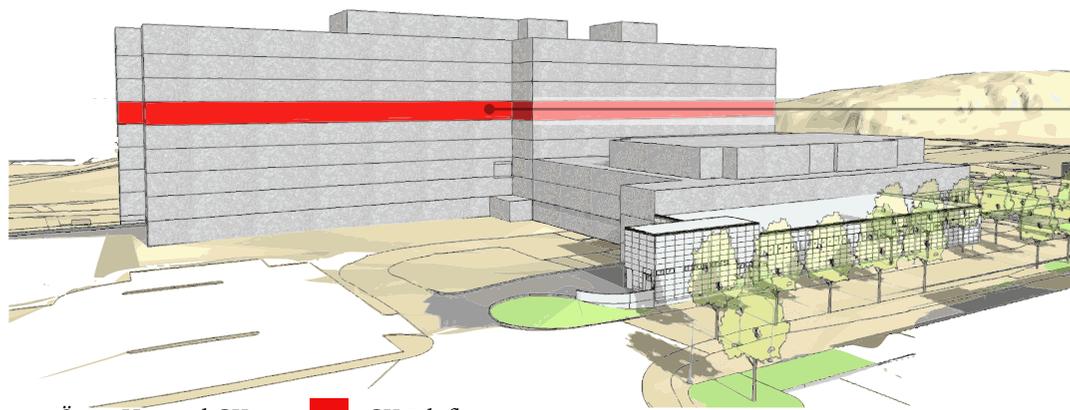
Östra Hospital CK   ■ *CK 5th floor*

Physical space evaluation

◉ 5th floor m^2

- 352A- 632m^2
- 352B- 632m^2
- 353A- 632m^2
- 353B- 632m^2

◉352A/ 325B

- patient rooms
- patient common areas
- employees area
- storage
- showers/bath areas

Social Evaluation

◉ ward 352A

- liver diseases
- CHF
- eating disorders

◉ ward 352B-

- diabetes

◉ 352A/ 352B each

- 20 patients
- 2 single bed rooms: 20m^2
- 3 double bed rooms: 20m^2
- 3 rooms of four beds: 35m^2
- average days of stay 5-7

CK building 5th floor

1.3 Central Clinic- ward 352A, 352B physical limitations

The physical location of the project being on the 5th floor of existing building creates the following limitations:

- consideration of the existing grid and working with it
- no possibility of changing shafts locations
- consideration of existing pipe walls
- facade is set to be updated- windows can be moved and reused
- max length of patient room 5,6 m. in consideration of corridor width of 2.4 m. (current corridor regulations- 3 m.
- limited possibility for facades extensions

wards 352A, 325B-
existing building grid

wards 352A, 352B-
physical limitations

- facade grid distance: 3.79 m
- central core grid distance: 7,18 m
- windows size: 0.60, 1.50, 2.40, 3.00 m
- original corridor width: 2.40 m

- grid
- pipe walls
- shafts
- max room length: 5.60 m

80 m

68.8 m

24.5 m
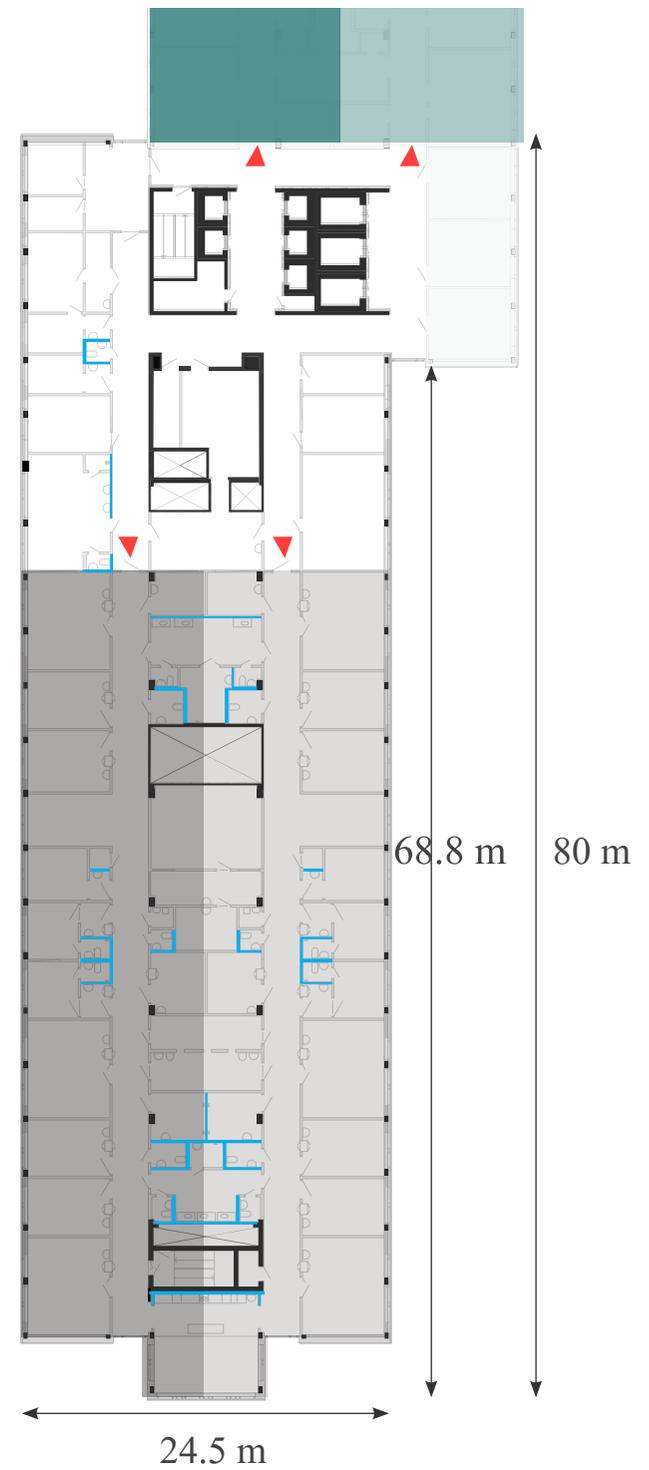
CK building 5th floor grid, scale 1:500

Corridor

Bed two in two bed room

1.4 Wards 352A, 352B visual portfolio

"....The mega hospital was conceived in strict opposition to nature…….The triumph of minimalism and high technology was everywhere to be found, in the modern hospital: the lack of natural ventilation, the shrinkage of the window aperture and the diminution of the total amount of glazed area, adoption of the hermetically sealed building envelope, dependence on artificial light over natural daylight, the rise of the block hospital and its rejection of courtyards and other green spaces for the use by the patient, and a de-emphasis on overall patient amenity were but a few technologicall driven modern developments..."

Verderber and Fine 2000

Bed one in 2 bed room

Patient kitchen

Patient common room

Separating beds in two beds room

Nurse station

Nurse station
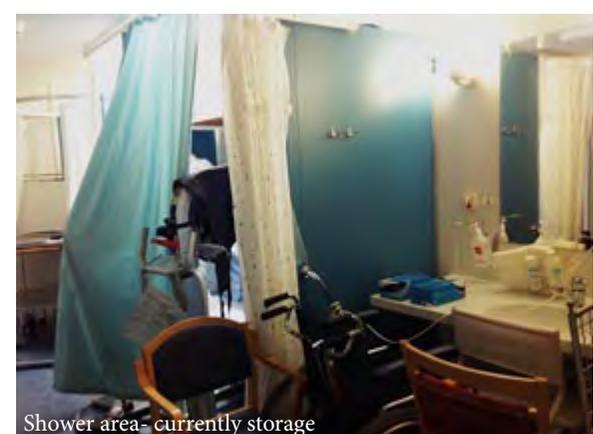
Shower area- currently storage

2. WARD 352A, 352B STUDY EVALUATION

2.1 Evaluation principles

Architectural interventions in the hospital environment can be classified by their purpose in achieving certain sustainable aspects. In the last years, one of the popular discussion topics has been a green design of hospitals in relation to their overall footprint. Main questions in focus are one concerning energy efficiency, water consumption, waste treatment, surrounding hospital's lands locked by parking lots and the infrastructure necessary to support the overall performance. However this master thesis architectural solutions have been driven by integrating the EBD research, with its outcomes related to the healing environment principles, and the PCC philosophy, implemented in development of more human hospital practices. Focus have been placed on analyzing possible design solutions structured around goals such as:

- hospital design aiming for the architectural elements and design aesthetics to become active part of the healing environment supporting and promoting person centered care
- reducing stress factors
- enhancing safety for patients and staff
- improving the overall vision of hospitalization

(*Ulrich Roger, 2008; McCullough Cynthia, 2011*).

To the right is a list of architectural elements and spaces (EBD, PCC based), which I will use as a main evaluation principles when looking in the existing hospital wards. All have been selected based on their importance of delivering significant changes in the healing environment along with consideration of the presented theory of the hospital building as a city and the importance of space syntax . (for full overview refer to chapter one selection of design criteria)

The first is a selection of architectural elements which as of today have been accepted and proven by EBD researchers to be effective and front running implementations of safe healthier hospital environment:
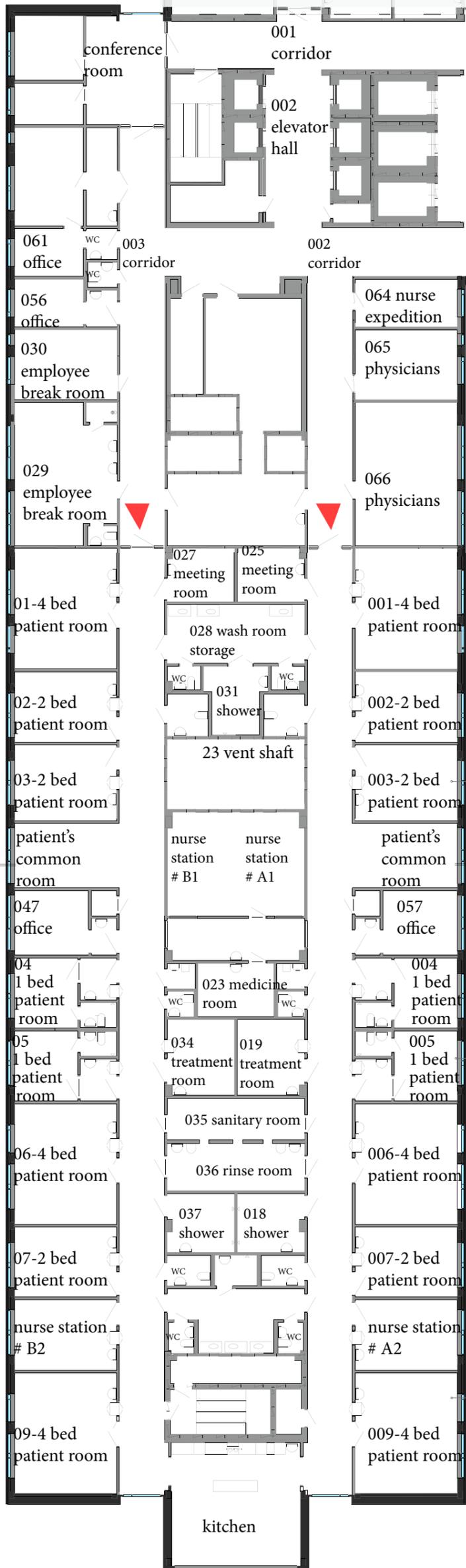
- patients lifts
- adequate light sources
- convenient room environment control
- sound absorbing materials
- visually pleasing environment

The second set represents architectural spaces whose evaluations are based on PCC philosophy and science-based, human-focused approach that investigates connections between spatial layout and a range of social, communicative, work and care relationships .

- private patient rooms
- private bathrooms
- sleep over relatives areas
- patients and relatives designated areas (separate from the patient room)
- private office areas flexible office spaces
- decentralized nurses stations/
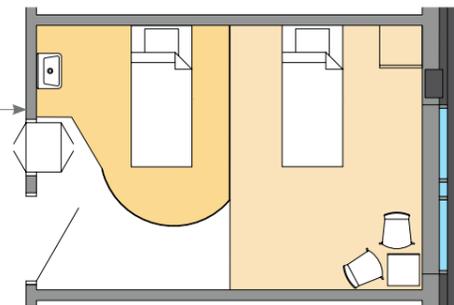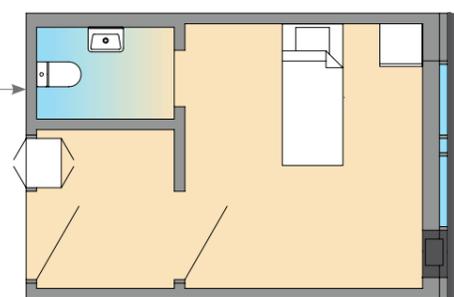- same handed room set
- outdoor nature areas

The presented below models are the three main types of rooms which are the structural elements in the CK wards today. The patient's beds face each other and the separation is in a form of ceiling attached curtain. Table and two chairs are positioned to the windows wall. Based on a conducted studies of the physical space and its effect over the patient's healing process, a conclusion of the ward space could be summarized:
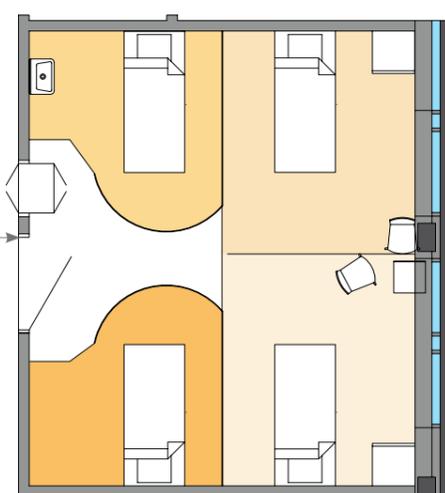
- insufficient sq m.
- no private bathroom - higher risk of bacteria infection, higher risk of injuries, higher use of catheters, higher involvement of the employees to bring patient to the corridor common restrooms
- limited movement for patient- 8-9 m^2 per person, including the 2 m^2 of bed space
- challenging work environment - absence of technology
- absence of ceiling lifts presents higher risk for injuries
- insufficient daylight for one of the patients bed caused by the use of bed curtain
- absence of comfortable room environment control
- limited source of fresh air
- insufficient variation of lighting sources
- generic environment, no ability for personalization of the room
- no privacy, and no ability for one to escape in a quieter space
- missing arrangement for relatives to stay overnight
- uneasy sleeping environment, numerous stress factors are present: noise, light, movement, vision
- missing connection between employees and patient caused by absence of physical transparency

CK building 5th floor Scale 1:250

Floor plan labels:
001 corridor
002 elevator hall
002 corridor
003 corridor
conference room
061 office
056 office
030 employee break room
029 employee break room
01-4 bed patient room
02-2 bed patient room
03-2 bed patient room
patient's common room
047 office
04 1 bed patient room
05 1 bed patient room
06-4 bed patient room
07-2 bed patient room
nurse station # B2
09-4 bed patient room
027 meeting room
025 meeting room
028 wash room storage
031 shower
23 vent shaft
nurse station # B1
nurse station # A1
023 medicine room
034 treatment room
019 treatment room
035 sanitary room
036 rinse room
037 shower
018 shower
kitchen
064 nurse expedition
065 physicians
066 physicians
001-4 bed patient room
002-2 bed patient room
003-2 bed patient room
patient's common room
057 office
004 1 bed patient room
005 1 bed patient room
006-4 bed patient room
007-2 bed patient room
nurse station # A2
009-4 bed patient room

352B
352A

2 bed room 20 m^2
10 m^2 patient space
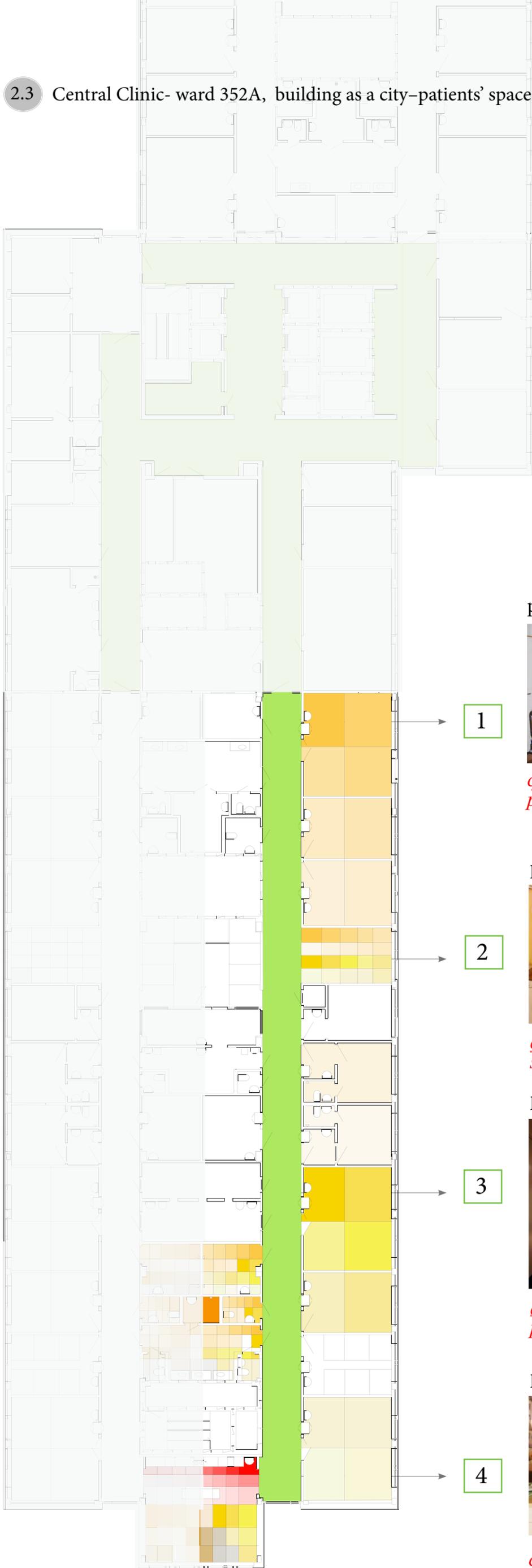no bathroom

1 bed room 20 m^2
17 m^2 patient space
2.5 m^2 bathroom

4 bed room 35 m^2
8 m^2 patient space
no bathroom

2.3 Central Clinic- ward 352A, building as a city–patients' spaces

Evaluated by their functions in the institutionalized healthcare practice there are four main group types that meet in a hospital space, namely: the patients and their visiting relatives, the healthcare professionals, researchers and administrative personnel. Each group has its own specific demands concerning the hospital's physical environment, healthcare services and possibility to interact there in a way that meets basic medical, social and psychological needs. When living in the city one is used to recognize spaces such as private, semi private, semi public and public. The city presents the ability for the individual to choose where in these places he/she needs or wants to be, and each person is recognized for its identity. As already discussed in book one pg:15, the standard of life provides each resident with at least basic living necessary accommodations. To compare it to the hospital environment the social expectation for the patient room is to be a miniature reflection of the apartment including all the necessary elements: bed (the bedroom); toilet, sink, shower (the bathroom); table and chair (the kitchen); and some kind of entertainment possibilities-TV (the living room). Clearly seen on the current floor plan presented to the right is that some of these are missing. The patients rooms are semiprivate, and all of the rest of places in the ward are public spaces. Considering patients' age and physical conditions private spaces where one can retreat when needed are desirable.

patient's semiprivate area

convert to single bed patient's room-private →

The current room set with 2-4 patient primarily does not provide the necessary amenities for one to feel safe, to keep their dignity and to concentrate on their healing. A conversion from semiprivate to private room adding a private bathroom can improve significantly the outcomes of the hospitalization.

patient's public space

convert to patients' semiprivate place →

The common area, (which is in the middle of the ward), is not sufficient neither for patients nor for visitors. It is too small 20 m^2 for 20 patients, with very outdated furniture, insufficient light sources and without possibility for distinguishing the clear boundary between it and the corridor. A way of enclosing it might be by putting sliding doors. It could communicate more clearly for whom the design is for.

patient's public space

add additional patient public places →

Smaller on the width from the current regulation for hospital corridor it measures today to 2.4m. The stress level in the corridor is to certain extend caused by employees movement patterns, the need for patient to be moved to showers restrooms, as well the understanding it was the main movement artery. As such it is hard for patient to view it as a desirable place to be and that limits their stay entirely to their patient bed. Adding additional public areas will stimulate patients leaving their rooms, and thus it will be beneficial for their health improvement.

patient's public space

convert to patients and visitors semi public space →

Various problematic of the kitchen area are hidden in the outdated furniture, absence of functional storage and its minimal presence, however the main concern for this wards' space kame from the understanding that this was a patients'-semipublic area however it played the role of an open public space used from the employee sometimes for meetings , sometimes for restocking and reorganizing, etc. Thus the place ownership was not stated and that created confusion as the space did not belong to any of the user groups and no one had responsibility

CK building 5th floor Scale 1:250

4 employees' semiprivate area-work associated

The initial purpose of the meeting room was to allow employee to meet and have private conversations without disturbing the patients rest. However the room is in the central dark core, no natural light, it is very limited on square meters, and it is often used either for storage or for additional patient room. A need for a place which holds the initial design ideas and adds to them the pleasant environment, technological updates and physical transparency is needed. Such will support PCC idea of efficient work flow by separating employees and patients and allow for better concentration.

5 nurses team #1,2 private area

Design problems of the nurses' stations are; insufficient m^2 ; location in the central core· - no daylight sources, absence of fresh air; hard to adjust temperature; stressful work environment based on location, material used, number of employees assigned.

6 GM semiprivate area

At the present there is an additional desk space and a person who works in the GM office along the general manager. Such practice become necessary forced from the lack of work spaces, and it affects the work efficiency

7 physicians' semiprivate area

The space is not used as designated since most of the physician examinations are performed in the patient's room. On certain occasions is converted to a patients room, however it is located in the central part of the ward and it lacks daylight and fresh air sources.

8 nurses team #3,4 private space

Design problems of the nurses' stations are: insufficient m^2 ; hard to adjust temperature; stressful work environment based on location in connection to nurses' station # 1 and the medicine storage, material used number of employees assigned to it; absence of storage.

9 employees' public space

The patient kitchen is often used by the employees as a main cross path between wards, as well as a main storage for food supplies. It is neither patients neither employees designated area which creates confusion and results in non used potentials of the space

CK building 5th floor

There is a need for consideration of evaluating all the various subgroups in order to understand the complexity of the services provided and the significance of recognizing them individually. Only then a sensitive to all the users space is possible to be discussed. It is important to observe that at major part of the physicians offices considered as the private employees' places, the semi public conference room, and the semiprivate -the employee kitchen at the moment are located outside of the ward. Such location creates separation in work flows, complication in communication, and obstructions in transparency of the work environment.

A summary of spaces which are viewed necessary and highly important is listed below:

private places- flexible office spaces, single patient rooms

semiprivate places- employees' kitchen area inside the wards premises; patients area such as tv room, or reading room

semipublic-employees' meeting room/conference room, patients' kitchen

public places- reception area, balconies

1 employees' semipublic area

2 physicians' private area

3 employees' semiprivate area rest associated

4 employees' semiprivate area- work associated

5 nurses team #1,2 private area

6 GM semiprivate area

7 physicians' semiprivate area

8 nurses team #3,4 private space

9 employees' public space

create team work spaces for nurses and physicians

provide a semiprivate area inside the premises of the ward

expand the borders of the ward

reconsider the position of the semi public areas

add flexible private work places

address connection concerns b/n employees' spaces

add employees public areas-reception balcony

CK building 5th floor Scale 1:250
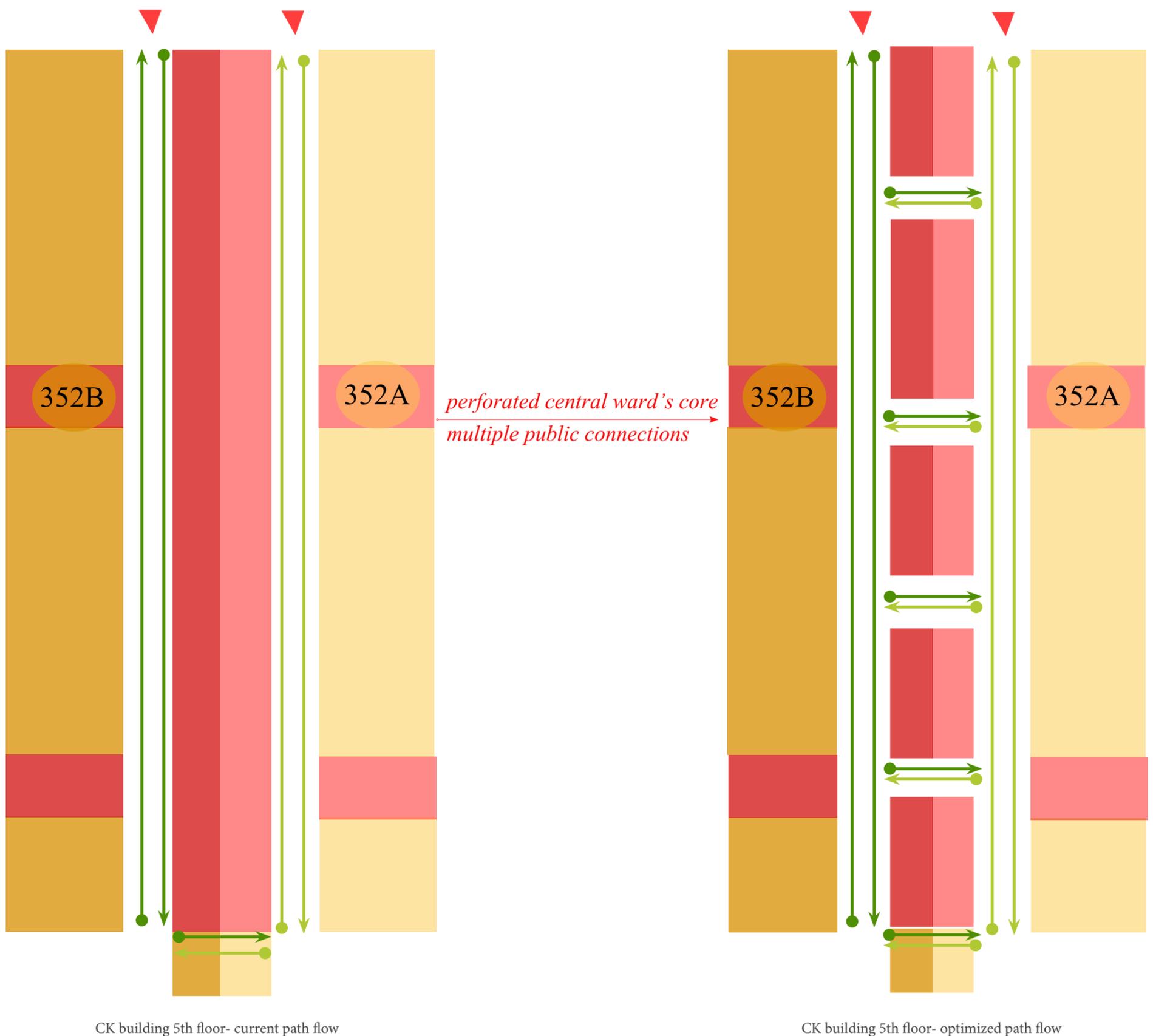
2.6 Central Clinic- ward 352A, 352B horizontal connections

vertical connections

all users horizontal connection

352A horizontal connection

352B horizontal connection

wards' entrances

1   connection through shower area

2   connection through nurses' station

3   connection through medicine storage

4   connection through sanitary room

5   connection through shower area

6   connection through kitchen-public

CK building 5th floor Scale 1:250

2.6 Central Clinic- ward 352A, 352B horizontal connections

Functional evaluation of the horizontal paths and connections in ward 352A and 352B showed: a very limited public connections where patients or their visitors could move through crossing from one to the other wards. Such limitation however is a way of establishing borders of two separate treatment places. The straight corridor in this sense becomes the only path of movement. The architectural organization does provide for the employees to move between the wards. However these are rarely used since they cross through spaces such as the storage, sanitation and medicine rooms. The only space which is often used as an active connection is the patients' kitchen. The reasons behind are: it is much more spacious and naturally perceived as an existing path; it is considered more convenient since one does not need to leave the wards; the absence of doors creates the understanding of a common space rather than designated patients' one. This results in no interest of patients to use the space as a common gathering area and limiting themselves only to stay in bed in their room.

The graphic below presents an evaluation of the same two wards movement paths and connections in case of the two wards being combined to one single unit. The essence of the existing central connections becomes vital for the proper work flow. The need to support the movement of all users of the space will change the connections paths in the central core from private to public. Additional design solution to the patient kitchen is needed to establish its status of a semi public space and to outline its main user group- the patients and their visitors.

*perforated central ward's core
multiple public connections*

CK building 5th floor- current path flow

CK building 5th floor- optimized path flow

CK building 5th floor Scale 1:250

Presented to the right is a study of a first time visitor's movement (predominantly relatives and patients' caregivers) through the 5th floor of CK building. The discussion does not include employees of the specific wards, physicians, visiting medical professionals, etc. which are familiar with structures of hospitals.

As discussed in book one, comparing hospitals floor organization to the city fabric could bring valuable new understandings of how does space syntax influence the behavior of its users. Based on such, architects and designers could reevaluate important points- space relationships between vital elements, considering adding, removing or improving the existing ones. What is valuable for me at the presented study are the points where one feels lost, and mainly #1 when exiting the elevator and # 2 when already in the ward looking to obtain information. Behavioral mapping study resulted in the understanding that quite often when entering the ward, one needs to know where his/her relatives are, or where is the patient they are picking up. Unfortunately at the present state there is no clear understanding whose job is to help the visitors. Walking in the city as a first time visitor one will do well when caring a map, or orienting by certain landmarks. However he/she will do much better by simply asking for directions. Thus one is most likely to do the same when needing help in the hospital. As a result quite often the visitors will address the first nurse they see. The absence of reception in each ward is something that needs to be very carefully evaluated. All of the visited places have planned for such as considering it vital architectural element. As pointed in book three (study visits) the reception importance is based on numerous factors, such as: the need to provide information to visiting persons, answering all the calls and redirecting them to the right personnel, dealing with most of the side responsibilities when a patient needs to be checked in and out, etc. All of the mentioned factors support a flawless work process. As such the receptionist becomes vital as he/she relieves the nurse duties load (allows them to concentrate on the care of the patients), as well as provide for a better logistics.
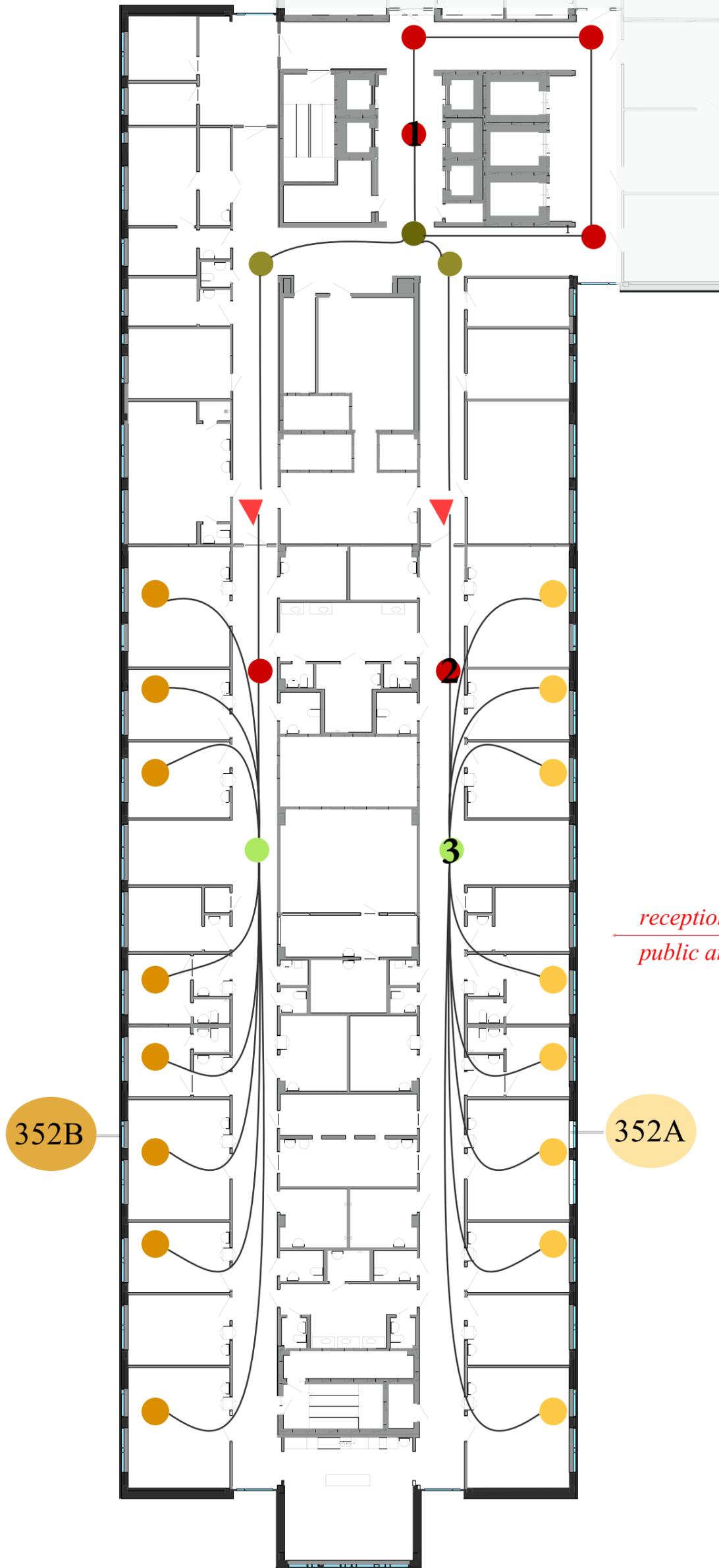
▼ ward's entrance

🟡 ward 352A patients' rooms

🟠 ward 352B patients' rooms

🟢 place when one needs to make movement choice

🟢 place when one has visual orientation

🔴 place where one feels lost 1,2

🟢 place where one gets information 3

reception desk
public area

handles paperwork
provides information
handles all the phone calls
transfers calls
orients visitors
supports nurses' work
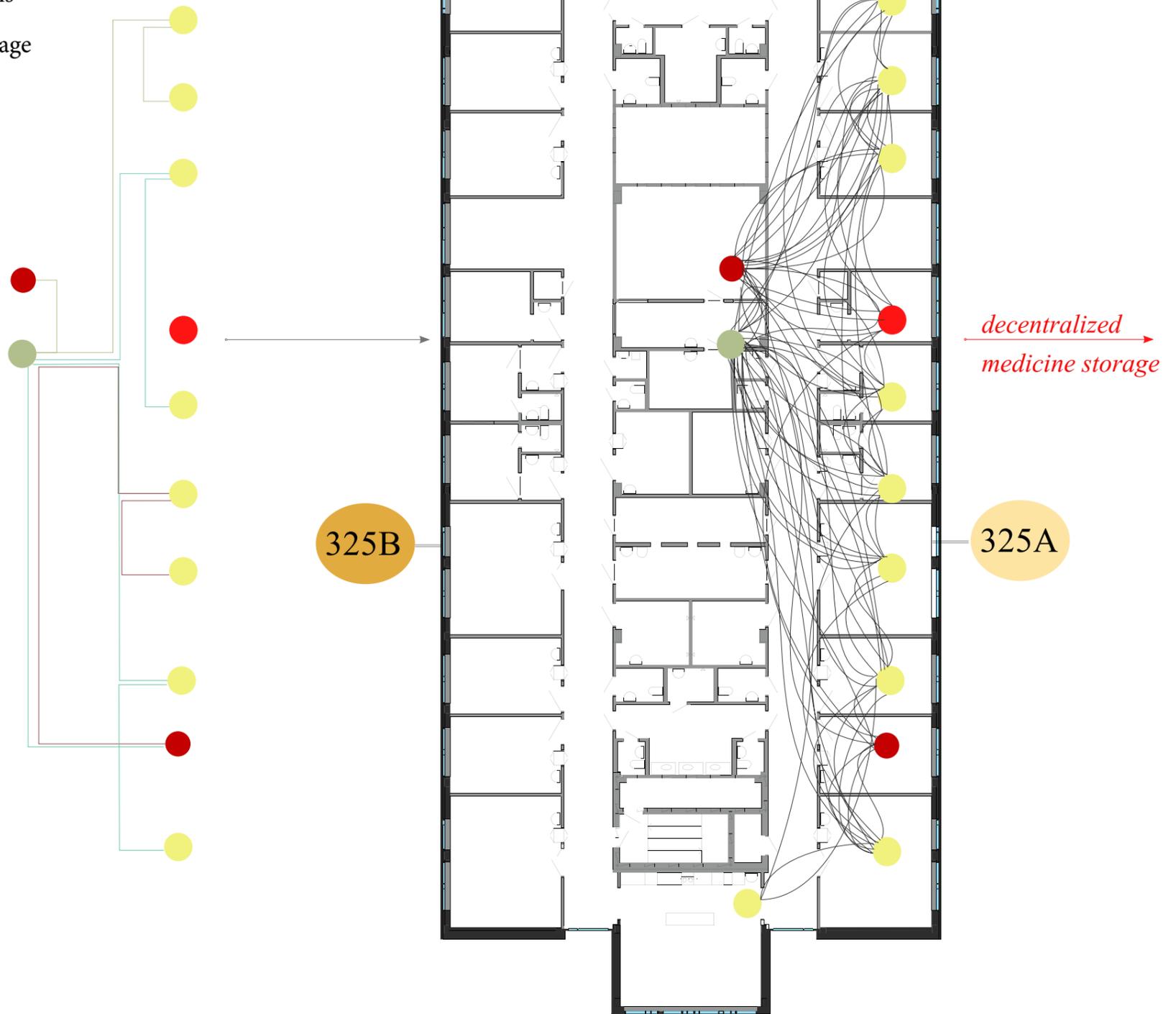*accounts for employees schedule*
provides connection b/n all users
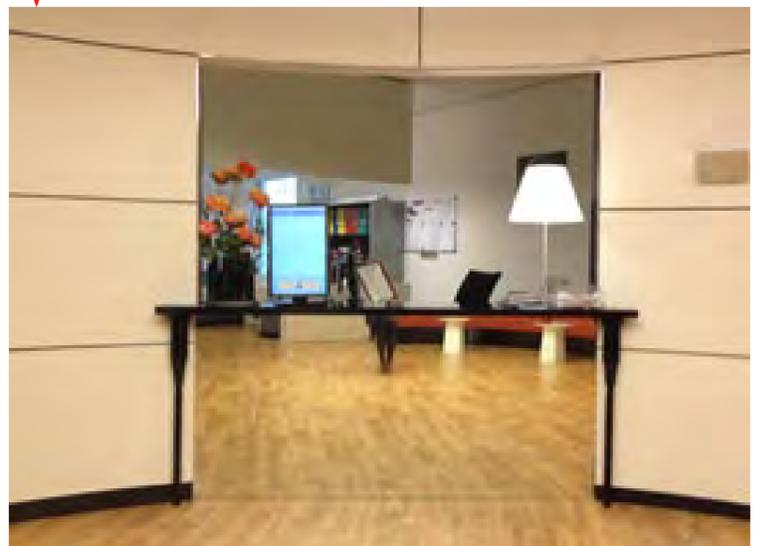
2.8 Wards 352A space syntax
employee's one hour work paths evaluation

In their PhD work Daniel Koch and Jesper Steen discuss the importance of the space position of the medication room and its relations to work spaces and patient rooms. They present the discussion of the centrality of the medication room on two different levels. In the first one the nurses distribute medication to each room one at a time, returning to the medication storage to prepare for the next patient. In such routine the medical storage becomes central element for the workflow and gains an additional socializing aspect. In the second evaluation Koch and Steen present a study where the nurses use medical wagons to distribute the medication. Such practice puts the medication storage as an essentially needed for the work performed, but not as a central point in the nurses' work flow. (Koch Daniel, Steen Jesper, 2012)

The graphic to the right presents a simplified evaluation of the current practices in ward 352A and looks for understanding to what extend they have been directed by the architectural space configurations (the drawing presents the movement of the nurses in all the teams- an afternoon shift, 6-7 p.m., in an hour frame). The work practice in the ward is to use the medical trolleys to distribute medication to the patients. Since a work team of two nurses is responsible for five patients there is an understanding that it is usually the extra nurse on the shift which will prepare and restock all the needed medications for the rest of the teams. Still with very old patients whose conditions do change fast it is quite often that a nurse has to make multiple trips to the medication storage room to take additional medicines. Such practice places a double importance on the medicine storage room: it is an important architectural place for the work and it

is a semycentral to the work flow.

▼ ward's entrance

🟡 ward 325A patients' rooms

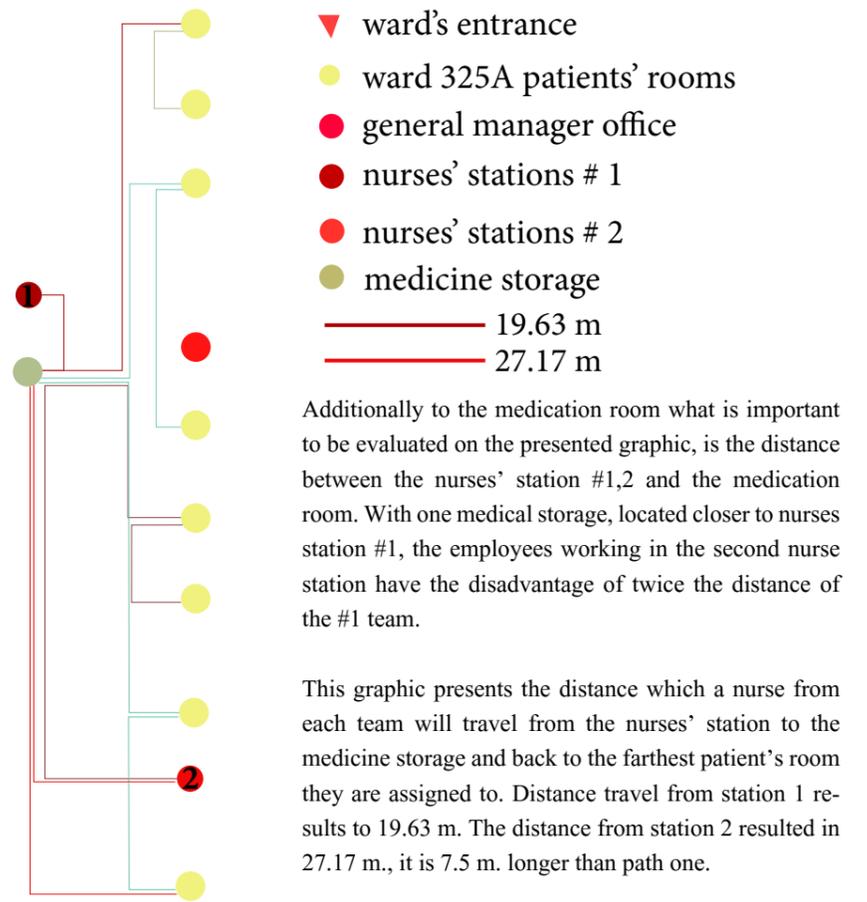🔴 general manager office

🔴 nurses' stations

🟤 medicine storage

decentralized
medicine storage

325B

325A

CK building 5th floor Scale 1:250

▼ ward's entrance
● ward 325A patients' rooms
● general manager office
● nurses' stations # 1
● nurses' stations # 2
● medicine storage
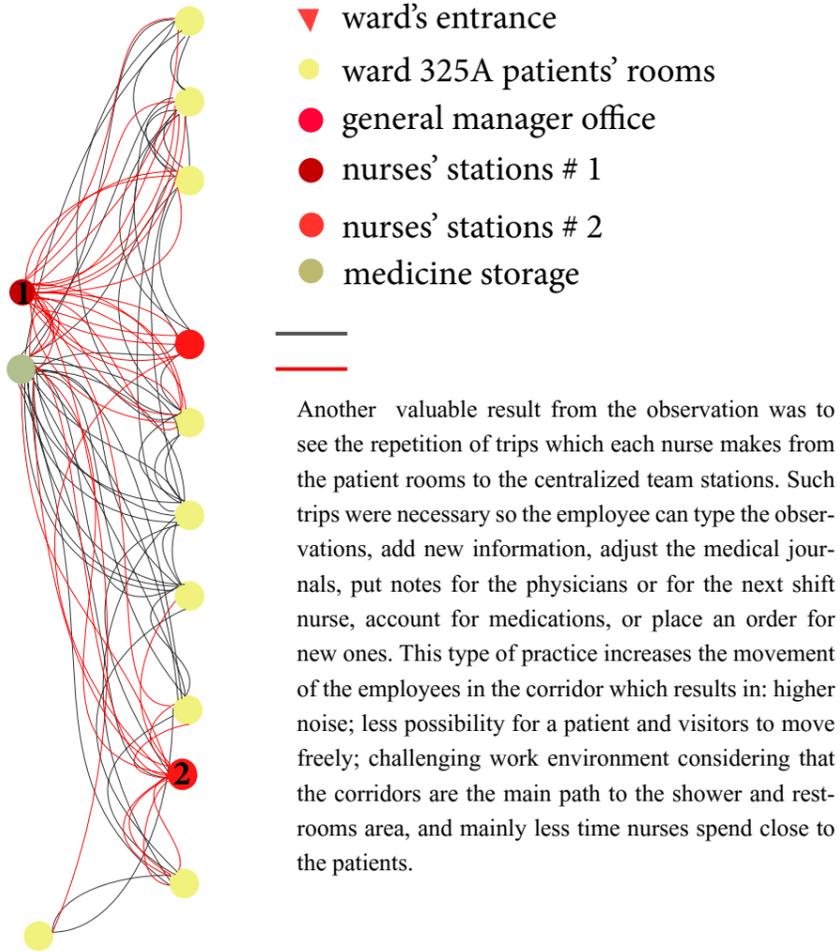
Another valuable result from the observation was to see the repetition of trips which each nurse makes from the patient rooms to the centralized team stations. Such trips were necessary so the employee can type the observations, add new information, adjust the medical journals, put notes for the physicians or for the next shift nurse, account for medications, or place an order for new ones. This type of practice increases the movement of the employees in the corridor which results in: higher noise; less possibility for a patient and visitors to move freely; challenging work environment considering that the corridors are the main path to the shower and restrooms area, and mainly less time nurses spend close to the patients.

employees' movement pattern in 1 hour

▼ ward's entrance
● ward 325A patients' rooms
● general manager office
● nurses' stations # 1
● nurses' stations # 2
● medicine storage
——— 19.63 m
——— 27.17 m

Additionally to the medication room what is important to be evaluated on the presented graphic, is the distance between the nurses' station #1,2 and the medication room. With one medical storage, located closer to nurses station #1, the employees working in the second nurse station have the disadvantage of twice the distance of the #1 team.

This graphic presents the distance which a nurse from each team will travel from the nurses' station to the medicine storage and back to the farthest patient's room they are assigned to. Distance travel from station 1 results to 19.63 m. The distance from station 2 resulted in 27.17 m., it is 7.5 m. longer than path one.

central architectural spaces relationships
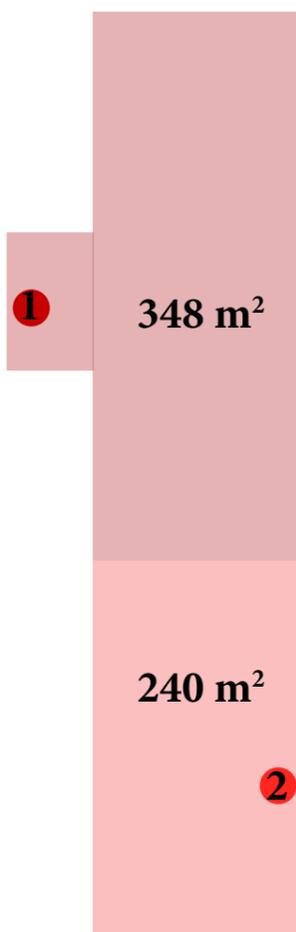
Close connection of nurses' station to the rooms they are responsible for is vital in the ability of the employee to stay connected, to see the patients and to have an efficient work flow. This graphic presents the difference in m² which the two nurses' stations need to cover.

348 m² ❶

240 m² ❷

nurses station & working floor areas

To conclude on the observation a possibility to decentralize the medical storage is an optimal solution. If such is not possible perhaps a consideration of small medical cabinets could be looked at. Through the study visits and the interviews it has been pointed out that there is a need of the employees to record, and type while sitting in the patients room participating in the discussion. Technology implemented through the corridor and in the patients' rooms will support efficient work environment and increase the time that the nurse spends with the patients. Additional consideration of central to the workflow and to the work process spaces connections needs to be considered.

close connection b/n medicine storage & nurses stations →

close connection b/n nurses stations & patients' rooms worked →

close connection b/n medicine storage & patients' rooms worked →
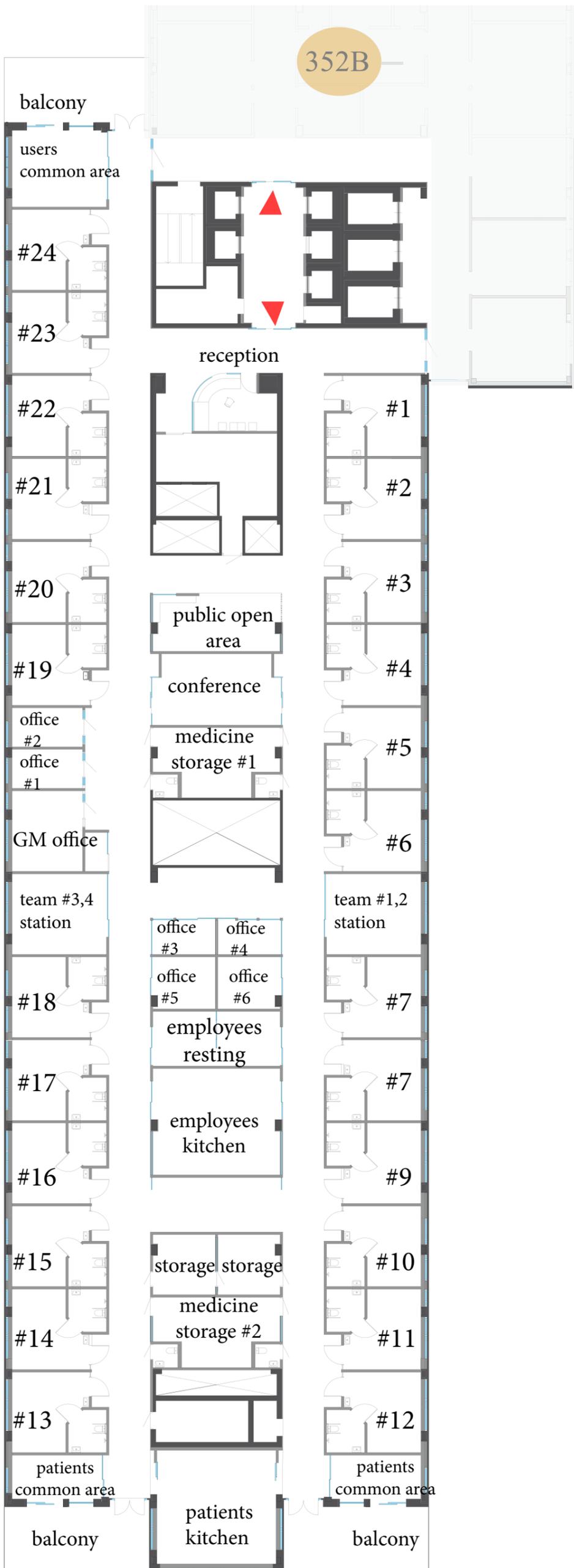
Using the outlined in chapter one selected design principles (presented above), along with consideration of the hospital building as a city theory and the importance of space syntax analyzes, I have outline problematical areas in the existing wards space and have proposed design interventions accordingly. During the analyze process certain evaluation principles had become strong enough to be viewed as a leverage points in the reconstruction processes and were carried on to the design solutions.

Presented below is a summary of the conclusions delivering architectural elements and design aesthetics which can become active part of the healing environment, supporting and promoting person centered care.

EBD+PCC+
Hospital building as a city+
Space syntax

expand the borders of the ward

single bed patient's room–private

add patients' semiprivate place

provide for patients' and visitors' semipublic space

add additional patient public places- balcony, central area, reception

add flexible private work places

provide employees' semiprivate area inside the premises of the ward

create team work spaces for nurses and physicians

add employees public areas-reception, balcony

decentralize the medicine storage

perforated central ward's core multiple public connections

reconsider the position of the employee semipublic areas

address connection concerns b/n employees' spaces

provide for close connection b/n medicine storage & nurses' stations

provide for close connection b/n nurses stations & patients' work rooms

*close connection b/n medicine storage & assigned patients' rooms*

2013

Östra Hospital

Ward 352A general floor space plan

352B

balcony

users common area

#24

#23

reception

#22

#21

#20

#19

office #2

office #1

GM office

team #3,4 station

#18

#17

#16

#15

#14

#13

patients common area

balcony

public open area

conference

medicine storage #1

office #3 | office #4

office #5 | office #6

employees resting

employees kitchen

storage | storage

medicine storage #2

storage

patients kitchen

#1

#2

#3

#4

#5

#6

team #1,2 station

#7

#7

#9

#10

#11

#12

patients common area

balcony

CK building 5th floor, ward 352A, Scale 1:250

- 352 A -1799 m^2
- 24 patients each/ 24 single rooms
- private showers and restrooms
- sofa-bed for relatives, common patients visitors area
- ceiling lift in each patient rooms
- 2.4 m corridors
- double corridor- cross connections
- two medicine storage
- 2 team stations/ additional work place in each patient's room
- team offices including the ward's physicians
- additional flexible office spaces
- additional work place in each patient's room and in the corridors
- inside the ward conference room
- separate patients' and employees' kitchen
- central reception area
- public central area
- semiprivate patients gather places
- outdoor balconies

4.2 Ward 352A horizontal connections

352B
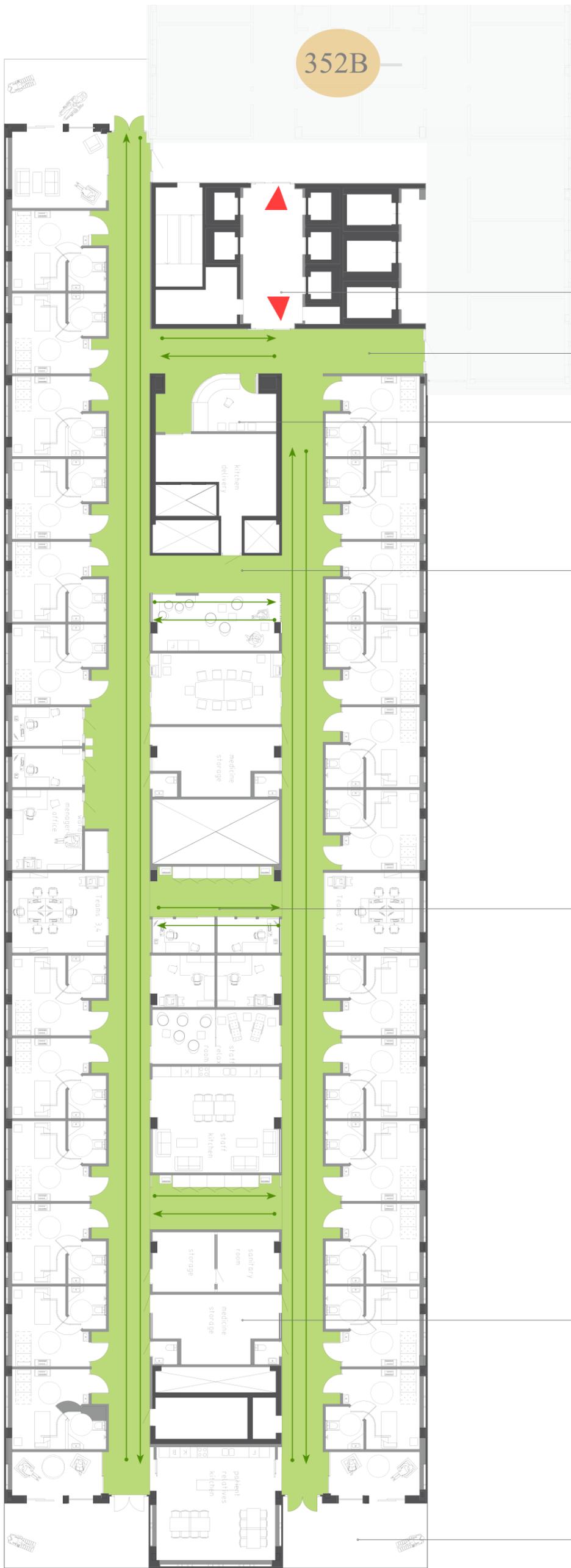
Unifying the space creates the necessity for new central connections allowing possibilities for shortening walking distance, freer movement, and better visual transparency.

- *new wards entrance*

- *expanded borders of the ward*

- *added reception - improved wayfinding*

- *perforated central ward's core multiple public connections*

- *separation of movement flows of employees and patients*

- *decentralized medicine storage*

- *added outdoor areas movement direction stimuli for patients*

CK building 5th floor, ward 352A, Scale 1:250

4.3 Wards 352A, 352B single patient's room model

single patient's room structural elements
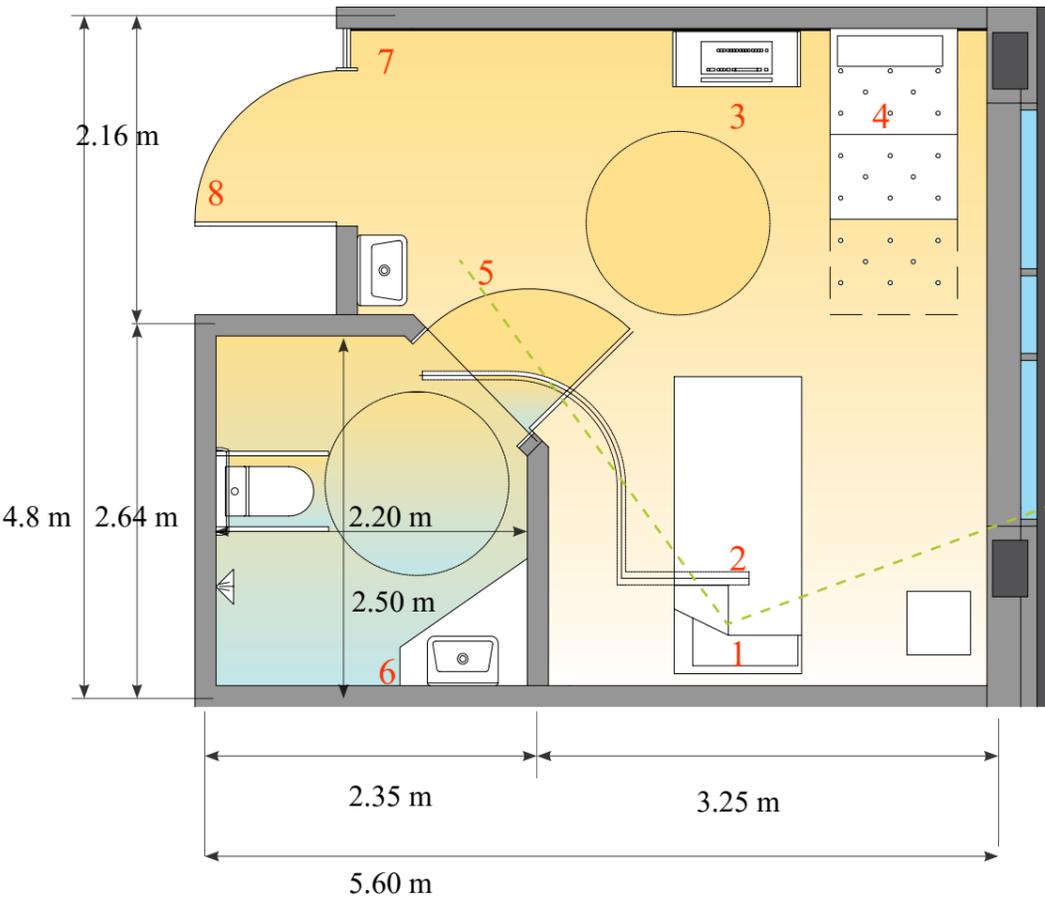
Numerous were the combinations of room spaces explored. Main attention was paid to: privacy, lowered stress environment, minimized spread of bacteria, minimized risk of fall related injuries, physical transparency of the space through visual connections, improved work space possibilities inside the patient room, views to the outside, possibility for visitors to engage in the care process supporting the need for them to sleep over. Various space arrangements were explored, starting with a Locum proposal of minimum ward room space of 21 m^2 . However considering factors such as the desire of placing a fold-in sofa for relatives, and including a PC in the room allowing the employees to work close to the patient resulted in presented to the left single patient room proposal- 23 m^2. Main points considered:

1. single bed- EBD, PCC supported

2. ceiling lift- EBD supported

3. PC for the employees - PCC supported

4. fold in bed- sofa for visitors - PCC supported

5. position of the bed giving possibility of the patient to see movement in the corridor, as well as to look outside the room windows; good visual transparency - PCC supported

6. private bathroom - minimizes bacteria, supports privacy, acknowledge patients dignity- PCC, EBD supported

7. the patients' room door is designed with an area of frosted glass allowing for visual transparency - PCC supported

8. the design of the room entry allows for unobstructed corridor movement even when one wants his/her door to stay open - PCC supported

Patient room

- accent wall
- light source # 1
- visual outline of bathroom area by color
- wall angle cut for visual abilities
- keeping time - design element
- physical transparency of space by material used
- message board - schedule updated daily
- nurses sink adjacent to the patient's bathroom
- nurses' decentralized work station
- patient bed
- relatives fold in sofa -bed
- electrical units
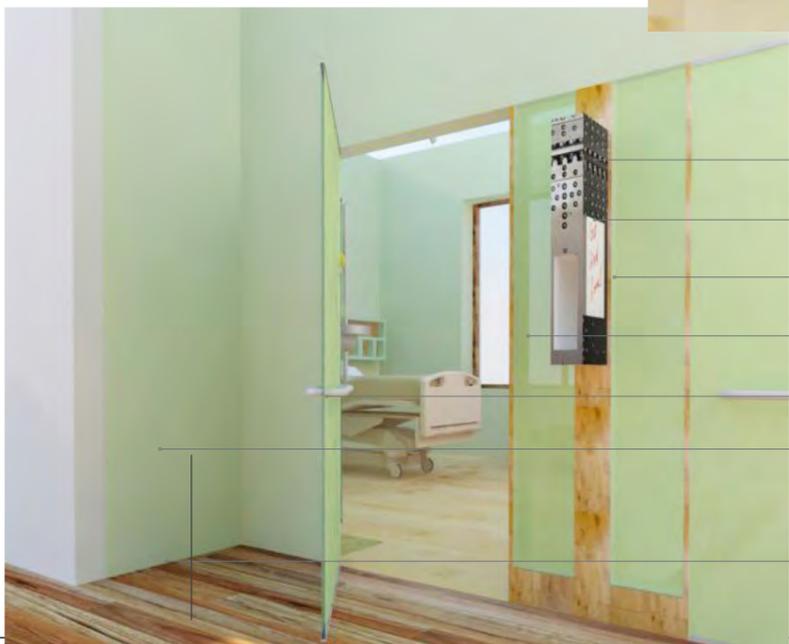
Patient room

- storage- organization units
- board for personal wishes
- visual patients rooms borders separation by use of material
- semi tinted glass- supports physical transparency
- tinted door glass, guards the privacy of the room
- visual separation between public area-corridor and the private patients' rooms in colors on the wall and difference in floor material
- doors niche saving corridor space, possibility for the patient door to stay open without creating movement obstacles
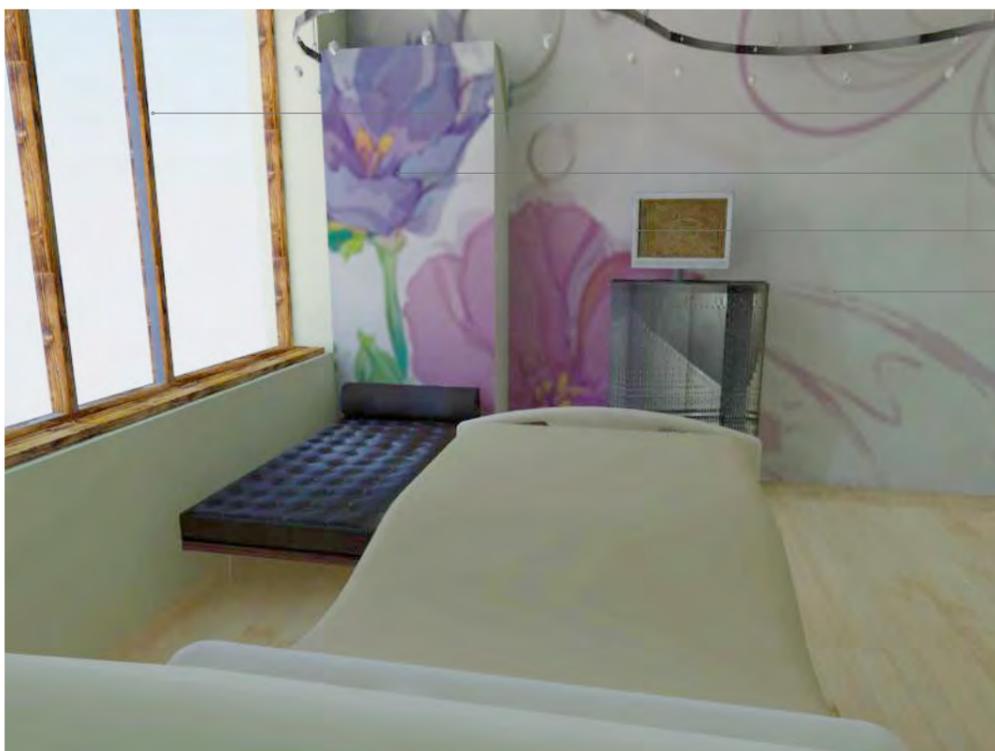
Patient room

- daylight, fresh air source, outside view
- personal storage
- electrical units
- adjustable bed with room environment control
- low windows base allowing for better view
- visual border separation of floor space outlining the position of the bed

Patient room

- *lights source #1*
- *bathroom entrance - tinted glass for security*
- *connection to the corridor*

Patient room

- *daylight, fresh air source, outside view*
- *wall build in bed for patients, visitors*
- *decentralized work place*
- *visual pleasing environment*

4.4 Wards 352A, 352B rooms' models

Consideration of future proofing the hospital ward, while accounting for its economical and social suitabilities, were the base for selecting a space model (set of two single rooms in this case) and multiply replicating it through the ward floor. Small adjustments considering the altered functions (flexible offices, teams' rooms, GM office) were implemented. Shown below is a list of rooms which are the main structure of the presented floor plan.
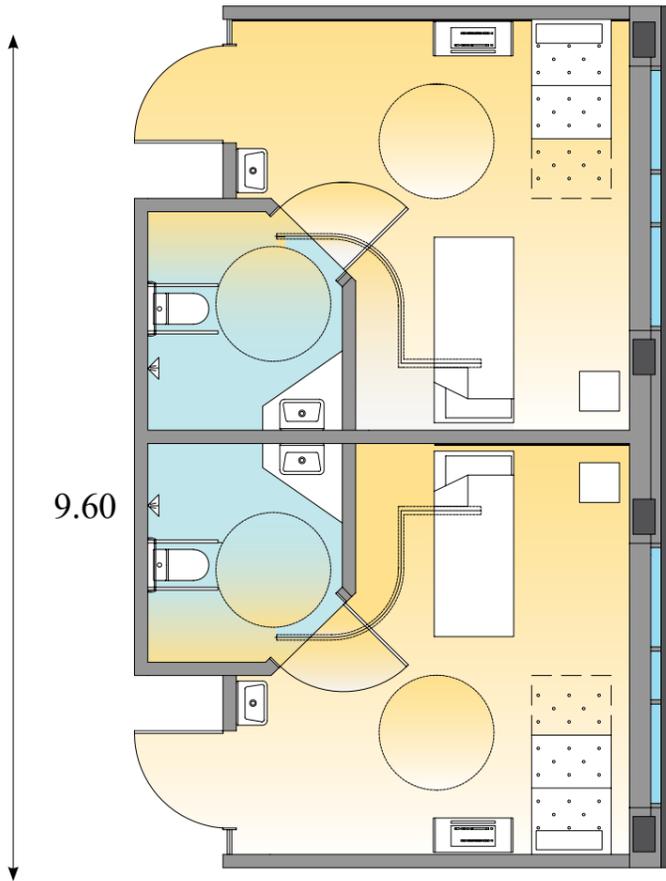
2 adjacent single patients' rooms- 23 m² each
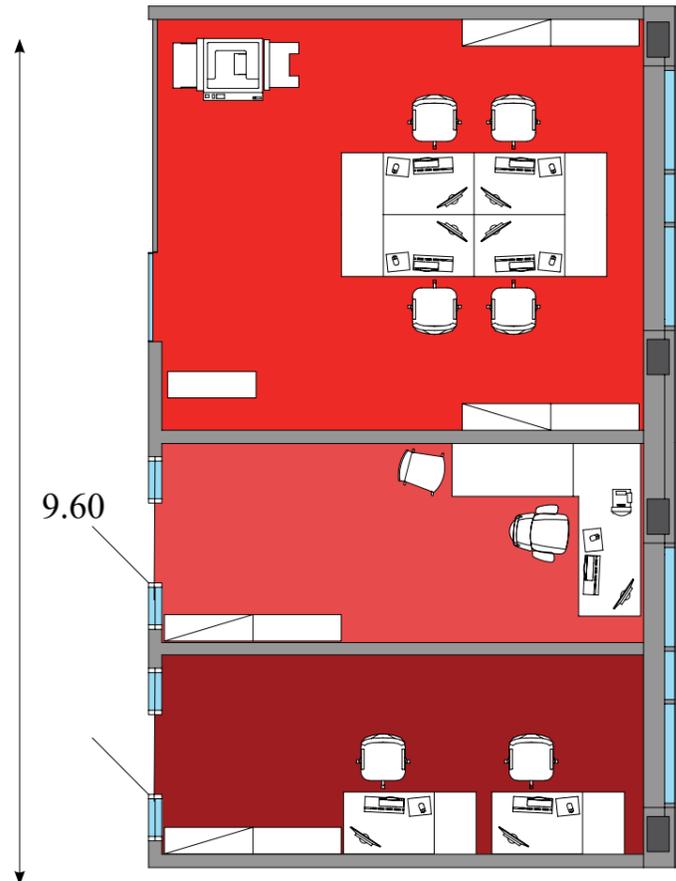
team station # 2-25.5 m², flexible offices -24.4 m²
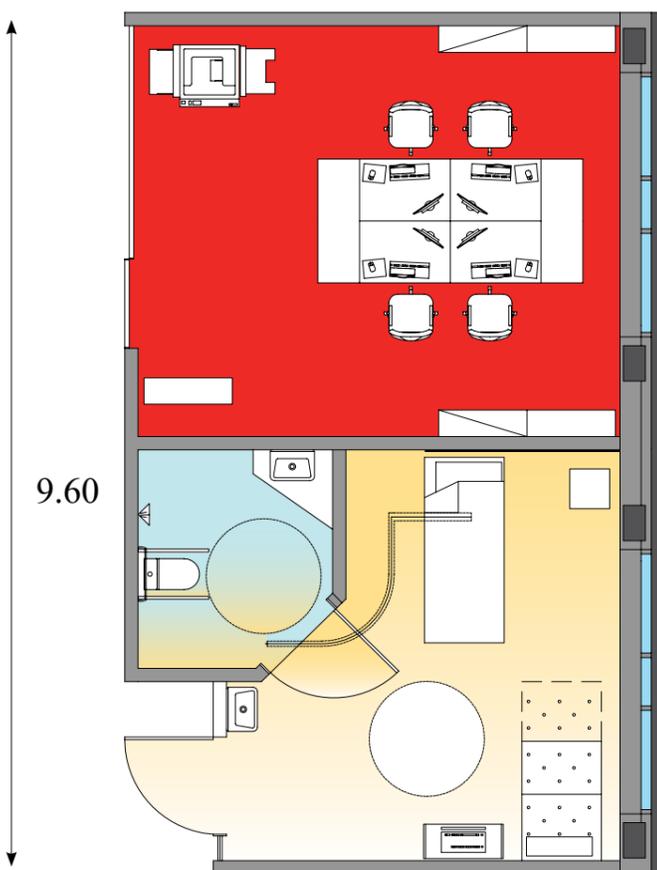
team station #1-25. 5 m², patients' room-23 m²
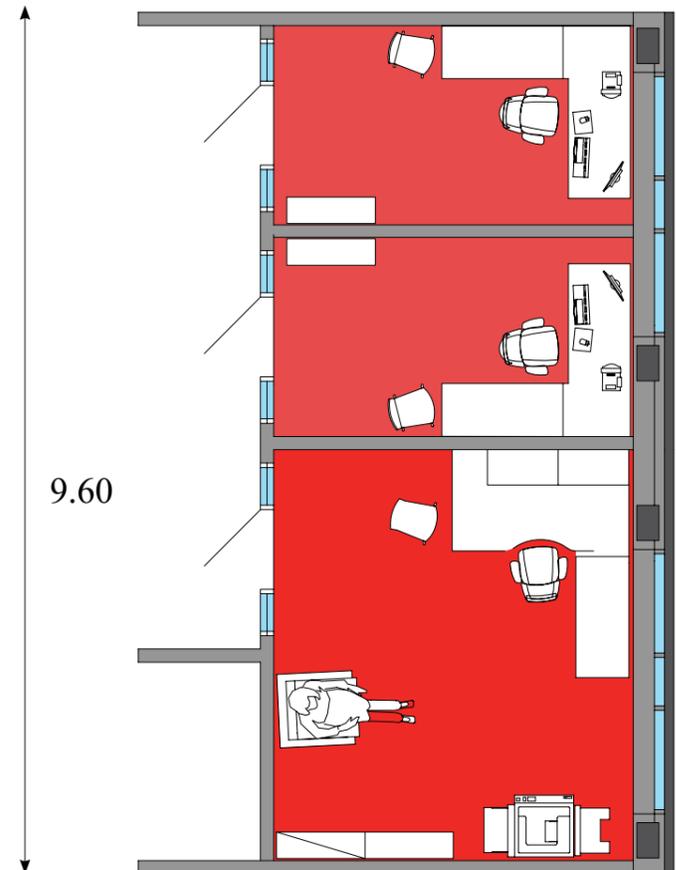
GM office- 18.9/ flexible work places- 9 m²

4.5 Wards 352A patients' spaces

Four sets of six patient rooms create the main grid of the patients' floor space. De-centralized semiprivate and public area along with a semipublic space completes the patients' space plan configuration.

- • *new outdoor public space*

- • *new semiprivate space*

352B

- • *new central public space*

- • *private spaces*

- • *new semiprivate space*

- • *new semipublic space*

- • *new outdoor public space*

CK building 5th floor, ward 352A, Scale 1:250

- *medicine storage #2*

- *patient's room*

- *patients' common area*

- *patients' kitchen*
- *balcony*

**Balcony area/
patients' relax room**

- *public balcony entrance*

  patterned glass for visual border separation

- *private balcony entrance*
- *automatic sliding door*

  tinted glass for privacy

- *lower window - seating area*
- *visual border separation b/n
  patients' rom and corridor*

  implementing material

**Balcony area/
patients' relax room**

- *wall flower pots*
- *automatic sliding door*
- *tinted glass*
- *recycled concrete slabs*
- *water repellent slip*

  resistant floor material

4.6 Wards 352A employees' spaces

352B

The importance of employees to create a valuable team connections are based on the ability to communicate, create plans together, engage in discussions and support each other in a daily work tasks. Architectural solutions selected to securing such social activities were:

- team stations- places where nurses and physicians could meat and work as a team, discuss patients, set goals, etc.
- flexible offices to be used by secretaries, physicians, or nurses when in a need of privacy
- conference room- inside the ward- allows the employee to have meetings without disturbing the patients piece of mind, as well without overlapping physical spaces as it is in the current situation
- reception area minimizing the work load for the nurses and securing improved wayfinding and overall communications
- close space plan position of all major work places

- *new public space*

- *inside the ward semipublic space*

- *new private work space*

- *new TEAM spaces*

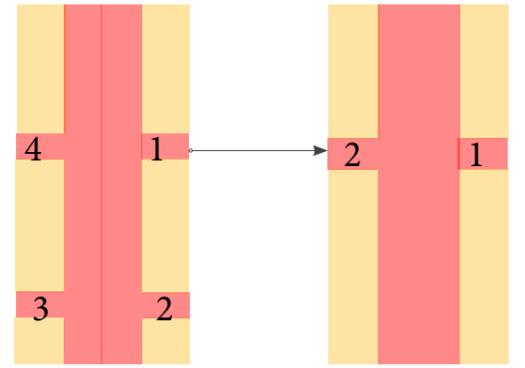- *new semiprivate rest space*

- *decentralized medicine storage*

- *new public space*

CK building 5th floor, ward 352A, Scale 1:250

Traditional hospital design of a ward with a 24 patient beds will have typical four nurses' stations spread through the floor pace. I have chosen to move away from such stations design solution and took a decision of decentralizing the nurses' stations spaces. Team stations are used as a central units for the nurses' work, however they are not to be considered central for the work flow. The need of the nurses to work close to the patient is supported by single PC stations installed in every patient room from where one can conveniently update records, change medicine order access health plan schedules. Along with that 6 additional small work stations are positioned in cross paths in the corridor. Such can be used for instance by swiping a key authorization card and will allow the employee to maximize their time and avoid constant return to the central team station.

- reception area

- decentralized nurses work station

- decentralized nurses' work station
- conference room

- flexible office space

- flexible office space

- GM office

- decentralized nurses' work station

- nurses', physicians' offices
- flexible office spaces

- flexible office spaces

- employees' relaxation room

- employees' kitchen area
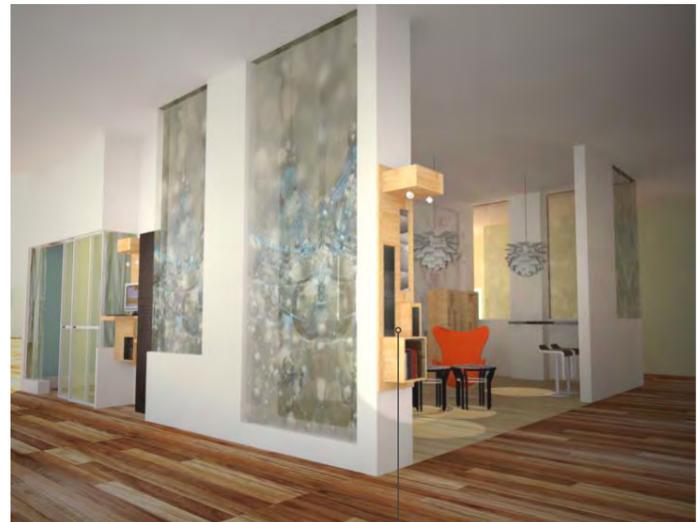
- decentralized nurses' work station

Reception area

- semi enclosed space
- tinted glass area for privacy
- sound reducing panels
- visual distraction elements
- visual space separation by color and light

Public area

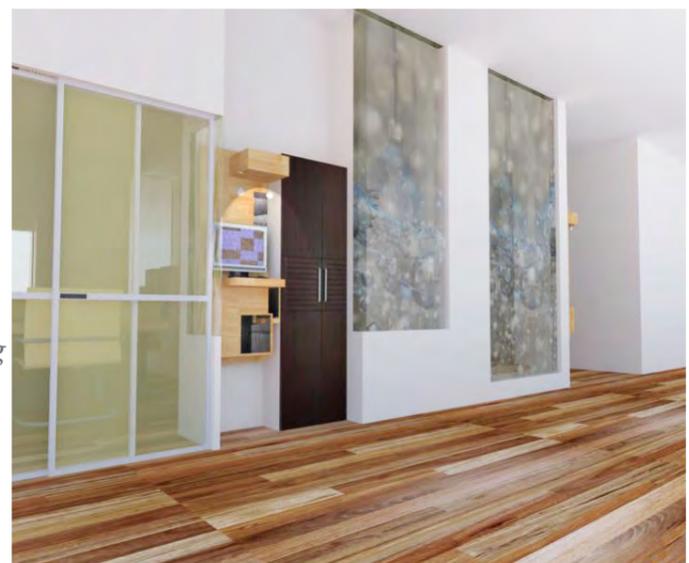- comfortable pleasing environment

- interactive elements-book shelve
- transparency of the place by use of materials

Decentralized nurses workplace & storage

- storage cabinets minimizes walking
- PC station allowing for convenient easier work

".....the prevailing attitudes, beliefs and social roles on the ward, reinforced by the physical design of the care environment may pose barriers to the patients by inhibiting them from using their own resources and by limiting them in their normal daily activities. ......Previous studies in the Scandinavian Countries have pointed out the importance of environments that promote activity, are aesthetic .....and facilitate social interaction with others. Such attributes form a crucial part in a person's perception of independence, identity, and feelings of security and being acknowledged."[21]

Edvardsson, Sandman & Rasmussen,2005

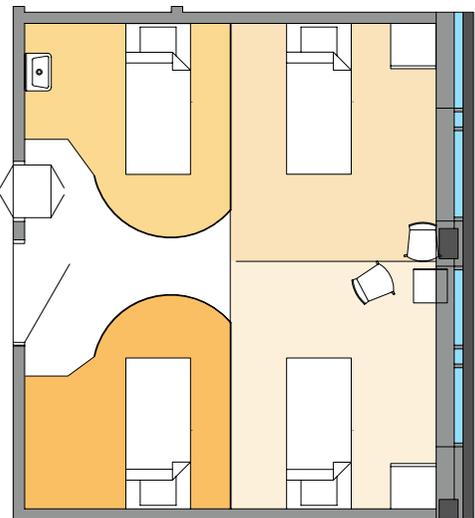Design proposal over all summary

patients' rooms

2 bed room 20 m ^{2}
- 10 m ^{2} patient space
- no bathroom
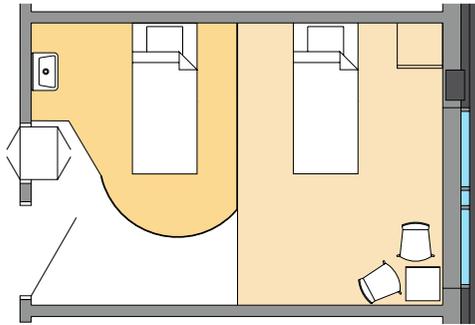
1 bed room 20 m ^{2}
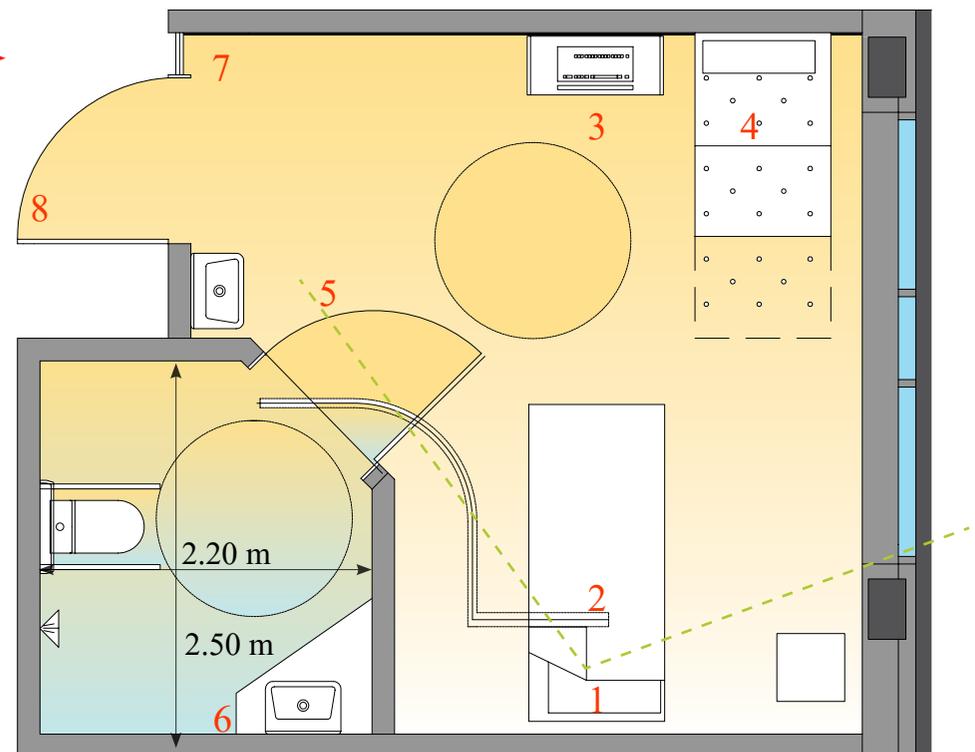- 17 m ^{2} patient space
- 2.5 m ^{2} bathroom
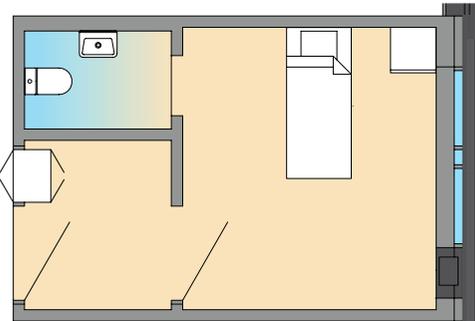
4 bed room 35 m ^{2}
- 8 m ^{2} patient space
- no bathroom

single patient room proposal- 23 m2

1. single bed- EBD, PCC supported

2. ceiling lift- EBD supported

3. PC for the employees - PCC supported

4. fold in bed- sofa for visitors - PCC supported

5. position of the bed giving possibility of the patient to see movement in the corridor, as well as to look outside the room windows; good visual transparency - PCC supported

6. private bathroom - minimizes bacteria, supports privacy, acknowledge patients dignity- PCC, EBD supported

7. the patients' room door is designed with an area of frosted glass allowing for visual transparency - PCC supported

8. the design of the room entry allows for unobstructed corridor movement even when one wants his/her door to stay open - PCC supported

2.20 m

2.50 m

Wards 352A, 352B

The proposed redesign results in transformation from four initial internal medicine wards holding 80 patients together, to two interconnected wards, holding 46 patients. The proposed changes does not means reduction of the employees, but rather reconsideration of personnel and reformulation of their duties. The proposal aims to improve the healing environment and to strengthens the overall outcomes of hospital stays, thus resulting in shorter hospitalization periods, minimizing the return rate and improving work practices. Such results are not only financially beneficial for the hospital but socially sustainable as well.

- 5th floor m^2
  - 352A- 632 m^2
  - 352B-632 m^2
  - 353A -632 m^2
  - 353B -632 m^2

- 325A/ 325B
  - 40 patients
  - 4 single bed rooms   20m^2
  - 6 double bed rooms   20m^2
  - 6 rooms of four beds 35m^2
  - 4 nurses' stations- 20m^2
  - 2 GM offices
  - average days of stay 5-7 days

353A   353B   352B

352B   352A

CK building 5th floor
current space Scale 1:500

352A

CK building 5th floor
proposed space Scale 1:500

- 5th floor m^2
  - 352A- 1800 m^2
  - 352B -1470 m^2

- 325A/ 325B
  - 46 patients
  - 44 single bed rooms   23 m2
  - 44 private bathrooms
  - 4 nurses' stations- 20m^2
  - 2 GM offices
  - 10 flexible office spaces
  - average days of stay ?3-4 days

Chapter I: "Hospital architecture as an active medicine- integrating architecture as a vital healing element in patient treatments"

Chapter II: " Architecture as a vital healing element in patient treatments – design proposal"

Chapter III: " Linking together research users and architects–learning process "

is what you can consider the appendix, of the master thesis. There are two initial intentions behind the creation of it. First to keep track of my thoughts, experience and daily progress in order to reach the set goals posed in the original MT proposal. The second one is very individualistically oriented, and it holds the essence of understanding myself as a professional. In its context it is a summary of the information gathering methods, evaluations, personal understandings and findings on the presented matter. It includes study visits, interviews,nurses's following, behavior mapping and questionnaires. It is constructed in five main parts, four of which are designated to specific method of research:

- *the first one is visitation including full review of the institutions, and places visited in relation to the subject of research - healthcare, healing environment, architecture*

- *the second one is interviews which have been conducted through different time through the whole MT and have been summarized briefly in book one*

- *part three reflects over the results of the distributed questionnaires to both employee and patients. Their summary has been presented graphically in this part of the MT and has a short narrative overview in book one*

- *in the fourth part of the book a reflection of free explorative observations, combining various sources of research and study is given*

- *conclusions based on the learning processes are presented in the last part*

1. FIELD STUDIES− EXPLORING HOSPITAL ENVIRONMENT

This particular chapter of the MT will present a short overview and summary of the finding of the field studies including multiple hospital and related institution visits, interviews and conducted questionnaires. Outlined will be the ones which are relevant to the presented theoretical part as well as related and influential over the design decisions.

As soon as the goals for the MT were set, a discussion of possible related study visits with the supervisor and the contact personnel from the PCC project took place. The selecting process for desired places was based on factors such as:

- similarity to the physical environment; facilities that have already undergone changes following either both or at least some of EBD principles and PCC philosophy
- hospitals or related institutions which have introduced the idea of PCC practices
- hospitals which have faced the challenges of new demands and the need to grow and advance technologically at the same time as they realized a social change needs to be introduced
- hospitals or care related places which have considered the involvement of the employees in the pre-design study phase

Each visit was organized with a pre-study of information provided, and a person contact was established. Short overview of the project was made and questions capturing the specifics of the place were prepared. The intention was to be able to understand possible differences in the environment as seen through the eyes of the employes, their routines, their communication and get their opinion on positives changes and areas for improvement.

All of the study visits were structured in a similar way: 1. short overview of the project been considered- Östra Hospital - ward 325 A, 325 B; 2. related to the subject discussion on the matter of changes undergone by the visiting facility; 3. a tour of the place of interest. In some of them the guide role was played by an employee who has been involved in the design pre-phase, or by an involved in the design process administrative personnel. Areas of focus included patient 's or resident's rooms (size, location, relation to each other, amenities); employee places (their connections and position to each other as well as to the patient rooms); public spaces-common areas; outdoor planned spaces (balconies, gardens, parks).

Presented below is the list of study visits, followed by a short summary of the finding. Outlined will be the ones which are relevant to the discussed theoretical part as well as related to and influential over the design decisions.

- Smart Textile- Borås, Sweden
- Östra Hospital - ward 325 A, Gothenburg, Sweden
- Vegahuse-Seniour house in Gothenburg, Sweden T-Hospital, Borås, Sweden
- T-Hospital, Borås, Sweden
- Sahlgrenska Universitetssjukhuset, Strokeenheten, avdelning 134/135, Gothenburg, Sweden
- Karolinska Universitetsjukhuset, Huddinge, Stockholm, Sweden
- ICU - Universitair Medisch Centrum Utrecht, Netherlands

1.1 Study visits- Smart Textiles, Borås, Sweden

Today I had the chance to visit a small library of Smart Textiles. Strategically set in one of the Sweden's developing textile centers, the library holds samples of products developed with the vision of designing and distributing specialized next generation's high technology textile products . Hospital industry has long dealt with the limited market materials able to pass the necessary high use wear and tear as well as be sterile proved, and easy to clean. Considering constant development in the industry field it was very exciting to see some of the samples exposed there. Numerous of the ideas presented are just that, an Idea. However for a designer with a vision all of them open for use in an innovative way. Underneath are some of the objects I find interesting and useful:

The fabric, whose color changes according to changes of temperature. The heat makes it fade away, which could be very easily factor in determining room temperature in a hospital ward

Wall paper sample which changed when the sun heated it up. It means that the environment of the ward could change depending on the sun and light coming through the windows

Slippery resisting coating which can be applied to almost any other type of material. Vital for preventing slip related injuries in hospital environment

1.2   Östra Hospital- Ward 352 A, Gothenburg, Sweden initial visit

The initial visit to ward 352 A was planned as an introductory phase towards becoming familiar with the physical structure of the space. Outcome of the visit was the possibility to observe the character of the space and its design aesthetics correlated to specific behavior which was occurring within. The ward visited was designated for internal medicine patients with liver problems, CHF and eating disorders.

Presented below is a short overview of the findings. Outlined will be the ones which are relevant to the discussed theoretical part as well as related and influential over the design decisions.

Looking at the floor plan on the blue print, an idea become to form in my mind on how the place could look like. However it did not in any way prepare me for the reality. The human factor was the one missing in my calculation. For one to be able to understand I will start with size explanation. The corridor entering the ward was on the plan 2.4 m, normal regulation for hospital build more than 30 years ago. On paper it did look specious enough. In reality however you had the nurse personnel walking around, moving from room to room, preparing for new patient admissions, moving equipment, transporting medicine, preparing for night shift changes. Thus, the space which I originally viewed as wide enough, had became chaotic for me. But it did not seem that for the professional personnel. They all knew what is expected of them, they moved in somehow organized chaos routine which was hard for me to comprehend. If the space was perceived only designated for the employees then I would say it did suited them, however there were an old gentlemen passing through the corridor and it seemed like a lost speck of human shadow finding its way in the chaos of a hospital ward. This brought the question in my head: how does he feel in those minutes outside of his room. Did he feel comfortable, did he feel like he was encroaching the professional's

space, or was he just in a hurry to get back to his room to the bed which he perceived as the place where he belonged to, after seeking escape from it.

Over all there was mainly personnel moving in the corridor, one other patient was sitting in the end in front of a window wall looking at the grey cold day outside. What were his thoughts like, I wondered? Was he in pain, or did he look to escape his bed for a couple of minutes. Did he think of his sickness, or maybe he though of family and loved ones. On the table next to him there was a single glass of water, but no books or a newspaper, no music to listen too. The kitchen space that was next to the small sitting alcove however was bigger and brighter than I expected. It was also used as a passing point for the staff to cross over to the adjacent ward. The question arises: who is the space really for. Is it for the patients and their relatives, and if it was what could they do there?

The physicians' rooms were situated outside the ward. In a room locked with code no visual contact was provided. This presented a mixed impression. At one side the professionals needs a space where they concentrate and focus, on the other the patient is not able to establish visual contact with them, and that minimizes the transparency of the treatment process.

The patient room which we visited was small- 20m^2 and minimal space to fit two beds. The position of the sink is questionable as it is very close to and facing one of the beds. Spread of bacteria and invasion of privacy were my first thoughts. The separating curtain between beds does not provide sound separation except a visual one and it also limits visual access to the window for the second bed.

There is no possibility for patients to have a quiet place when they needed to share anything with relatives. The closet space was small and insufficient. The fluorescent light above the bed was hard to look at and its position was right above the beds' pillow. Personalization of the room seemed impossible in the current state. The windows were wide enough to provide a view and a daylight source, but the only one that opened was way too small to allow fresh air circulation in the room. Color palette was generic and in a way depressing.

The images presented are from a 2 bed hospital ward in the central clinic 5th floor

Basic bed separated by curtain
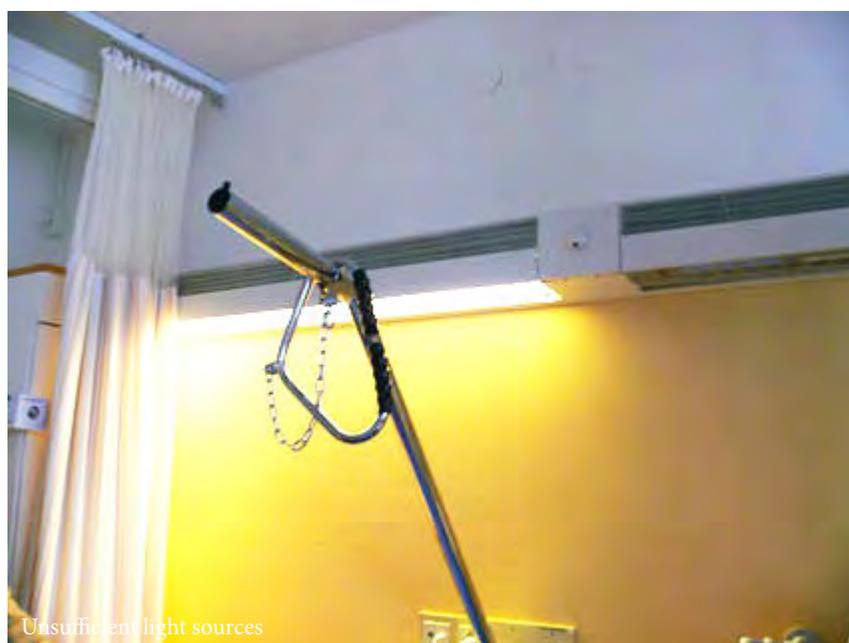
Unsufficient light sources

Besic bed , sink and storage

1.3 Vegahemmet, Vegagatan 55, Gothenburg, Sweden

The house is located right next to the nature science museum, at one side, and Slottssk-ogen on the other. It is tucked and feels protected from the noise of the streets, and at the same time is not isolated or locked in the surrounding land. The original home was housed in a building with a church in the courtyard; however, new building was created in the 70s. The inspirations for the new building model were taken from the architec-ture of hospital. It consists of three separate structures, joined together by the heart of the home-restaurant on the first floor. It is much rationalized special placement with a back garden and winter house. The home was later updated to reach its current state.

Presented below is a full overview of the findings. Outlined will be the ones which are relevant to the discussed theoretical part as well as related and influential over the design decisions.

Original structure

1970s reconstruction

Prior to the changes in the structure, the rooms of the residents were smaller, there was no private restrooms or shower attached to them, and in the central part of the corridor there was the sanitation area.
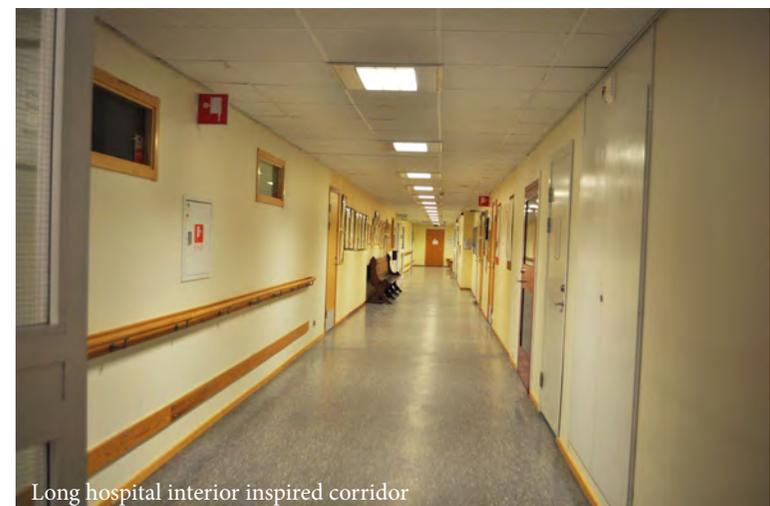
Long hospital interior inspired corridor

Today each floor holds 23 residents apartments. Included are spacious bathroom, and small kitchenette. There is the familiar hospital arrangement of double corridor with the rooms for common use. Cooperation between architects and the head staff of the facility had resulted in a very smart suitable application use. Rooms such as the spa, the TV quiet room, the position of the elevator and crossing vein like connection between the two corridors gives the floor an airy, spacious feel. Such architectural adjustments were directed from desire of the staff to stimulate the residents, to communicate, to experience variety of possible day activities. This brings the list of additional amenities included in the home:

There is the lovely designed home like library, where one can sit and enjoy a cup of tea while browsing through books or magazines. Day light streams through the wide windows, comfortable chairs and matching sofa in Queen Anne style are complimented by colorful pillows. Massive wooden table with what appear to be very old crafted chandelier complete the ensemble. Certain pieces of the furniture have belonged to the old church.

The heart of the three buildings is the restaurant strategically positioned in a way which you can pass through and find yourself in the opposite building. The environment reminds very much an outdoor terrace like eatery, thanks to its wooden tables and seats. The sun plays with the stained-glass brought from the church, and the wide glass wall overlooks the back garden. We understand that in spring and summer this is a busy place- favorite for the residents, since they can get involved with gardening and help the two landscapers who recreate the place in to a symphony of color and aromas. The restaurant is open to the public and that gives opportunity for the residents to connect with various interesting people. Small hairstyle salon and a massage therapist are conveniently located in the entry area.

Library

Restaurant

The home promotes independency, and the residents are free to involve in any activities offered. Each day there is a calendar with the possibility of classes or physical activities, as well as they are completely unrestricted in organizing their own days- walking in the park, visiting relatives, shopping in the streets of Gothenburg. The philosophy behind the whole care is to create an environment in which the residents will feel as independent as they will be living on their own, however with the knowledge that if they need help the staff is there to provide one. For that reason all the employees are either nurse aids or staff nurses. Essential for making the statement of human oriented architecture are elements such as: Each resident is allowed to design their apartment in a way comfortable for them. Their names are on the front door similar to a complex apartment arrangement. There is no night curfew, and adjustments have been made for relatives to be able to come and go freely as well as to stay in the apartments- sofa-beds, or additional beds can be placed if necessary. Wide windows allow the residents contact with the outside world, as well as floor terraces, which they can use if unable to walk outside. Common kitchens on each floor are provided in a way to stimulate the residents to communicate, and get involved in preparing food. One negative aspect which was inherited with the building was the presence of long corridors which staff and residents have to cross every day.

On the matter of care, each employee is educated and trained to work with patient centered care practices. Understanding and being aware of the problems which each one of the residents has in their health is part of the job, however the focus is placed in finding for the residents to live their life as comfortable and satisfactory as they can. Each resident is assigned a staff member which they can approach and address with any problems, concerns and questions. Thus continuity and a personal relationship are created.

◗ Summary Vegahemmet

Summarizing the experience: Being able to visit a home facility whose purpose initially is very similar to hospital goals of caring for all, strengthens the realization of the huge impact which small architectural interventions along with personal staff approach can create for the one who needs care.

Spa Room

Part of the Kitchen Floor area

(1.4) Tehuset, Borås, Sweden

Why was a new building needed:

- Medical developments
- Need for increased flexibility
- Technical limitations in the present main building
- New organizational solutions which demand new designs

Tehuset during construction

Hospital goals:

- First class and safe care
- Accessibility
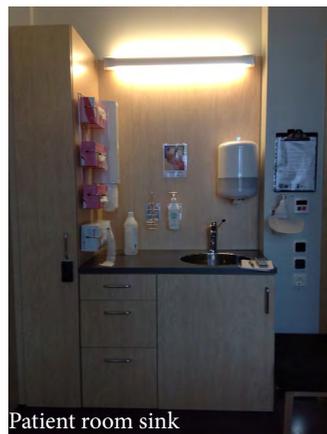- Participation
- Integrity
- Continuity

Practices Implemented

- Consider the patient´s perspective
- Professionalism through Communication
- Holistic approach

The planning for the building started in 2001, the project was completed in 2010. Total area 20000 sq. m., cost for the building only was 460 million SeK. As a construction it follows the principles of base and tower hospital building. The architects have chosen to blend the new with the old building by selection of similar row windows façade, and matched existing height of floors.

A single ward is separated in three individual modules connected in the center by a common kitchen and communication area. Each of the modules has its own team which works together, thus continuity in patient care is ensured. The team sets goals that they look at and improve. 7 rooms, six of them with single bed (24 m^2), and one with two beds are the main structure for each separate nod. Since the building opened in 2010 it has been shown that the single bedrooms quality provided for a better sleep outcome and reduction of drugs used for the hospitalized one. Each of the rooms is equipped with patient lift, room environment control, and an adjacent bathroom. This has improved patient privacy, as well as lowered slips and falls. Adjustable quite comfortable chair is provided in each room allowing a visitor to stay over if desired. Bright wide windows with lowered bottom application allowed for day light and visual contact. Sound reducing floor and ceiling material application minimized the noise transmission. What I personally though could be improved was:

The sink in the room was facing the bed, and no matter that its deep design bow minimized the splash of water still such a position is a precedent for bacteria spread. The room felt small and since there was no visual connection to the corridor where main movement activities occur a visual contact with the employees was lost. The windows though big and bright, do not open, except one. Its position directs the air straight in

to the patient bed, which is alarming especially with compromised immune system. The chair provided as much comfortable to sit and semi lay in, is the only option for someone who chooses to stay a couple nights over. The lights control was placed in different locations, some further from the bed. All of the equipment and exposure of cables dose not create pleasing visual scene and at the same time presents challenges when it needs to be sterilized and cleaned.

Wayfinding plays a very important role through the whole building design starting with the entrance where the floor is clearly marked with three easy to follow lines leading to different directions. Vertical color consistency was a visual orientation provided in the ward design. Art elements which were visually easy to memorize and quite unique, gave the possibility to recognize a space once you have passed it by. Difference in floor materials marked areas which needed to be distinguished from the rest

Patient room sink

Patient bed

Tehuset museam entrance

The red rose- wayfinding element

The rest of the floor plan of the ward was quite well developed. Decentralization of storages as one located at the front and the other one at the back of each module minimized the walking distance for the staff. Separate units, which are part of the logistics, supplying materials were introduced as a new work practice. They reduce the load of work for the nurses and allow them to focus on their patients. Privacy of patient was considered in the design of the staff meeting room in which the projecting board was not visible for the one walking in the corridor. Names for the patient rooms however were not provided.

of the space. Windows at the end of the corridors were excellent escape of the dead end space. Positive distractive spaces and elements such as: the lounge area outside of each ward, the books- magazine shelf, the quiet room where patient can escape out of their bed, TV in each room, and a quite spacious dining gathering room with a wide window wall full of light.

Tehuset lounge floor area

The use of materials was done in a way to bring nature from outside in, and to create warmth and visual interaction. Wood in floors application, wall panels, ceiling beams, combined with soft colors creates a safe escape from the white hospital stereotype. Airy entry areas, visual transparency provided by the use of high ceilings, glass walls, and vertical and horizontal visual connection possibilities give more of a feeling of entering anything else but a hospital (city museum, a hotel entry, a wide double story mall, etc.).

Outside garden for patients as well as for the rehabilitation practices, library and hospital museum are some of the spaces which do add an extra unexpected feeling of relaxation, interest, and reduce stress factors.
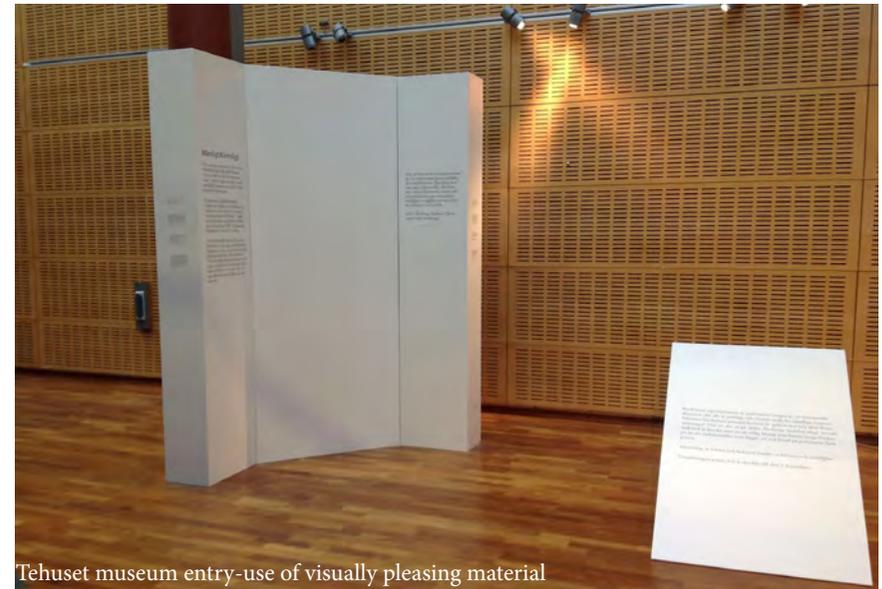
Tehuset museum entry-use of visually pleasing material

Tehuset corridor-day light
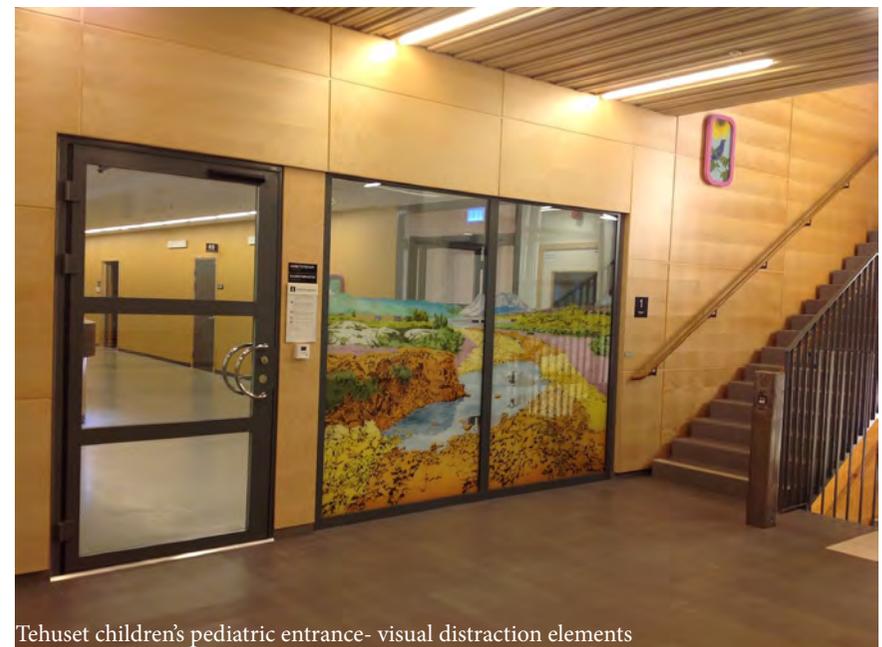
Tehuset children's pediatric entrance- visual distraction elements

(1.5) Sahlgrenska Universitetssjukhuset, Gothenburg, Sweden

The planning and design of the new Sahlgrenska wing started in 2001 and the relocation was completed in 2009. The wards visited were avdelning 134/135 and the ones treated there are stroke patient. Each of the wards is divided into four modules (three for patients and one for employees), joined together by the reception and the common patient areas.

Presented below is a full overview of the findings.Outlined will be the ones which are relevant to the discussed theoretical part as well as related and influential over the design decisions.

The architecture and design of the floors have followed certain EBD principles and some of the PCC vital philosophical aspects. When the building was planned decision were taken that there should be variety of room size which resulted in the floor plans consisting of 8 single rooms, 3 double and 3 with 3 beds. Total number of patient to be cared for is 23.

All of the patients' rooms are located to the outside core of the building providing for a wide windows and daylight. Each room has private bathroom, which is evaluated from the employees as one of the biggest positive changes, as compared to the previous ward design. In additional to that a common bathroom equipped with bed shower is placed in the central part of the ward. Ceiling lifts are present in each room, which lowered the possibilities for injuries to all users. Higher ceiling in the patient rooms compensates for the width of the space. Brighter color palate of the ceiling tiles and higher windows position resulted in feeling of space airiness. In the case relatives wish to stay overnight a bed can be put in each room to accommodate the need. The new design for the single rooms did not include a door which had a see through area to allow for visual transparency. Central location for the employee kitchen allowed for taking a break close to the work place without leaving the ward. That carried both positive and not so appreciated results. Rooms which hold two or three patients still use a small folding self-standing curtain, however it is short and positioned on the floor. This allows for better light distribution over the room area, but still does not provide desired privacy or noise regulation. One main problematic area which has been already mentioned, concerns the ability to control the environment of the room easily (all the switches were located next to the door).

In the center of the ward a common patient area is created. The idea behind it was to stimulate the treated ones to leave their room if they were able, to move and socialize. To see through glass surrounding allows for a visual contact with the employees passing in the corridor and thus ensures the patient's safety. It provides semi public space where if needed one can meet with their relatives or just come out to sit and watch television. Double lines of daylight fixtures in the corridors provide for a better lighted space, minimizes the possibilities for injuries. In the new floor design the long double corridors were replaced with square organized ones, which limited the visual connection between employees and patient. The absence of employee communicative system often results in the employees searching for each other. Sliding doors for all of the employees' work places provided for a better utilized space in connection to the corridors and resulted in less noise.

Each team consists of nurse and assistant nurse. Their organization depends on the number of patient to care for. All the teams are connected to a certain physician and that created the need for all the offices to be closely located, if not directly joined. The ability to organize all of the administration and employee work places around a central outdoor courtyard presented an ideal solution for providing a day light to each single room. One essential element which is highly missing is the central nurse station which could have the privacy of the walls (in one of the wards a semi enclosed area was provided by adjusting a clear glass surrounding to the centrally positioned nurse station). Reception area positioned close to the entrance turned to be a positive addition for all users of the space. The absence of soundproof solution that would allow the receptionist to work efficiently without being disturbed or to disturb the rest of the users has been pointed as one of the results of the open design. Central location for the employee kitchen allowed for taking break close to the work place without leaving the ward. Understanding a vital principle when a design is planed is to consider the need of pleasing aesthetics and comfortable areas not only for the one being treated but also for the ones who provide the care. The employees had a possibility to have a balcony in their resting area which was pointed out to be of a great importance, as the one can take a step out " get some fresh air" without the need to go to the outside of the building. The same was valid for the patient area which had a small balcony directly adjacent to

it. Implementing the idea of decentralizing the work a new logistics organization was introduced. Part of it was adding a service team which took over certain responsibilities such as: stacking, organizing storages, food delivery,….etc.

◯ Summary Sahlgrenska Universitetsjukhuset

To summarize the experience I should say that the new floor plans for both wards represented quite obvious difference not only in management and administrative view but in work ethics - team cooperation and higher consideration of patient needs. All of the above had received an architectural-design reflection throughout the space based on which I could conclude that these particular wards have made a significant step in the direction of improved healing environment.

Medication room

Employee kitchen area

Border markings in corridor space

Patient kitchen area
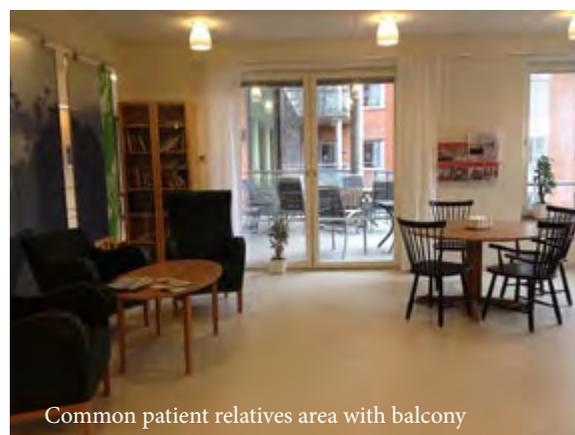
Common patient relatives area with balcony

Semi-enclosed reception desk

1.6 Karolinska Universitetsjukhuset, Huddinge, Stockholm, Sweden

Introduction: the hospital wards were planned, designed and build in total of two years, finished in 2010. The one we visited was for internal medicine, kidney problems patients.

Presented below is a full overview of the findings. Outlined will be the ones which are relevant to the discussed theoretical part as well as related and influential over the design decisions.

When the idea for the new wards emerged, the team project leader took a radical for the time approach and had nurses and physicians involved in the pre design research phase. Understanding of hospital as place which needs to provide balance between the needs of the employees and the need of the patient is the main principle under which the two new wards function today.

The needs for a practice built on the understanding of teams work is supported by design solutions such as: office expeditions, small flexible offices, nurse stations, interconnected to allow collaboration. Since each space could be used by multiple employees depending on shifts such an organizations is quite suitable. Similar to Sahlgrenska hospital, here new units of the logistic services take care for supplying and restocking materials used. Taking such a step needed planing and consideration of finances, however it allows the nurses to engage in a better care of the patient relieved from side duties responsibilities.

The hospital wards were planned, designed and built in total of two years. The one visited consists of 22 rooms with 24 patient. Two of the entry points rooms were initially planned for a day care centers, however then they were converted to a two bedroom rooms which now are considered to be too small in sq. m. The significance of the single rooms (26.1 m^2) was pointed out to be an optimal solution for both employees and patients. Based on their experience such a solution is able to secure dignity and safety, provide openness and possibility to share space and knowledge. Single rooms have allowed the employees' work stress to be reduced, as well as improved patient's sleep abilities, reduced drug use, allowed stronger family involvement, reduced patients' anxiety, improved their privacy and reduced average hospitalization stay.

Each room has a ceiling lift which has significantly minimized injuries in both workers and patients. There is a bathroom in each room and it has been stressed to be crucial for hygiene, minimizing infection spread, allowing for better patient privacy, comfort and dignity. All of the rooms present, are same-handed design except two of them at the end of the corridors. Their ceiling lifts extend in the restrooms, and as such they are planned for shower bed use. To meet accommodation needs of the relatives a build in wall bed which can be folded is included in the design of each room. Additionally an lounge chair for visitors or the patient itself has been included in the furniture of each room. Small wheels attached on the bottom of the legs allow the chair to be rolled around the hospital floor. Thus it can become a means of transportation, replacing the wheelchair. In such a way the patient's feeling of helplessness is minimized. The ability for the patient to control the room and its environment is presented in the form of a small side movable table where essential switches could be found. Along with it a small PC provides positive distraction such as news , magazines, electronic newspapers.

Patient room–26.1 m²

Relatives wall build in bed

Patient/ relatives lounge chair

Patient bed

Side bed table

Patient bathroom

Wide windows

New work culture has been introduced with the construction of the previous ward in 2007 and it is implemented in the visited ward as well. The main core is the understanding of the importance of each and single employee as part of a team work structure. Teams consist of nurse, help nurse, doctor-physician, and students. Decentralized approach of work - three teams in each sides, creates the need for flexible design and sufficient sq. m. work places. The managers' office is positioned outside the wards, close to flexible office rooms which can be used by all the present employees. Offices for employees in the ward are planned in the central core, however there is a possibility to have day shafts to bring light in to the space allowed such design. Small rooms for students, inside the ward are equipped with desk computers. They are flexible to be used by any one who needs them. A conference room is planned on each floor directly adjacent to the entrance, opposite to the manager office. Meeting rooms are available in couple spaces, and they are flexible to be used either by employees or by physicians when they need to meet with patients or their relatives. Three restrooms for the staff are provided through the corridor. Kitchen areas for both employee and patients are in the centre of the ward, with the employees one next to a light shaft allowing generous daylight. Reception was considered essential element for all users' way finding abilities. The middle core of the ward is divided by a couple of passages allowing employees to connect faster by shortening their walking. A small resting room is placed in the middle core of the ward designated for the needs of employees (in cases they have to sleep for couple minutes, to distress, to meditate). The size could be significantly enlarged. The width of the corridors are 2.8 m. to allow for a better flow. Common patients room equipped with library like shelves provides an alternative for those who want to stay at a place more quiet than the common kitchen.

Consideration of daylight importance for all users of the space was outlined in the design with the implementation of two light shafts around which common areas were arranged and employee work places were organized. Minimizing stress factors such as noise, light and smell have been planned, by use of soundproof materials; dimming of the light in the corridors during night time; size, position and kind of rooms. The overall choice of materials followed the goal of creating high quality of design solution and escape the sterile environment of hospital, in compliance with sanitary regulation , consideration of noise absorbance and light properties. The design has opted for a maximum use of the space with storages provided all around the floor plan hidden behind sliding doors. Technology solution such as transportation system, part of the logistics, allows for an automatic delivery of blood samples which saves time for the employees allowing them to concentrate on the patient.

◉ Summary Karolinska Universitetsjukhuset

To summarize the experience I should say that the new floor plans for the wards showed considerable changes and improvements seen from management and administrative perspective, but also in work ethics by increasing team cooperation and paying mere attention to patient's needs. All of the above had received an architectural-design reflection throughout the space for which I could conclude that these particular wards have made a significant step in the direction of improved healing environment. The involvement of the employees in the architectural design posed challenges as well as brought valuable contribution. Implementing EBD principles along with clear understanding of PCC philosophy resulted in a well balanced design solution accommodating patients and professionals.
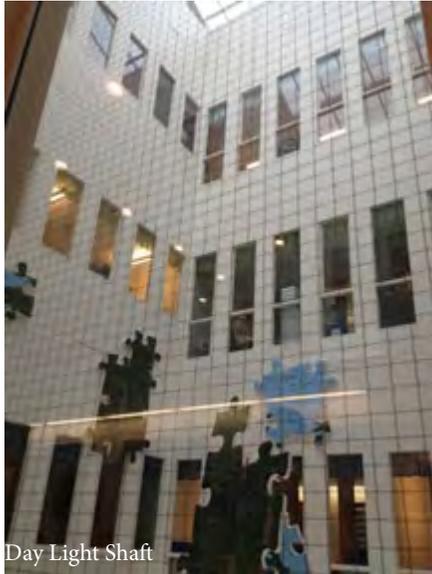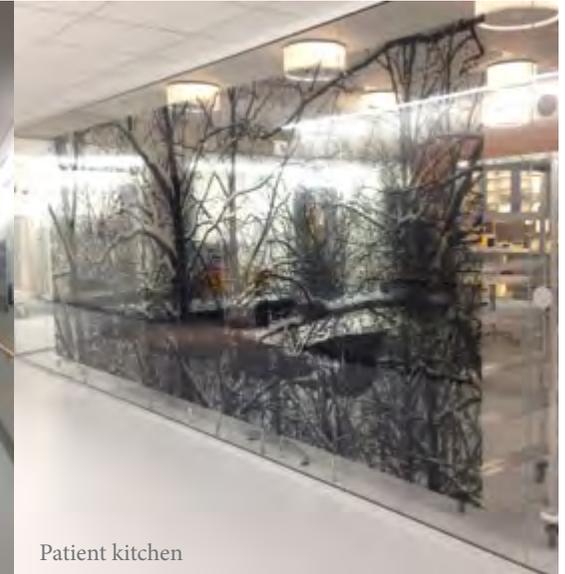
Day Light Shaft

Automated delivery system

Corridor space

Patient kitchen

Flexible office space

Patient small common area- read

Employee kitchen

1.7 ICU- Universitair Medisch Centrum, Utrecht, Netherlands

With fast changing social understanding of what healthcare should look like, the Utrecht medical center has adopted a practice of timely reevaluation of its building stocks in order to keep up to date with reflecting physical and social needs. As much as this is not uncommon for most of medical facilities, there are a couple innovative points in their approach: the idea to move the location of their facilities (for instance the new operational rooms have been built in different location other than the existing ones which allows for uninterrupted treatments, saves time, it is safer for both practitioners and visitors, and it is most likely to be finished on time rather than delayed); the consideration of what position should certain practices be related to the future city planning; strong consideration of social factors such as ones' feeling of safety, privacy, dignity, comfort, knowledge, accessibility etc., when planning the overall structure and it interconnections; willingness to involve all variety of users during the design process- patients, relatives, employees, architects and interior designers; each one has been given opportunity to contribute with their most valued professional knowledge. All that has undoubtedly contributed to the fact that the ICU unit in University Medical Center Utrecht, the Netherlands was awarded the 2011 ICU Design Citation Award Recipient.

Presented below is a full overview of the findings. Outlined will be the ones which are relevant to the discussed theoretical part as well as related and influential over the design decisions.

The building where the ICU is located is part of ……Utrecht. Original structure dated from the 1989s. Originally there were four different ICUs located in multiple places in the hospital, now all of them are merged into one, which was moved to the top of the existing building occupying the whole floor. The original challenges to overcome were: noise, insufficient space, no privacy, no accommodation for relatives, unpleasant work environment, not full safety. The ICU plan started in 2005 and the move was done in 2010. The budgets for all of them were combined and the new ICU is not specialized in only one treatment. Any patient that comes to the ICU will be given a bed. The set goals were:
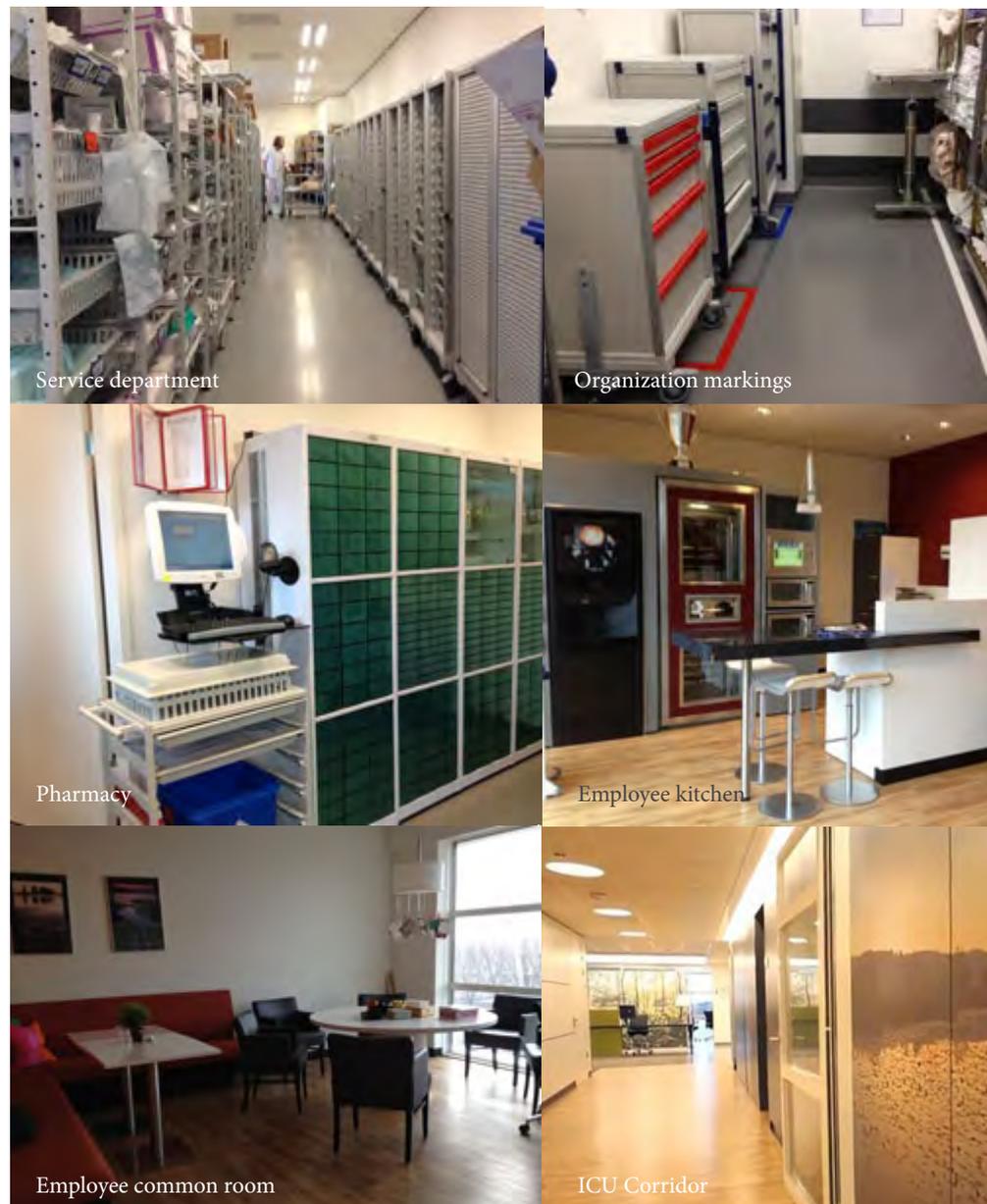
- Patient centered care
- Hospitality

and the principle implemented was a design collaboration between interior designers, architects, personnel, employees. The architectural solution and design details of the new unit are based on principles such as but not limited to: new work ethic, EBD, deep understanding of PCC with the focus on the patient, sensitive balance between technological innovation and social communication. Vital is the understanding of the building as a live city-like organism whose constant growth and inner social changes are always considered and reflected in its structure. Such practice allows the hospital to provide all of the necessary first class procedures in a safe, accessible, functionally flexible and socially valuable environment.

Old ICU

A new philosophy of work practices reflecting PCC desire for the nurse to work close with the patient was implemented through the understanding that each single care component is of high quality and the service provided is deeply rooted in the knowledge oriented on patients (for example: the nurse's and physician's responsibility is the patient not the restocking of supplies or the sanitizing of the bed). For such a reason a pharmaceutical department responsible for medication of each patient is located on the same floor, which minimizes medical mistakes, reduces the possibility of overdosing, provides an easy way for monitoring the supplies as well as having continuity of what has been prescribed to the same patient. Almost 90% of the medication is prepared by the pharmacy department and restocked twice a day, afterwards the employee from the logistic restocking department will be taking care of preparing the trays for the nurse, a good way to administer medications. In addition to that, a service department deals with stocking and restocking of medication for each particular patient for 24 hours. It takes only three minutes to change the medication in each room, and to provides logistics without disturbing the patient. Such service usually will require new budget, however new methodology and combining all the ICUs allowed to reshuffle the budget without additional finances.

Interior designer involvement was extremely valuable to make decisions on materials supporting goals such as visually pleasing environment; easy wayfinding; reduced stress by light sound and color; positive distractions; time accounting; variation in space and personalization abilities

Service department

Organization markings

Pharmacy

Employee kitchen

ICU Entrance

Employee common room

ICU Corridor

The ICU presented only single bed rooms however it was pointed that flexibility in the physical arrangement of the ward rooms in the hospital is extremely important. Main considerations were the recent study results showing that single bed rooms are optimal for certain cases, however depending on the situation treated rooms with 3 beds could be perceived as positive, especially for long term conditions such as cancer, tumor, oncology, etc. The reasons behind are most likely to be found in the feelings such as loneliness, sadness, anxieties, etc..

The ICU is a level three ICU, which is the highest level in Holland, which means that it should provide the highest quality design to support the "sound of silence". In order to reach such a level, design choices were made to have only single rooms for treated patients. High pressure sound minimizing doors along with sound absorbing materials were implemented. A new alarm system which was designed to be personally connected to the employee pager. It eliminated the sound which everyone could hear and directed the call or notification to the desired recipient.

Team work including all the nurses, help nurse and physicians as they are not assigned specific work desks. This allows all to use the spaces as needed and minimizes the need to build multiple single offices. However office space is provided outside of the treated area and it was decided that in order to save space and because the staff works in shifts three people could share one office space. Visible borders in the ICU are successfully implemented to support the understanding of all users to which space they are welcome. Each team member work with so called "buddy" in a closer understanding to support each other (if one is on a lunch all the calls and alarms will be redirected to the buddy pager), which minimizes the stress level and allows for better team building. All of the ICU rooms are located at one level, including administrative offices, relatives area, reception, pharmacy, logistics related to sterile cleaning, doctors-physi-

cians, nurses, patient rooms, and common gathering and eating facilities. There is an employee restaurant which is 20 min walking distance, and for that reason a small but well designed kitchen-restaurant is designed on the premises. The employee has their choice of food from the restaurant which is restocked daily, and there is an access to an outside garden. There are three main modes of the ICU floor which are identical to each other with minor design variation implemented to support wayfinding and positive distraction (wall paper, colors, light). Each module holds 12 individual ICU rooms from which 2 in the front are the infection- isolation rooms. Each room has windows and a view to the outside and some of them to the inner courtyard garden. Central reception areas provides information to all users of the space. Visitations are allowed 24-7, and after the reception hours one can enter using a secure punch code to buzz the nurse in the directed unit. To support the treated one and their visitors, relatives areas are provided adjacent to the central reception area, as they are separated in multiple places allowing for privacy, and retreat. There are six relatives rooms where if needed one could stay for a single or couple nights. The room is adjacent to single bathroom and has a view either at an inner courtyard, or towards the city center. Close by is another waiting area where visitors can wait in case that they cannot enter the patient room right away. Smaller room for relatives are included in close proximity to each ICU department entrance in case they need to just step out for a minute.

◉ Summary Utrecht ICU

Implementing EBD principles along with clear understanding of PCC philosophy resulted in a well balanced design solution accommodating patients and professionals without going over budget.

Reception

Relatives stay over bedroom

Relatives area

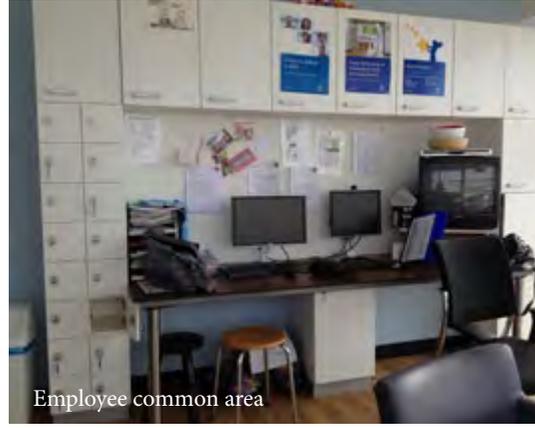Patient isolation room- high pressure doors
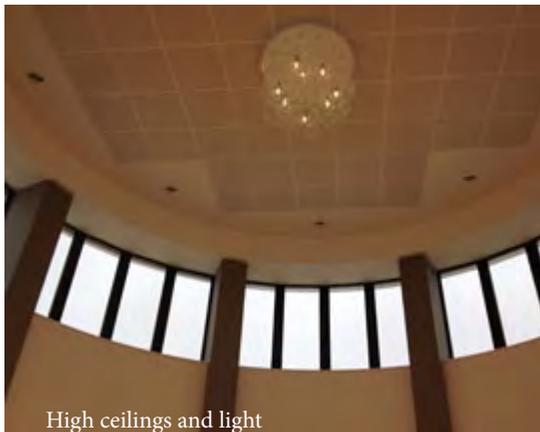

Office

ICU patient room

Employee Kitchen balcony

Employee common area

Central gardens

High ceilings and light

ICU Corridor visual border marks

Corridor storage

1.8   Östra Hospital employee observation follow/ behavioral mapping

Observations were performed twice in the same ward 352 A. An afternoon shift and a night one were evaluated. On the first one a registered nurse was followed closely through her work which allowed for an inside understanding of movement patterns, space relationships, central points in the ward with higher or lower significance, communication abilities and overall interactions. On the second one, a more free exploration and observation of the space was performed. Since most of the patients were sleeping, the corridor became the primary study area. Rooms' doors needed to be closed to prevent patients from being disturbed, and that allowed me to realize how important the visual transparency is in the ward environment. Both of the sessions recorded an observations on all the involved parties as a way of understanding team work, movement patterns in the space, social and professional communications, relations and dependency.

The main purpose for the behavior mapping was to follow one employee through the work shift (in this case the afternoon one). It is common for practicing architects to conduct initial interviews with their clients. It is the time when goals are set on the table for discussion, wrapped with financial budget bow limitations. After informative meetings architects could completely (if they want to) withdraw in the privacy of the office, surrounded by blue prints, literature on the matter, and create their own vision of what the building in question needs to be like to meet the original set of goals. Up to now, only two main players in the project have been presented: client and architect. Thus who represents the users (especially in cases when they are not one and the same as the client)?

Understanding the gap which such practices have created in the past, I wanted to give right to all participants and users to collaborate and bring their ideas to the design process table. Interviews with the employees and questionnaires for the hospitalized people gave me available information reflecting individual opinions. To get even more holistic view on the interactions between all the parties involved, I observed the interplay between all the users groups and employees during my following sessions. The interplay between following subgroups was focused on: employees versus employees, employees versus patients, patients versus other patients, employees verses relatives, and patients verses relatives. Putting myself in one of the users' shoes was a valuable way to gain insights in the through the professionals' eyes, to see the interaction with and within the architectural physical space. It was the only way to understand the space syntax dictated by the established work routines and physically limited by the present architecture state of the building.

Below follows some of my observations which I found are relevant in discussing the design of the wards.

- The common area, (which is in the middle of the ward), is not sufficient neither for patients nor for visitors. It is too small 20 m^2 for 20 patients, with very outdated furniture, insufficient light sources and without possibility for distinguishing the clear boundary between it and the corridor. A way of enclosing it might be by putting sliding doors. It could communicate more clearly for whom the design is for. The medical room was the only room where you could escape from the noise the smell and the stress. Entering there you could clearly evaluate the difference in light quality. Much higher than anywhere else in the whole floor. The ceiling was higher than the corridor one, and with brighter material. Sound pressure isolating doors provided for a quiet escape, and supported the needed proper medication storage temperature. What should be considered as a better way of planning in this particular room were the storage options. Ideally I think it would be if smaller storages were decentralized in both ends of the ward, or even better if they were strategically positioned directly in the patient rooms
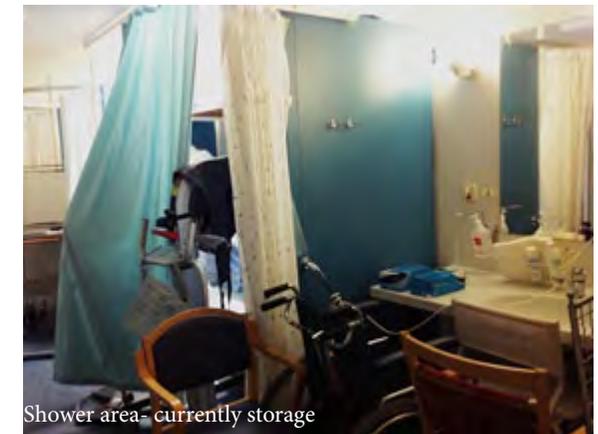
Nurse station

Nurse station

Separating beds in two beds room

Patient kitchen

Patient common room

Shower area- currently storage

Window

Corridor

Common table- end of corridor

- The fist central nurses station is located at the entry half of the dark middle core. Stepping in, your body can feel the heat difference. Originally designed as a pass way connecting the two wards, it was transformed into the nurses' station because of growing need of patient rooms. No day light could ever enter that room, and the space- 19.6 m^2 is insufficient to support a good work environment for up to 9 nurses at a time. When a nurse needed to access a journal, check out medications, write down new information she needed to be there if a phone call was needed, consultation with physician, notification from the laboratory, etc. All that made it difficult   to concentrate on the tasks and the room failed to deliver a comfortable work environment. Instead it did created numerous trips for the nurses between the patient room and the nurses' room. It increased the noise level in the area, and since there was no other staff room in the whole ward it naturally absorbed that function as well.

- While being there for around 8 hours I stopped a couple times in the kitchen, however it seemed that most of the patient preferred to eat in their rooms. Evaluating the space by its architectural qualities it definitely needs a renovation. It has not enough storage especially considering that it should serve for both of the wards which makes for up to 45 people. The furniture was outdated and worn out and the room had no aesthetically pleasing qualities except the wide windows overlook ing the outside. What the place missed to deliver was a person oriented relaxing atmosphere, and possibility for communicative activities. It felt as no one really belonged there. The staff needs it to arrange the distribution of food and drinks, the hospitalized persons however did not see it as a place that was specifically designated for them to use .

- What seemed to be more used by patients was the small two seated table positioned in the window end of the corridor, near the kitchen. This place was often taken by someone from the corner rooms and appreciated in both of the wards. The curious element here was that the small two seat table was by space adjacent to the kitchen. However somehow it was more appreciated, and preferred as it seems in both wards.

- The current set of the wards holds three rooms with four patients each (35 m^2),

three rooms with two patients (20 m^2) and two rooms with one (20 m^2 including private bathroom). Only the single rooms are equipped with attached sink and restroom, but there are no shower possibilities. All of the rooms have a window view to the outside, but it is only one of the patients in double rooms and two in the four bed rooms that could enjoy the view. Curtains are the main space separating methods and they are used all the time. However they only provide a cocoon like dark space around the bed and do not account for privacy, noise reduction, sleep habits, light and visual contact. The limited space around the beds and the space over all were impossible to work in a comfortable way for both employes and patients. When a nurse was working on one patient it felt like a constant encroachment of the other patient body space. Some patients need two nurses' help and there is simply not enough room. With so many people in the room, it is hard to adjust light, sound, smell and temperature to satisfy everyone. In case anyone wants to discuss a subject in privacy, opportunities were limited if any at all. The absence of a bathroom in each room increases the possibility for spread of bacteria, risks of falls and creates complicated maneuvering in the corridor.

- Showers and wash areas positioned in one side of the ward created unbelievable traffic in the corridor. Patients needed to be wheel-chaired most of the time, and those who were good enough to move by themselves needed to maneuver slowly between everyone else and sometimes wait standing in the corridor for their turn

- Lighting sources in the rooms need to be reconsidered, since they produced unpleasant noise, plus they were insufficient and positioned right above the patient's head.

- The position of the sink facing one of the beds in a very close distance creates a higher risk of bacteria spread possibility. Absence of visual contact when passing in the corridor created the need for the doors of the patients room to stay constantly open, and that resulted in two main things: higher noise stress; irritation for the one facing the door; disturbance of full sleep cycle and unrest.

- Noise and its constant presence was one of the factors which I found extremely irritable. It came from everywhere: movement of beds, patients calling for help, patients talking, the notification system telling the nurses that someone in certain

room needs help, the opening and closing the doors, ringing of phones, talk of staff, relatives asking questions, the TV in the patient common area, the opening and closing of the front entry door, distribution of food which created not only noise but brought a smell to the whole ward.

- Nurses were in constant movement patterns, as they had to split their time mainly between the medication room, attending patients, filling journals, preparing for new patients, answering phones, delivering food, making snacks, etc. The space syntax organization did not allowed for those to be performed quietly, and efficiently, the outcome was a long constant walking path. At the end of the shift I felt existed, dizzy and tired. The absence of fresh air made me sneak in the second nurses' station and put my face toward the small opening of the window. Feeling the breeze on my face I took a couple of deep breaths.

◉ Summary–employee observation

I realized that no matter how good in their profession the employees were, no matter how caring and attentive they were, their spatial practice became highly regulated by the existing architectural space configuration. Considering the short term of my observation and the absence of statistics on recovery processes I can only base my understanding of healing process based on personal experiences and the studies and theory of EBD and PCC. However I by no means could discuss the hierarchy, organizational configuration and the implemented work process and routines. All my observational conclusions were based on my understanding of space in a search of existing syntax and with the goal of delivering an improved healing environment design.

2. FIELD STUDIES– INTERVIEWS

This particular chapter of the MT will present a short overview and summary of the finding of the conducted interviews. Outlined will be information which is considered relevant to the presented theoretical part as well as related and influential over the design decisions.

During the research phase of the MT along with theory studies, a set of interviews were conducted. The choice of professionals involved needed to represent wider group range. Two researchers who are both registered nurses as well as are closely involved with PCC from the initial beginning phase and two registered currently practicing nurses (one of them employed in a different ward in the hospital). Unfortunately there was no possibility to interview any physicians or patients. The interviews were pre prestructured, however they allowed for freedom of exploring variety of correlated topics depending on the natural direction of the conversation. Presented below is the list of questions used, followed by a full summary of the finding (for a short version refer to book one, pg: 46-49). Outlined will be the ones which are relevant to the discussed theoretical part as well as those which were related and had an impact on the design decisions.

Position:

1. How long have you been employed in this particular ward?

2. Have you worked anywhere else?

3. Have you worked in another care development project before?

4. How long have you been involved with the process of PCC?

5. What is the essence of patient centered care for you? What are the key attributes of person centered care? Please highlight certain aspects

6. Can you describe any changes in your routine practice and since then? Do you see any improvement, if so, what it was?

7. Share an example of a positive experience practicing PCC? How can it be applied broadly?

8. What are the major obstacles and barriers which stand in the way of implementation of PCC principles?

9. Do you think that time pressure, and volume of work load influences your direct contact with patient?

10. How important for you is a visual contact with patient? (Absence of a window in the corridor areas overviewing the patient rooms)

Physicality

1. How the environment of the work place supports or hinders you in your work performance? What can lower your level of stress?

2. How the environment of the work place supports or prevails the process of collaboration on different levels: staff-staff, staff- patient; patient- relatives, staff- relatives

3. If you would like any changes, additions in the physicality of the work place, what would they be? In what way will they support your work efficiency? Office? Private resting room?

4. How would you describe the importance of the physical environment for the patients treated?

5. By your observation how does the physicality of the ward influence, stimulate or holds back the healing process of a patient?

6. Using five words, three of them adjectives, please describe patient room? (physical, social, or feeling)

7. If any, please define the difference in recovery outcome in patient between singleand double room?

8. When do you use the common kitchen area? For what kind of purpose?

9. From the physicality of the ward, please describe the importance of the corridor as your work space? What in it do you view as an obstruction?

Relatives

1. What is the family involvement like in the unit ward?

2. Is family involved different in the single opposed to double room?

3. Do you think visitors spend more time in the patient room, or the common areas?

4. What could be done to encourage relatives to be involved in the patient healing process?

2.1 　Interview # 1

The interview presented was conducted on the 31st of January 2013, and later over viewed on the 1st of February. It took place at the hospital premises with 2 current employees. One of them is practicing as process leader, educator and researcher in Person Centered Care, the second one, a registered nurse, is participating in the research of implementation of Person Centered Care. The interview is summarized in a narrative form.

⬤ On the matter of PCC and multi - social aspects

- PCC is a practice tool which is actively changing the culture of providing professional care, in institutionalized systems such as hospitals.

- PCC is a tool of moving the care practice forward, towards understanding the hospitalized person perception of their sickness, fears, emotion and willingness to recover. Three amain components in PCC needs to be considered in designing: 1. what does the patients' narrative holds and communicate; 2. the partnership between caregivers and the sick; 3. the process of documentation.

- it is hard to measure changes in the practice of the PCC , since it is very intuitive process, and changes in culture behaviour and staff practice are hard to measure. However they can be evaluated by the impact they have over the process and outcome of recovery.

- related to the change of working culture: the professionals are often in position when they have to adjust the way they talk to the people in need of help. Adapting a practice in which the sick becomes part of cooperating healing process reflects on the time which the employees need to spend in close communication with the one being treated.

⬤ On the matter of technological and structural aspects

- the physical environment does not supports possibilities to have a contact with the patient. One does not see them, and then he/she do not know what is happening behind closed doors. The patients themselves cannot accept sometimes that they are not physically able to perform certain tasks and they feel embarrassed to ask for help. The staff is in constant movement and most of the fall related injuries happens when a patient has not been seen when getting out of the bed or going to the shower-bathroom areas outside the long corridors.

- the ability for the staff to work close to those they are treating is vital for processes such as 1. visual connection; 2. accurate documentation; 3. interactive patient involvement in the creation of the care plan; 4. the ability for the employee to listen to the patient and understand them.

- the state of the physical environment needs to allow for better transparency and communication which creates feeling of safety.

- the staff needs a place where they can retrieve for a couple of minutes during their shift, to bring down the stress level, to close their eyes and relax, to be able to sit and shake off the body tension.

- the patient needs rooms where they can retreat and relax, other than their hospital room, as well as place to be active, play games, read book, watch TV, or just interact with others. Such activities will stimulate their mobility which is extremely important in many cases for their recovery and for social support.

- social interactions are considered as positive distraction through the healing process. The physical support promoting social interactions is completely missing today.

- certain spaces in the ward which are designated for staff or hospitalized ones have no clear borders and thus no one feels welcome to use them, since it is viewed as trespassing into an unknown zone.

- today the ward environment has no connections with nature other than through the view from the windows. The staff however does not have even that, since their workspace is located in the dark central core between both of the wards
- when the employees are satisfied with their work place and the environment is created in a way to support, stimulate and improve their performance they get the feeling of importance and appreciation of their hard work. That reflects in their attitude while at work, it is woven in their whole routine, it can be read in their body language when performing certain tasks
- the visitors feels as intruders mainly because of complete disregard of the room, eliminating the possibility for them to be an active part in the healing process
- there are no patient lifts in the rooms and that endangers both employees and the treated one from incidental injuries
- the current physical environment in the hospital does not support the idea of PCC

⬤ Summary interview # 1

To summarize the first interview I can say that: if Östra CK wants to be able to deliver high quality healthcare, an urgent implementation of changes related to both physical environment and work practice is needed. PCC methods do focus on the ability of the employee to develop a very intuitive psychological methods which will allow him/her to focus on the individual and thus develop personalized healing plans based on each person mentality, habits, life routine and expectations. However all that needs to be supported by technological updates, and architectural changes providing a new space syntax. Such will not come by themselves and do require a possibility for cooperative discussions and teamwork.

2.2 Interview # 2

The interview presented bellowwas conducted on the 8th of February 2013, and later over viewed on the 9th of February. The interviewed person is an educator and researcher in Person Centered Care, Registered Nurse, and overall highly experienced and versatile healthcare professional. The interview had the form of discussion where I felt at ease to ask and share my own impressions and thoughts on the matter of interest. The thoughts presented are summarized and selected by importance for the project.

◉ On the matter of PCC and multi - social aspects

- PCC is the perception that the three main links in the healthcare process- the physician, the nurse and the treated one should have the same level of possibility to express and influence the treatment plan
- working with PCC means that the employees need to implement a wide range of methods to understand the patients as a persons, which means the environment needs to support their ability to 1. listen; 2. concentrate; 3. communicate;
- PCC implemented in hospital environment has proven to be very cost effective. It significantly reduces the hospital stay and the hopes are that it will have a positive influence on patient's understanding of their sickness and thus reduce the rehospitalization rate as well
- it is important that the patients are given some way of being in charge of their treatment. The patients have the best and most valuable expertise of their own self, and know how much effort they can give to achieve the goals the healthcare professionals create for them. The one that is treated needs to feel valued, and to have the possibility to communicate with physicians and nurses
- both employees and patients are affected by procedures such as: addressing the patient by their room number (for privacy reasons), believing and relying entirely on technology and medication treating the biological body and depriving the person from their identity

◉ On the matter of technological and structural aspects

- the physical environment which one works in has a strong effect on their professional self reflection. Employees for instance have expressed that they feel more appreciated for the work they do when the surroundings are changed to support their needs
- the importance of transparency in both communicative processes and physical environment is vital for stress relief in hospital environment, creating feeling of safety, minimizing injuries, saving time and misunderstandings. Today this is hard to be created in the existing architectural settings
- one provision missing in many current hospital settings in Sweden is the ability for the patient to walk, move and perform tasks other than just being in their bed
- in numerous cases the mobility is completely absent from the daily routine of the treated
- the ward space often does not allow for important internal space connection which can ease work flow
- absence of convenient control of the surroundings in the patient's room and the work spaces
- time is of the essence and with numerous tasks there is a need for better space organization supporting teams work
- the current physical environment in the hospital does not support the idea of PCC

◉ Summary interview #2

Many professionals who work in the architecture field have neglected a very influential factor- the importance of the surrounding environment and the effect which it has over human health. Too much trust has been given in the hands of medication and technology, since we believe that intervention by both is the only care a sick person needs. However that is a very wrong approach, since the borders which technology can reach in the matter of healing are very limited when concerning one's psychological state of willingness to be healthy. The real essence of a successful hospital then lays in gaining the balance between both technological and social factors.

2.3 Interview # 3

The interview presented below was conducted on the 4th of March 2013, and later over viewed on the 5th of the same month. It took place at the hospital premises. The participant is a registered nurse who has been working with Person Centered Care approach from the beginning of the established employment. The thoughts presented are summarized and selected by importance for the project.

◉ On the matter of PCC and multi - social aspects

◉ On the matter of technological and structural aspects

- the initial interview and talk with patients is very valuable to get to know them as well for them to be able to meet the staff and know who they can address if they have questions. When that is done in rooms with 2-3 other patients the possibility to concentrate and the ability of the patient to feel secure and comfortable.
- singles rooms are great, however certain patient can become depressed or feel isolated, so they do usually benefit from other person in the room.
- visual communication and the possibility for a nurse to see her patients before they meet with the physician is extremely important. One need to check with them, see what state they are in, read if there were any changes in their healing process before one summarizes it for the physician. Employees can do that in the room in close communication with the patients but the technology allowing them to view updated journals and make sure changes from shifts are missing at the present time
- space in the rooms is not sufficiently planned. When morning routine visitations are in process a privacy is desirable. Patients feel quite small when there are numerous people standing surrounding their bed. A small chair to sit and be on the

same eye level could release stress for both sides involved. An efficient way would be to record the discussions at the same time that the visit is done. It will save time and be more accurate.

- a journal written for the patients called "team decision", which is written in an understandable language for them is given to each hospitalized person. It discusses why they are in the hospital, what is their current condition, what is the treatment plan, and when they are expected to check out. Such helps with communication, it allows the patient to fallow the goals of the treatment and thus release some necessary stress. However between the time the morning visitation has been done and the time the nurse types the journal from notes taken, could be a substantial time gap.
- one of the most stressful factors in the ward is noise. Sounds can be from patients who need help, patients that have relatives visiting and discussing matters, nurses talking, and phone ringing. It is quite challenging environment to be able to concentrate and perform well at the same time it has a negative impact on patients who lock possibilities to change anything in the environment that disturbs them
- at the moment one of the nurses station is positioned in the middle of the, so called dark core of the ward. The absence of light has definitely effected the biological clock of all working there, as well as resulted sometimes in tiredness and headaches. The absence of fresh air is another factor which should be addressed
- a place for the staff where they can relax, distress for a couple of minutes, but still have the opportunity to stay aware if a patient is in a need is highly needed
- on the matter of the patients' experience, some of the most stressful factors are the absence of privacy, no ability to rest properly due to noises, hard way for good

- night sleep, missing the possibility to have relatives, no place to walk other than the corridors, too small common area,

- light in the patient rooms should be improved. Possibly with dimmed lights in the rooms that have more than one person since the nurses have to come in and give medication to one and it will be ideal not to disturb the others in the room

- bathrooms for each room will be ideal in a way to prevent and minimize injuries, to provide privacy, to be more hygienic. Bathrooms are located down in the corridor and that presents a challenge for both employees and patients. For some patients it is hard to walk so far. Showers and bathrooms are at the same room and one needs to wait if any of them is occupied. With 20-22 patient such a missing basic accommodation presents numerous challenges for all

- the importance of mobility is vital in certain cases and if the showers and restrooms are further outside in the corridor it results usually in two things: much more used catheters (financial and social negative effect), the employees need to wheel out the patient to the restroom (limits the patient ability to move); (limits the nurses time as well)

- ceiling lifts are important in order to prevent numerous falls and injuries for both employees and patients

- it will be helpful to have a place for both employees and hospitalized ones to step outside of the building to a garden or a balcony for a couple of minutes to get some fresh air

◉ Summary interview #3

The ability of the employee today to work in a PCC manner in the conditions given is very much minimized and restricted by the environment of the space and the outdated technological solutions. Numerous are the cases where new innovations have been implemented in order to address matters such as: stress in the work environment and in the patient surroundings; recognition of the patient as an individual and its importance for the decision making process; decentralization of services and logistics in order to provide the nurses with more time to spend with the patient, and much more accurate and safe material flow; recognition of relatives as an active element in the healing process; etc. Knowing that, one should ask the question which one of the social, technological and economical demands and expectations will Östra Hospital consider when taking the steps in improving its healthcare services.

3. FIELD STUDIES– QUESTIONNAIRES

◉ Employee's questionnaires

Both of the wards have received the same employee's questionnaire, however they selected specific ways of distributions. In ward 352A the set was mailed to each and single employee following their preference of filling it in private at home environment. Opposite approach was taken in ward 352B where the manager distributed the set on a staff meeting, and they had a choice to fill them in whenever they feel comfortable.

 The questionnaires are structured in four main parts: employee personal data (which is optional and will not be shared for the reason that the research is done on the base of a MT and thus it is not granted Salgrenska authorization for personal ....); information related to PCC; multiple choice questions on the matter of physicality of various spaces; and an open questions part with the possibility to reflect on concerns such as relatives, employee interaction, possible wish list for changes, reflection on PCC practices, etc. The employees were given an option to rate their work experience dependent on number of beds per room, as well as to evaluate vital architectural and design elements related and actively effecting their work performance, communication and interaction with the patients. In order to clarify the finding of the questionnaires a summary of the answers provided in a narrative form is presented.

◉ Patient's questionnaires

 The questionnaire for the patient was developed first in English and then translated and revised in Swedish. The distribution was allowed by both of the managers on the wards, and they were the one responsible for it, as well as the return collection. In order to maintain the required personal data protection no such has been collected. The questionnaire was created in a way to allow interviewed to rate their own room, surrounding and experience in the hospital. Multiple choice questions as well as open ended ones were incorporated. In order to clarify the findings of the questionnaires a summary of the answers provided in a narrative form is presented.

⬤ Employee's questionnaires

PART 1 : BACKGROUND INFORMATION

Date : _____

Your age (circle one) :   under 30   30-39   40-49   50-59   60+

Position : _____

How long have you been employed in the ward :   mindre än 1år   1-3 år   4-10 år   mer än 11 år

PART 2 : INVOLVEMENT WITH PATIENT CENTERED CARE

How long have you been involved with the process of PCC?   _____

Have you worked in another care development project before?   _____

What is the essence of patient centered care?   _____

_____

Can you describe any changes in your routines since the implementation of person-centered care?

_____

Do you see any improvements with the new approach?   _____

_____

What are the major barriers which stand in the way of implementation of PCC principles?

Please rate the following   **agree**   **strongly agree**   **disagree**   **strongly disagree**
statements by marking in this way: ⬤————————◯————————◯————————◯
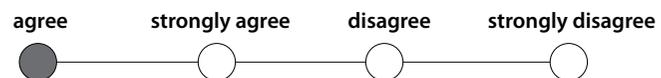
PART 3 : PHYSICAL ENVIRONMENT

3.1 THE DESIGN OF THE PATIENT ROOM :   SINGLE ROOM   DOUBLE ROOM

   supports private conversations   ◯—◯—◯—◯   ◯—◯—◯—◯

   support the patient's feeling of safety   ◯—◯—◯—◯   ◯—◯—◯—◯

increases patient satisfaction of care   ◯—◯—◯—◯   ◯—◯—◯—◯

facilitates patient personalization
adjustment   ◯—◯—◯—◯   ◯—◯—◯—◯

influences patient recovery   ◯—◯—◯—◯   ◯—◯—◯—◯

reduces patient isolation ○—○—○—○   ○—○—○—○

reduces patient stress level ○—○—○—○   ○—○—○—○

supports patient's chance for a good night's sleep ○—○—○—○   ○—○—○—○

allows for a good communication between you and patient ○—○—○—○   ○—○—○—○

reduces your stress level ○—○—○—○   ○—○—○—○

prevents work injuries ○—○—○—○   ○—○—○—○

prevent medical errors ○—○—○—○   ○—○—○—○

increases your work satisfaction ○—○—○—○   ○—○—○—○

allows for good professional collaboration ○—○—○—○   ○—○—○—○

increases the time you can spend with the patients ○—○—○—○   ○—○—○—○

reduces the risk of of infection ○—○—○—○   ○—○—○—○

provides a better environment for relatives ○—○—○—○   ○—○—○—○

has adequate day light source ○—○—○—○   ○—○—○—○

has sufficient lighting for various needs ○—○—○—○   ○—○—○—○

3.1 THE DESIGN OF THE PATIENT ROOM :   SINGLE ROOM   DOUBLE ROOM

allows visual contact with the patients ○—○—○—○   ○—○—○—○

has views of nature ○—○—○—○   ○—○—○—○

has access to physical contact with nature ○—○—○—○   ○—○—○—○

reduces stress caused by noise ○—○—○—○   ○—○—○—○

gives opportunities to control the environment (light, temperature, equipment) ○—○—○—○   ○—○—○—○

3.2 THE DESIGN OF THE WORK SPACE :

supports staff collaboration ○—○—○—○

makes it easy to move ○—○—○—○

supports staff's perception of time (day and night), place and person ○—○—○—○

offers views of nature ○—○—○—○

gives adequate daylight ○—○—○—○

reduces stress caused by noise ○—○—○—○

gives opportunities to control the environment (light, temperature, equipment) ○—○—○—○
Östra Hospital

3.3 THE DESIGN OF THE CORRIDOR :

makes it easy to move ○—○—○—○

gives adequate daylight ○—○—○—○

makes it easy to find in the ward ○—○—○—○

3.4 THE DESIGN OF THE KITCHEN :

supports relationship between patient and staff ○—○—○—○

supports relationship between patient and relatives ○—○—○—○

makes it easy to move ○—○—○—○

is attractive (feel, appearance, atmosphere) ○—○—○—○

gives adequate daylight ○—○—○—○

has views of nature ○—○—○—○

gives opportunities to control the environment (light, temperature, equipment) ○—○—○—○

How does the environment of the work place supports your work performance?

_____

_____

Does the physicality of the work place supports or prevails the process of collaboration on different levels:

staff - staff   _____

staff- patient   _____

patient- relatives   _____

staff- relatives   _____

If you would like any changes or additions in the physical space, what would they be? In what way will they support affect your work routine?

How would you describe the importance of the physical environment for the patient?

_____

How the physical design in the ward affects the patient's recovery?

_____

Describe the ward with five words (at least three of the words are adjectives).

_____

From the physicality of the ward, please describe the importance of the corridor as your work space? What in it do you view as an obstruction, and what function well as it is?

_____

_____

If any, please define the difference in recovery outcome in patient between single and double room?

_____

_____

How could the patient room stimulate the involvement of relatives?

_____

Other comments about the patient room environment

_____

_____

When do you use the common kitchen area?

● Patient's questionnaires

Bedöm följande uttalanden
genom märkning på detta sätt:

instämmer   **överens**   **oense**   **starkt emot**

DEL 1 : FYSISK MILJÖ

1.1 UTFORMNINGEN AV PATIENTRUMMET (MARKERA MED ETT KRYSS) :   ENKELRUM   DUBBELRUM

stödjer din integritet

stöder känslan av säkerhet

ger personlig frihet

stöder en god nattsömn

stimulerar din rörlighet

stöder patientens orientering av tid, plats
och människor

möjliggör en god kommunikation mellan
dig och personalen

ger en bättre miljö för de anhöriga

stödja privata samtal

ger tillräckligt med dagsljus

har tillräckligt med belysning för olika
behov

tillgodoser ditt behov av visuell kontakt med
personalen

tillgodoser ditt behov av visuell kontakt med
naturen

ger tillräckliga möjligheter att kontrolera
miljön (t.ex. belysning, temperatur, utrustning)

1.2 DESIGNEN AV KORRIDOREN :   ENKELRUM   DUBBELRUM

gör det lätt att röra sig

tillgodoser behovet av dagsljus

är attraktiv (känsla, utseende, atmosfär)

1.3 UTFORMNINGEN AV KÖKET :

stödjer förhållandet emellan dig och anställda

stödjer förhållandet mellan dig och dina anhöriga

gör det lätt att röra sig

är attraktiv (känsla, utseende, atmosfär)

tillgodoser behovet av dagsljus

erbjuder utsikt över naturen

ger tillräckliga möjligheter att kontrollera miljön
(t.ex. belysning, temperatur, utrustning)

DEL 2 : FRÅGOR

Vilken är din dagliga rutin när du är på avdelningen?

_____

_____

Vad får dig att må bra i din dagliga rutin på avdelningen?

_____

_____

Vad saknar du i ditt rum?

_____

_____

Har du behov av förändringar i ditt rum? i så fall vilka?

_____

Övriga kommentarer om din rumsmiljö.

_____

_____

Hur viktiga är besök från dina närstående för dig?

_____

Var brukar du och dina närstående träffas när du är inlagd på sjukhuset?

När använder du det gemensamma köket?

_____

questionnaires summary

SINGLE PATIENT ROOM

prevents work injuries - 76% yes 24% no (employees)

has views of nature - 57% yes 43% no (employees)

gives adequate daylight - 80% yes 20% no (employees)

supports staf collaboration - 71% yes 29% no (employees)

support patient's feeling of safety - 88% yes 12% no (employees)

has sufficient lighting for various needs - 99% yes 1% no (employees)

reduces the risk of of infection - 73% yes 27% no (employees)

increases patient satisfaction of care - 98% yes 2% no (employees)

prevent medical errors - 98% yes 2% no (employees)

allows for good professional collaboration - 25% yes 75% no (employees)

supports private conversations - 99% yes 1% no (employees)

allows for a good communication - 75% yes 25% no (employees)

increases your work satisfaction - 99% yes 1% no (employees)

increases the time you can spend with patients - 73% yes 27% no (employees)

facilitates patient personalization adjustment 100% yes 0% no (employees)

influences patient recovery - 98% yes 2% no (employees)

reduces stress caused by noise - 98% yes 2% no (employees)

supports Patient's good night sleep - 99% yes 1% no (employees)

provides better environment for relatives - 85 % yes 15% no (employees)

allows visual contact with the patients - 72% yes 28% no (employees)

reduces patient stress level - 98% yes 2% no (employees)

reduces your stress level - 75% yes 25% no (employees)

reduces patient isolation - 25% yes 75% no (employees)

Employees answers expressed in %

MULTI BED PATIENT ROOM

has views of nature- 65% yes 35% no (employees)
55% yes 45% no (patients)

gives adequate daylight- 50% yes 50% no (employees)
60% yes 40% no (patients)

supports staff collaborations   71% yes 29% no (employees)

support patient's feeling of safety - 80% yes 20% no (employees)
80% yes 20% no (patients)

has sufficient lighting for various needs- 60% yes 40% no (employees)
66% yes 34% no (patients)

reduces the risk of of infection - 25% yes 75% no (employees)

prevent medical errors - 50% yes 50% no (employees)

allows for good professional collaboration - 80% yes 20% no   (employees)

reduces stress caused by noise - 25% yes 75% no (employees)
18% yes 82% no (patients)

prevents work injuries - 48% yes 52% no (employees)

supports patient's good night sleep - 60% yes 40% no (employees)
30% yes 70% no (patients)

supports private conversations - 48% yes 52% no (employees)
33% yes 67% no (patients)

increases your work satisfaction -   allows for a good communication - 30% yes 70% no (employees)
66% yes 34% no (patients)

facilitates patient personalization adjustment   40% yes 60% no (employees)

effect patient recovery - 70% yes 30% no (employees)   increases the time you can spend with patients- 73% yes 27% no   (employees)
30% yes 70% no (employees)
36% yes 64% no (patients)

allows visual contact with the patients- 60% yes 40% no (employees)

reduces patient stress level - 15% yes 85% no (employees)

provides better environment for relatives - 25 % yes 75% no (employees)
30% yes 70% no (patients)

reduces your stress level - 60% yes 40% no (employees)

reduces patient isolation - 70% yes 30% no (employees)

Employees and patients
answers expressed in %
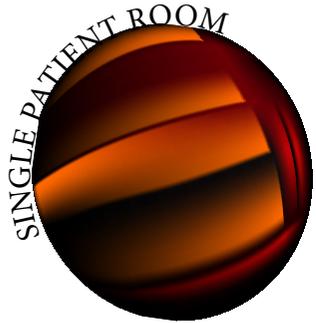
◉ Single patient room

- single rooms were pointed to work as an optimal solution by both employees and patient
- the concept is to provide full and uninterrupted individual experience, securing dignity, safety, trust, openness
- allowed the employee work stress to be reduced
- improved sleep abilities
- reduced drug use
- allows for family involvement

- reduced patient anxiety
- improved privacy
- each room has a ceiling lift which reduces injury related accidents
- each room has a bathroom included which is pointed to be crucial for hygiene, minimizing infection spread, allowing for better patient privacy, comfort and dignity
- enough space is usually presented to allow the possibility of lounge chair or bed for the relatives

◉ Multiple beds patient room

- insufficient sq m.
- no privet bathroom - higher risk of bacteria infection, higher risk of injuries, higher use of catheters, higher involvement of the employees to bring patient to the corridor common restrooms
- limited movement ability for patient
- challenging work environment - absence of technology
- absence of ceiling lifts presents higher risk for injuries
- insufficient daylight- prevented by use of the bed's separating curtains
- absence of comfortable room environment control
- very limited source of fresh air

- insufficient variation of lighting sources
- no ability for personalization of the room
- no privacy
- no ability for one to escape in a quieter space
- missing arrangement for relatives to sleep over
- uneasy sleeping environment
- stress factors presented: noise, light, movement, vision
- missing transparency connection between employees and patients

KITCHEN AREA

gives adequate daylight 99% yes 1% no (employees)
99% yes 1% no (patients)

is attractive (feel, appearance, atmosphere) - 34% yes 66% no (employees)
71% yes 29% no (patients)

easy control of the surrounding environment 34% yes 66% no (employees)
86% yes 14% no (patients)

supports relationship between patient and relatives 50% yes 50% no (employees)
43 % yes 67% no (patients)

supports relationship between patient and staff - 66% yes 34% no (employees)
71% yes 29% no (patients)

makes it easy to move - 40% yes 60% no (employees)
62% yes 38% no (patients)

has views of nature - 98% yes 2% no (employees)
100% yes 0% no (patients)

Employees and patients
answers expressed in %

● Kitchen Area:

As the only space in the ward at the moment where all users can meet, the kitchen, does not support certain main functions and effects as intended. Such as:

- does not supports flexibility in movement
- does not provide easy to control environment
- is not attractive
- does not provide the optimal support as a gathering place for patients and relatives

CORRIDOR AREA

is attractive - 30% yes 70% no (patients)

makes easy wayfinding in the ward - 88% yes 12% no (emploees)

gives adequate daylight 28% yes 72% no (employees)
66% yes 34% no (patients)

makes it easy to move - 61% yes 39% no (employees)
100% yes 0 % no (patients)
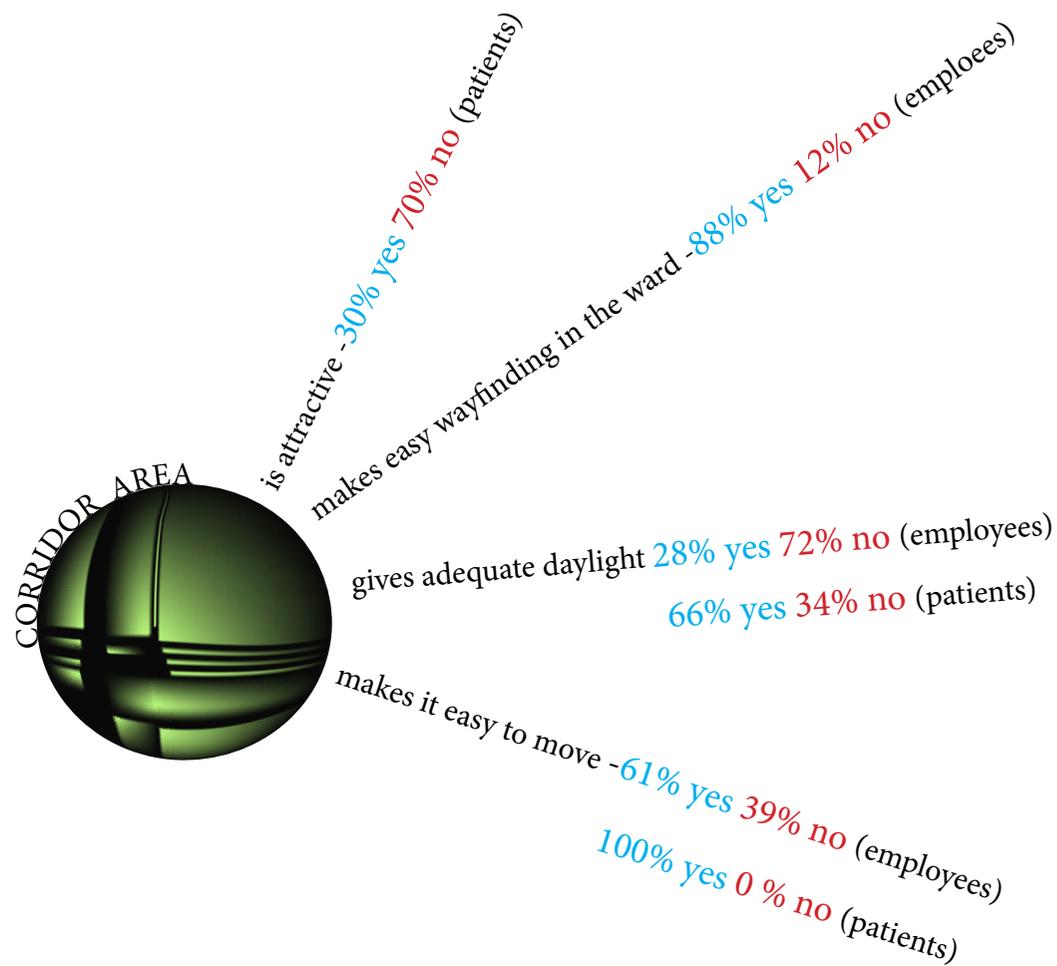
⬤ Corridor area:

The corridor is considered one of the main areas of interaction, mainly for the employees, and as it seems from the answers provided, numerous of the patients do not step out of their rooms. Main problem area of the properties for that particular place have been pointed to be

• the absence of daylight

• unpleasant aesthetic appearance

Employees and patients
answers expressed in %

WORK SPACE

supports staff collaboration - 71% yes 29% no (employees)

gives adequate daylight- 28% yes 72% no (employees)

easy control of the surrounding environment - 25% yes 75% no (employees)

supports staff's perception of time (day/ night), place and person 42% yes 68% no (employees)

reduces stress caused by noise - 33% yes 67% no (employees)

makes it easy to move - 33% yes 67% no (employees)

has views of nature- 28% yes 72% no (employees)

Employees answers expressed in %

◯ Work Space

To provide quality health a hospital space should support not only its patients but those who work there as well. Employees spend countless hours in the hospital and it is vital for their work performance as well as their health on a long run to consider the environment they work in. Subjected to numerous stress factors, side distractions, and specifics of the space syntax the employees need to adjust to their best abilities in order to be able to perform their work duties. According to the results of questionnaires the existing work space:

- lacks daylight
- does not provide stress- free surroundings
- it is hard to control, adjust
- it is missing view of nature
- has insufficient work space
- it's hard to move around - insufficient sq m.

4. FIELD STUDIES− GENERAL FINDINGS

This fifth part of the book focus on additional material which has influenced my understanding of healthcare as profession and as a services received.

"........In the caring literature of today, Rogers and Watson have been influential in focusing on the inter-relationship between humans and their environment. They both state that health and well-being can be improved by supportive surroundings as people are in constant interchange with the environment. The influence of environments of care also appears in studies about caring in general. Rasmussen showed that patients at a hospital found experiences of good nursing care inseparable from the overall hospital atmosphere. A consoling atmosphere supported experiences of wholeness. Moreover, general experiences of an atmosphere of being seen, welcomed, and connected to others facilitated well-being and hope among patients. For significant others, involvement in care of a loved one was supported by a welcoming and open environment........" [22]

"........Research has shown that a physical environment offering natural scenes and possibilities for interaction and social support, as well as providing a sense of control, can foster improved healthcare outcomes and greater wellbeing among patients .For example, postsurgical patients recovering in a room viewing nature tended to recover more quickly than patients in rooms viewing a brick wall. Likewise, familiar and home-like physical environments of care can ease psychological stress and positively affect healing and well-being of patients. Patients associate the presence of medical objects with feeling unwell and prefer objects associated with everyday life......." [23]

"However, healthcare research has, to some extent, overlooked the meaning of the environment in the care process. Lawton, an important contributor to our understanding of the inter-relationship between humans and their environments, has shown that behavior can be seen as a function of individual competence and environmental demands. An environment where demands and individual competence are in balance supports the individual to behave adequately. Conversely, when environmental demands exceed individual competence, it becomes more difficult to maintain an adequate behavior. These understandings have particular implications in care settings, where patients often experience diminished physical or mental competence due to their illnesses, increasing the environments' influence on behavior. Research has shown that a physical environment offering natural scenes and possibilities for interaction and social support, as well as providing a sense of control, can foster improved healthcare outcomes and greater wellbeing among patients. For example, postsurgical patients recovering in a room viewing nature tended to recover more quickly than patients in rooms viewing a brick wall. Likewise, familiar and home-like physical environments of care can ease psychological stress and positively affect healing and well-being of patients Patients associate the presence of medical objects with feeling unwell and prefer objects associated with everyday life. " [24]

22, 23, 24. Edvardsson MSc, Sandman, Rasmussen, 2005

4.1 Historical development of hospital wards through images

Hospitals in the past were quite often designed in a way to ease the professional staff work load, with less attention to the patient. Multiple patient rooms not allowing for private moments, with beds along the walls, hallways entrances only to one side where nurse station observing the activity in the ward was located. By common understanding the wards space is assigned multiple purposes. It is the meeting place for relatives, the work environment for the staff, and physical space where patients have to find a way to recover and heal. In what way has the space understanding of hospital wards have changed through history? Take a tour with me looking through the lens of historical images. Try to trace significant physical changes in the understanding of hospital wards. Can you find any?

Florence 1820-1910

Mens' Ward-London, 1860

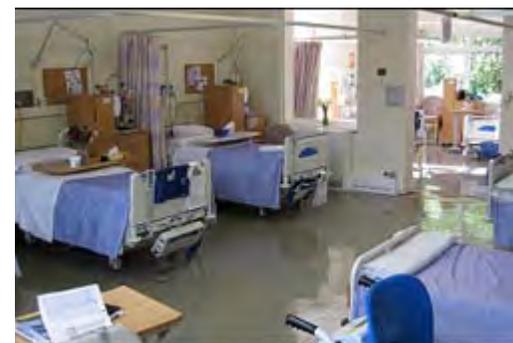Accident ward-London 1887

Birmingham 1949

Women Ward-London 1950

Women Ward- Scotland 1955

Manchester 1970

Bernham 2011

4.2   Notes on nursing- what is it, what is it not

In the year of 1898 Florance Nightingale have published a guide book in help of nursing practices in that time in London, England. Reading through them I asked myself where and why have we lost all of that knowledge gained through experience and proven to be effective through practices.

"...The following notes are by no means intended as a rule of thought by which nurses can teach themselves to nurse, still less as a manual to teach nurses to nurse. They are meant simply to give hints for thought to women who have personal charge of the health of others" [25]

" .....the very first cannon of nursing, the first and the last thing upon which a nurse's attention must be fixed, first essential to a patient, without which all the rest you can do for him is as nothing, with which I had almost said you may leave all the rest alone, is this: TO KEEP THE AIR HE BREATHS AS PURE AS THE EXTERNAL AIR, WITHOUT CHILLING HIM" [26]

"Where there is sun there is thought. All physiology goes to confirm this. Where is the shady side of deep valleys, there is cretinism. Where are cellars and the unsigned sides of narrow streets, there is the degeneracy and weakliness of the human race– mind and body equally degenerating. Put the pale withering plant and human being into the sun, and, if not too far gone, each will recover health and spirit." [27]

"Unnecessary noise, or noise that creates an expectation in the mind, is that which hurts a patient. It is rarely the loudness of the noise, the effect upon the organ of the ear itself, which appears to affect the sick. How well a patient will generally bear, the putting up of a scaffolding close to the house, when he cannot bear the talking, still less the whispering, especially if it be of a familiar voice, outside his door." [28]

"The effect in sickness of beautiful objects, of variety of objects, and especially of brilliancy of colour is hardly at all appreciated. People say the effect is only on the mind. It is no such thing. The effect is on the body, too. Little as we know about the way in which we are affected by form, by colour, and light, we do know this, that they have an actual physical effect." [29]

"Irresolution is what all patients most dread. Rather than meet this in others, they will collect all their data, and make up their minds for themselves. A change of mind in others, whether it is regarding an operation, or re-writing a letter, always injures the patient more than the being called upon to make up his mind to the most dreaded or difficult decision. Farther than this, in very many cases, the imagination in disease is far more active and vivid than it is in health. If you propose to the patient change of air to one place one hour, and to another the next, he has, in each case, immediately constituted himself in imagination the tenant of the place, gone over the whole premises in idea, and you have tired him as much by displacing his imagination, as if you had actually carried him over both places." [30]

"Conciseness and decision in your movements, as well as your words, are necessary in the sick room, as necessary as absence of hurry and bustle. To possess yourself entirely will ensure you from either failing--either loitering or hurrying." [31]

"The effect of music upon the sick has been scarcely at all noticed. In fact, its expensiveness, as it is now, makes any general application of it quite out of the question. I will only remark here, that wind instruments, including the human voice, and stringed instruments, capable of continuous sound, have generally a beneficent effect--while the piano-forte, with such instruments as have _no_ continuity of sound, has just the reverse. The finest piano-forte playing will damage the sick, while an air, like "Home, sweet home," or "Assisa a pie d'un salice," on the most ordinary grinding organ, will sensibly soothe them--and this quite independent of association." [32]

4.3 Heling Evidence based design principles applied in hospital architecture spaces

Mercy Hospital, Springfield, IL, 2008

"The new Children's Hospital, designed through a collaboration with the Children's Advisory Board made up of patients ages 11-18 from diverse populations. These children have spent more time than any child should have to, battling for their life in hospital settings." [33] Children Memorial Hospital, Chicago, IL, USA

Children Hospital -Chicago

Children Hospital -Chicago

It is inspiring for me as architect-designer in a process of learning to reflect on such design solution in children hospital settings. The artistic design approach brushes off the sterility of the hospital, transforming it in to a recreational place for the youngsters. Visual images, light and sound features allow for imaginary play for the young patients. It is a naturally accepted child distraction shifting their attention from the procedures they undergo to something more familiar and pleasant.

The importance of daylight, visual contact with the outside helps keeping touch with reality and account for time. Color, visual pleasing materials, natural forms are all elements used in a process of creating comfort and allowing the users of the space to feel in ease. Common spaces for meeting relatives outside of the patient room borders are important for the possibility of the treated to move, walk and change environment. That helps for better blood flow, lowers their anxiety, minimizes stress, and distracts them in positive way.

Lurie Children's Hospital,Chicago, IL 2009

4.3 Heling Evidence based design principles applied in hospital architecture spaces

"……..proactive, evidence based design is an important growing trend in healthcare .
Numerous are the reasons for such growth:
  • The need to replace aging facilities
  • A competitive marketplace for healthcare services
  • The need to improve staff and material flow to achieve operational efficiencies
  • The ability to accommodate technological advances
  • Consumer demand for privacy and family-centered care
  • The need to reduce preventable hospital acquired injuries and infections" [34]

Looking at the points above it seems there are quite many angles to the problem of healthcare facilities. One, can be feeling of strong institutionalization, and structural hierarchy. Another can be pointed towards the diminished or in some cases lost social communication between professionals, researchers and patients. Third can be the barriers which physical existing hospital structure creates and their effect on the users' life and practice. As it seems the scope for improvement is quite wide. The images presented below show how could EBD principles be implemented and support architectural choices for better healing environments. Consideration of colors, materials, forms and sizes, along with space relations, light, air circulation were part of the presented examples.

Proton therapy Children Hospital- Philadelphia



Hospital Restaurant - Philadelphia

University of Iowa Children Hospital

Pediatric Clinic -Chicago

34. McCullough, 2011

4.4 ICU design- Foothills medical centre, Canada

Architectural interventions in hospital environment are structurally classified by their purpose in achieving certain sustainable aspect. In the last years popular discussion topic has been the green design of hospitals in relation to their overall footprint. Main focuses – questions such as energy efficiency, water consumption, waste treatment, surrounding lands locking and so on. The core of the presented architectural solutions in the ICU in Foothill however have added a couple extra goals for its new building. Combining already emphasized EBD research related to healing environment principles, and PCC philosophy it had set to create patient and family centered care. Intertwining physical and social factors supports the advancement of new cooperative ideas structured around goals such as: deliver a hospital design which will allow the architectural elements and design aesthetics to become active part of the healing environment; supporting and promoting patient centered care; reducing stress factors; enhance safety for patient and staff; and improve the overall vision of hospitalization.
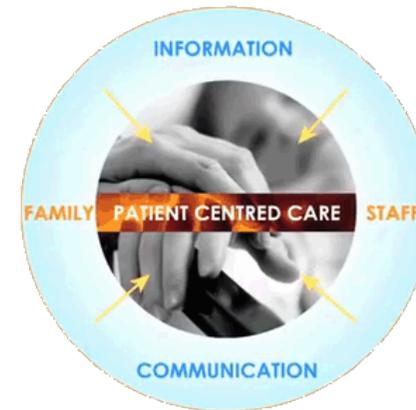
Decentralized nurse station

Maximal use of corridor space

Relatives common waiting area

4.5 Ubuntu- " I exist as a result of your existence, we create each other together"

Cognitive psychology development has opened a new door of understanding neuro-science and evaluating the healing power of emotions. The hospitalized and the staff participation could be a valuable source in the search for answering questions such as: the extent to which institutionalized hospitals with respect to their architectural characteristics have affected the healing process, and employees' professional performance. Hospitals on their own are structured as a city, understanding their social configuration will be vital for my work. Current interest is directed towards achieving the balance in the mind, body and spirit in treatments of humans. Hospitals are unique in their structure and functions, and for the past couple of years a diverse association of the well being of the person, based on selected professional elements strong enough to become the leverage points in the change of care, has been developed around the globe.

It is a practice today to address the one being treated by a room number, when the staff discusses their conditions. Such practice implemented to protect ones' privacy is the smallest example of a chain hospital institutionalized culture by which the human is leveled to the state of patient. Thus the hospital stresses the absolute importance of the actions directed towards physical healing processes. According to Cambridge dictionary patient is *"someone who is being treated by a doctor, nurse, etc".*[35] What is missing in the definition is clarification of what has been treated, and it seems that majority of hospitals are operating under the presumption of heeling the body. Without accounting for the whole body, mind and spirit the health practice will continue to stumble upon simple questions such as where the person perspective is, what is the individual side of the health process and how am I responsible for my own health. Patient Centered Care in that matter is still only directed towards healing the biological problem, and looks at the one in need as human matter buried down in a sick body. The responsibility ac-

quired in that case is for the body material, while the human side is often disregarded. What Person Centered Care is aiming for is simple: switch of perceptions, understand and focus on the human who in its complexity is caring certain unhealthy conditions.

"Ubuntu" is a collaboration between the Center for Person Centered Care at Gothenburg University- GPCC, Salgrenska University Hospital-Gothenburg, the Röhsska Museum of Fashion Design and Decorative Arts- Gothenburg. As such its final result was a interactive exhibition set located at Salgrenska hospital. The personnel could walk and participate in a discussions concerning the essential difference in the patient versus person oriented practice and care.

"If you consider time in helathcare it is also very routine" [36]

" ..the clock is always chasing you but at the same time routines are good and the clock is useful for planning your day." [37]

35. http://dictionary.reference.com/browse/Hospital

36, 37. http://www.youtube.com/watch?v=LUM8iDAdN_4

" .....you must look at the patient as a person not an object that you just care for......" [38]

" .....involve the patient in their own care and all the decisions
that need to be made....." [39]

" .....they must participate in order to get a better life afterwards....." [40]

" ....what weight the most to create a balance when two people meet....." [41]

" .....power, hope, passion, culture, empathy....." [42]

" .....listen seems to be so small but powerful, and language as well
how do we express ourselves....." [43]
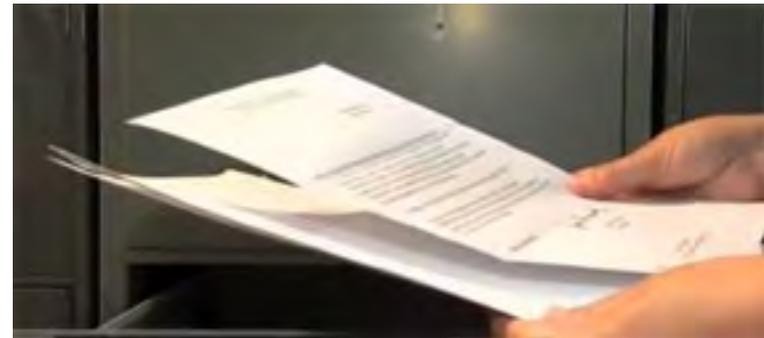
" .....all patients you see are a persons with resources and background...." [44]

" .....they have their own story which you really need to get to know...." [45]

" .....as patient in a care environment you often feel very reduced...." [46]
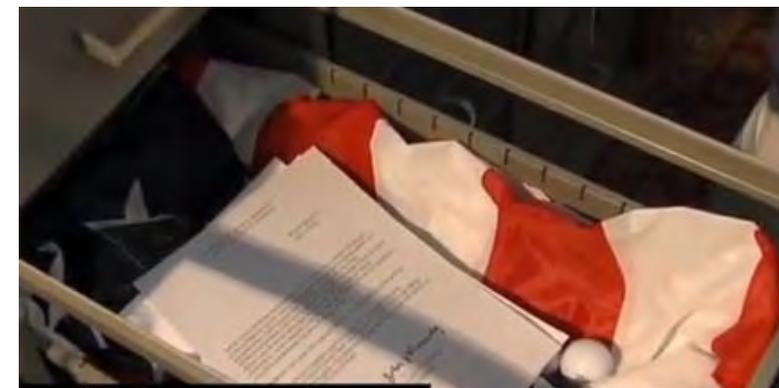
" ....you loose your identity that can say anything about you...." [47]

" ..you get dressed in a hospital robe and you don't have any personal
belongings around you...." [48]

PERSONAL REFLECTION

Starting the master thesis with the clear idea of what kind of a building design I was interested in could be considered as advantage in this particular study. However what I have intended to discover and present was influenced and modified in numerous ways by the end of the learning process. My initial thoughts of designing a patient ward based on the principles of EBD took on a new meaning thanks to two additional studies: PCC and work space syntax. Given the chance to gain a firsthand information right at the place of work, helped me to put a realistic perspective to all the theoretical studies. Major part of what the design proposal reflects is based on a conclusions build upon information gained through the study visits, observations, interviews, and questionnaires. It would be a misrepresentation to state that the theoretical knowledge did not play an essential part in the design process. However I considered it the fundamental base to which I could refer in the search and learn process. Collaborating with number of facilities gave me the opportunity to understand various working philosophies and compare the design outcomes based on decisions given a selected number of prioritized principles. Combining all of it: the theory, the impressions, the reflections on interviews and the statements of employees and patients had created a wider range of factors to consider when space planning for the new floor plans.

In the context of the main theme-healing environment, it is imperative for me to say that today I view Person Centered Care and Evidence Based Design as two complimenting each other principles with the same initial goal. Collaborative approach complimenting PCC supported architectural interventions and EBD principles have already introduced a new professional practice into the healthcare culture, improved the human experience of the healing process and supported better overall healing results. Such set of goals is a fundamental part in hospital architecture which is coming to grips with the need not only for durable building packages but for overall social sustainable practices.

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trust concerns may belive listen universal needs profit give

comfort patient make give help food private universal attend services belive

drug paying provide afford making something need conditions

available conditions first new way one industry health able

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